Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Thru Section 2.0
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
1	Preface; pg. 2	Clarification. Revision Record Table. Column 5. Please clarify what is meant by "Project Configuration Version?" No action requested. Provide intent.	This is a designation that is part of the TMM Document Control Process.
2	Cover letter	RGU Note. Cover Letter. The public review Scoping EAW will not have a cover letter of this type. Information presented may or may not be reflected in future documentation. No action requested.	Comment is noted. TMM is choosing not to resubmit the cover letter.
3	Cover letter; 2nd paragraph	Correction. Last sentence. The statement "If permitted this would be the first underground mining operation" is incorrect. Add "non-ferrous" and it would be correct. Action requested: Text correction.	Comment is noted. TMM is choosing not to resubmit the cover letter.
4	Cover letter; 2nd paragraph	Clarification. Last sentence. This article (https://www.minnpost.com/mnopedia/2016/04/very-brief-history-mining-cuyuna-iron-range/) states that the Armor #2 Mine near Crosby was the last operating underground mine to close (also in 1967). There may be other statements in conflict if one searched more sites. Action requested: For accuracy confirm and revise as necessary.	Comment is noted. TMM is choosing not to resubmit the cover letter.
5	Cover letter; 5th paragraph	Clarification. Text includes statement regarding 11 operating mines. Action requested: Provide citation and clarify if they were operating at the same time or otherwise.	Comment is noted. TMM is choosing not to resubmit the cover letter.
6	Cover letter; 5th paragraph	Clarification. RGU notes the project is within the BWCAW watershed, and thus the statement about outside the Wilderness could be confusing. Action requested: Revise by noting outside the BWCAW but within the watershed to improve accuracy.	Comment is noted. TMM is choosing not to resubmit the cover letter.
7	Cover letter; pg. 2	Correction. Top of page; last sentence. The formation is the Duluth Complex, not the Duluth Mineral Complex. Appears to only use in document. Action requested: Text correction.	Comment is noted. TMM is choosing not to resubmit the cover letter.
8	Cover letter; pg. 2; bullet list	Note. Bullet list; numbers 1 & 5. Statements regarding specific percentages of reduction in footprint or impacts cannot be verified without the previous mine plans. Absent this and other information, such assertions are speculative. RGU reserves judgment as to relevance for disclosure in future documentation. No action requested.	Comment is noted. TMM is choosing not to resubmit the cover letter.
9	Cover letter; pg. 2; bullet list	Future information request. Bullet list; number 2. Kinetic testing is required to state tailings would not produce ARD (or AMD). DNR will need to review this data and evaluate if the assertion is supported. No action requested. DNR will be making a specific request for the data.	Comment is noted. TMM is choosing not to resubmit the cover letter.

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10	Cover letter; pg. 2; bullet list	Note. Bullet list; number 8. Regarding assertion that "no waste rock stored on the surface." The assertion is correct however the RGU notes the project proposes to handle rock with sulfide mineralization during construction and classify this as ore, which would be temporarily stockpiled on the surface at the temporary rock storage facility. No action requested.	Comment is noted. TMM is choosing not to resubmit the cover letter.
11	xiii	Glossary; acid rock drainage. Definition asserts ARD always contains both metals and sulfate. Action requested: Confirm proposed definition or remove statement.	The ARD definition within the glossary is from the GARD guide glossary produced by the International Network for Acid Prevention. It is consistent with the glossary definition of ARD in the Twin Metals Minnesota Mine Materials Characterization Program Volume 1. TMM's use is consistent with the GARD guide definition – low pH, presence of sulfate and metals.
12	xiv	Glossary; closure. Closure is defined in Minns Rules part 6132.0100, subp. 6. Action requested: Add reference to Minnesota Rules in the text.	Text has been edited to read: "Closure begins when, as prescribed in the Permit to Mine, there would be no renewed use or activity by the permittee and is defined in Minnesota R., part 6132.0100, subpart 6."
13	xv	Glossary; construction stormwater. Because instances may be present where constituent loading occurs to construction water that requires additional management, the definition should be modified to reflect this potential situation. Action requested: Modify text to read: "Construction stormwater: direct precipitation or stormwater that has contacted surfaces disturbed by construction that could have increased constituent loading."	See Comment 181.
14	xv	Glossary; contact water. Note on water management classifications and definitions. It will be necessary to consider implications of definitions of the various types of water in terms of regulatory definitions. This can be a source of confusion. RGU- and regulatory-approved defintions for the EIS and any subsequent permitting will need to not only make sense for describing the project but must also align with language and definitions in permits. Will require future consultation. No action requested.	See Comment 71.
15	xv	Glossary; contamination. More precisely "contamination" implies the presence of physical, chemical, biological, or radiological elements at concentrations above regulatory standards. Action requested: Revise as necessary.	This glossary is intended to help a wide audience understand how TMM is using terms within this document. Generic or plain language is used in some cases. These are not intended to be legal or regulatory definitions, nor are they intended to encompass or resolve the comprehensive and differing definitions and interpretations that can be found in federal, state, and local law and rule. Regulatory definitions can be adopted in TMM documentation after agency engagement on definitions is complete. Documents requested by the state that aim to satisfy EIS- and permitting-level analysis will adopt regulatory language as required.
16	xv	Glossary; corehole. Action requested: Provide definition of corehole. See Line 3143.	Glossary revised: "corehole: A hole drilled in bedrock to retrieve a core sample."
17	xvi	Glossary; dam. The text provided is not the "state" definition of a dam. Action requested: See Minn. Rules part 6115.0320, subp. 5, for the definition of a dam under the rules. Modify text to accommodate this definition.	Text has been edited to read: "Dam: A structure that impounds water and is defined in Minnesota Rules Chapter 6115.0320, Subpart 5."

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18	xvi	Glossary; dry stack facility. The proposed definition for use describing the project states: "…a dry stack facility does not require a dam or berm." For this definition to apply as listed, the facility would have no berm (i.e., that creates slope to contain the tailings). Action requested: Confirm no berm is proposed at the dry stack facility.	No berm is proposed at the dry stack facility, definition has been edited to read: "Since the tailings would be filtered and the majority of water is removed, a dry stack facility does not require a dam." Additionally, see Comment 155 as to why buttressing is not required for the design.
19	xvi	Glossary; dry stack facility. For the purposes of the EIS, the definition should better describe the actual proposed facility in more detail, not expressly focusing on its function or how it is constructed. Action requested: Modify text.	Glossary is meant to introduce terms at a high level. The dry stack facility is explained in detail in the text (see lines 843-872 for construction and lines 933-990 for layout and operations). Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details on the dry stack facility and operating details of the dry stack facility.
20	xvi	Glossary; development rock. Text identifies the definition of development rock as "sulfide barren." No rock is devoid of sulfur. The mine materials characterization plan is intended to address the appropriate cut-off of rock reactivity that could be used for construction. Action requested: Modify definitions accordingly and use consistently throughout the document.	See Comment 42 as it describes how development rock glossary text has been changed.
21	xviii	Glossary; gravity concentration circuit. Text reads: "…used to recover dense minerals and produce gravity concentrate." Greater consistency with the definition of the flotation circuit would include a reference to the target metals. Such text might read: "...used to recover targeted metals, including platinum, palladium, and gold to produce gravity concentrate. Requested action: Review recommended text for accuracy, revise if necessary, and adopt.	Text has been edited to read: "gravity concentration circuit: Process circuit within the comminution circuit used to recover targeted metals, including platinum, palladium, and gold to produce gravity concentrate. The gravity concentration circuit uses the differences in the density of the gold, platinum, and palladium minerals to separate these denser minerals from the remaining minerals." Definition of concentrator has also been corrected to read: "concentrator: A subset of the process related to recovery of the target metals. The concentrator would include grinding, gravity concentration, flotation, concentrate dewatering, concentrate storage and loadout, and reagent makeup. The concentrator would be located at the plant site."
22	xix	Glossary; mine supply water. Add definition for mine supply water to glossary. Action requested: Add the definition.	Text has been edited to read: "mine supply water: Water that would be pumped underground and used for dust suppression and equipment requirements like drill water."

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23	xxi	Glossary; ore. The proposed definition for ore lists production of three concentrates. To be consistent with the definitions of the flotation circuit and gravity circuit respectively, consider adding phrase: "…through the concentrator to recover targeted metals into three concentrates, two from flotation and one from gravity. Ore is found..." Action requested: Review recommended text for accuracy, revise if necessary, and adopt.	Text has been edited to read: "ore: Rock that contains the targeted metals which would be processed by TMM through the concentrator to recover targeted metals into three concentrates, two from flotation and one from gravity. Ore is found in the basal mineralized zone of the Maturi deposit." Additionally glossary had been expanded to include definition of concentrate, copper concentrate, gravity concentrate, and nickel concentrate. "concentrate: Concentrates would be the end products of the TMM project. These concentrates would contain the minerals that would be separated from rock in the mine. TMM's concentrates would be produced either through the flotation process or the gravity concentration process and would be sold on a global market." "copper concentrate: The first flotation product that would recover copper, gold, silver, platinum, and palladium while minimizing the amount of nickel and cobalt recovered." "gravity concentrate: The product of the gravity concentration circuit that would target the recovery of platinum, palladium, and gold. "nickel concentrate: The second flotation product that would recover nickel, cobalt, the remaining copper, platinum, palladium, gold, silver, and the remaining sulfides."
24	xxi	Glossary; overflow ore stockpile and pre-operational ore stockpile. From comment at text at Lines 605-605. Action requested: Modify text to make distinction clearer. May need to refine definitions in the glossary.	Overflow ore stockpile and pre-operational ore stockpile are two different ore stockpiles that would exist at different times on the footprint of the temporary rock storage facility. See lines 628-658.
25	xxii	Glossary; proposed action and proposed project. Outside each respective definition, the term "proposed action" is used three times in the document while "proposed project" is used once. The use of these terms in the text have a specific context in NEPA and MEPA respectively, with the term "Project" referring to the Twin Metals Minnesota Project subject to the EIS. Action requested: For the definitions for "proposed action" and "proposed project" respectively, add the NEPA and/or MEPA qualifying language to better distinguish between the two.	See Comment 15. The term "proposed action" only occurs within the glossary and the term "proposed project" only occurs within the glossary and an explanation of cumulative potential effects.
26	xxii	Glossary; reclamation. The reclamation definition seems to combine too much (or possibly combined two definitions). Reclamation definition goes beyond what is outlined in Minn. Rules part 6130, subp. 29, but references Minn. Rules parts 6132.2000 to 6131.3200. Action requested: Revise in line with rules and then ensure consistent use throughout document.	Text has been edited to read: "reclamation: Activities that successfully accomplish the requirements of Minnesota Rules, parts 6132.2000 to 6132.3200. Actions intended to return the land surface to an equivalent undisturbed condition. When the objective of reclamation is to return the land to pre-mining conditions and uses, it is sometimes called restoration." Minn. R. 6130 and 6131 would not be applicable to the Project.
27	xxii	Glossary; reclamation stockpile. From comment at Lines 826-828. Add definition for mine reclamation stockpile to glossary. Action requested: Add term to glossary.	Text has been added to glossary: "reclamation stockpile: stockpile of material suitable as a growth medium such as topsoil and peat for reclamation. Material would be stripped and stored during clearing and construction of the Project."

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28	xxiv	Glossary; temporary rock storage facility. RGU notes that although the proposed definition is correct, it could be written to be more specific and understandable. Proposed text: "temporary rock storage facility: Physical infrastructure on which the pre-operational ore stockpile, and the overflow ore stockpile in operations, would be located. It is a lined facility at the plant site that would convey precipitation to the central contact water pond." Action requested: Review recommended text for accuracy, revise if necessary, and adopt.	Text had been edited to read: "temporary rock storage facility: Physical infrastructure on which the pre- operational ore stockpile, and the overflow ore stockpile in operations, would be located. It is a lined facility at the plant site that would convey precipitation to the central contact water pond."
29	xxv	Glossary; waste rock. From text at Lines 253-255. Would the sulfur content of waste rock be S% > 0% and less than the ore grade cut-off? Action requested: Please confirm and state more directly. Apply any clarifications to the glossary definition.	Text was edited to read: "waste rock: Rock mined during operations from the basal mineralized zone below the targeted cut-off grade that would be managed underground and placed in mined out stopes for permanent storage." From the basal mineralized zone was added to convey that TMM anticipates waste rock to have sulfide mineralization.
30	xxv	Glossary; wetlands. Wetland delineation definition does not include enough specificity. Add that it also differentiates between types of wetlands. Action requested: Revise as needed.	See Comment 15.
31	xxv	Glossary; Wetland Conservation Act. Definition should note WCA has been amended since 2000. Action requested: Update definition.	Text has been edited to read: "This act was passed into law in 1991 (and amended in 1993, 1994, 1996, and 2000, and 2009)..."
32	9-11	RGU note. The term "preliminary" is applied to a number of designs and locations. This is appropriate at this stage however the public review Scoping EAW will evaluate the Project proposed by TMM. Because the MEPA review per se results in no final governmental actions, it is possible for project features to change over the course of the EIS. Therefore, information presented at this time may or may not be reflected in future documentation. No action requested.	Comment is noted.
33	13-14	RGU note. This document is not really intended to "provide information needed for the environmental review and permitting process." This characterization appears inconsistent with language on document purpose on lines 16-19 and 32-35. A more accurate statement might read: "The purpose of this document is to provide necessary information for the environmental review of the Project." Action requested: Review recommended text for accuracy, revise if necessary, and adopt.	Text has been edited to read: "The purpose of this document is to provide necessary information for the environmental review of the Project."
34	64-66	Clarification. This text indicates information will come from different sources, some of which is publicly available and some of which is newly developed by Twin Metals Minnesota. For example, presumably the analysis involves ore processing information that is not generally public. A clearer statement might read: "This SEAW data submittal uses information from a number of sources, some of which is publicly available with other information, for example, being data acquired by TMM that is summarized to supplement the assessment. Beyond what's presented in the data submittal, additional work and data collection is ongoing and reflected in the sections on future scope." Action requested: Review recommended text for accuracy, revise if necessary, and adopt.	Text edited to read: "This SEAW data submittal uses information from a number of sources, some of which is publicly available with other information being data acquired by TMM that is summarized to supplement the assessment. Beyond what is presented in the data submittal, additional work and data collection is ongoing and reflected in the sections on Future Scope."

Twin Metals Minnesota EIS
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Comment Tracking Table - Section 3.0 Background
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

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35	152	RGU note. Project locations with section, township, and range information will be verified by agency staff. No action requested.	Comment is noted.
36	210-211	Clarification. The sentence identifies that three products would be created, a "copper concentrate, nickel concentrate, and gravity concentrate." Because the metallic character of the copper and nickel concentrates are captured in their name, a consistent approach would do the same for the gravity concentrate. Action requested: Suggested text might read: "...produce three products, copper concentrate, nickel concentrate, and a gravity concentrate targeting platinum, palladium, and gold." Alternative language might also be: "...platinum group metal gravity concentrate." Action requested: Review recommended text for accuracy, revise if necessary, and adopt.	Glossary definition revised in response to Comment 21. Additionally the targeted minerals of gravity concentrate are explained on line 672.
37	221-222	Clarification. If understood correctly it appears gravity concentrate is where all metals except copper and nickel would collect during processing. If correct, the gravity concentrate definition on page xviii could be improved by stating that. Action requested: If accurate, consider potential application in the glossary definition.	Glossary definition revised in response to Comment 21. Additionally, platinum, palladium, and gold are "floatable" and do report to the copper concentrate and the nickel concentrate if those metals are not captured as a part of the gravity concentration circuit (which occurs before flotation in the process). What metals report to what concentrates is detailed in lines 668-673.
38	224	Clarification. Comment also refers to Table 3-2. Question: Is the Q3 Yr-3 projected start of construction independent of when all permits and approvals would have been secured? In other words, is it possible for the construction phase to commence in Q1, Q2, or Q4 of Yr-3? Action requested: Confirm and clarify, with any further RGU recommendations predicated on the response.	Text has been edited to read: "The construction phase would occur during a 30-month period from Q3 Year -3 to Q4 Year -1 (note that in the Project schedule quarters refers to a 3 month unit of time and not to a specific calendar quarter)." As Q3 corresponds to a 3 month unit of time and not to a specific calendar quarter construction could commence in any of the calendar quarters during YR -3.
39	231	Clarification. Use "progressive" instead of "concurrent" to match the language used in Minn. Rules Chapter 6132. Action requested: Text substitution.	See Comment 15.
40	238-241	Clarification. The intent of post-closure maintenance and monitoring is not clear. Would it be the plan that a complete release would be the goal at the end pursuant to Minn. Rules part 6132.4800, subp. 3? Action requested: Modify text to match project intent with this provision in Minnesota Rules.	Text added to read: "The end of this phase would be marked by completing all applicable maintenance and monitoring requirements set forth in federal or state surface authorizations, mineral leases, permits, and applicable land management plans after which TMM would submit a request for release from applicable authorizations, such as the Permit to Mine."
41	242	Clarification. The document makes no reference to lower grade or "lean" ore. Action requested: Confirm that there is no plan to have lean ore. If the answer is "yes, there would be lean ore," then propose supplemental text to describe the situation.	There is no plan to have "lean ore." All ore brought to the surface would be processed through the concentrator.

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42	248	Clarification. The text identifies the definition of development rock as "sulfide barren." No rock is devoid of sulfur. The mine materials characterization plan is intended to address the appropriate cut-off of rock reactivity that could be used for construction. Action requested: Modify definitions accordingly and use consistently throughout the document. See also glossary definition.	Glossary definition for development rock was edited to: "development rock: Development rock is mined when mine development would occur underground but outside the basal mineralized zone. It would be used for construction aggregate and would be mined during the construction of the declines and ventilation raises, and periodically throughout the Project." Description of development rock in line 248 removed "sulfide barren" and clarified that hanging wall is outside of the basal mineralized zone.
43	253-255	Question: Would the sulfur content of waste rock be S% > 0% and less than the ore grade cut-off? Action requested: Please confirm and state more directly. Apply any clarifications to the glossary definition.	See Comment 29. In addition to updating the glossary definition, the description of waste rock in line 253-255 was clarified to state that waste rock is expected to be rock from the basal mineralized zone which has sulfide mineralization.
44	253-255	Clarification. The definitions of the types of rock should be aligned with the definition of waste rock in Minn. Rules part 6132.0100, subp. 34. For example, development rock would be a sub-category of waste rock. Action requested: Review the cited rule and modify, as needed, the Project definitions to match the rule. This will introduce clarity into both the EIS and permitting.	In the Mine Material Characterization Program volumes, TMM states that within the Mine Material Characterization Program that TMM will be aligned with Minn. R. definition of waste rock. Consistent with the response to Comment 15, the description of waste rock is intended to help a wide audience understand how TMM is using terms within this document. Generic or plain language is used in some cases. These are not intended to be legal or regulatory definitions, nor are they intended to encompass or resolve the comprehensive and differing definitions and interpretations that can be found in federal, state, and local law and rule. Regulatory definitions can be adopted in TMM documentation after agency engagement on definitions is complete. Documents requested by the state that aim to satisfy EIS- and permitting-level analysis will adopt regulatory language as required.
45	264	Clarification. The text indicates the "cut-off point" would be determined as mined rock would be monitored and tested during construction of the mine declines and ventilation raises. Best mining practice would suggest the "cut-off point" be determined ahead of time. Testing at the time of construction would then be used to determine which rock exceeds sulfide mineralization criteria and that which does not (e.g., development vs waste rock vs ore). No action requested but anticipate further discussion as it may be beneficial in development of later information submittals.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
46	264	Clarification. The description would benefit from some additional detail on "monitoring and testing" proposed to assess the cut-off point. Action requested: Provide additional detail on proposed monitoring and testing. Anticipate further discussion as it may be beneficial in development of later information submittals.	TMM intends to work with the MDNR through the development of the Mine Materials Characterization Program to define the details on the monitoring and testing required.
47	268	Clarification. Ore mined during construction would be placed on a temporary stockpile. How long is temporary? Action requested: Provide some temporal definition to the term "temporary" in the document text.	See lines 636-644. Temporary in this context would be a maximum of four. Two years during the construction phase and two years during the operations phase. "The pre-operational ore stockpile would be consumed through the process within the first two years of operations."

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48	268	Clarification. The text identifies a number of project features in place during operations but does not mention the temporary surface crushing facility. This is identified in Figure 3-9 as well as in later text. The document should identify how this would work at the appropriate place? Are there impact avoidance features in the proposed design (e.g., containment of materials and dust; covered facility, or other features)? Action requested: Address the item and modify text as appropriate.	In Pre-Operation Ore Stockpile text has been added to read: "BMPs such as water sprays to control dust and the containment of materials at the temporary rock crushing facility would be included."
49	269-271	Clarification. The text is unclear as to where the collected contact water reports until the commissioning of the plant? Action requested: Provide clarification on the point and revise the text as needed.	Text has been edited to read: "The temporary rock storage facility is a lined facility designed with ditching to direct flow of stormwater to the central contact water pond where it is collected and stored until use in the processing circuit during commissioning and operations. The collected stormwater in the central contact water pond may be used underground as necessary (e.g. drilling water)." Contact water at the site would be collected at the central contact water pond and may be used underground during operations. The rest would be stored for use as make-up water that would be utilized once the concentrator is commissioned, the process water pond could also be used to store this water until the start of operations. This storage capacity is based on a preliminary water balance. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water management and design or construction details of water management features.
50	273	Usage. This text represents one of several instances where consistency across rock terms is needed. All rock is either ore or waste rock, with waste rock then being further classified as, for example, development or construction rock. Action requested: Please clarify the text consistent with rock definitions in Minn. Rules part 6132.0100, subp. 34.	See Comment 44
51	273	Clarification. During construction, a rock containing sulfides would not be classified as waste rock because it has a lower grade of sulfides than low-grade ore. Is it not still a sulfide bearing waste rock? Action requested: Respond to query and modify text as warranted.	See lines 265-269 and 281-284. Any material brought to surface with sulfide mineralization would be considered ore and processed through the concentrator.
52	273-275	Clarification. The fate of rock placed on the temporary storage facility is unclear. Does this mean that all of the rock placed on the temporary pile would be processed once operations begins? Action requested: Confirm that the cut-off grade changes between construction and operations. Modify text as needed to address the fate of rock placed on the temporary pile.	See lines 265-269 and 281-284. Any material brought to surface with sulfide mineralization would be considered ore and processed through the concentrator. The cut-off grade does change between construction and operations.
53	274-275	Question. Is it correct that during construction, rock is either barren or has sulfide mineralization, and if so, then would be ore (thus not dependent on cut-off grade, but on whether there is sulfide mineralization)? Action requested: Provide clarification and modify text so this is clear.	See lines 265-269 and 281-284. Any material brought to surface with sulfide mineralization would be considered ore and processed through the concentrator. The cut-off grade does change between construction and operations.

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54	276	Clarification. Will there be both pre-operational ore and actual ore onsite at the same time, and if yes, how would this rock be managed? Has storage capacity been estimated and addressed in the design? Action requested: Address the item and modify text as warranted.	See Comment 99 for a detailed response. During start up and the first 2 years of operation, there will be ore conveyed to surface and added to the coarse or stockpile that then feeds the concentrator. The pre-operational ore stockpile is processed at this same time and is reclaimed from the pre-operational ore stockpile and fed to the coarse ore stockpile where it would be mixed with ore that was currently being mined.
55	278-279	Question: Is there sufficient capacity underground during construction as drifts are excavated and before stopes are created? Action requested: Address the item and modify text as appropriate.	The referenced lines refer to the operation phase. Capacity would be created and the underground mine could start accepting engineered tailings backfill within approximately six months after mining starts. Waste rock as necessary could also be added to mined out stopes in that same time period before engineered tailings backfill is added. Additionally, refer to lines 263-275 for the treatment of rock brought to surface during the construction phase.
56	277-278	Clarification. Lines 250-251 state that there may be development or "construction" rock generated during operations. Does this align with this text? Action requested: Confirm and clarify text as warranted.	Development rock would be mined periodically throughout the project. See lines 281-284. "At no point in time throughout the construction or operation phases would waste rock be transported to the surface; rock transported to surface would either be classified as ore (and processed through the concentrator) or development rock (and used as construction aggregate)."
57	281	RGU note. It would simplify and add clarity to simply state: "At no time would waste rock be brought to the surface," if it is assumed the current definition of waste rock remains. Action requested: Consider text revision once rock definitions are settled.	Text has been edited to read: "At no time would waste rock be brought to the surface"
58	281	Clarification. The text states no waste rock will be transported to the surface. When tunneling into the basal unit and encountering low grade ore (waste rock), where would it be placed if it cannot be transported to the surface? Action requested: Amend text as appropriate to address comment.	If low grade ore was encountered during construction it would be transferred to the pre-operational ore stockpile and processed through the concentrator as ore. See lines 263-275.
59	281-284	Clarification. As noted previously, by definition in Minnesota Rules, this rock is waste. Action requested: Please clarify the text is consistent with rock definitions in Minn. Rules part 6132.0100, subp. 34.	See Comment 44.
60	281-284	Clarification. Rock that would be transported to the surface during construction would be considered waste rock during the operational phase. Action requested: Consider eliminating the statement "that no waste rock will be transported to the surface during construction and operational phases."	See Comment 57.
61	285-288	Clarification. The section appropriately has a focus on ARD potentials. Are there other non-targeted metals (such as arsenic or similar) or other compounds in tailings? Action requested: Address the item and modify text as appropriate.	Text has been edited to read: "Metal leaching (ML) potential of the tailings is currently being analyzed through kinetic testing as summarized in Section 5.1.3." Additionally the definition of tailings has been edited in the glossary to read: "tailings: Tailings are the leftover finely ground (milled) ore after the desired minerals have been physically separated and removed."

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62	285-288	Information need. Further information is needed to confirm that potential ARD from waste rock stockpiles and tailings is avoided. Pre-construction, ore would be on the surface for a period of before it is processed and could produce ARD. There is also no detail on what could become low grade pre-operational ore, which cannot be processed, and may need to be disposed of. For tailings, additional information is needed to demonstrate 0.2% S tailings would not produce AMD. Action requested: Consider eliminating the statement that the potential for ARD has been avoided recognizing this will be an issue receiving detailed treatment in the EIS. Another approach is to identify "preliminary analysis suggests that...; see Sections 5.1.3 and 5.3" or similar.	Text has been edited as requested to include: "Preliminary analysis suggests that through the design of the Project and the rock management strategy, the potential for acrid rock drainage (ARD) from the two most common ARD sources associated with mines of this type (ARD from waste rock stockpiles and ARD from tailings) has been avoided." Additionally, the end of the paragraph states that test work results are summarized in Section 5.1.3.
63	288	Clarification. The text reads: "…the Project would not have permanent waste rock stockpiles on the surface…" If there is no temporary waste rock storage, then the phrase "permanent waste rock" is not needed. Action requested: Please clarify and revise the text to be consistent with other changes to rock classification and management terminology.	Text has been edited to remove permanent, so the sentence now reads: "First, the Project would not have waste rock stockpiles on surface, due to the underground mining and processing strategy of ore, thus avoiding the potential for ARD from waste rock stockpiles on surface." This change has been applied universally to be consistent with the definition of waste rock presented in the SEAW data submittal.
64	292	Clarification. The text reads: "…the Project would recover most sulfides from the ore, producing tailings with sulfur less than 0.2% S." Whether the tailings have less than 0.2% S or produce no AMD is yet to be determined. Also to be determined is the potential for release of trace metals in neutral drainage. Action requested: Consider eliminating the statement that the potential for ARD has been avoided recognizing this will be an issue receiving detailed coverage in the EIS. Another approach is to state "preliminary analysis suggests that...; see Sections 5.1.3 and 5.3" or similar.	See Comment 62.
65	292	RGU note. Assertions from Lines 285 to 295, much of which is based on Section 5.1.3, will likely receive detailed analysis during the EIS. Information in this section will eventually be cross-referenced to its proposed treatment in the SEAW and draft scoping decision. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
66	294	Clarification. The word "concentration" is missing from this line of text: "...demonstrated that sulfur content at this to be non-acid generating (testwork results…" Action requested: Modify text to address the item by substituting "content" with "concentration."	Text has been edited to read: "...has demonstrated that sulfur concentration at this level to be non-acid generating..."
67	296	Information need. A detailed project water flow diagram will be crucial. The design flow will need to define the design storms for all of the various water holding and collection systems. For holding ponds, long duration storms will govern; but for collection systems/ditches/diversions, short-duration high-intensity storms are likely to govern the design. Various storm types will need to be evaluated. Action requested: Ensure the applicable Future Scope section(s) address the item as appropriate. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on process water flow.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
68	302-305	Clarification. To be more clear and distinguish water routing from the underground mine, it makes sense to identify the source(s) of water leaving the mine (principally mine water inflow) being routed to the plant site. The rest of the cycle involving the plant site and tailings management site would be described followed by the Birch Lake reservoir reference. Action requested: Modify text as recommended. In general, there will need to be a text description of the content of Figure 3-3 prepared.	The details of water routing from the underground mine, as well as more detail about all the flows shown on Figure 3-3 are provided in the Water Management Plan in Section 3 (starting in line 1099). Line 302 is within the Overview of the Water Management and Water Balance, while further description occurs in the Water Management Plant in Section 3 (starting line 1099).
69	302-305	RGU note. DNR will request an analysis to determine whether treatment of circulated water is needed to prevent the build-up of chemical constituents in the water, which could affect use in the processing circuit. No action requested. This will be assessed as a future information need to be identified in the proposed EIS scope.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
70	311	Project definition. The text states that stormwater and surface water "would be diverted." Would any of this diverted water be used in the process? Action requested: Modify text with sentence added at the end answering the question whether "yes" or "no" about use in the process.	Text has been edited to read: "Stormwater and surface water from outside the site would be diverted, following natural drainage patterns to the extent possible, so it does not mix with water on the site. This water would be classified as non-contact water and would not be used as a source of process water."
71	314	Definition. The definitions include construction stormwater, contact water and noncontact water, but does not include industrial stormwater. Industrial stormwater (ISW) would include stormwater that contacts any industrial activity, which differentiates it from the defined "contact water" but also would be different from the defined "noncontact" water that only seems to refer to upstream water that is diverted to prevent run-on. Conversely, it is possible that "contact water" is intended to encompass all industrial stormwater on the site? It is also noted that SDS-Industrial Stormwater Permit is listed in Item 8. Action requested: Consider the item and modify text as appropriate.	The details of water routing from the underground mine, as well as more detail about all the flows shown on Figure 3-3 are provided in the Water Management Plan in Section 3 (starting on line 1099). Text has been added stating "TMM is continuing to evaluate regulatory classification of water as construction stormwater, industrial stormwater, and wastewater. TMM will begin to use these definitions during the EIS process after engagement with agencies to improve the precision of impact analyses and inform permitting." Additionally, Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water definitions.
72	314	Regulatory guidance. Activities at the site would transition from generating construction stormwater to generating industrial stormwater. At some times these construction and industrial stormwater activities will overlap. There will need to be a plan for the transition between these two activities, which are defined and regulated differently. Action requested: Modify text to address the item. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water definitions.
73	329	Clarification. The text identifies the priority sources for process water. Requesting clarification about whether runoff from mining areas would be a source of process water? Action requested: If the answer is "yes," then modify text accordingly.	Contact water is defined in lines 317-319 and would include direct precipitation or stormwater that would potentially come in contact with ore or tailings. This contact water would be used as a process water source line 331).

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
74	350-352	Clarification. The text reads: Water from mine inflow...and water that could not be used immediately...would be stored in ponds..." It seems like process water would not be needed until the concentrator is operative, which is estimated to be at least 2 years after mine construction and dewatering starts. How will all this water be held for that time, including winter snow melt? In the ponds "across the site?" Action requested: Address the item and modify text as appropriate.	See Comment 49 for a discussion on how water is stored from the temporary rock storage facility contact area. See Comment 71 as the project has not identified industrial stormwater and is continuing to evaluation regulatory classification of water. During construction, precipitation (including snowmelt) classified as construction stormwater and non-contact water will be discharged in compliance with permits. Only contact water will be stored, and during construction the stored contact water will be used to meet construction water demand, for example for underground drilling and dust suppression. Water balance modeling will include the construction period to inform pond design for adequate capacity.
75	361	Clarification. The text indicates that the instantaneous rate of pumping would be 800 gpm. Provide an explanation on how this was determined. Action requested: Provide how this was calculated. Modify text as appropriate.	This rate was estimated using a preliminary water balance and will be updated based on water balance modeling outlined in Section 6.3.1.
76	359	Information need. Greater detail needs to be provided on the proposed appropriation Birch Lake, especially on timing and related range of volumes. Any seasonality in withdrawals needs to be understood. Action requested: Modify text to better describe proposed appropriations from Birch Lake.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water appropriations.
77	363	Clarification. The text provide a comparison to a garden hose output to provide context for understanding 800 gpm. DNR considers the typical flow rate from ½" – ¾" garden hoses ranges from 10-15 gpm. Action requested: Modify text to match this rate or provide a different example for comparison.	Text has been edited to read: "...put the withdrawal into context, 800 gallons per minute is equivalent to approximately 50 to 80 garden hoses..."
78	362	Clarification. It is possible that during periods of drought or low flow, surface water appropriations may be suspended. Other surface ponds would also likely be deficient during this time. Do plans call for the filling of secondary ponds from Birch Lake during drier conditions so that there is stored water is surface appropriations are suspended? Action requested: Provide response and modify text as appropriate.	Based on a preliminary water balance, TMM does not anticipate the need for secondary ponds during drier conditions. As the water balance is refined, design storms are detailed, and impacts are assessed the need for secondary ponds will be re-evaluated during EIS preparation and if necessary, TMM will research regulatory options for withdrawal during low flow conditions.
79	414-416	Inquiry. The text indicates that rock from drilling of the ventilations raise(s) would be handled as development rock. Question: Is it already known that the ventilation raises would not pass through any sulfide mineralized rock? If not, is it possible there could be waste rock/rock to be processed as ore brought to the surface at that time? In other words, it seems unlikely that all decline-construction-rock would be classified as developmental rock; some may be low-grade ore. Action requested: Clarify and modify text with answer.	The drilled rock would be handled in the same manner as the other rock during the construction phase. See lines 263-269. "During the construction phase, as the mine declines and ventilation raises approach the BMZ, mined rock would be monitored and tested to determine the cut-off point where sulfide mineralization begins. When sulfide mineralization begins, this would represent the “end” of the development rock. During the construction phase rock with sulfide mineralization would be handled as ore."
80	459-471	RGU note. DNR will need to understand the basis for the proposed 40:60 stope-to-pillar ratio with the project. No action requested. Future discussion item."	Comment is noted.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
81	488	Clarification. Greater detail should be provided on the ventilation raise sites, including surface infrastructure, heating requirements, propane storage, etc. Table 3-2 identifies 15 acres of total covertype conversion to accommodate the sites and roads. Action required: Supplement text with the requested detail. For example, a description of the features provided on Figure 3-4.	Text has been added to read: "To heat the mine, TMM would use propane gas-fired air heaters located on the surface at ventilation raise site 2. Fresh air would initially enter the heater station and pass through a direct-fired propane heater before being ducted to the main intake raise. A propane tank storage facility for the heater stations would be located in close proximity to both heater stations. The facility would include multiple propane tanks. Tank sizing and quantity would be determined by the contracted propane supply company and would be based on peak propane consumption for a minimum of three days." Additionally refer to Lines 402-416 for details on construction and Lines 479-488 for details on operations.
82	498-500	Clarification. Minn Rules part 6132.3200, subp. 2(4)c requires that all other equipment, facilities, and structures shall be removed and foundations razed and covered with a minimum of two feet of surface overburden. Action requested: Revise text to include the overburden requirement (including throughout document for similar occurrences).	Text has been edited to read: "During reclamation, TMM would demolish surface ventilation structures. Foundations that are above-grade or buried 0 to 2 ft (0 to 0.6 m) below grade would be broken and buried in place and covered with a minimum of two feet of surface overburden."
83	501	Clarification. Regarding non-hazardous demolition debris, it is reasonable to presume that all demolition debris would be appropriately disposed. Detail should be provided on how waste would be characterized and sorted for proper disposal (e.g., sorting any hazardous from non-hazardous). Action requested: Modify text to include the sorting methodology.	See Comment 161. It is expected that demolition waste management at the underground mine area would follow the same procedure as the plant site.
84	503-508	Additional information. The text indicates that it is expected some equipment could be left underground at closure. How will the determination be made that equipment does or does not have the potential to impact groundwater quality? Action requested: Provide additional detail and modify text accordingly. DNR takes the opportunity to note that all equipment should be planned for removal.	Text has been edited to remove equipment and re-written to read: "Underground infrastructure which has no potential to impact future groundwater quality could be left underground if it could not be economically removed and recovered." TMM takes the opportunity to note that ground support (bolting and/or shotcrete) is not intended to be removed from the mine. Reclamation and closure would be conducted pursuant to an approved plan under Minn. R. 6132.
85	508	Clarification. A criteria for proposing to leave equipment underground includes "could not be economically removed and recovered." This needs further clarity/discussion. Action requested: Please modify text to incorporate the requested information.	See Comment 84.
86	513-514	Clarification. Wouldn't workings that had been backfilled also passively fill with groundwater? Please clarify. Action requested: Modify text as warranted.	Text had been edited to read: "After removal of equipment and infrastructure from the underground workings, backfilled stopes would be allowed to passively fill with groundwater as groundwater levels progressively rise to pre-Project conditions after mine operations cease."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
87	513-514	Clarification. It appears that not all areas of the underground workings would be either backfilled with waste rock or with tailings. The text should expressly identify any areas would not be backfilled and proposed treatment in closure. Action requested: Modify text as appropriate.	As defined in the glossary, underground workings include: all underground excavations (i.e., ramps, haulage areas, drifts, stopes, and ventilation raises) beginning at the point the decline or raise goes below ground surface. The engineered tailings backfill would be used to backfill the mined out stopes. Engineered tailings backfill is not proposed for ramps, haulage areas, drifts, and ventilation raises. Engineered tailings backfilling of areas other than stopes has not been determined to be geotechnically required based on the current analysis. As stated in lines 512-515, the plan would be to allow the underground workings to passively fill with groundwater as groundwater levels progressive rise to pre-Project conditions after mine operations cease.
88	514	Clarification. DNR's preliminary understanding was there is no groundwater at mine level. Why would groundwater levels rise to pre-mine levels at closure? Action requested: Provide response.	Groundwater exists at the mine level, however at a very low hydraulic conductivity. Please refer to discussion on Description Hydrogeologic Units (lines 3282-3380) and Site-Specific Hydraulic Conductivity (lines 3381-3418) for discussion on groundwater levels.
89	516-521	Clarification. Regarding closure of the portal and upper segment of the declines, Minn Rules part 6132.3200, subp. 2 (1) requires that "Access to underground mines shall be properly sealed as approved by the commissioner and county mine inspector." Action requested: Revise text to indicate this is the proposed method, subject to approval by the DNR commissioner and the county mine inspector.	Text had been edited to read: "Once closure activities in the underground workings have been completed and approved pursuant to federal and state regulations, fill would be placed within the upper segment of the declines and at the portal as a barrier to block mine re-entry. The barrier would be covered with a granular cover layer, above which rooting soil would be placed to support revegetation of the portal area."
90	522-523	Clarification. Presume that the backfilled areas of the portals would also be monitored for potential subsidence. Action requested: Revise text as needed.	Text had been edited to read: "Post-closure maintenance would consist of vegetation monitoring and monitoring the portal, ventilation raise sites, and above first 2,000 feet of mine decline to confirm closure integrity and lack of subsidence."
91	526	Clarification. Based on this description, it would be useful and improve clarity for figure 3-1 to include a box labeled "tailings management site" surrounding the tailings dewatering, engineered tailings backfill, and the dry stack facility. Action requested: A comment is provided at Figure 3-1.	See Comment 751.
92	548	Clarification. The nomenclature of the term "temporary" as in stockpiles is potentially confusing. Generally a stockpile present throughout the life of the project should not have a "temporary" classification. Is the adjective "temporary" necessary in the name of the project feature? Action requested: Consider dropping "temporary" from the name. If there some kind of non-temporal value believed necessary, choose a different term. Modify text as appropriate.	The pre-operational ore stockpile would exist during Project construction and the first two years of Project operations. The overflow ore stockpile would exist intermittently to feed the concentrator during shutdowns of the underground mine. Use of the word "temporary" is accurate.
93	555	Clarification. Additional detail needed on above ground rock crushing conducted during the construction period and early operations. Action requested: Modify text with additional detail.	See Comment 108.
94	552-553	Clarification. Text reads that use of development rock, including crushing, would be evaluated through "testing to prove its geochemical suitability." Instead of using the term "testing" more precise to state: "…after adequate characterization to prove its geochemical suitability." Action requested: Revise text.	Text has been edited to read: "The development rock would be used as construction aggregate after adequate characterization to prove its geochemical suitability."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
95	562	Future action. As proposed the temporary rock storage facility would be lined and store pre-operational ore, and early operation ore, without any type of "enclosure" structure. The feasibility of such a measure or some other containment will likely undergo future consideration. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
96	564-567	Future action. The text identifies the rock storage facility is lined with water management features. What would be done with water collected at the temporary rock storage facility during the construction phase? Would treatment be available during construction, or would water that comes in contact with potentially AMD producing rock need to be stored until treatment is available? Action requested: Modify text to address the questions. Future discussion item.	See Comment 49.
97	570	Future action. As proposed the Project places the temporary crushing facility on the surface. The feasibility of having the pre-operational and early operational rock be crushed underground will likely undergo future consideration. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
98	572	DNR notes the importance of understanding the two-year period of surface rock crushing, especially in terms of layout, design, and staging, in order to assess the treatment of potential impacts in the EIS. No specific action requested, however next data submittal should provide particular focus for this part of the project.	Additional text has been added in response to Comment 108.
99	576	Clarification. Would "new" ore that is not from construction be added to overflow ore stock pile while the construction ore is still being managed? Action requested: Provide response and modify text as appropriate.	The pre-operational ore stockpile would be exhausted before the temporary rock storage facility is used to store ore in the ore overflow ore stockpile. The pre-operational ore stockpile and the overflow ore stockpile would not exist at the same time.
100	585-586	Clarification. Commissioning of the plant would involve some amount of processing ore. Consider when Year-1 ends and Year 1 begins. Action requested: Modify text if needed to accommodate the point. If no change needed, please explain.	Text has been added to state: "Some ore or rock may be required for commissioning individual processing circuits or mechanical completion checks, however first run-of-mine ore processed through all circuits in the concentrator and filter plant would denote the start of operations (Day 1 of Year 1) and the beginning of production ramp-up." See Figure 3-2. Commissioning and ramp-up of the concentrator begins in Q3 of Year-1 with commercial production starting at the end of Q2 of Year 1. Initial commissioning would include mechanical checks and wet commissioning ahead of first run-of-mine ore. Ore would be available from the pre-operational ore stockpile for these mechanical checks and wet commissioning.
101	601	Clarification. The listing should also include "contracted mobile equipment for services." Action requested: Modify text.	Text has been edited to read: "...mobile equipment for services that TMM plans to contract such as employee bussing, snow removal, and contracted mobile equipment."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
102	604-605	Nomenclature. Review of the document in general seems to reveal that names of stockpiles and storage facilities change between phases of the mine (e.g., overflow ore vs temporary rock storage). To introduce some consistency across project phases, as an example could the temporary rock storage facility be named the ore storage facility? Another example would be the coarse ore storage facility, which is separate and distinct (outside the footprint of the temporary rock storage)? Action requested: Consider the possibility of a more uniform naming system for the project features; implement any that are immediately feasible. Future discussion item.	The temporary rock storage facility is the footprint and infrastructure that would support both the pre-operational ore stockpile and the overflow ore stockpile which both would be placed on it.
103	604-605	Question. Why is pre-operational ore stockpile separate from overflow ore stockpile? Different because one is crushed? Clarify. Action requested: Modify text to make distinction clearer. May need to refine definitions in the glossary.	Text has been added to the Temporary Rock Storage Facility sub-section: "The pre-operational ore stockpile and the overflow ore stockpile would both be placed on the temporary rock storage facility but the stockpiles would occur at different times of the Project. The pre-operational ore stockpile would contain blasted ore before it is crushed and would exist during Project construction and the first two years of Project operations. The overflow ore stockpile would be crushed ore and would exist at the temporary rock storage facility after processing the pre-operational ore stockpile. The overflow ore stockpile is much smaller than the pre-operational ore stockpile and would be intermittently utilized based on Project maintenance. The pre-operational ore stockpile and the overflow ore stockpile are discussed in more detail in the following two sub-sections." The descriptions of both the pre-operational ore stockpile and the overflow ore stockpile have both been updated in response to multiple other comments.
104	611	Clarification. How is ore moved from overflow ore stockpile to coarse ore stockpile? Action requested: Address item by modifying text to read: "…would be supplemented via ??? with ore from the pre-operational stockpile…"	See Lines 645-658 for discussion on the overflow ore stockpile. In this section text has been edited to read: "ore in the overflow ore stockpile would be reclaimed by front end load, loaded onto a conveyor, transferred to the coarse ore stockpile feed conveyor and conveyed to the coarse ore stockpile, along the same conveyors as the pre-operational ore stockpile was reclaimed."
105	614	Clarification. The text indicates the coarse ore stockpile would have a concrete floor. Is this the same for the reclaim area (with conveyor)? Also for both, identify measures in the design to protect groundwater. Action requested: Address item and modify text as appropriate.	Text has been edited to read: "The coarse ore stockpile would have a concrete working floor with a reclaim area in a concrete tunnel underneath the working floor, and a covered geodesic dome structure." Measures to protect groundwater include covering the entire coarse ore stockpile with a geodesic dome which would prevent infiltration of precipitation into the ore and having the entire coarse ore stockpile and reclaim area underlain by concrete reducing potential impacts to groundwater.
106	629	Nomenclature. Section starts by reading: "Throughout the life of the project, two stockpiles would be managed on the temporary rock storage facility." Another example of potentially confusing nomenclature around the use of the term "temporary." Action requested: Consider dropping "temporary" from the name. If there some kind of non-temporal value believed necessary, choose a different term. Modify text as appropriate.	See Comment 92.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
107	636	Question. Pre-operational Ore stockpile - this stockpile would be present for the 30 months of construction as well as during the first two years of operation. Does/will the hydrologic model account for volumes that could accumulate during this extended period? Action requested: Answer the question and modify text as appropriate.	This will be part of the surface water supplemental scope, specifically the water balance model. Text has been edited in Section 6.3.1 to read: "The combined hydrologic regime, both surface water and groundwater, for all Project operations, including construction and closure, will be simulated using a water balance model."
108	640	Guidance. More detailed information is needed for the two years of operations for the above-ground temporary rock crushing facility to identify potential impacts. Design and detailed location, how ore would be moved from the stockpile to the crusher, and then to the coarse ore stockpile needs to be easily understood. Action requested: Modify text to provide additional clarity. May need to consider a specific figure or figures to demonstrate what will be occurring. Future discussion item.	Text has been edited to read: "Ore extracted from mine development during the construction stage would be trucked from the underground mine and be temporarily stockpiled in the pre-operational ore stockpile within the temporary rock storage facility. Once the concentrator is commissioned and ready to process ore, a front-end loader would place the stockpiled ore into temporary crusher feed bins that direct ore into the mobile jaw crusher (together called the temporary surface crushing facility) which are located next to the temporary rock storage facility. The crusher would place ore onto the reclaim conveyor that leads to the transfer station before being placed on the coarse ore feed conveyor, joining the run-of-mine ore and finally feeding the coarse or stockpile." Refer to Figure 3-9 for conveyor lay-out and for location of the temporary surface crushing facility.
109	636 - 644	Clarification. Regarding materials handled at the pre-operational ore stockpile, would any low-grade ore that cannot be processed be transported to the surface during construction? If yes, what is the plan for how the rock would be handled separately from pre-operational ore that would be processed? If no, why? Action requested: Supplement the existing text to clarify the treatment of "low-grade ore." If this is an issue of rock classification, make it clear how this is addressed.	See Comment 41 for response regarding lean/low grade ore and Comment 51 for response regarding discussion on material brought to the surface during construction.
110	636 - 644	Clarification. The text should be expanded to provide more information on pre-operational ore handling and processing, and address whether pre-operational ore would need to be segregated by ore quality. Action requested: Modify text.	See Comment 108 for text edits. At this stage, there are no plans to segregate ore based on quality.
111	636 - 644	Clarification. The text should elaborate on oxidation or other potential issues that could affect the processing of the pre-operational ore, and whether it could prevent some of the ore from being processed. Action requested: Modify text.	Pre-operational ore would not be crushed before it would be stockpiled. Therefore it is expected that minimal oxidation would occur to pre-operational ore and processing would not be impacted.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
112	650	Clarification. How would crushed overflow ore be moved to the stockpile from the crusher and then back to the coarse ore stockpile? Understanding this part of the project allows insights on assessment of potential impacts from dust and dust control, spillage, and water management. Action requested: Modify text to address the item as appropriate.	Text has been edited to read: "The conveyor transfer system on surface has the ability to divert ore from the main decline conveyor to one of two conveyor: 1) the coarse ore stockpile feed conveyor or 2) the overflow ore stockpile feed conveyor. During operations when the coarse ore stockpile is temporarily full, crushed ore would be diverted to the overflow ore stockpile feed conveyor and conveyed to the overflow ore stockpile. If there is ore in the overflow ore stockpile and there is space available in the coarse ore stockpile, ore in the overflow ore stockpile would be reclaimed by front end load, loaded onto a conveyor, transferred to the coarse ore stockpile feed conveyor and conveyed to the coarse ore stockpile, along the same conveyors as the pre-operational ore stockpile was reclaimed. The overflow ore stockpile would exist intermittently, based on the maintenance schedule of both the underground mine and the concentrator." Measures to mitigate potential impacts are described in lines 1706-1709: "The coarse ore stockpile would be covered; Conveyors would be covered and water sprays would be provided at transfer points, as needed, to control dust." Additionally, Plant Site Contact Water Management section outlines the management of water in these areas.
113	636 - 658	Question. Why is the pre-operational ore stockpile / overflow ore stockpile not covered like the coarse ore stock pile? Action requested: Provide a rationale for not covering this project feature.	The ore in the pre-operational ore stockpile is not crushed and the overflow ore stockpile would only be used intermittently. Note while these are not covered the temporary rock storage facility - where both these stockpiles would be located - is lined.
114	696	Clarification. Please confirm the gravity concentrate only recovers platinum, palladium, and gold as target metals. Cobalt and silver are recovered from the two flotation circuits, along with copper and nickel. Action requested: Confirmation.	See lines 668-673. With gravity concentration TMM is targeting the recovery of platinum, palladium, and gold, but it's worth noting that: 1) the gravity concentrate may recover some silver, and 2) TMM has found instances where gold and silver occur together as an electrum in Maturi ore.
115	718-732	Clarification. The text indicates reagents would be used in the copper flotation circuit. What type of reagents added? Action requested: Include complete listing.	See Table 7-2 Process Reagents for reagents used by the Project.
116	790	Clarification. This section on reclamation of the plant site does not address decommissioning the various contact water ponds, any contaminated soils, and water management in terms of where the latter would be routed. Also no mention of vegetation type. Because the site is near the water, the impact on run-off water quality and quantity that reaches the lake is dependent on what is re-planted and how permeable the site is. For example, conversion from forested to grassland vegetation can influence surface water run-off quality and quantity. Action requested: Modify text to provide detail as currently envisioned. If necessary, identify as a future information need in appropriate Future Scope section(s).	Text has been edited to read - relating to contact water ponds: "Building areas would be graded to promote proper runoff and drainage. Pond liners and other debris would be hauled to a licensed landfill for disposal. Additional soil cover would be imported as needed to provide sufficient soil cover thickness over remaining buried infrastructure. " Additionally, text has been edit in response to Comment 119.
117	797-798	Clarification. DNR notes Minn. Rules part 6132.3200, subp. 2(4)c, requires that all other equipment, facilities, and structures shall be removed and foundations razed and covered with a minimum of two feet of surface overburden. Action requested: Revise text to include the overburden requirement.	Text has been edited to read: "Building foundation walls and equipment foundations that are above-grade or buried 0 to 2 ft (0 to 0.6 m) below grade would be broken and buried in place and covered with a minimum of two feet of surface overburden."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
118	804-808	Advisory. Project-related changes in surface hydrology and wetlands at the plant site will need to be fully understood. Whether the closure condition results in return to the pre-project hydrology, or some derivative thereof, is necessary to estimate any permanent impacts on aquatic habitat such as Keeley Creek and wetlands. This will be a factor in determining the EIS's treatment of these issues in scoping. Future discussion item.	This is highlighted in Section 8.3.2. specifically "Potential impacts to aquatic resources will be assessed using results from the future scope for water resources outlined in Section 6.3."
119	815	Clarification. What type of cover would be restored? Because this part of the site is within shoreland management area, the type of vegetative cover is important for water quality and can be a factor in degree of change to runoff quality and quantity, and impacts to aquatic habitat. Action requested: Address the item and modify the text as determined appropriate.	Text has been edited to read: "Reclamation of the plant site would include use of water management infrastructure to control erosion and stormwater quality, quantity, and rates. Once the planned plant site post-closure surface topography is established, reclamation cover materials that would serve as a growth medium for revegetation would be placed. Plant communities selected for revegetation would be confirmed based on reference site and revegetation plot findings. Until then, plant communities have been selected considering climate change and the anticipated evolution of plant communities in the project region. The target plant community at the plant site would include a range of mixed hardwood pine forest to jack pine barrens."
120	821-823	Clarification. The tailings dewatering plant seems to be a series of buildings as in figure 3-13. Consider labeling the figure to coincide with the text or alter definitions. Action requested: Comment submitted on Figure 3-13.	See Comment 762.
121	826-828	Glossary. The reclamation material stockpile should be defined in the glossary. Action requested: Add to glossary.	Glossary revised in response to Comment 27.
122	843	Future action. RGU notes there are specific methodologies for the siting of dry stack facilities. During consideration of potential locational alternatives, it will be necessary to describe how the site location was determined, including the methodology and parameters used in that siting. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
123	845	Clarification. First sentence. Remove the word "start." Action requested: Edit.	Text has been edited to read: "The dry stack facility would be developed in three stages from west to east and development would occur during the construction phase and continue through the 25 years of the operation phase."
124	848	Operations. Trucking tailings is not recommended during periods of precipitation. Action requested: Incorporate text that addresses the item.	See lines 954-958: "Placement at the dry stack facility during wet periods or during cold periods (below 5 degrees Fahrenheit) would be avoided as much as practicable. Placement of tailings filter cake at temperatures below 5 degrees Fahrenheit increases the likelihood of re-handling and re-compaction and thus preference would be to avoid placement at that time."
125	849	Clarification. The K value spec for the compacted tails should be provided. Sentence would read: "…placement on the drystack facility where it would be dozed into place and compacted with mobile equipment to a projected K value specification of X." Action requested: Make edit with K value included.	The K value of compacted tailings is still being evaluated. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
126	853 Figure 3-13	Clarification. Neither the document nor the figure appear to identify where contact water ditch and groundwater cut-off wall would be. It will be necessary to depict these features so that the resulting flow patterns can be assessed for potential impacts. Action requested: Address the item and modify the text and figure(s) as determined appropriate.	A contact water ditch label was added to Figure 3-13. The groundwater cutoff wall occurs between the perimeter haul road and the contact water ditch, we recommend reviewing Figure 3-20 to see a typical cross-section that include the road, groundwater cutoff wall, and the contact water ditch. Lines 1385-1399 in the text describe the location of the groundwater cutoff wall.
127	857-858	Clarification. The text reads: "…for as long as possible to delay impacts." It is unclear what "impacts" are being delayed. If for example that site clearing would be limited to each stage of footprint development, then the impacts related to covertype conversion would too occur in stages over the operational life of the project. Action requested: Provide clarity in the text as to what specific impacts are being delayed.	Delayed impacts would be related to delays in land clearing and grubbing discussed on lines 860-861. Text has been edited to read: "This staged approach would minimize the footprint of the dry stack facility for as long as practical to delay impacts related to clearing and grubbing."
128	863-865	Clarification. The text indicates the likelihood of areas with exposed bedrock. Is blasting of the bedrock expected to occur at the DSF? Action requested: Describe need or reason blasting won't occur. Modify text to address the issue "yes" or "no."	Text has been edited to read: "The majority of the area is expected to be fill, however localized blasting may occur in high reliefs areas and sections of the contact water ditches may be blasted depending on elevation."
129	864	Question. Is 6 inches of sand adequate for a liner foundation over bedrock, especially if bedrock is sharp or jagged? Action requested: Provide response and modify text as warranted.	If there are areas that engineers recommend a deeper bed layer additional fill will be used.
130	872	Clarification/information need. There are no design or construction details of the ponds, for example volume. They seem to be bermed, which leads to the question of whether these would constitute some type of failure risk to downslope public waters? Most of these ponds are just uphill from public waters so the design is important. Action requested: Address the item and modify text as determined appropriate. Ensure the Future Scope section(s) identify the design specifications of these ponds and relevant engineered features are captured.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
131	874	Correction. Figure 3-17 does not appear to be the correct figure. Consider Figure 3-13. Action requested: Revise as needed.	Correct. Figure reference has been edited.
132	880	Clarification. Fig. 3-13 does not identify all components of water management infrastructure such as the contact water ditch. It also shows a culvert from the dry stack facility to an area that does not have a contact water pond. On Fig 3-31, this culvert is shown between the label for "E-house Switchyard..." and the label for "Emergency Pond." Action requested: Because this text specifically summarizes the content on Figure 3-13 (the correct reference), modify text and or figure to address the item. Action requested: A comment is provided at Comment 3-13.	See Comment 763.
133	886	Clarification. Is characterizing the tailings filter cake as being "dry" a common terminology for a product exhibiting a 13% to 16% moisture content? Action requested: Provide response and modify text as warranted.	"Dry" is common industry terminology used to describe tailings filter cake.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
134	886	Information request. What is the moisture content of these tailings when saturated? Action requested: Provide response.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including operation details of the dry stack facility.
135	886	Information request. What is the degree of saturation of 15% moisture of these tailings? Action requested: Provide response.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including operation details of the dry stack facility.
136	886	Operations. DNR notes these are optimal moisture contents. Dry Stack operations commonly do not achieve this level during the first year or two of operation and depart from this level during system upsets such as precipitation, snow, or high humidity. Action requested: Modify text to address the item.	The feasibility of dry stacking tailings as proposed by TMM is high based upon widely accepted criteria and engineering analyses. TMM proposes to backfill stopes when dry stacking conditions are not favorable. TMM looks forward to continued dialogue with the MDNR on this technology.
137	888-891	Clarification. The text indicates a feature of the binder would be to "minimize movement of water" through the engineered backfill. Question: Is the hydraulic conductivity of the engineered tailings backfill known? Action requested: If yes, the text could be modified to read: "...increase structural integrity, minimize movement of water (estimated K = X), and enhance..."; also a sentence could be added on how it compares to the natural, undisturbed K values of the unmined surrounding material. If no, this is likely a future information need and point of discussion.	The K value of the engineered tailings backfill is still being evaluated. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope.
138	905	Clarification. The design and construction of emergency pond is not clear. This is the only time it is mentioned except on Fig. 3-13. Action requested: Provide text to address the item.	Text has been edited to read: "The emergency pond would be lined with a 60 mil HPDE or engineer-approved alternate geomembrane liner over a 1-ft (300-mm) thick, low-permeability, compacted soil liner; the soil layer would be compacted to meet maximum hydraulic conductivity requirements of not more than 1 x 10-6 centimeters per second (cm/sec)."
139	917	Clarification. Are conveyors covered? Action requested: Provide response. Modify text if warranted.	Text has been edited to read: "The filter cake would be transported via covered short-run conveyors to either the backfill plant or the filter cake storage and loadout building."
140	919 - 921	Clarification. The text indicates the load out building is being designed with a capacity to house 1.5 days of tailings production. A sentence should be provided that explains the basis for this capacity, especially in the event that tailings cannot be placed. In addition, if there are circumstances where it may be too small to house all tailings, the text should explain where the tailings would be stored before they are placed on the dry stack. Action requested: Address the issue and modify text as appropriate.	See lines 949-958. With placement of engineered tailings backfill underground increases the flexibility of the overall tailings management system and reduces the tailings storage capacity required. The filtered tailings is not expected to gain any appreciable amount of moisture from the air.
141	920	Clarification. The text indicates the load out building is being designed with a capacity to house 1.5 days of tailings production. 1.5 days of storage provides a small margin considering that dry stack tailings cannot be deposited in severe cold, during snow melt, and at other times of liquid precipitation, which can last for days. In addition, would the heated tailings draw moisture from the air while in storage? Action requested: Address the issue and modify text as appropriate.	Same as Comment 140.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
142	927	Clarification: Confirming the correct term for the backfilled tailings is "thickened tailings" and not "paste tailings." Thickened tailings are less dense than paste tailings. Action requested: Address the issue and modify text as appropriate.	As referred to in line 927, engineered tailings backfill is a blend of thickened tailings and tailings filter cake. This is done to achieve the desired moisture content for the engineered tailings backfill where it remains pumpable and still achieves the required strength as backfill after a desired cure time.
143	937	Closure. DNR notes that given the final design height of the dry stack facility, it would likely be a source of ongoing dust generation, even after closure. Even with a good topsoil, it would be difficult to maintain a good vegetative cover, especially during droughts. Action requested: Address the issue and modify text as appropriate.	Comment is noted. TMM will not address speculation of potential impacts. TMM looks forward to engaging the MDNR on the details of air quality analysis during EIS development.
144	938	Clarification. Based on local elevation data (see also Figure 10-1), the statement "…similar to hills in the area…" is not particularly accurate. Action requested: Consider eliminating the sentence or provide a rationale to warrant retaining it. There is no apparent rationale from the lake view projected in Figure 10-1.	Text edited sentence removed.
145	943	Clarification. The K value spec for the compacted tails should be provided. Action requested: Make edit with K value included.	See Comment 125.
146	943	Clarification. Overall slope is 4:1, what is actual side slope? Or is the side slope 4:1, and the overall slope with berms is less steep than 4:1? Action requested: Modify text to address the item.	See Figure 3-19. The overall slope is 4H:1V so the slope would be steeper than 4H:1V between benches.
147	943	Operations. The slopes would be steeper than 4H:1V between benches. Rainwater erosion could be a problem. Maintenance could also be a challenge. Existing facilities are known for instances of sediment flows and pond filling during periods of intense rain. Action requested: Address the issue and modify text as appropriate.	Comment is noted. TMM will not address the speculation in the comment. TMM looks forward to engaging the MDNR in detailed analysis during the course of the EIS. Also, see Comment 155: "The exterior slopes were flattened to provide a stable embankment slope that would not only meet or exceeds slope stability requirements but would also limit erosion potential and support the establishment and long-term sustainability of a vegetated reclamation cover."
148	945	RGU note. More text to clarify, and provide more map detail, will be needed on development (e.g., phases) of the dry stack facility; also on benches and vertical intervals. No action requested. This will be assessed as a future information need in the proposed EIS scope.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details on the dry stack facility.
149	949-958	Clarification. Provide more information on how cold conditions affect tailings placement and how tailings would be handled during these periods. How was 5 degrees F chosen as the temp below which tailings can't be placed on the dry stack facility? More detail should be provided regarding dry stacking operations below freezing. Action requested: Consider breaking the treatment of dry stack facility operation into "above-freezing" and "below-freezing" sections to address these issues; if there's an appreciable break in management prescriptions at a higher temperature (than freezing), provide a rationale and use that.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including operating details of the dry stack facility.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
150	949-958	Clarification. Provide more information on how wet conditions affect tailings placement and how tailings would be handled during these periods. More detail should be provided regarding dry stacking operations during wet conditions. Action requested: Consider breaking the treatment of dry stack facility operation into "wet" and "dry" sections to address these issues; if there's an appreciable break in management prescriptions at a particular rainfall rate, probability, or similar, provide the rationale and use that.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including operating details of the dry stack facility.
151	955	Clarification. "Practicable" as applied in this instance should be better defined. Action requested: Address issue and modify text as appropriate.	The determination of practicability is a combination of meeting permit requirements, engineering specifications, and operational objectives or constraints that are managed hour to hour.
152	956	Clarification. If understood correctly it would not be possible to sequester thickened tailings underground during the first several years of operations. How would the large volume of filter pressed tailings be addressed for those early months that cannot be placed at the DSF due to cold and rainy conditions on the surface? Action requested: Address the item and modify text as appropriate.	The underground mine can start accepting engineered tailings backfill within six months after mining starts. Once the concentrator begins processing ore and creating tails there would be space available in the underground mine for engineered tailings backfill. The Project would be capable of producing 100% tailings filter cake for the dry stack facility, 100% engineered tailings backfill, or different portions of each.
153	969-977	Clarification. Details of the stages of construction are lacking. This is important when assessing potential water management impacts. Action requested: Provide additional detail as warranted.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details on the dry stack facility.
154	978-979	DNR note. More detail on the two-dimensional stability analyses that were performed, and figures showing all 2D cross sections that were modeled, will be a future information needs. Stability analyses will likely be required to consider how higher than average annual precipitation and extreme precipitation events could affect stability. No action requested. Future information and discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details on the dry stack facility.
155	978 - 990	Clarification. The text should include a sentence identifying the rationale as to why buttressing is not required as an additional added factor of safety to ensure the stability of the dry stack facility. Action requested: Add sentence to address item.	Text has been edited to read: "Based on the dry stack facility design and initial stability analysis, buttressing would not be required. The purpose of buttressing is to increase resistive forces at the toe of a slope. This can be an effective solution when a slope is too steep or when shear stresses have already mobilized along a failure plane. Another means of improving slope stability is to flatten a slope. The dry stack facility design of the 4H:1V exterior slopes and well-compacted tailings in the structural zone have shown, through limit equilibrium analysis, that the dry stack facility would meet target design factors of safety and provide long term stability around the perimeter of the dry stack facility. The exterior slopes were flattened to provide a stable embankment slope that would not only meet or exceeds slope stability requirements but would also limit erosion potential and support the establishment and long-term sustainability of a vegetated reclamation cover."
156	978 - 990	DNR note. More detail on the geotechnical and hydrological properties of the tailings, including the unsaturated hydraulic properties for the tailings, will be a future information need. No action requested. Future information and discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
157	978 - 990	Question. Is there the potential for tailings coming out of the filter plant to not always meet the target moisture content needed for maximum compaction? If so, the text should identify how these tailings would be handled. Action requested: Modify text to address the issue. May need to consider designing separate storage into the dry stack facility for these tailings if needed.	Text has been edited in Tailings Dewatering Plant Layout and Operational Activities to read: "The Project would be engineered to handle periods of upset that may occur resulting in the production of off-spec tailings filter cake. This would be accomplished by both ensuring that the filter presses are properly sized and engineered with enough design capacity and an operational flexibility that would allow disposal of tailings as an engineered tailings backfill or tailings filter cake."
158	985	Clarification. As noted previously, provide the estimated K value specification in noting the "well-compacted tailings." Action requested: Add value to text.	See Comment 125.
159	985	Clarification. It is unclear what is intended by use of the term "structural zone." Action requested: Explain what this represents with the facility and modify text to clarify. Comment provided at Figure 3-19.	Text has been edited to read: "Two-dimensional stability analysis was conducted using a typical cross-section of the dry stack facility structure and foundation design. The analyses considered a number of scenarios including: construction (with elevated pore pressures), long term static, post liquefaction and pseudo-static seismic loading. The stability analyses were used to inform the design of the dry stack facility embankment geometry and foundation treatments and to confirm that the dry stack facility design meets required factors of safety for stability during operations and closure. The dry stack facility would have a structural zone that consists of placed and compacted filtered tailings under the sloping exterior perimeter slopes and crest of the dry stack facility. This structural zone would be compacted to a minimum nominated compactive effort and governed by quality control guidelines to provide sufficient strength to ensure a safe and stable landform. The non-structural zone within the interior of the dry stack facility would also comprise compacted filtered tailings, though to a lesser standard of compaction compared to the structural zone. Tailings placed within this zone would not have a material impact on the global stability of the dry stack facility, however compacting of the tailings would provide trafficability and stability for working surfaces and slopes and would also reduce the required storage volume of tailings filter cake for the project."
160	1000	Clarification. What is the estimated depth for the topsoil to be placed on the slopes and top of the dry stack? Action requested: Address the item and modify text as appropriate.	See lines 1420-1425. The dry stack facility would be concurrently reclaimed during the operation phase. As portions of the slope and crest of the dry stack facility are constructed, the completed surfaces would be graded and covered to promote runoff and inhibit infiltration. The cover would consist of at least 2 ft (.6 m) of cover soil underlain by a hydraulic barrier. Cover soil would be sourced from the reclamation material stockpile and seeded to establish grasslands.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
161	1006	Clarification. What is the likelihood of having contaminated materials on the tailings plant site? How would these be handled during restoration to prevent environmental impacts? Action requested: Address the item and modify text as determined warranted.	Plant Site Reclamation, Closure, and Post-closure Maintenance text edited to read: "It is anticipated the majority of the demolition waste (material not salvageable, saleable, recyclable, or reusable) from removal of structures would be acceptable for disposal in a new (location to be determined) or existing demolition debris landfill. Any remaining concentrate would be shipped to customers. Reagent suppliers, which would be under contract to TMM, would remove reagents remaining at the closure stage of the Project. Solid waste and industrial solid waste would be managed per state regulations and requirements. Other special materials - defined as those materials not classified as demolition debris, not classified as solid waste, and not a RCRA-regulated material - on site at the time of closure may include nuclear sources, partially used paint, chemical and petroleum products, fluorescent and sodium halide bulbs, batteries, electronic waste, lighting ballasts, and small capacitors. These materials would be safely collected, removed, and properly recycled or disposed." It is expected that buildings at the tailings management site would be reclaimed following the same procedures outlined in the section Plant Site Reclamation, Closure, and Post-closure Maintenance, specifically salvage (when practicable / feasible), demolition, disposal, and restoration
162	1016	Clarification. It will be necessary to understand the projected lifetime of the proposed liner. This will inform the potential for impacts (e.g., water quality) in closure, potential monitoring and/or remediation measures, and play into financial assurance. Action requested: Modify text to provide any clarification as currently understood. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of liners and cover systems.
163	1001-1018	Clarification. There needs to be an explanation of vegetation management plans on the dry stack. How is timely vegetation to be established with proposed progression (i.e., taconite stockpiles are reclaimed from the bottom up as mining progresses)? It is uncertain whether the establishment of vegetation is proposed in a way that allows a progression of reclamation and minimization of erosion. Action requested: Add text as requested.	Reclaimed Portion of the Dry Stack Facility text has been edited in to read: "The dry stack facility would be constructed in three stages, generally starting on the west side of the dry stack facility nearest the tailings dewatering plant, and progressing eastward during the life of the Project. The dry stack facility would correspondingly be constructed by placing, grading, and compacting tailings to form lifts and benches on as described in the Tailings Management Site section. The exterior side slope of the dry stack facility would be reclaimed concurrent with their construction and BMPs, such as silt fences, erosion control mats and / or logs, and temporary mulch erosion controls, placed until vegetation became established."
164	1019	Clarification. The non-contact water diversion area described as a series of diversion dikes and ditches to divert water may cause direct and indirect wetland impacts. Wetlands in and around these areas need to be delineated and evaluated for potential impacts. Action requested: Comment provided in the wetlands section.	See Comment 535.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
165	1025	Clarification. Provide a reference of an existing figure for access road location and USFS road. Consider whether Figure 2-1 is appropriate. Action requested: Provide a citation or possibly a new figure.	Text has been edited to read: "The access road would extend from Highway 1 to the northern edge of the plant site as shown in Figure 2-1."
166	1029-1031	DNR note. Sizing culverts to handle more than a 100-year, 24-hour storm event should be considered (as they may not be adequate). No action requested. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
167	1049	Clarification. Change "ordinary high water mark" to "ordinary high water level elevation." Action requested: Text edit.	Text has been changed in Section 3.0 and in Section 4.0. All references to ordinary high water mark have been updated to ordinary high water level elevation.
168	1049	Clarification. The text states the water intake pump house would be located 100 feet from the OHWL on Birch Lake. Is that outside of the shoreland setback also? Action requested: Based on answer, modify text to read: "…ordinary high water mark of Birch Lake reservoir, which is within/outside? the shoreland setback."	See line 2133 and line 2399. The water intake facility, would be required to abide by setback requirements for Birch Lake, identified by Lake County Shoreland Zoning Ordinances.
169	1049	Question. What is the OHWL elevation of Birch Lake? Action requested: Based on answer, please include within sentence. Sentence could read: "…ordinary high water level elevation of XX for Birch Lake reservoir, which is…"	Text edited to read: "A water intake pump house would be located 100 ft (30.5 m) from the ordinary high water level elevation of 1419.99 ft (432.8 m) for Birch Lake."
170	1049	Question. At what elevation above the 100-year flood elevation would the pump house infrastructure be constructed? MDH Well Rules Chapter 4725 state: "…to prevent the entry of flood water by: A. extending casing at least 5 feet above the regional flood level." Action requested: Respond to question and modify text to address.	Note the water intake facility is not a well. See Figure 3-17 for design of the water intake facility, set back, and heights above reservoir water level.
171	1050	Clarification. The text indicates a water intake pipeline would be installed underground and then proceed under the lake. Will this part of the project actually involve any physical activity below the Ordinary High Water Level? Action requested: Modify text to address the item, either yes or no.	Text has been edited in response to Comment 172.
172	1053-1055	Permit need. The proposed activity is subject to a DNR permit. Action requested: End the paragraph with a new sentence that reads: "A DNR Public Waters Work Permit will be required for the water intake structure proposed to be placed on the bed of Birch Lake reservoir."	TMM uses the Table 3-17 through Table 3-19 exclusively to identify needed permits. To introduce the need for one or all permits again in the text is redundant.
173	1065	RGU note. Rather than speculate on conditions that may or may not be present at closure, more direct to just describe the two scenarios being proposed on the fate of the remaining equipment and infrastructure. This approach allows for a more direct assessment for future EIS scoping. Action requested: Edit sentence to read: "...removed and transported to an approved landfill for disposal or abandoned in place, either of which would be subject to required site closure provisions." Note that it will more than likely be required to remove the infrastructure from the lake.	Text has been edited to read: "During reclamation, saleable equipment or salvageable materials at the water intake facility would be removed and transported to an approved landfill for disposal or abandoned in place, either of which would be subject to required site closure provisions."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
174	1085	RGU note. Characterizing the power supply as "sufficient" is not relevant to the project description. Simply noting power would be sourced from a regional power provider is fine. Action requested: Modify sentence to read: "…a regional power provider would supply the Project with power."	Text has been edited to read: "At the off-site electrical substation, the Project transmission line would connect to an existing transmission line, and a regional power provider would supply the Project with power."
175	1098	Clarification. DNR notes the reclamation and closure should plan for complete removal of the power infrastructure. Action requested: Revise text accordingly.	Text edited to read: "Future use of overhead electric transmission lines would be based on future input from the utility provider and pursuant to state and federal reclamation requirements." Additionally, updated project descriptions will be furnished during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on reclamation and closure.
176	1100	Guidance. Both DNR and MPCA will need a detailed water balance to assess TMM's claim that there would be no discharge of process/contact water. The water balance will need to cover different potential operating options (full operation, partial shutdown, temporary idle, and similar) and cover the full range of reasonably possible climatic conditions (for example). Action requested: Ensure the appropriate Future Scope sections of the document identify this as an information need. Future discussion item.	Comment is noted. TMM will produce detailed water balances for various operating conditions and climatic conditions as part of Phase 2 of the surface water supplemental scope described in Section 6.3.1 and will be provided during EIS development to satisfy the EIS scope
177	1105	Regulatory Guidance. Four types of water for purposes of management are defined. Consider revising the definitions to be more consistent with rule and permit definitions. For instance, process water and contact water as defined would be considered wastewater and would require an NPDES/SDS permit to discharge (which the text indicates would not be required as there would be no discharge). Similarly, non-contact water would be considered stormwater associated with industrial activity, which would require a different NPDES/SDS permit to authorize discharge. Action requested: Consider the guidance in reviewing potential definitions of water being managed with the project. Apply revised definitions in next data submittal as appropriate. Future discussion item.	See Comment 71.
178	1106-1127	Guidance. Both DNR and MPCA will need a better definition/understanding of the proposed categorizing process of wastewater vs contact water, as it relates to both regulatory definitions and practical considerations. This will be necessary for the state to be able to fully assess potential environmental effects as well as what water quality permits may or may not be required for the proposed project. Action requested: Modify text if possible to address the item. Future discussion item.	See Comment 71.
179	1106-1127	Question. Would any of the water described as "contact water" be proposed to be regulated under a general Industrial Stormwater permit? Action requested: Answer the question and modify text as appropriate.	See Comment 71.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
180	1113	Definition of contact water. It will be necessary to consider implications of definitions of the various types of water in terms of regulatory definitions. This can be a source of confusion. RGU- and regulatory-approved definitions for the EIS will need to not only make sense for describing the project but must also align with language and definitions in permits. It is possible contact water would be defined to also include water that comes in contact with development rock, or temporary waste rock, or pre-operational ore, or overflow ore. No action requested. Will require future consultation.	See Comment 71.
181	1126	Definition. Because instances may be present where constituent loading occurs to construction water that requires additional management, the definition should be modified to reflect this potential situation. Action requested: Modify text to read: "Construction stormwater: direct precipitation or stormwater that has contacted surfaces disturbed by construction that could have increased constituent loading." Comment also provided in glossary.	The Project's construction stormwater is anticipated to have constituent loading consistent with construction stormwater regulated throughout Minnesota under the Minn. Construction Stormwater General Permit. TMM has edited the Project's definition of construction stormwater to more closely align with the regulatory definitions of "stormwater" and "construction activity" (per Minn. R. 7090.0080): "Construction stormwater: Stormwater runoff, snow melt runoff, and surface runoff and drainage associated with activities for the purpose of construction, including clearing, grading, and excavating, that result in land disturbance."
182	1134-1137	Information need. MPCA and DNR will need a detailed chemical balance to assess whether all process water (and contact water?) would be managed in a closed loop with no discharge as offered in the text. The chemical balance will need to cover a range of potential operating scenarios, climatic conditions, and rock reactivity. For example, it is possible that constituents could build up to the point where it might interfere in the concentration process or adversely affect equipment. Action requested: Ensure the appropriate Future Scope section(s) addresses the item. Modify text as appropriate. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on process water flow.
183	1147-1148	Question. Would contact water need to be treated before it can be added to the process water? If so, the text should describe what type of treatment might be needed, and any bi-products (and their disposal) that might be generated during the treatment process. Action requested: Modify text to address the item.	Contact water will not require treatment before it is used as process water.
184	1158	Glossary. There needs to be a definition of mine supply water in glossary, which may include information from lines 1205-1207. Action requested: Create definition and add to glossary.	Glossary revised in response to Comment 22.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
185	1158	Clarification. The document is unclear as to the mine supply water source? In addition and as relevant, some explanation would be useful on the need to bring "mine inflow" back to surface rather than using it for "mine supply water." Action requested: Provide clarifying text and modify accordingly.	Text has been added to Underground Mine Process Water Management: "Mine supply water for the underground mine would flow from the mine water tank to the portals to feed the underground mine-wide supply water distribution system. The mine water tank would be supplied from the fresh/fire water tanks, when new water can be added to the system, otherwise the mine water tank would be fed by the sediment pond. Mine supply water would and be used for dust suppression and equipment requirements like drill water." and "Underground mine water would need to be cleared of sediment as well as de-oiled before it could be re-used for underground equipment or as process water. This would occur at the sediment pond before recirculating back underground through the mine water supply system or added to the process water circuit for use in processing."
186	1159	Guidance. The naming convention for DNR Public water 69-3P in the EIS will be Birch Lake. First usage in all EIS-related documents will be as follows: Birch Lake reservoir (Birch Lake); subsequent usage as follows: Birch Lake. Action requested: Global revision requested throughout in text, tables, and figures.	See Comment 394.
187	1159	Future information need. More figures are needed on the overall water management program. Action requested: Coordinate with DNR on how to address this request.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on process water flow.
188	1179-1186	Clarification. The text lists a series of bullets for process water losses. Question: Could process water be lost via seepage through water collection ditches that are not lined with liners? Action requested: If the answer is "yes," revise and/or add to the bullet list accordingly.	The potential magnitude of seepage has not yet been quantified and would be addressed as a future scope of work, as discussed in Section 6.3.2.
189	1205	Clarification. The document is unclear as to the mine supply water source? In addition and as relevant, some explanation would be useful on the need to bring "mine inflow" back to surface rather than using it for "mine supply water." Action requested: Provide clarifying text and modify accordingly.	See Comment 185.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
190	1205-1207	Guidance. Mine supply water would be pumped underground from the process water pond and used for dust suppression and equipment requirements like drill water. Excess mine supply water would be recaptured through a series of sumps. This results in pumping of wastewater into the mine. This will be an issue of interest for permitting under the Class V injection well program. Action requested: Ensure the Future Scope of the appropriate section(s) addresses the item. Modify text as appropriate to address the item. Ensure Table 3-8 addresses the item.	Mine supply water would primarily be sourced from the sediment pond and feed the mine water tank. The sediment pond's feed is precipitation and the underground mine water that is pumped from the mine; the water pumped from the mine is classified as process water as it is a mix of mine inflow, process water associated with the engineered tailings backfill, and mine supply water. Text updated to read: "Mine supply water for the underground mine would flow from the mine water tank to the portals to feed the underground mine-wide supply water distribution system. The mine water tank would be supplied from the fresh/fire water tanks, when new water can be added to the system, otherwise the mine water tank would be fed by the sediment pond. Mine supply water would be used for dust suppression and equipment requirements like drill water"
191	1212	Project description. The text states that the water from these pumps and sumps would be de-oiled and clarified. The section would benefit from a basic statement identifying the process for de-oiling, where it takes place, what equipment/process and to what degree, and what is the fate of the de-oiling byproduct? Action requested: Provide additional text to address item. If this is a complex procedure, providing high-level treatment is appropriate at this stage. A more expansive explanation can be provided in the detailed Project Description necessary for the EIS.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including process water flow and water management.
192	1225-1230	Question. The sediment pond accepts process wastewater, where the process wastewater pond is double-lined. Why is the sediment pond not similarly double-lined? Action requested: Address the question and modify text as appropriate.	The sediment pond would handle water dewatered from the mine. While this may contain some process water it would be diluted with mine inflow and other water sources.
193	1228-1230	Guidance. It is noted that the proposed design will be subject to agencies' review and approval. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
194	1229	Clarification. What is the K Value spec for the low-permeability compacted liner? Action requested: Modify text to include K value specification. Text could read: "…thick, low-permeability, compacted soil liner (K = XX) and would be sized…"	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including liners and cover systems.
195	1230	Clarification. The text should provide detail on how it would be done, frequency, and under what criteria would sediment pond be cleaned out and how would the removed sediment be managed? Action requested: Modify text to address the item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including operating details of water management features.
196	1231	Clarification. Are the ponds dugout into natural material, or are there constructed embankments? Action requested: Provide response and amend text as appropriate.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
197	1231	General Pond Comment (all lined ponds). Would synthetic pond liners include cover material? MPCA pond guidance recommends HDPE liners at least 100 mil for uncovered applications. Additionally, for exposed liner a dual - white on black - liner is recommended. Action requested: Conduct global document edit to address each instance of this item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of liners and cover systems.
198	1236	Design note. A rationale/modeling will need to be provided for the volume of the process pond (18.5 MG). No action requested. Future discussion item and information need.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
199	1236-1241	Clarification. Regarding characterization of PMP, should be more specific than "probable maximum precipitation" when describing how the process water pond would be sized. Action requested: Modify text to address item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
200	1236-1241	Design recommendation. Should consider greater than 100 yr-24 hr storm event for sizing pond. Should have the ability to pump water out of the pond to another area in the event the maximum free board is reached. No action requested. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
201	1239	Clarification. The process water pond would be designed with the appropriate freeboard to contain the probable maximum precipitation from direct precipitation for the process water pond "footprint." What is/would be the recurrence interval/event size for sizing? Action requested: Provide the answer and modify text to address the item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
202	1240	Need for footnote. The parameters used in calculating the PMP should be listed. Action requested: Add footnote to address the item.	The storm event considered was the 72-hour PMP event. Text was edited to read: "therefore the process water pond would be designed with appropriate freeboard to contain the 72-hour probable maximum precipitation from direct precipitation for the process water pond footprint."
203	1241-1245	Guidance. It is noted that the proposed design will be subject to agencies' review and approval. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
204	1244	Clarification. The text reads: "...or engineer approved alternate geomembrane." MPCA notes that generally 40-mil HDPE is the minimum synthetic liner. Action requested: Consider this point and modify text as appropriate.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including liners and cover systems.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
205	1250	Question. Is the tailings dewatering plant the same as the "Filter Plant" (Fig. 3-13)? Action requested: Respond to the query.	See Lines 895-899. "The tailings dewatering plant would consist of • Tailings thickener; • Filter plant – which would produce filter cake; • Filter cake storage and loadout building; and • Backfill plant – which would produce engineered tailings backfill." Definition of tailings thickener has been edited in the glossary to read: "tailings thickener: The equipment that would be used to initially dewater tailings before being fed to the filter plant to produce a tailings filter cake."
206	1262	DNR note. The potential for the draining of entrained water from the tails would be classified as draindown. Where would that water report to? Action requested: Modify text to address item.	Draining of entrained water from the tailings would mix with any infiltration and the combined stream would be referred to as draindown. The draindown would be collected by the above liner drain before reporting to the contact water ditch. See Lines 1361-1370. "The intercepted precipitation that would infiltrate through the tailings – referred to as draindown – would be intercepted by the liner and collected by a network of gravel finger drains constructed above the liner extending across the dry stack facility footprint in the same location as the under-liner drains (i.e., natural drainage courses). A gravel blanket drain would also be constructed around the full perimeter of the dry stack facility at the toe, having a width of 160 ft (50 m). The over-liner drains - both finger drains and blanket toe drain - would discharge to the perimeter contact water ditch. The potential magnitude of draindown has not yet been quantified and would be addressed as a future scope of work, as discussed in Section 6.3.2. " The definition of draindown has been edited in the glossary to read: "draindown: Draindown is any draining of entrained process water that would mix with infiltrating precipitation and be collected by the dry stack facility liner system."
207	1263	Information need. The need for additional study is cited. All such future study needs should be captured in the Future Scope section regarding potential for draining of entrained process water. This should include the proposed mixing of process water and precipitation at the DSF. Action requested: Ensure that Future Scope section(s) identify the item as an information need, including as part of the project's water and chemical balances.	This is information need is outlined in the Section 6.3.2, specifically lines 4410-4415: "Potential pathways for how process water and/or contact water could be released to groundwater will be considered and then quantified consistent with surface water analyses. Anticipated pathways that could be considered are leakage from process water and contact water ponds, leakage from the dry stack facility, flow from flooded mine workings in closure, unique project-related conditions (such as, system failures, up-set conditions, storage overtopping, etc.) and dust deposition."
208	Section starting at 1267	Clarification. The text provides discussion of contact vs. non-contact areas, as well as a non-contact water diversion area. The layout of these areas all influence changes in surface hydrology and surface permeability. Additional detail will be necessary to inform the scoping process in offering the potential significance of impacts for the EIS. Providing supporting material, such as a map/figure identifying these areas, or a table giving area measurements, could be warranted. Action requested: Consider how to beef up the text, plus what additional supporting materials would be useful, to assist in better understanding the project and its potential impacts.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water management and design or construction details of water management features.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
209	1280-1281 1236-1241 1403-1404 1405-1407 1468-1471 1471-1473 1656-1659	Guidance. In the project description, it is noted that contact water ponds (plant site contact pond and tailing site management contact pond [lines 1280-1281, 1403-1404) and diversion dikes (tailing management site [lines 1468-1471]) are to be designed for the historical 100-year 24-hour storm event. Based on the project description, the noncontact water ditches in the tailing management are to be sized for the historical 10-year 24 hour storm event, while the process waste pond is to be sized to contain 'probable maximum precipitation' (lines 1471-1473, 1236-1241). The dry stack contact water pond is to be sized for the 100-year historical snow pack [lines 1405-1407]. In the analysis, the sensitivity of these ponds and dikes to overflow under future climatic normals, e.g., frequency and intensity of forecasted future extreme precipitation events, should be evaluated. Action requested: Ensure Future Scope of appropriate section(s) identify this item as an information need. See comments at Lines 4202-4204, 4207-4212.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
210	1280-1281	Design recommendation. Consider sizing plant site contact water ponds to handle more than a 100-year, 24-hour storm event (to provide greater certainty). Part of the thinking is to address changing climate and winter melt, especially to avoid circumstances that could result in adverse impacts to adjacent public waters. Also, the proposed sizing criteria may not be adequate to accomplish a "no discharge" project goal. Additional rationale and long-term water balance will be required. Action requested: Ensure Future Scope of appropriate section(s) address the item. Modify text as appropriate. Future discussion item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including design or construction details of water management features, including ponds, dikes, and ditches.
211	1281-1285	Guidance. It is noted that the proposed design will be subject to agencies' review and approval. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
212	1284	Design note. The text refers to a secondary soil liner with conductivity 1x10-6 cm/s. Wastewater soil liners typically require conductivity to be an order of magnitude lower, or at 1x10-7 cm/s. Action requested: Consider the item and modify text as appropriate.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including design or construction details of liners and cover systems.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
213	1288	Clarification. Please confirm that the contact water area does not include the concentrator or ore stock pile area? Action requested: Provide the confirmation and modify text to address the item. This needs to be clear as noted in comment for Line 1267.	Text has been edited in Plant Site Non-contact Water Management to read: "The non-contact area at the plant site would include, the security gatehouse, reclamation material stockpile 1 and 2, the plant site electrical substation, the ball storage bunker, the concentrator, the concentrator services building, the reagent storage building, the coarse ore stockpile, and the areas surrounding and connecting these facilities that are not directly involved in transport of ore or tailings by truck." The concentrator and the coarse ore stockpile are both covered facilities which would prevent direct precipitation or stormwater potentially coming in contact with ore or tailings. Additionally, see Comment 71 as TMM is continuing to evaluate regulatory classification of water (including industrial stormwater), which could have an impact on the description of contact and non-contact areas around the plant site.
214	1289-1291	Design note. Water must be able to be pumped down within a reasonable timeframe to ensure sufficient space for extreme/multiple storm events. Action requested: Consider the design recommendation and modify text as appropriate. Future discussion item.	Comment is noted. The storage capacity is based on a preliminary water balance and will be updated based on water balance modeling outlined in Section 6.3.1. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including operating details of water management features.
215	1292-1293	Design note. Why does the design opt for LLDPE rather than HDPE for this structure? Action requested: Answer the question and modify text as appropriate.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that will be provided in updated project descriptions including liners and cover systems.
216	1293 1355 Figure 3-14	Clarification. Liner is 80 ml in text (line 1293), 60 ml in text (line 1355) and in figure. Action requested: Rectify the differences in the text and figure.	80 mil is the liner proposed for the temporary rock storage facility on line 1293. 60 mil is the liner proposed for the dry stack facility on line 1355 which is consistent with Figures 3-19 and 3-20. Note Figure 3-14 does not contain liner information.
217	1293-1295	Design note. Great care will need to be taken when compacting material over a synthetic liner to ensure its integrity. Is any additional protection anticipated, such as geotextile? Action requested: Answer the question and modify text as appropriate.	Text has been edited to read: "The temporary rock storage facility would be lined with an 80 mil (2.0 mm) linear low-density polyethylene (LLDPE) or engineer-approved alternate geomembrane liner. The LLDPE liner would be installed over 12 inches (300 mm) of compacted low permeability soil. The liner would be protected by 12 inches (300 mm) of sand which would be pushed into place by dozers and compacted prior to any truck traffic being allowed over the liner. "

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
218	1295-1297	Design recommendation. The proposed 10-year storm event capacity may not be sufficient. Another consideration would be where would the water go if a larger event? In addition, the text does not identify the duration (intensity) of the event; shorter, higher intensity events are generally more important for collection systems. Also, the proposed sizing criteria may not be adequate to accomplish the "no discharge" project goal. No action requested. Future discussion item.	Comment is noted. The storage capacity is based on a preliminary water balance and will be updated based on water balance modeling outlined in Section 6.3.1. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
219	1302	Clarification. The text identifies that plant site roads would be divided into two categories based on water management…into contact (water) and non-contact (water) roads. Describe in more detail how this would be managed. For example, Figure 3-10 indicates a tire wash would be located at the Plant Site; is this the only tire wash? Another detail may be describing what project features are serviced by one or both categories. Action requested: Provide greater explanation on contact and non-contact roads.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features and details on water definitions.
220	1308	Clarification. The text identifies that there would be three snow storage areas at the plant site. Describe in more detail how plant site snow-related runoff, both within and outside the designated snow storage areas, including where it would report to. Action requested: Provide greater explanation on snow-related runoff management.	Text has been edited to read: "Snowmelt would also be managed as contact water. For snow that is not plowed snow-related runoff would end up in the same location as if it were rain water. For snow plowed in active areas there would be three designated snow storage areas. Grading of the plant site would ensure snow-related runoff from snow storage areas would flow into one of the plant site contact water ponds."
221	1308-1311	Clarification. Add to the text how would snowmelt from the snow storage areas be collected? Action requested: Provide this detail to the discussion.	See Comment 220.
222	1309-1311	Clarification. Add to the text an explanation on why snow storage areas were designed to handle a snow water equivalent of 7.3 to 11.9 inches. Action requested: Supplement text with this detail.	Sizing of water management features and request for additional detail and analysis is covered in Comment 557.
223	1310	Background information request. How many inches of snowfall per year have been accounted for in the three storage areas? Confirm storage is adequate within the projected snow water equivalent. Action requested: Provide a rationale for storage capacity against predicted annual snowfall.	Sizing of water management features and request for additional detail and analysis is covered in Comment 557.
224	1314	Clarification. According to the text describing the Tailings Management Site at Lines 826-828, this facility would stock suitable growth mediums stripped in preparation of the DSF footprint. Question: Would runoff from any of these materials be classified as contact water? Action requested: Edit text to address the answer to the question.	See Tailings Management Site Non-contact Water Management lines 1509-1517 for a discussion on management of water from the tailings management site reclamation material stockpile.
225	1314-1316	Future activity. More information on items 2 and 3 is needed before designating these as noncontact water. Runoff onto the liner may have contacted tailings and the areas of partial cover would need to be confirmed as noncontact water. Note that erosion of dry stack TSF is an ongoing concern within the industry. Action requested: Modify text if can address the item. Future discussion item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features and details on water definitions.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
226	1318-1320	Project description. The text indicates contact water would be used for dust control. Question: Would contact water need to be treated before it can be used for dust control at the tailings management facility? If so, elaborate on what type of treatment might be needed, and any by-products that might be generated during the treatment process. Action requested: Modify text to address the issue.	At this time TMM is not proposing water treatment for dust control. Future analysis will inform the potential need for treatment.
227	1332	Clarification. Where is this contact water ditch? Where is the gravel blanket drain? How is contact water from the surrounding road diverted? Figure 3-13 lacks water management details. Action requested: Assessment of potential impacts would be aided by additional detailed maps of the three stages of tailings pile construction, where contact and non-contact water areas are clearly defined, ditching and berming is identified (as it may change with each stage?), and surface water flow patterns are clearer. Modify text as appropriate and create supporting figures.	Figure 3-13 has been revised to show the contact water ditch. Additionally Figure 3-21 has been included to show phased dry stack facility construction. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
228	1344-1346	Clarification. The sentence includes two separate statements separated by a comma. Question: Are those two separate reasons for underdrains, which would have an "and" after the comma? Or, does limiting phreatic head prevent the uplift of the liner prior to tailings placement? Action requested: Provide clarification and edit text if warranted.	Text has been edited to read: "The purpose of the under-liner drains would be to limit the phreatic head in the foundation soils under the geomembrane liner to prevent uplift of the liner prior to tailings placement. "
229	1350	Information requirement. Potential magnitude of seepage needs to be addressed to inform environmental review. Action requested: Ensure Future Scope addresses the item in the appropriate location (s) in the document.	Section 6.3.2 identifies potential leakage from the dry stack facility as part of the planned future scope.
230	1351-1354	Information need. The agencies agree that additional work is needed to address the potential magnitude and quality of seepage, as well as how it may affect the water and chemical balances. This all feeds into verification of "no discharge" goal for the project. Action requested: Ensure that Section 6.3 addresses the item. Future discussion item.	Section 6.3.1 identifies detailed water balance modeling as part of the planned future scope.
231	1355-1360	Guidance. It is noted that the proposed design will be subject to agencies' review and approval. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
232	1358	Clarification. The text as offered is unclear on how the compacted tailings would be applied. Rephrase to ensure clarity that compacted tailings protecting the liner would be on top not below as foundation. Action requested: Revise text to clarify.	Text has been edited to read: "The liner would be protected by a minimum 1 ft (0.3 m) thick layer of compacted tailings on top of the liner which would be, pushed into place by dozers and compacted prior to any haul truck traffic being allowed over the liner. "
233	1365	Clarification. DNR notes the location(s) of the gravel blanket drain is not clear on fig. 3-13. Action requested: Provide the feature on future versions of this and/or other figures as appropriate.	Text is accurate in describing the gravel blanket drain. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details on the dry stack facility.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
234	1362-1368	Clarification. It appears that finger drains, blanket drain, and water ditch are described out of sequence of construction. Action requested: If this is correct, edit text to appropriately sequence these parts of the project.	The purpose of this paragraph is to describe what would happen to draindown within the dry stack facility. The sequence described in the text is: 1. draindown would be intercepted by the liner, 2. draindown would collect in the gravel finger drains or gravel blanket drain, 3. draindown in finger drains and blanket toe drain would discharge to the perimeter contact water ditch.
235	1368-1369	Concurrence. DNR and MPCA concur the magnitude of drain down quantities is needed to assess potential impacts to water quality. Action requested: Ensure Section 6.3 identifies this as an information need. Future discussion item.	Potential pathways for how process water and/or contact water could be released to groundwater will be considered and then quantified is part of Section 6.3.2 planned future scope.
236	1378-1384	Clarification. The text identifies contact water ditches are a component of the DSF. Question: What is the largest size storm event that the contact water ditch is designed to convey? Action requested: Amend text to include the storm event size.	Text has been edited to read: "The contact water ditch would route the water to the closest contact water pond. For significant portions of the perimeter length, the contact water ditch would be excavated into bedrock. The contact water ditches would be sized for the peak flow from a 100-year, 24-hour rainfall event."
237	1378-1384	Design recommendation. Consideration should be given to designing the contact water ditch with a capacity larger than a 100-yr, 24 hr storm. More detail will be necessary on the proposed design. Action requested: Modify text as appropriate to address the item. Future discussion item.	Comment is noted. The capacity is based on a preliminary water balance and will be updated based on water balance modeling outlined in Section 6.3.1. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
238	1380-1382	Clarification. Why was a low permeability soil and not some sort of liner chosen to line the contact water ditch? Is some seepage expected through the contact water ditch if a low permeability soil is used? The proposed compaction for the slopes and base are of interest. Action requested: Answer the questions and modify text as appropriate.	The preliminary design of the contact water ditches lines the ditch with low permeability soil instead of a geomembrane liner to allow the ditches to collect seepage from adjacent soil and upper bedrock into which the ditches would be excavated, thus creating a hydraulic gradient towards the ditch. The contact water ditch is not expected to have seepage from it and would work in conjunction with the groundwater cutoff wall to protect groundwater. Further analysis of the contact water ditch and groundwater cutoff wall performance will occur during EIS development.
239	1385-1393	Clarification. The text would benefit from more detail being provided on the design of groundwater cutoff wall/trench. Action requested: Modify text to address the item.	At the end of the paragraph, text was added to reference Figure 3-20 which illustrates a typical groundwater cutoff wall (which is inclusive of the seepage cutoff trench and a grout curtain installed as necessary depending on bedrock condition): "Figure 3-20 shows a typical perimeter contact water ditch and includes more detail on the contact water ditch, groundwater cutoff wall, and the perimeter gravel road." Additionally, see Comment 238
240	1394	Clarification. Would water from the haul road, which would likely have tailings spills, be able to run off outside of the tailings facility because the wall is under it? This could adversely affect the water quality of surface run-off. Action requested: Address the item and modify text as determined appropriate. Ensure Future Scope of appropriate sections address the issue.	Text has been edited to read: "The groundwater cutoff wall would be on the outer edge of the contact water ditches beneath the perimeter haul road to encompass the dry stack facility and contact water ditch. The perimeter haul road would be graded to drain to the contact water ditch." Additionally, please refer to Figure 3-20 for a cross-section that depicts this along with proposed grading arrows.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
241	1396	Clarification. What is "restrict" in terms of flow of contact water? Action requested: Address the item and modify text as determined appropriate.	As outlined in Section 6.3.2 planned future scope will include modeling to quantify Project influences on groundwater systems. This modeling will quantify any flow of contact water out of the contact water ditch and dry stack facility footprint. Estimates of this flow will be provided during EIS development.
242	1399	Design consideration. Maintaining positive pressure to the exterior of the grout curtain (part of the seepage cutoff trench), so that water pressure confines contact and drawdown water in the TSF, should be considered. Action requested: Address as appropriate for current document. Future discussion item.	See Comment 238
243	1400-1409	Future information. Modeling should be provided to support the volumes of collection ponds. Action requested: Ensure the Future Scope of the appropriate section(s) addresses the item.	As outlined in Section 6.3.1 planned future scope will include water balance modeling to simulate process water flow, including water gains and losses and consumptive use, contact water management, and rerouting of non-contact water flows. This will inform future design of the ponds. Updated project descriptions will be furnished during EIS development to satisfy the EIS scope.
244	1402	Information need. As noted earlier, the temporary construction of contact ponds during the stages of the tailings facility is an area where more information is needed. Action requested: Provide additional detail in next data submittal.	Text has been edited to read: "Five tailings management site contact water ponds would be constructed, as shown on Figure 3 13, in addition to two interim contact water ponds that would be installed to manage water during stage 1 and stage 2 of the dry stack facility before the facility is at the full footprint. The interim contact water ponds would be designed and function the same as the contact water ponds and are necessary to accomplish the phased staging of the dry stack facility. The interim contact water ponds would be located in the allowance for water management features as shown in Figure 3-21. The ponds are temporary as tailings would eventually need to be stacked in their locations." In this context, temporary is meant to convey that the ponds are only present during Stage 1 and Stage 2 of the dry stack facility and at the end of the respective stages, are reclaimed.
245	1403-1405	Design recommendation. Consider sizing tailings management site contact water ponds to handle more than a 100-year, 24-hour storm event (may not be sufficient). Also, the proposed design criteria may not be adequate to accomplish the project's "no discharge" goal. No action requested. Future discussion item.	Comment is noted. The storage capacity is based on a preliminary water balance and will be updated based on water balance modeling outlined in Section 6.3.1. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
246	1405-1407	Background information request. What snow melt rate was used when determining snowpack size the contact water ponds should be able to handle? Was a rapid melt scenario considered? How does a 100-year snowpack compare to a 100-year, 24-hour storm event and why was it chosen? Action requested: Provide background information.	The storage capacity is based on a preliminary water balance and will be updated based on water balance modeling outlined in Section 6.3.1. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
247	1407	Background information request. What is the water equivalent in the 100-year snowpack? Action requested: Provide background information.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
248	1413-1419	Clarification. Cite existing figures as they align with the stages. Action requested: Amend text with figure citations.	See Comment 244.
249	1413-1419	Recommendation. Consistent with text there would be benefit with development of new figures with the various stages (i.e., stages for figure 3-13 or 3-14). This would include location of interim ponds, for example. Action requested: Comment submitted in figures.	See Comment 756.
250	1423	Clarification request. Is two feet of cover soil above the geomembrane enough to protect from long term degradation? Action requested: Provide text identifying the purpose of the two feet of cover soil.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of liners and cover systems.
251	1423-1424	Clarification. Understanding the project would benefit from a more-detailed description of "hydraulic barrier." Action requested: Modify text to address the item.	Text has edited to read: "The cover would consist of at least 2 ft (.6 m) of cover soil underlain by a hydraulic barrier. The type of hydraulic barrier would be selected based on future design evaluations that would assess compatibility with infiltration design criteria and availability of cover soil materials. Infiltration criteria would be determined based on future tailings geochemistry test work results and permitting requirements."
252	1430	Clarification. The text provides discussion of contact vs. non-contact areas, as well as a non-contact water diversion area. The layout of these areas all influence changes in surface hydrology and surface permeability. Additional detail will be necessary to inform the scoping process in offering the potential significance of impacts for the EIS. Providing supporting material, such as a map/figure identifying these areas, or a table giving area measurements, could be warranted. Action requested: Consider how to beef up the text, plus what additional supporting materials would be useful, to assist in better understanding the project and its potential impacts.	The sizing of ditches, ponds and diversion areas will continue to evolve based upon further engineering, impact assessment, public input, and agency engagement on a number of water-related topics. It is premature to offer specificity described. Updated project descriptions will be furnished during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water management and design or construction details of water management features.
253	1432	Permit need. The diversions dikes and ponds may need dam safety permits. No action requested.	See Comment 727.
254	1452 and 1462	Clarification. In concert with text at Lines 1452 and 1462, the non-contact ditches are not clear on Figure 3-13 (e.g., thickness correct?). Recommend add legend or label as needed. Action requested: Comment provided in the figures section.	See Comment 764.
255	1453	Future analytical need. Modeling/analysis needed for diversion dikes flow/control. Action requested: Ensure appropriate future scope section identifies this analytical need.	As outlined in Section 6.3.1 planned future scope will include modeling to quantify Project influences on surface water systems. This modeling will quantify Project impacts to surface water flows as compared to baseline conditions. This includes runoff from precipitation and melt, and streamflow routing.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
256	1458	Guidance. In typical usage a dike is a means to prevent flooding of an area. Similarly, in typical usage if water is being held back or stored, the structure is a "dam. Action requested: If the structure is a dike, then modify language to read: "These dikes would not result in ponding of non-contact water from adjacent surface flows." If this is not an accurate statement, then modify language in entire paragraph replacing the term "dike(s)" with "dam(s)" where the structures do result in ponding or similar action.	On an on-going basis the dike prevents flooding against the dry stack facility. Periodically, depending on the precipitation event, water may pool temporarily upgradient of the dike and be diverted through non-contact water ditches.
257	1464-1467	Clarification request. Cite appropriate figure or develop figure with greater detail to illustrate water management. For example, does this refer to the non-contact "pond" adjacent to contact water pond 5 on figure 3-13? Action requested: Add citation and possibly provide visual that better illustrates water management.	See Comment 227.
258	1468-1473	Design recommendation. Consider sizing diversion dikes to handle more than a 100-year, 24-hour storm event (may not be sufficient). No action requested. Future discussion item.	Sizing of water management features and request for additional detail and analysis is covered in Comment 557.
259	1470-1471	Clarification request. Why are non-contact water ditches designed to convey the peak flow from only a 10-year, 24-hour storm event with no erosion? Action requested: Provide clarification.	This is an appropriate design for non-contact water ditches at this stage in project development. During operations the ditches can be re-armored as necessary.
260	1471	Clarification. Unclear whether the "overflow weirs" are the same as the diversion dikes? This is the only use of the term overflow weir. Action requested: Modify text to clear up usage of the term.	Reference to overflow weirs was removed to simplify description. Text has been edited to read: "The non-contact water ditches would be designed to convey the 100-year, 24-hour storm event with a minimum freeboard of 1 ft (0.3 m)."
261	1477-1499	Regulatory guidance. Several water management activities appear to be classified as industrial stormwater. All areas that generate and may discharge industrial wastewater need permit coverage, and any discharges of industrial wastewater would require sampling. Note that industrial wastewater cannot be categorized together with upstream diversion water. For example, things like office buildings and parking lots would not be considered industrial wastewater, but maintenance areas, fuel storage, fueling areas, material handling, refuse sites, waste storage, plant yards, and buildings where industrial activities occur are considered industrial wastewater areas. The site drainage areas (with surface flow direction arrows) and the activities within those drainage areas need to be better defined and illustrated to determine areas where industrial wastewater is generated. Some areas that are now identified as non-contact water may need to be regulated as industrial wastewater. Action requested: Consider the regulatory guidance against how water is proposed to be classified at this time versus a more appropriate regulatory construct. Modify text as appropriate. Future discussion item.	See Comment 71.
262	1479	Clarification. The text indicates management flexibility needed to address extreme storm events. Explanation would be valuable in distinguishing extreme storm events versus typical precipitation years. Two approaches appear viable. One is to add term "extreme storm event" to glossary and define in a way that contrasts with typical precipitation years. Second is to provide text at this location, either a new sentence in the paragraph or a footnote (where footnote avoided with termed defined in glossary). Action requested: Consider how to clarify text regarding extreme storm events.	Definition has been added to glossary: "extreme storm event: unexpected, severe, or unseasonal weather events, specifically weather events at the extremes of historical distribution"

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
263	1486-1490	Guidance. Additional information will be needed to conclusively determine how runoff from each of these features would be managed from a regulatory perspective (i.e., process/contact water vs industrial stormwater, etc.). No action requested. Future discussion item.	See Comment 71.
264	1489	Clarification. Based on the layout and discussion it seems like the area around the concentrator should be a contact water area. There would be concentrate stockpiled in the building, moved by heavy equipment, and loaded into containers. It seems likely the run-off around the building would pick up concentrate or its leachate with spillage and trucks exiting the building. With a public water near, any changes in run-off quality have the potential to be important. Action requested: Address the item and modify text as determined appropriate. Ensure that the issue is identified in the Future Scope of the appropriate section(s) in the document.	See Comment 71.
265	1490	Clarification. It is unclear what constitutes the "slopes of the working pad" provided in the text. Action requested: Modify text to clarify.	The plant site would be cleared of vegetation, filled with compacted rock, and graded to create a working pad. To manage contact and non-contact water the working pad would be higher than the surrounding topography and the outer extent of the working pad would be sloped to tie in with the existing topography. These slopes of the working pad would likely be covered with suitable growth medium and vegetated to control erosion.
266	1493-1496	Clarification request. The management of water from the non-contact area would seem to require some way to divert water at various points, potentially quickly in the case of 24 hour storms. Is that the intent? Is this applicable to the contact water area too? Action requested: If yes for either, add text to capture this aspect of water management.	Lines 1493-1496 describe the intent of water management during storm events at the plant site for non-contact water. For contact water: Text was added to the Plant Site Contact Water Management section that reads: "The contact water ponds would be normally kept at a minimal level and water would be pumped to the process water pond. If the process water pond is at risk of exceeding a maximum operational volume threshold based on freeboard requirements, excess water would be directed to the process circuit where it would be included in the tailings stream sent to the tailings dewatering plant." Text was added to the Tailings Management Site Contact Water Management section that reads: "In upset conditions, excess process water at the tailings dewatering plant could be routed to the tailings management site contact water pond 1."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
267	1507	Clarification. It is necessary to know what constitutes a "portion of the tailings dewatering plant" to assess potential impacts. The layout of this area influences changes in surface hydrology and surface permeability. Additional detail will be necessary to inform the scoping process in offering the potential significance of impacts for the EIS. Providing supporting material, such as a map/figure identifying these areas, or a table giving area measurements, could be warranted. Action requested: Consider how to beef up the text, plus what additional supporting materials would be useful, to assist in better understanding the project and its potential impacts.	TMM anticipates adding industrial stormwater as a defined type of water for the project in consultation state agencies during the EIS development and subsequent permitting. Industrial stormwater is likely to better describe the stormwater run-off and can provide some further clarity to this, after the coordination between TMM and the agencies occurs. As industrial stormwater definition has not been agreed upon between TMM and state agencies, TMM is continuing with the current description in the SEAW. Non-contact water management at the tailings dewatering plant is described in lines 1535-1542: "A portion of the tailings dewatering plant would be managed as a non-contact area to allow flexibility for water management during extreme storm events. During extreme storm events, stormwater on the non-contact area at the tailings dewatering plant would be routed through appropriate discharge controls. However, during typical precipitation years, stormwater from the non-contact area at the tailings dewatering plant would be routed to and collected by the contact water collection system and used in the process." Contact water management at the tailings dewatering plant is described in lines 1321-1325: "At the tailings dewatering plant, surfaces would be graded so stormwater would flow to the south and into tailings management site contact water pond 1. The dry stack facility contact water management system would include a liner system (including over-liner and under-liner drains), contact water pond, groundwater cutoff wall, and contact water ponds."
268	1518	General comment. Treating the undeveloped areas of the TSF as noncontact water requires consideration. Fugitive dust and precipitation runoff may impact undeveloped areas. Action requested: Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details on the dry stack facility.
269	1525	Clarification. The text ends the sentence at Lines 1525-1256 as "The footprint of dry stack facility stage 2…" Should this read stage 3? As written, it says the water from the tailings at stage 2 would be considered non-contact water. Action requested: Review comment and modify text as appropriate.	Text edited to read: "The footprint of dry stack facility stage 2 would be managed as non-contact water during operations when tailings are placed on stage 3. "

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
270	1529-1530	Clarification request. How will runoff from the tailings stack be handled to prevent it from running onto exposed sections of the dry stack facility liner? Would it be easier to manage all sections of the exposed liner as contact areas and any areas that have yet to be constructed as non-contact areas? Action requested: Modify text to address the issue. Could be a topic of future discussion.	Text has been edited to read "Prior to development of each stage of the dry stack facility, the liner would be installed over the entire footprint of that stage, an area of approximately 120 to 160 acres. Tailings filter cake would be placed and compacted gradually from west to east across the lined area, with a portion of the liner remaining exposed until the stage is complete. To minimize the volume of contact water, TMM would manage portions of the exposed dry stack facility liner as non-contact areas. TMM would prevent runoff from the dry stack (contact water) from flowing onto the non-contact areas of the exposed liner by using a temporary system of berms, piping, and pumps as necessary to route contact water to a contact water ditch. The temporary infrastructure separating the contact and non-contact areas of the exposed liner would be periodically adjusted as tailings placement progresses eastward."
271	1530	Question. How would the eastern edge of stage 1 of the dry stack facility be separated from the stage 2 area during stage 2 construction and up to the point of tailings being deposited in stage 2? Action requested: Provide response. If part of the answer improves the understanding of the existing text, then modify text accordingly.	There would be a "temporary" contact water ditch along the eastern side of stage 1 present only during stage 1. Additionally, there would be a "temporary" contact water ditch along the eastern side of stage 2 present only present during stage 2.
272	1530	Clarification request. Explain in detail how portions of the exposed dry stack facility liner would be managed as non-contact water. Action requested: Provide the detail and modify text as requested, which may be substantial enough such that the section warrants reorganization into two sections (?).	See Comment 270
273	1534	Clarification. How would the water from the non-contact areas be managed? Action requested: Address item and modify text accordingly.	See Comment 270
274	1535	Design Consideration. Given the relative small area here compared to the actual tailings deposition area, it seems like it wouldn't be saving much by diverting some of the water of the dewatering plant area as non-contact during large storm events. Under the current design, if there are diversion ditches, isn't there the possibility they would be intercepted by contact water at times (thus becoming "contact surfaces/structures themselves)? Recognizing the practical challenge of separating and changing flow directions, and given the proximity of the filter plant to Birch Lake (within 1000 feet), information requirements are high to assess the potential for impacts to water and natural resources. Action requested: Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water management.
275	1536-1542	Clarification. Provide greater detail regarding how the tailings dewatering plant manages contact and non-contact water. This detail not only improves the text but is necessary to determine how runoff from these features would be managed from a regulatory perspective (i.e., process/contact water versus industrial stormwater). Action requested: Modify text to address the item. Future discussion item.	Comment is noted. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water management.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
276	1544-1549	Clarification. More detailed information on the design of the cover system is needed. This information would be used, in part, to help determine whether MPCA Solid Waste or SDS permits or other agency approvals are required. Action requested: Modify text to address the item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of liners and cover systems.
277	1555-1559	Clarification. What size storm event would the temporary non-contact water ditches be designed to convey and would they be lined? Action requested: Modify text to reflect the response to the question.	Text has been edited to read: "In these areas, a temporary non-contact water ditch would be constructed near the toe of the dry stack facility inside and above the contact water ditches, as shown on Figure 3-20. These temporary non-contact water ditches would have the same design and function as the other non-contact water ditches and would drain to controls to remove suspended solids." See line 1470 for the description of the storm event for non-contact water ditches.
278	1562	Clarification. Having two different drainage systems is hard to follow and understand in this text. Action requested: Assessment of potential impacts would be aided by additional detailed maps of the three stages of tailings pile construction, where contact and non-contact water areas are clearly defined, ditching and berming is identified (as it may change with each stage?), and surface water flow patterns are clearer. Modify text as appropriate and create supporting figures. See RGU Comment 227.	Based on Comment 227, Figure 3-21 has been included to show phased dry stack facility construction. Additionally, Figure 3-19 displays the exterior slope prior to reclamation and after reclamation which shows the non-contact water ditch that is included in more detail in Figure 3-20. Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on reclamation.
279	1562	General comment. Text states: "…and would drain to the surrounding environment…" This level of detail does not allow for extrapolation of potential environmental effects. Timing of draining also requires understanding. Action requested: Supplement text as current design allows. Ensure Future Scope identifies this information need at the appropriate section(s). Future discussion item.	A preliminary dry stack facility closure concept has been developed and the specific locations of discharges are still being evaluated. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect stream routing and drainage patterns will be provided during EIS development to satisfy the EIS scope.
280	1565	RGU note. Preliminary review of the information suggests contributing watershed impacts to Keeley Creek, in terms of a new surface hydrology in operations and closure, will receive detailed analysis in the EIS. A focus area would be to evaluate the degree to which "downstream surface water receptors" may or may not receive run-off in the same amounts, and at the same rates, as the pre-project or No Action Alternative. Action requested: Ensure Section 6.3 identifies this item as a future information and analytical need for the EIS.	Watershed impacts from the Project to Keeley Creek will be part of the future work, specifically the Water Balance Model outlined in Section 6.3.1 (lines 4219-4228).

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
281	1565-1568	Information need. As proposed the tailings area would be converted from forest to grassland. It should be noted this type of covertype conversion can change the quantity, quality, and rates of run-off. Action requested: Ensure Section 6.3 identifies this item as a future information and analytical need for the EIS.	As outlined in Section 6.3.1 future work will include modeling to quantify Project influences on surface water, groundwater, including quantity, quality, and rates of run-off. The change in vegetation type will be captured by this modeling and will be provided during EIS development.
282	1571	Future information need. How the contact water ditches and ponds are reclaimed is important to understand to assess potential for impacts in the closure condition. For example, how would they be drawn down and where would any remaining water, and any possible contaminants, be managed? Action requested: Ensure that reclamation plans for these facilities, including water management, be identified as an information need in the Future Scope of the appropriate section(s). Modify text as appropriate to address the item.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on reclamation and closure.
283	1585	General note. DNR will seek further information regarding construction stormwater management, including ponds, collection, treatment, and conveyance in order to support the EIS impact analysis. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
284	1603-1604	Clarification. This sentence seems contrary to the claim that all contact water would remain on the project site. Either specify what is meant by "discharged" in the context of no contact water leaving the site, or explain otherwise. As has already been noted, the management of contact water during construction, operations, and closure is of high interest. Statements that discharges would be "in compliance with permits" does not negate the need to fully detail what may be planned. Parameters of interest around any such discharge include: source/where; volumes; predicted water quality; timing; and destination. Action requested: Provide qualifying text to the paragraph on this discharge. Ensure that Future Scope in the appropriate section(s) addresses the item.	Text corrected to indicate that "Construction stormwater would be discharged, as required, in compliance with permits."
285	1618	RGU note. Preliminary review of the information suggests contributing watershed impacts to wetlands, in terms of a new surface hydrology in operations and closure, will receive detailed analysis in the EIS. A focus area would be to evaluate the degree to which wetlands may or may not receive run-off in the same amounts, and at the same rates, as the pre-project or No Action Alternative. Action requested: Ensure Section 6.3 identifies this item as a future information and analytical need for the EIS.	Methods for modeling and monitoring indirect impacts to wetlands will be refined as the future work scope related to surface water and groundwater. The modeling results from the Section 6.3.1 and 6.3.2 will inform the potential indirect impacts to wetlands.
286	1619-1620	Information need. Detail will be necessary on drain down and seepage water quality and quantity after closure. Action requested: Ensure that Future Scope in the appropriate section(s) addresses the item.	As outlined in Section 6.3.2 future work will include modeling to quantify Project influences on groundwater systems. This modeling is for all Project impacts including reclamation and closure and will include modeling drain down and seepage water quality and quantity and will be provided during EIS development.
287	1619-1620	Information need. The possibility that vegetation changes due to normal successional processes, such as trees growing, could alter permeability is an information need for assessing potential impacts in closure. Action requested: Ensure that Future Scope in the appropriate section(s) identifies this as a future information need.	As outlined in Section 6.3.1 planned future scope will include modeling to quantify Project influences on surface water systems. Analysis and modeling of the hydrologic system will include baseline conditions, the mine operational period, and the reclamation / closure period.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
288	1625-1626	Clarification. The text states: "…it would be routed to non-contact water ditches." Action requested: Would non-contact water ditches remain in closure? If yes, ensure consistent treatment of this proposed closure condition and modify text as appropriate.	Text edited at the end of Non-contact Water Diversion Area Water Management section to read: "The non-contact water ditches would discharge to existing drainage ways or other diversions ditches through energy dissipation devices (e.g., rip-rap, erosion control mats, etc.). Non-contact water ditches would be maintained throughout concurrent reclamation activities and would be integrated into drainage features at the tailings management site during the closure stage of the Project."
289	1619-1626	Clarification. The text indicates if planned water quality management efforts are no longer available, timing of this would be important. If treatment is indeed needed, then it would be necessary to know ahead of time, and at a minimum, include in cost estimates. In addition, appropriate water quality permitting would be required. Action requested: Provide explanation on possible treatment options and monitoring necessary to know if contingency actions should be triggered. Cost estimates will be a subject of future discussions.	It is premature to perform this analysis or know if it is needed without first developing a complete scope for water quality assessment which is on-going as well as a detailed impact assessment which is forthcoming during EIS development.
290	1619-1626	DNR note. Drain down seepage would be considered "contact water" even if it meets applicable water quality standards. No action requested. Future discussion needed in determining whether this would be classified as some type of discharge.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
291	1622	RGU note: Expect future discussion on potentially available treatment technologies. No action requested. Future discussion required to determine treatment in the EIS.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
292	1627	RGU note: The SEAW will not include this section. However, it is likely that some of the information presented is appropriate to include in the document itself. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
293	1630	DNR notes an important consideration in the project design stems from the location of the deposit. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
294	1634-1635	Guidance. If a discharge of process water or contact water is a possibility, even on an infrequent or contingency basis, appropriate water quality permitting (potentially a NPDES/SDS permit) would need to be addressed. Action requested: Ensure Table 8-1 appropriately captures the possibility of permitting for this project feature. Modify text as appropriate. Future discussion item.	The table is complete as offered. TMM understands that as potential Project impacts are completed permit requirements may change. We recognize the RGU will make changes to the table as it deems appropriate or necessary.
295	1638-1639	DNR notes stating "eliminating a potential source of ARD" remains to be validated by a fully-reviewed kinetic testing program. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
296	1645	RGU note. Inconsistent to state "no permanent infrastructure" would remain and then list permanent infrastructure that would remain. A possible revision might read: "After Project closure the only permanent infrastructure that would remain would be the dry stack facility and some non-contact water management features." Action requested: Modify text to remove contradiction.	Text has been edited to read: "After Project closure the only permanent infrastructure that would remain would be the dry stack facility and some non-contact water management features."
297	1650-1686	Guidance. The project features listed in this section of text will have to undergo agency review and approval for each item's proposed design and performance of the various engineering controls. This will likely require additional information and discussion that could result in changes in the design to be able to be approved. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
298	1727-1729	Design consideration. Likely that consideration will be given to the proposed height of the dry stack relative to potential visibility and dust impacts. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
299	1756-1757	RGU note. The relationship of the current proposed action to any future activity remains to be determined. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
300	1775	Permit need. DNR notes a dam safety permit may be needed (not yet determined). Action requested: See comment provided in tables section.	See Comment 727.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 4.0 Land Use
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
301	1780	RGU note. Section 4.1.1 describes land use in the vicinity at a variety of scales (e.g., regional; ~ 10 miles; 25 miles). It may be beneficial to break land use into a broad regional category along with a well-defined Project area section (~ 10 miles). Action requested: Consider reorganizing section to provide a consistent geographic scale in describing land uses and features relevant to the project context.	Recreational uses are described in a wider scale to capture the large number of recreating opportunities in Northern Minnesota. Text has been revised and added to Section 15.1 where effects on recreation and future scope are addressed.
302	1780	Existing recreation. Section 4.1.1 should note the Transmission Corridor would cross an existing Grant-In-Aid (GIA) snowmobile trail in the approximate location of NWNE sec 29, T61N, R11W. This trail is managed by the Ely Igloos snowmobile Club. Action requested: Modify the text to address the item. Text should be added indicating the project's compatibility with this recreation resource, including during construction, operations, reclamation, and closure. Identify measures incorporated into the proposed project to mitigate any potential incompatibility.	Text has been edited in Section 15.1 to read: "A Grant-in-Aid snowmobile trail, which currently runs through the footprint of the transmission corridor, is maintained by the Ely Igloos Snowmobile Club. The trail crosses the footprint of the transmission corridor in NWNE Section 29, T61N, R11W." Potential effects on recreation will be studied as outlined in Section 15.1.
303	1780	Existing recreation. Section 4.1.1 should identify that several recreational facilities are accessed by, or located on, the Spruce Road. The Spruce Road is within the project boundary. Facilities on the Spruce road include the South Kawishiwi River Water Access, Prospector Loop ATV Trail, Tomahawk Snowmobile Trail, and the Little Gabbro lake Water Access. The project should avoid ingress or egress impacts to Spruce Road. Action requested: Modify the text to address the item. Text should be added indicating the project's compatibility with access to the named recreational features. Identify measures incorporated into the proposed project to mitigate any potential incompatibility.	Lines 1827-1832 generally discuss the recreational uses within 25 miles of the Project area. These recreational facilities are outside the Project area and no impacts are planned to Spruce Road which would impact ingress or egress. Impacts to recreation will be assessed as Section 15.1 and some text has been moved from Section 4 into Section 15.1.
304	1780	Existing recreation. Section 4.1.1 should identify the US Forest Service operates the South Kawishiwi Campground, which is located at the intersection of Hwy 1 and the Kawishiwi River. The facilities include a campground, swimming beach, pavilion, and DNR administered public water access. The project should avoid ingress or egress impacts to these recreational facilities. Other possible impacts include light and noise effects. Action requested: Modify text to address the item. Text should be added indicating the project's compatibility with access to the named recreational features. Identify measures incorporated into the proposed project to mitigate any potential incompatibility. See Sections 10 and 12.	See Comment 311. Impacts to recreation will be assessed as part of Section 15.1.
305	1802	Addition. These categories are appropriate land uses to add to the list provided: Water oriented commercial businesses (e.g., resorts; houseboat rental; fish guiding; other); Lake shoreland residences. Action requested: Modify text.	Text has been edited to include additional bullets.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
306	1804	Clarification request. Review of Figure 4-4 appears to indicate both resorts and parks occur within 10 miles of the Project, which is analogous to the distance to Babbitt and Ely. Action requested: If accurate, then modify bullet text to read: "Recreation (resorts, parks).	This is covered in list with: "Hunting and fishing; Year-round recreation, including downhill skiing, snowmobiling, off-highway vehicle (OHV) use, mountain biking, hiking, and golf; Recreational trails." Additionally bullets in text have been edited to include: "Water oriented commercial businesses (e.g., resorts; houseboat rental; fish guiding; other);" in response to Comment 305.
307	1805-1822	Clarification. This area is primarily forested and the main uses currently are for timber production and recreation. Recreation is a high use of the area, including on Birch Lake and connected waters. It is noted that mining and industrial uses of the area have not occurred, although there is a history of mineral exploration. Past mineral exploration has left little footprint on the land. Action requested: Modify text as appropriate to make characterization of land use better reflect the existing project area.	The text discuss previous land use in the Project area and this correctly includes mineral resource development. Mineral resource development continues within and near the Project area with exploration drilling from TMM and Encampment Minerals as well as mineral development in Kasota Stone's 120-acre industrial mineral lease with the state of Minnesota (MLIN200002) within the footprint of the Project.
308	1806	Text clarification. The text reads the Project area has a history of both mineral "exploration" and "development." Depending on the defined boundary of "Project area," uncertain that "development" applies. Clearly however that "exploration" activity applies. Action requested: Modify text by dropping "development" unless rationale for inclusion is supported.	Mineral development is appropriate as Kasota Stone is an industrial mineral producer with a quarry currently operating in the proposed footprint of the tailings management site with an industrial mineral lease with the State of Minnesota.
309	1815	RGU note. The introduction could be read to imply the Project area exhibits commercial and industrial uses, which is not accurate. Action requested: Modify text to drop introductory qualifier for sentence to read: "The region is a destination for recreation."	In addition to Kasota Stone (see Comment 308) there are timber harvest activities on Federal and State land near the Project area as well as commercial resorts and travel options near the Project. No change made.
310	1817	Clarification. DNR notes the Project area seems closer than 5 miles to BWCAW. Figure 1-1 shows the BWCAW 2 miles from the northeast corner of the Project Area. Figure 4-1 shows the BWCAW 3 miles from the northeast corner of the Project Area. Action requested: If this is correct, it may be more accurate to state as a range (e.g., 2 to 5 miles) across the various project features.	The BWCAW is approximately 5 miles away from the nearest point to any areas of potential ground disturbance - the northeast end of the access road corridor. Text has been edited to read: "The Project lies within the Bear Island State Forest boundary and is approximately five miles from the southwestern border of the Boundary Waters Canoe Area Wilderness (BWCAW) at the nearest point to any areas of potential ground disturbance."
311	1833-1837	Information need. Assessing potential impacts to recreation resources requires a full description of the recreation management classifications of state and federal ownerships, including permitted uses and targeted experiences. As appropriate it may be relevant to identify SNF recreation classifications for the greater area around the project as a function of the extent of project impacts. There are areas of Semi-primitive Motorized Recreation both to the northeast and south of the project. The parts of the Project area within the SNR are classified as General Forest, which too specifies recreation settings and permissible activities. More broadly, the non-motorized recreation use that is present typically occurs on lakes, trails, portages, and low standard roads. This management type is along all the shore of Birch Lake and the South Kawishiwi and there are two back country campsites immediately adjacent to the project site; these should be acknowledged. There are also two USFS campgrounds; the South Kawishiwi Campground is immediately adjacent to the Project area according to Figure 12-1, while the Birch Lake Campground is located to the west-southwest of the DSF across Birch Lake. Action requested: Modify text to better account for recreation classifications and features in the project vicinity. Ensure that the Future Scope of the appropriate section(s) address the item as determined appropriate.	Recreation has been identified as an area of other potential environmental effects and has been incorporated in Section 15.1. Text has been edited in Section 15.1 to include additional specifics on recreation in the immediate vicinity: "Within 1 mile (0.6 km) of the Project area there are two campgrounds: • South Kawishiwi River Campground – northeast of Project and • Birch Lake Campground – southwest of the Project on the west shore of Birch Lake. In addition to the campgrounds, two backcountry camping sites are located within 1,000 ft (300 m) of the Project area on the eastern shore of Birch Lake – these campsites are accessible by any type of watercraft. Additionally, two USFS designated moderately developed trails, T5-1901a and T5-1904, are located within the Project area."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
312	1857-1858	RGU note. EQB guidance states for RGUs to consider conservation lands as the following: "Conservation lands. Typical land uses that fall in this category include Wildlife Management Areas (WMA), Waterfowl production areas, Scientific and Natural Areas (SNA), wildlife refuges, conservation easements, and potentially other federal, state, and local programs designed to conserve natural resources;" EAW Guidelines (2013). Figure 4-3 identifies both a "Research Natural Area" and "Unique Biologic Area" under the Superior National Forest Plan Management Areas. Action requested: Modify text to align with EQB guidance.	Text has been edited to read: "Within 1.5 miles (2.5 km) of the Project area in the SNF there is the Keeley Creek Research Natural Area and a Unique Biological Area as shown on Figure 4-3. In the Project area there are no prime or unique farm lands, agricultural preserves, or conservation lands"
313	1859	RGU note. EQB's EAW Guidelines (2010) cautions RGUs that "the EAW should not include information that serves only to justify or promote the project but is otherwise irrelevant to the purpose of an EAW." The Scoping EAW will follow this guidance for Item 9 - Land Use. No action requested.	Comment is noted.
314	1883	Clarification. There are residences on the west shore of Birch Lake that are very close (appears to be less than a mile) from the project and within Residential Recreational zoning classification. For the Inset Map on Figure 4-4, confirm that each "blue square" represents a private residences to ensure all private (residential) properties are identified. Action requested: Modify text to address residential properties on the west shore of Birch Lake across from the project. Comment provided in the figures section.	Correct. Each blue square represents a private residence. Residential properties on the west shore of Birch Lake across from the project are addressed in Comment 776.
315	1888	Clarification. Although detail provided on the land use plan, little text is devoted on any relevant ordinances. No mention here that much of the project is within the Shoreland management zone (within 1,000 ft. of a lake and 300 ft. of a stream), though it is partially shown on Fig. 4-3. Action requested: Consider comment and modify text as determined appropriate.	Shoreland zoning provisions and shoreland management are discussed on lines 2134-2152. These sections have been revised to include additional description in response to other comments. Rules are not repeated in full however they are cited and portions of the Project that would be required to meet these rules are identified.
316	1907	Clarification. Does the Lake County Plan end in 2013? The reference document listed at Lines 6842-6843 was effective June 2017. Action requested: Confirm duration compared with project activities; modify text if warranted.	This document was effective June 23, 2017 and the reference to 2013 is in the document approved by the Lake County Board of Commissioners in 2017. However, to avoid confusion "until 2013" has been removed from the text.
317	1908	Clarification. Other potentially relevant land use plan goals, which will have to be assessed for project compatibility, include: General Goal 1: C5) Work with federal and state officials to retain resident hunting, trapping, and fishing rights on publicly owned lands and waters, and C6) Work with applicable entities to maintain public access to all public land and waters in Lake County. Under general Goal 2: Recreational/ Cultural, there is Goal D) Encourage preservation of historic sites, E) Work with State and Federal agencies to ensure residents' continued rights to hunt, fish, and trap and manage forest land within the County, and H) Support the multiple-use of public lands and recognize the importance of all recreational activities. Action requested: Amend the text as appropriate to address the item.	Text has been edited to read: "The plan provides the general goals as follows: General Goal 1: Continue to develop Comprehensive Plan to guide decision-makers that considers the values, traditions, and customs of County residents, utilizing locally accepted comprehensive planning principles. General Goal 2: Assure a balance between development and quality of life considerations."
318	1909	Clarification. The "Land Use Goal: Support growth that is orderly and planned" is actually a part of a larger goal with multiple categorized goals. General Goal 2: Assure a balance between development and quality of life considerations. Land Use Goal: Support growth that is orderly and planned. Action requested: Modify text to address the item.	Text has been edited to read: "The plan provides specific land use goal as follows: Land Use Goal: Support growth that is orderly and planned."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
319	2049	Clarification. The management areas of the proposed project are identified in the SNF Plan are "Semi-primitive Non-motorized Recreation" and "General Forest" (https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_050602.pdf). This section should provide more information on the intent of the management areas as the basis of assessing the treatment of this topic in EIS scoping. Action requested: Modify text to address the item as determined appropriate.	To clarify, the Project area is within General Forest and Recreation Use in Scenic Landscape management areas. The Project area is outside any Semi-primitive Non-motorized Recreation (see Figure MAS-6 in the SNF Plan). Text has been edited to read: "The SNF is broken out by management areas which are assigned desired conditions, objectives, standards and guidelines. Most of the Project area is in General Forest management areas with portions near Birch Lake identified as Recreation Use in a Scenic Landscape management areas. General Forest Management Areas General Forest management areas “emphasize land and resource conditions that provide a wide variety of goods, uses, and services” (USFS, 2004). These management areas are the most common in the SNF, may have buildings and structures to support resource management objectives, and most special uses can be accommodated. Recreation Use in a Scenic Landscape “Recreation Use in a Scenic Landscape management area emphasizes land and resource conditions that provide a scenic landscape for recreational activities in natural-appearing surroundings” (USFS, 2004). Developed facilities and access may result in concentrated recreation and a high degree of user interaction. The management areas may have buildings and structures to support resource management objectives and most special uses can be accommodated." In addition to these edits see Lines 2355-2374 for Project impacts to the SNF Plan.
320	2049	Clarification. The SNF Resource Management Plan relies on monitoring and evaluation to improve ongoing management and inform planning decisions. The 2017 Superior National Forest Monitoring and Evaluation Report allows the USFS to determine how well the desired conditions, goals, objectives and outcomes of the Forest Plan have been met. Potential applicability of the findings of this report should be considered. Action requested: Modify text to address the item as determined appropriate.	TMM has not incorporated these findings as they are not currently reflected in the SNF Land and Resource Management Plan. Further considerations as to the applicability of the 2017 Superior National Forest Monitoring and Evaluation Report will be assessed by the RGU as identified in Comment 335 during development of the EIS.
321	2072	Clarification. DNR notes that planning for the cited plan is underway, while the previous applicable subsection plan is out of date. Action requested: Modify sentence to read: "…drafted with an anticipated completion in the near future. The state forest management units…"	Text has been edited to read: "The Northern Superior Uplands Section Forest Resource Management Plan is in the process of being drafted with an anticipated completion date of 2019 according to information available on the MDNR website. drafted with an anticipated completion in the near future."
322	2077-2085	Clarification. The text identifies that Figure 4-3 identifies the Shoreland Zoning areas around a number of water features. The text would benefit from discussion of the "additional shoreland zoning requirements" to which the project may subject. Action requested: Add some detail to the text.	Text has been edited under the Shoreland Zoning Provisions to read: "Structures developed within the shoreland of these water courses are required to be setback 100 ft (30.5 m) from the ordinary high water level elevation. Structures within shoreland zoning are subject to certain requirements including placement, design, height, and vegetative standards."
323	2079	Clarification. Activities on DNR administered state lands may require compliance with all applicable municipal, county and state laws, ordinances and regulations, and obtaining and paying for all leases, licenses, easements and permits as may be required by its use. Action requested: Modify text by breaking out state-administered lands from the joint sentence with federal lands. In new sentence use same language regarding state lands plus clarifying text.	Text has been edited to read: "Federal lands are not subject to local zoning controls but are governed by federal rules and regulations. State lands are not subject to local zoning controls but may require compliance with all applicable municipal, county and state laws, ordinances and regulations, and obtaining and paying for all leases, licenses, easements and permits as may be required by its use."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
324	2085	Clarification. At the appropriate location provide a bulleted listing of all project elements that occur within shoreland districts that is consistent with Figure 4-3. According to the figure, the Plant Site, DSF, and Transmission Corridor encroach within designated shoreland districts. Action requested: Review figure and ensure text and figure are consistent. RGU recognizes there may be a data layering issue that will be rectified in future submittals.	Text edited to read: "Parts of the Project that are within shoreland zoning include portions of the. • Tailings management site; • Transmission corridor; • Non-contact water diversion area; • Ventilation raise sites; • Plant site; and • Water intake corridor."
325	2133	Clarification. Shoreland zoning involves more than buildings meeting setback requirements. This section on shoreland zoning provisions should include text identifying the specific controls on shoreland alterations (Sec. 7.08), shoreland excavations (7.09), and road location (Sec 7-10) that are likely relevant to the proposed project. For example, greater detail will be necessary to assess the proposed amount of excavation and vegetation removal for impacts. Action requested: Modify text to address the item.	Text has been updated to state, "Additionally, shoreland zoning provisions also describe requirements for shoreland alteration, shoreland excavations, and road locations." Further considerations as to the applicability of these provisions will be assessed by the RGU as identified in Comment 335 during development of the EIS.
326	2134	Information request. What are the zoning requirements for Keeley Creek? Action requested: Modify text with zoning requirements for Keeley Creek.	Text has been edited to read: "...of the ordinary high water level elevation of public watercourses (Keeley Creek, Denley Creek, Stony River, and Unnamed Stream [Kittle Number H-001-092-015]). Structures within the shoreland of Birch Lake are required to be set back more than 100 ft (30.5 m) from the ordinary high water level elevation or require vegetative screening. Keeley Creek, Denley Creek, Stony River, and Unnamed Stream are watercourses with special shoreland classifications."
327	2137	Addition. Need to list public waters Keeley Creek and Unnamed tributary to Bob Bay (Birch Lake) also. Action requested: Modify text to address item.	See Comment 326.
328	2138-2139	Clarification. Sec 7.05 Standards For Commercial, Industrial, Public, and Semipublic Uses states setback for non-water oriented commercial structures is greater than 100 ft. (or requires vegetative screening). Action requested: Modify text to address the item.	Text has been updated to state, "Structures within the shoreland of Birch Lake are required to be set back more than 100 ft (30.5 m) from the ordinary high water level elevation or require vegetative screening.
329	2143	RGU note. DNR will further develop the relevant information for this section. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
330	2144 - 2149	Clarification. Minn. Rules Chapter 6120 are the minimum standards developed by the state and the standards adopted by LGUs, who administer the rules. The state is the administrator only on state-owned land. Action requested: Clarify text to match DNR authority.	Text has been edited to read: The MDNR is responsible for developing Minn. R., chapter 6120, which set the minimum standards for shoreland management for public water basins and watercourses. On private lands these standards are implemented through local shoreland ordinances and administered by the local zoning authority. However, on state lands the MDNR administers the shoreland rules directly."
331	2153	Clarification. If the Project type in St Louis County is classified as electrical lines and substation, and because the Project crosses RES-5 and FAM-1 zoning, then the substation component may require a performance standard permit. Such an approval would not be required for the electrical lines part of the project. Action requested: Confirm if indeed this is the project type for St. Louis County, and if yes, confirm whether such a permit is required. Modify text as appropriate. Add this approval to Table 8-1 if needed.	See lines 2410-2411. "The transmission corridor is listed as an acceptable use in all three zoning districts it crosses in St. Louis County (FAM, RES, and IND) but would require local permitting." The electrical substation would be located on private land within the Mineral Mining -City of Babbitt and on federal land within St. Louis County and would not be subject to St. Louis County zoning ordinance.
332	2293	Coordination. DNR will engage the Fond du Lac Band of Lake Superior Chippewa, and any other Tribes with usufructuary rights, on any tribal use of resources in the Project area and 1854 Ceded Territory. No action requested.	Comment is noted.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
333	2316	Text clarification. The SEAW item addresses compatibility with all the respective plans. Assigning the term "impact" to any project incompatibility with the respective land use plans is awkward. Action requested: Either drop the first two sentences found in Lines 2315-2317 and start the section to read: "The Project would be compatible...;" or propose different language.	Text has been edited to remove the sentences.
334	2317	RGU note. DNR will assess the Project compatibility with planned land uses identified by Lake County, St. Louis County, the City of Babbitt, and the USFS. No action requested.	Comment is noted.
335	2318	Guidance. The RGU will assess the Project proposed resource extraction purpose for compatibility with planned land uses identified by Lake County, St. Louis County, the City of Babbitt, and the USFS. The Scoping EAW will identify any incompatibilities and propose the treatment of the issue in the EIS. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
336	2320	Guidance. The RGU will assess the Project for compatibility with the Lake County Comprehensive Plan and Land Use Ordinance. The Scoping EAW will identify any incompatibilities and propose the treatment of the issue in the EIS. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
337	2321	Clarification. Because some of the land would be removed from public use, this may be in conflict with goals of the comprehensive plan, in particular the Recreational/Cultural Goals of the Lake County Land Use ordinance. These elements in the comprehensive plan may be relevant to the project: **Recreational/Cultural Goal -** Support the establishment and maintenance of recreational facilities and systems: C) Encourage cultural partnerships. D) Encourage preservation of historic sites. E) Work with State and Federal agencies to ensure residents' continued rights to hunt, fish, and trap and manage forest land within the County. H) Support the multiple-use of public lands and recognize the importance of all recreational activities. No action requested. The RGU will assess compatibility of project with the county's land use ordinance.	Comment is noted.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
338	2326	Clarification. There is a need to see if there are potential conflicts with the project proposed within a priority watershed: Kawishiwi. Action requested: Assess the item and modify text as determined appropriate.	The text has been edited to read: "This plan identifies six high priority watersheds, including the Kawishiwi Watershed. The Project area lies within the Kawishiwi Watershed which is made up of the following U.S. Geological Survey (USGS) Hydrological Unit Code (HUC)-10 watersheds: •Kawishiwi River, •Isabella River, •Stony River, •Birch Lake, and •portions of Fall Lake. From the Kawishiwi Watershed Protection Project Implementation Plan (Wenck Associates, Inc., 2013) the priority management areas are: •Enforce shoreland management regulations as property develops and redevelops, and encourage voluntary actions to mitigate the impacts of past development. •Proactively protect beneficial uses by taking positive actions to halt or minimize the spread of Aquatic Invasive Species. •Protect and improve water quality by reducing the number of noncompliant Subsurface Treatment Systems and increase the number of Subsurface Treatment Systems that are properly operated and maintained. •Protect and improve water quality and aquatic and terrestrial habitat by implementing shoreland Best Management Practices to stabilize and restore eroding shoreline and establish native shoreline and emergent vegetation. •Continue to monitor water quality and evaluate water quality trends. •Coordinate education and outreach messages and delivery methods with and between federal and state agencies, county and local governments, lake associations and other groups. The Project would be compatible with these priority management areas and their underlying objectives."
339	2328	Clarification. The text states "...This plan identifies six high priority watersheds, none of which are included in the project area." The Lake County local water management plan identifies the Kawishiwi watershed as one of the six priority watersheds. Action requested: Confirm the project is not in the Kawishiwi River watershed. Figure 6-2 appears to place parts of the DSF, plants site, vents, and parts of the transmission corridor within the South Kawishiwi subwatershed. Modify text if necessary to reflect location in the Kawishiwi River watershed, and if yes, provide text addressing project compatibility with the plan.	See Comment 338.
340	2355	RGU note. The potential significance and subsequent treatment in the EIS remains to be determined regarding the project's potential compatibility with planned land use as identified in available SNF Land and Resource Management Plan. Potential areas requiring consideration include non-motorized recreation and forestry. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
341	2385-2387	RGU note. The potential significance and subsequent treatment in the EIS remains to be determined regarding the project's potential compatibility with planned land use as identified in available comprehensive plans and other applicable plans for land use, water, or resources management by a local, regional, state, or federal agency. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
342	2384	RGU note. The potential significance and subsequent treatment in the EIS remains to be determined regarding the topic of land use. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
343	2390	Text clarification. The SEAW item addresses compatibility with all the respective plans. Assigning the term "impact" to any project incompatibility with the respective land use plans is awkward. Action requested: Either drop the first two sentences found in Lines 2389-2390 and start the section to read: "The Project would be compatible...;" or propose different language.	Text has been edited to remove the sentences.
344	2391	Information request. It is stated that: "The Project would likely require conditional use permitting in Lake County and St. Louis County and would be compatible with the underlying zoning." Project aspects that may lead to the need for conditional zoning should be identified. This text should also note any need for a performance standard permit for the electrical substation. Action requested: Modify text to specify what likely requires conditional use permitting, and possible need for performance standard permit.	Conditional use permits are discussed for Lake County on lines 2087-2132 and for St. Louis County on lines 2153-2190. See Comment 331 for performance standard for the electrical substation.
345	2395	RGU note. The treatment in the EIS remains to be determined regarding the project's potential compatibility with planned land use as identified in the zoning and management codes for Lake County. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
346	2398	Information need. Confirm that the ventilation access road is compatible with the zoning as proposed. Action requested: Modify text to include this project feature and compatibility with zoning.	Text has been edited to read: "The plant site, water intake corridor, ventilation raise sites and access road, and transmission corridor are acceptable uses in the zoning districts with which they are associated (FR and RR in Lake County but would require local permitting)."
347	2399	Clarification. Shoreland zoning involves more than buildings meeting setback requirements. For example the road to the water intake building may not meet setback. Greater detail will be necessary to assess the proposed amount of excavation and vegetation removal for impacts. Action requested: Modify text to address the item.	See Comment 325.
348	2399-2402	Clarification. It appears that portions of the Transmission Corridor cross shoreland setbacks. If this is true, these locations within the shoreland setbacks should be identified. Action requested: Modify text to address issue.	Text states that "portions of the transmission corridor would be required to abide by setback requirements for Birch Lake, Keeley Creek, Denley Creek, and Stony River, identified by Lake County Shoreland Zoning Ordinances."
349	2405	Clarification. It appears that portions of the tailings management site fall within the shoreland setbacks. If this is true, these locations within the shoreland setbacks should be identified. Action requested: Modify text to address issue.	Text states that "Most of the tailings management site would be outside of the shoreland boundary. The tailings management site would adhere to the shoreland setback requirements identified by Minnesota's Administrative Rules. The Project would be compatible with the statewide minimum shoreland standards."
350	2407	RGU note. The treatment in the EIS remains to be determined regarding the project's potential compatibility with planned land use as identified in the zoning and management codes for Lake County. No action requested.	Same as Comment 345.
351	2407 - 2408	Clarification. Project needs to be consistent with LGU standards as the LGU may have stricter standards than the state. Identify where project is not compatible with LGU requirements for lands under state jurisdiction. Action requested: Modify text to address issue.	This is identified earlier in the text. See lines 2144-2152
352	2417	Future action. DNR notes the amount of tree clearing for this project should be compatible with the intent (or actual ordinance) of Shoreland Zoning. In general, structures are not placed within the Shoreland Impact Zone. No action requested. Future discussion item.	Comment is noted.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
353	2425	Number guidance. Action requested: Lead the value ".03%" with a zero to read: "0.03%." Assign this rule globally in the document.	Text has been edited to read: "The change in accessibility represents a 0.03% reduction in total acreage within the 1854 Treaty Territory."
354	2429	RGU note. The potential significance and subsequent treatment in the EIS remains to be determined regarding the topic of zoning impacts. No action requested.	Comment is noted.
355	2431	RGU note. DNR will identify any Project incompatibilities with applicable plans, zoning, or other land use measures before identifying treatment of the issue in the EIS. No action requested.	Comment is noted.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 5.0 Geology, Soils, Topography
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
356	2441	Text correction. The Duluth Complex is not referred to as a "geologic group." It is part of the Midcontinent Rift Intrusive Suite. In contrast, the North Shore Volcanic Group is a "geologic group." Action requested: Revise text accordingly.	Text has been edited to read: "The Project area is underlain by the Duluth Complex which is composed of igneous rocks associated with the Midcontinent Rift System. "
357	2442	Clarification. Use of the term magmatic rocks is unusual and potentially confusing. The Duluth Complex is almost exclusively comprised of igneous rocks. Classic terminology distinguishes two types of igneous rocks: plutonic and volcanic; or intrusive and extrusive. Action requested: Revise text accordingly.	Text has been edited to read: "The Project area is underlain by the Duluth Complex which is composed of igneous rocks associated with the Midcontinent Rift System. "
358	2460	Text correction. The Duluth Complex is not composed of magmas. Action requested: Revise text accordingly.	Text has been edited to read: "The Duluth Complex is composed of mafic to felsic tholeiitic igneous rocks related to the Midcontinent Rift System and makes up much the bedrock of northeast Minnesota. "
359	2465-2469	Clarification. Is the SKI also bordered by the Bath Tub Intrusion? Action requested: Revise accordingly.	Text has been added to read: "A small portion of the southwestern extent of the SKI is bordered by the Bath Tub intrusion near Babbitt."
360	2467-2468	Text wording. Probably best to use a consistent "direction to feature" sequence through the entire sentence. The sentence is otherwise unclear. Bullets may be easier to accomplish. Action requested: Reword for clarity.	Text has been edited to read: "The SKI is bordered by: • the Giant's Range Batholith (GRB) and Biwabik Iron Formation to the northwest, • the Anorthositic Series to the northeast, and • the Partridge River Intrusion to the southwest, • the Bald Eagle Intrusion to the southeast."
361	2485	Additional information. Discuss the potential for incorporation of Duluth Complex rock in glacial material (i.e., scouring of ice sheets including Duluth Complex outcrop during deposition). Action requested: Address the issue and incorporate into text as warranted.	Text has been edited to read: "The Rainy Lobe Till is a brown, sandy till that contains basalt, gabbro, and other rocks." Rainy Lobe contains a large variety of rocks from differing provenances not all necessarily from the Duluth Complex. Given this unsure of what outlining the potential for Duluth Complex rocks adds to the SEAW data submittal.
362	2574	Text edit. Action requested: Heading should be changed to "Unconsolidated Material Thickness."	Text has been edited to change the heading.
363	2582	Clarification. The use of Acid Rock Drainage (ARD) here is out of context. Typically ARD is reserved for natural occurrences where acid is released from weathering rocks. The term Acid Mine Drainage (AMD) is more appropriate here because the topic is anthropogenic influences that may impart the release of acid. See Rimstidt and Vaughan (2003) *Pyrite oxidation: A state-of-the-art assessment of the reaction mechanism, in* Geochimica et Cosmochimica Acta vol. 67 no. 5 pp. 873-880, *Section 1. Introduction and references within that section.* Action requested: Consider point and revise text accordingly. If relying on the proposed literature, add to reference material.	The term is accurate as offered. TMM will continue to use it for documents it prepares. See GARD guide and terminology adopted by the International Network of Acid Prevention. TMM's use of ARD is widely accepted and understood. TMM understands that the MDNR will adopt language it prefers in documents it publishes.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
364	2583	Clarification. ARD is not the correct term. Because the required EIS is related to a mining action, therefore the characterization work being performed would be to evaluate the potential for AMD, where AMD is not the result of natural oxidation. Most commonly AMD is from the excavation of earth materials taken from a geochemical stable environment and placed in a highly reactive environment. Action requested: Modify text. Apply global fix to document UNLESS there is a circumstance where usage of the term ARD is appropriate as DNR is defining it .	See Comment 363.
365	2584	Clarification. The text references "stages" in a series of chemical reactions that is somewhat unclear. The series of chemical reactions that constitute sulfide oxidation are acid generating. Action requested: Clarify text to better state what is expected.	Text has been edited to remove "and in stages" and the text "the process of oxidation occurs in a series of chemical reactions" remains accurate.
366	2585-2587	Text correction. The reaction rate of sulfide oxidation does not depend on mineral content or climate. Action requested: Edit text.	The statement is accurate as offered. See GARD guide and terminology adopted by the International Network of Acid Prevention. TMM understands that the MDNR will adopt language it prefers in documents it publishes.
367	2586	Clarification. Action requested: Delete the word "environmental."	Text has been edited to read: "The rate at which this reaction occurs can vary based on a number of different factors such as mineral content and climate."
368	2589-2600	Clarification. Paragraph needs to be rephrased to discuss chemical weathering or chemical weathering trends rather than weathering patterns. Action requested: Elaborate and revise text.	Weathering patterns has been revised to weathering rates. Weathering rates is the terminology utilized in the GARD guide in Section 5.4.12 when they discuss predictions from laboratory kinetic testing methodology. Additional text has been added within this section to further expand: "Kinetic testing are primarily intended to generate information on weathering rates of primary minerals (e.g., sulfides); information that can be used to estimate the potential for future net-acid conditions. Dissolution rates of readily soluble primary and secondary minerals present at the onset of testing can also be derived from kinetic testing results. "
369	2601	Clarification. Sulfur content is an indirect measure of the controlling factor for ARD. The actual controlling factor is the proportion of exposed sulfide mineral surfaces relative to acid neutralizing mineral surface area. This concept needs to be incorporated into the text. Action requested: Add perspective to discussion.	This bullet and the following 2 bullets, were originally meant to summarize key points from the previous material characterization studies on non-TMM Duluth Complex rocks. The paragraph following the 3 bullets previously starting on line 2611 is specific on how TMM has developed a project-specific material characterization program in consultation with MDNR and in alignment with Minn. R., part 6132.1000. Therefore, TMM has elected to eliminate these three bullets as they are not project specific and TMM believes the discussion in paragraphs following these 3 bullets better address the comments specific to TMM's project.
370	2603-2609	Clarification. This assertion of higher total sulfur content rocks being capable of maintaining a circumneutral leachate only occurs for a very specific sulfur content and bulk mineralogy. Action requested: Provide more clarity and revise to make this an accurate statement.	See Comment 369.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
371	2603-2609	Information need. Relying on a so-called lag time to acid generation to implement controls to avoid development of AMD requires additional investigations and analysis beyond what has been conducted to date. A complete plan will be needed prior to extraction of this type of rock. Action requested: Ensure Section 5.3 identifies this as an information need. Future discussion item.	See Comment 369. TMM looks forward to future discussion on this item as it relates to the TMM Project.
372	2603-2609	Clarification. The assertion that higher [should state "lower"] total sulfur content rocks being capable of maintaining a circumneutral leachate only occurs for a very specific sulfur content and bulk mineralogy. Action requested: Provide more clarity and revise to make this an accurate statement.	See Comment 369.
373	2603-2609	Information need. Additional supporting evidence that the specific sulfur content and bulk mineralogy of the material would result in maintaining a circumneutral leachate is needed. Action requested: Further analysis will be needed of these rocks to determine if this is applicable to this project. Ensure Section 5.3 identifies this as an information need. Future discussion item.	See Comment 369. TMM looks forward to future discussion on this item as it relates to the TMM Project.
374	2610	Clarification. The text offers an oversimplified description of the control on metal leaching. Acid drainage would either not occur or the waste would be managed to avoid, thus the control on metal leaching is more about pH and substrates for sorption. Action requested: Modify text.	See Comment 369.
375	2612	Clarification. Because the material characterization program is not finished, using the term "developed" gives the impression of an approved set of activities even though it is later acknowledged to be "ongoing." Action requested: Revise text to read: "TMM is developing a Project-specific material characterization program..."	Text has been edited to read: "Although a fundamental understanding of the potential for ARD and ML within Duluth Complex rocks exists, TMM is developing a Project-specific material characterization program in consultation with MDNR and in alignment with Minn. R., part 6132.1000."
376	2615-2617	Clarification. DNR notes the tailing characterization work is only partly started; there is also no approved tailing kinetic testwork that could inform the ARD and ML of TMM pilot tailings. The current status of activity should be better reflected. Action requested: Modify first bullet to read: "Preliminary characterization of sulfide mineralization..."	Text has been edited to read: "Preliminary characterization of sulfide mineralization and ARD and ML potential of tailings, waste rock, development rock, and ore associated with the Duluth Complex and GRB rock;"
377	2618-2619	Clarification. DNR notes DNR-LAM has not reviewed or been provided any documentation regarding utilization of characterization data to inform material management. The current status of the activity should be better reflected. Action requested: Modify second bullet to read: "Future utilization of characterization data..."	Text has been edited to read: "Future utilization of characterization data to further inform material management; and"
378	2620-2621	Clarification. DNR notes DNR-LAM has not reviewed or been provided any documentation regarding incorporating characterization program data for understanding impacts to water quality. The current status of activity should be better reflected. Action requested: Modify third bullet to read: "Develop a plan for inclusion of data obtained ..."	Text has been edited to read: "Develop a plan for inclusion of data obtained from the material characterization program into modeling to further understand potential impacts to water quality."
379	2622	Clarification. It is unclear what constitutes "ARD analysis?" Is this supposed to be Acid Base Accounting for determining the acid generation potential? See also line 2634. Action requested: Modify text to provide a more precise description of what the "ARD analysis" being referenced is.	Text has been edited to read: "To date, TMM has conducted chemical analysis (elemental and whole rock analysis), acid-base accounting, net acid generation, and mineralogical and petrological analyses on development rock, waste rock, and ore; and chemical composition, acid base accounting, mineralogical and petrological, and preliminary kinetic testing analyses on tailings"

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
380	2623-2625	Clarification. No definite chemical classification has been made as to what constitutes "development rock," which would be a management-based classification sub-category of waste rock. Therefore, discussion regarding the ARD potential of development rock is premature as it has not been defined. Action requested: Modify text to acknowledge uncertainty in any prediction of ARD potential for development rock until it is defined.	See Comment 381.
381	2623-2625	Clarification. At this time the statement is unsupportable and thus is false as offered. The existing rock characterization data is not well suited to make determinations of ARD potential. This is because the static tests performed are designed for carbonate bearing rocks that are importantly beyond the very modest amounts found in the Duluth Complex. Furthermore, the existing characterization indicates that about half of the ore is acid generating. Action requested: Eliminate the sentence or revise the text to provide a more accurate assessment based on the known limitations of the existing work to date.	Statement has been removed.
382	2623-2627	Clarification. Note that this is only based on static testing, not kinetic. Action requested: Modify text to specify that only static testing has occurred, not kinetic. Should occur early in the paragraph.	See Comment 381.
383	2630-2633	Clarification. Regarding the "planned future testing" program noted in the text, what is necessary to inform the EIS and permitting is subject to DNR approval. Starting the sentence as "Planned future testing" gives the impression of a fully-vetted and approved methodology that has not happened. It is also noted this has not been indicated in the current waste characterization program. Action requested: Eliminate the word "planned" and rather modify the text to treat this as a future information need. Ensure this is identified in Section 5.3.	Text has been edited to read: "Future material characterization of the development rock, waste rock, and ore will need to include continued static testing to inform necessary kinetic testing and additional mineralogical analysis with a specific focus towards the GRB that comprises the footwall, as this is a lesser studied rock unit."
384	2642-2643	Clarification. The tailing kinetic data discussed was conducted outside of the waste characterization program that is being developed with the DNR. Based on the current understanding that the test duration was 20 weeks, this data will not be applicable to the long term evaluation required for tailings reactivity. Although the DNR has not received or reviewed the data, the DNR does not expect to rely on this information in assessing ARD potential of tailings. Action requested: Further discussion item.	The tailings kinetic data was conducted by a third party lab and undertaken using standard ASTM kinetic protocols. The data generated by the test is valid (not preliminary) and may be used, in conjunction with other tailings testwork, to inform water quality predictions and long term tailings performance.
385	2648	Reference request. Please provide Wood, 2019 reference on subsidence and crown pillar stability. Action requested: Provide this report to DNR upon receipt of these comments.	This reference has been removed. Text has been added to clarify that this analysis is preliminary. TMM is continuing to update and refine geotechnical information which will be provided as part of a geotechnical data package during EIS development. This anticipated deliverable has been incorporated into Section 5.3.2.
386	2668	Clarification. It is not clear how a comparison of modeled subsidence to heave of unconsolidated material is relevant. Action requested: Modify text to provide some additional context in what's offered. Is this to allow the reader a relative comparison from another more well-known phenomenon?	This is included to give the reader a relative comparison to a common phenomenon around the Project area.
387	2754-2756	RGU note. DNR will need to review available information regarding subsidence and crown pillar stability, and soils and topography, before identifying the treatment of the issue in the EIS. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
388	2766	Information need. The work plan needs to include waste rock characterization. Action requested: Add the term "waste rock characterization" to the work plan list.	Text has been edited to read: "A work plan for the characterization of waste rock, development rock, ore, and tailings including data quality objectives, testing methods, sample selection rationale, laboratory selection, and data management"
389	2771-2772	Clarification. The last bullets notes a "field testing" component. Is this referencing a field testing program that has already begun, or is this a future data collection effort? Action requested: Modify text to clarify the field testing reference. Future discussion item.	No field testing has occurred. The two references to field testing (both within Section 5.3.1 future scope) have been removed as discussions around field testing as part of the Mine Material Characterization Program have been centered around if field testing is necessary to support permitting and a need has not been determined yet. TMM remains open to field testing if future testing deems it necessary for permitting.
390	2773-2774	Future action. If the current focus is to conduct more static testing, those plans have not been provided to the DNR. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 6.0 Water Resources
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
391	2780	Note. In general, this section lacks information on Keeley Creek that will be necessary to assess whether potentially significant issues require evaluation in the EIS. This will be considered over the development of the Scoping EAW and proposed EIS scope. Action requested: Consider where information regarding potential project impacts are lacking and ensure Section 6.3 identifies how the information will be provided for the EIS.	Stream morphology assessment was conducted in 2019 on three reaches along the creek and water quality sampling at location DMSW15 in the creek has been conducted for seven years. The need for supplemental data collection on surface waters, including Keeley Creek is outlined in Section 6.3.1: "Although TMM has obtained and developed a substantial database with respect to surface water hydrology, additional information is needed to evaluate potential impacts to the surface water hydrologic system. Instrumented gaging stations will be installed to further define the flow regime in Keeley Creek upstream and downstream of the tailings management site." Additional data on Keeley Creek will be provided during EIS development to satisfy the EIS scope.
392	2785	Guidance. Clear identification of impaired and high value surface waters (wetlands, streams, lakes) and analysis considering potential impacts would be beneficial. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
393	2816	Clarification. The bulleted list of Project-specific watersheds should include the Stony Creek watershed and be depicted in Fig. 6-4. Action requested: Modify the text and figure to address the item or provide a rationale why this should not be the case.	These are Project-specific watersheds that were developed for the plant site, tailings management site, and underground mine area. No Project-specific watersheds were developed for the transmission corridor as impacts expected in this area from construction activities, vehicular travel and potential effects to surface water resources are not anticipated to be perceptible at the watershed level. Denley Creek and Stony River watersheds are included in Figure 6-2 and Table 6-1.
394	2826	Guidance. The naming convention for DNR Public Water 69-3P in the EIS will be Birch Lake. First usage in all EIS-related documents will be as follows: Birch Lake reservoir (Birch Lake); subsequent usage as follows: Birch Lake. Action requested: Global revision requested throughout in text, tables, and figures.	Per MDNR guidance, "Birch Lake reservoir" has been changed to "Birch Lake" in text, tables, and figures.
395	2832	Reference. The Water Management Plan needs to be referenced in the document for the Winton Hydroelectric Station. Action requested: Modify text to include the reference. Add reference to Section 17.	Desired reference is unclear from comment. Please provide a copy of the reference for TMM to review.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
396	2866-2871	Available data. The copper nickel study from the 1970s has a large amount of stream flow and water quality data that should be included, as appropriate, in future evaluations. Action requested: Assess utility of this dataset in relevant analyses. Consider noting in Section 6.3 any requirements for this data.	Comment is noted. TMM has incorporated data from the Minnesota Regional Copper-Nickel Study as part of the Regional Surface Water Quality baseline description and will evaluate and include relevant data in a during EIS development to satisfy EIS scope.
397	2878	Data availability. Is there data available for Keeley Creek? Action requested: Answer the question and modify the text as appropriate. Ensure Section 6.3 identifies this item as a potential information need for the EIS.	As indicated in Table 6-5 through Table 6-6, stream flow data is not available for Keely Creek. TMM plans to collect Stream flow data for Keeley Creek, as described in Section 6.3.1.
398	2893	Data availability. Surface water monitoring data, related to the Dunka Pit, is available through 2020 on the MPCA Wastewater Data Browser (beyond year 2013). Action requested: Update with new data; modify text as determined appropriate; add reference to Section 17.	The data provided for Dunka Pit is adequate for purposes of scoping for the TMM Project EIS.
399	2896-2900	Data requirement. A complete record of water quality data (i.e., individual sample results) will need to be made available (in addition to the summaries and averages, etc. provided here). No action requested. Expect a great deal of scrutiny on this topic. Future discussion item.	Comment is noted. TMM will submit necessary water quality data during EIS development to satisfy the EIS scope.
400	2909; 2922	Terminology. The term "relatively impermeable bedrock" (used here and elsewhere in the document) should be used cautiously. The degree of GW interaction between the surficial materials and bedrock (including bedrock transition/weathering zones) will need to be thoroughly investigated before conclusions can be drawn. No action expected. Expect a great deal of scrutiny on this topic. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
401	2923-2929	Information need. Detailed hydrographs and complete stream flow data will need to be made available to assess the current conditions and to design any subsequent data collection efforts. No action requested. Future discussion item.	Comment is noted. TMM will submit necessary hydrographs and stream flow data during EIS development to satisfy the EIS scope.
402	2929	Clarification. Keeley Creek is mentioned here but not listed as stated in Table 6-5. Action requested: Comment provided in tables section.	A stream gage has not yet been installed in Keely Creek. Creeks with the lowest flows, as shown on Table 6-7, are North and South Nokomis Creeks. Text has been edited to read: "Magnitude of flow varies widely with stream size with the highest flows measured in the South Kawishiwi River and the lowest flows in North Nokomis Creek and South Nokomis Creek."
403	2930-2948	Future discussion. Initial efforts at characterizing base flow using PART will need to be further discussed and evaluated. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
404	2934	Clarification. The text should provide the time of year that the samples were taken because seasonal variability in flow can interact with project impacts resulting in differential impacts to aquatic habitat that should be considered in the analysis. Action requested: Modify text to address the item.	The baseline PART analysis was run on data from 2014-2018 and the time period for each station contains 1,826 mean daily streamflow values. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Modeling to the surface water system including differential impacts to aquatic habitat is outlined in Section 6.3.1 and will be provided during EIS development to satisfy the EIS scope.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
405	2938-2941	Clarification. Provide more detail on how it was determined that groundwater routed through unconsolidated deposits provides a significant portion of baseflow to area streams and rivers. Action requested: Modify text.	The PART analysis, described in the previous paragraph determined that groundwater baseflow makes up 85% to 90% of streamflow at the three stations that were assessed (Table 6-8). The conceptual model is that baseflow is routed through the unconsolidated materials above the bedrock due to the impermeable nature of the bedrock and topography of the bedrock surface. Text has been edited to clarify.
406	2938	Data need. Local impacts on groundwater to Keeley Creek streamflow, not just to Birch Lake Reservoir, is a data need. Action requested: Ensure Section 6.3 addresses the item as a future data need. Modify text as current information allows to address the item.	Comment is noted. TMM considers this request appropriate for consideration in the EIS development and plans to collect stream flow data for Keeley Creek, as described in Section 6.3.1, for use in this evaluation.
407	2949	Data requirement. Need to collect and include continuous stream flow data at these sites. Action requested: Ensure Section 6.3 identifies this as a future data need. Modify text as determined appropriate. Line 2949.	Stream gages have been installed at DMSW3 (N. Nokomis Creek) and SW29 (S. Nokomis Creek). Data from these gages will be provided during EIS development to satisfy the EIS scope. A gage has not been installed in Denley Creek (DMSW16) because, other than the transmission corridor, the project would not alter the Denley Creek watershed. Continuous stream flow data need is captured in Section 6.3.1 and will be provided during EIS development to satisfy the EIS scope..
408	2958	Data need. Baseline Keeley Creek stream morphology is a data need. Action requested: Ensure that Section 6.3 addresses the item as a future data need. Modify text as current information allows to address the item.	See Comment 391.
409	2994	Data source. Minnesota Power has extensive records on flows and water levels. This data should be accessed along with any information provided by the DNR LakeFinder dataset. Action requested: Procure relevant data from Minnesota Power as appropriate. Modify text as current information allows to address the item.	See Comment 401. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including hydrographs and water levels will be provided during EIS development to satisfy the EIS scope.
410	2995	Reference. The text should reference the Winton Hydroelectric Station management plan. Action requested: Modify text to make the reference.	See Comment 395.
411	3042	Clarification. There are three Impaired Waters within 1 mile. Filson Creek is impaired for aquatic life-fish bioassessment. Both Keeley Creek and Filson Creek are listed with aluminum as the pollutant. EPA classification status of these waters is 4D. This information should be in this section. Action requested: Modify text to address the item.	Text has been updated with information from the draft 2020 impaired waters list: "• Birch Lake (AUID 69-0003-00) for aquatic consumption-mercury in fish tissue (No TMDL, EPA category 5); • Keeley Creek (AUID 09030001-520) for aquatic life, aluminum stressor (No TMDL, EPA category 4D); • Filson Creek (AUID 09030001-605) for aquatic life, aluminum and copper stressors (No TMDL, EPA category 4D) • Unnamed Creek tributary to Filson Creek (AUID 09030001-983) for aquatic life, aluminum stressor (No TMDL, EPA category 4D) "
412	3042-3044	Clarification. Additional information on the two impairments should be included, including status/results of any further assessment, stressor ID, or TMDL work, and similar. Action requested: Amend text to address the item.	Text has been updated with information from the draft 2020 impaired waters list. Four impaired waters are listed, along with their impairment, stressor, EPA category, and TMDL status.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
413	3045	Data need. A complete record of available WQ data will need to be made available for scoping and the EIS. No action requested. Future discussion item.	Comment is noted.
414	3046	Clarification. It is unclear why the data summarized in Table 6-7 limited to only 2017 and 2018? MPCA understands potentially relevant water quality has occurred over a much longer period of time. If correct, no reason is given for the exclusion of earlier data. Action requested: Amend the text to address the item or explain the unavailability or innaplicability of other data.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including relevant water quality will be provided during EIS development to satisfy the EIS scope.
415	3059	Clarification. The actual concentrations of aluminum should be noted here for Keeley Creek and Filson Creek. Action requested: Modify text to address the item.	Refer to Table 6-9 through Table 6-10 for an average aluminum value for Keeley Creek. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including relevant water quality will be provided during EIS development to satisfy the EIS scope.
416	3059-3065	Clarification. Please provide the respective concentrations at each location, rather than the average. Action requested: Modify text to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including relevant water quality will be provided during EIS development to satisfy the EIS scope.
417	3117-3129	Clarification. Text and Figure 6-8 only describe shallow and deep bedrock however Figure 6-11 depicts monitoring wells in very deep bedrock. Understanding of text would be improved if very deep bedrock was better described in text and a figure. Action requested: Modify text with additional explanation.	Only two bedrock hydrogeologic units have been defined: shallow bedrock and deep bedrock. The legend on Figure 6-11 has been corrected to indicate that there are three types of bedrock monitoring wells: Shallow Bedrock (B1) Monitoring Wells; Shallow Bedrock (B2) Monitoring Wells, and Deep Bedrock (B4) Monitoring Wells
418	3131	Available data. PWI data needs to be looked at as a source of available data. Action requested: Access the PWI data and modify text accordingly.	The use of PWI is included in the SEAW data submittal in Tables 6-3, 6-4 and Figure 6-3. Additional use of PWI data is captured in Section 6.3.3, as part of the wetlands supplemental scope.
419	3135	Clarification. Provide description and evaluation of the historical data. Action requested: Modify text to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including relevant historical data will be provided during EIS development to satisfy the EIS scope.
420	3143	Definition. Provide a definition for corehole. Action requested: Modify text. Add to glossary.	See Comment 16.
421	3148-3152	Note. The 74 coreholes for which hydrogeophysical testing have been completed are all located over the underground mining area; none are at the plant site or tailings site. Action requested: Modify text to address the item.	Text has been edited to read "TMM has conducted corehole hydrogeophysical testing at over 400 intervals in 74 coreholes located in the underground mine area."
422	3171	Future data need. May need to add additional groundwater monitoring wells at the project boundary or outside of project area depending upon location of groundwater compliance points. Action requested: Ensure Section 6.3 identifies this item as a potential information need. Future discussion item.	Section 6.3.2 states that the groundwater supplemental scope includes installation of new monitor wells. Locations for new monitor wells will be discussed with the agencies. Details on future monitoring well locations are beyond the scope of an SEAW data submittal, so no change was made.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
423	3172	Data need. Well logs for the monitor wells and piezometers installed will need to be made available. No action requested. Future discussion item.	TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
424	3177-3209	Clarification. Very deep bedrock wells should be described in this section. Action requested: Modify text to address the item.	Deep bedrock wells (B4) are described on lines 3201-3206.
425	3200	Clarification. Is there a B3 monitoring well category? If so, include, otherwise revise accordingly. Action requested: Answer the question and modify text to address the item.	There is no B3 monitoring well category.
426	3212	Note. Monitor wells are mostly all located at the underground mining area. Few, if any, are at the plant or tailings sites. Action requested: Modify text to address the item.	Text has been edited to read "Figure 6-11 shows the monitor well locations. Most are located in or near the underground mine area. Additional monitoring wells will be installed at the plant site and tailings management site as part of future scope."
427	3219	Clarification. Were the surrounding wells measured also during each test? If so, please include this information. Action requested: Answer the question and modify text to address the item.	During the performance of the pumping tests, water levels were monitored at other wells located in the same well pad, although these wells were screened in different hydrogeologic units (HGUs) than the pumped well. Generally, water levels in the other HGUs did not respond to pumping in the pumped well. No nearby wells were available for monitoring in the same HGU as the pumped well. Typically, the nearest well located within the same hydrogeologic unit as the pumped well that could have served as an observation well, was located several hundreds to over 1,000 feet away. Considering the flow rates and the durations of the pumping tests, the effects of pumping were not projected to result in drawdowns at such large distances.
428	3227	Data need. The details of the "standard aquifer test analysis" will need to be made available. No action requested. Future discussion item.	Comment is noted.
429	3230	Clarification. DNR understands the 2019 data collection from well testing is complete. If yes, update text accordingly. Action requested: Modify text to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including aquifer testing and analysis will be provided during EIS development to satisfy the EIS scope.
430	3246-3253	Clarification. What are the "select constituents" and how were they selected? Action requested: Modify text to address the item.	Groundwater quality sampling parameters are listed on Table 6-26 through Table 6-28. The objective of groundwater quality sampling is to obtain representative samples that accurately reflect environmental conditions and the parameters were selected to adequately characterize the baseline conditions and support impact analysis.
431	3246-3253	Future discussion. It is advisable that the selection of locations, parameters, frequency, and similar be done in consultation with the state. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
432	3260-3262	Future discussion. It is advisable that these future monitoring activities for the plant and tailings be done in collaboration with the state. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
433	3306	Clarification. Is there site-specific information on site ET rates? Action requested: If yes, modify text to address the item. If no, could potentially be a future information need to be identified in Future Scope.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including analysis and modeling of site specific evaporation conditions will be provided during EIS development to satisfy the EIS scope.
434	3308	Clarification. Is there site-specific information on site recharge rates? Action requested: If yes, modify text to address the item. If no, could potentially be a future information need to be identified in Future Scope.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including analysis and modeling of site recharge rates will be provided during EIS development to satisfy the EIS scope.
435	3359-3360	Clarification. Providing data or analysis will be of use given interest in fracture flow. Please provide further detail. Action requested: Modify text to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including aquifer testing and hydrophysical logging will be provided during EIS development to satisfy the EIS scope.
436	3360	Clarification. Below 300 feet the flow zone frequency is less. What is the flow zone frequency value below 300 feet? Further discussion needed regarding this analysis. Action requested: Modify text to address the item.	See lines 3365-3377. "The average fracture flow zone frequency is approximately 0.5 measurable fractures per 100 ft (30.6 m) of vertical thickness in the depth range of 300 ft to 4,000 ft (91.4 to 1219.2 m) bgs."
437	3395 Fig 6-12	Plot review. Data used to create this plot will need to be reviewed in detail. For example, are the few data points 2018-2019 representative to entire site? No action requested. Future discussion item.	TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
438	3419	Clarification. General note for section that lacking in analysis of flow to Keeley Creek. Absent this data, impact assessment not possible. Action requested: Ensure Section 6.3 identifies this item as a data need. Modify text as current information allows to address the item.	See Comment 391.
439	3420-3432	Clarification. Available data looks to be focused only on the underground mine area. Will need additional data/evaluation for plant and tailings sites (including potential effects on Keeley Creek). Action requested: Modify text to ensure correct geography indicated. Plant and tailings site should be considered a future data need; ensure Section 6.3 identifies this as a future information need.	Text edited to read: "94 monitor wells and piezometers have been installed. Most are located in or near the underground mine area." Section 6.3.2 highlights the need for additional data collection including aquifer test analysis and new monitor wells for water level and water quality sampling.
440	3428-3430	Question. Why was it determined that 1419.5 ft was the hydraulic head? How does this elevation compare to long-term average lake and river elevations? Action requested: Provide a rationale for the hydraulic head value. Modify text to address the item as determined appropriate.	The Birch Lake water elevation used for creating the potentiometric surface figures was taken from the MDNR Lakefinder (the DNR official source for lake level readings statewide) site on 6/5/2019 as documented in note #5 on Figures 6-14, 6-15, and 6-16. The elevation of Birch Lake, as measured at the dam by Minnesota Power between 2007 and 2019 varies seasonally between approximately 1417.2 and 1419.9 feet.
441	3453	Correction. Is "rand" supposed to be "range"? Action requested: Modify text with correction.	Text corrected. "rand" changed to "range"

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
442	3460-3467	Future review. There will be a need to more fully evaluate and document potential groundwater-surface water interactions. Action requested: Ensure Section 6.3 identifies this item.	Section 6.3.1 describes surface water supplemental scope "supplemental data acquisition and analysis will better define the surface water baseline environmental conditions, hydrologic regime, surface water / groundwater interactions and relationships, and potential Project impacts to the surface water system." Both the surface water and groundwater supplemental scopes will be necessary to define this interaction and relationship. The results of these supplemental scopes will be provided during EIS development.
443	3487	Clarification. Is there information about aluminum levels that could be added here? This would provide relevant context considering the known MPCA impairments. Action requested: Modify text to address the item.	2018 average aluminum concentrations in groundwater are provided in Table 6-26 through Table 6-28. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including water quality will be provided during EIS development to satisfy the EIS scope.
444	3518-3524	Data need. MCPA will need to see the complete record of individual sample results. It is correct that 2019 data (and likely beyond) will need to be gathered and incorporated into the analysis. Action requested: Ensure Section 6.3 addresses the item. Future discussion topic.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including groundwater quality will be provided during EIS development to satisfy the EIS scope.
445	3545-3546	Clarification. The phrase "more dilute than" is not meaningful. Clarity could include: for all parameters? how much? implications? or similar. Action requested: Modify text to address the item; provide specificity to make less vague.	Text has been edited to remove sentence.
446	3551-3566	Clarification. Some of the values listed here are above secondary groundwater/drinking water standards. To the extent that this may be claimed as "natural background," additional data and documentation will be needed. Action requested: Ensure Section 6.3 identifies this item as an information need. Future discussion item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including groundwater quality will be provided during EIS development to satisfy the EIS scope.
447	3595	Clarification. It should be noted that this statement pretty much refers to the one well. This is not the foundation for it to be offered as a definitive statement on overall conditions. Action requested: Amend the text to better characterize available data or provide a rationale for the assertion.	Text has been edited to read: "The cations / anions in well MN-503B4 were significantly more concentrated than surface water as would be expected in a monitor well screened within the mineralized BMZ, however the average TDS concentration was two orders of magnitude lower than the concentration defined as a brine."
448	3595	Clarification. MPCA notes that some of the chloride and TDS values from B1 wells indicate that saline (to some extent) water is being encountered. Also important, the presence of "saline waters" could impact the chemical balance for the project. Action requested: Ensure that Section 6.3 addresses this issue. Future discussion item.	Comment is noted. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Water modeling is outlined in Section 6.3.1 and will include a water balance model which will simulate of contact and process water flows.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
449	3605	General note. The Scoping EAW will require a summary discussion of the frequency, duration, location, depth, and parameters of existing wetland monitoring, and include how it is proposed in the future. The EIS will require robust baseline wetland hydrology, water quality, and vegetation data to serve as a comprehensive baseline with which to compare future data for possible direct and indirect effects on the quantity and quality of the water resources. Action requested: Ensure Section 6.3.3 identifies these as a future information need. Future discussion item.	Section 6.3.3 currently details the plans to establish baseline conditions and compare to future data for possible direct and indirect effects to wetlands
450	3605	General note. MPCA indicates the antidegradation portion of Section 401 requires an inventory of the existing uses and level of water quality necessary to protect existing uses (Minn. Rules part 7050.0250), and mitigation thereof. Existing uses are the highest existing on or after November 28, 1975. These are not necessarily current uses or quality. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
451	3605	Regulatory guidance. MPCA indicates preservation credits might not be considered adequate mitigation for wetland losses. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
452	3666	Clarification. In the Eggers and Reed 2015 publication, Wetland Plants and Plant Communities of Minnesota and Wisconsin, Wooded Swamps are referred to as Hardwood Swamps and Coniferous Swamps. Action requested: Verify that terminology/nomenclature is being used consistently in the text across references.	Edited Text, Table 6-29 and Table 6-31 through Table 6-38, and Figures 6-19 and 6-20 to reflect "Hardwood Swamp" verses "Hardwood Wetland"
453	3699	Clarification. In the Eggers and Reed 2015 publication, Wetland Plants and Plant Communities of Minnesota and Wisconsin, Shrub Swamps are referred to as Shrub Carr and Alder Thicket. Action requested: Verify that terminology/nomenclature is being used consistently in the text across references.	Edited Text, Table 6-29 and Table 6-31 through Table 6-38, and Figures 6-19 and 6-20 to reflect "Shrub-Carr" verses "Shrub Wetland"
454	3706	Future data need. Wetlands need to be documented in an area that is larger than the defined project area to be able to determine the potential for indirect wetland impacts. Increase area for delineation accordingly. Action requested: Ensure Section 6.3 identifies the item as a future information need. Modify text to address the item as determined appropriate. Future discussion item.	Section 6.3.3 indicates that wetland delineations will occur, followed by an assessment of potential direct and indirect impacts.
455	3783-3785	Question. Can an equally definitive statement be made for "contact water?" Action requested: Answer question and modify text as determined appropriate to address the item.	As stated in the Water Management Plan section, the project is designed not to require a discharge of contact water. Future scope, described in Section 6.3.1, will include detailed assessment of process water and contact water flows. Please refer to lines 307-308.
456	3781-3786	Clarification. What is the source of domestic water and how would it be stored prior to off-site disposal? Issue of better understanding of the proposed water management. Action requested: Answer question and modify text to address the item as determined appropriate.	Text added in the project description (Line 813): "The domestic water source required to provide the services described in the mine services building and concentrator services building has not been identified. Preliminarily considerations include a domestic water plant that would source water from Birch Lake. Potable water source has not been identified; preliminary considerations for potable water would include transporting water jugs to site."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
457	3783-3788	Clarification. Water balance information needed regarding how does the cycle of reusing process water end at closure? For example, what if water would have to be released if the system was seasonally high (e.g., due to precipitation and/or snowmelt)? The section also does not address decommissioning contact water ponds (dewatering and restoration), with the potential for site contamination not being addressed. Potential impacts are possible to Keeley Creek and Birch Lake, in the form of changes in quality and quantity of surface water runoff. Action requested: Answer question and modify text to address the item as determined appropriate. Ensure Section 6.3 addresses the item as a future information need.	Comment is noted. Section 6.3.1 specifies that the future scope includes development of a water balance model that will simulate process water flow. Text added to read: "Closure and reclamation of the plant site and tailings dewatering plant would include use of surface water management features to control erosion, and stormwater quality, quantity, and rates."
458	3786	Clarification. From where does the domestic water come? Presume it should be accounted for in project losses? Action requested: Answer question and modify text to address the item as determined appropriate.	See Comment 456.
459	3794	Clarification. What constant rate value was used for this calculation? Action requested: Answer question and modify text to address the item as determined appropriate.	Calculation assumes 800 gpm as stated as the project description as the instantaneous rate of pumping in Line 361. Please further refer to Lines 3798-3803 which further expands on how this over estimates the required withdrawal as it was assumed across the full year for this calculation. The rate was additionally added to Line 3797 in the text.
460	3796-3798	Clarification. Please better describe what appropriation volume/pump rate was used to determine the impact on Birch Lake's water level. Discuss if anticipated Birch Lake pumping rates would change with mine life and what volume of water would initially need to be pumped out of Birch Lake to fill the process water reservoir, etc. Were potential changes in water appropriation needs taken into account when determining impacts on water levels? Action requested: Modify text to address the item.	See Comment 459 for deatils on the appropriation calculation and Comment 76 for details on future appropriation requirements.
461	3804	Text addition. Add "for the project" after "… water withdrawn…" Action requested: Modify text.	Edited as requested.
462	3807	Impact assessment. Information on the timing and rate of water withdrawal is necessary to project the potential for impacts. Action requested: Ensure Section 6.3 identifies this item as a data need. Modify text as appropriate to reflect current information.	Section 6.3.1 specifies that the future scope includes development of a water balance model that will simulate process water flow.
463	3807	Question. Is there a potential for the appropriation to affect ice safety? This could be a form of recreation impact? Action requested: Answer the question and consider where any issue of ice safety should be presented.	Winter recreation is practiced on hundreds of lakes near the proposed Project. Ice safety issues at the proposed water intake point should not be presented in the EIS. Any potential loss in ice cover is insignificant in comparison to the total acres of winter lake recreation available in the region. Moreover, natural weather variation causing seasonal late ice cover or early ice out is a far more significant impact to winter lake recreation year to year. Measures can be taken to warn people of the presence of any thin ice.
464	3807	Question. Is the proposed withdrawal compatible with the rule curve for Minnesota Power? Action requested: Answer the question. Modify text as appropriate.	Preliminary calculations using an overestimated process requirement show that appropriating water would result in <2 inches (5 cm) of water level decrease to Birch Lake. This calculation does not account for any inflows or dam operational water management. Compatibility will be verified as part of the Section 6.3.1 after the water balance has been finalized.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
465	3809	Clarification. "Seasonal" was not described in the paragraph above. How was that accounted for in order to include in this statement? Add detail as needed. Action requested: Modify text.	Text has been edited to read: "Based on this simple calculation, it appears that Birch Lake would be sufficient to supply the required make up water for the Project and the impact of water appropriations would be insignificant compared with the managed water level fluctuation of the reservoir."
466	3812-3816	Clarification. Need to quantify how much watershed would be removed from affected stream(s) by construction of plant site and calculate the reduction of volume of water flowing to affected streams. Also, define or qualify "temporary impact" because a temporary but long-term impact may require mitigation. Action requested: Modify text to address the item.	The reduction in volume of water flowing to affected streams and the time period of the impacts will be quantified as outlined in Section 6.3.1 and will be provided during EIS development to satisfy the EIS scope.
467	3814	Clarification. Is an impact "temporary" if it is for the life of the project? In normal usage, many construction effects are characterized as "temporary." The temporal dimension of operational effects is typically characterized in terms of permanence or reversibility. Action requested: Consider more targeted use of the term "temporary;" modify text accordingly.	Definition of temporary has been added to the glossary that reads: "temporary: lasting for only a limited period of time or a fixed duration and not permanent. If a potential impact would be reversed as a part of the Project, it has the characteristic of being temporary." In relation to impacts, temporary impacts may be short- or long-term and may or may not correspond to phases of Project development such as construction, operations, and reclamation and closure, however they are not permanent. If an impact could be reversed, it has the characteristic of reversibility. If a potential impact would be reversed as a part of the Project, it has the characteristic of being temporary. All temporary impacts have the characteristic of reversibility, however an impact could be reversible but is not proposed as such.
468	3815	Note. Project-related changes to topography and surface run-off patterns would be permanent not temporary. To the degree that some measure of function can be restored in reclamation, this remains to be seen. Action requested: Modify text to address the item.	Text has been edited to read: "During project closure and reclamation natural drainage patterns would be re-established to the extent possible, minimizing the potential for permanent impacts."
469	3816	Clarification. Potential effects also include reduced Keeley Creek watershed resulting in permanent lower flow in the creek, and consequent changes in aquatic habitat (due to changes in stream geomorphology). Also the impacts would not just be under low flow conditions. Action requested: Modify text to address the item.	Section 6.3.1 specifies that the future scope will evaluate the potential impacts to surface waters, which includes Keeley Creek.
470	3818	Clarification. Paragraph describes additional losses to Birch Lake. Were these included in the <5% in section 6.2.1? Should be a total expected addition to annual variation if going to state <5% above. Action requested: Modify text to address the item.	Section 6.3.1 specifies that the future scope will evaluate the potential impacts to surface water quantity, which includes Birch Lake.
471	3818	Clarification. Were Birch Lake water level impacts looked at based on reductions in flow to the Birch Lake from the plant site and the tailings storage facility? If so, please include. If not, it needs to be included. Action requested: Modify text as appropriate to address the item.	Section 6.3.1 specifies that the future scope will evaluate the potential impacts to surface water quantity, which includes Birch Lake.
472	3820-3823	Clarification. Need greater detail to use term "negligible effect." Action requested: DNR will need to verify potential change to verify characterization as "negligible effect." Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
473	3822	Clarification. Containment and rerouting of surface water may have an impact on the quantity of water and needs further consideration. It may also have impacts on the quality of water if there is reduced infiltration of run-off. Action requested: Ensure Section 6.3 identifies this as a future information need. Modify text as current information allows to address the issue.	Section 6.3.1 specifies that the future scope will evaluate the potential impacts to surface water quantity and quality.
474	3823	Clarification. The last sentence ends with "…not future considered." This is an awkward phrasing (that also occurs elsewhere). If the intent of this phrasing is the issue is not being proposed for further evaluation, then probably better stated by ending the sentence without the phrase with new sentence that might read: "...Containment and rerouting of stormwater are expected to have a negligible effect on surface water quality. No future scope proposed on the issue" or similar. Action requested: Consider intent of usage and modify text accordingly. Do a global document search on the term and revise consistent with this revision.	Text has been edited to remove "not future considered" to "No future scope is proposed to address this issue" throughout the document.
475	3829-3833	Information need. It will need to be determined how much of the watershed would be removed by the construction of the dry stack facility and other features at the tailings management site, and also determine the impact on surface waters. Action requested: Ensure Section 6.3 identifies this item as a future information need. Modify text to add any detail known on the item at present. Future discussion item.	Section 6.3.1 specifies that the surface water supplemental scope will evaluate the potential impacts to surface water quantity and quality.
476	3835	Information need. Containment and rerouting of surface water would change local watersheds both during the project and upon reclamation. Local watershed maps of before, during, and after project would be useful in assessment. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
477	3835	RGU note. The potential significance of the changes in local hydrology have not yet been determined. Information on changes to the Keeley Creek watershed, and the new non-contact water ditch watershed, is necessary to assess type, extent, and reversibility of impacts on aquatic habitat. No action requested. Additional work necessary in development of the treatment of the item in the Scoping EAW and draft scoping decision.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
478	3835-3836	Clarification. Need greater detail to use term "negligible effect." Action requested: DNR will need to verify potential change to verify characterization as "negligible effect." Future discussion item.	Same as Comment 472.
479	3839	Clarification. Is an impact "temporary" if it is for the life of the project? In normal usage, many construction effects are characterized as "temporary." The temporal dimension of operational effects is typically characterized in terms of permanence or reversibility. Action requested: Consider more targeted use of the term "temporary;" modify text accordingly.	See Comment 467.
480	3842	Clarification. Potential effects also include reduced Keeley Creek watershed resulting in permanent lower flow in the creek, and consequent changes in aquatic habitat (due to changes in stream geomorphology). Also the impacts would not just be under low flow conditions. Action requested: Modify text to address the item.	See Comment 404 and Comment 466.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
481	3847	Clarification. DNR has understood the term "textured" could be applied to describe the surface of the dry stack facility during progressive reclamation and closure. If this is correct, include discussion of the meaning and purpose of "texturing." Action requested: Modify text to address the item.	We have searched the data submittal text for "textured", "texturing", and "texture" and have not found this term to describe the surface of the dry stack during concurrent reclamation.
482	3851	Clarification. The text states: "…precipitation would be diverted back to the natural system…" Where would water be diverted to? Locations should be specified in text. Action requested: Modify text to address the item.	A preliminary dry stack facility closure concept has been developed and the specific locations of discharges are still being evaluated. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect stream routing and drainage patterns will be provided during EIS development to satisfy the EIS scope.
483	3851	Clarification. The language "natural surface water system" is too vague to assess impacts. Where this water goes is important and is insufficiently described. Action requested: Modify text to address the item.	See Comment 482
484	3852	Question. Why would it be that the cap "may" cause some additional loss via evapotranspiration? Presume that it would cause loss. Action requested: Answer question and amend text to address the item.	Edited to change the use of "cap" to "cover system" consistent with the description in Section 3 and added text to specify evapotranspiration will occur from the cover soil and vegetation.
485	3854-3856	Clarification. Permanent impacts to stream routing and drainage patterns caused by the tailings basin need to be quantified and the statement, "The total volume of surface water contribution would remain largely unchanged," needs to be better explained. What watershed/water body is this based on? Action requested: Answer the question and modify text as appropriate to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect stream routing and drainage patterns will be provided during EIS development to satisfy the EIS scope.
486	3854-3856	Clarification. Need to provide more detail on routing characteristics for non-contact water at TSF during different stages in TSF life cycle. Action requested: Modify text to respond to the item.	Section 6.3.1 specifies that the surface water supplemental scope will evaluate the potential impacts to surface water quantity and quality.
487	3862	RGU note. Without data on watershed changes and analysis of impacts to stream flow, the assumption that impacts to surface water flow and stream channel effects would be minor cannot be supported at this time. No action requested. DNR will evaluate available information during the development of the Scoping EAW to determine the treatment in the EIS. Ensure that Section 6.3 adequately identifies this as a future information need.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect stream routing and drainage patterns will be provided during EIS development to satisfy the EIS scope.
488	3864	General comment for section. In the case in this section, more clarity and separation in the text between construction, operation, progressive reclamation, reclamation, and closure would make it easier to follow. Revise for a pattern to the discussion on these topics in the various sections. Action requested: Attempt to better separate the text by the stages of project activity.	Comment is noted. TMM declines to make the formatting change. It is TMM's understanding that the MDNR will re-format the data submittal.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
489	3868-3869	Clarification. Where would water be diverted to? Please provide locations. Based on topography, flow would likely be altered with potential consequences to Keeley Creek. Action requested: Answer the question, and modify text to provide locations any current information on potential impacts to Keeley Creek. Ensure Section 6.3 addresses the item as an information need.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect stream routing and drainage patterns will be provided during EIS development to satisfy the EIS scope.
490	3885	Clarification. Add to the listing loss of wetland function and loss of aquatic habitat. Action requested: Modify text.	Sections 6.3 and 8.3 addresses the need to assess wetland function and aquatic habitat losses, respectively.
491	3890-3891	Clarification. Need to quantify impacts to stream routing characteristics. Action requested: Modify text to provide the requested detail.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect stream routing and drainage patterns will be provided during EIS development to satisfy the EIS scope.
492	3891	Clarification. The assertion is incorrect because routing characteristics would be permanently modified. Even the EAW states this in line 3933. Action requested: Modify text to address the item.	Text has been edited to read: "The total volume of surface water entering waterways would remain largely unchanged, however, routing characteristics would be permanently modified. "
493	3890-3892	Clarification. Need to quantify changes to volume of surface water entering waterways. Action requested: Modify text to provide the requested detail.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect volume of surface water entering waterways will be provided during EIS development to satisfy the EIS scope.
494	3890-3892	Clarification. Is an impact "temporary" if it is for the life of the project? In normal usage, many construction effects are characterized as "temporary." The temporal dimension of operational effects is typically characterized in terms of permanence or reversibility. Action requested: Consider more targeted use of the term "temporary;" modify text accordingly.	See Comment 467.
495	3893	Clarification. The assertion is incorrect because this is a likely permanent indirect effect. Action requested: Modify text to address the item.	Text has been edited to read: "This change may also have a permanent indirect effect locally on surface water contribution to wetlands."
496	3894	RGU note. The information presented is not sufficient to conclude no changes to water quality. Also the changes to quantity and surface routing are not addressed. No action requested. DNR will assess the available information during development of the Scoping EAW to identify treatment of the item in the EIS.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
497	3898-3908	Closure conditions. What is the plan with the features in this section at closure? Action requested: Modify text to provide requested detail.	Section 3.6.2 includes the details regarding reclamation of the access road, water intake corridor, and transmission corridor.
498	3910-3912	Note. DNR and MPCA agree that available information is insufficient to fully assess potential impacts and that future work is needed. Action requested: Ensure Section 6.3 addresses this item.	Section 6.3.1 includes the details regarding the plan to assess potential impacts to surface water resources.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
499	3910-3913	Future scope. Please provide how impacts to surface water will be assessed/modeled. Action requested: Ensure Section 6.3 identifies future work done to assess/model potential impacts to surface water resources.	Section 6.3.1 includes the details regarding the plan to assess potential impacts to surface water resources. Specific assessment and modeling methods will be informed by scoping, therefore remain under development. A detailed proposed approach to modeling potential impacts to surface water resources will be provided during EIS development. TMM looks forward to state input.
500	3911	Future scope. What is the plan to obtain this information? Include plans as future work. Action requested: Ensure Section 6.3 identifies future work done to assess/model potential impacts to surface water resources.	See Comment 499.
501	3914	Clarification. Timing of withdrawals and related water levels changes in Birch Lake needs to be better defined. Also ice safety concerns. Action requested: Modify text to address the item.	See Comment 76 for details on future scope for proposed appropriation and Comment 463 for details on ice safety.
502	3918-3920	Clarification. Define "temporary" impacts to Birch Lake; impacts may be temporary but long-term and require mitigation during operation. Action requested: Modify text to use a more targeted use of the term "temporary" as it may apply to impacts to Birch Lake.	See Comment 467.
503	3920	Clarification. In terms of the proposed location and site design for the DSF, DNR would expect there to be permanent re-routing of water with the permanent dry stack facility. Action requested: Modify text to address the item.	The potential for permanent impacts related to rerouting runoff around the tailings management site is addressed later in the same bullet list (lines 3927-3935).
504	3921	Note. Information developed to date is insufficient to conclude that impacts to stream flow would be minimal. No action requested. DNR will determine potential treatment of the item in the EIS over the course of developing the Scoping EAW.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
505	3924	Clarification. Need to add Birch Lake water levels. Action requested: Modify text to address the item.	Edited to include Birch Lake water levels
506	3925	Clarification. The text use of the phrase "the precipitation loss period" is not meaningful. This potential impact should be referred to as changes in surface run-off and routing, which is a permanent effect. Action requested: Modify text to address the item.	Text has been edited to read: "The net effect would be expected to be minimal as the impact would be temporary and limited to the period of mining operations"
507	3931	Clarification. The assertion that the combined effects would be "minimal" is not supported at this time. This is premature because the combined effects of loss and rerouting were not sufficiently evaluated to this point. In assessing the treatment in the EIS, both the temporary and permanent decreases in watershed size for Keeley Creek must be assessed. Action requested: Ensure Section 6.3 addresses this item as a future information need. Modify text as current information allow.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect surface water flows and stream morphology will be provided during EIS development to satisfy the EIS scope.
508	3941-3951	Clarification. This does not address changes in quantity of run-off. Also the loss of infiltration due to changes in topography and wetland changes is not evaluated. Shoreland management zoning is based on keeping vegetated surfaces, minimizing impervious surface, and reducing rate of run-off to reduce nutrient load to public waters. This was not considered in the discussion of potential changes to water quality. Action requested: Modify text to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1, including how project water management could affect surface water flows and surface water quality will be provided during EIS development to satisfy the EIS scope.
509	3966	Language check. Should "cone of depressurization" be "cone of depression"? Action requested: Confirm the usage and modify text as needed.	Cone of depressurization was intentional. Text edited to make consistent throughout document.

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510	3967	Language check. Is "cone of depression" intended usage? Action requested: Confirm the usage and modify text as needed.	See Comment 509.
511	3971-3974	Note. Additional analysis will be necessary to verify the statement. Action requested: Ensure Section 6.3 addresses the item. Future discussion item.	Section 6.3.2 states that the future scope includes modeling to evaluate groundwater conditions in closure. No change made.
512	3972	Language check. Should "cone of depressurization" be "cone of depression"? Action requested: Confirm the usage and modify text as needed.	See Comment 509.
513	3982-3983	Information need. Modeling will be required to assess effects on groundwater system. Action requested: Ensure Section 6.3 addresses the item as a future modeling need. Future discussion item.	Section 6.3.2 states that the future scope includes modeling to evaluate groundwater conditions in operations and closure. No change made.
514	3994-3995	Clarification. The groundwater would also be expected to contact waste rock backfill. Action requested: Modify text to address the item.	Edited to include waste rock backfill in list of items that groundwater would be expected to contact.
515	3994-4004	Clarification. The text identifies the potential for groundwater quality impacts. This paragraph needs additional content on groundwater quality, movement, and what is/is not expected. Such information is needed to characterize the treatment of the issue in the EIS. Action requested: Modify the text to address the item. Ensure Section 6.3 addresses any future information need.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including how project water management could affect groundwater flow and groundwater quality will be provided during EIS development to satisfy the EIS scope.
516	3998-4001	Note. Additional analysis will be necessary to verify the statement. Action requested: Ensure Section 6.3 addresses the item. Future discussion item.	Section 6.3.2 states that the future scope includes modeling to evaluate groundwater quality, including potential impacts from the flooded mine workings.
517	4001	Question. The text identifies "exposed surfaces" as being a reason why changes to GW quality would not be expected. Aren't these "exposed surfaces" in part ore grade material in remaining in pillars or walls of stopes that one could infer might adversely affect water quality? Action requested: Answer question and modify text as determined appropriate.	TMM agrees that potential groundwater quality effects of exposed surfaces in the underground mine should be evaluated. A sentence was added to note that future scope will evaluate potential impacts to groundwater quality from the flooded underground mine (as stated in Section 6.3.2). Text has been edited to read "However, substantive changes are not expected in groundwater quality at distances away from the mine due to the very low hydraulic conductivity of the bedrock."
518	4007-4008	Clarification. Presume that depth to bedrock data would be collected to confirm assumptions in this section. Action requested: Provide response on collection of depth to bedrock data. Modify text to address the item. Ensure Section 6.3 identifies this as a future information need.	Map of unconsolidated material thickness is provided in Figure 5-12. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Groundwater modeling as outlined in Section 6.3.2 will use depth to bedrock data and will be provided during EIS development.
519	4009-4026	Future discussion. DNR notes further discussions needed on stream flow characteristics. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
520	4017	RGU note. Absent any quantitative assessment, the potential for impacts, significance, and subsequent treatment in the EIS remains to be determined regarding the topic of groundwater recharge associated with the Plant Site contact water management. Action requested: Ensure the Section 6.3.2 addresses the item. Future discussion item.	Section 6.3.2 states that the future scope includes modeling to evaluate groundwater conditions in operations and closure, including potential impacts due to "changes in land-use which can impact aquifer recharge."

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521	4017-4019	Clarification. The analysis will also need to quantify impacts due to changes in groundwater recharge. Action requested: Modify text to address the item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.2, including how project water management could affect groundwater recharge will be provided during EIS development to satisfy the EIS scope.
522	4020-4022	Clarification. Define "temporary" impacts to groundwater recharge; impacts may be temporary but long-term and require mitigation during operation. Action requested: Modify text to use a more targeted use of the term "temporary" as it may apply to impacts to groundwater recharge.	See Comment 467.
523	4024-4026	Guidance. DNR will evaluate the projected impacts and provide a temporal characterization of impact. Foundation for minor, temporary effect not established. Additional analytical content necessary to support "minor, temporary effect." No action requested. Future discussion item.	Comment is noted.
524	4029-4049	Future discussion. Further discussions needed on stream flow characteristics. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
525	4035-4037	Clarification. The SEAW will need to quantify impacts to the QUM and shallow bedrock, and the amount of change in groundwater recharge. Action requested: Provide additional detail to address the item.	Section 6.3.2 outlines the groundwater supplemental scope. The goal of this work is to "better define the groundwater baseline environmental conditions, hydrogeologic regime, surface water / groundwater interactions and relationships, and Project impacts to the groundwater system." This includes quantifying impacts to the QUM and shallow bedrock, and the amount of change in groundwater recharge.
526	4044	Clarification. The text should address potential impacts to Keeley Creek. Action requested: Modify text to address the item.	Section 6.3 addresses the need to evaluate the potential for impacts to surface water resources, including Keeley Creek.
527	4044-4046	Information need. The effects to resources which interact with groundwater need to be quantified, especially permanent impacts. Action requested: Modify text to provide the requested detail.	Section 6.3.2 outlines the groundwater supplemental scope. Modeling will assess changes to the groundwater system based on Project operations, specifically changes to the baseline conditions due to underground mine operations and changes in land-use.
528	4047	Clarification. Data appears insufficient to conclude that 25 years of changed groundwater recharge would not impact streams and wetlands. Action requested: Modify text to address the item. Ensure Section 6.3 identifies the item as an information need.	Section 6.3 addresses the need to evaluate the potential for impacts to groundwater, surface water, and wetland resources.
529	4052	Information need. What is the plan to obtain this information? Action requested: Ensure Section 6.3 includes information to address the item.	Section 6.3.2 presents the plan to gather additional information on potential groundwater effects.
530	4055	Language check. Should "cone of depressurization" be "cone of depression?" Action requested: Confirm the usage and modify text as needed.	See Comment 509.
531	4055	Language check. Use "cone of depression." Action requested: Confirm the usage and modify text as needed.	See Comment 509.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
532	4071	Question. The text identifies "exposed surfaces" as being a reason why changes to groundwater quality would not be expected. Aren't these "exposed surfaces" in part ore grade material in remaining in pillars or walls of stopes that one could infer might adversely affect water quality? Action requested: Answer question and modify text as determined appropriate.	TMM agrees that potential groundwater quality effects of exposed surfaces in the underground mine should be evaluated and Section 6.3.2 states that future scope will evaluate potential impacts to groundwater quality from the flooded underground mine. Text has been edited to read "Given the very low hydraulic conductivity of the bedrock, any groundwater quality impacts would be expected to be limited to the immediate vicinity of the underground mine.
533	4075	RGU note. It is premature to determine whether impacts to groundwater resources are not significant. More data and analysis is necessary. Action requested: Ensure Section 6.3 identifies this item as a future information need. DNR will use the information developed over the Scoping EAW to propose the treatment of the item in the EIS.	Section 6.3 addresses the need to evaluate the potential for impacts to groundwater resources.
534	4083	Guidance. Consider adaptive management and BMP options to prevent direct and indirect impacts to wetlands, streams, and lakes. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
535	4084	Clarification. Based on the text at Line 1019, the non-contact water diversion area, which is described as a series of diversion dikes and ditches to divert water, may cause direct and indirect wetland impacts. Wetlands in and around these areas need to be delineated and evaluated for potential impacts. Action requested: Ensure existing information and/or Section 6.3.3 identifies this as an information need.	Section 6.3.3 addresses the need to complete wetland delineation for the project as a whole and evaluate the potential for direct and indirect impacts.
536	4096	Clarification. Understanding that a wetland delineation has not yet been conducted, indicating total direct wetland impacts of 155.9 acres provides a level of certainty not yet documented. Please phrase as an estimate based on NWI. Action requested: Modify text to address the item.	Edited text and Table 6-31 through Table 6-46 to reflect that the direct impacts are estimated based on NWI data.
537	4098	Clarification. Impacts would be to local watersheds and percentage of loss should be related to the small watersheds for the local streams (Keeley Creek and Nokomis Creek). This is the scale at which impacts for comparison would be expected. Action requested: Modify text to address the item.	Edited to remove this sentence "As shown on Table 6-17, these impacts are minimal relative to the proportion of these wetlands within the Rainy River Headwater watershed and would account for <0.03% reduction in watershed wetland acres." Removed columns from Tables 6-16 and 6-17 that reference Rainy River-Headwaters Watershed.
538	4100	Inappropriate comparison. Stating that wetland "impacts are minimal relative to the proportion" is misleading. Providing proportional comparison of impacted wetlands to the greater Rainy River Headwaters is irrelevant since wetlands are protected by state and federal laws and the overall intent is no net loss. At best this may be an element of project cumulative effects. Action requested: Retain first two sentences. Eliminate third sentence.	Edited to remove this sentence "As shown on Table 6-17, these impacts are minimal relative to the proportion of these wetlands within the Rainy River Headwater watershed and would account for <0.03% reduction in watershed wetland acres." Removed columns from Tables 6-16 and 6-17 that reference Rainy River-Headwaters Watershed.
539	4105	Wetland impacts. The potential for the project, especially the dike systems, to fragment and impact wetland hydrology remains to be determined. Any changes to surface water direction and flow due to the project could impact wetlands. Action requested: Ensure Section 6.3.3 addresses the item. Future discussion item.	Section 6.3.3 notes that modeling and monitoring indirect impacts to wetlands will be refined as the supplemental scopes related to surface water and groundwater are completed.
540	4111-4112	Future discussion. How potential dust-related emissions could affect wetland resources requires consultation. No action requested. Future discussion item.	TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
541	4118	Clarification. If crushing underground is a project element that would reduce dust emissions, then may be appropriate to add to the list. Action requested: Modify text to address the item as warranted.	Edited bullet list to include underground crushing activities.

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542	4119	Regulatory guidance. Type for type is important in water resources mitigation. The predominant wetland type listed is bog, which can be difficult to create or restore. The goal should be to replace bog with bog. If wetland/restoration is considered, note that preservation credits might not be considered adequate mitigation. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
543	4126	Permit need. The 401 certification process will likely need to include an antidegradation assessment. Action requested: Modify text to address the item.	Comment is noted. Permitting-level analyses are not included in the SEAW data submittal unless they are also needed for the EIS. Because this was identified as a permit need, no change was made.
544	4128	Available data. DNR notes the current wetland delineation is insufficient to assess potential impacts. Action requested: Ensure Section 6.3 identifies this item as a future information need.	Section 6.3.3 addresses the need for wetland delineation. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
545	4131-4132	Clarification. Potential mitigation needs to be identified for consideration in Scoping the EIS. Action requested: Ensure Section 6.3 includes information to address the item.	TMM distinguishes between EPMs and mitigation. TMM has voluntarily adopted EPMs as part of the Project to reduce potential environmental impacts. When potential impacts to the Project are assessed it is assumed EPMs are implemented. Mitigations are additional measures that are not a part of the TMM proposed Project identified by agencies and members of the public that the state believes should be assessed.
546	4143-4146	Clarification. This list should include a separate bullet referencing the potential for change to wetland water quality. Action requested: Add a wetland water quality bullet.	Section 6.3.3 currently address the need to assess the potential direct and indirect impacts to wetland water quality.
547	4153-4154	Guidance. The plan for the collection of addition surface water monitoring data should be developed in coordination with the state to ensure that the sampling includes all necessary elements. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
548	4169	Clarification. Surface water quantity should be included in the listing here. Action requested: Modify text to address the item.	Edited to include water quantity
549	4182	Clarification. The bulleted item should read: "…surface water flows and stream morphology of Keeley and Nokomis Creeks?" Action requested: Modify text to address the item.	Edited to include Keeley and Nokomis Creeks
550	4184	Clarification. The bulleted item should read: "…impacts to water quality in area streams, specifically Keeley and Nokomis Creeks, or Birch Lake, or the non-contact water ditch?" Action requested: Modify text to address the item.	Edited to include Keeley and Nokomis Creeks
551	4194-4271	Guidance. This conceptual approach seems to be, in general, a reasonable one to work from. Given the complexity, the details should be developed in coordination with agencies' involvement and inputs. For example, an appropriate source and range of values inputted into the various models. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
552	4199	Clarification. Please explain "grab samples" in the context of the flow regime of the creek. Action requested: Modify text to address the item.	Grab samples characterize a medium at a particular point in space and time and are collected by sample container immersion or by using a transfer device, such as a beaker or dipper.
553	4202	Clarification. All users of water, and Birch Lake level manipulation, should also be included in the modeling. Action requested: Modify text to add this to the description for the Water Balance Model.	Text has been edited to read: "The water balance model will be developed using the commercial simulation software GoldSim to combine and integrate all Project, natural conditions, and existing uses."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
554	4202	Advisory. Would recommend creating future climate data set that incorporates climate change projections from International Panel on Climate Change (IPCC) or other sources to account for potential changes to precipitation and other climate variables due to climate change. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
555	4202	Information need. This analysis needs to include how contact water would be kept onsite at start-up, and also how it would be disposed of at project end. Action requested: Ensure the Future Scope includes these elements.	See Comment 74 for details on contact water onsite at start-up and Comment 282 for details on disposal of contact water at Project end.
556	4202-4204 4207-4212	Guidance. The text reads: "Phase 2 – Water Balance Model. The combined hydrologic regime...of conditions at the site, both current and projected into the future." With a few scattered exceptions, the background science on climate is fairly well unanimous in concluding that earth climate is changing and will continue to change, at a global, continental and regional/local level, in response to climatic forcing of greenhouse gas accumulations in the atmosphere. With almost no dissent, the science supports a continued climatic warming, persisting for hundreds to thousands of years, with cascading effects on most other climatological descriptors or parameters, and at all scales. Given the now central place of this understanding in the present body of scientific knowledge, the project consultant should base its modeling of the surface and ground water impacts of the project on an assumed continuation of human-forcing of climate. Regional and local output from advanced global and regionally down-scaled climate models is readily available for a range of forcing scenarios and terminal forecast years or decades. The output from the CMIP5 models developed to support the 2013 IPCC scientific assessment and the 2017 US National Climate Assessment is available. The output from the CMIP6 models should become available during the development period of this EIS. The project consultant should base its modeling of meteorologically- or climatically-dependent environmental impacts on the most recent, readily available model output. Should the project consultant conclude that the state of art of future climate modeling remains inadequate to the EIS modeling requirements, e.g., for whatever reason cannot be used to support an analysis of impacts, in accordance Minnesota Environmental Quality Board rules on information unavailability, the project consultant should clearly demonstrate, on the basis of 'credible science, why and how this is the case. In developing its assessment of meteorologically- or climatically-dependent environmental impacts of the project, the project consultant should use the 6.5 Representative Concentration Pathway (RCP), as the most likely global emissions trajectory. In developing its assessment, the project consultant should use model output for at least two future dates: one for the out-years (out-decade) of the project's 25-year operational period and one for the monitoring period post-mine closure, somewhat distant in the future, to capture the effects of very long-term climatic change. The model output usually terminates in 2100. Forecast local climatological	Thank you for the discussion regarding climate models. As we identified in Section 2.0, beginning at line 101, the future scope of work identifies specific studies or data collection that we have identified would be conducted to obtain additional data identified as lacking but able to be reasonably obtained. The future scope sections identify the following: •Specific questions that need to be answered by the additional study; •Which permits (if any) the scope of work would inform; •The approach for the study; •The study boundary under consideration; and •The specific deliverables. Some of the key components of this are to develop the scopes of work in a manner that answers the fundamental questions, appropriately designed, and appropriately scaled to the questions. TMM is committed to developing a sound approach to future modeling and impact assessments. Choosing the appropriate climate information is an important component, but the data and modeling platforms used must be fit for purpose. We encourage further discussion on what additional questions may need to be answered and how to best develop any missing data as part of the scoping decision.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
557	4202-4203 4207-4212 continued	Guidance. The assumption of a changing, nonstationary climate should be used to evaluate impacts to surface water and groundwater quality and quantity, both of which may be sensitive to future changes in regional climate. The discussion in the Scoping EAW submittal of available data sources for surface water and ground water quantity and quality is exclusively limited to historical data, typically dating from the period 2007-2013/2014 (lines 2855-2903 [data, surface water], lines 3045-3103 [data, surface water quality], lines 3130-3278 [data, groundwater water], lines 3517-3595 [data, ground water quality]). Regarding facility design, based on the project description, contact water ponds (plant site contact pond and tailing site management contact pond [lines 1280-1281, 1403-1404) and diversion dikes (tailing management site [lines 1469-1471]) are to be designed for the historical 100-year 24-hour storm event. Likewise, the noncontact water ditches in the tailing management are to be sized for the historical 10-year 24 hour storm event, while the process waste pond are to be sized to contain 'probable maximum precipitation' (lines 1471-1473, 1236-1241). The dry stack contact water pond is to be sized for the 100-year historical snow pack [lines 1405-1407]. In the analysis, the sensitivity of these ponds and dykes to overflow under future climatic normals, e.g., frequency and intensity of forecasted future extreme precipitation events, should be evaluated. Action requested: Ensure the Future Scope in the appropriate section(s) identifies this item as an information need.	See Comment 556.
558	4202-4203 4207-4212 continued	Guidance. For consistency, to the degree that this is practical, the assumption of persistent human-forced climatic change as background condition for the project should extend to all other environmental modeling, including the modeling of impacts to terrestrial and air resources. Fundamental processes like ozone formation or mercury methylation are temperature-sensitive, hence depend on what is assumed about future climate. Action requested: Ensure Future Scope of appropriate section(s) identifies this item as an information need.	See Comment 556.
559	4202-4203 4207-4212 continued	Guidance. In addition to its assessment of meteorologically- or climatically-dependent environmental impacts of the project, the project consultant also should evaluate alternatives to the proposed facility design against the assumptions of a changing climate. No action requested. Future discussion item.	Comment is noted. The proposed Project would emit greenhouse gases. As such climate change is correctly scoped as a cumulative potential effect. Analyzing alternatives within an assessment of cumulative effects is outside the scope of an EIS.
560	4207	Clarification. What data set is the climate generation model using? Action requested: Modify text to address item.	See Comment 556.
561	4207	Clarification. Are there surface water models and groundwater models that are being used, which feed into the Goldsim model? Action requested: Modify text to address item.	The GoldSim model will use the results of other surface water and groundwater models. Specifics on modeling software and procedures will be provided during EIS development.
562	4212-4215	Clarification. Will WGEN also be used to generate air temperature and solar radiation inputs in addition to precipitation? Action requested: Modify text to address item.	See Comment 556.
563	4212-4215	Clarification. Where will the climate inputs needed for WGEN be sourced from? Action requested: Modify text to address item.	See Comment 556.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
564	4236	Note. The phrase "...the project will not discharge any process water and is designed not to require a discharge of contact water…" is used several times in the document and seems of curious wording. Why the distinction in wording between process water and contact water? Action requested: Modify text to address the item.	Comment is noted. The phrase " ... the project will not discharge any process water and is designed not to require a discharge of contact water ... " describes TMM's understanding at this stage of project design. Detailed water balance modeling described in Section 6.3.1 will evaluate the potential for process water or contact water discharge, and results will be provided during EIS development to satisfy EIS scope.
565	4236	Note. The concept of "no discharge" needs to be fully articulated and understood because it has direct bearing on what water quality permits may or may not be required, among other issues. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
566	4239	Clarification. The assertion it is "unlikely" that the project would result in water quality effects is not supported at this time. Action requested: It is appropriate for Section 6.3 to address this item as a future information need.	Sectin 6.3 includes the assessment of potential impacts to water quality.
567	4242	Question. Also how would contact water ponds be handled at closure in terms of potential for soil contamination, spillage, or other considerations? Action requested: Answer the question and modify the text as current information allows.	See Comment 116.
568	4251	Note. This "geochemical conceptual model" is an absolutely critical component of the state review of the project and forms a foundation for any water quality review conducted by the MPCA. MPCA and DNR will need to fully understand and approve how this model is developed in order to be able to proceed with assessments on the need for or requirements of MPCA permits. Provide more details as to the geochemical conceptual model. Action requested: Modify text to address item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 6.3.1 and 6.3.2, including data on the geochemical conceptual model will be provided during EIS development to satisfy the EIS scope.
569	4252-4253	Information need. While screening level calculations are good, a more thorough (sophisticated) dynamic systems model will need to be conducted (potentially including additional baseline data). Action requested: Modify text to address the item. Future discussion item.	Comment is noted. The intent is to apply screening level mixing calculations to identify any potential measurable impacts and if these are identified TMM could use more sophisticated modeling. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS.
570	4272	Guidance. For water resources, expect supporting information to be supplied as GIS layers, raw data, interpretations, and discussions with appropriate QAQC at the appropriate time. No action requested.	Comment is noted.
571	4272-4276	Guidance. This conceptual approach seems to be, in general, a reasonable one to work from. Given the complexity the details should be developed in coordination with agencies' involvement and inputs. For example, an appropriate source and range of values inputted into the various models. No action requested. Future discussion item, including the 401 certification process will likely need to include an antidegradation assessment.	Comment is noted.
572	4289	Clarification. "Stream and lake" are specifically called out. Does this list include wetlands? Action requested: Answer the question and modify text as determined appropriate.	Phase 3 in Section 6.3.3 notes that modeling and monitoring indirect impacts to wetlands will be refined as the future work scope related to surface water and groundwater are completed.
573	4289	Clarification. Surface water flow and small scale stream watersheds should be characterized here too. Action requested: Modify text to add these to the list of bulleted items.	Surface water analysis and modeling as outlined in Section 6.3.1 will define the hydrologic regime associated with the Project area and would include surface water flow and small scale stream watersheds if necessary to adequately establish the baseline conditions.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
574	4345-4349	Clarification. The list should include bullet stating that one of the "questions to be answered" is to provide sufficient information to be able to complete a groundwater non-degradation analysis, which may be required for MPCA permitting. Action requested: Amend text to address the item.	See Comment 543.
575	4353-4367	Clarification. The list should add bullet asking what alternatives or mitigations are available to reduce potential impacts to groundwater quality? This would be information needed for a groundwater non-degradation analysis, if one is needed, as described in RGU Comment 566.	See Comment 543.
576	4369-4424	Guidance. This conceptual approach seems to be, in general, a reasonable one to work from. Given the complexity, the details should be developed in coordination with agencies' involvement and inputs. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
577	4375-4377	Clarification. Presume monthly groundwater levels and "to be determined" water quality samples will be taken. Adjust parenthetic statements and rephrase for clarity. Action requested: Modify text to address the item.	Text has been edited to read: "...generally monthly groundwater levels, and quarterly water quality samples..." Exceptions are wells with pressure transducers (continuous water level monitoring), and wells that recharge extremely slowly (twice a year water quality sampling).
578	4375-4389	Clarification. This list should specifically include a statement that additional monitoring wells will be needed in and around the plant and tailings sites, where existing data is absent or limited. Action requested: Modify text to address the item.	TMM's hydrogeological dataset is more robust than any mining project TMM is aware of and is several orders of magnitude larger than any project the RGU has permitted. Nevertheless, data collection continues and language is included in Section 6.3.2 that TMM will "install new monitor wells at selected locations to supplement the current monitor well network." TMM looks forward to engaging the RGU on the topic of data adequacy during EIS development.
579	4382-4383	Figures. Please provide a figure that shows where additional monitoring wells will be installed. Action requested: Ensure Future Scope includes development of a new figure and provide in next data submittal.	During EIS development, TMM will provide updated documentation on the location of wells.
580	4382-4383	Information need. DNR will be requesting all well logs and collected data for each well (existing and new monitoring wells). No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
581	4388	Clarification. This bullet should Include testing for submerged waste rock. Action requested: Modify text to address the item.	This has been accounted for in Section 5. See lines 2611-2621 and lines 2773-2778.
582	4392	Clarification. Surface water will have a no-action alternative (see lines 4314-4315). Groundwater section does not describe a no-action alternative. Action requested: Modify text to address the item or provide explanation for not pursuing a no-action alternative model run.	Groundwater modeling will include a no-action alternative. The baseline (current groundwater) conditions model, run over the same time period as the Project model, will represent the no-action alternative. Text has been edited to state "The numerical model will be capable of assessing changes to the groundwater system based on Project operations, specifically changes to the baseline conditions (represented by a no-action alternative simulation) due to underground mine operations and changes in land-use which can impact aquifer recharge."
583	4422-4424	Clarification. Are these reports different from the ones in 4426-4429? Action requested: Provide explanation and modify text if supported.	The deliverables noted in lines 4426 - 4429 are the same as noted in lines 4422-4424

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
584	4430	Clarification. Proposed/monitoring for direct and indirect impacts to wetland and stream hydrology from ditching, and other watershed alterations, are unclear in the supporting text, including but not limited to potential flow (or lack thereof) of water from one water body to another. Action requested: Consider the point and modify text as determined appropriate.	A detailed impact assessment is necessary informed by scoping before monitoring location and protocols can be established.
585	4430	Guidance. Anticipate supplying information on wetland and stream avoidance, minimization, replacement, indirect effects (draw down, diversions, chemistry, flora and fauna, etc.), quality, and monitoring for the EIS analysis. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
586	4432	Future discussion. A larger area than the project area will need to be defined for wetland delineations in order to determine if indirect wetland impacts would occur. Likely an increased area requiring planning for delineation. No action requested. Future discussion item.	TMM notes that without an impact assessment there is no basis to expand the area for delineations beyond the Project area.
587	4438	Clarification. Presume the delineation work would also inform the 401 Certification process. Action requested: Modify text to address the item.	Text has been edited to read: "This work will also inform permit applications, including Minnesota WCA, U.S. Army Corps of Engineers (USACE) Section 404, and MPCA Section 401 Water Quality Certification."
588	4445-4447	Clarification. Include avoid and mitigate in addition to "reduce." Action requested: Modify text to address the item.	Text has been edited to read: "Are there potential impacts to wetlands identified that are significant, and can Project EPMs or reduction methods be identified to avoid, minimize, or mitigate the significance of the impacts?"
589	4470	Correction. The Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) was published in January 2012, not 2011, as indicated in the text. Action requested: Make text correction.	Edited to correct the date of publication to 2012.
590	4484-4485	Clarification. Further detail is needed regarding how wetlands may be grouped for functional assessment. Action requested: Modify text to address the item.	The intent is to develop a more detailed work plan. Sections on the future scope of work identify specific studies or data collection that would be conducted to obtain additional data identified as lacking but able to be reasonably obtained. The future scope of work sections are not comprehensive work plans and these full work plans will not be appended to the data submittal; however, TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
591	4488	Guidance. Consider Floristic Quality Index monitoring for comprehensive wetland quality. Action requested: Consider the recommendation and modify bulleted list as warranted.	Comment is noted. TMM considers this request/comment appropriate for consideration in the EIS development and suggests that it be addressed as part of the development of a future scope and/or the draft scoping decision document.
592	4513	Addition. Presume need to add "how" before "…the relevant areal extent…" or clarify meaning. Action requested: Add the term "how" to the text or identify alternative language or edit.	Text has been edited to read: "The methodology will include a decision matrix for how effected resources are determined, how the relevant areal extent is defined, how potential impacts are determined,"

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 7.0 Contaminants, Hazardous Materials, Waste
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
593	4577	Clarification: Would demolition waste also be generated? If so, include in this list. If not, explain why not. Action requested: Modify text accordingly.	Text has been edited to read: "Solid industrial waste – tires, scrap metal, concrete, construction waste, non-salvageable demolition debris, and office waste (paper, utensils, etc.). Solid industrial waste generated by the Project would be taken off-site to be treated by a third party and recycled when available"
594	4594	Clarification. Are any detectors involving radioactive elements or mercury needed for the project? If so, include in discussion; could require consultation with MDH. Action requested: Modify text accordingly.	Instrumentation needs for the Project have not been developed extensively enough to determine if detectors involving radioactive elements or mercury are needed. Table 3-8 identifies the potential need for a Hazardous Materials - Radioactive Material License from the Minnesota Department of Health. Any use and disposal of detectors involving radioactive elements or mercury would follow the appropriate state and federal regulatory requirements.
595	4667	Clarification. The methods of waste disposal discussed are primarily methods of containment, and compliance with RCRA requirements. Please add additional details/estimates on quantities and types of hazardous materials that are expected to be on site over the proposed 25 year mine life. Action requested: Provide requested detail.	Tables 7-1 and 7-2 outline estimates of Fuel Storage and Consumption and Process Reagents. Table 7-3 has been added that outlines Approximate Emulsion Quantities. These annual estimates can be extrapolated for the 25 year mine life. Additional assessment of hazardous materials are anticipated to be part of the EIS development.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 8.0 Terrestrial & Aquatic Resources
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
596	4743-4744	Guidance. The use of the Rare Species Guide (RSG) needs to be better explained with a supporting rationale. It is correct the RSG provides good quality information, but it by no means can be used as a stand-alone source for species information, especially when it relates to a species' habitat requirements. Action requested: Modify text to qualify limits of RSG, especially in terms of habitat requirements. Be prepared to utilize other information sources for species receiving attention over the course of the EIS.	Text has been edited to read: "The MDNR Rare Species Guide was used to further refine the selected habitats and sensitive species for inclusion in the analysis. The habitats described by the MDNR Rare Species Guide are those commonly used by a species but are not inclusive of all the habitats that a species may use or be found in."
597	4887-4888	Guidance. The text indicates that approximately 650 acres associated with the Transmission Corridor have not been mapped within the DNR Native Plant Database. A plan should be provided to address this data deficiency. Action requested: Identify how similar-level information will be provided for these acres. One option is for this area to be surveyed and mapped as per DNR recommendations.	This work is identified in the Section 8.3 Future Scope - specifically lines 5533-5557. Phase 2 – Terrestrial vegetation baseline surveys.
598	4895-4902	Clarification. Use of the term "disturbed" needs to be better defined. This wording implies that disturbed is "bad." However, based on Table 8-5, much of these disturbed forests may be upwards of 50-60 years of age. Ecologically and in terms of habitat, in many of these cases they are aspen stands and could be quite large (DBH), thus offering quality habitat for forest interior species such as goshawks. For example, a more accurate description might be "mature early-successional forest undergoing transition from primary-to-secondary successional status" or similar. Action requested: Refine the definition of "disturbed" to tighten the meaning in an ecologically-sound manner.	The text does not equate disturbed is "bad". Specifically the text reads: "The MBS data files include raw candidate data that has been mapped by MDNR's Ecological and Water Resources division but not certified for inclusion in the NPC database. Much of this candidate data shows disturbed features not part of the NPC classification and are tracked for future NPC mapping purposes. By definition these disturbed areas would not contain NPC."
599	4995	Information source. Data on fishing and angler catch is also available from the 2017 DNR Birch Lake Open Water Creel Survey Report. Action requested: Use the data as appropriate in characterizing the fishery resource of Birch Lake. Contact DNR EIS Project Managers for this report.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
600	5005	Clarification. The text should note this species' greater destruction of submerged vegetation than native species, which negatively impacts fish habitat, particularly for sunfish. Action requested: Modify text.	Text has been edited to read: "The rusty crayfish is of concern for disrupting ecosystems due to its greater destruction of submerged vegetation than native species, which negatively impacts fish habitat, particularly for sunfish."
601	5012	Clarification. The *Notropis* species found should be listed by individual species. Action requested: Modify text to address the item.	No data on the individual species is available for the genus notropis from the 2014 MPCA assessment. The assessment counted 5 total genus notropis with a length 75-89 mm.
602	5016	Clarification. Information on MPCA's listing of Keeley Creek as impaired should be here. Type of impairment, pollutant, and recommended action. Action requested: Modify text.	See Comment 412. Impairments are listed in the Surface Water Quality Baseline section.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
603	5020	Reporting consistency. Fish species are listed for Keeley Creek and Unnamed Creek, but not for Stony River or Denley Creek. List the species in each case for consistency and information (could include in table form). Action requested: Provide sentence listing the eight fish species.	Text has been edited to read for Stony River: "MPCA documented the following fish species in the 2014 assessment: burbot, mottled sculpin, tadpole madtom, Johnny darter, central mudminnow, rock bass, northern pike, and longnose dace." For Denley Creek: "MPCA documented the following fish species in the 2014 assessment: northern redbelly dace, blacknose dace, creek chub, blacknose shiner, common shiner, central mudminnow, white sucker, pearl dace, fathead minnow, finescale dace, and brook stickleback."
604	5020	Clarification. The 8 species found should be listed out the same way it was done for Keeley Creek. Action requested: Modify text to address the item.	See Comment 603.
605	5030	Clarification. The 11 species found in Denley Creek should be listed out the same way it was done for Keeley Creek. Action requested: Modify text to address the item.	See Comment 603.
606	5031	Clarification. More detailed information regarding the invertebrates found should be included. Action requested: Modify text to address the item.	Text has been edited to read: "In addition, MPCA documented a diverse invertebrate community including: amphipods, balloon flies, beetles, black flies, broad-winged damselflies, chiggers, darners, epitheca, gastropods, hirudinea, large caddisflies, long-horn caddis, mayflies, micro-caddisflies, midges, net-spinning caddisflies, northern caddisflies, oligochaeta, and orconectes."
607	5078	Clarification. Wild rice was not surveyed by DNR Fisheries after 1997, which means this resource was not mentioned in subsequent reports. Action requested: Add sentence to end of paragraph that reads: DNR Fisheries discontinued wild rice surveys after 1997.	Text has been edited to read: "Wild rice is specifically identified in the Lake Survey Reports for 1954, 1975, and 1997. MDNR Fisheries discontinued wild rice surveys after 1997."
608	5080	Clarification. Potential for wild rice in Unnamed Creek, Stony River, and Denley Creek not mentioned. Make reference for those waters in addition to Birch Lake and Keeley Creek. Action requested: Identify the status of wild rice in listed waters.	Given the Project design, no impacts to wild rice are expected in Unnamed Creek, Stony River, and Denley Creek therefore no baseline information has been provided.
609	5080	Information source. Keeley Creek data is available from the DNR Finland Area Fisheries Office. Action requested: Contact this office to arrange for inspection.	Comment is noted.
610	5082-5083	Clarification. Additional detail regarding wild rice investigation will be needed (i.e., "some documents did not contain.." leads to the question of what was contained). Action requested: Modify text to provide more detail on the results of the document review of the DNR Tower Fisheries Office. If not done consider a technical support memorandum summarizing the results.	The full complement of wild rice data will be provided during EIS development. If there are data gaps that are necessary to inform baseline conditions, additional data can be sought. TMM will offer conclusions about the density and geographic extent of wild rice at that time.
611	5100	Clarification: DNR notes that there are few areas where wild rice is extensive on Birch Lake due to the reservoir's morphology, thus the areas where wild rice is present are ecologically valuable. Rice is found mainly in less than ten shallow bays on the lake. Three areas are adjacent or nearly adjacent to the Project: north and south of the water pipeline and pumphouse, and the bay which the non-contact water ditch is to discharge to. Action requested: Modify text to address the item.	See Comment 610.
612	5106	Clarification. The text should list the aquatic plants found in Birch Lake Reservoir. Action requested: Modify text to address the item.	Text has been edited to read: "In 2018, 31 water samples were collected from water bodies near wild rice stands. Macrophyte species observed include, but are not limited to: common spikerush, Canadian waterweed, small floating mannagrass, yellow pond-lily, American white waterlily, pickerelweed, long-leaf pondweed, broadleaf arrowhead, and floating bur-reed."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
613	5124	Clarification. Text identifies habitat would be re-established on the tailings management site. Although disturbance-accustomed species may find some habitat value for the reclaimed areas, for the purposes of environmental review an active tailings should not be considered habitat as intended in SEAW Item 13. Action requested: Remove the reference to the tailings management facility for the sentence to read: "During the Project operation phase habitat would not be re-established on these sites."	Text has been edited to read: "During the Project operation phase habitat would not be re-established on these sites."
614	5141	Clarification. The text asserts habitat effects "would be temporary." Although the intent of site reclamation into closure is to restore natural and other resource values, by definition the post-project habitat would not likely be the same as the pre-project condition, which is one way of viewing temporary. Removal of the term is a more factual statement. Action requested: Revise sentence to read: "Habitat impacts due to the Project would be of limited duration and at closure the habitats would be reclaimed to restore affected habitats" or similar.	Text has been edited to read: Habitat impacts due to the Project would be of limited duration and at closure the habitats would be reclaimed to restore affected habitats.
615	5142-5145	Clarification. This sentence not relevant here. Remove as it is duplicative and not particularly accurate as not all areas of the project would be returned to like vegetation or habitat. Requested action: Remove sentence.	Text has been edited - sentence has been removed.
616	5185-5190	Future discussion. DNR concurs that additional consideration will be necessary to assess potential impacts to rare natural communities; the topic will need further evaluation. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
617	5185-5190	DNR notes this text lays the foundation for the Future Scope on the issue detailed in Section 8.3.1.	Comment is noted.
618	5209	Clarification. Stating that the project has a "temporary" nature is misleading. Project operations are expected for 25 years, and even with reclamation and closure, effects would last on the landscape long after mining operations cease. Action requested: Modify text to address the item.	See Comment 467.
619	5210-5212	Clarification. The text offers a somewhat circular argument because the project area itself has land with restricted use and is proposed for development (with this action). Stating that surrounding lands are "use restricted" is less relevant because those lands could be proposed for development as well. Action requested: Remove last sentence from the paragraph. Expect DNR to provide technical input later in the SEAW process in characterizing the potential habitat fragmentation effects of the Project.	Text has been edited - sentence has been removed.
620	5217-5220	Clarification. Absent specific detail on the reclamation plan, it is premature to claim potential negative effects to the landscape would be reversed. An example of the type of detail necessary to support the assertion would be what specific tree species plantings would be proposed, or other mitigation plans. No action requested. DNR will assess the potential treatment of the item in the EIS during development of the Scoping EAW.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
621	5228-5230	Clarification. The "magnitudes greater" characterization in the text should be described. How much different were these footprints? Action requested: Modify text to address the item.	Text has been edited to read: "The size of the surface features and the scale of their respective impacts described in those reports are orders of magnitude greater than the Project's potential ground disturbance. For example, the Barr (2009) report cited MDNR data that "mining features cover 118,315 acres along the Iron Range, including 36,962 acres of open mine pits, 78,620 acres of stockpiles and tailings basins, and 212 acres of facilities and infrastructure.""
622	5231-5238	Clarification. Natural impediments to what wildlife species? DNR notes that larger mammals, moose, wolves, bears, and similar would all utilize these bodies of water to travel. Rare bird species in the area would not be impeded by these water bodies. Action requested: Either better define what is meant by "wildlife corridor" as it is being used or modify the text to address the item.	Text has been changed to read: "The Project is in an area that has physical limits in providing a wildlife corridor. The Project area is bounded to the north and the west by Birch Lake which could present a physical or behavioral impediment to terrestrial species of wildlife. Recreation use of Birch Lake during spring, summer, and fall months may deter species that would typically cross bodies of water and previous and current disturbances, including existing forest roads and rural residential roads, intersect the Project area and influence the movement of wildlife."
623	5231-5233	Clarification. DNR notes wildlife corridors are not limited to terrestrial wildlife only. At a minimum the text should be modified to account for bird species, specifically waterfowl, and potential access to the several river/stream systems within the project area. Action requested: Modify text.	No text has been edited. As outlined in Section 8.1, terrestrial species encompass bird species in the data submittal. Section 8.2 discusses potential impacts to terrestrial species and lists birds as one of the species considered in this designation.
624	5268-5271	Clarification. In this and in other places (e.g., line 5314), the implication is that the entire site would be reclaimed to a natural area, but the tailings facility is a permanent feature and thus would have permanent impacts. Phrasing of duration of impacts should take this into account. Action requested: Modify text.	Comment is noted. TMM considers this request/comment appropriate for consideration in the EIS development and suggests that it be addressed as part of the development of a future scope and/or the draft scoping decision document.
625	5356-5360	Note. The RGU notes it is premature to determine potential significance of this issue. No action requested. DNR will use information developed over the course of the Scoping EAW to propose how the issue will be addressed in the EIS.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
626	5370	Analytical gap. This section identifies infrequent noises such as back up alarms could result in displacement. Section 12.2 does not specifically address back up alarms. Action requested: Comment provided in Section 12.	Text has been edited to read: "These sudden, infrequent impulse noises such as back up alarms on mobile equipment or material handling at the plant site and tailings management site, could displace a variety of wildlife found in and around the Project area, including mammals and birds many of which could successfully relocate into adjacent habitats. The Project would aim to reduce the impact of both sudden, infrequent impulse noises and steady or continuous to receptors outside the Project footprint by ensuring noise levels remain below the NAC-1 nighttime limit of 50 dBA. At this level, impacts would be limited to sensitive receptors proximal to the plant site, tailings management site and the potential significance of the impacts of noise on wildlife would be reduced."
627	5387-5396	Clarification. What data sources were used for the habitat associations of the sensitive wildlife species? Only the rare species guide? Action requested: Answer the question and modify the text to address the item.	See line 4743-4751. "The MDNR Rare Species Guide was used to further refine the selected habitats and sensitive species for inclusion in the analysis"
628	5420	General comment. This section should address changes to baseflow, streamflow or water levels that may impact aquatic resources. Action requested: Address in Version 2.	Comment is noted. The modeling efforts necessary to characterize changes in baseflow, streamflow, or water levels are outlined as part of the surface water and groundwater supplemental scopes outlined in Sections 6.3.1 and 6.3.2.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
629	5428	Clarification. Any impacts due to the access road being in the shore impact area should be identified. Action requested: Modify text to address the item.	The access road is not within the Lake County Shoreland Zoning Ordinances or any shoreland management area.
630	5434-5435	Clarification. Presume that transmission corridor access road that follows the transmission lines would require culverts/bridges. Action requested: Whether correct or not, revise text to address the issue.	Text has been edited in Section 3.6.2 Transmission Corridor to read: "The transmission corridor would include a two-track, unpaved maintenance road and the power transmission line, which would originate from an off-site electrical substation and terminate at the plant site electrical substation. The two-track maintenance road would be accessed from existing local roads and would not require culverts or bridges. The two-track maintenance road would be accessed from existing local roads and it is anticipated that it would not require culverts or bridges. "
631	5438	Clarification. The section limits consideration to potential construction effects only. Changes to the watershed of Keeley Creek would be expected to affect flow, both during the project and after reclamation. Impacts to aquatic habitat may resulf from any flow-related or other changes in channel geomorphology, and water quantity and quality. It is noted that flow changes alone can alter habitat suitability for aquatic species. Other considerations include changes in vegetation type, amount of impermeable surface present, and ditches created by the project, all of which may affect surface water quality and quantity. Nutrient and sediment run-off often is permanently increased due to land alteration and vegetation changes, which can result in decreased water clarity due to algal blooms (in some instances). Action requested: Modify text to address the item as determined appropriate.	Text has been edited to read: "The tailings management site would be sufficiently set back with design and EPMs to avoid impacts to Keeley Creek related to surface disturbance. Consideration for changes to groundwater or surface water flow to Keeley Creek are included in Section 6.3."
632	5441	Clarification. Impacts to aquatic habitat and biota are intrinsically connected. For example, reduced flows to a stream could cause the stream to become more shallow and wide. This would mean a loss of habitat for some fish species while possibly benefitting others, but resulting in an overall adverse impact on biota. Action requested: Modify text to address the item.	Comment is noted. The SEAW was prepared using the best available data and did not use provisional data. This has been identified as a future need - lines 5470-5473.
633	5441	Additional impact. The possibility of potential impingement of small and larval fish by the water intake should be addressed. Action requested: Add text to address the item.	Lines 5467-5469 preliminarily identifies that impacts associated with the water intake pipe are expected to be insignificant but additional work is necessary. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data will be furnished during EIS development to satisfy the EIS scope.
634	5458	Additional impact. If any wild rice bay receives water collected from a non-contact water ditch, then any potential impacts should be assessed. Action requested: Add text to address the item.	This has been identified as a future need - lines 5470-5473.
635	5470	Note. DNR concurs that analysis of potential project impacts to surface water quantity and quality has applicability to aquatic resources and biota. No action requested.	Comment is noted.
636	5474-5476	RGU note. The potential significance and subsequent treatment in the EIS remains to be determined regarding the topic of aquatic resources. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
637	5486-5487	Clarification. Describe the intent of collecting evidence of natural or human disturbances (also lines 5544-5547). Action requested: Modify text to address the item.	The purpose of this work would be to account for any previous disturbances to habitat, vegetation, and wildlife. Text has been edited to read: "•Creating a plant community map and recording evidence of natural or anthropogenic disturbances to document previous impacts to habitats, vegetation, and wildlife;"
638	5512	Future discussion. DNR concurs that additional consideration will be necessary to assess potential impacts to rare natural communities; the topic will need further evaluation. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
639	5523	Confirmation. Please identify if the intent is to develop a more detailed work plan for these efforts? Action requested: Provide response. As part of work plan development DNR will identify if it would be preferred for the agency reviewers for the sequential aspects were delivered upon completion (rather than as one report at the end). Future discussion item.	The intent is to develop a more detailed work plan. Sections on the future scope of work identify specific studies or data collection that would be conducted to obtain additional data identified as lacking but able to be reasonably obtained. The future scope of work sections are not comprehensive work plans and these full work plans will not be appended to the data submittal; however, TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
640	5569-5571	Information need. DNR will need more detail regarding these surveys (timing, number of locations, methodology) to ensure a robust and useful data set. Action requested: Modify text as information is now known to address the item. Future discussion item.	See Comment 639.
641	5572-5575	Data note. Although this is a source of information, typically this is not a rigorous survey but instead the documentation of incidental observations. No major conclusions on game bird populations can be made from this type of data. Action requested: Ensure that any use of this information is appropriately qualified in future data submissions.	Comment is noted. This will be considered in developing future scope for terrestrial wildlife baseline surveys.
642	5576-5579	Clarification. For this bullet, what will the survey methodology be here? Observer based? Acoustic detectors? Action requested: Answer the question and modify text as appropriate.	See Comment 639.
643	5584	Clarification. Why are bats lumped in with reptiles and amphibians? Absent a specific reason, bats should be listed with the mammals. It is noted one possible reason is that bat-related work would occur coincident over the same three, week-long survey periods with the herps. Action requested: Modify text to address the item.	See Comment 639.
644	5585-5586	Clarification. The text should identify when will these three weeklong periods occur? Action requested: Modify the text to address the item.	See Comment 639.
645	5587-5588	Clarification. When will these surveys occur? What conclusions will be made from the acoustic data? If a species is present acoustically within the project area, then will it be assumed this means that breeding (maternity colonies) is occurring within the project area? If not, how will breeding presence be determined (by mist netting/telemetry)? Who will be reviewing the calls files collected by the acoustic detectors? Action requested: Modify text to address the item.	See Comment 639.
646	5589-5590	Clarification. More details are needed in the survey methodology here. How will visual meander surveys be done? What time of the year and by who? Where and when will trapping occur? Action requested: Modify text to address the item.	See Comment 639.
647	5591-5592	Clarification. Will this be done using acoustic detectors or by trained staff? Action requested: Answer the question and modify the text to address the item.	See Comment 639.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
648	5596-5599	Data collection. The statistical validity of using only 10 camera traps to survey 1156 acres is questionable? This will likely result in the project area being insufficiently surveyed for any statistically valid results. What time of year will surveys be done? Timing will have to be different to target certain species (i.e., Canada lynx vs. black bears). More detail is necessary to support the proposed methodology. Action requested: Modify text to address the item. Future discussion item.	See Comment 639.
649	5600-5601	Clarification. More details are needed to describe the small mammal surveys. When will surveys occur, what trap types/sizes will be used, what habitats will be targeted, etc.? How does the methodology account for the fact that often rare small mammals are notoriously difficult to catch using live traps? Action requested: Modify text to address the item.	See Comment 639.
650	5568-5603	Question. What conclusions will be made from these surveys? It is important to note that lack of presence during surveys does not equal the ability to conclude a specific species does not occur within the project boundary. Action requested: Provide an answer to the question, which will be considered in the proposed EIS scope over development of the Scoping EAW. Future discussion item.	See Comment 639.
651	5605-5610	Clarification. Compare deliverable report described on lines 5605-5610 with that listed on lines 4504-4521. Are these separate reports or the same? Action requested: Provide clarification and modify text to provide clear distinction across the two items.	The Future Scope Section has been corrected to read: "The result of this work will be combined with the results from the Wetlands Baseline work outlined in Section 6.3.3 " The work accomplished in the 8.3.1 will be combined with the first two volumes of the wetland work outlined in 6.3.3 as this work will inform the baseline and existing conditions of wetlands, habitats, vegetation, and wildlife.

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Comment Tracking Table - Section 9.0 Historical & Cultural
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Comment #	Line # Table # Figure #	Comment	Twin Metals Response
652	5718	Addition. The summary also addresses Section 9.2.1 regarding archaeological sites (not in title or text of this section). Action requested: Incorporate as necessary findings of Section 9.2.1 into summary.	Section 9.2.4 has been edited to include reference to archaeological sites.
653	5724-5727	Consistency. The section is not completely internally consistent. Lines 5706-5708, for example, state that there is a known site within the project area (and noted it would be avoided by construction) that conflicts with statement here. Action requested: Correct this inconsistency and check the entire section for other potential errors.	Text has been edited to read: "Archaeological sites, historic properties, and cultural resources which have been identified during previous investigations all fall outside of the construction limits of any features associated with the Project. As a result, there are no anticipated impacts for areas of the Project that have been previously investigated. "

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Comment Tracking Table - Section 10.0 Visual
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Comment #	Line # Table # Figure #	Comment	Twin Metals Response
654	5820	Existing recreation. The text identifies "campgrounds" as one of many features as part of the Birch Lake viewshed. The South Kawishiwi Campground located at the intersection of Hwy 1 and the Kawishiwi River should be considered as a potentially affected resource due to project-related visual effects. Action requested: Modify text to address the item or provide a rationale why visual impacts are not expected.	From preliminary visual simulations there would be no line of sight from the South Kawishiwi Campground to the Project. Future work to inform the assessment of potential visual impacts related to plumes is outlined in Section 11.3.6. Additional effects to recreation will be assessed as part of Section 15.1.
655	5831	Clarification. To be more precise consider modifying the title to read: "Landscape Visual Simulation." Action requested: Modify title.	This section encompasses more than just a "Landscape Visual Simulation" assessing all potential project impacts to visual resources.
656	5884	Clarification. To be more precise consider modifying the title to read: "Direct Line of Site Viewshed Analysis." Action requested: Modify title.	The text notes that the viewshed analysis is a preliminary “direct line of sight” viewshed analysis.
657	5832	Affected resource. The potential for the South Kawishiwi Campground to be affected from infrastructure visibility, light visibility at night, and visibility of plumes should be assessed. Action requested: Modify text to address the item.	See Comment 654.
658	5931	Clarification. The first paragraph calls the impact being addressed light "pollution." To be more precise consider modifying the title to read: "Light Pollution." Action requested: Modify text.	For consistency with Project nomenclature references to light pollution have been edited to light visibility.
659	5949	Bullet 4. Add "permanent" prior to "stockpile." Action requested: Modify text.	Consistent with Comment 63 - there are no temporary or permanent waste rock stockpiles.
660	5982	Clarification. Would there be no light at the tailings facility or other access features at the end of project? Action requested: Modify text to match the answer.	Text has been edited in Section 10.2.4 to read: "Lighting would be removed during reclamation and post-closure maintenance and monitoring phases unless a future use is identified and approved."
661	5987-5989	Clarification. Was the view shed analysis conducted on the reclaimed tailings facility compared to the operational facility? If not, is it known that the viewshed is partially restored? Action requested: Future discussion item. In addition, modify text to read: "...reverse impacts associated with construction and operation of the dry stack facility;..."	The viewshed analysis represents the scale of the dry stack facility at full development after 25 years of operation. Viewshed analysis was not done for the reclaimed dry stack facility.
662	5987	Clarification. The text identifies "grading and revegetation" as the principle measures to partially reverse visual impacts. Describe the closure of the dry stack in greater detail to better support the assertion. Action requested: Modify text.	See lines 1424-1425 for discussion on revegetation at the dry stack facility. "Cover soil would be sourced from the reclamation material stockpile and seeded to establish grasslands." See lines 1563-1568 for discussion on grading at the dry stack facility. "The post-closure surface of the dry stack facility would be graded to drain toward the perimeter of the dry stack facility. Reclamation design would aim to create conditions where runoff rates and volumes are similar to runoff reaching downstream surface water receptors for pre-Project site conditions. When the dry stack facility surface is fully revegetated and vegetation growth is dense and well established, runoff may no longer require suspended solids removal to meet water quality standards."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
663	6005-6007	Future scope. Section 11.3 does not address plumes as noted in the text. Action requested: Modify text if potential plume visibility is not proposed for future study and provide the rationale for not doing so.	Section 11.3.6 added to clarify that potential visibility impacts of plumes is part of future scope. Text has been added that reads: "The specific requirements for a visual impact analysis will be negotiated and discussed with the RGU as part of the visual impact analysis process. This process will be conducted to satisfy environmental review requirements. Associated tasks could include assessing the potential for physical changes to the visual environment at surrounding receptors, assessment of visible plumes or fogging at selected receptors, and simulation of changes to particular scenic vistas."

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Comment Tracking Table - Section 11.0 Air
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
664	General	Information request. Section 11.1 should identify all Federal and State rules that may be applicable to the proposed project. Action requested: Review the existing text to ensure all applicable regulations have been identified. Modify text for any omissions.	Text in Section 11.1.2 has been edited to identify potentially applicable Federal and State rules.
665	6022	Guidance. Follow the MPCA Air Dispersion Modeling Practices Manual guidelines for developing PM10 background concentrations based on ambient monitoring data. Action requested: Modify text to reflect item.	Comment is noted. This will be considered while developing the air future scope.
666	6025-6027	Future Action. The treatment of the two monitoring sites to represent "background" will require confirmation. DNR understands these sites were established as part of the required monitoring program for existing mining and processing operations. It will have to be determined whether impacts from this operation can be appropriately considered as background. No action requested. Future discussion item in consultation with MPCA.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
667	6065	Guidance. All assumed control efficiencies will need to be reviewed in order for emission totals to be verified before conclusions can be drawn. Action requested: Modify text to address item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 11.3.1, including data on emissions calculations including activities and equipment will be provided during EIS development to satisfy the EIS scope.
668	6068	Guidance and information need. All emission sources will need to be considered. Additionally, a process flow diagram detailing emissions sources should be provided for the next data submittal. Action requested: Modify text to address item. Provide a figure for next data submittal.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data, as outlined in Section 11.3.1, including data on emissions calculations including activities and equipment will be provided during EIS development to satisfy the EIS scope.
669	6069-6071	Clarification. The text correctly assumes that additional stationary sources identified as the project design is refined would need to be included as part of evaluation for potential significant effects. A possible way to better capture this might to simply read: "Table 11-2 would be updated to reflect any additional sources included in the Project design and used..." Action requested: Modify text.	Text has been edited to read: "Table 11-2 through Table 11-9 would be updated to reflect any additional sources included in the Project design and used in the additional modeling work discussed in Section 11.3."
670	6074	DNR notes the Project defines drilling and blasting as emission sources. Emission sources must be qualified and quantified with drilling and blasting plan details. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
671	6074	Guidance. Air dispersion modeling should consider the impact of particulate emissions generated from blasting during the development of the declines during the construction phase. Action requested: Modify text to reflect item.	Comment is noted. As outlined in Section 11.3.1, all Project operations (which includes construction) will be included in the emissions calculations. This additional data will be provided during EIS development to satisfy the EIS scope.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
672	6078-6082	Applicability review. The applicability of ventilation shafts as point sources for air quality emissions should be considered. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
673	6099-6111	Clarification. Is it correct that above-ground crushing would be for 5 years during both construction and early operations? Action requested: If correct, modify text to add temporal dimension and account for both activities.	Text has been edited to more clearly reference the construction and operation phases defined in Section 3.6.2. Above-ground crushing of development rock will occur during the construction phase which is defined in Section 3.6.2 as a "30-month period from Q3 Year -3 to Q4 Year -1." Above-ground crushing of ore will occur during the first two years of the operation phase defined in Section 3.6.2 as beginning "with the commissioning of the concentrator." Operation of the crusher during the construction phase is expected to be more intermittent and at a lower throughput.
674	6109-6110	Clarification. What happens to the <0.5' blasted rock? Action requested: Clarify and revise accordingly.	The ore stored at the temporary rock storage facility would primarily be 0.5 to 1 ft in diameter, this is the target from blasting. However, when looking at a full PSD of these ore, there would be pieces smaller than 0.5ft in diameter (as well as some pieces larger than 1ft in diameter). Text changed to the following to clarify: "Ore stored at the temporary rock storage facility would nominally between 6 to 12 inches(10 to 30 cm) in diameter."
675	6125-6128; Table 11-3	Guidance. "In addition to gaseous criteria pollutants such as NO2, SO2 and CO, greenhouse gas (GHG) emissions are anticipated from mine heaters and underground blasting activities. Table 11-3 provides an estimate for preliminary GHGs for the project." For the project carbon footprint, all GHG emissions should be estimated from the following sources: Scope 1, direct emissions - stationary combustion sources, mobile combustion sources, stationary or area industrial process sources, permanent land-clearing [aboveground biomass carbon], and GHG emissions from stockpiled stored peats and soils; Scope 2, indirect emissions - emissions associated with purchased electricity. In estimating CO2 emissions from permanent land-clearing, emissions should be estimated for CO2 losses from removed and marketed or combusted woody biomass and lost sequestration potential from cleared acres. Mobile combustion sources would include all mobile above and below ground mining equipment plus aboveground trucks, front end-loaders, dozers and the like. In developing the project footprint, this should use projected actual hours of operation, rather than potential maximum hours of operation. Action requested: Modify text as appropriate in the GHG section. Modify text as appropriate in section 11.3.2. Future discussion item.	See Comment 556.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
676	6132-6134 and Table 11-3	Guidance. "Preliminary GHG emission calculations show carbon dioxide equivalent emissions would be 58,072 tons per year (tpy), which is well below the threshold for a major source of air emissions of 100,000 tpy in Minnesota." For PSD determination (Prevention of Significant Deterioration), a more limited carbon footprint should be developed than discussed above in comment 664. This should be similar to what is found in Table 11-3, but also include emissions associated with the above-ground biomass removed from the site during land-clearing, should that biomass be marketed as fuelwood. Under USEPA guidance, biogenic emitted to the atmosphere as a result of permanent forest clearance should be included in GHG emission totals in the determination of which facilities need or need not undergo a BACT (best available control technology) analysis. Emission totals used for PSD determinations normally do not include GHG emissions from mobile sources or biogenic area sources not related to permanent forest-clearing. They also do not include indirect GHG emissions associated with the generation of purchased electricity, and are calculated on a maximum potential-to-emit basis. The emission threshold for GHGs for a facility that otherwise must undergo a criteria pollutant-related BACT analysis is 75,000 short CO2-equivalent tons. Action requested: Modify text as appropriate in the GHG section. Modify text as appropriate in section 11.3.2. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
677	6138-6144	Guidance. "The impact of GHG emissions would be further reviewed with respect to direct and indirect impacts from a regional and global perspective. Total GHG emissions from the project would be compared against GHG emissions emitted globally, nationally, and within Minnesota. GHG emissions from the Project could then be assessed against the overall contribution from each of these sectors as total emissions and as a percentage." In addition to these baseline metrics (used for comparative purposes), the assessment should compare the estimated average annual emissions of the facility (full facility carbon footprint, both direct and indirect sources, projected facility capacity factor) to the net incremental state-level GHG reduction found in the Minnesota Next Generation Energy Act for the proposed facility's initial year of operation. The Minnesota Next Generation Energy requires an GHG emission reduction from 148 to 122 million CO2-equivalent tons between 2015 and 2025 (or at an annual rate of -2.62 million CO2-equivalent tons) and from 122 to 35 million CO2-equivalent tons between 2025 and 2050 (annual rate of -3.49 CO2-equivalent short tons). This is based on the most recent Minnesota Pollution Control Agency estimate of 2005 state-level baseline emissions. If the facility begins operation between 2020 and 2025, estimated total facility emissions should be compared to an incremental state-level reduction in the initial years of the facility's operation of -2.62 million CO2-equivalent tons, and, if it begins operation between 2025 and 2050, to an incremental state-level reduction in the initial years of the facility's operation of -3.49 million CO2-equivalent tons. Action requested: Modify text as appropriate in the GHG section. Modify text as appropriate in section 11.3.2. Future discussion item.	See Comment 556.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
678	lines 6124-6147	Guidance. In addition to the pieces of analysis outlined in lines 6124-6147 with respect to GHGs, the assessment should estimate the incremental impact of the proposed facility on the natural and built environment through its incremental contribution to global climatic change. In the past, it has been a common practice to conclude that the estimation of the incremental impacts of any single facility were not (or are not) amenable to estimation or analysis. With the development this last roughly 10 years of social cost of carbon estimates, this is no longer true. Social cost of carbon relates emission of the next or marginal ton of GHGs to their damages via formal modeling of GHG atmospheric retention, the response to climate of the next ton of GHG accumulation in the atmosphere for each forecast year modeled, roughly the present out to 2100, and damages from the accumulation of GHGs in the atmosphere. The modeling relies on relationships found in the scientific literature relating climate change to impacts to: agricultural production, forestry, human health, sea level and coastal settlement, labor productivity, tourism, amenities, natural species and habitat and other resources or activities. Damages in this construct are monetized damages, discounted using various discount rates. In 2016, the Minnesota Public Utilities Commission (MPUC) formally adopted a damage cost value for incremental GHG emissions from power generation using as a base estimates of the social cost of carbon from national analyses. Adjusted by GWP, the MPUC damage cost value can be used to estimate the stream of future damages from the emission of any greenhouse gas. These damage cost estimates (CO_2 externality values) should be used in evaluating the incremental average annual and lifetime environmental impacts or damages resulting from the proposed project. The damage-cost estimate that presently is in use (calendar year 2020) by the MPUC in its proceedings is $9.05 to $42.46 per ton of emitted CO_2, with a mid-point of $25.76 per ton. Under MPUC order, this will rise to $11.16 to $51.47 per ton of emitted CO_2 by 2030 (2015 dollars). As in the case of climate forecasts, it is permissible to opt out of the use of these values with a clear demonstration, based on the criteria given in Environmental Quality Board rules for nonavailability of information, that the MPUC-generated values do not adequately represent the stream of likely marginal damages from the next ton of emissions or that the modeling on which the those values were generated was flawed or too uncertain for use. Action requested: Modify text as appropriate	See Comment 556.
679	lines 6148-6317	Guidance. For consistency, to the degree that this is practical, the assumption of persistent human-forced climatic change as background condition for the project should extend to all other environmental modeling, including the modeling of impacts to terrestrial and air resources. Fundamental processes like ozone formation or mercury methylation are temperature-sensitive, hence depend on what is assumed about future climate. Action requested: Modify text as appropriate in the GHG section. Modify text as appropriate in section 11.3.2. Future discussion item.	See Comment 556.
680	6162	Guidance. Air dispersion modeling should consider the impact of particulate emissions generated from underground blasting activities that may exhaust from the ventilation raises. Action requested: Modify text to address item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
681	6165	Note. All emission factors used for blasting assumptions will need to be verified before conclusions can be drawn. No action requested.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
682	6225	Guidance. The Federal Regional Haze rule 40 CFR §51.308, establishes a goal of attaining natural visibility conditions by the year 2064. Generally, States submit State Implementation Plans (SIP) to show progress toward attaining this goal every 10 years, although the originally scheduled 2018 SIP revision submittal deadline was extended to 2021. The next scheduled full SIP revision is due 2028, and every 10 years thereafter. In developing its long-term strategy for each 10-year SIP, the State must consider the anticipated net effect on visibility due to projected changes in point, area, and mobile emissions over the period. The State must include sources or groups of sources selected for consideration to evaluate the feasibility for controls. In developing the current SIP submittal (due 2021) for regional haze, Minnesota selected an emissions/distance threshold for sources to evaluate emissions controls. Using the criteria-if the proposed project existed today-Minnesota would require the proposed facility to evaluate the feasibility of emissions controls. The regional haze program requirements specify four factors to evaluate the feasibility of emissions controls: Cost of compliance, time necessary for compliance, the energy and non-air quality environmental impacts of compliance, and the remaining useful life of any potentially affected anthropogenic source of visibility impairment. Project proposers should address these four factors to evaluate potential controls as part of the project scope in an attempt to avoid the prospect of potential retrofits soon after. Project proposers should consult with the MPCA air quality team on carrying out this course of action. Action requested: Add to Sections 11.2.3 and 11.3.4 as warranted. Future discussion item.	Section 11.3.4 outlines the future work for Class I Air Quality Analysis. As stated in the data submittal this future work "will be negotiated and discussed with the RGU as part of the air quality impact analysis process."
683	6251	Clarification. This section needs additional content on vehicle emissions and "other aboveground mobile equipment," including identification of the categories of impacts possible from these sources. Action requested: Add the specified content. Ensure that Section 11.3 addresses any future information needs.	Text has been edited to include examples of "other above ground equipment" and identify categories of impacts possible from vehicle tailpipe emissions.
684	6242-6246	Clarification. Should a potential increase in personal vehicle traffic in the area and busing of employees, and increased traffic in general, be included as project emission sources? May require consultation with MPCA. Action requested: Modify text as the issue is understood. Possible discussion item with MPCA.	Comment is noted. Emissions from mobile sources such as personal vehicles, busing, etc. are not considered part of "project emission sources'" when evaluating stationary source permitting. These kinds of emissions are however considered when evaluating GHG impacts. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
685	6247	Guidance. The potential to emit from all tailpipe source above and below ground needs additional supporting information prior to conclusions can be drawn for project impacts as well as modeled emission rates. Action requested: Ensure Section 11.3.1 identifies data needs as listed. Future discussion item.	Lines 6323-6324 in Section 11.3.1 acknowledge the need to further refine emission calculations. Additional data, as outlined in Section 11.3, including emissions inventories and calculations will be provided during EIS development to satisfy the EIS scope.
686	6263	Question: Will there be odor and dust monitoring/modeling/data collection, etc.? The text does not identify any future actions. RGU will need to review available information regarding the potential for dust and odor effects before identifying the treatment of the issue in the EIS. Action requested: Future discussion item.	TMM is not proposing to perform odor data collection or modeling. For dust, see information on air quality. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
687	6264	Guidance. For the proposed project and each project alternative, provide a cumulative Air Emission Risk Analysis (AERA) as described on MPCA's website for each phase of the project. Action requested: Ensure Section 11.3 addresses likely AERA needs. Future discussion item. The analyses shall include but are not limited to: • Mobile sources • Piles on site • Tanks & refueling on site • Blasting activities • Pollutants in the MPCA Risk Assessment Screening Spreadsheet (RASS) • Per- and poly-fluoroalkyl substances (PFAS) • Mineral fibers • Documentation of modeling and exposure assumptions	Lines 6326-6327 in Section 11.3.1 outline that human risk to air toxics will be fully evaluated using the Minnesota AERA process. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests. Additional data, as outlined in Section 11.3, including a cumulative AERA will be provided during EIS development to satisfy the EIS scope.
688	6308-6310	Clarification. Some amount of fugitive emissions would continue into the closure period while reclamation was being completed. Action requested: Modify text to address the item.	Text has been edited to read: "Revegetation practices associated with reclamation would reduce fugitive dust emissions during the reclamation and closure phase. Fugitive dust emissions would be mitigated in the post-closure phase."
689	6314	Clarification. Engineering controls and fugitive dust management practices need to occur during construction and closure and not only during operations. Action requested: Modify text to address item.	Text has been edited to clarify fugitive dust management practices will occur during construction, operation, and reclamation and closure phases of the Project. Text has been edited to read: "Engineering controls and fugitive dust management practices would be employed throughout the construction, the operational life and reclamation and closure phases of the Project;"
690	6319	Future scope. The section does not address the potential visibility impacts of plumes originating from the two exhaust ventilation raises as identified in Section 10.3. Action requested: Modify text to address the item or provide a rationale for why no assessment is deemed necessary.	Section 11.3.6 added to clarify that potential visibility impacts of plumes is part of future scope.
691	6338-6339	RGU note. The EIS may also review potential alternative methods to reduce the impacts. No action requested.	Comment is noted.
692	6340	Guidance. Consider land ownership and control when evaluating ambient air and receptor placement. The concept of ownership/control should be relative to the Permittee only. Any areas considered non ambient will need effective measures to preclude public access at the boundary of these areas. Action requested: Modify text to address item.	Lines 6343-6344 establish that refinement of the site boundary and or modification of the receptor grid will be necessary. Additional data, as outlined in Section 11.3, including refinement of the site boundary and or modification of the receptor grid will be provided during EIS development to satisfy the EIS scope.
693	6340-6353	Guidance. Modeling should follow guidance in the MPCA Air Dispersion Modeling Practices Manual guidelines related to Class I and Class II modeling. No action requested. Future work plans should reflect the cited guidance.	Comment is noted.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
694	6345	Guidance. The project should address baseline ambient visibility conditions in the Class I areas: Boundary Waters Canoe Area Wilderness and Voyageurs National Park. Baseline ambient visibility conditions are determined from Interagency Monitoring of Protected Visual Environments (IMPROVE) network monitoring stations BOWA1 and VOYA2 located within Class I area boundaries. The MPCA calculates the baseline ambient visibility conditions from these monitors, which are based on the most recent 5-years of speciated particulate matter less than or equal to five microns in size. Project proposers should consult with the MPCA air quality team on obtaining and incorporating the data. Action requested: Modify text to incorporate this guidance into section. Future disucssion item.	Comment is noted. Section 11.3.4 identifies the need to conduct Class I area impact analysis to satisfy environmental review requirements. Text has been edited to include, "visibility impacts analysis of haze." TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
695	6354	General comment for section. Because a substantive presentation of neither potential air toxics nor cross-media impacts was included in the preliminary scoping document, no conclusions were made concerning the exclusion of any components of these analyses. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
696	6354	For the proposed project and each project alternative, provide a cross-media analysis for each phase of the project. Action requested: Ensure section 11.3.5 adequately addresses these points. Future discussion item. The analyses shall include but are not limited to: • Pollutants in these groups: metals, metalloids, dioxins, furans, PAHs, PFAS • Estimates of pollutant concentrations in relevant media due to deposition and gas-exchange • Mercury deposition • Pollutant bioaccumulation in fish and exposure via fish consumption • Exposure via soil • Exposure via garden and agricultural produce and food products, such as poultry, eggs, beef, and dairy • Exposure via drinking water • Documentation of modeling and exposure assumptions	TMM does not have information that justifies this analysis as a potentially significant adverse effect, however consideration for this analysis is outlined in Section 11.3.5. Additional data, as outlined in Section 11.3, including cross-media analysis will be provided during EIS development to satisfy the EIS scope.
697	6279	Guidance. The proposed project may need to consider monitoring for non-asbestiform mineral fibers. Action requested: Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

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RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 12.0 Noise
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Comment #	Line # Table # Figure #	Comment	Twin Metals Response
698	General	Guidance. MPCA notes abbreviated monitoring and modeling results were provided within Section 12. There is a placeholder Appendix for noise in the document, so the assumption is that the relevant studies will be provided, but it would be beneficial to have early review of those studies for more thorough examination before any conclusions are reached. Action requested: Future discussion item.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. If additional data is required for assessing noise impacts - including monitoring and modeling - data will be provided during EIS development to satisfy the EIS scope.
699	6370-6372	Clarification. No explanation is provided regarding why the USFS was monitoring noise in this area; was it project related? If so, is there a reason that monitoring locations were so spread out? Perhaps these were the areas measured for noise in the federal mineral withdrawal EIS process? Action requested: Engage MPCA on why these particular locations were measured in the first place, for example, are these all sensitive receptors? Modify text as determined appropriate.	No change made. TMM received the this data from the USFS. The data provided was collected between 2014 and 2016.
700	6380-6388	Clarification. Provide some explanation as to the inapplicability of the other 8 sites (out of 11) in defining ambient noise conditions at the Project area. Action requested: Supplement text.	The other eight sites were not inapplicable but as discussed in lines 6380-6388 these three sites were chosen to represent seasonal variability and cover important noise-sensitive receptors.
701	6389-6399	Clarification. The averaging time for the values provided in Table 12-1 is unclear - do the columns represent averaged/aggregated hourly averages over the course of the monitoring seasons? In order to best (and most accurately) assess ambient noise conditions in comparison to the state noise standards, the form of the provided statistics need to match the forms in Minn. Rules part 7030.0040; L_{eq} is not directly relatable to the hourly L_{10} and L_{50} standards. Further, the statistics need to reflect single hours of monitoring that are not averaged over a given season. Action requested: Address the item and modify text as appropriate.	Lines 6389-6399 identify that these measurements reflect single hour averages of monitoring calculated from one-second measurements in accordance with Minn. R. part 7030.0040. Those single hour averages were then used to calculate an Leq minimum, average, and maximum for both daytime and nighttime.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
702	6400-6404; Fig 12	Clarification. Several "Nearby Sensitive Receptors" were identified in figure 12-2, but it is unclear how exactly those receptors figured into the noise modeling efforts outlined in section 12.2.1. Each of the identified receptors fall under the NAC 1 (strictest) category. There may be a concern about noise at these receptors, particularly for those identified along the western shore of Birch Lake (receptors R01 through R12), as well as the campsites identified on the eastern edge of Birch Lake (R54 and R55). We would like to see the outcome of modeling on these receptors, particularly knowing how sound can carry over water (see comment 5, below). This may be less of an issue as the dry tailings area is filled and machinery moves further east and away from the lake. Additionally, the boundary of the project, as indicated on aerial maps, is drawn up to the southern shoreline of the South Kawishiwi River (the extent of the underground portion of the proposed mine). Currently, there are several residential receptors along that boundary, and it is unclear if there will be any sort of buyout of those properties or agreements about potential noise (or other) impacts. Lastly, there would be important noise concerns for individuals using the campgrounds indicated at R54 and R55, particularly during 24 hour operating scenarios. The availability of these spaces for use is under the authority of the USFS, but their proximity to both the plant and tailings areas would likely lead MPCA to recommend closing those campling locations, or at least providing signage to users that those sites (which seem to be water-access sites) may experience high levels of noise during the day and night. Action requested: Address the item and modify text as determined appropriate.	The results of initial modeling are discussed in Section 12.2.2. This results indicate that noise levels at all receptors identified fall below required nighttime L50 levels for NAC-1 designated areas. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. If additional data is required for assessing noise impacts - including monitoring and modeling - data will be provided during EIS development to satisfy the EIS scope.
703	6403	Clarification. The "camping to the north, west, and southwest," and the "resort" should be identified. Action requested: Modify text to address the item.	Text has been edited to read: "A total of 55 nearby sensitive receptors were identified including residences (single family homes or cabins) to the north and to the west (across Birch Lake), camping to the north (South Kawishiwi River Campground), west (two backcountry sites on the east shore of Birch Lake), and southwest (Birch Lake Campground), and a resort (River Point Resort & Outfitting Co.) across South Kawishiwi River to the northwest) as shown on Figure 12-2."
704	6425	Analytical gap. At Line 5370 references this section for EPMs. Section 12.2 does not specifically address back up alarms. Action requested: Add text to address back up alarms. Cross-reference to RGU Comment 626.	Text has been edited in Section 8.2.1 to read: "These sudden, infrequent impulse noises such as back up alarms on mobile equipment or material handling at the plant site and tailings management site, could displace a variety of wildlife found in and around the Project area, including mammals and birds many of which could successfully relocate into adjacent habitats. The Project would aim to reduce the impact of both sudden, infrequent impulse noises and steady or continuous to receptors outside the Project footprint by ensuring noise levels remain below the NAC-1 nighttime limit of 50 dBA. At this level, impacts would be limited to sensitive receptors proximal to the plant site, tailings management sit and the potential significance of the impacts of noise on wildlife would be reduced."
705	6448	Clarification. Aboveground crushing needs to be addressed for noise. Action requested: Add to list of bulleted items or provide explanation why not applicable.	This list of sources of noise is specific to the operation phase of the Project and no above ground crushing will occur during this stage.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
706	6469-6474 6475-6482	See above comment at Lines 6404-6400 for context. Clarification. Based on the information provided in lines 6469-6474 and section 12.2.2 (lines 6475-6482), it seems as though the modeling exercise only covered noise from mine operations, and excluded data collected regarding ambient (baseline or background) noise levels or modeled background noise. The MPCA interprets the noise standards in Minn. Rules Chapter 7030 as total standards, which would include noise from mine operations in addition to background/ambient noise. This interpretation is particularly relevant during summer months, when there are more people in the area recreating on the lake or surrounding the nearby residences. (USFS monitoring indicated higher noise levels during the summer months, presumably due to increased seasonal use of natural resources in the area.) MPCA would like to see modeling results that include background or ambient expected noise, expressed as hourly L_{10} and L_{50} values, for all sensitive receptors during all seasons. Action requested: Future discussion item. Recognizing the need to consult, modify text as appropriate to address the item.	Comment is noted. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. If additional data is required for assessing noise impacts - including monitoring and modeling - data will be provided during EIS development to satisfy the EIS scope.
707	6475	Clarification. Section 12.2.2 should indicate whether project-related changes in noise levels would be perceptible from the current condition at the three sites? Action requested: Modify text to address the item.	42 dBA is similar to a quiet library and within the range of the current ambient noise levels. In terms of minimum current ambient noise levels, it can get very quiet (< 20 dBA) regardless of site, season, or time of day. Similarly, it can get louder at all locations, day or night, winter or summer, with maximum one-hour levels reaching 50 to 60 dBA. A change of 1-2 dBA would not be perceptible to barely perceptible. Only at >5 dBA would you consistently hear an audible difference. Therefore perceptibility of Project impacts could vary based site, season, or time of day.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 13.0 Transportation
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
708	6544-6545	Clarification. Confirm that intent of sentence that there would be no growth expected without the project. Action requested: Confirm intent. RGU notes this will be a consideration in definition of conditions around no-build alternative.	Correct. Based on historical traffic volumes from MnDOT it has been assumed no growth should be applied to the existing AADT values as traffic patterns have been stable in this area over the past ten to twenty years.
709	6623	Note: RGU will need to review available traffic-related information before identifying treatment of the issue in the EIS, including potential future scope. No action requested.	Comment is noted.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 14.0 Cumulative Effects
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
710	6625-6749	Guidance. Minn. Rules part 4410.0200, subp. 11, defines cumulative impact to mean "the impact on the environment that results from incremental effects of the project in addition to other past, present, and reasonably foreseeable future projects regardless of what person undertakes the other projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time." Working from that definition, it is necessary to evaluate the impacts of projected climate change on natural sources, the built environment and human health in the vicinity of the projected facility. This should be an evaluation of impacts of ongoing and impended climatic changes resulting from the historical accumulation of GHGs in the atmosphere from all global sources, as well as from the projected and the projected accumulation of GHGs in the atmosphere, again from al projected sources. The project consultant should discuss discrete impacts from climatic changes that are addressed in the scientific literature. Because this discussion relates to the impacts of total global accumulations of GHGs in the atmosphere, rather than projected incremental accumulations resulting from proposed project, this analysis is/would be distinct from the analysis discussed above in comments at Lines 6124-6147.	Text has been added in Sections 11.3.2 and Section 14.2 to address this comment. The cumulative potential effects analysis will be focused on climate change impacts on natural sources, the built environment and human health primarily related to resiliency to these projected impacts. TMM will prepare the cumulative potential effects analysis in the EIS guided by the Council on Environmental Quality's August 1, 2016 memo titled "Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews".
711	6711	RGU note. Consideration will be given to existing dimension stone mining operations in defining potential existing and future projects whose impacts may intersect with the Project. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
712	6729	Clarification. "Area" is not defined. Define the radius used in this context and revise for consistency. Note that "area" used to name human disturbances appears to be wide, whereas "area" used to analyze project impacts is often smaller. Action requested: Provide qualifying text in summary to match treatment of geographic scale in the earlier sections.	Text has been edited to read: "Within the vicinity of the Project area (~10 miles [16 km]) there are many past human disturbances, which include:"

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Section 15.0 Other Environmental Effects
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
713	6750	Correction. Table of contents includes two additional topics (recreation and wilderness). Action requested: Provide text on these topics or correct Table of Contents.	Text has been edited. Sections have been added.
714	6750	DNR note. The EIS scope will likely include the topics of reclamation cost estimates and financial assurance. Action requested: Add placeholders for these topics to the section.	TMM notes that providing reclamation and financial assurance cost estimates during EIS preparation is premature. TMM supports recognition of these permit requirements.
715	6751-6755	Future data. What further studies are planned to document vibration affects? Are there theoretical estimates on the peak particle velocity and how it varies with depth? Action requested: Modify text to address. If a future information need, propose a future scope.	Comment is noted. Specific documentation planned to disclose potential environmental effects are typically disclosed in the scoping decision document.
716	6774	Future information. It is expected that a detailed drilling and blasting plan will provide the needed details to analyze vibration from underground blasting. Ensure that this information is planned to be provided. Action requested: Clarify and revise accordingly.	Lines 7205 - 7207 identify the need to assess vibration impacts from underground blasting activities. Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the MDNR publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. If additional data is required for assessing noise impacts - including monitoring and modeling - data will be provided during EIS development to satisfy the EIS scope.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Tables
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
717	Table 3-1	DNR notes that project locations with section, township, and range information will be verified by agency staff. No action requested.	Comment is noted.
718	Table 3-3	Definition. Clarify "cassette" as listed as a count. Action requested: At a minimum provide a definition of cassette. More broadly, consider a generic description of all items listed. Some are obvious with others less so.	Cassette was originally indicated on the table to show that the functions of the powder trucks would be accomplished with the utility cassette carrier. To avoid confusion these have been removed.
719	Table 3-3	Clarification. Under abbreviations, are tons metric or not. Include in abbreviation list with detail. Alternatively, spell out as in table 3-5 and in other places. See also tpd and tpy. Action requested: Modify text.	Ton is described in the glossary "ton: A unit of measurement equivalent to 2,000 pounds." When metric tons are used they are written as tonnes.
720	Table 3-3	Clarification. The fleet count as represented in the table is 67. What is the "extra" vehicle? Action requested: Determine if there is an inconsistency and modify accordingly.	The table incorrectly summed to 68. The table has been corrected.
721	Table 3-6	Table headings. What is the difference between industrial and commercial? Action requested: May make sense to provide a definition to go with the headings (down at the bottom of the table with abbreviations).	Commerical building areas are workplaces, offices, locker rooms, that support the operation. Industrial building areas are factory or warehouse buildings, where product is made or stored. To clarify table footer has been revised.
722	Table 3-6	Clarification. For the Commercial Building Area column, Row 1. "Inclusive of all buildings below" intends all or only those listed in plant site section? Action requested: If yes, to be more clear consider the Concentrator Building row as a sub-heading with a colon and no other text across the columns. Provide a footnote that indicating all buildings are attached.	Foonote added to table that reads: "3 Concentrator is composed of grinding mill area, flotation and dewatering area, concentrate storage and loadout area, reagent makeup area, and air services area"
723	Table 3-6	Question. Do building heights include any and all stacks? Action requested: Add notes accordingly.	Footnote has been added to table that reads: "Building heights are inclusive of any associated vertical stacks"
724	Table 3-7	Clarification. All area of the TMS would be grassland? Wouldn't there need to be some infrastructure (access road, ditching), even in a fully-reclaimed state in closure? Action requested: Modify text as appropriate with the response. For example, note that impervious surface is accounted for in the "before" condition.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on reclamation and closure.
725	Table 3-7	Question. If the plant site can be converted to wooded/forest, then why not the transmission corridor? Action requested: Please revise with this consideration in mind.	See Comment 175. The future use of the power infrastructure could require the transmission corridor to maintained to prevent tall growing vegetation from interfering with the overhead power lines.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
726	Table 3-7	Clarification. Subtracting the Project "after" from the Project area after results in a balance of 40.5 acres of impervious surface in the "after" condition. Footnote 2 states the values are based on "planned post-closure usage and reclamation types, outlined in the Project Reclamation Plan. Action requested: Provide some type of clarification in Footnote 2 tied to the closure discussions in Section 3. It appears this results from 43.6 acres of access road remaining after the project.	The 43.6 acres is based on the access road corridor being all impervious surface and leaving it in place. This is a simplification - the entire corridor would not be impervious and it assumes that future use/need is found for the road and it is approved pursuant to Minn. R. 6132.
727	Table 3-8	Guidance. A dam safety permit may be required. There are many structure that could meet the definition of a dam. Action requested: Add the potential need for a DNR dam safety permit to the table. Identify status as "if needed."	Table has been edited to include the potential need for a MDNR dam safety permit. A dam safety permit should not be required for the dry stack facility based on design however ponds used to captured and retain water that may meet the definition of dam in Minn. R., chapter 6115.
728	Table 3-8	Request height and storage volume of all such structures, including water ponds, contact water ditch embankment, etc.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including design or construction details of water management features.
729	Table 3-8	Question. Why is the COE 404 Permit status listed as "to be applied for, if needed?" Has a jurisdictional determination been requested? Action requested: Provide clarification.	No jurisdictional determination has been made. Permit need would be pending any jurisdictional determination.
730	table 3-8	Note. Any lease for use of state lands includes various provisions related to timber management, including requirements for timber damages. These are a provision of any lease that may be issued for the project. No action necessary.	Comment is noted.
731	Table 3-8	Clarification. Include Public Water Permits for new culverts or replacement culverts. Action requested: Modify text to read: Permit to Work in Public Waters (water intake and outfall; new culverts and replacement culverts).	Table has been edited to read: "Permit for Work in Public Waters (water intake, outfall, new culverts, and replacement culverts)"
732	Table 3-8	Clarification. Additional MPCA permits that should be added to this table include: "Individual NPDES/SDS or SDS permit" and "Solid Waste permit." It is likely that even without a point source discharge that at least an SDS permit will be needed for the project (ponds, treatment systems, etc. And, given the uniqueness of the DSF component to the project, MPCA will need to assess on a case-specific basis the potential need for a Solid Waste permit. The consideration of the need for these two permits will be coordinated to reduce duplicity of permits. Action requested: Modify the table to address the item.	See Comment 177 for details on NPDES/SDS permitting and Comment 276 for details on Solid Waste permitting.
733	Table 6-1	Clarification. Is "unknown" watershed the same as Unnamed Creek in text? Action requested: Modify text to clarify.	No change made. The watershed is the: MDNR Minor watershed #: 72131. It is not the same as Unnamed Creek.
734	Table 6-1	Addition. Requested action: Add column with the total watershed size.	Total watershed size has been added to the table.
735	table 6-4	Clarification. Define "government controlled stations." Action requested: Add text or table endnote with a listing of governmental units control the stations listed.	Footnote added to table: "Government controlled stations are any station that is controlled by the MDNR, USGS, or by both."
736	Table 6-5	Clarification. At Line 2929, Keeley Creek is mentioned here but not listed as stated in Table 6-5. Action requested: Modify Table 6-5 to address the item.	See Comment 402.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
737	Table 6-6	Question. How was the Mean Daily Baseflow derived on this table? Action requested: Add footnote to identify the method used for this.	Method for deriving mean daily baseflow is described on lines 2930-2937.
738	Table 6-6	Clarification. The table should list number of samples at each site. Action requested: Modify the table to address the item.	Table updated to add a footer indicating there were 1,826 mean streamflow values for each station.
739	Table 6-7	Note. Ensure that mercury is included in future analysis and modeling as appropriate. Action requested: Future discussion item.	Mercury is included in the analytical sampling of surface and groundwater (as shown in Table 6-9 through Table 6-10 and Table 6-26 through Table 6-28).
740	Table 6-7	Clarification. Waterbody names should be included with Site IDs in the table. Action requested: Modify text to address the item.	Table has been modified to include waterbody and watercourse names.
741	Table 8-7	Clarification. Why are moose not included in this table? Action requested: Include moose or provide a rationale for not including moose in the table.	Moose are not identified in the Table due to the screening methodology used - see lines 4743-4751. Specifically the screening used the Minnesota Rare Species Guide. While the moose has habitats that are within the Project area the moose is not listed because its range as defined by the MDNR does not fall within the Border Lakes Subsection. The MDNR updates these range maps based on their biotics database, but some species like the moose are not defined because the biotics database does not have any records.
742	Table 8-7	Heading. The table relies on the DNR Rare Species Guide, specifically the section on habitat, as a source of information. A footnote should be provided stating that the habitats described by the rare species guide are those commonly used by a species, and by no means do they encompass all habitats utilized. Action requested: Add footnote to address the item.	Footnote added to table that reads: "The habitats described by the MDNR Rare Species Guide are those commonly used by a species but are not inclusive of all the habitats that a species may use or be found in"
743	Table 8-7	Footnote. The statement that the project is not expected to have an impact on northern bog lemmings is overreaching. The RSG states that large tracts of peatlands should be protected, but it states that they are found elsewhere including conifer forests, black spruce swamps, shrubswamps, or similar. This statement below the table should be removed and the column "potentially present in areas of potential ground disturbance" should be changed to an "X." Action requested: Modify text to address the item or provide explanation as to why not appropriate.	Table modified to address comment.
744	Table 8-7	Clarification. The habitat descriptor for Blanding's turtles is incomplete. The RSG includes 11 habitat links, where this is by no means all encompassing. Action requested: Modify text to address the item.	No change made. Only habitats that were identified as being present - using the methodology described on lines 4743-4751 - in the Project Area are listed.
745	Table 8-8	Clarification. The column "potentially present in areas of potential ground disturbance" for Blanding's turtle should be marked with an X. Action requested: Modify table to address the item. Ensure any potential project impacts are adequately identified in other section(s) as appropriate.	Table modified to address comment.
746	Tables 11-1 thru 11-5	Advisory. Generally, conclusions indicated in Tables 11-1 through 11-5 can't be drawn until information used to complete tables has been reviewed. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
747	Table 11-2	Additional information. Preliminary project emission sources should clearly define drilling and blasting emissions for construction of raises and declines. Same table should also define those constructed features as emission sources once constructed. Action requested: Address issue.	See Comment 671. Lines 6323-6324 in Section 11.3.1 acknowledge the need to further refine emission calculations. Additional data, as outlined in Section 11.3, including emissions inventory and calculation will be provided during EIS development to satisfy the EIS scope.

Twin Metals Minnesota EIS
RGU's Review of Proposer's Initial Data Submittal
Comment Tracking Table - Figures
Provided to Twin Metals Minnesota on June 15, 2020 / Response provided from TMM to MDNR on July 24, 2020

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
748	Figure 1-1	Addition. The figure should include concentrate hauling to Duluth along the primary path. This can be added on the scale as offered. No need for an insert, just showing corridor leaving the site. Action requested: Edit figure.	Figure modified to show concentrate haulage to Duluth.
749	Figure 1-1	Addition. Identify the source data for the "Mesabi Range Mining Features" layer. Can be done in Notes. Action requested: Edit figure.	Footnote added. "This layer was received in email from the MDNR Division of Lands and Minerals. The metadata is for: Mine Features (minefeatures.shp) Originator: Minnesota Department of Natural Resources (MN DNR) Division of Lands and Minerals. " Abstract: The Range Mining Features data layer contains detailed information regarding disturbed mining areas within the Mesabi Iron Range. Use Constraints: Credit given to MN DNR Division of Lands and Minerals
750	Figure 2-1	Discussion. Need to consider environmental setting boundary from Minn. Rules Chapter 6132. No action requested. Future discussion item.	Comment is noted. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
751	Figure 3-1	Clarification. Based on the text at Line 526, it would be useful and improve clarity for figure 3-1 to include a box labeled "tailings management site" surrounding the tailings dewatering, engineered tailings backfill, and the dry stack facility. Action requested: Modify figure to improve clarity.	The tailings management site would only include the tailings dewatering plant and the dry stack facility. The tailings dewatering plant would include the infrastructure to produce the engineered tailings backfill - however it is not part of the tailings management site as it would be pumped from the tailings management site through pipelines to the underground mine for permanent storage.
752	Figure 3-1	Future figure development. Consider more diagrams/figures like these to assist with understanding, providing a more detailed focus on any given step. Action requested: Provide additional figures in next information submittal.	Please clarify the request
753	Figure 3-3	Addition. Include stormwater and non-contact water on this diagram or another. Action requested: Edit figure or add new figure.	Figure 3-3 has been revised. See Comment 71 for information concerning water definitions.
754	Figure 3-3	Recommendation. Spell out DSF for ease of understanding. Action requested: Provide full term.	Figure 3-3 has been revised.
755	Figure 3-3	Future figure development. A more in-depth water movement figure is needed. Action requested: Consult with DNR on what should be included in the next level of figure detail for the process water flow dynamic.	Project descriptions have been provided that TMM believes are adequate to scope analyses for the EIS. Project descriptions are expected to be updated during EIS development to satisfy the EIS scope. Text has been added to Section 2.0 to outline additional details that may be provided in updated project descriptions including details on water management and water definitions.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
756	Figure 3-4	Clarification. Route from Site 2 to Site 3 is not indicated as a route for the project. Note that text states that forest road 1900 only used during construction. Would there not need to be access during operations? Action requested: Respond to the query. Modify figure as appropriate.	National Forest Road 1900 will also be used during operations. Ventilation raise access is discussed in the glossary: "An existing drill road would be upgraded in order to access ventilation raise site 1 and 2. Ventilation raise site 3 would be accessed via the existing USFS road, National Forest Road 1900. A portion of National Forest Road 1900 would also be used to access the upgraded drill road," and line 418.
757	Figure 3-9	Question. Does the plant site layout extend out into the stream channel? No action requested unless explanation is available. Future discussion item.	Plant site extends approximately 30 feet past the stream. These are preliminary construction grading limits.
758	Figure 3-13	Consultation. Further understanding is needed on the undisturbed footprints of the non-contact and contact water ponds (natural?). No action requested. Future discussion item.	See lines 1442-1476 for discussion on the Non-contact Water Diversion area. Based on comment unsure what is specifically being asked but TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
759	Figure 3-13	Clarification. On the east side, how are contact and non-contact waters kept separate? Appears to be a berm/dike. Would these meet the criteria of a dam? Action requested: Clarify and revise accordingly.	Contact and non-contact waters are separated by the diversion dikes. See lines 1453-1463. See Comment 727.
760	Figure 3-13	Addition. What are the dark blue thick lines? Action requested: Define and add to legend.	Thick blue lines are ditches. Legend has been modified to add this feature.
761	Figure 3-13	Question. What is the shape of magenta (non-contact diversion area) on the east side (near pond 5)? Action requested: Respond to question.	The non-contact water diversion area is defined to encompass all necessary infrastructure and impacts that could result from non-contact water management. The non-contact water ponds on Figure 3-13 are shown as the size pond that would form from a 100-year, 24-hour storm event.
762	Figure 3-13	Clarification. Based on the text at Lines 821-823, the tailings dewatering plant seems to be a series of buildings as in Figure 3-13. Consider labeling the figure to coincide with the text or alter definitions. Action requested: Modify the figure to provide the requested clarity.	Figure has been modified to include the footprint of the tailings dewatering plant. See Lines 881-932 for additional description on the tailings dewatering plant and associated infrastructure.
763	Figure 3-13	Clarification. Fig. 3-13 does not identify all components of water management infrastructure such as the contact water ditch (as provided at Lines 880, 1099). It also shows a culvert from the dry stack facility to an area that does not have a contact water pond. On Fig 3-31, this culvert is shown between the label for "E-house Switchyard..." and the label for "Emergency Pond." Action requested: Because this text specifically summarizes the content on Figure 3-13 (the correct reference), modify figure to address the item. Action requested: Modify figure to provide clarity.	Figure has been modified to show the extent of the contact water ditches. Culverts in question are positioned to drain stormwater towards the contact water ditch.
764	Figure 3-13	Clarification. In concert with text at Lines 1452 and 1462, the non-contact ditches are not clear on Figure 3-13 (e.g., thickness correct?). Recommend add legend or label as needed. Action requested: Modify figure to provide clarity.	Legend has been modified to account for ditches. All ditches within the non-contact water area are non-contact water ditches. See lines 1442-1476. The non-contact diversion dikes intercept and divert water around the tailings management site. The non-contact water ditch is shown as a cross-section in Figure 3-20.
765	Figure 3-14	Clarification. Please elaborate on why stages 1-3 do not appear to incorporate benching construction? All other stockpiles are built in layers bottom to top. Is this not how construction is proposed for the dry stack? Action requested: Respond to question.	The dry stack facility does incorporate benching. Benching is shown on Figures 3-14 and 3-19. See lines 941-942. "The exterior side slopes of the dry stack facility would have 16 ft (5 m) wide benches at 46 ft (14 m) vertical intervals."

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
766	Figure 3-14	Clarification. Please explain why the vegetation of the dry stack is not established until stage 2 (approximately year 16 of production)? Action requested: Respond to question.	This figure does not depict reclamation - i.e. the coloring/shading does not depict reclamation. The coloring/shading only depicts the different construction stages. See lines 1007-1009. "The dry stack facility would be concurrently reclaimed throughout the Project operation phase. As portions of the slope and crest of the dry stack facility are constructed, the completed surfaces would be concurrently reclaimed with a cover. "
767	Figure 3-13 Figure 3-14	Recommendation. Consistent with text at 1413-1419, there would be benefit with development of new figures with the various stages (i.e., stages for figure 3-13 or 3-14). This would include location of interim ponds, for example. Action requested: Consider how this may be accomplished and apply if possible in next data submittal.	See Comment 244.
768	Figure 3-19 or Page 26 (933-1000)	Question. What is the proposed compact clean fill to be placed on the dry stack and where is it sourced? The text implies this is to be coarse tails. Peat is mentioned as an additive. Further detail is needed (e.g., ratio of peat and tails planned, determined by known parameters/research). Action requested: Add explanatory text to Notes.	See lines 1424 - 1425. During reclamation at the dry stack facility "Cover soil would be sourced from the reclamation material stockpile and seeded to establish grasslands." The reclamation stockpiles would be composed of stockpile of material suitable as a growth medium such as topsoil and peat for reclamation
769	Figure 3-19	Clarification. At Line 85 it is unclear what is intended by use of the term "structural zone." Action requested: Explain what this represents with the facility and modify text to clarify. Consider how might be depicted (if relevant) on Figure 3-19.	See Comment 159.
770	Figure 3-20	Clarification. Detail 3 in 411 is referred to in diagram and does not seem to be in document. Clarify what would be included on that inset. Action requested: Respond to comment.	Please clarify the request
771	Figure 4-2	Addition. Label inset map with 1854 Treaty for clarity. Action requested: Modify inset.	Figure has been modified.
772	Figure 4-3	Additional informaton. Please supply surface and mineral ownership maps. Also indicate if "control" has been obtained or is pending. Action requested: Coordinate with DNR on supplying this information.	Please clarify the deliverable required for the scoping process. TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
773	Figure 4-3	Clarification. It appears the pale gray grid represents sections under the Legal Land Survey. Why is the grid discontinuous? Action requested: Respond and modify figure as warranted.	The pale gray grid represents general ownership classes that were used to create the zoning legend.
774	Figure 4-3	Clarification. The difference between figures 4-3 and 4-4 is unclear? Private vs what type of land? Is Figure 4-3 more appropriately a land use figure than zoning? Action requested: Address and modify figure as warranted.	See lines 1880-1883. "A comprehensive map of local zoning and management areas can be found on Figure 4-3. Figure 4-4 shows private parcels of land within Lake and St. Louis Counties subject to local land or water management plans. Additionally, Figure 4-4 identifies the nearest residences, which are associated with the South Kawishiwi Association." Figure 4-4 displays only private (no state or federal) land where local zoning would be applicable.
775	Figure 4-3	Recommendation. The project boundary should be moved out of the shoreland management area wherever possible. Structures and access roads should be kept out of the shoreland management area. Action requested: Revise as necessary. May be a future discussion item.	TMM acknowledges that the RGU may identify alternatives and disclose them in the scoping decision document.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
776	Figure 4-4	Clarification. Consistent with the text at Line 1883, there are residences on the west shore of Birch Lake that are very close (appears to be less than a mile) from the project and within Residential Recreational zoning classification. Action requested: Provide inset into Figure 4-4 that should include the tailings site and private lands across the lake (west shore) from the project.	The purpose of this map is to show all Private Lands Zoning within the Project area. As these properties and their zoning is outside the Project area they are not shown. The data is part of two maps: zoning for these properties is shown on Figure 4-3 - Zoning and Land Use Map and the residences are shown in Figure 12-2 - Sensitive Receptors.
777	Figure 5-10	Query. The unconsolidated material depth seems to present a fair amount of detail for the wells depicted. Is there other data? How was the depth to bedrock determined? Action requested: Provide additional detail to figure and notes, as warranted.	Baseline data and impact assessments have been provided that TMM believes are adequate to scope analyses for the EIS. Once the RGU publishes the SEAW, and the draft and final scoping decision documents, TMM will review the required analysis and the data needs necessary to support the EIS. Additional data will be furnished during EIS development to satisfy the EIS scope.
778	Figure 5-8	Recommendation. Separate the transmission corridor from the main mine area in order to enlarge the scale and improve readability of the information on the map. Several other maps, such as 5-9, 6-19, and 6-20 would benefit from this as well. Action requested: Implement in the next data submittal.	To help with readability Figures 5-8, 5-10, 6-19, 6-21, 8-2, 8-4, and 8-6 have been modified to show the information in the "Project area north" which includes the plant site, tailings management site, underground mine area, water intake corridor, ventilation raise sites and access corridor, and access road corridor Additionally, Figures 5-9, 5-11, 6-20, 6-22, 8-3, 8-5, and 8-7 have been added to show the information in the transmission corridor.
779	Figure 6-3	Question. What are the purple areas? Include in legend. Action requested: Modify figure.	These purple areas (e.g. directly northeast of Birch Lake reservoir) are waterbodies in the aerial photo. The other lakes are PWI Basins and appear as such, however, the South Kawishiwi River is a PWI watercourse represented by a polyline and not a polygon so the aerial photo shows.
780	Figure 6-4	Clarification. Watershed names differ from figures 6-1 and 6-2. Confirm and revise if needed. Action requested: Confirm and modify as needed.	Figure 6-1 shows the USGS Hydrological Unit Code Watershed name and Figure 6-2 displays the MDNR Watershed name.
781	Figure 6-6	Data Need. Streamflow should be monitoring on Keeley Creek in order to better determine watershed impacts from the tailings basin. Action requested: Ensure addressed in Section 5.3.	See Comments 391 and 397.
782	Figure 6-8	Addition. Provide a definition for corehole. Action requested: Add definition to the notes.	See Comment 16.
783	Figure 6-8	Question. Why is the B4 label in the BMZ? Action requested: Verify and revise if needed.	Deep Bedrock HGU – B4 monitor wells are discussed starting on Line 3200. "B4 Wells – 2-inch or 5-inchstainless steel wells installed by setting a cemented surface casing into the bedrock and then coring into the bedrock to the approximate bottom of the BMZ (approximately 300 ft to 2,200 ft [91.4 m to 670.6 m] depending on location) and isolating the well in the BMZ (approximately 200 ft (61 m) of screen)."
784	Figure 6-13	Clarification. This figure needs more explanation. Action requested: Provide notes to explain what the figure is showing.	Figure is explained in the text. See lines 3409-3418.
785	Figures 6-14, 6-15 and 6-16	Future data need. Additional wells should be installed to confirm potentiometric surface within the project boundary. No action requested. Future discussion item.	See Comment 578.
786	Figure 6-19	Scale. This map needs to be zoomed in to show more details. At its current scale, smaller-sized wetlands/types are not clear. This impacts understanding potential project impacts to wetland plant and animal species. Action requested: Consider a higher resolution figure for the next data submittal.	See Comment 778.

Comment #	Line # Table # Figure #	Comment	Twin Metals Response
787	Figure 8-5	Clarification. What are the orange shaded areas on the map? Does this mean the polygon represents the habitat appropriate to the NHIS feature? Action requested: Provide response and include in legend as appropriate.	Added footnote. The orange polygon shows the approximate location of the Eastern Heather Vole. This observation was made in 1940 without the aid of GPS and represents the likely area that it was documented.
788	Figure 8-5	Presentation. The locations of the NHIS species occurrences should be presented more clearly if possible. This way they can be more easily compared to the landcover types in the figures above 8-5. Also, species occurrences in the areas surrounding the project site should be included as well. Vertebrate animals are not stationary, and home ranges could very likely include areas both within and outside the proposed project area. Action requested: Modify figure to address the item.	NHIS species locations outside the Project area are included. Due to data license restrictions, mapping has been done in two ways. Outside the Project area locations of the sensitive species are shown, but species are not identified by name. Within the Project area species are identified however the location is obscured.
789	Figure 8-7	Addition. Indicate on map area over which survey was conducted. Presume it would depict areas that were surveyed but no rice found (or lower density than 1). Action requested: Modify figure.	Figure has been modified.
790	Figure 10-2	Question. Should the viewshed location in figure 10-1 (across river from dry stack) also be included on this figure? Action requested: Consider the question and modify as appropriate.	The visualization simulation point is shown in Figure 10-1 represented by the camera on the west side of Birch Lake reservoir. Figure 10-2 shows the different viewshed analysis locations. These analyses are distinct and should be kept separate.
791	Figure 12-1	Clarification. River Point Resort is on the northern shore (near "s" in South Kawishiwi River; see also figure 2-2 R13, R14, and R15). Confirm location of "River Point" noise measurement location. Action requested: Verify.	Figure has been corrected.
792	Figure 12-2	Addition. Include all mine features on this map. Action requested: Modify figure.	Figure has been modified.
793	Figure 13-1	Requirement. Public Waters Work Permits will be required for any new or modifications of existing public waters crossings along the new Tomahawk Road. Include on figure and ensure discussed in text. Action requested: Modify figure.	The need for a Public Waters Work Permit for existing public waters crossings along the new Tomahawk Road is unknown at this point and TMM looks forward to continued engagement during the EIS development and will be responsive to inquiries and requests.
794	Figure 13-1	Confirmation. Does this figure represents roads for all time periods, including construction, operations, and closure. Action requested: Provide confirmation.	The figure shows roads for all time periods.
795	New	A map showing prevailing wind speeds and directions, and peak wind speeds and direction, would be informative for reviewers. Action requested: Add a new figure.	Figure 11-1 has been added. Additional text has been added to Section 11.1 that reads: "A wind rose has been included in Figure 11-1. The wind rose shows prevailing wind directions, based on data from Hibbing, Minnesota (Station #94931), are generally from a northwesterly direction. Maximum wind speeds are associated with northwesterly wind directions and the average wind speed for the period of record (01-01-2012 through 12-31-2016) was 7.5 miles per hour (3.37 meters per second)."