NorthMet PSDEIS - DRAFT Chapter 5 Water Comments - 08/03/2012
Commenter Name/Agency: MDNR/USACE/USFS

Comment #	Line #	Comments	Reviewer
1	General Comments	Need to edit for consistent use of tenses (past/present/future).	Erik Carlson- MDNR
2	006	Under prediction methods consider a section on Model Calibration and Corroboration. Also this section needs to be clearer on what the compliance points are at both the mine and plant site for ground and surface waters that need to be met for all regulated solutes. Now the discussion of compliance points is under wild rice. Wild Rice should be a section that follows a discussion of standards and compliance points.	Erik Carlson- MDNR
3	051	Are we using "evaluation pathways" and "flow paths" interchangeably? If so, I suggest choosing one term. I recommend flow path.	Erik Carlson- MDNR
4	076	Consider: "...unconsolidated glacial alluvium *(i.e. or drift)* , and tailings." Double check that glossary has a definition for alluvium; be sure it refers to drift.	Erik Carlson- MDNR
5	077	Consider: "A solute transport model then utilizes the hydraulic predictions from the surface water *(i.e., XP-SWMM)* and groundwater *(i.e., MODFLOW)* models in conjunction with pollutant-release rates from various media rates." [I only recommend doing this repetition the one time...just to cement the connection between "surface = XP-SWMM" and "gw = MODFLOW."]	Bill Johnson- MDNR
6	080	"...developed using GoldSim, a dynamic system model." Is there any value to the layperson in noting that GoldSim is a type of model platform too?	Bill Johnson- MDNR
7	081	NOTE: "...draws from the *latest* versions of the…" Need to track use of the term "latest" between now and final document approved for distribution. Typically, for the SDEIS we are mostly operating from final, approved base documents from the proposer.	Bill Johnson- MDNR
8	085	Consider: "The estimate of overall uncertainy in predicted stream flows reflects uncertainty in the fraction of snow and rain that runs off to surface water tied with variability in monthly precipitation." This is the same language in active than passive tense. Needs to be checked to ensure no new meaning is added.	Bill Johnson- MDNR
9	089	Was a sensitivity analysis completed? Specifically, is it known how sensitive the model is to changes in the hydrualic conductivity for the various layers?	Greta Schmalle, USACE
10	089	"It is calibrated *mainly* by adjusting estimates…" Do we need the "mainly?"	Bill Johnson- MDNR
11	092	LINES 92-100. Very good.	Bill Johnson- MDNR
12	103	Edit; should read: "…*is* propagated…" Consider another way to say this. Maybe: "...can be run in probabilistic mode, which allows uncertainty in model parameters to be calculated as probability distributions, or confidence intervals, on predictions;..."	Bill Johnson- MDNR
13	115	Note: "developer's" or "developers'"; possessive case.	Bill Johnson- MDNR
14	118	Consider: "remains actively supported by the developers, *particularly to answer questions and correct code errors.* "	Bill Johnson- MDNR
15	120	Use of "commonly" here means that we can back this up. Not saying not to offer this, just should have a basis in the record somewhere (beyond any characterization the applicant might make to this effect).	Bill Johnson- MDNR
16	127	I went back to the Impact Criteria IAP to see the proposed SDEIS IC text for hydrology. Based on that language, how does this work: "Based on modeling, the deviation from existing conditions in the mean values of the hydrologic parameters is the basis of determining the degree of impact to stream ecology. Significance of any project-related changes is assessed qualitatively by water management specialists familar with the hydrologic conditions in the NorthMet Project area." This would replace Lines 127-129 in the current text.	Bill Johnson- MDNR
17	130	Strike USGS, already mentioned they developed this model	Erik Carlson- MDNR
18	133	Is grid size constant throughout the MODFLOW model?	Greta Schmalle, USACE
19	140	Usage. Do not capitalize the "t" in "The" after using "1)" and "2)" in the series. Apply the rule from here on out.	Bill Johnson- MDNR
20	178	Are there locations in the model where error was much greater than 15%? Is the model warped, in that there is small error in some regions but outer regions have high error?	Greta Schmalle, USACE
21	185	Low permeability may be misleading. The model assumes a 100% capture efficiency for the containment system.	Erik Carlson- MDNR
22	186	The AWMP proposed a containment system that completely encircles the Cat 1 stockpile	Erik Carlson- MDNR

NorthMet PSDEIS - DRAFT Chapter 5 Water Comments - 08/03/2012
Commenter Name/Agency: MDNR/USACE/USFS

Comment #	Line #	Comments	Reviewer
23	198	Text edit: drop "But." Have two sentences that read: "For the Plant Site, the MODFLOW model includes bedrock, alluvium, and the interaction of the alluvium with the Embarrass River. *The model* also simulates water flow in the existing LTVSMC tailings and the tailings from the NorthMet Project.	Bill Johnson- MDNR
24	210	Consider: "...(i.e., oxidizing zones in the tailings *projected to leach* sulfate)..."	Bill Johnson- MDNR
25	214	Does numerical instability occur for any other cases (e.g. too large of a time step)?	Greta Schmalle, USACE
26	215	I think there are two sentences intended here: "...flow of water in the unsaturated *zones. The* selected tool,…"	Bill Johnson- MDNR
27	218	I went to Wikipedia (yikes!) and saw this definition for "numerical instability": "...An opposite phenomenon is [numerical] instability. Typically, algorithms would approach the right solution in the limit, if there were no round-off or truncation errors, but depending on the specific computational method, errors can be magnified, instead of damped, causing the error to grow exponentially." Is it too much of a stretch to try: "...and avoids some of the *potential computational errors that can* arise in the standard versions of MODFLOW when layers alternate between wet and dry conditions."	Bill Johnson- MDNR
28	223	Consider: "...nine years between 2002 (*when* placement of LTVSMC tailings ceased in 2001) and 2011."	Bill Johnson- MDNR
29	226	Why was the vertical hydraulic conductivity of the alluvium allowed to change at the plant site but not the mine site?	Greta Schmalle, USACE
30	229	Can we say: "...3) recharge from *precipitation* ;…"	Bill Johnson- MDNR
31	230	Consider: "...and 5) *simulated conductance of a known seep observed* on the south edge of the Tailings Basin." Not sure whether citing the "drain" mechanism here is too much information. Fine either way.	Bill Johnson- MDNR
32	241	See comment 178	Greta Schmalle, USACE
33	241	"...(target was 15%)." Period at end of sentence.	Bill Johnson- MDNR
34	263	Consider for this paragraph (from Lines 263-278) breaking out the text into bullets for the three categories (dam, beach, pond). This may make it a little easier to follow.	Bill Johnson- MDNR
35	265	The sentence beginning with "The material" is unclear as written.	Greta Schmalle, USACE
36	265	Second sentence in paragraph is difficult to understand. BJ concur. Maybe it's meant to read: "The material under the pond was further modified by lower*ing* its assumed conductivity with increasing burial depth to…"	Erik Carlson- MDNR; Bill Johnson- MDNR
37	267	Consider: "Estimated infiltration rates into the tailings exposed to the air (i.e., the dams and beaches) *are based on* the plan to amend these surfaces…"	Bill Johnson- MDNR
38	272	"is also is" I think should be "it also is"	Erik Carlson- MDNR
39	278	beaches, dam and pond bottom	Erik Carlson- MDNR
40	280	change "will be used" to "was used"	Erik Carlson- MDNR
41	281	"was" not "is", generally need to get past/present/future tense more consistent with the idea that this document is being submitted after all the modeling is done	Erik Carlson- MDNR
42	292	Need a citation for this statement or further explanation. BJ concur. Consider identifying the conductivity rates in the model, which are based on drill cores and/or literature.	Erik Carlson- MDNR; Bill Johnson- MDNR
43	296	Consider: "...estimate the change in Partridge River streamflow *at each of the seven evaluation points for 23 flow parameters (described in next section)* ." Just a reordering.	Bill Johnson- MDNR
44	299	Consider ending paragraph on this line. See next.	Bill Johnson- MDNR
45	300	Use this sentence, and the next one, to start the next paragraph. Just join text at current Line 303 to these for new paragraph.	Bill Johnson- MDNR
46	310	"Suggested" is the wrong word. Use "stated"	Erik Carlson- MDNR
47	332	Consider: "...lowest expected flows, *which is when* all flow to the rivers is assumed…"	Bill Johnson- MDNR
48	333	Consider: "*Because* groundwater is the primary transport mechanism…"	Bill Johnson- MDNR
49	346	Should a valence be provided? "...then the NorthMet Project is predicted to cause an *adverse* environmental consequence." …Or, even to read: "...then the NorthMet Project is predicted to cause a *significant* environmental consequence." Not recommending the change, but a qualifier under the proposed situation (exceeding a standard) may be appropriate.	Bill Johnson- MDNR

NorthMet PSDEIS - DRAFT Chapter 5 Water Comments - 08/03/2012
Commenter Name/Agency: MDNR/USACE/USFS

Comment #	Line #	Comments	Reviewer
50	352	Substitute "substantially" for "significantly."	Bill Johnson- MDNR
51	356	Consider: "...exceed water quality thresholds *during facility operation, closure, or post-closure conditions* ."	Bill Johnson- MDNR
52	361	Consider using "*changing* " instead of "*evolving* ."	Bill Johnson- MDNR
53	401	Consider: "...and anions (i.e., negative ions)…"	Bill Johnson- MDNR
54	412	of-the-shelf	Erik Carlson- MDNR
55	414	How were the distributions chosen for each parameter?	Greta Schmalle, USACE
56	418	I would flip this around to say "Probabalistic model results that by their nature incorporate uncertainty help one understand possible environmental effects better than deterministic results alone."	Erik Carlson- MDNR
57	444	delete "resources" and insert "quality" ; water resources in my mind includes hydrology which is a different animal that what is discussed here	Erik Carlson- MDNR
58	478	The <u>magnitude of</u> deviation from existing conditions…	Erik Carlson- MDNR
59	479	degree of <u>potential</u> impact…. note: *potential* should be used whenever we are talking about predicted effects	Erik Carlson- MDNR
60	496	This acronym should be defined above	Erik Carlson- MDNR
61	545	FDL WQ standards could be mentioned here. The USACE asked for interpretation of their standards. I suggest disclosing what we have with appropriate context.	Erik Carlson- MDNR
62	579	The west pit overflow passive treatment system is designed to retain water and then release it so the effluent does not reach a water body used for the production of wild rice prior to August 31. This indicates to me that they will indeed request a seasonal application.	Erik Carlson- MDNR
63	587	It should be stated that meeting the sulfate standard is the most difficult and by meeting this standard the tailings basin facility PolyMet should meet all other standards (to be confirmed), this is why the permitability of the tailings basin is focused on sulfate.	Erik Carlson- MDNR
64	588	I believe that the term "permitability" is working its way into the professional lingo. No need to hyphenate in my opinion.	Bill Johnson- MDNR
65	595	This text needs updating now that PolyMet would be adopting the Cliffs Erie NPDES permit if this project proceeds.	Erik Carlson- MDNR
66	599	All GW quality standards?	Erik Carlson- MDNR
67	600	What does it mean that all applicable surface water quality standards be met at the facility.	Erik Carlson- MDNR
68	607	This is a new sentence since completion of the Impact Criteria IAP process. MPCA's determinations (as contained in the memos) are the driver for the tailings basin IC. Reference to USEPA not necessary.	Bill Johnson- MDNR
69	630	I take this to mean the state has a methylmercury standard but it is not applicable in this case.	Erik Carlson- MDNR
70	632	…has <u>a</u> fish tissue	Erik Carlson- MDNR
71	633	This sentence structure makes it seem that the 0.2 was amended in 2008 not the result of the amendment	Erik Carlson- MDNR
72	639	This standard was introduced on line 632-633, it sounds repetitive here.	Erik Carlson- MDNR
73	646	Need a brief explanation of why this attempt is not made.	Erik Carlson- MDNR
74	655	in the parlance of this EIS, mitigation should be replaced with engineering controls	Erik Carlson- MDNR
75	660	The existing conditions and no-action model at the plant site are different	Erik Carlson- MDNR
76	667	Suggest "and whether the NorthMet Project can adapt their engineering controls to make them more effective or adopt contingency mitigation that would prevent…"	Erik Carlson- MDNR
77	672	This paragraph is mostly about inputs, setting up the model for outputs. I think it should be integreated into section 5.2.2.1	MDNR

NorthMet PSDEIS - DRAFT Chapter 5 Water Comments - 08/03/2012
Commenter Name/Agency: MDNR/USACE/USFS

Comment #	Line #	Comments	Reviewer
78	676	From version 4 of the Mine Site Calibration doc. "Additional regional data available from the US Geological Survey (USGS) and Minnesota Pollution Control Agency (MPCA) were not included in developing the groundwater distributions for input in the No Action model due to the addition of new data collected at the Mine Site, as directed by the Co-lead Agencies."	Erik Carlson- MDNR
79	681	Collection of background water quality is not a "outputs" discussion	Erik Carlson- MDNR
80	691	The No Action alternative as I understand it includes Cliffs Eries meeting NPDES permit requirements at the plant site. This is different from existing conditions. From Water Modeling Data Package Plant Site v7 "The No Action Alternative for the Plant Site includes existing conditions and compliance measures currently required as part of the Cliffs Erie Consent Decree for the Tailings Basin and Area 5. Specifically, it assumes the following: • Seep SD026 (the headwaters of Knox/Second Creek) is captured and returned to the Tailings Basin • Seeps SD004 and SD006 are captured and returned to the Tailings Basin • No changes to the Pit 5NW discharge (SD033) from current conditions"	Erik Carlson- MDNR
81	694	This text to me seems to be more about prediction methods than outputs. I have the same comment for essentially all the paragraphs in this section. I think they are out of place and potentially redundant with earlier text.	Erik Carlson- MDNR
82	699	Modeling is being used to go out 500+ years. Also change "Point of Evaluation" to evaluation point for consistency with rest of section.	Erik Carlson- MDNR
83	725	I'm unlcear why calibration is in this section. Wouldn't this be best up front? Calibration to existing conditions is model set up in my mind along with establishing agreed upon inputs and assumptions and conceptual model.	Erik Carlson- MDNR
84	763	"would not be altered" NOT "will not be altered"	
85	764	change to "would not"	Erik Carlson- MDNR
86	771	Why is "Public Water" capitalized?????? Please fix throughout.	Tom Hale- USFS
87	784	784-785: Not sure we can say this for hay lake?	Tom Hale- USFS
88	826	would NOT will… this seems to occur a lot in this section. I suggest a global search for "will" and evaluate each occurrence. I know it seems trivial, but it is predecisional language that needs to be avoided.	Tom Hale- USFS
89	832	would NOT will…	Tom Hale- USFS
90	855	would NOT will…	Tom Hale- USFS
91	865	would NOT will…	Tom Hale- USFS
92	Figure 5.2.2-2	ERM has been using MDNR no MnDNR as in figure. "Key has "Existing Railroad" but this feature is not apparent on the figure. It would be nice to see a figure with all the compliance points	Erik Carlson- MDNR