Attachment A: Stibnite Gold Project Water Resources SDEIS Compilation Table
A-1:Water Resources

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quantity	1	3-102	3.8.2	1	PRII	"*This is typically achieved by pumping from wells installed around the pit* ***or*** *sumps within the pit.* " Both are typically needed. Please replace "or" with "and".
Surface Water and Groundwater Quantity	2	3-102	3.8.2	3	PRII	"*Note that the SGP might still alter streamflow conditions (including access roads, utilities, and off-site facilities) outside the analysis area; however, such alterations are expected to be minor based on regulatory requirements for these alterations and the application of best management practices.* " Changes in streamflow conditions would be limited to a change in the hydraulics at road crossing culverts only. No streamflow depletions would occur. Please consider deleting this sentence.
Surface Water and Groundwater Quantity	3	3-105	3.8.4.1	6	PRII	"*Low elevation snowpack usually melts quickly during the spring, but high elevation* ***snow pact*** *can persist into June or later* " Please replace "snow pact" with "snowpack".
Surface Water and Groundwater Quantity	4	3-109	3.8.4.2	5	PRII	"*The creek flows in the direction of, and then adjacent to, Stibnite Road (CR 50-412) in a channel around the Bradley Northwest mine dump complex, disappears and then reemerges among historical mine development rock piles, and flows through* ***a culvert*** *before entering the East Fork SFSR.* " Please update in the FEIS to reflect ASAOC diversion, which has the same surface course and outfall but eliminates it subbing out in the dump. Also, Hennessy Creek flows through 2 culverts before entering East Fork SFSR. Please replace "a culvert" with "two culverts".
Surface Water and Groundwater Quantity	5	3-111	3.8.4.2	3	PRII	"T*hese values represent about 20 percent of the estimated* ***annual precipitation for the SGP area*** *, which is equal to 32.19 inches* " Please define if "annual precipitation" is the MAP or the valley precipitation.

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Surface Water and Groundwater Quantity	6	3-113	3.8.4.2	-	PRII	Section 3 describes existing conditions. For Figure 3.8-3, please delete information related to modeling and action alternatives.
Surface Water and Groundwater Quantity	7	3-116	3.8.4.2	-	PRII	In Table 3.8-5, please add significant digits to the numbers for YP-SR-6 (8.00), YP-T-11 (3.30), YP-T-40 (0.80 and 2.80), YP-T-43 (49.00), and YP-T-48 (1.0) for consistency
Surface Water and Groundwater Quantity	8	3-118	3.8.4.2	2	PRII	"*Mean discharge measured at the sites ranged from 0.0023 cfs at YP-AS-7 in the Meadow Creek drainage to 0.25 cfs at* ***YP-SEBS-2*** *in the East Fork SFSR drainage.* " YP-SEBS-2 is the re-emergence of Midnight Creek and should not be included as a seep or spring. Please replace "0.25 cfs at YP-SEBS-2 in the East Fork SFSR drainage" with "0.21 cfs at YP-S-10 in the Meadow Creek drainage"
Surface Water and Groundwater Quantity	9	3-119	3.8.4.2	-	PRII	In Table 3.8-6, please add significant digits to the numbers for YP-AS-4 (0.30 and 0.10) for consistency
Surface Water and Groundwater Quantity	10	3-121	3.8.4.2	3	PRII	"*It is not necessary to record a water right for the random diversion of water for fire suppression purposes.* " Please add "or for the purpose of capture and use of diffuse water runoff."
Surface Water and Groundwater Quantity	11	3-122	3.8.4.2	1	PRII	"*Water Right 77-14190 is subordinate to* ***future non-domestic, commercial, municipal, and industrial uses and future non-domestic, commercial, municipal, and industrial development*** *up to 8.2 cfs.* " Please replace "future non-domestic, commercial, municipal, and industrial uses and future non-domestic, commercial, municipal, and industrial development" with "all future domestic, commercial, municipal and industrial (DCMI) uses and future non-DCMI"

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Surface Water and Groundwater Quantity	12	3-122	3.8.4.2	-	PRII	Table 3.8-8 - please identify the waterway this water right applies to. Please add "EFSFSR at SFSR" to the end of: "*State of Idaho, IDWR Water Right No. 77-14190 Minimum Stream Flow* "
Surface Water and Groundwater Quantity	13	3-123	3.8.4.2	4	PRII	"*A discharge to Meadow Creek would be located adjacent to the TSF Buttress and discharges to East Fork SFSR would be located west of the Stibnite Worker Housing Facility and west of the Process Plant* " Please indicate which discharges are sanitary (Stibnite Worker Housing Facility) and which would be industrial (other two).
Surface Water and Groundwater Quantity	14	3-123	3.8.4.3	5	PRII	"*In select locations, historical mine workings, such as adits, that penetrate the* ***bedrock units act to promote groundwater flow in bedrock*** " - Consider revising to reflect that they don't really "promote...flow in bedrock"; rather, they act as drains for GW and discharge it to the surface
Surface Water and Groundwater Quantity	15	3-124	3.8.4.3	2	PRII	"*Most bedrock wells in the analysis area are screened within the batholith unit, with wells in the northeastern part of the project screened within the metasedimentary units* " Please clarify that this is because of lithologic units are present in those areas, i.e., that the batholith occurs everywhere but the NE corner also includes a metasedimentary package of rocks.
Surface Water and Groundwater Quantity	16	3-124	3.8.4.3	2	PRII	"*Tertiary intrusive rock units are interspersed within the other bedrock lithologies and are* ***generally not specifically targeted*** *by monitoring well completions due to their generally low permeability and small volumetric presence compared to the batholith and metasedimentary units.* " Not targeted, but are intersected. Please replace "**targeted**" with "**intersected**"
Surface Water and Groundwater Quantity	17	3-128	3.8.4.3	Table 3.8-9	PRII	For the Gestrin well, the Screened interval "To" depth is 109, not 209. Please correct.

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Surface Water and Groundwater Quantity	18	3-130	3.8.4.3	Table 3.8-9	PRII	In footnotes, may want to clarify that UTM is in meters, as this may not widely known to the public.
Surface Water and Groundwater Quantity	19	3-131	3.8.4.3	1	PRII	"*Figure 3.8-10 shows water table elevation contours for the analysis area computed by the groundwater model calibrated to water levels* " Model also calibrated to streamflow yield. Please edit this sentence to say "…groundwater model calibrated to water levels **and streamflow yield**."
Surface Water and Groundwater Quantity	20	3-134	3.8.4.3	3	PRII	"*Overall, the results reported by the investigations (from 1989 to 2013) for the alluvial groundwater system indicate hydraulic conductivity ranging from 1 to 100 feet/day, with an average of approximately 10 feet/day* " Please clarify if this is geometric mean.
Surface Water and Groundwater Quantity	21	3-134	3.8.4.3	6	PRII	"*A long-term pumping test has not been completed in the deeper bedrock portions of the Idaho Batholith rocks in the Analysis Area as zones of groundwater inflow at depth sufficient to sustain a multi-day constant rate test have not been typically encountered in drillholes* " - Consider revising: This description discounts the Hangar Flats pumping test. That hole was drilled to the specific purpose of testing deeper bedrock in the IB and it could not because there was no water. "not typically encountered" understates this.
Surface Water and Groundwater Quantity	22	3-136	3.8.4.3	2	PRII	"*Anticipated project groundwater supply areas would be in the vicinity of Hangar Flats pit area south of the currently authorized points of diversion (77-7141 and 77-7285) plus in the vicinity of the Yellow Pine pit* " - Please clarify that these are industrial supply wells - the future worker housing will have its own well near that facility, along EFSF above MC
Surface Water and Groundwater Quantity	23	3-136	3.8.4.3	2	PRII	"*The supply well locations represented on Figure 3.8-12 are preliminary in that specific locations for have not been finalized and will depend on engineering site evaluations to finalize well designs.* " Missing the word “wells" between "for…have".

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Surface Water and Groundwater Quantity	24	3-139	3.8.4.3	1	PRII	"*There would also be groundwater production from a well located near the worker housing facility.* " Should also be mentioned above. Also the reader would benefit from some explanation as to the distinction between industrial supply, dewatering, and dual-use wells.
Surface Water and Groundwater Quantity	25	4-142	4.8.2.1	8	PRII	"*Under the No Action Alternative, there would be no large-scale mine operations by Perpetua, and water resources would continue to be impacted by currently permitted Perpetua drilling activities for exploration* ". - Stating that water resources would be "impacted" by exploration drilling activities is misleading and alludes to negative impacts. Activities approved by the exploration drilling EA assume a finding of no significant impact. Also, this passage does not acknowledge that these uses would occur in accordance with PRII's existing water rights. Please revise this to: "Under the No Action Alternative, MMP would not proceed and Perpetua Resources would not obtain a permit to acquire additional water rights. Perpetua Resources could continue to conduct approved exploration drilling activities and exercise their current water rights." This appropriately queues up the minimal impacts that follow.
Surface Water and Groundwater Quantity	26	4-143	4.8.2.1	1	PRII	"*Phase 1 of this agreement includes ...This work is planned to occur between 2022 and 2024 .* " - The information in this passage is provided elsewhere, is more pertinent to water quality than quantity, and restating here is unnecessary and risks inconsistency with other locations in the document. Suggest replacing with a reference to the description of ASAOC activities in Section 1.3 and maintaining the last sentence, "*These activities are not....*" .
Surface Water and Groundwater Quantity	27	4-143	4.8.2.2	3	PRII	"*The SWWB evaluates operational consumptive use (e.g., mill water supply, dust control), TSF water volumes, and contact water volumes generated over the span of the project from construction through closure (Figure 4.8-2).* " - There is no mention of water treatment here. Suggest it is applicable in the context of water quantity through storage of contact water and treatment capacity.

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Surface Water and Groundwater Quantity	28	4-143	4.8.2.2	4	PRII	"*The SHSM also forecasts the groundwater drawdown,* and *effects on groundwater discharge to surface water and* the West End *pit lake* ~~*recharge associated with the dewatering and water supply diversions*~~ *(Brown and Caldwell 2021e).* " - Suggest the changes as indicated to clarify this sentence. "pit lake recharge" (a GW discharge) isn't a good term due to ready confusion with GW recharge.
Surface Water and Groundwater Quantity	29	4-143	4.8.2.2	4	PRII	"*Both the SWWB and SHSM provide input to the water chemistry and water temperature models described in the companion SGP Water Qualit y Specialist Report (Forest Service 2022f)* ." This sentence is inapplicable to a Water Quantity section. Suggest removing.
Surface Water and Groundwater Quantity	30	4-144	4.8.2.2	6	PRII	"*Properties of the East Fork SFSR tunnel design include:* " - Please include mention of the fishway for completeness. It is a very substantial element of the EFSFSR tunnel.
Surface Water and Groundwater Quantity	31	4-144	4.8.2.2	6	PRII	" *rock-cut, conrete-lined tunnel 15 feet wide by 15 feet high* ," - Please correct: Shotcrete and concrete are not the same product; the EFSFSR tunnel will be lined with shotcrete, steel sets, and rock bolts in various measures depending on local rock quality, but NOT concrete
Surface Water and Groundwater Quantity	32	4-148	4.8.2.2	Table 4.8-1	PRII	For Fiddle Creek row, "pipeline" should be replaced with "culvert"
Surface Water and Groundwater Quantity	33	4-148	4.8.2.2	Table 4.8-1	PRII	For Meadow Creek row: Meadow Creek also has low flow pipes during operations and into closure. It would be good to highlight because these mitigate stream temps and also it is mentioned above. Please revise.
Surface Water and Groundwater Quantity	34	4-149	4.8.2.2	2	PRII	"*The effects of stream diversions on water quantity would be moderate, long-term , and localized.* " - Please clarify how this impact is quantified or strike; there is nothing in the preceding discussion that indicates impacts to water quantity due to stream diversions.

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Surface Water and Groundwater Quantity	35	4-150	4.8.2.2	Table 4.8-2	PRII	Footnote N/A should be not applicable, and it would be helpful to explain that they do not have embankments but rather are excavated in the ground.
Surface Water and Groundwater Quantity	36	4-150	4.8.2.2	4	PRII	"*Capture of contact water for consumptive use would reduce the volume of runoff and hence, stream flow by between 0 and 1,600 gpm with typical average capture rates of approximately 800 gpm during the first 6 years of processing as the site water inventory is built (Figure 4.8-3)* " Please correct, passage mixes volume with a rate. Moreover, these numbers are incorrect and conflate contact water storage with TSF inventory building for mill startup, and greatly overstate the rate and continuity of streamflow impact associated with contact water capture. Plus they presume a 1:1 ratio of contact water to streamflow. Contact water is generated from mine facilities that produce runoff at higher rates than wildlands. That contact water was destined for recharge or ET, not streamflow that same day. Please clarify (and correct) the source of the flowrates.
Surface Water and Groundwater Quantity	37	4-150	4.8.2.2	5	PRII	"*Contact water that is not used consumptively would be routed to the water treatment plant to achieve a water chemistry suitable for discharge to surface water in accordance with Idaho IPDES permit requirements* " - For completeness, water treatment and discharge rates should be noted here as an offset to the depletion noted in the contact water storage.
Surface Water and Groundwater Quantity	38	4-151	4.8.2.2	2	PRII	*"In addition,* while much of the the East Fork SFSR *is not below the local water table,* some sections of *the East Fork SFSR tunnel* may periodically ~~*would*~~ *intercept inflows of groundwater* ~~*in its vicinity*~~ ." Suggest modifying this sentence as presented to increase clarity.

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Surface Water and Groundwater Quantity	39	4-151	4.8.2.2	2	PRII	"*Water demands for ore processing would necessitate the installation of production wells and a surface water diversion from the East Fork SFSR, in addition to the dewatering system* ". Please insert "**contact water that includes** the dewatering system" to clarify this sentence.
Surface Water and Groundwater Quantity	40	4-151	4.8.2.2	4	PRII	"*A detailed explanation of the conceptual hydrogeologic model, modeling approach and setup, steady-state and transient calibration…* " - There is no "steady-state" calibration. Delete "steady-state"
Surface Water and Groundwater Quantity	41	4-151	4.8.2.2	6	PRII	"No *flow conditions...* " - Add hyphen to no-flow to clarify appropriate meaning.
Surface Water and Groundwater Quantity	42	4-152	4.8.2.2	3	PRII	"*Model calibration was accomplished using a process that included simulation of pre-mining steady state conditions and then transient conditions associated with the pumping tests* ." - Delete 'steady state'.
Surface Water and Groundwater Quantity	43	4-152	4.8.2.2	3	PRII	"*…the hydraulic conductivity values to vary within the range of the aquifer test results for each unit..* " - Should also discuss that the MWB and SHSM were calibrated together. MWB included soil storage parameters (thickness, FC, WP).
Surface Water and Groundwater Quantity	44	4-152	4.8.2.2	4	PRII	"...*dewatering requirements to achieve dry mining conditions …*" - Dewatering is also important/more important for pit wall stability. Please revise.
Surface Water and Groundwater Quantity	45	4-153	4.8.2.2	2,3	PRII	Paragraphs 2 and 3 are repeated paragraphs from above. Please revise.
Surface Water and Groundwater Quantity	46	4-153	4.8.2.2	5	PRII	"*Predicted dewatering rates and underdrain flows were combined with estimated volumes of mine- impacted waters from the SWWB to forecast the volume requirements for water treatment during operations and closure.* " - Incorrect. Underdrain water was assumed to be discharged without requiring treatment in the SWWB and SHSM models, based on predicted water quality assumed to likely to meet IPDES permit limits. Please revise.

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Surface Water and Groundwater Quantity	47	4-153	4.8.2.2	5	PRII	"*These volumes ranged from 2,000 gpm during the years of highest dewatering production down to 150 gpm …*" - Please clarify that "these volumes" refers to the water treatment volumes. Also, predicted treatment volume goes to zero gpm many months, not just down to 150 gpm.
Surface Water and Groundwater Quantity	48	4-153	4.8.2.2	5	PRII	"*…range between the 5th and 95th percentiles of meteoric inputs …*" - The reported 5th-95th stats are on the outputs (treatment, storage volume, etc.) not the meteoric inputs. Please revise.
Surface Water and Groundwater Quantity	49	4-158	4.8.2.2	5	PRII	"*Predicted flows averaging approximately 1,400 gpm would reduce to approximately 1,200 gpm in response …*" Please clarify what these flows represent (e.g. average, max, annual)
Surface Water and Groundwater Quantity	50	4-158	4.8.2.2	5	PRII	"*Groundwater levels away from the pit dewatering focus areas would observe measurable reductions in water levels constituting a minor or moderate effect while groundwater levels in the dewatering focus areas would observe drawdown of several hundred feet, constituting a major effect* " - Please provide context for the reader here as to how these assessments are made. Active dewatering only lasts single-digit years and rebound similarly only a few years after max extent at YP and HF.
Surface Water and Groundwater Quantity	51	4-159	4.8.2.2	5	PRII	"*Away from the TSF area, groundwater levels would rebound during the post closure period, with most recovery occurring within 3 years following the cessation of groundwater pumping …*" - Please clarify that pumping of YP and HF stops long before overall site closure; this sentence alludes to it occurring in post-closure.
Surface Water and Groundwater Quantity	52	4-160	4.8.2.2	Figures 4.8-8 and 4.8-9	PRII	Please provide context for these figures in light of their titles; The apparent persistent and large drawdowns at YP and HF are entirely due to topographic changes not lingering effects of dewatering. Please revise.

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Surface Water and Groundwater Quantity	53	4-162	4.8.2.2	1	PRII	"*Impacts to Groundwater Dependent Ecosystems* " Section 4.8 Surface and Groundwater Quantity and Section 4.11 Wetlands and Riparian Resources both use groundwater drawdown as an important part of impact characterization. Section 4.8 refers to streams and wetlands and groundwater dependent ecosystems (GEDs) (Impacts to Groundwater Dependent Ecosystems) and Section 4.11 (Alteration of Wetlands and Riparian Areas Due to Changes in Water Balance) does not use this terminology at all, and only addresses wetlands, and not streams. The part of Section 4.11 that addresses groundwater drawdown effects on wetlands does not specifically reference Impacts to Groundwater Dependent Ecosystems. As a result, there are two sections that analyze the same thing, but are independent and present things differently. The analysis of groundwater dependent resources should be taken out of Section 4.8 and integrated into 4.11, and the terminology made consistent.
Surface Water and Groundwater Quantity	54	4-162	4.8.2.2	1	PRII	"*This groundwater discharge may emanate from a local system or from the regiona l groundwater system* " - There is no evidence of any "regional" GW system at the site. The term should be removed globally from the SDEIS document.

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Surface Water and Groundwater Quantity	55	4-162	4.8.2.2	2	PRII	"*Potential impacts to seeps, springs, and GDEs were evaluated by comparing surface water locations to the predicted ten-foot drawdown contour resulting from mine dewatering and water production* ." - Additional clarification will be helpful here. With the statements above that, "*For this impact analysis, the area that is predicted to experience a change in groundwater elevation of ten feet or more is used for quantification and comparison of project effects and baseline conditions.* ", it should be clarified how the 10 ft contour is being used to evaluate impacts to the GDEs. Moreover, many of the GDEs shown on Figure 4.8-10 are beneath the footprint of the TSF, which should be disclosed to put perspective on the impact; many of these wetlands and streams (GDE's) are "directly" impacted as they will be lost during construction, and so to point them our as being "indirectly" impacted due to groundwater lowering is misleading. Only GDEs that are not directly lost (and thus potentially impacted by groundwater lowering) should be presented. Please revise.
Surface Water and Groundwater Quantity	56	4-162	4.8.2.2	5	PRII	"*This rate would be for combined groundwater and surface water diversion in addition to existing water rights* ." Suggest adding to the end of this sentence, "...including dewatering flows that are treated and discharged,"
Surface Water and Groundwater Quantity	57	4-163	4.8.2.2	paragraph 1 and global	PRII	"*Separate water rights applications would be submitted for each wel* l" - These water rights applications have been submitted. Multiple references to pending applications in this document should be corrected.
Surface Water and Groundwater Quantity	58	4-163	4.8.2.2	7	PRII	"*Stream diversion around mine facilities*" - Please clarify how modifying the location of a stream will impact water quantity.
Surface Water and Groundwater Quantity	59	4-163	4.8.2.2	8	PRII	"*These activities have the potential to modify the location and flow rate of stream flows in the analysis are* a." - This should be "and/or" if stream diversions must be included.

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Surface Water and Groundwater Quantity	60	4-164	4.8.2.2	Figure 4.8-10	PRII	This figure is misleading because the discussion above states essentially that drawdown of less than 10 ft is uncertain with the regional scale model and seasonal fluctuations. Here, there is no information aside from the 10 ft contour. The reader is left to guess if seeps/springs within the contour are affected, even though the model can't predict at that resolution. Also, it should show/explain that many GDE's shown here are directly lost to construction (direct impact) and should not be also shown as indirectly impacted, because they will not longer exist. Please revise discussion.
Surface Water and Groundwater Quantity	61	4-165	4.8.2.2	3	PRII	"*The model predicts reductions in Meadow Creek flows between the TSF and Hangar Flats pit compared to baseline flows of up to approximately 40 percent during low flow periods...during the construction and operational period for the SGP* ". This statement is misleading as presented, does not provide numerical flow rates provided for similar statements below, is provided without context as to the temporal range of this potential impact, and separated by 2 additional sentences from a design feature that is intended to ameliorate its impact. Please move the following passage: "*However, baseflow depletion is largely offset by the addition of treated water in this portion of Meadow Creek via an IPDES permitted outfall . This offset is anticipated to be substantially effective because the predicted impact is primarily associated with dewatering of the Hangar Flats pit.* " to follow it directly. Also, please provide the reader with numerical flow rates (as with other examples below) as well as temporal context for this impact, which begins in year 5 and ends in year 6. As presented, the reader is left to understand this as an impact that occurs from construction through operations.

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Surface Water and Groundwater Quantity	62	4-165	4.8.2.2	Table 4.8-4	PRII	Please verify that the streamflow impacts presented in Table 4.8-4 are aligned with those presented in Section 4.12.
Surface Water and Groundwater Quantity	63	4-165	4.8.2.2	Table 4.8-4	PRII	For the Station *East Fork SFSR below Sugar Creek (13311500)* - The location of this station is beyond the model domain and therefore point of comparison would be the same as 13311250.The reference to gauge 13311500 should be deleted.
Surface Water and Groundwater Quantity	64	4-166	4.8.2.2	2	PRII	"*Flow reductions are predicted during the project's operational period with the largest flow reductions (i.e., on the order of 40 percent) occurring during Mine Years 4 through 8 as Hangar Flats pit is being dewatered* ." - Please provide the reader appropriate clarification here: the phrase "during….operational pd" makes it sound like the reductions are longer-term than they really are. There is only about 18 months of mining HF below the GWT.
Surface Water and Groundwater Quantity	65	4-166	4.8.2.2	1	PRII	"*Flows recover toward the No Action Alternative condition following the cessation of Hanger Flats dewatering and are near equivalent to the No Action Alternative conditions by Mine Year 12.* " - Please correct: HF dewatering ends before 8, and by EOY 8 groundwater there is actually rebounded.

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Surface Water and Groundwater Quantity	66	4-166	4.8.2.2	2	PRII	"*...minimum baseflows based on comparison of model results to the existing conditions model for the action alternatives would be approximately 6.6 cfs compared to 8.9 cfs (26 percent reduction) for the No Action Alternative attributable to the diversion and capture (contact water) of surface water as well as mine dewatering. Downstream of the Yellow Pine pit area prior to the confluence with Sugar Creek, minimum baseflows for the action alternatives are predicted to be 7.9 cfs compared to 11.3 cfs under the No Action (30 percent reduction) under the proposed water management scenario and its associated water balance* " - Please provide additional context for the reader. Putting it in later sentences is misleading, and this ignores the treated water discharge.
Surface Water and Groundwater Quantity	67	4-166	4.8.2.2	3	PRII	Referenced Figure 4.8-15 does not include Sugar Creek. Please add.
Surface Water and Groundwater Quantity	68	4-166	4.8.2.2	3	PRII	"*During the post-closure period when the West End pit lake is forming, predicted Sugar Creek flows decrease by up to 9 percent primarily.* " - Please clarify what part of the flow regime / how long and often.
Surface Water and Groundwater Quantity	69	4-174	4.8.2.2	4	PRII	"*Typical rates of surface water diversion during the build-up of project water inventory would be approximately 4 cfs* ". - The reader may not be familiar with what "buildup of project water inventory" means. Moreover, it is misused elsewhere to refer to several years of mine ops. Please clarify its definition here.

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Surface Water and Groundwater Quantity	70	4-174	4.8.2.2	5	PRII	"*and up to 8.2 cfs of new non-domestic, commercial, municipal, and industrial uses. This would allow authorization of up to 8.2 cfs of new non-domestic, commercial, municipal and industrial water rights to which Water Right 77-14190 would be subordinate.* " - the term non-DCMI can be used here. Also, please clarify that the PRII water right applications are for industrial and domestic uses and thus the EFSFSR minimum streamflow right is subordinate to it.
Surface Water and Groundwater Quantity	71	4-174	4.8.2.2	7	PRII	"*would be insufficient* " should be "would be sufficient"
Surface Water and Groundwater Quantity	72	4-174	4.8.2.2	7	PRII	"*Instream rights on the SFSR are subordinate to 20.6 cfs; maximum diversions proposed by Perpetua from all sources and uses would be 9.68 cfs, within the allowance of the SFSR instream rights.* " For clarity and accuracy, this sentence should say, "Instream rights on the SFSR are subordinate to all future DCMI uses and up 20.6 cfs for future non-DCMI uses; maximum diversions proposed by Perpetua are within the allowance of the SFSR instream rights."
Surface Water and Groundwater Quantity	73	4-174	4.8.2.2	8	PRII	"*The current seasonal low baseflow in the Salmon River is approximately 4,150 cfs near Shoup gage.* " - Incorrect. Average flow at Shoup gage in late August and early September is 1400 cfs.
Surface Water and Groundwater Quantity	74	4-176	4.8.2.4	6	PRII	"*For the Yellow Pine pit dewatering, peak pumping rates associated with the sensitivity analysis ranged up to approximately 2,000 gpm compared to the model predicted rate of approximately 650 gpm. For Hangar Flats pit and West End pit dewatering, the sensitivity analysis peak pumping rate ranged up to approximately 2,400 gpm compared to a predicted value of approximately 1,500 gpm,* " - It should be stated that the 10x sim for layer 3, 4, 5 was poorly calibrated and this is an overestimate. Additional details are in the attached comment letter.

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Surface Water and Groundwater Quantity	75	4-177	4.8.2.4	2	PRII	"*Therefore, surface water flow rates would be within 0.5 cfs of those predicted by the model, representing the difference between predicted surface flow rate reductions and removing the rate of forecasted withdrawal from the intake above the EFSFSR tunnel, which would no longer be needed* ." - This should have a reference and its accuracy validated. BC did not conduct this analysis.
Surface Water and Groundwater Quantity	76	4-177	4.8.2.4	4	PRII	"*Predictive sensitivity to various possible degrees of hydraulic transmissivity of the fault zones, only one of which has been explicitly represented in the model;* " - This could be more clearly stated as: "Predictive sensitivity to various possible degrees of hydraulic transmissivity of the fault zones, of which the major fault zone has been explicitly represented;...".
Surface Water and Groundwater Quantity	77	4-177	4.8.2.4	4	PRII	"*Putative inability to directly observe the effects of long-term hydraulic stresses on the bedrock aquifer as attempted deep bedrock pumping tests have not been completed due to the inability to sustain groundwater production from a pumping wel* l." - This statement does not consider the current aquifer testing program and will need to be struck from the final EIS. Moreover, the inability to observe effects is the result of the pumping test. And that result is more correctly characterized as no effect observed from pumping stress (drawdown) induced at the pumping well indicates extremely low or no hydraulic connection in deep bedrock.
Surface Water and Groundwater Quantity	78	4-179	4.8.4.1	1	PRII	Here and globally where applicable, descriptions of the No Action Alternative should acknowledge ASAOC activities. Please revise.
Surface Water and Groundwater Quantity	79	4-179	4.8.4.2	2	PRII	"*Impacts to surface stream flow rates from the SGP would be irretrievable commitments of these resources.* " - This statement seems contradictory to the rest of the preceding paragraph which calls out no permanent impacts. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quantity	80	4-179	4.8.4.2	4	PRII	"*These would be irreversible commitments of these resources* ." - Please clarify how the rerouting of a stream is an irreversible commitment of a resource.
Surface Water and Groundwater Quantity	81	4-179	4.8.4.2	5	PRII	"*...the groundwater levels in the backfills are expected to reach approximate baseline elevations as influenced by the revised groundwater flow in the backfills. These would be irreversible commitments of the groundwater system in these locations* .". - Please clarify how this is characterized as an irreversible commitment.
Surface Water and Groundwater Quantity	82	4-179	4.8.4.2	6	PRII	"*The West End pit lake would be situated primarily in bedrock and therefore would not receive substantial groundwater inflows* .". - Being situated primarily in bedrock could also be said of the Yellow Pine pit. A more substantial description would be helpful here.
Surface Water and Groundwater Quantity	83	4-180	4.8.5.2	4	PRII	"*Implementation of the SGP would result in long-term impacts to surface water quantity at the SGP through groundwater withdrawal and stream diversions* ." - Here and elsewhere in this Section, please provide clarifying information as to how stream diversions are an impact to water quantity.
Surface Water and Groundwater Quantity	84	4-180	4.8.5.2	5	PRII	"*Saturated thickness of alluvial deposits and their groundwater transmissive properties would remain similar to baseline conditions except in the three open pit areas where the alluvial deposits were removed during the mining period.* " Unclear if its stating otherwise, but backfills would be thicker and higher-K than the alluvium, since they replace both alluvium and bedrock. Please clarify.
Surface Water and Groundwater Quantity Specialist Report	85	9	2.4	Table 2-3	PRII	Table 2-3 includes no discussion of backfill covers or the TSF cover as a proponent design feature. Please add.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quantity Specialist Report	86	15	5.1.1	8	PRII	"*The Meadow Creek Fault Zone acts as an aquitard to bedrock flow based on observations of surface water expressions above the fault zone gouge outcrops and artesian conditions observed in drillholes in its vicinity where it passes between the Yellow Pine pit and West End areas.* " - The MCFZ is identified in as the major structure of the area here, however, a source of uncertainty in Section 4.8 is stated as "Predictive sensitivity to various possible degrees of hydraulic transmissivity of the fault zones, only one of which has been explicitly represented in the model". This tone of this statement should be carried over to Section 4.8 page 4-177.
Surface Water and Groundwater Quantity Specialist Report	87	27	6.2.1	6	PRII	"*Table 6-5 provides the maximum instantaneous flow predicted to occur for various return periods from a 1.5-year event up to a 500-year event* ". Table 6-5 provides flows only up to a 100-year event, not 500 years as indicated here.
Surface Water and Groundwater Quantity Specialist Report	88	34	6.2.4	3	PRII	"*Water Right 77-14190 is subordinate to future non-domestic, commercial, municipal, and industrial uses and future non-domestic, commercial, municipal, and industrial development up to 8.2 cfs.* " - This repeats non-DCMI twice. The statement should read, "Water Right 77-14190 is subordinate to future non-domestic, commercial, municipal, and industrial uses and future non-domestic, commercial, municipal, and industrial development up to 8.2 cfs".
Surface Water and Groundwater Quantity Specialist Report	89	35	6.2.5	3	PRII	"*They also are subordinated to specified quantities of future beneficial use rights. Additional detailed information regarding these two water rights can be found in Water Right Reports (referenced by water right number) available on the IDWR website…* " - This water right should be treated in more detail and highlight the allowable water right development under the WR and the subordination clause. This is a pretty critical understanding for water right application at the SGP.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quantity Specialist Report	90	61	7.2.2.3	4	PRII	"*Model calibration was accomplished using a process that included simulation of pre-mining steady state condition* s…" - This is incorrect - reword to remove steady state and include other calibration parameters.
Surface Water and Groundwater Quality	91	3-145	3.9.3	Table 3.9-1	PRII	For parameters in Table 3.9-1 that are indicated as EPA Secondary Drinking Water Standards (Al, Fe, Fl, Mn, SO3, TDS) please note/indicate that these standards are not enforceable or directly applicable for environmental waters.
Surface Water and Groundwater Quality	92	3-146	3.9.3	2	PRII	*"table-reported standard values utilize the 12 ng/L (0.000012 mg/L) representing the lowest concentration adopted as a standard* " - Please clarify if the 12 ng/L value is for MeHg or just Hg.
Surface Water and Groundwater Quality	93	3-147	3.9.4	1	PRII	"*Antimony occurs as the mineral stibnite (Sb2As3)* " - Please correct: Stibnite is Sb2S3. It is a sulfide and has no arsenic in its formula.
Surface Water and Groundwater Quality	94	3-147	3.9.4	3	PRII	"*The primary intrusive and metasedimentary rock types at the mine site include alaskite, granodiorite (i.e., quartz monzonite), diorite, rhyolite, calc-silicate, carbonates (e.g., dolomite and limestone)…* " - Limestone is not a metamorphic rock, please revise to marble (metamorphosed limestone).
Surface Water and Groundwater Quality	95	3-147	3.9.4	5	PRII	"*Results from the multi-element testing show that arsenic, mercury, sulfur, and antimony are enriched...* " - Please clarify by defining "enriched" (enriched vs. average crustal abundance). Without context, this sentence implies a high concentration of Hg when there really isn't.
Surface Water and Groundwater Quality	96	3-148	3.9.4.2	Table 3.9-2	PRII	TSF Embankment column, Height row - "state" should be "stage"
Surface Water and Groundwater Quality	97	3-154	3.9.4.2	2	PRII	"*...Net Potential Ratio (NPR)* " - should be "Neutralizing", not "Net"

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	98	3-158	3.9.4.2	1	PRII	"*Effluent concentrations of aluminum, antimony, arsenic, and mercury frequently exceeded their respective most stringent water quality criteria* …" - It should be clarified that this is the TEST effluent, not a direct prediction of contact water quality
Surface Water and Groundwater Quality	99	3-158	3.9.4.2	2	PRII	"*Decant solution chemistry for five samples of synthetic tailings materials…* " - Please replace "synthetic" with "pilot" or "metallurgical pilot program" These tailings were from a full-flowsheet pilot test, not synthesized after the fact / or to match predictions and solely for environmental testing as is often done in water treatment piloting.
Surface Water and Groundwater Quality	100	3-166	3.9.4.2	2	PRII	"*A few constituents are mobile under these neutral to alkaline pH conditions, including aluminum, antimony, arsenic, manganese, and mercury, which were frequently leached at concentrations above the strictest potentially applicable surface water quality standar* d." - Please clarify this is from samples, and is NOT a direct prediction of leachate at field scale. Hg for example is predicted to be below WQS.
Surface Water and Groundwater Quality	101	3-166	3.9.4.2	Table 3.9-8	PRII	In table 3.9-8, please clarify for the reader that the reported values are the test leachate values and not a direct prediction of Project mine-impacted water quality.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	102	3-168	3.9.4.2	1	PRII	"*HCT analytical results were utilized in developing modeling source terms for the water chemistry predictions. In the development of source terms, the initial flushes from the HCTs were not utilized (SRK 2018) because the first flush chemistries would be indicative of material leaching during the mine operating period, when leachate would be collected as contact water for water treatment or would be expected to dissipate in the near-term due to dilution and/or solubility controls.* " - Additional clarification of this point that supports the use of steady state conditions for development of source terms would provide a more complete justification of source term development. Suggested addition is "Steady state chemistry is typically considered more representative for use in geochemical predictions (Maest and Kuipers, 2005; Price 1997). The initial flushing in humidity cells mobilizes oxidation products that formed prior to initiation of the test (i.e., they represent an accumulation of load derived at steady-state rates)". Please reference the comment letter for additional detail.
Surface Water and Groundwater Quality	103	3-175	3.9.4.3	1	PRII	"*The water quality of nearby seeps associated with the Bradley tailings, SODA, and Keyway Dam also was elevated in metals, an indication that historical mining features are impacting the alluvial and bedrock aquifers.* " - Please support this assertion with evidence or remove. Nothing described in this sentence should have any effect on bedrock as these are mine waste features sitting on top of alluvium in the valley bottom where gradients are generally vertically upward and down-valley, not into bedrock.
Surface Water and Groundwater Quality	104	3-175	3.9.4.3	3	PRII	"*Natural springs and seeps also occur where bedrock faults and fractures intersect the ground surface* ". - Please provide a source for this statement or remove. It would be more general and more accurate to say "Natural springs and seeps occur at other locations where the local water table intersects the ground surface..."

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	105	3-175	3.9.4.3	5	PRII	"*Similarly, in the East Fork SFSR drainage, arsenic and antimony concentrations in seeps and springs are elevated below the Yellow Pine pit and Northwest Bradley waste rock dump, suggesting that these historical mine facilities are responsible for elevated concentrations of arsenic and antimony in discharging groundwater* " - Please provide a more recent citation (than URS 2000b) to qualify this statement. Identifying the mentioned springs below YPP would be helpful as well.
Surface Water and Groundwater Quality	106	3-176	3.9.4.3	5	PRII	"*The low sulfate and TDS concentrations also could point to a lack of mineralized deposits and historical mining-related impacts in the Fiddle Creek drainage, and different lithologies in the catchment area, specifically calcareous rock formations* " - Please clarify the mentioned calcareous rock formations in the Fiddle drainage.
Surface Water and Groundwater Quality	107	3-185	3.9.4.4	Table 3.9-11	PRII	Please clarify the purpose of this table. It seems to imply a bias on the part of one of the sampling entities. But since the % differences are absolute values, the reader has to look more closely to see which entity reported higher values. Please validate calculations as well. It is also worth noting that the USGS specifically samples at highest flow events, so their Hg numbers are expected to be elevated relative to PRII, which normally samples in mid-May per their quarterly sampling schedule.
Surface Water and Groundwater Quality	108	3-187	3.9.4.4	2	PRII	"...*attributable to the dissolution of soluble salts and the flushing of water concentrated by evaporatio* n." - Evapoconcentration is not likely the cause as the water in question is held in pore space below the root zone (and there is little vegetation on many of the piles in any event)...It is more likely the long residence time of GW in the waste piles all summer/fall/winter, leading to higher concentration, followed by it being displaced by incoming melt in spring.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	109	3-187	3.9.4.4	4 and Table 3.	PRII	"*The range of observed MeHg values varied between a minimum of <0.1 ng/L (all sites) to a maximum of 0.64 ng/L (Sugar Creek). Mean MeHg values (calculated using the method detection limit for non-detect results) were at or just above the 0.1 ng/L detection limit.* " - Including mean MeHg values ("average in table 3.9-12) is not likely helpful to the reader, and it isn't needed to understand the results. Moreover, it does not seem reasonable to assign the MDL to all non-detect samples when doing this calculation (see EPA Unified Guidance). This section could simply specify the number of samples that were non-detect and remove the averages from Table 3.9-12.
Surface Water and Groundwater Quality	110	3-188	3.9.4.4	2	PRII	"*Despite these relatively high concentrations, the mine site seeps do not appear to significantly influence surface water MeHg levels (e.g., loading), either due to the low seep flow rates compared to surface water flows* ". - Incomplete sentence. Please clarify.
Surface Water and Groundwater Quality	111	3-200	3.9.4.4	1	PRII	"*Based on data from the 2016 Integrated Report …*" - Elsewhere the 2020 report is cited. Please check this reference.
Surface Water and Groundwater Quality	112	3-203	3.9.4.4	2	PRII	"*These analytical method detection limits are greater than the strictest potentially applied water quality standard and it is uncertain whether the pit lake water meets that standard* ." - It could be inferred, if the stream above and below meets the standard, the lake does as well given the short residence time and fully-mixed conditions.
Surface Water and Groundwater Quality	113	3-204	3.9.4.5	6	PRII	"*Data presented in this table show that average concentrations of pH, aluminum, arsenic, iron, manganese, and antimony exceed the groundwater quality standards* .." - Identification of secondary GW quality standards is relegated to a footnote in Table 3.9-18. Please clarify what secondary standards are here when introducing this table, and their lack of relevance to ambient water.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	114	3-212	3.9.4.5	1	PRII	"*whereas criteria for iron, aluminum, and manganese are based on secondary standards established to protect aesthetic and cosmetic qualities of drinking water* " - It would be helpful to the reader to move this content to the introduction of Table 3.9-18. The current introduction lists apparent violations of standards that aren't really standards at all, and is thus misleading.
Surface Water and Groundwater Quality	115	4-181	4.9.1	4	PRII	"*Surface water quality parameters (e.g., pH, temperature, major ions, TDS, metals, sediment content, and organic carbon"* - Please clarify the significance of organic carbon as an indicator; a precursor to MeHg perhaps but it doesn't seem likely to be itself an indicator, or much influenced by the project (small amount in sanitary wastewater).
Surface Water and Groundwater Quality	116	4-181	4.9.1	7	PRII	"...*water quality predictions from modeling studies completed by Perpetua and their consultants for the SGP* ..." - Please note and clarify for the reader that modeling was conducted and updated specifically for the 2021 MMP.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	117	Global	4.9.1		PRII	"*The hydrologic modeling is summarized in the companion SGP Water Quantity Specialist Report (Forest Service 2022e) and additional modeling details can be located in the modeling reports provided by Perpetua (Brown and Caldwell 2021a, 2021e, 2021i, SRK 2021a).* " - In the reference list, SRK 2021a is listed as the Geochemical Characterization Report. This paragraph should cite the ModPRO2 SWWC Modeling Report (which should be added to the reference list. The SWWC report was included in the SDEIS supporting documents on the USFS website). General comment – the SRK reports are often referenced incorrectly throughout this section of the SDEIS: •Any references to the SWWC modeling should cite the Stibnite Gold Project ModPRO2 SWWC Modeling Report, October 2021 (not in the reference list, but IS in the SDEIS supporting documents) •Any references to the SWWC model sensitivity analysis should cite the ModPRO2 SWWC Model Sensitivity Analysis Report, November 2021 (currently listed as SRK, 2021b in the reference list) •Any references to the geochemical characterization should cite the Comprehensive Baseline Geochemical Characterization Report, November 2021 (currently listed as SRK, 2021a in the reference list).
Surface Water and Groundwater Quality	118	4-182	4.9.1.1	1	PRII	"*…testing of synthesi zed and legacy tailings samples.* " - As in Section 3.9, these are pilot plant tailings and not accurately characterized as "synthesized". That term is likely to lead to bias and the incorrect impression that the tailings samples were somehow not representative. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	119	4-182	4.9.1.1	1	PRII	"*The test cell HC-14 from the Phase I testing program was selected to represent PAG development rock and wall rock because this cell had the highest total sulfur and highest sulfate leaching rate, which corresponds to maximum sulfide oxidation and acid rock drainage potential.* " - It would be helpful to clarify for the reader here that none of the HCTs developed acidic conditions. Suggest adding context to the effect of: "Even though the material is technically classed as PAG based on an NPR<1.5, in reality this material is unlikely to be acid generating. None of the humidity cells (7 out of 25 of which were classed as PAG based on the static test results) generated acidic leachates despite continued testing of up to 184 weeks (significantly beyond the standard timeframe of testing). This is supported by: (i) the historical mining wastes, which have not generated acid despite being exposed at surface for several decades; and (ii) the circum-neutral to moderately alkaline groundwater and surface waters in the project area."
Surface Water and Groundwater Quality	120	4-182	4.9.1.2	2	PRII	"*A site-wide water balance model was performed by Brown & Caldwell…* " - This is incorrect; the SWWB model was prepared by Perpetua though it relied on BC's SHSM and MWB. Please revise and correct reference list.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	121	4-183	4.9.1.4	Entire Section	PRII	*4.9.1.4 Groundwater Chemistry Model* - The title of this section (Groundwater Chemistry Model) is misleading. The geochemical modeling performed by SRK encompasses predictions of seepage and contact water chemistry from proposed mine facilities (e.g., TSF, TSF Buttress, Hangar Flats and Yellow Pine backfill) as well as the pit lake water quality predictions for the West End pit. The section would be more appropriately titled 'Mine Facility Water Chemistry Models'. Source terms from these facility models were used as inputs to the SWWC model to evaluate impacts to surface water. An evaluation of impacts to groundwater are limited to the TSF and TSF Buttress facility models. Please revise.
Surface Water and Groundwater Quality	122	4-184	4.9.1.5	1 (bulleted list)	PRII	"*...inundated backfill in the Yellow Pine pit, Hangar Flats pit, and Midnight pit…* " - This is incorrect. The Midnight Pit backfill is unsaturated. Please revise.
Surface Water and Groundwater Quality	123	4-184	4.9.1.5	2	PRII	"...*the TSF Buttress, pit lake* s…" - Please correct "pit lakes" to be singular. The reference to plural pit lakes is found throughout the document and this change needs to be made globally.
Surface Water and Groundwater Quality	124	4-184	4.9.1.5	2	PRII	*"Ammonia concentrations in surface waters were not explicitly modeled…"* - Suggest striking this passage. There are other parameters that were not modeled and more explanation is needed to explain what was modeled, what wasn't and why. This level of detail is beyond a summary level of information.
Surface Water and Groundwater Quality	125	4-185	4.9.2.1	3	PRII	"*This removal is part of the planned Phase I scope for the ASAOC signed in 2021 with implementation anticipated in 2022 and 2024* ". - ASAOC activities are planned in 2023 as well. please correct.
Surface Water and Groundwater Quality	126	4-185	4.9.2.1	4	PRII	"*Soil sampling and analysis indicate that legacy mining wastes…* " - To clarify, please add "and naturally occurring mineralization"

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	127	4-185	4.9.2.1	4	PRII	"*The elevated antimony and arsenic concentrations in groundwater are unlikely to improve in the future under the No Action Alternativ* e." - This is not consistent with the statement above that "there would also be a potential improvement in groundwater analyte concentrations" associated with the ASAOC activities. It would helpful to the reader to include a statement in here that says the ASAOC activities will result in some improvement in surface water and groundwater conditions, but that it is limited and not to the same degree as implementing the mine plan.
Surface Water and Groundwater Quality	128	4-186	4.9.2.1	1	PRII	*"As such, there would be no change to the existing condition of surface water quality related to off-site facilities* ." - Here or elsewhere, the No Action description should also state that vegetation restoration and plantings would not occur under No Action. The plantings proposed for the SGP include streams that will not be directly impacted by mining activities. Without the restoration plantings, the shade along these reaches would not increase as quickly.
Surface Water and Groundwater Quality	129	4-186	4.9.2.2	3	PRII	"*Solutes generated from mined materials are expected to be partially to substantively controlled by water management practices that are part of the SGP* " - It is also worth mentioning that there are numerous engineering controls also being proposed (i.e., geosynthetic liners) that prevent solutes from being generated or entering the environment; a significant design feature added to the MMP. Please revise.
Surface Water and Groundwater Quality	130	4-186	4.9.2.2	5	PRII	"*In addition to solute mobilization, the temperatures of surface waters would be affected by the proposed project as it modifies the flow and shading characteristics of the mine area which affect stream temperatures* ." - please clarify that this is not a permanent condition by adding: '...during mine operations. Once pit watering stopped, groundwater levels and stream flows would increase and return to No Action levels. Shading characteristics would return to No Action conditions and improve over time as a result of the restoration plantings, vegetation monitoring, and adaptive management.'

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	131	4-187	4.9.2.2	1	PRII	"*…consolidation water from the TSF (construction through closure which includes process water);* " - Please correct, there is no consolidation water in construction as there is no processing and no tailings.
Surface Water and Groundwater Quality	132	4-187	4.9.2.2	4	PRII	The header "*Contact Water Pond Chemistr* y" should also mention contact water use, which is described within the subsection. Please revise.
Surface Water and Groundwater Quality	133	4-189	4.9.2.2	Table 4.9-1	PRII	For SODA pond, iron should not be listed as being above the strictest potentially applicable WQS. Please revise.
Surface Water and Groundwater Quality	134	4-189	4.9.2.2	Table 4.9-1	PRII	Inflow sources for Plant ponds should also include plant site runoff. Please revise.
Surface Water and Groundwater Quality	135	4-189	4.9.2.2	Table 4.9-1	PRII	For Plant ponds, selenium should not be listed as being above the strictest potentially applicable WQS. Please revise.
Surface Water and Groundwater Quality	136	4-189	4.9.2.2	3	PRII	The final paragraph of p 4-189 describes trends that are not consistent with the dewatering chemistry provided in Appendix D of the SWWC report. Also, this level of detail is not consistent with a summary. Please revise.
Surface Water and Groundwater Quality	137	4-190	4.9.2.2	4	PRII	"*Predicted water chemistries for the stockpiles exhibited circum-neutral pH values with antimony concentrations (0.008 mg/L to 0.016 mg/L) and arsenic concentrations (0.069 mg/L to 0.25 mg/L), both above the strictest potentially applied water quality standards* " - It is incorrect to say these values relate to predicted water chemistry for the stockpiles. These values relate to the ore stockpile HCT source terms and have not been scaled to field conditions. Please correct/clarify.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	138	4-191	4.9.2.2	5	PRII	"*The residence time in the aquifer..* ." - Rather than referring to the residence time in the aquifer, it would be more appropriate to state the assumptions that were made in the model. Suggest replacing the sentence with the following "According to the hydrologic model (BC, 2021), groundwater underflow in the uppermost 32.8 feet (10 meters) of the alluvial aquifer beneath the TSF Buttress and Embankment averages approximately 620 gpm (1,300,000 m3/year). The flux of groundwater in the assumed 10-meter zone of interaction beneath the facility was incorporated into the model by accounting for the volumes of groundwater that move through the groundwater system beneath the facility on an annual basis."
Surface Water and Groundwater Quality	139	4-192	4.9.2.2	2	PRII	"*...concentrations of antimony, arsenic, copper, manganese, mercury, and thallium above the strictest potentially applied water quality standards* ." - As written, it sounds like these constituents are consistently above the standards, which is not the case. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	140	4-192	4.9.2.2	4	PRII	"*Upon placement of the geosynthetic cover, …*" - In this passage it should be stated that the groundwater quality predicted below the TSF Buttress is improved compared to the current conditions. Removing the Hecla Heap and SODA is anticipated to improve groundwater significantly in this area. It would be good to clarify that groundwater arsenic and antimony concentrations are predicted to be orders of magnitude lower than the current conditions as a result of mining. This is not captured in what is written. Could be restated as follows. "Upon placement of the geosynthetic cover on the TSF Buttress, infiltration is significantly reduced and arsenic and antimony concentrations in groundwater decrease but remain elevated above groundwater standards due to the recharge of residual water within the TSF Embankment and Buttress. However, the predicted arsenic and antimony concentrations in groundwater during the post-closure period are significantly lower than the existing conditions due to the removal of legacy facilities (Hecla Heap and SODA) during mining. Based on average concentrations from MWH-A04, arsenic and antimony in groundwater are 1.8 and 0.06 mg/L respectively under existing conditions. Arsenic and antimony concentrations are predicted to be an order of magnitude lower for the post-closure period due to the removal of the legacy facilities but still elevated above background groundwater quality as defined by MWH-A01."
Surface Water and Groundwater Quality	141	4-195	4.9.2.2	Table 4.9-2	PRII	Maximum value for manganese is less than SW quality criteria and should not be shaded. Please revise.
Surface Water and Groundwater Quality	142	4-197	4.9.2.2	Table 4.9-3	PRII	Not all of the shading in this table is correct. The values need to be re-checked against the standards and shaded appropriately. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	143	4-197	4.9.2.2	Table 4.9-3	PRII	"*Post-mining the application of a low permeability geosynthetic cover to the TSF Buttress and Embankment means any toe/pop-out seepage would report to groundwater* " - This could be seized upon as representing a potential groundwater impact, particularly given the high concentrations of arsenic and antimony in toe/pop-out seepage. In reality the volumes of toe/popout seepage are very low. This could be clarified in a footnote.
Surface Water and Groundwater Quality	144	4-203	4.9.2.2	3	PRII	"*This minor seepage would interact with groundwater in the uppermost 32.8 feet (10 meters) of the alluvial aquifer* " - Please clarify that this mixing zone thickness is a modeling assumption, not an established fact.
Surface Water and Groundwater Quality	145	4-206	4.9.2.2	Table 4.9-5	PRII	Table caption or supporting text should specify that values are for tailings solids and not pore-water chemistry.
Surface Water and Groundwater Quality	146	4-207	4.9.2.2	1	PRII	"*Representative process water chemistry data were obtained from HCT tailings decant solution…* " - Incorrect as stated as decant water is not from an HCT but rather it is from pilot testing; remove 'HCT tailings' to correct this description.
Surface Water and Groundwater Quality	147	4-207	4.9.2.2	3	PRII	"*When tailings are sufficiently consolidated to allow equipment to access the TSF surface around Mine Year 23,...* " - The cover placement starts around year 19 and finished in or by 23. Please clarify that covering instantaneously in year 23 is a conservative model assumption, not the actual cover emplacement plan.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	148	4-207	4.9.2.2	3	PRII	"*Through this period (approximately 40 years), TSF surface water would be routed to the water treatment plant before discharge to Meadow Creek.* " - The period described is 25 years (Year 15-40), not 40 years. Also, this statement is incorrect. From years 23 to 40 the consolidation water is collected underneath the cover. The "surface" water is clean as there is a geosynthetic and up to several feet of soil/rock/growth media between the tailings and the ground surface. The surface water reports to Meadow Creek during this time period. The following revision of the paragraph is proposed: "When tailings are sufficiently consolidated and mine equipment can safely access the TSF surface, a geosynthetic cover would be placed over the tailings to reduce meteoric water contact with tailings material and infiltration into the TSF. Cover placement will begin around Year 19 and will be complete by Year 23. During and following cover placement, tailings would continue to consolidate and produce water. The collected consolidation water would be directed to the water treatment plant for 40 years into post-operations. Surface water from the TSF after cover placement reports directly to Meadow Creek during this time."
Surface Water and Groundwater Quality	149	4-212	4.9.2.2	1	PRII	"*To summarize, these mine-affected waters include: ... post-closure TSF facility solutions* ." - Please remove from this list. "Post closure TSF facility solutions" would not be used in ore processing, which will have long since ceased.
Surface Water and Groundwater Quality	150	4-212	4.9.2.2	3; Global	PRII	"*The Site-Wide Water Balance model (Brown and Caldwell 2021a)* …" - Global / all chapters - Perpetua was the author of the SWWB model for the 2021 MMP. Please correct for the FEIS.
Surface Water and Groundwater Quality	151	4-212	4.9.2.2	3	PRII	"*A 120-year precipitation record was utilized to develop percentile estimates for meteoric inputs to the water balance (5th through 95th perc entile ranges)…* " - While some precipitation percentiles are reported, the SWWB results generally look at percentiles of the OUTPUTS not those inputs. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	152	4-212	4.9.2.2	3	PRII	"*Any short-term volumes in excess of the water treatment capacity (i.e., following a large storm event) would result in water storage within the TSF and/or contact water ponds* ." - Please clarify this statement: any excess stormwater would not be directly transferred to the TSF, but will effectively remain there by foregoing reclaim and preferentially consuming other water in ore processing. The net effect is the same as to water balance.
Surface Water and Groundwater Quality	153	4-219	4.9.2.2	1	PRII	"*During warmer months, retention times for contact water in ponds would be up to 34 days resulting in warmer water treatment plant feeds with the potential to increase Meadow Creek temperatures downstream of the treatment plant outfall by up to 2.5oC* ." - Please clarify here that in this scenario, we would have the option of directly treating and discharging cooler dewatering water, and using the stored contact water in ore processing. Also confirm the value 2.5oC; this appears to be quite high vs. past modeling.
Surface Water and Groundwater Quality	154	4-219	4.9.2.2	5	PRII	"U*nder an IPDES permit, the water treatment plant effluent would be directed to Meadow Creek at a location upstream of the Hangar Flats pit when flow augmentation is required and otherwise to the East Fork SFSR for the remainder of operations* ***(i.e., when Hangar Flats groundwater pumping results in decreased Meadow Creek baseflow)*** . " - bolded passage is misplaced; move to earlier in sentence after "required".

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	155	4-220	4.9.2.2	1	PRII	"*The first-stage iron coprecipitation would be modified to include gypsum precipitation to reduce sulfate concentrations. The second-stage iron coprecipitation would then be converted to ettringite prearecipitation which would reduce sulfate and TDS concentrations to the target levels for treatment plan effluent. Cyanide would be treated using a two-stage alkaline oxidation process that converts cyanide to carbon dioxide, nitrogen gas, and water.* " - The description provided in here is based on an earlier draft version of the WMP, not the Final December 2021 version (The December 2021 version is referenced in the SDEIS and posted as a supporting document by USFS). Please replace it with the description from the December 2021 version (page 8-33 of the WMP), *"The treatment process begins with chemical oxidation followed by iron coprecipitation to remove a significant fraction of dissolved metals. Organic sulfide precipitation of mercury is provided. Softening will be performed via lime and soda ash to remove calcium and magnesium. Adjustment of pH will be provided in advance of ultrafiltration to remove carryover solids from the solids contact clarifier and prevent particulate fouling of the RO membranes. RO membrane treatment will separate the dissolved solids into a concentrated brine while the permeate water will be pH adjusted and re-mineralized prior to discharge to Meadow Creek via an IPDES-permitted outfall. The concentrated brine will be sent to an evaporative crystallizer that converts the dissolved solids into a crystalline solid, which will then be dewatered. Distillate from the evaporative crystallizer will be pH adjusted prior to discharge to Meadow Creek."* Note that the treatment process described in the final version of the WMP will result in a higher water quality discharge to Meadow Creek compared to the draft version of the WMP.
Surface Water and Groundwater Quality	156	4-220	4.9.2.2	1	PRII	"*...and thereafter dewatered and disposed of in a location constructed in the TSF above the cove* r." - Please correct: final cover of the TSF would be deferred in areas of residual solid disposition.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	157	4-220	4.9.2.2	2	PRII	"*At the start of closure, water treatment plant effluent would be discharged to the East Fork SFSR until the cover of the TSF is completed (approximately nine years to allow for tailings consolidation, cover installation, and stream channel restoration). Once the TSF cover is completed, the treatment plant and discharge would be relocated to Meadow Creek, nearer the TSF, for the duration of its operation (to approximately Mine Year 40).* " The text presented here does not align with the plan described in the final version of the WMP (BC, Dec. 2021, see previous comment). There will actually be two separate water treatment plants (WTPs); the operations phase WTP will continue to treat mine-impacted water collected from the truck shop and plant site ponds until mine year 18. The reclamation and closure WTP will be constructed prior to mine year 15 and will be located on top of the TSF Buttress on private property where it will operate until approximately mine year 40 (reference section 8.7, 8.7.1, 8.8, and Table 8-17 of the WMP [BC, Dec. 2021]). Please revise text to clarify that there will be two separate treatment plants for operations and closure; the operations WTP will not treat process water and will not be relocated.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	158	44-219	4.9.2.2	3	PRII	"*These temporary systems would utilize trailer- mounted or skid-mounted equipment packages containing membrane treatment and/or iron coprecipitation systems that can be set up with limited lead time. Figure 4.9-10 illustrates the construction period water treatment flowsheet.* " -As stated, the temporary systems would be equipment packages containing membrane treatment and/or iron coprecipitation systems, but the referenced Figure 4.9-10 is the treatment flow sheet for only the membrane alternative. Please revise the last sentence of the quote above to state, "Figure 4.9-10 and Figure 4.9-11 illustrate the construction period water treatment flowsheet." Please also update the captions for Figures 4.9-10 and 4.9-11 to state either could be potential flowsheets for the construction period.
Surface Water and Groundwater Quality	159	4-223	4.9.2.2	Figure 4.9-12	PRII	This flow sheet is from a draft version of the WMP and does not reflect the information provided in the final version of the WMP, dated December 2021 (see previous comments), which included RO with an evaporative crystallizer. Please update the figure to match that shown in Figure 8-5 on page 8-34 of the Final version of the WMP.
Surface Water and Groundwater Quality	160	4-230	4.9.2.2	1	PRII	"...*and from the Yellow Pine and Hangar Flats pits in the Yellow Pine backfill* ." - Statement is incorrect; Yellow Pine backfill is comprised primarily of material from West End. Please revise.
Surface Water and Groundwater Quality	161	4-230	4.9.2.2	1	PRII	"*Midnight pit backfill would be mounded at closure to promote runoff and the highwall and backfill material would be unsaturated.* " - This is the correct statement; previous statement referring to inundated backfill at Midnight Pit is incorrect. Please revise.
Surface Water and Groundwater Quality	162	4-230	4.9.2.2	3	PRII	"*Representative leachate chemistry for the non-PAG and PAG pit wall rock, talus and backfill material were obtained from humidity cell data associated with the* ***backfill materia*** **l…**" - Bolded words should be corrected to "development rock and ore material" as the wall rock and talus represent a combination of both development rock and ore-grade material.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	163	4-230	4.9.2.2	6	PRII	"*Further details of the modeling are available in Brown and Caldwell 2021e and SRK 2021a* ". - The SRK Characterization report is incorrectly referenced here. See previous comment about SRK references to revise.
Surface Water and Groundwater Quality	164	4-243	4.9.2.2	4	PRII	"*The tracking analyses indicated that these destinations were typically surface stream segments in Meadow Creek, the East Fork SFSR, or Sugar Creek* ." - Discussion here should include explanation of why receiving stream segments percentages shown on figure 4.9-20 do not sum to 100%. Suggest the following additional language. *"In each sub-basin the majority of the particles report to a stream; however in every case there are some particles that remain in the groundwater at the end of the 100 year simulation. The degree of this effect varies between the stream basins because the geometry of each basin is different with respect to groundwater flow gradients and speed, which in turn causes some particles to move more slowly and necessarily take longer to reach a discharge point to surface water. "*

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	165	4-244	4.9.2.2	2	PRII	"*Approximately two percent of the groundwater particles originating from the Yellow Pine pit backfill are predicted to reach those groundwater areas which could observe an associated increase in groundwater antimony and arsenic concentrations.* " - The application of the particle tracking results is not used correctly here. Even though 2% of the particles were estimated to originate from the backfill, this does not automatically relate to groundwater concentrations, nor does it speak to the potential for the pore water to degrade groundwater. The potential to degrade groundwater depends upon the existing groundwater chemistry and how different it is from the pore water leaving the backfilled pit. In the case where the existing groundwater is already impacted and concentrations are higher than the pore water, there could actually be an improvement in existing groundwater conditions. This potential to improve previously impacted groundwater downgradient of the YPP needs to be acknowledged. Furthermore, the conclusion that some areas would see major negative effects, is premised on the assumption that these areas are not already impacted by legacy mining materials and in-situ mineralized rock. The cited wells (i.e., MWH-A17 and SRK-GM-04S) are only drilled to about 100' and are screened at elevations of 6100' and 6040' respectively; approximately the same elevation as the existing pit lake (6040') and elevation of future backfill. These screen elevations may not be sufficiently deep to adequately assess existing water quality of the receiving alluvial or bedrock aquifer where it could be impacted by pit backfill materials or pit wall contact. It is expected that water quality in the bedrock aquifer and alluvial aquifer downgradient of the YPP ore body and at depths below shallow wells, is already impacted by spatially extensive mineralization and alteration in the area as well as legacy facilities. Please revise the statements where the results of particle tracking analysis are used.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	166	4-244	4.9.2.2	2	PRII	"*The effects of the infiltration of leachate from the TSF, TSF Buttress, stockpiles and Midnight pit backfill, groundwater interaction with the Yellow Pine and Hangar Flats pit backfills, and West End pit lake on groundwater chemistry would be minor to major depending on the existing condition of receiving groundwater, permanent, and localized.*" - Facilities that receive caps, particularly the buttress, would have temporary/short-term impacts not permanent. The remaining permanent impact if any, would be minor. Please clarify/correct.
Surface Water and Groundwater Quality	167	4-244	4.9.2.2	5	PRII	"*The Forest Service would require that where haul roads pass within 25 feet (slope distance) of surface water, dust abatement would only be applied to a 10-foot swath down the centerline of the road* ." - Please strike this sentence. This is infeasible and ineffective for haul roads which are roughly 100' wide and is likely a carryover from the exploration Golden Meadows EA which applied to roads that are only 12 to 30' wide or so.
Surface Water and Groundwater Quality	168	4-246	4.9.2.2	Figure 4.9-21	PRII	Please clarify what the values in the tables represent (averages, mins/max) and what the red coloring indicates.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	169	4-248	4.9.2.2	3	PRII	"*Immediately downstream of the Yellow Pine pit on the East Fork SFSR at node YP-SR-4 (above the confluence with Sugar Creek), predicted surface water chemistry is similar to existing conditions with some variability in predicted antimony, arsenic, and mercury concentrations during the operating and initial closure period* " - There is a significant reduction in arsenic and antimony concentrations during the operation and post closure period at YP-SR-4 with respect to existing conditions. The text as written indicates that the predicted concentrations for this time period are similar to existing conditions, which is not correct. Please quantify these values rather than use subjective descriptors: A 40% reduction in closure, and more than that in operations, is not adequately described by "similar" or "with some variability" to existing conditions; it is unquestionably lower with respect to the key COCs arsenic and antimony; please describe as such.
Surface Water and Groundwater Quality	170	4-251	4.9.2.2	1	PRII	"*During operations, mercury concentrations are greater than the most stringent applicable water quality standard because the surface water in upper West End Creek is above the standard under existing conditions*" - Clarify that this water is routed around legacy features where presently that mercury gets dropped out, and in operations will just flow past.
Surface Water and Groundwater Quality	171	4-251	4.9.2.2	2	PRII	"*Similarly, predicted arsenic concentrations decrease relative to existing conditions during the operating period then recover to a concentration comparable to existing conditions in the post-closure period.* " - Table 4.9-21 shows reductions in As and Sb concentrations on the order of 30-40% relative to existing conditions. Effects should be described as moderate (beneficial) impacts, not as comparable concentrations .

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	172	4-251	4.9.2.2	3	PRII	"*This suggests that a naturally-occurring mechanism reduces mercury concentrations in the creek between the sample locations upstream and downstream of the pit area.* " - This could be clarified - mercury is reduced as the stream flows through the upper West End waste rock dump and it deposits in the pore space of the dump. While the physics of the porous media flow and the resulting retention of particulate mercury is "naturally occurring" the dump is not.
Surface Water and Groundwater Quality	173	4-251	4.9.2.2	4	PRII	*"Diversion of West End Creek around the pit area during operations has the potential to affect the naturally-occurring reduction in mercury concentrations, allowing higher upstream concentrations to appear in the downstream segment"* - The reference to "naturally occurring mercury reduction" should be removed. Suggested rewording of the paragraph is, *"Diversion of West End Creek around the pit area during operations has the potential to affect the mercury concentrations by eliminating a current source of attenuation that occurs as water moves through the legacy development rock facilities in the area. Therefore, the SWWC model assumes that the higher upstream mercury concentrations would occur in the downstream segment when the West End Creek diversion is constructed. Despite this conservative model assumption, mercury concentrations are predicted to remain below the surface water standards."*
Surface Water and Groundwater Quality	174	4-252	4.9.2.2	2	PRII	"*Effects of the project on surface water concentrations* (in Sugar Creek) *are expected to be negligible relative to applicable standards and calculated human health criteria, permanent, and localized.* " - It should be acknowledged that there is a moderate positive effect on surface water concentrations relative to existing conditions as a result of mining. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	175	4-252	4.9.2.2	6	PRII	"*Air emissions from the project have the potential to contribute metals to the ground surface via wet and dry deposition that have the potential to affect surface water chemistry. Most of these contributions would be in the form of particulate matter, but a portion of the local aerial deposition of mercury may also occur in elemental form. Total mercury emissions from the project are predicted to be approximately 13.6 pounds of mercury per year* ." - This description is inaccurate and misleading to the reader. The presented emissions would not be aerially deposited, as the heading suggests. The modeled deposition rate of Hg due to the project is well under 1 g/km2 per year, a value that is far less than 1% of background mercury deposition as quantified in the REMSAD model.
Surface Water and Groundwater Quality	176	4-259	4.9.2.2	1,2,3	PRII	These paragraphs should reflect and discuss the air quality analysis report, which quantifies Hg emissions and also models Hg deposition based on project emissions and relative to background deposition rates. These values are in the SDEIS document and the reader to should be directed to them. Background deposition rates for Hg from the REMSAD model in the project vicinity are 12.7 to 13.9 g/km2 per year; modeled deposition from project emissions is, at most, 0.056 g/km2 per year...far less than 1% of background. This can not be equated to a "minor to moderate" effect on particulate mercury loads in streams due to project activities due to aerial deposition. It is less than negligible. Please revise to include project-specific information and analysis.
Surface Water and Groundwater Quality	177	4-259	4.9.2.2	4	PRII	"*Predictive modeling indicates that mine facilities and water treatment would contribute dissolved..* ." - Please rewrite to clarify. Water treatment would not degrade water quality, based on IPDES antidegradation regulations.
Surface Water and Groundwater Quality	178	4-259	4.9.2.2	5	PRII	"*An incremental increase in organic carbon content due to wastewater effluent (as described above) would yield an incremental increase…* " - please replace 'would' with 'could'.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	179	4-259	4.9.2.2	5	PRII	"*For Meadow Creek, the East Fork SFSR, and Sugar Creek, predicted total mercury concentrations varied up to 5 ng/L compared to existing conditions which ranged between 2.5 ng/L and 159 ng/L* ."- Please clarify whether "existing conditions" refers to SGP baseline data, model predictions, or Holloway et al data.
Surface Water and Groundwater Quality	180	4-259	4.9.2.2	5	PRII	*"If upstream total mercury concentrations in West End Creek persist to downstream areas of the creek due to its diversion around the West End pit area, application of the methylation ratio would indicate a potential increase of methylmercury concentrations up to 0.9 ng/L in that portion of West End Creek.* " - The use of a ratio developed for Sugar Creek cannot necessarily be applied to West End Creek as the two streams have differing morphology with West End Creek being steeper gradient and more incised, reducing wetland area and associated methylation potential. West End Creek is about 25% gradient. Sugar Creek, Meadow Creek, and EFSFSR range from <1 to 7%, and usually <5%. From surface water monitoring data collected as part of the Surface Water Quality Baseline Study (HDR, 2017) and collated by Brown and Caldwell, mercury concentrations show a positive correlation to the proportion of Total Suspended Solids (TSS). The positive correlation between total mercury and TSS indicates the majority of mercury is present in particulates coarser than 0.45 µm and therefore less likely to methylate or be bioavailable. These results suggest mercury methylation is unlikely to be significant in the Stibnite district owing to the majority of mercury being associated with the particulate or 'total' fraction. Based on the site data collected as part of the Surface Water Quality Baseline Study (HDR, 2017) and collated by Brown and Caldwell, the mercury budget available to methylate is small, being less than 1% in any sample and less than 0.1% in most samples. Therefore, the 2% methylation ratio is highly conservative based on the available data. Please revise the ratio or acknowledge that it is very conservative.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	181	4-260	4.9.2.2	2	PRII	Paragraph 2 - P 260 discusses sediment generation and management practices; It seems applicable here to also include discussion on interim measures to reduce sediment production in the East Fork of Meadow Creek early in the project through the Blowout Creek Restoration, and ultimate reclamation of that drainage. This is a significant facet of the project that improves water quality. Please revise.
Surface Water and Groundwater Quality	182	4-260	4.9.2.2	3	PRII	"*Perpetua would limit the potential for sedimentation impacts by following conditions in the Dewatering Practices section of their current Multi-Sector General Permit , or the Multi- Sector General Permit…* " - Substantial portions of the mine site and several off-site facilities are expected to have IPDES coverage under the MSGP during construction and operations, as was discussed in the Water Management Plan. This coverage, which may include haul roads, access roads, maintenance and logistics facilities, and other parts of the SGP not included in the industrial Individual IPDES permit, is outlined in the SGP Water Management Plan (BC 2022) and will be administered by IDEQ. For the FEIS, additional information about MSGP coverage should be added for clarity.
Surface Water and Groundwater Quality	183	4-261	4.9.2.2	Figure 4.9-26	PRII	This figures indicates that high pH equates to lower methylation. Whereas the project site has elevated pH, please address/discuss the implication of this in the text.
Surface Water and Groundwater Quality	184	4-267	4.9.2.2	2	PRII	"*To protect surface water, snow removal standards or performance would include depositing snow and ice away from stream channels; maintaining appropriate snow floor depth to protect the roadway* ;" - Please remove this sentence. This is a remnant from the exploration EA. It is not a requirement and it is a safety hazard; the road would be plowed to the surface as per the first part of this paragraph.
Surface Water and Groundwater Quality	185	4-269	4.9.2.2	2	PRII	"*Mining and vegetation removal…* " - Please add *'...and subsequent restoration plantings.'* as they are also considered in modeling.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	186	4-269	4.9.2.2	2	PRII	"*Permitted discharge of treated water or non-contact water to surface water.*" - please delete 'permitted'; non-contact water is not "permitted" in the sense of needing a discharge permit, and the word is not important to the meaning of the sentence.
Surface Water and Groundwater Quality	187	4-270	4.9.2.2	Table 4.9-24	PRII	Section 5.1 of the Fisheries Specialist Report indicates that this 6.6C increase applies across the analysis area of the EFSFSR upstream of Sugar Creek. This is misleading. Most of the temperature increases are less than 1C and through much of the EFSFSR they actually go down (noted by "-" in this table). Please revise discussion.
Surface Water and Groundwater Quality	188	4-271	4.9.2.2	2	PRII	"*…residence time of surface flow in the low-gradient sinuous restored stream channel would allow warming of temperatures above existing conditions* …" - Lack of shade is also an important factor; suggest adding to discussion.
Surface Water and Groundwater Quality	189	4-271	4.9.2.2	3	PRII	"*…and industrial supply wells lowers water levels and groundwater discharge to surface water during operations* ." - Please clarify it is not throughout operation. The HF pit is only below valley bottom for about 18 months, then it is backfilled and groundwater recovered by year 8. Please revise.
Surface Water and Groundwater Quality	190	4-271	4.9.2.2	3	PRII	"*In addition, underdrain flow from the TSF is intercepted during operations* ". - This statement is incorrect; TSF underdrain water is assumed to be discharged to Meadow Creek for the base case of the water modeling. In the base case, it was assumed that it would meet IPDES permit limits to be directly discharged into Meadow Creek without treatment. It would be use in processing or treated before discharge if it turns out to be impacted by the TSF - but again that is not the base assumption. Please revise.
Surface Water and Groundwater Quality	191	4-274	4.9.2.2	1	PRII	"*On the Meadow Creek segment atop the reclaimed TSF, temperature reductions would occur more slowly remaining warmer than existing conditions after 100 years.* " - This is not accurate. As shown in Table 4.9-24, we get back to existing conditions somewhere between 50 and 100 years. Please revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	192	4-274	4.9.2.2	2	PRII	"*In the Yellow Pine pit area and downstream, …*" - To clarify this statement, please add to beginning: 'During operations, in the YPP area…'
Surface Water and Groundwater Quality	193	4-274	4.9.2.2	3	PRII	*"Achievement of these predicted temperatures would depend on the effective and durable installation of the Stibnite Lake feature* ." - This is an unnecessary statement that could be speculated about any constructed feature. With respect to sedimentation, an ancillary benefit of the Blowout Creek repair is that Stibnite Lake will remain a lake far longer than the present YPP lake would under No Action (and note Rio ASE calculated fill time / issued to USFS previously). Please remove.
Surface Water and Groundwater Quality	194	4-274	4.9.2.2	4	PRII	P. 274, paragraph 4 includes discussion of sediment control measures and restoration effects for Blowout Creek that should also be included in (or moved to) the sedimentation discussion in "Sediment". Here, the allusion is that its primary purpose is to improve the durability of Stibnite Lake, which is not the case. It's primary purpose is to reduce sedimentation and improve water quality in the EFSFSR. Please revise.
Surface Water and Groundwater Quality	195	4-275	4.9.2.2	3	PRII	P. 4-275 paragraph 3 is inconsistent with the preceding paragraphs. If it is intended to be a summary, it should not simply focus on the temperature increases because singular number are difficult to interpret out of context. Please validate the cited values or simply refer the reader to the tables. 3C in EFSFSR "below YPP area" is misleading; the author should clarify that once Sugar Creek enters the system, the simulated maximum increase is 1C. 10C in Meadow Creek is relative to the piped condition; the paragraph introduction states "compared to existing conditions"; the increase above baseline in Meadow Creek is 6.6C. Please evaluate and revise.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	196	4-275	4.9.2.2	3	PRII	*"Compared to existing conditions, project operations are predicted to increase temperatures in West End Creek by up to 9oC and the East Fork SFSR below the Yellow Pine pit area by up to 3oC. Upon closure activities, Meadow Creek temperatures are predicted to increase by up to 10oC as the stream channel is restored atop the TSF while formation of the West End pit lake raises temperatures in West End Creek by approximately 4oC. With the exception of the West End Creek segment below the pit area, predicted temperatures return to existing conditions over a period of approximately 100 years as stream restoration and riparian plantings along with the moderating effect of the Stibnite Lake feature take effect (see also Section 4.9.3)* " - -The author should clarify that the West End Pit Lake is not predicted to have a surface outflow, and the simulated increase in West End Creek does not significantly impact temperatures in Sugar Creek because the flows in West End are very low. -The last sentence is incorrect: it does not take 100 years for temperatures to return to existing conditions everywhere else on site. The only location of significant lasting temperature increase is on the TSF, and even there, temperatures return to baseline sometime between 50 and 100 years. Most of the EFSFSR temperatures actually decrease relative to existing conditions as shown in Table 4.9-24 visualized with the dashes in the maximum temperature increase for the project column. Table 4.9-24 list 36 rows of area-season-metric combinations. 18 rows either have a dash or have temperature increases that are less than or equal to 0.2C of baseline. 24 rows have a dash or temperatures increases less than or equal to 0.5C from baseline.

Resource	Comment Number	Page # or Global	Section	Paragraph (count from top of page)	Reviewer Initials	Comment
Surface Water and Groundwater Quality	197	4-278	4.9.2.3	3	PRII	"*The potential for surface water quality impacts from accidental fuel or chemical spills along the mine access roads would be comparable between the alternatives* ". - Please correct this unsupported statement. JC has nearly 4X the road length within 100' of streams. Thus, the potential for SW quality impacts from fuel or chemical spills cannot reasonably be described as comparable; the BL Route has demonstrably lower risk.
Surface Water and Groundwater Quality	198	4-279	4.9.2.3	1	PRII	"*The technical adequacy review identified the following sources of model uncertainty and potentially non-conservative model assumptions:* " - If non-conservative model assumptions are being listed, the conservative ones, of which there are many, should also be so listed to give the reader a full picture of how modeling was conducted. It is also notable that "non-conservative" with respect to one thing (say, water supply from contact water runoff) is "conservative" with respect to something else (leachate volume reporting to GW).
Surface Water and Groundwater Quality	199	4-279	4.9.2.3	2	PRII	"*…actual long-term conditions for the proposed mine facilities could vary the rate of sulfide oxidation along with the leachate pH and/or leached analyte concentrations.* " - Please note for the reader here that actual long-term conditions (i.e. site data) show that acid generation has not occurred from historical mine waste despite exposure at surface for several decades. Circum-neutral to moderately alkaline baseline surface water and groundwater chemistry (and pit lake chemistry) also supports the assumption there has been no/limited acid generation from historical mine wastes.
Surface Water and Groundwater Quality	200	4-279	4.9.2.3	3	PRII	"*First-flush releases from the development rock material could cause short-term increases in downstream concentrations above and beyond what is currently predicted by the model* ". - Please note here (or correct this statement to note) that it is very likely the first flush chemistry will occur during operations and will be managed as contact water, therefore this will have minimal effect on in-stream concentrations.

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Surface Water and Groundwater Quality	201	4-279	4.9.2.3	3	PRII	"*Air temperature correction factors used to scale laboratory reaction rates to field conditions by the model could underestimate actual reaction rates and chemical releases from mined materials, and hence, surface water quality impacts.* " - The term 'correction factors' is misleading here. It should be clarified that *measured* (not arbitrary) air temperature data are used to scale laboratory data to field conditions.
Surface Water and Groundwater Quality	202	4-279	4.9.2.3	4	PRII	*"The surface water quality model predictions do not include mass loading inputs from permitted IPDES outfalls that would be required for the SGP* ." The statement that the surface water quality model predictions do not include mass loading inputs from permitted IPDES outfalls is incorrect. Treated effluent from the water treatment plant has been incorporated into the models and this bullet can be removed from this section. Reference to a water treatment sensitivity scenario should also be removed from this section.
Surface Water and Groundwater Quality	203	4-279	4.9.2.3	4	PRII	"*Additionally, mercury inputs from atmospheric deposition caused by the SGP have not been considered in the model.* " - As noted in the air quality section of this SDEIS, atmospheric deposition of Hg caused by project emissions represents a fraction of 1% of the background Hg deposition noted in the REMSAD model. This should not be cited as an uncertainty in the SW quality model when there are data available within this report that clearly indicate that this would have a negligible impact on SW quality.
Surface Water and Groundwater Quality	204	4-279	4.9.2.3	5	PRII	*"Model-predicted concentrations generated by the SWWC Model are for the dissolved fraction only and may underpredict concentration levels for constituents such as mercury that have been shown to occur in particulate form"* . The particulate form of the constituents that will be in surface water runoff will be managed during operations. A geosynthetic cover would be placed on the facilities at closure and overlain by an inert soil/rock layer and growth media and revegetated. These controls will limit the potential for particulates to contribute to constituent load in the surface water system. Please revise.

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Surface Water and Groundwater Quality	205	4-279	4.9.2.3	5	PRII	"*The lined Stibnite Lake feature would receive inflow from the cover material in contrast to the existing groundwater inflow* " - Add the word 'minimal' here before 'existing' as statement refers to inflow from bedrock.
Surface Water and Groundwater Quality	206	4-279	4.9.2.3	5	PRII	"*The current temperature model does not incorporate any potential cooling effects from subsurface inflow into the Stibnite Lake feature,* " - This should be identified as a conservative modeling assumption. Any groundwater influence is going to beneficial not detrimental to temperature.
Surface Water and Groundwater Quality	207	4-280	4.9.2.3	2	PRII	"*Qualitatively however, insufficiently effective closure activities and/or adverse changes in broader climate conditions could result in higher than predicted stream temperatures* " - Please note that in this case, the mitigation measures described in Section 4.9.3 would apply, and that "higher than predicted" stream temperatures would prevail in unaffected streams not just the SGP restoration projects. Please revise.
Surface Water and Groundwater Quality	208	4-281	4.9.2.3	2	PRII	"*At less than full design efficiency* " - This sentence is likely unclear to the reader. Suggest this intro clause should be replaced with "Even when shade is assumed to be only 40 percent of that designed..."
Surface Water and Groundwater Quality	209	4-281	4.9.3	6	PRII	"*Without this temperature reduction, stream temperatures downstream of the Yellow Pine pit area could also be greater than existing conditions* ". - This is a misleading statement especially in light of the 40% shade sensitivity analysis shown later in this Chapter. Also, in EOY27 when temperatures on the TSF are simulated to be the warmest, the temperatures downstream of YPP are within 0.4C. The context of the increase should be included in these types of statements through out this Chapter and the Fisheries Report. Please revise.
Surface Water and Groundwater Quality	210	4-281	4.9.4.1	5	PRII	"*Under the No Action Alternative, there would be no open pit mining or removal of legacy waste material at the mine site.* " - This disregards ASAOC activities. Please correct.

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Surface Water and Groundwater Quality	211	4-285	4.9.4.2	3	PRII	"*However, surface water quality changes caused by the 2021 MMP would effectively be irretrievable…* " - This is a misleading statement; most of the changes are positive, and towards restoring beneficial uses, particularly in Meadow Creek. Please revise.
Surface Water and Groundwater Quality	212	4-285	4.9.5.1	5	PRII	"*Under the No Action Alternative, there would be no open pit mining or removal of legacy waste material at the mine site.* " - This disregards ASAOC activities. Please correct.
Surface Water and Groundwater Quality	213	4-286	4.9.5.2	5	PRII	*"Under the Johnson Creek Route Alternative, long-term losses of groundwater and surface water productivity would be the same as the 2021 MMP except that transportation-related impacts to surface waters in the Johnson Creek drainage could be greater in nature and/or extent.* " - This is correct; please note that it contradicts a faulty assumption made in Section 4.9.2.3 (see comment above). Please revise the earlier section.
Surface Water and Groundwater Quality Specialist Report	214	30	6.2.1	Table 6-2	PRII	There appear to be calculation errors in this table, e.g. Yellow Pine percentages sum to 85%. Please validate.
Surface Water and Groundwater Quality Specialist Report	215	60	6.4.1.2	2	PRII	"*Greater variability is evident between the dissolved and total mercury sample averages. The variability in mercury results may be attributable to the generally low concentration values, differing amounts of particulate matter in the total mercury samples, laboratory protocol differences between the two studies, or different runoff conditions...* " - It is likely worth noting that the USGS specifically samples at highest flow events, so their Hg numbers are elevated relative to PRII, which normally samples in mid-May. Please include that in discussion.

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Surface Water and Groundwater Quality Specialist Report	216	65	6.4.1.3	4	PRII	"...much of the sediment entering the East Fork SFSR was derived from Sugar Creek, Meadow Creek, and East Fork Meadow Creek (i.e., Blowout Creek)". - Reclamation of EF MC is not discussed in sediment effects analysis, but is noted here as a significant source. Suggest clarifying this for the reader in the effects analysis.