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Public Comment

VOLUME 1.

Figure 2.4-15 Tailings Storage Facility underdrain system connects to an IPDES outflow point at the SW corner of the SODA pond. This TSF effluent will flow directly into Meadow Creek and bypass the Water Treatment Facility. This TSF underdrain effluent will be contaminated with multiple heavy metals in excess of water quality standards at maximum concentration as per the effluent loading tables. Despite this, only the "target" effluent standards are used for all following analysis and effects statements rendering them unrealistic and misleading. Why are average or maximum outflow concentrations not used in analysis of surface water quality?

p. 2-101 Use of rodenticides is discussed in table 2.4-12 with no description of which types/brands would be used, what quantities, and no assessment whatsoever of the environmental impact of rodenticides to wildlife, no proposed alternative such as integrated pest management, no disposal plan, and no mitigation strategies are presented. Rodenticides are a major cause of wildlife fatalities among mountain lion, owl, hawks, and other predators who endure long and painful deaths after ingesting one or more rodents containing blood coagulants or other lethal chemicals (van den Brink et al. 2018). There is new research to indicate that rodenticides may also pose significant risk to aquatic systems via sewage (Ajo et al. 2018). Rodenticides do not belong in wilderness areas.

p. 2-110 Limestone is the primary method for decreasing soluble heavy metal concentrations and moderating pH levels. However, no estimate is provided on the potential total volume of limestone that will be used throughout the mine's operation. Or, where the limestone will be sourced from and what is its purity standard. While limestone has benefits, there are unaddressed risks associated with its use such as: deposition of fine limestone particles in river beds and loss of substrate diversity, deposition of heavy metal particulates as the decreasing pH draws them out of solution, and inconsistent results of buffering at high flows. The project area has extremely high concentrations of arsenic, antimony, and aluminum that will be exacerbated by mining operations if allowed to proceed as planned. Additional mercury, lead, and copper exceedances are anticipated. The river systems that run through the impacted area and contact heavily contaminated water sources at multiple points (TSF run-off, underdrains, etc.), have very high flows in spring when the mountain snowpack melts. This is a critical time of year for fish migration and spawning and it is unlikely that any volume of lime will be able to neutralize the pH of high flow waters, being naturally acidic from snowmelt, and the result every spring for decades after mining ends that dissolved heavy metals will be carried for miles downstream impacting huge reaches of the Salmon River and generations of fish and all who eat them.

p. 2-144 Why are no alternatives provided to the destruction of 23 mature cone-bearing whitebark pine? Can they not be worked around? What is the anticipated effect of noise pollution and land clearing on Clark's nutcracker, and what are implications for the impending listing of whitebark pine?

p. 2-145 The loss of wetlands through drawdown or direct disturbance from mine construction (119 acres stated) is not included in the climate change impacts assessment. A low-end estimate of the carbon stored by wetlands is 81 metric tons (The Conservation Fund) per acre. Loss of these 119 acres in the SGP area could contribute up to 9,639 T of carbon, equivalent to 25,000 T CO_2, to the atmosphere via leaching, oxidation, and rapid

decomposition. Considering a truck emits 160 grams CO2 per mile, this loss of wetland-stored carbon is equivalent to driving a truck over 100 million miles, making the climate change assessment, that is based on engine combustion alone, completely irrelevant. Other impacts to climate change not addressed in the analysis are rock blasting, which is a significant source of NO2 and CO2 not accounted for in the GHG analysis.

Table 3.9-5 The Acid-generating potential (NAG) of the SGP ore rock is extremely high, with acidity as extreme as 2.6 pH (Alaskite), 3.4 pH (Quartz-Monozite-Alaskite), 3.6 pH (Granite). Quartz-Monozite-Alaskite has the highest risk and is the most abundant mined material in the SGP, comprising 26-40% of deposits in Yellow Pit, and 48-70% in Hangar Flats Pit. These ores will have the greatest impact to water chemistry at and downstream the project area, especially at the ore stockpiles and ore tailings pile. The tailings pile underdrain will flow directly into Meadow Creek, making acid-generation highly likely at this point and acid mine waste will not be preventable, or addressed until it is too late. This will become increasingly problematic post-closure as liners degrade exponentially over time. In addition to direct outflows and underdrains, ore tailings and open pit walls and backfill interact with the groundwater, and there will be no mechanism to prevent chronic or acute releases of acid mine waste contaminated with antimony, arsenic, aluminum, and mercury all above water quality standards. Lead (pb) leachability also exceeds standards (Table 3.9-6b), why is this not thoroughly discussed as a risk? The Quartize-Monozite-Alaskite Ore also has a NPR >1.5, beyond the threshold for potentially-acid generating material, creating an extremely strong likelihood of acid mine waste release.

Despite the major risk and suitable conditions for the development of acid rock pollution, the tailings piles will be contaminated with high levels of heavy metals and other pollutants that will dissolve into water even without acidic conditions. It is stated that "a few constituents are mobile under neutral to alkaline pH conditions, including aluminum, antimony, arsenic, manganese and mercury, which were frequently leached (in Humidity Cell Tests) in concentrations above the strictest surface water quality standard. In addition, sulfate, selenium, TDS, copper, cadmium, and zinc were occasionally elevated (p. 3-166)." Furthermore, the HCT test did not use first flush water flows and chemistries (p. 3-168), which can be fully anticipated to flush huge amounts of dissolved pollutants from the SGP far down the Snake River. These risks of acid waste rock generation and heavy metal contamination are clear as day in the tables and analyses, but are largely trivialized and unscientifically dismissed in the EIS text to create a misleading read of the true environmental impacts and destruction of the watersheds that can be clearly anticipated to occur. To be particularly negatively affected are the spawning reaches for Chinook Salmon, Steelhead, and Bull Trout in and immediately downstream the project area. Why is acid mine drainage so dismissed albeit highly probable?

Will cyanate be tested for in water outflows and water quality testing sites? What is the expected concentration? And impacts to aquatic life?

VOLUME 2.

The treatise outlined in pages 3-500 to 501 effective in years 1855, 1863 and 1868 are precedent to the General Mining Law of 1872. The Nez Perce Tribe Treaty grants "exclusive right of taking fish at all usual and accustomed places in common with citizens of the territory." The right of Perpetua to take fish via habitat loss is illegal by these terms. Furthermore, the General Mining Law of 1872 does not pertain to Perpetua Resources, as they are not an American Citizen, a requirement clearly stated in the Law.

Table 4.3-3 Why is ammonia not measured in air quality analysis?

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4.8.52 States that post-closure the streamflow system would "return to a stable seasonal pattern similar to existing conditions." Yet, permanent installation of geosynthetic liners in piles will increase overland flow and intensify peak flows. These peak flows disproportionately contribute to heavy metal source pollution from the

historic mine area to downstream reaches. Overland flow and peak flow will also be intensified by impermeable surfaces of mine facilities, parking, roads, and loss of tree cover. What is the anticipated increase in overland flow due to installation of impermeable surfaces?

Figure 4.9-1 What are "process losses?" Their quantity, composition, phase state, transport mechanism, and impacts?

Figure 4.9-1 With the anticipated degradation of geosynthetic liars, what will prevent the tailings slurry from leaching indefinitely and at an increasing rate post-closure? p. 4-211.

4.9-1 Why wont tailings storage facility outflow water be treated? It will contain water from open pits, ore stockpiles, tailings slurry, contact water ponds, process facilities, and truck shop, yet it is allowed to flow directly into Meadow Creek via IDPES outfall?

Table 4.9-9 What are the Predicted Maximum Concentrations in Water Treatment Plant influent for cyanide, cyanate, and TDS?

4-202 What is the purpose for reroute Meadow Creek over the seepage pond at mine closure? This decision will delay remediation, as slurry pond needs to sufficiently dry before revegetation and increases surface water contact with highly contaminated materials.

4-219 The basis for predicting operational and post-closure effluent water quality, and therefore stream quality, are based on "the MINIMUM of the predicted water treatment plant influent or the TARGET effluent concentrations was used." This basis for analysis will result in understated risks and the best case scenario, rather than the most likely case scenario.

4-219 Why will a temporary water treatment plant be permitted? Operations should not start until a permanent water treatment plant is up and running. What is the capacity of the temporary treatment plant? Are effluent standards, and predicted maximums, the same for the temporary and permanent treatment systems? How many years will construction of the permanent water treatment facility take?

4-207 What measures are in place to prevent or mitigate the event of a mass failure of the TSF buttress and embankment wall?

4-212 What is the standard error for the expected maximum water volume to enter the Water Treatment Plant? Is 100 year flood an applicable maximum given the anticipated increase in flood events due to climate change effects on precipitation trends? What are the anticipated volumes of water to be produced in the TSF and contact ponds, in relation to the Water Treatment Facility capacity? What is the remediation plan for contact water ponds?

Why is there no remediation plan for Hangar Pit or other mine pits that will have indefinite contact with groundwater and be an eternal source of heavy metal pollution to the local watershed?

4-219 The use of both Meadow Creek and the East Fork Salmon River spread the potential for contamination to two critical creeks, what is the justification for this? Flows could be increased with other water sources.

4-220 Climate change analysis does not include gaseous emissions predicted by the 2 stage alkaline treatment for cyanide reduction. Why not?

4-220 Will the water treatment facility be a permanent installation on the landscape, or will it be decommissioned and remediated to a natural state? At what timeline?

4-220 What is the explanation for the discrepancy between the predicted 25,000-50,000 g wastewater flow, but only 2,000 g per year effluent? How will 25,000 gallon/day flow affect flow rates in streams?

4-220 There is no quantification of sewage wastewater chemistry, or temperature? This debases any final analysis of mine impacts of fish populations as this is critical information. Many commonly used personal care products are not addressed in water treatment systems and can have deleterious effects on aquatic lifeforms, not addressed in the EIS. Why not?

4-224 Why are the IDPES Cyanidation Permit limits and requirements not incorporated into the analysis and final impact statements? The argument that fish habitat will be increased is a negligent statement given the exclusion of this data.

4-225 The West End Lake Pit is predicted to be a long-term source of Antimony, arsenic, mercury during operation and post--closure. This pit interacts with ground water and will be a source of heavy metal pollution downstream for the indeterminable future. Antimony is toxic to embryonic and larval stages of fish at very low levels (Nam et al. 2009). Arsenic exposure in the aquatic environment causes bioaccumulation in aquatic organisms and can lead to physiological and biochemical disorders, such as poisoning, liver lesions, decreased fertility, cell and tissue damage, and cell death (Bears et al. 2006; Ribeiro et al. 2005). "Mercury is one of the most serious contaminants threatening our Nation's waters because it is a potent neurological poison in fish, wildlife, and humans.. (USGS 2018)."Arsenic and lead will alos exceed water quality standards in teh Hangar Pit backfill (Table 4.9-15). The claims made in the cumulative effects section that fish habitat will suffer no net loss, and rather, wil be expanded under the operation of SGP alternatives, is completely debased and unscientific given the multiple documented sources of heavy metal pollution that is certain to be sourced from tailings underdrains, contact water ponds, ore stockpiles, and backfilled pits. The EIS is highly deceiving in its description of cumulative effects to fish. Furthermore, there is no analysis whatsoever of the effects of anticipated heavy metal leaching on the aquatic invertebrate food chain, without which the fish populations cannot survive. I cannot state with enough emphasis the certainty, given the predicted water chemistries, that the project area will be inhabitable to fish populations, or for many miles downstream as heavy metals will be released and will persist in the environment, decimating invertebrate populations, accumulating in fish and other wildlife populations, and ultimately denuding the project area and downstream reaches of life and productivity. Why are water quality exceedances not thoroughly discussed in the cumulative effects on fish sections?

4-230 Where is the pit backfill coming from and what is the composition and toxicity of this material?

4-230 What is the potable water source for the mine workforce, during operation and for the decades post-closure that water treatment will be required?

4-243 The only reason that no exceedances are predicted is because the method for imputation was using the effluent targets, and not the anticipated maximums. Why? Under maximum metal concentration conditions, there absolutely will be exceedances and this is an extremely deceitful presentation of information considering the maximums are provided in tables and could very well be used in the calculations of effluent chemistry when compared to treatment effectiveness and capacity.

4.9-21 Upstream reaches of multiple streams flow through the TSF, adding a continuous source of water contact, and primarily acidic rainfall and snowmelt. Why not relocate the tailings pit to occupy one drainage, instead of 3? Given the predicted exceedances of antimony from multiple documented sources (TSF, contact ponds, ore stockpiles, open pits), why is antimony predicted to decrease post-closure, but arsenic predicted to increase?

4-252 Given the increases in antimony, arsenic, mercury, and lead, why are "effects on surface water concentration expected to be negligible?" This seems like an unfounded claim given the data provided in multiple

tables.

4-225 The concentrations of antimony and arsenic and mercury in groundwater from contact with the West End Pit will be permanently above water quality standards. Why are the effects of these heavy metal exceedances on fish, humans, invertebrates, and waterfowl not discussed or incorporated into the cumulative effects section?

Fencing around toxic pits, ponds, and pilings is mentioned, but no mitigation for waterfowl. Waterfowl using and feeding in these locations will be diseased and pose a risk of bioaccumulation to predators. What will prevent this?

4-283 Will revegetation be delayed permanently if water temperature fails to meet standards?

4-285 It is stated that there will be no surface water impacts because it is a renewable resource? What does this mean, given the indefinite contact of surface water with multiple sources of contamination within the project area?

4-285 Where will material from the SODA and Bradley pits be relocated or remediated?

4-348 What is the rationale for stating that a spill would have effects that are "moderate, temporary, and localized?" Wouldn't a major spill have effects that are severe, permanent, and widespread. The risk of a spill is extremely downplayed in the EIS and very little information or analysis is provided on the potential environmental impacts. The EIS is written with extremely rose-colored glasses and I pray that officials use the data in the tables and there own minds to see the clear and present danger posed by mine operations in this location with extremely high naturally occurring heavy metal concentrations, multiple headwater streams running through contaminated mine material, and a poorly-conceived water treatment plan that allows multiple sources of contaminated water to go untreated and rather run through effluent out-pipes. Even if concentrations at the point of release are below standards (which would be extremely unlikely given the data) the accumulation of these metals downstream and in the Salmon River watershed food chain are highly likely and will not be measurable until mediation is far too late. The cumulative effects statement only speaks on the physical habitat distances expected to be physically accessible, and does not consider the poor water quality that will occur in these reaches. I pose to officials, would you eat a fish reared below the TSF? Because numerous wildlife will.

Why is underground mining not considered as an alternative? When an open pit mine has never been able to operate without severe environmental contamination in the history of the United States.

4-367 Impacts to Steelhead and other fish are categorized under "water temperature" "flow productivity" "intrinsic potential" and "critical habitat". There is no criteria for water quality, which will create toxic conditions for fish embryos, larva, and critical invertebrate food sources that are not analyzed in this impact statement.

How can the mine be approved without an analysis of water quality impacts on stream invertebrates or fish? Besides fish, many other riparian insectivores rely on sensitive populations of stream invertebrates such as birds, amphibians, and bats, including the big-eared bat. Are loss of food sources included in wildlife cumulative effects statements?

4-434 Why are there no acreage estimates for bald eagle habitat or big eared bat?

The alternative action option of "no mine" is not seriously considered in the EIS despite its clear benefits to human health, water quality, endangered species, aquatic food chains, and fish. Why is the EIS written without due attention to the no action alternative?

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