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Comments: I am writing as a concerned resident of Patagonia, AZ. I am 36 years old and have lived in Patagonia for 9 years. I am currently building a house with my partner and planning our family, so I am deeply invested in the community and landscape and have contributed significantly to the local economy. I work in the field of ecological restoration and am currently pursuing a Masters of Natural Resources, so my perspective is coming from my botanical and sustainable natural resource management expertise. Furthermore, my work is highly dependent on the sustainability and health of non-timber forest products on the public lands surrounding Patagonia. Below are my concerns and questions that I would like to see addressed in the EIS:

The shallow aquifers that Patagonia and eastern Santa Cruz County depend on recharge at a slow rate that relies on large precipitation events that are increasingly unpredictable. Therefore, the continued unchecked overdraft of groundwater threatens access to clean water for future generations. South 32's dewatering process threatens to lower the water table due to the "cone of depression" effect, potentially reducing the sustainability of freshwater resources by compromising future water availability. Although South32 describes groundwater recharge occurring passively through streamflow driven by dewatering discharge in their plan of operations, large evaporation losses are likely to occur in the process, resulting in a net reduction in aquifer recharge. South32 also proposes the use of "Rapid Infiltration Basins" but how will evaporation be addressed in a hotter, drier future? How will these practices account for changes in recharge rates due to climate change?

The already fragile forest habitats that are relegated to the high elevational reaches of the Madrean Archipelago are expected to experience an elevational shift due to global warming, causing the threat of shrinking biomes that may eventually disappear, decreasing biodiversity. Dewatering practices could result in the rapid lowering of the water table and if drought causes insufficient aquifer recharge this could result in large-scale die-off of deep-rooted trees in the Patagonia Mountains whose survival depends on water availability. Climate models all suggest hotter drier regional conditions which would increase fragmentation caused by an elevational shift of montane habitats. Long-term industrial groundwater exploitation could compound the effects of climate change, both potentially having adverse effects on the most dominant keystone species of the Madrean Archipelago, the Emory oak (*Quercus emoryi*). Emory oak decline would alter forest structure and composition, potentially causing a cascade effect that could negatively impact species richness and the ecological integrity of this biodiversity hotspot. How would the effects of dewatering and disturbance regimes on an already drought stricken ecosystem be addressed?

Mine wastewater discharge into streambeds can negatively impact the ecosystem at and around the discharge site, as well as downstream, due to chemical runoff and the lowering of the water table. Riparian ecosystems are sensitive to water quality in addition to water quantity. Toxic contamination of surface water from metals in mine wastewater discharge can accumulate in fish tissues and can alter species structures in invertebrate communities as well as affect vegetation. To address this and other concerns, I would like to suggest the requirement of independent monitoring to track impacts and gauge mitigation effectiveness during the life of the project.

Groundwater management practices should anticipate increased climate variability and population growth. In striving for a strong sustainability model, resource management plans must prioritize ecosystem health and account for the environmental limits that constrain human economic and social needs. Doing this requires the balance of groundwater exploitation with recharge, and accounting for climate change induced precipitation variability and shifts in demand that diverge from historic norms due to population growth. In a time of climate uncertainty, management plans for a resource as critical as groundwater must not depend on reference conditions for precipitation, withdrawal, and recharge. Rather, resource managers should develop adaptive

management plans that are informed by climate models, hydrological models, remote sensing data, and seasonal forecasts so they can have the flexibility to adjust as needed in seasons with low recharge rates. How will South32 account for recharge rates when future precipitation patterns change? In drier years will dewatering practices adjust?

How will the USFS balance the needs of supporting healthy non-timber forest products to provide the source material for numerous regional revegetation projects with the potential impacts to vegetation due to ground disturbance from mining activities?

In their 2021 study in South Africa based on participants with environmental exposure to manganese due to proximity to a smelter, Racette et al found that exposure is associated with parkinsonism, even at significantly lower exposure levels than current allowable thresholds in the United States (Racette et al, 2021). What accountability structures are in place for unpredicted water contamination or air borne contaminants that could cause exposure that could impact public health?

South32 describes detailed engineering for containment of ore, treatment of wastewater, and containment of tailings stacks, in their plan of operations. However, the legacy of 20th century mines that resulted in acid mine drainage and heavy metal contamination has made numerous residents of Patagonia and eastern Santa Cruz County distrustful of the effectiveness of accountability structures meant to safeguard residents from failed mitigation strategies. Studies that have challenged the perception that modern mining methods are vastly improved from historic techniques have compared hard rock mines' predicted impacts of activities on water quality versus observed impacts. These studies underscore local distrust by showing that in a study of 25 US mines, 100% expected total compliance with water quality standards prior to operations, but only 24% did not exceed the criteria for acceptable levels of metal contaminants in water, and 64% of mines in the study failed to mitigate water quality contamination (Maest et al. 2005; Kuipers et al. 2006). Again what accountability structures are there to protect ecosystems and local communities from failed mitigation? What independent monitoring is planned?

One of the United Nations' 2030 Sustainable Development Goals (SDG) is SDG 7: Affordable and Clean Energy. In the summary for this goal there is a line that says, "we must accelerate electrification", while little is mentioned about social causes for intensive energy consumption or the inequitable distribution of the benefits and harms of energy production and consumption across space and time and along sociocultural lines. Because the efforts required to achieve the goals of SDG 7 will drive deforestation, development in the transportation, mining, and energy sectors will undercut sustainable development goals related to forests, clean water access, and land-based living, such as SDG 15: Life on Land. How will the public be ensured that industry-driven energy development goals will not come at the cost of forest-development goals?

The amount of cement required for back-filling tailing stack piles is immense. Between this and the machinery required to develop the infrastructure for the mine, and the industrial processing required, what is the carbon footprint of the minerals extracted from cradle-to-grave and how will this compare to the carbon offset from the emissions reductions achieved?

How will the activities of this project reduce tradeoffs between short-term economic benefit and long-term water security, or between global climate goals and local deforestation? How will the USFS mission of intergenerational equity as it relates to natural resources and ecosystem services be addressed?