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JAN LESHER
County Administrator

March 11, 2024

Arizona Dept. of Environmental Quality
Water Quality Division/Groundwater Protection
Attn: Bernice Manuelito
1110 W. Washington St.
Phoenix, AZ 85007

Re: **Copper World Operations; Aquifer Protection Permit No. 513690, LTF 90620**

Dear Ms. Manuelito:

Pima County, Pima County Regional Flood Control District, Pima County Regional Wastewater Reclamation Department, and Pima County Department of Environmental Quality (collectively referred to here as Pima County) submit the attached comments on the above-referenced draft Aquifer Protection Permit (APP) for Copper World Operations.

As reflected in the attached comments, Pima County is concerned that in several important respects the design proposed in Hudbay's application is even less protective of the environment than designs submitted by previous owners of the original Rosemont Mine Project. Under this current application, Hudbay proposes to use water to convey tailings in a slurry pipeline, operate an unlined tailings facility, leave waste rock dumps uncovered at closure, and deploy inadequate monitoring systems. The planned processing facilities include a heap leach and other facilities that will process significant amounts of acid, and they will be located much closer to Tucson and Sahuarita's municipal water supplies and rural domestic wells than was formerly the case.

Pima County respectfully requests greater deployment of industry standard technologies for minimizing pollution, and we ask that ADEQ require the additional permit conditions, design requirements and agency reviews detailed in our comments to better ensure the design of this mine is more protective of the aquifer.

Where ADEQ is unable to require the deployment of industry standards to minimize pollution, ADEQ should encourage Hudbay to voluntarily incorporate such standards. ADEQ's Best Available Demonstrated Control Technology is no longer the "Best Available" when it is outdated and less than industry standards. Compromising the quality of our community's

Arizona Dept. of Environmental Quality, Attn: Bernice Manuelito
Re: **Copper World Operations; Aquifer Protection Permit No. 513690, LTF 90620**
March 11, 2024
Page 2

water supply due to outdated standards in Arizona law in the name of reducing Hubday's costs is unacceptable.

We appreciate the opportunity to comment on this matter and the time ADEQ staff have taken to meet with us and the community, but our community deserves more protection than this.

Sincerely,



Jan Lesher
County Administrator

Attachment

c: Honorable Chair and Members, Pima County Board of Supervisors
Carmine DeBonis, Jr., Deputy County Administrator
Francisco Garcia, MD, MPH, Deputy County Administrator and Chief Medical Officer
Steve Holmes, Deputy County Administrator
Scott DiBiase, Director, Environmental Quality
Nicole Fyffe, Interim Director, Conservation Lands and Resources
Jackson Jenkins, Director, Regional Wastewater Reclamation
Eric Shepp, Director, Regional Flood Control District

Copper World Aquifer Protection Permit: Pima County Staff Comments

Staff have reviewed the application materials submitted by Hudbay Minerals as well as the proposed Copper World Aquifer Protection Program (APP) draft permit # P-513690. The following comments are submitted on behalf of Pima County, Pima County Regional Flood Control District, Pima County Regional Wastewater Reclamation Department, and Pima County Department of Environmental Quality, collectively referred to here as Pima County. The comments are organized in the order of the draft permit terms.

In general, the mine's design should be made more protective of the aquifer through additional permit conditions, design requirements and reviews by your agency. In several important respects, Hudbay has proposed a design that is inherently less protective of the environment than was the case for the Rosemont project under Augusta. Hudbay will use water to convey tailings in a slurry pipeline; they propose no liner under the tailings facility, no cover for waste rock dumps at closure, and inadequate monitoring systems. The processing facilities now include a heap leach and other facilities producing and using much acid, and they are located much closer to Tucson and Sahuarita's municipal water supplies and rural domestic wells than was formerly the case. Local communities deserve greater protection from pollution than is reflected in the draft permit conditions as currently written. Our comments call for greater deployment of permit conditions and standard technologies for minimizing pollution.

Authorization

1. The permit is premature. Hudbay has not yet applied for Bureau of Land Management (BLM) permissions for the construction of the tailing slurry pipeline, the tailings seepage return pipeline, and re-construction of the tailing facility roadway across federal land as shown in the APP and air quality permits. The ponding caused by the waste and tailings facilities may also impinge federal lands. A state right-of-way permit has been issued, but it is not clear if it is legally valid for the pipelines. Federal or state requirements may affect the location, design or permissibility of these facilities.

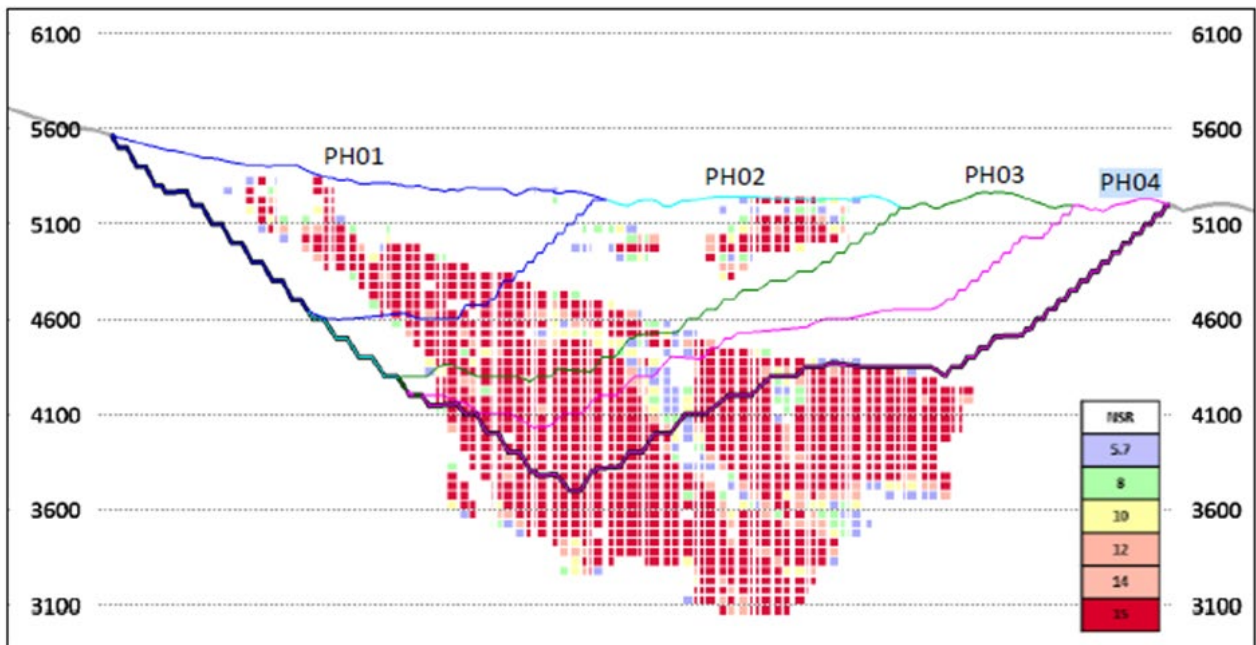
Given licensing timeframes, Pima County understands Arizona Department of Environmental Quality (ADEQ) must respond to the application, however we request that if a state permit is granted, the permit be contingent on receipt of all applicable federal and state permits, and the initial term be restricted to Phase 1. Further, we request that the permit be restricted to the operation of the concentrator, not the heap leach facility, of Phase 1 alone. Hudbay representatives indicate to Pima County that the heap leach is not part of their current plan of operation, consistent with their 2023 Pre-Feasibility Study (PFS). An amendment could be used to add the heap leach later.

Facility Site Description

2. Pima County believes that it is intentionally and inappropriately misleading to say this is a permit for a 15-year project, when the actual term of the permit is valid until suspended or revoked by ADEQ. The entire Copper World project has an extended 30+ year Phase 2 to begin once Hudbay can acquire the necessary federal permits that have so far impeded their progress towards permitting of the original Rosemont Copper project. While a two-phased

approach was presented in the 2022 Preliminary Economic Analysis (PEA), their 2023 PFS claims that Hudbay has redesigned their plan into a single 20-year plan with four smaller phases. However, the APP application discusses a mine life of 15 years, indicating that their plan is once again for this Phase 1 and Phase 2 as presented in the PEA. The figure below is from Section 16.2.3.2 of the PFS and although Hudbay claims that the bold purple line represents their final phase of their 20-year mine life, it is clear and obvious that they are simply positioning the pit to go back and process the remaining ore body as modeled by red. It is difficult to believe that Hudbay will do all this work, construct these facilities, and then leave the remaining ore body unmined. As mentioned earlier, the only reason they cannot do it from the beginning is because their resultant pit would be too wide and the extra waste would need to be deposited onto federal lands. The private lands they currently hold are not large enough for the waste material. In granting the permit, ADEQ should acknowledge to the public that this permit, as amended, could be active for at least 45 years.

FIGURE 16-7: SECTION A-A' – EAST PIT MINE PHASES



3. Pima County requests the addition of the East Pit as an APP-regulated facility under the Copper World permit. ADEQ is obligated to evaluate whether or not the East pit is a discharging facility under A.R.S.§49-241.A. It is claimed in the application and supported by studies that the Rosemont Pit will eventually become a hydraulic sink, and is therefore not a discharging facility. However, this behavior of hydraulic sink will take time to establish. During initial pit construction and operation, the pit may not act as a hydraulic sink. The applicant has not demonstrated that the discharged pollutants will be captured and hydrologically isolated in the depressed water table around the pit at early timeframes. Additionally, the use of the dewatering volume used to maintain the hydraulic sink during closure and post-closure have not been addressed.

Copper World Aquifer Protection Permit: Pima County Staff Comments

4. Pima County requests that any east-side discharge of water from the East Pit dewatering wells be considered an APP-regulated facility with monitoring. Such discharges to the land surface are proposed in the APP application on page 45. For comparison, Pima County operates its smallest water reclamation facility (WRF), the Mount Lemmon WRF, on bedrock outside an aquifer and discharges a miniscule volume compared to Copper World's proposed discharges, yet is required to get APP permit coverage. It is inconsistent with APP requirements to exempt Copper World's discharge activities from permit coverage.
5. The Rosemont pit dewatering analysis (Neirbo 2016) and Final Environment Impact Statement called for 18,500 acre-feet of dewatering to assure pit stability, mostly in the first two years of construction. The Copper World Site Water Management Plan identifies the groundwater discharge at 296 gallons per minute, and this far exceeds dust control requirements. Because the pit is located outside the Tucson Active Management Area (TAMA), water derived from dewatering cannot be conveyed to the mine facilities on the western side of the mountains. Please have the applicant identify the location of any discharge to a watercourse and acknowledge that the discharge may be contingent on federal land permissions and compliance with their Multi-Sector General Permit (MSGP; see AZMSG2019-002, section 1.1.3.1.10).
6. The geology is complex and it can't be assumed that the pumped groundwater has the same water quality as surface water at the discharge point. A water quality monitoring plan and action to control downstream erosion and sediment discharge should be provided.
7. Pima County requests that ND-GS-05 Tailings Slurry Pipeline(s) be included as APP facilities. No design has been submitted, and the location is unclear. The APP application merely states it will be double-walled and operated so as not to discharge.
8. Pima County requests that the return pipeline from Tailing Storage Facility (TSF)-1 be included as an APP-regulated facility. A design should be submitted for review. The pipeline is shown to cross BLM land for which no permission has been secured. Both the tailing slurry pipeline and return pipeline have the potential to create large discharges to the aquifer.
9. Pima County requests that exemptions not be granted for the following facilities: NP-PS-20-Bulk Cu/Mo thickener, ND-PS-23-Tailings Thickeners, and ND-PS-26-Concentrate Leach Fine Grinding Plant. As noted by ADEQ in their letter of April 21, 2023 on page 6 of 43, these facilities have the potential to overflow or discharge.
10. The upstream ponding areas for the stormwater drains should be evaluated in a stormwater management plan to determine if ponding will result in "contact". If so, they should be considered APP facilities.
11. The description of the discharging facilities needs clarification of what goes into each facility, where overflows/upsets go, transport method (pipeline, spillway, etc.) and at what rate. For example, 2.1.1.1. describes that tailings will be placed there using a started dam, the centerline method and hydro-cyclones, and an underdrain seepage collection system; however, it does not say that the reclaimed water goes to the PSP nor does it identify how water from TSF-1 is transported to AR-TF-03. Figures 4 and 5 (Application, Appendix A) show a buried tailings

Copper World Aquifer Protection Permit: Pima County Staff Comments

pipeline (ND-GS-05) that takes materials to TSF-1. Is there another pipeline transporting the reclaimed water from a lower elevation to the invert of AR-TF-03? Given that the recovery system is essential to prevent oversaturation resulting in tailings failure or runoff of contaminated water, this information must be added to the draft permit. The rate, or range of rates, is important to verify the design components are sized to function properly.

12. The Processing Stormwater Pond has a capacity of 18.8 acre-feet to hold runoff from the plant site (~110 acres from the switchyard to the crusher dump pad) for the 100-year, 24-hour storm event. Using the Helvetia Santa Rita Range station (ID 02-3981), this storm event is 4.64 inches. The runoff generated from this event is $(4.64/12 \times 110 =)$ 42.5 acre-feet, which is larger than the capacity of the Processing Stormwater Pond. Something is not adding up with this calculation and draft permit and the Application, Appendix E, Site Water Management Plan (Wood, June 24, 2022). Please explain.
13. Pima County requests that ADEQ correct their identification of a sulfuric acid solution as a weak acid. The fourth paragraph of Section 2.1 of the Copper World Draft APP Permit refers to the acidic leaching solution (dilute sulfuric acid) as a "weak acid solution" that percolates through the stockpiled material. Sulfuric acid (H_2SO_4) is a strong acid, regardless of concentration, and it is inappropriate to call it a weak acid solution. In Chemistry, a strong acid such as sulfuric acid undergoes complete disassociation in an aqueous solution, releasing all of its hydrogen ions (H^+) into solution. In contrast a weak acid has very different chemical characteristics, and only partially disassociates in water and therefore releases only some of its hydrogen ions.

Financial Capability

No comment.

Best Available Demonstrated Control Technology (BADCT)

14. Pima County requests that reference to site-specific geology as BADCT should be stricken. Site-specific geological characteristics are cited as BADCT in the draft permit. The applicant characterizes the site geology as limiting and compartmentalized, therefore long-distance groundwater transport should be minimal. This expectation is contradicted by studies referenced in the Rosemont EIS and subsequent isotope studies indicating that recharge in the mountains contributes to discharge at distant springs and streams downgradient in the Cienega valley. Long-distance transport of seepage from Copper World on the westside is also expected based on the particle analysis.
15. Pima County requests verification of the flow model used to demonstrate the East Pit's hydraulic sink can be maintained through construction, operation and closure, not just monitoring and reporting of aquifer levels. Model verification was formerly required as part of the Rosemont Project's safeguards.
16. Pima County requests that ADEQ consider how sustained discharges of pit water to the washes may affect the development and maintenance of the hydraulic sink conditions at the East Pit.

Copper World Aquifer Protection Permit: Pima County Staff Comments

17. When passive containment is used, the statutes still require the facility to employ "additional processes, operating methods, or other alternatives to minimize discharge." Instead, Copper World proposes to discharge excess water from the East Pit to watercourses if there is too much to be fully used in dust control. While there could be some value to this in terms of supporting wildlife habitat in washes downstream, it is not demonstrated that surface water quality standards could be protected. Pima County therefore requests that additional measures be considered in addition to passive containment and discharge to washes, especially if the dewatering discharge water chemistry shows contaminants are present above surface water quality standards.
18. ADEQ should analyze and disclose the advantages and disadvantages of backfilling the East, Peach and Elgin pits and should include the opportunity for water conservation due to reduction of evaporative loss in their BADCT analysis. The assumption that contaminants will not move from the East pit to the aquifer is based on modelled parameters that may not be real or achieved.
19. Incomplete surveys for shafts, adits, and previous boreholes threaten the integrity of the waste and tailings disposal systems. Pima County requests that the APP permit require a complete survey to identify adits, shafts and other voids. Pima County appreciates that ADEQ's proposed compliance schedule requires closure report for each shaft and adit within the HLF and TSF footprints, but without a complete survey of voids including previous boreholes and including the waste disposal sites, some opportunities to reduce pollutant movement to the aquifer will be overlooked.
20. We share ADEQ's concern that the water in the Elgin pit lake could become elevated above water quality standards for arsenic, antimony, cadmium, and thallium. We request backfilling the pit with NAG waste rock to reduce the risk. This would also reduce the perpetual waste of water that pit lakes represent.
21. Pima County requests that ADEQ require a Stormwater Management Plan which clearly contains, within a single document, the design calculations and design plans for perimeter drainage channels, stormwater collection galleries under TSF and HLF, perimeter containment areas, retention / detention basins and pools on the Tailings and Waste Rock Disposal Facilities final cover system and disposal mound side slopes, and all planned perimeter containment areas where surface water will be trapped against the base slope of the tailings and waste rock disposal mounds.
22. Pima County has specific concerns about the stormwater collection galleries to be used under the tailings storage and heap leach facilities. Given the length and size of these pipelines there are concerns about:
 - Maintenance and long-term performance;
 - Potential cross contamination by tailings water seepage and associated downstream surface water quality impacts should there be cracks or ruptures due to settling;

Copper World Aquifer Protection Permit: Pima County Staff Comments

- Performance of the upstream stormwater collection system and the potential for long-term ponding against the sides slopes of the TSF and HLF creating the slope instabilities should portion of the pipelines fail; and
 - Upstream and downstream impacts to federal, state and private properties.
23. Pima County requests that ADEQ require routing of non-contact water around the tailing and heap leach facilities, without reliance of underground conveyances.
24. If drains for storm water are used under the tailings, then the design consideration must include calculation of upstream ponding impacts should the storm drains fail and cease to function. This analysis should include whether the potential ponding results in contact with tailings or heap leach materials and whether the ponding be significant enough to result in stormwater developing a new flow path or impact other property owners.

ADEQ voiced similar comment, Item 12, about the clogging of the proposed 36-inch collection pipes and the collection galleries. Hudbay's April 21, 2023, response was that protection inlet grates would be used and design gradients will aid in flushing debris. Their letter further noted such design has been in use at the Carlota Mine in Miami, Arizona, since 2007. This is a short time period given the lifetime of both operations and post-closure, and does nothing to assure safety of a design.

Hudbay's response (in the same April letter to ADEQ) did not mention potential impacts from upstream stormwater ponding onto adjacent lands at their proposed stormwater collection sites which includes at one location a small dam. Analysis of upstream impacts should be included in their Stormwater Management Plan.

25. The Dam Break Analysis memorandum maps of incremental impacts at each TSF cell contain the note stating: *The information shown is approximate and should be used for emergency preparation and response.* We think it should read "should *not* be used for emergency preparation and response". Please verify whether this information is intended to be used for these purposes.
26. Given potential impacts to downstream properties, utilities, roads, and other facilities and improvements, Hudbay's *Contingency Action Plan* mentions local authorities should be contacted immediately and emergency services should be arranged. In the case of potential failure or a breach at a TSF, we advise that the closest downstream residences (residents) should be notified.
27. In Hudbay's *Emergency Preparedness and Response Plan* for the Tailings Storage Facilities for TSF failure response, "authorities" must be notified. There are no details on which local authorities should be notified. Both of these plans require more detail on notification actions including identifying the Fire District and Pima County's Office of Emergency Management.

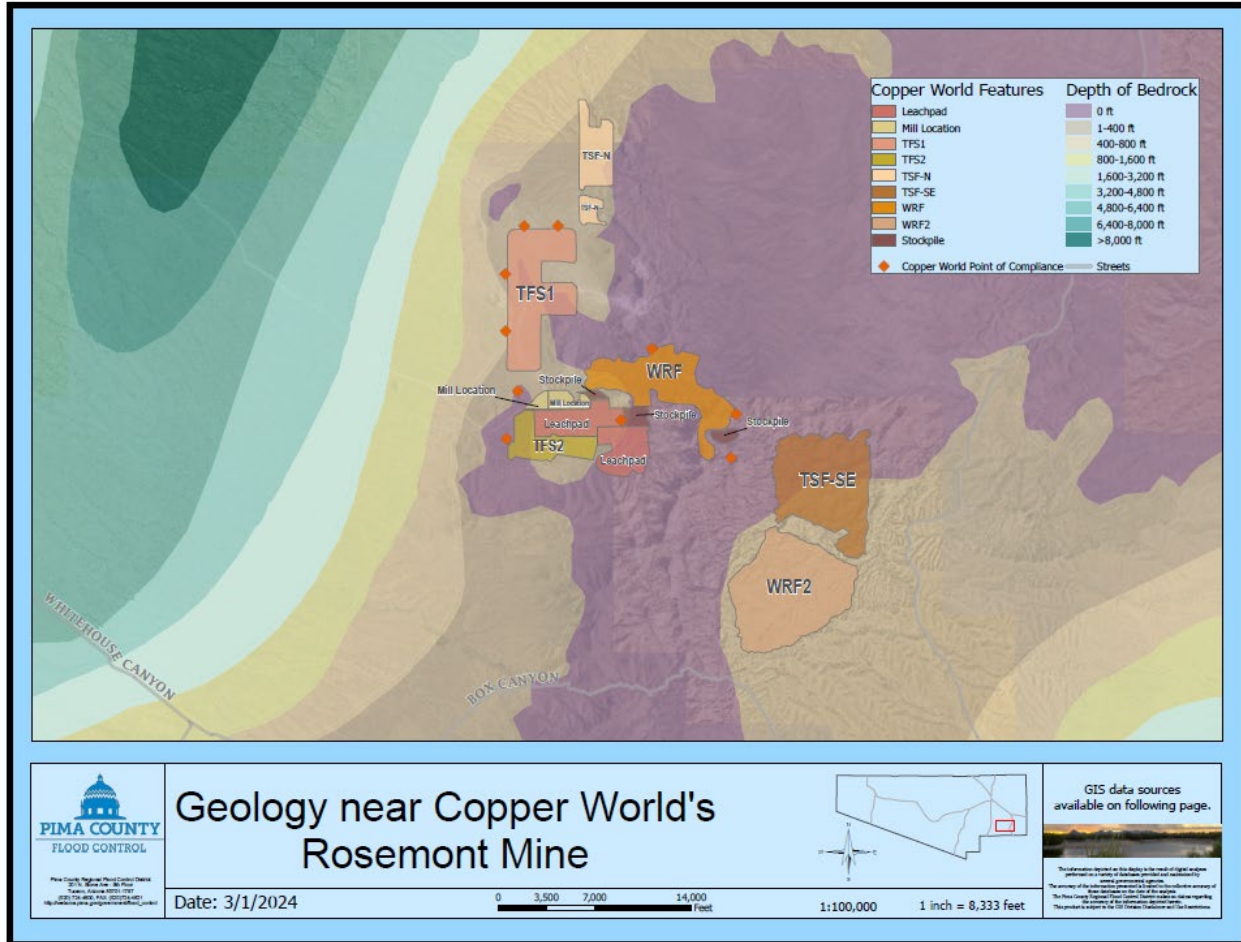
28. The TSFs and associated seepage collection system must be lined. We offer two supporting reasons: 1) Hudbay's individual BADCT justification is based on inaccurate site descriptions. The suggestion that the groundwater is limited and discontinuous and that there is no appreciable groundwater flow or travel over distances is proven false by Figure 70-1 from Attachment 31 of Hudbay's response to ADEQ's initial Request for Additional Information (RAI). 2) It is inappropriate for ADEQ to approve an individual BADCT plan for the TSFs that is less protective than the prescriptive BADCT. It is clear that lining the TSFs is more protective of the aquifer. Text below provides more detail on the flawed justifications for individual BADCT.

Inaccurate Site Descriptions

The site description in Section 10.4.1.2 of the application does not accurately represent the site description in the Hydrogeological Characterization Study (Appendix F.1). Section 4.3.9 for Appendix F.1 says that the TSF sites are underlain by thin Piedmont, Holocene, and Pleistocene alluvial deposits, and that these sections are no more than 400 feet (ft) thick. A 2023 isopach map based on additional borings and field observations of outcrops and test pits show that the alluvium under the TSFs mostly ranges from 0-30 feet in thickness, and is underlain by granitic rock and limestone, some of which is "highly fractured". Appendix F.1. says that Alluvium units have high hydraulic conductivity, and "The depth to water measured at six monitoring locations at TSF-1 ranges from 20 to 90 ft bgs" (below ground surface,) and "The depth to water measured at three monitoring locations at TSF-2 ranges from 48 to 272 ft bgs". Appendix F.1 clearly remarks that both TSF-1 and TSF-2 are on alluvial deposits with high hydraulic conductivity, and a minimum depth to water of 20 and 48 bgs, respectively.

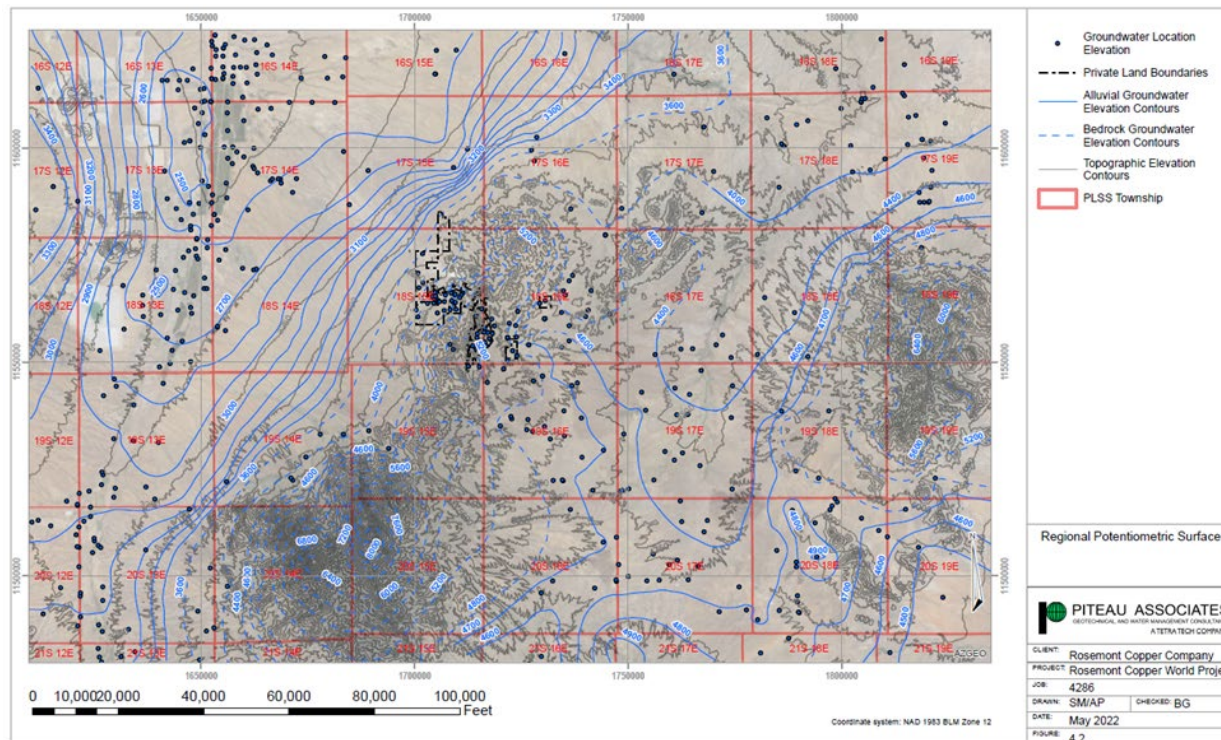
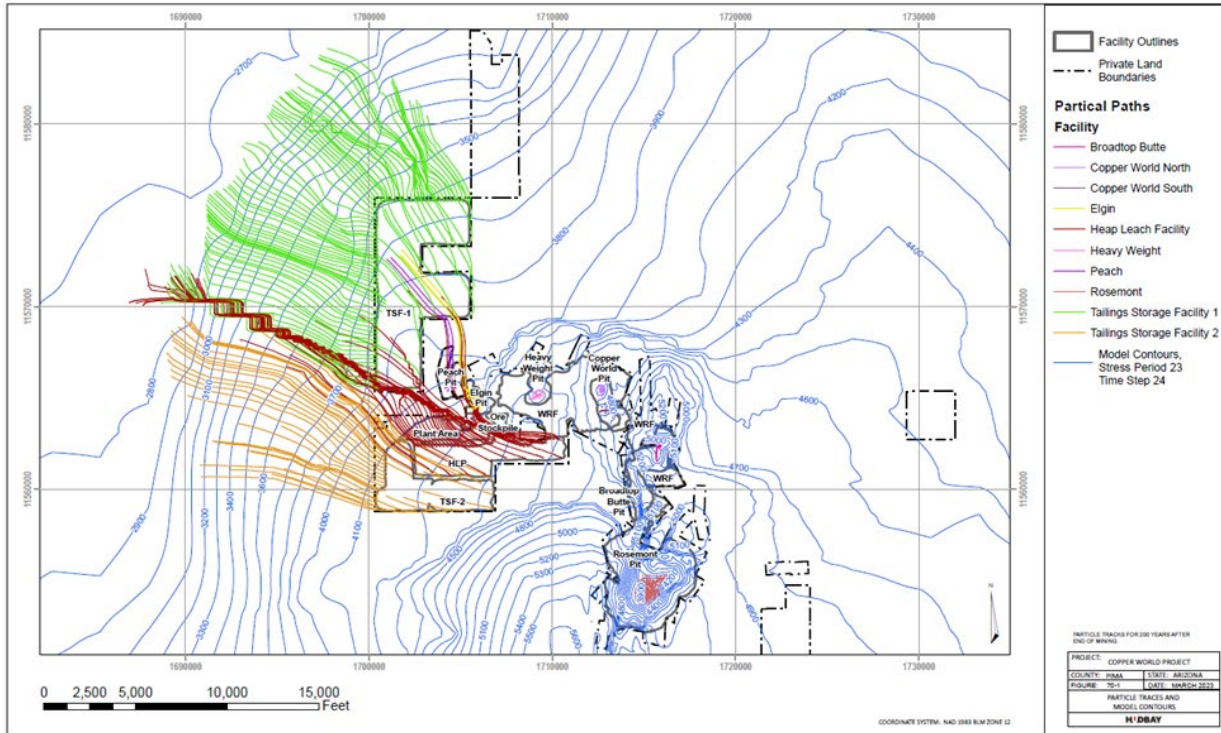
This inappropriate site description is perpetuated further in Section 2.2.2 (Site Specific Characteristics) of the draft APP. This four-sentence description is intended to be a summary of Pages 52 through 62 of Appendix F.1, in which Piteau Associates spent approximately 10 pages describing 9 different facilities, over a geographic area of several thousand acres, and across several geographic features such as mountain ranges and alluvial plains. It is completely inappropriate to imply that there is a single set of site characteristics that can accurately describe the entire Pollution Management Area.

The figure below provided by Pima County Regional Flood Control District shows the depth to bedrock. There is a large drop off in the bed rock which goes to 400-800 feet. This demonstrates the varied site conditions and the possibility for leakage through the bedrock and directly into the aquifer. The site-specific conditions given in the draft permit are inappropriate and are inadequate in managing pollution in the TSFs.



The particle traces and groundwater model contours as displayed in Figure 70-1 (below) from Attachment 31 of Hudbay’s response to ADEQ’s initial RAI is useful in demonstrating the hydraulic gradient and the mobility of pollutants discharged at certain points within the PMA. Not only does this figure demonstrate a clear hydraulic gradient to the northwest of the TSFs with the blue contour lines, but it also confirms via the particle traces (in red and green) that there is significant pollutant mobility for the TSFs and the HLP. The hydraulic gradient is again confirmed by Figure 4.2 (below) of Appendix F.1.

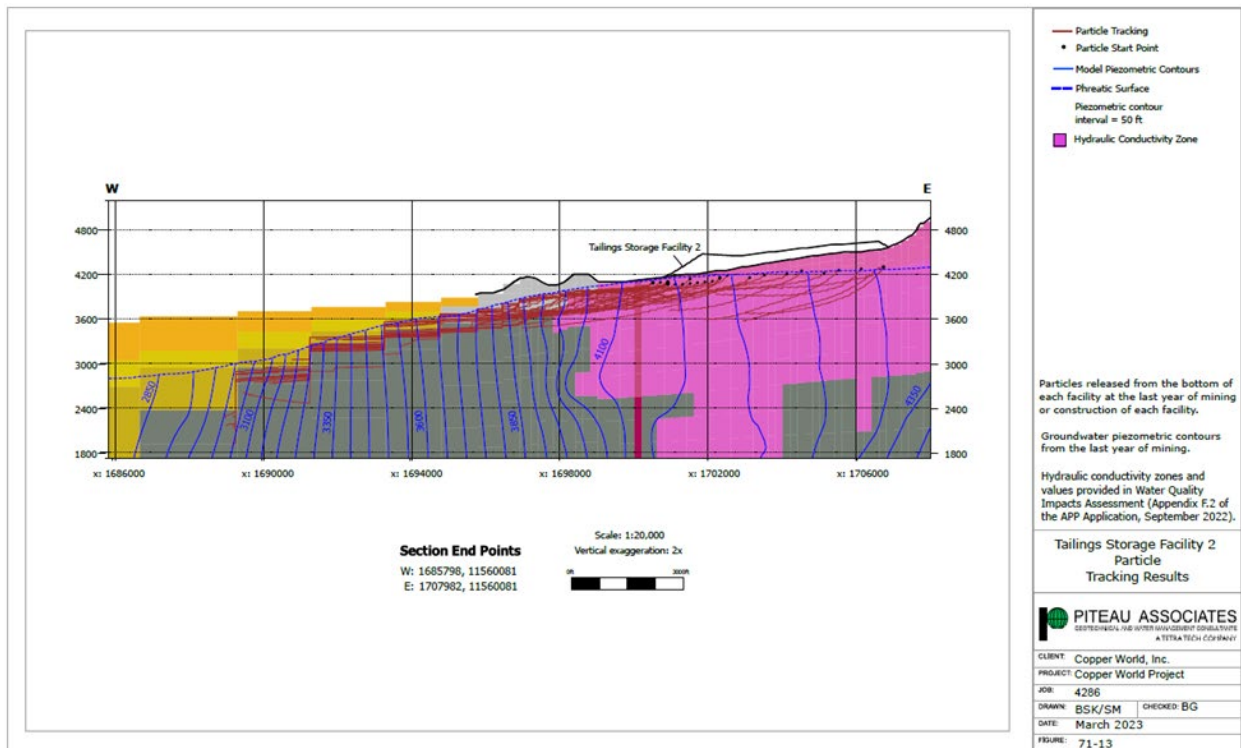
Copper World Aquifer Protection Permit: Pima County Staff Comments



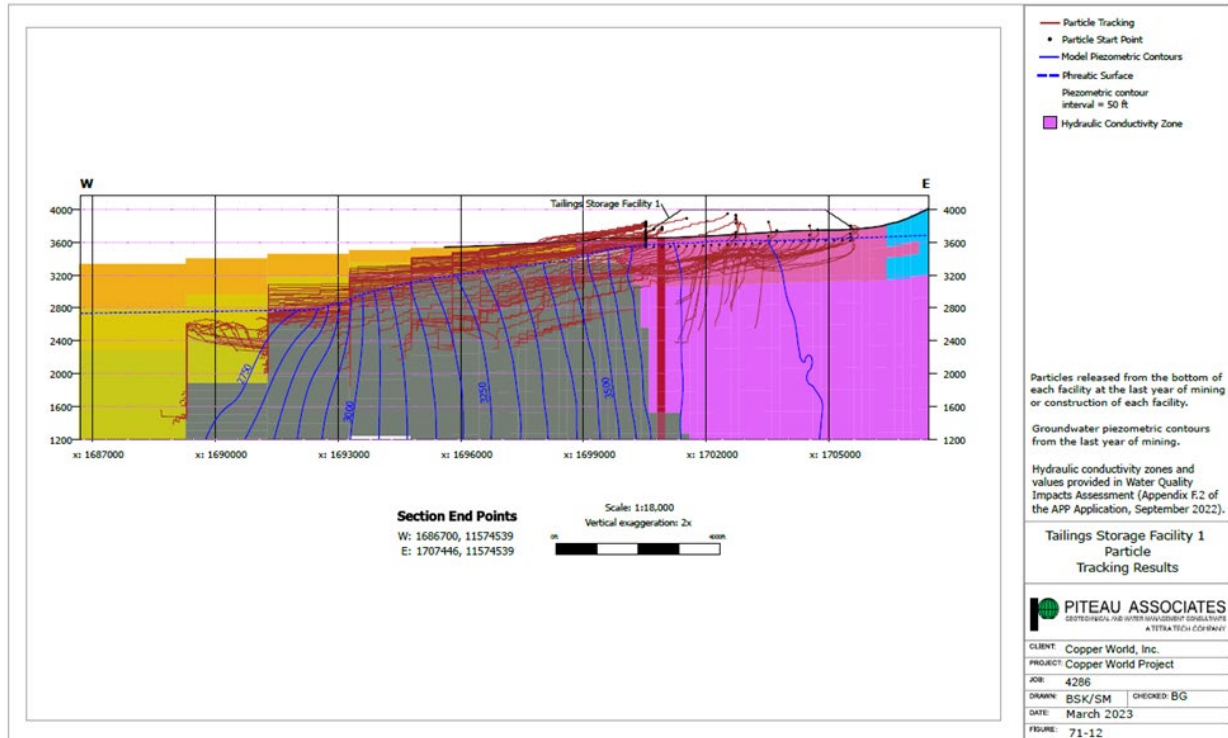
Additionally, Figures 71-12 and 71-13 (below) from Attachment 32 to Hudbay's response to ADEQ's initial RAI show the cross-sectional particle traces for TSF-1 and TSF-2, respectively, and further demonstrate the high mobility of pollutants downward and laterally. In the traces

Copper World Aquifer Protection Permit: Pima County Staff Comments

below, the model shows pollutants moving down and through the alluvium unit towards the Tucson Basin aquifer. The dashed line in these documents is the phreatic surface, and it represents the depth to water. When a particle tracking line has passed below the phreatic surface, it has effectively entered the aquifer. This should be no surprise, as it was previously stated that the depth to water above the TSFs is only 20 to 48 feet. It can be seen that particle tracing lines nearly immediately cross the phreatic surface, and thus nearly immediately enter the aquifer. Another potential direction of movement would be in the alluvium just above the bedrock contact until it reaches the adjacent basin fill units. The model did not represent thin alluvial unit which underlies the TSFs, which eliminated any consideration of this potential.



Copper World Aquifer Protection Permit: Pima County Staff Comments



Individual BADCT is less protective than Prescriptive BADCT

The Tailings Storage Facilities have among the largest potential for aquifer pollution, and yet are prescribed among the least amount of protection. The TSFs will be receiving tailings slurry that will inevitably produce seepage that will reach the aquifer, and it is unclear why ADEQ has approved a plan in which the TSFs and associated seepage collection system are not lined, when the prescriptive BADCT (Section 2.5.2.4 ADEQ BADCT Guidance Manual) for a TSF is to use a 60 mil HDPE liner above 12 inches of compacted native soil. If Hudbay has decided that their HLP and PLS should be lined (so they don't lose their valuable leach solutions), then the same level of liners should be used to prevent pollution into the environment from the TSFs.

The Tailings Storage Facilities are the only facilities in Hudbay's application in which they applied for individual BADCT instead of using the prescribed BADCT. Section 10.4.1.3 of the Copper World Application lists the three BADCT alternatives for construction of the TSF as Alternative 1 – TSF with No Underdrain, Alternative 2 – TSF with Underdrain, and Alternative 3 – TSF with Geomembrane Underliner. Hudbay's application reports that Alternative 1 would have an approximate 759 gallons per minute (gpm) and 377 gpm seepage from TSF-1 and TSF-2 respectively, for a combined seepage of 1136 gpm. In comparison, the total seepage for Alternative 2 was estimated to be 17.4 gpm. While this is a significant improvement at 98% reduction of seepage, Alternative 3 would have a combined seepage of only 0.43 gpm.

This 0.43 gpm relates to an additional 98% reduction in seepage compared to Alternative 2, and an approximate 99.96% reduction compared to Alternative 1. Item 15 of Hudbay's

Copper World Aquifer Protection Permit: Pima County Staff Comments

response to ADEQ's initial RAI, Hudbay estimates that the amount of seepage from the TSFs using Alternative 2 would be 5,794 acre-feet, which will relate to a "base case" value total mass loading of approximately 6,362 tons of sulfate polluted into the aquifer, with a standard deviation of 11,543 tons. As the standard deviation is larger than their base case value, there exists a high level of uncertainty in the delivered number. These given values represent only the seepage that bypasses the seepage collection system, which is estimated to be about 2% of the total. A further 98% reduction of this value, as represented by the lined TSFs in Alternative 3 would lead to 99.96% overall reduction, with an expected 115.9 acre-feet of seepage, with base case total mass loading of 127.24 tons of sulfate, and a standard deviation of 230.86 tons of sulfate.

Practicality of lining the TSFs

At the February 20, 2024 Community Meeting held at Corona Foothills Middle School, ADEQ staff indicated that the requirement for a TSF to be lined as prescribed in Section 2.5.2.4 of the ADEQ BADCT Guidance Manual only applies to the water fraction of a tailings facility, and that because Hudbay plans to thicken their tailings prior to deposition, this section no longer applies. Pima County would like to emphasize that the thickened tailings is estimated by Table 11.01 of the permit application to have a water content of approximately 31.8% by weight and that stormwater will be stored within the TSF impoundments (Section 2.1, paragraph 5). Pima County disagrees that this section should not apply, and requests complete explanation along with sections of Arizona Administrative Code or statute that make this distinction.

ADEQ staff also said that it is not practical to line the TSFs because the excess water content needs to go somewhere (i.e. the ground) or else stability issues and liquefaction become a problem. These stability and liquefaction issues only occur when a thickened slurry is deposited on a lined TSF. The concerns of practicality are eliminated when the tailings are filtered or pressed dry prior to deposition and do not receive site stormwater flows. Pima County would like to return to Hudbay's original design of dry stacked tailings as a demonstration of environmental stewardship.

ADEQ's decision that the appropriate resolution to this issue is approval of a cheaper design that is less protective of the environment occurred because of the perceived hardship on Hudbay that would be caused by construction of appropriately protective facilities. This is an unfair compromise between environmental protection and practicality, and one that Pima County disagrees with. It is not acceptable that the excess water from the TSF be allowed to seep into the ground as a compromise in practicality. If the design of an unlined TSF is not environmentally protective, then it should not be approved. If the design of a lined TSF to receive a 30% water content slurry is not practical or safe due to stability, then it should not be approved. A reasonable solution is to line the TSF and to stack dry tailings, which clearly accomplish the goals of environmental protection.

Additional Research Required

Pima County requests that a complete economic and practical evaluation of TSF alternatives be completed by Hudbay, to include a lined and dry-stacked facility, among other potential redesigns. As the current design also uses the TSF to hold stormwater run-on that is not

diverted by the diversion channels, the evaluation will also need to include stormwater containment designs. Pima County requests that construction of the TSFs include consideration of the Global Industry Standard on Tailings Management (GISTM) specific to Topic III, and Principles 4 through 7. The ADEQ BADCT Guidance manual is 20 years old, and considerable advancements have been made in mining technology. It would be short-sighted of ADEQ to not incorporate new design practices or techniques that lead to a safer mine that is more environmentally protective. Pima County request that ADEQ update its BADCT requirements to more recent and proven practices. The BA in BADCT stands for Best Available, and as such should not be restricted to old practices that have better alternatives.

Consequences of not lining the TSFs

We share ADEQ's concern that seepage may be above Aquifer Water Quality Standards for beryllium, cadmium, fluoride, selenium and zinc. Under the current proposal, about 5000 acre-feet of tailing seepage is expected to be lost. Some of the material under TSF-1 is limestone, some of it "highly fractured".

This mine has the potential to pollute a considerable amount of sulfate and other materials into the Sahuarita and Green Valley regional aquifers. If sulfate is being transported into the aquifers, as demonstrated by the Hudbay application and supporting documentation, then so are other contaminants. Southern Arizona is already dealing with the after-effects of the Sierrita Mine sulfate plume. It has been clearly demonstrated that water is present below the surface of the TSFs, that there is high hydraulic conductivity, and that the aquifer is in danger of being polluted. In the countries with the highest copper production, Chile and Peru, research has shown that contamination by mine tailings is significant for the health and environment of the surrounding communities due to a lack of adequate management of tailings and mine closures [<https://pubmed.ncbi.nlm.nih.gov/34089446/>]. The prescriptive BADCT for a TSF is to line the facility, yet the TSFs are among the only facilities in Hudbay's application that are not lined. Therefore, it is inappropriate for ADEQ to approve an individual BADCT plan for the TSFs that is less protective than the prescriptive BADCT. Lining the TSFs is the solution which is more protective of the aquifer.

29. Pima County requests that ADEQ carefully review construction plans and timelines to ensure that the appropriate environmental protection structures are appropriately in place prior to operation of a discharging facility that rely on such structures. Hudbay's response to Item 13 of the Feb 27, 2023 RAI says that "As development occurs over the first 5 years, there will be no period where an APP-regulated mine feature is constructed prior to completion of a permanent diversion feature upgradient of that feature." However in Figures 6 and 7 of the Site Water Management Plan (Appendix E in the September 2022 APP application), it is indicated that tailings are already being added to TSF-1, though one of the drains (indicated by green dashed line) in Cell 2 is not in place in Figure 6. This drain should be in place before any tailings are added to TSF-1 in order to satisfy Hudbay's claim that all upgradient permanent diversion structures are in place prior to operation and construction of the APP facility.

Discharge Limitations

Copper World Aquifer Protection Permit: Pima County Staff Comments

30. Pima County requests that any east-side discharge of water from the East Pit dewatering wells be subject to applicable surface water quality standards established under baseline surface-water monitoring for the Rosemont Copper Project. Such discharges are proposed in the APP application on page 45.
31. Pima County requests that any east-side discharge of water from the East Pit and Broadtop dewatering wells be monitored for compliance with state surface water quality standards. We note that Broadtop Butte pit is mostly outside the Tucson AMA and therefore pit water export is subject to the same restrictions as at the East Pit.
32. The proposed mining facility is required to obtain Arizona Pollutant Discharge Elimination System (AZPDES) permits for construction and industrial activities under state statute ARS §49-255 that protects surface water quality and was which was adopted under section 402 of the CWA. Mining facilities are a category of industrial operations required to obtain AZPDES permit coverage for stormwater discharges. Rosemont Copper Operations obtained AZPDES Multi-sector permit coverage in 2013 and renewed the permit in 2020 under AZMS81296, in contradiction of the permit application Appendix A page 45.
33. The draft APP inappropriately refers to stormwater ponds for non-diverted stormwater run-on when all ponds are non-stormwater ponds as identified in Table 1 of the permit. They are non-stormwater ponds because they can contain contact water, process solutions or upset events, however brief the periods may be. Pima County requests ADEQ properly rename them to non-stormwater ponds and modify the draft permit to clarify that waters entering these ponds are unauthorized non-stormwater discharges.
34. Pima County requests that the monitoring frequency be adjusted in Table 20 from biennial (once every two years) to semi-annually (twice per year). Section A.A.C. R18-9-A206(A)(2) says: "If monitoring is required, the Director shall specify to the permittee: a. The type and method of monitoring; b. The frequency of monitoring." It is well within the right of the Director to increase the frequency of this monitoring, and not only would this increase in required monitoring frequency be more protective of the aquifer, but this increase would also be consistent with APPs from Wastewater Reclamation Facilities (WRFs). WRFs have regular quarterly requirements for metals and nutrients, as well as semi-annual requirements for the analysis of organic pollutants. The current draft permit has Hubbay sampling and reporting metal and nutrient pollutants on a quarterly basis, and sampling and reporting organic pollutants and radioisotopes of Radium and Uranium biennially. In order to fulfill the requirement of ambient groundwater conditions for organics and radionuclides, biannual sampling will allow the collection of the 8 sampling rounds of data needed prior to the expiration of the estimated 15-year mine life.
35. Pima County requests that all one-time effluent characterization as defined by Section 2.5.1 and Tables 15 and 16, be instead changed to regular periodic discharge monitoring. Pima County believes that a one-time effluent characterization for the PLS pond, Raffinate Pond, Reclaim Pond, and Primary Settling Pond is not sufficient. These ponds will be receiving leaching solution from (at least) 6 different pits over the course of the mine's lifetime (40+ years). There should be continuous effluent characterization as is the case for other entities with APP permits, such as wastewater treatment facilities. Pima County recommends the same

Copper World Aquifer Protection Permit: Pima County Staff Comments

parameters and frequency as prescribed in Tables 19 and Table 20 for groundwater monitoring. This approach is consistent with other types of industry with APP permits. Monitoring a facility's discharge is important to evaluate and identify potential problems early. Monitoring only the groundwater will only discover a problem after it's a problem.

Point of Compliance

36. Pima County is concerned about the limited extent of POC wells to monitor impacts to the aquifer from the Copper World mine. ADEQ has required the county to have POC wells up to 7 miles downstream of discharge locations of water reclamation facilities. For municipal landfills POC wells are also located down gradient, not just at the boundary of the solid waste facility. Yet proposed POC wells for Copper World are placed no farther than the perimeter of discharging facilities, such as TSF-1. Pima County requests that ADEQ review the GPS coordinates of POC1. The coordinates given in the draft permit indicate that this POC well is to be located on a parcel of land that is currently owned by the State of Arizona. Pima County requests additional west-side POC wells located farther downgradient from the outermost discharging facilities. There are dozens of domestic water wells downstream and less than five miles of discharging facilities, and with the Tucson Basin being a sole source aquifer, these drinking water resources must be protected.
37. Even if it is not an APP facility, the Pollutant Management Area for Copper World's Phase 1 should include the entire East Pit and the headwaters of small streams near the Broadtop Butte and Copper World pits to provide the best chance of detecting contaminants.
38. Pima County requests that POC wells around the TSFs be screened in both the alluvial and bedrock aquifers. It is not clear that the proposed screen intervals in Table 50-1 of the RAIS provides this opportunity, and the text elsewhere refers to screening only in the bedrock.
39. We share ADEQ's concern that POCs 7-10 may not be downgradient of the facilities. If the POCs remain as situated, we request post-installation verification be submitted to ADEQ. In particular, we suggest relocating the POC for Broadtop Butte away from a possible groundwater divide toward 31.84754 degrees North, 110.75290 degrees West.
40. Pima County requests two additional point of compliance wells be established to ensure that the east-side aquifer is not impaired by operations at the East Pit. The applicant has not shown that hydrologic sink conditions will exist during construction and the earliest phase of operations. The proposed location of the first well is on parcel 305-65-003K owned by Rosemont Copper and more specifically outside the Phase 1 pit at 31.83156 degrees North and 110.75103 degrees West. The second well is proposed on parcel 30561007H owned by Rosemont Copper at 31.82620 N and 110.76518 W outside both the Phase 1 and Phase 2 pits.

Monitoring Requirements

41. Pima County requests repeated water-quality monitoring of the stormwater collection galleries to ensure they are not capturing seepage during operation and post-closure of the Tailings

Copper World Aquifer Protection Permit: Pima County Staff Comments

facility. Such stormwater monitoring is needed to ensure no contaminants are being discharged into downstream drainage systems.

42. Pima County requests biannual rather than biennial monitoring of the expanded list of parameters listed in Table 20. The more frequent monitoring will aid detection of pollutants that may otherwise go undetected too long and thereby delay an investigation and implementation of a remedy.
43. Pima County thanks ADEQ for inclusion of a Hydrologic Sink Monitoring Plan (CSI 16) at the East (Rosemont) Pit. However, as written the plan is not required until cessation of pit dewatering. Rather than at cessation of dewatering, Pima County requests that monitoring plan be submitted for ADEQ before issuance of the permit. Dewatering will begin during construction. ADEQ should be aware of how Hudbay plans to monitor the hydraulic sink before it becomes a hydraulic sink, as this is essentially an irreversible process. It is imperative that Hudbay has a plan in place before they single-handedly alter the hydrogeological characteristics of the area.
44. Pima County requests that ADEQ require Hudbay to monitor the volumes of pit dewatering and report this periodically to ADWR as well as ADEQ.
45. Pima County requests quarterly visual monitoring for areas of dry-weather seepage or ponding in natural wash bottoms around the tailing storage facilities to detect unauthorized discharges.
46. Pima County requests quarterly visual monitoring and reporting for areas of dry-weather seepage or ponding in perimeter ditches and inside backfilled pits.
47. The behavior of hydraulic sink will take time to establish. Therefore, there will be some period of time that the East Pit will be a discharging facility, and as such there must be POC wells established that are hydrologically downgradient of the Rosemont Pit and along the Backbone fault to verify the assumptions presented in the application by Hudbay. Monitoring must occur at these POC wells as required at all other POC wells. Additionally, these new POCs should be monitored even after the point at which the Rosemont Pit becomes a hydraulic sink and continually until the end of the post-closure period. See comment 33 above for some possible locations.
48. Pima County requests that a minimum frequency of waste rock acid content analysis be defined for continued operations following the first year. The Waste Rock Handling Plan (Appendix G.3 to the application) lists in Section 4.0 that "The minimum required testing is as follows: During the first year of operation: Once per month; or 500,000 tons of waste rocks mined." There is no requirement listed in the plan for any waste rock analysis after the first year of the mine, and instead the document says that "testing will vary thereafter based on the trend that is identified and proven by our model." Pima County recommends that a minimum frequency be required for analysis of waste rock even after the first year of operation. Each blasting pattern will produce approximately 250,000 tons of blasted material. Relating this back to the requirement in Appendix G.3, section 4.0, this would imply that a

Copper World Aquifer Protection Permit: Pima County Staff Comments

waste rock will be analyzed for NAG, PAG, or AG material every other blasting, or every month, whichever is more.

Contingency Plan Requirements

49. In the event of dry-weather ponding or seepage being observed in washes on the perimeter of tailing storage facilities, efforts to monitor the discharge and correct drainage must be undertaken.
50. In the event of ponding in backfilled pits, we request additional back-filling with NAG waste rock.

Reporting and Record-Keeping

51. At 2.7.4.3. of the permit, ADEQ proposes to receive the annual hydrologic sink reports during post-closure. We request that the hydrologic sink reporting begin during construction and continue during any temporary cessations of operations. Longer-term trend analysis will facilitate understanding the evolution of the sink and be more protective of the sink condition.

Temporary Cessation

No comment.

Closure

52. Pima County requests that the soil cover be at least 1 meter on the TSF and the HLF, as this is the minimum thickness tested (tests were between 1-2 meters) in the 2017 Global Cover System Design Technical Guidance Document written by the International Network for Acid Prevention. Per Hudbay's response to Item 19 of the Feb 27, 2023 RAI, "Approximately 5 million cubic yards of growth media cover are needed for the HLF and TSFs." A quick calculation of the expected areas of the HLF, TSF-1, and TSF-2 provides a total area of approximately 1589 acres, or 7,690,760 square yards. These rough values indicate that Hudbay plans to cover the facilities with less than 2 feet of alluvium material. This is confirmed in Sections 16.2.3.2 and 16.2.4.4, in which Hudbay says the tops will receive an 18-inch soil cover, and the embankments will receive a 24-inch cover. Pima County questions the sources that determined that this is an appropriate amount of material to support growth of vegetation. It is understood that there will be some loss of the soil covering due to wind and precipitation, leaving even less material to support vegetative growth. As there are many potential goals when designing a soil covering of a waste pile, it is important to understand Hudbay's methodology in this effort in order to then understand whether their claim that 5 million cubic yards of growth media will be sufficient. If the thickness of the soil covering is too thin, then not only will the media not support vegetation establishment, but it will fail in its roles of contaminant migration and erosion control.
53. Hudbay says in Section 10.3.1.7 that "The waste rock [facility] will be revegetated directly without the placement of a soil cover." Pima county requests clarification and explanation as to how Hudbay plans to revegetate a pile of waste rock without any further soil amendments. With no soil, Hudbay will not achieve its ranching and wildlife habitat objectives for mine land

Copper World Aquifer Protection Permit: Pima County Staff Comments

reclamation. Lack of cover on waste rock also exposes the material to more weathering and generation of seepage. Closure should include achieving a soil cover on the waste rock piles to support future uses for ranching and wildlife habitat.

54. Pima County shares ADEQ's concern that APP closure costs are underestimated. We are concerned about the adequacy of funding to obtain soil cover for reclamation of the two tailings facilities, the waste rock landforms, the backfilled pits, and the heap leach. The extant data provided demonstrate there is adequate soil cover for reclamation of only the tailings and heap leach. The closure costs do not include any funding for purchase and transport of any off-site soils needed to achieve a stable cover on the waste rock or backfilled pits. Pima County requests that ADEQ require the applicant demonstrate that adequate soil cover can be derived from on-site locations to achieve waste rock reclamation. If on-site soil cover is inadequate, closure costs should include off-site purchase and transfer costs for covering and closing the APP facilities.

Post-Closure

55. The 2023 Pre-Feasibility Study at page 20-5 notes that sulfate treatment cells are anticipated to be needed in post-closure period. Our preceding comments, if implemented, might be reduce the need for such, but given that Hudbay anticipates needing them under the current design, ADEQ should account for maintaining them in the permit.

Compliance Schedule

56. We request additions be made to the compliance schedule as needed to support the requests made in our preceding comments.

References and Pertinent Information

No comment.

Notification

See comment 19 regarding emergency notifications.