

October 18, 2024

Submitted online via <https://azdeq.commentinput.com/?id=mcYdPsx25R>

Vimal Chauhan  
Environmental Engineer  
Groundwater Protection and Reuse Section  
Arizona Department of Environmental Quality  
1110 West Washington Street  
Phoenix, AZ 85007

Re: South32 Hermosa Inc. Comments on Proposed Significant Amendment for Hermosa Project,  
Permit No. 512235; LTF No. 101257

Dear Mr. Chauhan:

South32 Hermosa Inc. (South32) submits these comments in support of the proposed significant amendment to the aquifer protection permit (APP) for its Hermosa critical minerals project.

The Hermosa Project will provide a domestic source of two critical minerals needed to reduce U.S. reliance on fossil fuels and foreign sources of these critical minerals to facilitate a shift toward renewable energy to combat climate change and assist the U.S. in meeting its goal of “net zero” carbon emissions by 2050. Both zinc and manganese have been identified as “critical minerals” by the U.S. Department of Interior (DOI) under the Federal Energy Act of 2000. In addition, manganese has been identified as a strategic and “critical mineral” by the U.S. Department of Defense (DOD) under Title III of the Federal Defense Production Act. The Federal Government recognizes zinc and manganese as crucial in establishing a domestic supply chain of critical minerals needed to manufacture electric vehicle batteries, solar panels, wind turbines, and other infrastructure required to secure the Nation’s energy future.

The proposed amendments are relatively limited in scope, consisting chiefly of authorizations for:

1. A lateral (27-acre) and vertical (100-foot) expansion of the existing, state-of-the-art lined dry stack tailings storage facility (TSF), using the same technology as has been in place at the existing TSF for years.
2. Increasing to monthly (from quarterly) the frequency of monitoring of highly treated surface water discharges to Harshaw Creek and Alum Gulch.
3. Installing additional piezometers to monitor the stability and functioning of the TSF and the associated underdrain collection pond (UDCP).
4. Increasing the amount of financial assurance required to be demonstrated by South32 (via a surety bond) by 77%, to \$24,657,909.
5. Submission by South32 of additional information related to ongoing operation of the TSF as part of an annual report.
6. Placement of new production dry stack tailings on the existing dry stack TSF.

7. Placement of additional minor sources of water in the double-lined UDCP.

As discussed below, each of these amendments is adequately justified by the application and subsequent information requested by the Arizona Department of Environmental Quality (ADEQ) and legally supported by the APP statute and rules. Issuance of the amended permit is, therefore, warranted.

This letter also will briefly address some of the concerns with the amendment that have been expressed publicly to this point. Finally, South32 will point out minor deletions that are required in order to provide clarity in one section of the draft permit (Part 2.3.2).

**The Proposed Amendments Are Technically and Legally Justified**

South32 submitted an administratively complete amendment application, totaling over 1500 pages, in December 2023. ADEQ submitted a comprehensive request for additional information in April 2024, to which South32 responded in July 2024.<sup>1</sup> ADEQ's request included 45 individual items. Additional technical documents (e.g., an updated climate report) were generated in response to ADEQ's request. Collectively, the application materials support ADEQ's decision to approve the amendment and the specific changes requested by South32, the primary of which are discussed further below.

TSF Expansion: The amendment would allow a lateral expansion (increasing the facility footprint from 28 to 55 acres) and a vertical expansion (allowing an additional 100 feet of height) to the existing TSF. This expansion is amply justified by the application materials and subsequent technical materials requested by ADEQ, as well as the permit conditions.

Dry stack (also called filtered) tailings storage facilities provide substantial sustainability benefits compared to traditional slurry tailings storage facilities. These benefits include a smaller facility footprint due to material placement and compaction specifications, significant reduction in consumptive water use, reduced seepage due to significantly lower moisture content and material compaction, simplified closure and reclamation, and superior geotechnical stability.

Discharge control measures for the expansion (see Part 2.2.1.1.5) will be the same as previously determined to represent the best available demonstrated control technology (BADCT) for the existing TSF. These measures include (but are not limited to):

- Placement of compacted, filtered (dry stack) tailings with a moisture content of only approximately 14%.
- Diversion of run-on around the TSF of at least the 100-year/24-hour storm event with 1 foot of freeboard.
- A 60-mil high-density polyethylene (HDPE) liner overlying a 12-inch low permeability soil layer or a geosynthetic clay liner, with both liners overlain by an 18-inch granular protective layer.
- An underdrain collection system located above the liners to collect the limited moisture that reaches the bottom of the TSF and direct it to a double-lined pond (the UDCP).
- Rock armoring on exterior slopes of the TSF to minimize erosion.

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<sup>1</sup> The ADEQ request called for a response by June 4, 2024. South32 timely filed several partial responses that collectively responded to all ADEQ questions. ADEQ then provided additional feedback on some items and requested a single comprehensive and consolidated response. South32's July 10, 2024 letter represents that consolidated response.

- Management and compaction protocols for the filtered tailings.
- Routine facility inspections.
- Monitoring of slope conditions and piezometric head.

The discharge control measures proposed by South32 and approved by ADEQ generally meet or exceed the prescriptive BADCT described in the Arizona Mining Guidance Manual BADCT (TB 04-01) (Manual) for non-base metal TSFs.<sup>2</sup> The design is also consistent with the most recent standards recommended by the Global Industry Standard on Tailings Management (GISTM) and the Australian National Committee on Large Dams (ANCOLD), to the extent those recommendations are pertinent to dry stack TSFs (they were primarily developed for conventional wet deposition TSFs).<sup>3</sup> The expanded TSF will also be highly stable, as demonstrated by submitted stability analyses postulating both drained and undrained conditions (although South32 continues to maintain that a widespread undrained response is not an appropriate analysis for the dry stack TSF at the Hermosa Project considering the filtered tailings material properties and placement controls).

These factors strongly support ADEQ's conclusion that the TSF expansion will employ BADCT.

WTP1 and WTP2 Increased Monitoring Frequency: Whether and how often monitoring is required in a permit is left to ADEQ's discretion. See A.A.C. R18-9-A206(A). The amended permit would increase the sampling frequency for treated surface water discharges from WTP1 and WTP2 to monthly rather than quarterly. See Part 4.2, Table 9. This was suggested by South32 in part to respond to community concerns, even though quarterly monitoring of WTP2 discharges at Outfall 002 was determined to be appropriate in an earlier appeal of the existing APP.<sup>4</sup>

This change aligns the APP monitoring frequency for these discharges with that of the AZPDES permit (#AZ0026387) also held by South32 to authorize these discharges. This frequency is as or more stringent than generally required by APPs for surface water discharges (typically quarterly or semi-annually for most parameters).

For these reasons, the amendment to require monthly monitoring of surface water discharges is amply justified.

Additional Piezometers: The amended permit would require South32 to install eight additional vibrating wire piezometers associated with the TSF. See Part 4.2, Table 8. South32 had proposed two additional piezometers but agreed to install six more in response to ADEQ comments. These additional piezometers will monitor phreatic conditions within the stack or the hydraulic head on the underlying liner system. In this fashion, they will monitor the operational performance of the TSF and ensure that it is performing in line with expectations. The permit outlines required response actions if the specified alert level is exceeded. See Part 2.6.2.7.

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<sup>2</sup> Available at [https://static.azdeq.gov/legal/subs\\_azmining\\_badct.pdf](https://static.azdeq.gov/legal/subs_azmining_badct.pdf)

<sup>3</sup> See South32 APP significant amendment application (December 21, 2023), Attachment A, Part 4.3, Table 4.1.

<sup>4</sup> See *Chris Werkhoven and Patagonia Area Resource Alliance v. ADEQ*, Nos. 21-004-WQAB and 21-006-WQAB (ALJ decision filed June 21, 2022), at 36 ("The preponderance of the evidence shows that the Permit's discharge limitations and quarterly monitoring at Outfall 002, when coupled with BADCT at WTP2, are sufficient to protect the health of downstream well owners") (emphasis added). As noted below, the ALJ decision upholding the existing version of the South32 APP was upheld by the Water Quality Appeals Board and then a Maricopa County Superior Court judge.

The eight additional piezometers are a conservative and appropriate manner of monitoring the performance of the dry stack TSF.

Financial Assurance: The proposed amendment would increase the amount of financial assurance required to be demonstrated by South32 from \$13,920,872 to \$24,657,909. The assurance would be provided by a surety bond. See Part 2.1.2.

In prior permit actions, ADEQ approved closure and post-closure cost estimates developed using the Standardized Reclamation Cost Estimator (SRCE), which the State of Nevada developed in conjunction with the federal Bureau of Land Management. It is South32's understanding that SRCE is ADEQ's preferred (though not required) tool for estimating closure costs and is the tool used most often by mining applicants.

The application for this amendment included a revised closure and post-closure cost estimate for the expanded TSF using the same SRCE model as prior permit actions at Hermosa. The updated estimate also encompassed the other APP-permitted facilities (UDCP and both WTPs), and therefore represents a comprehensive update of estimated closure costs. See South32 APP significant amendment application (December 21, 2023), Attachment C.

The updated cost estimates included with the application, using a tool previously approved by ADEQ to estimate closure costs at this site, are reasonable and justified, as is South32's choice to use a surety bond to provide that assurance. See A.A.C. R18-9-A203(C)(2).

Additional Annual TSF Reporting: The amended permit will require South32 to submit additional data regarding the ongoing operation of the TSF as part of an annual report (Part 2.7.4.1). Additional data to be submitted annually includes a summary of InSAR (Interferometric Synthetic Aperture Radar) satellite monitoring data for permanent TSF slopes, a hydrograph of the piezometer readings, and a TSF progress report verifying that the material placed aligns with assumptions used for slope stability modeling.

This information will allow ADEQ, along with South32, to monitor the performance of the TSF and ensure that it is constructed as designed and is operating in accordance with expectations.

Placement of New Production Dry Stack Tailings on the Existing Dry Stack TSF: The permit (Part 2.2.1.1.5) describes how filtered tailings will be handled and placed (moisture content, minimum compaction, slope measurements, etc.). These operational measures are part of the overall facility BADCT. See A.R.S. § 49-243(B)(1) (including "processes" and "operating methods" as part of BADCT). Moreover, as described in the application, the new production tailings, when generated, will be placed similarly to the historic tailings already present in the lined TSF. The placement of new production tailings in the TSF does not and should not require any different BADCT control measures than those already in place in the TSF and planned for incorporation into the TSF expansion.

Placement of Additional Materials into the Double-Geomembrane Lined UDCP: The amended permit would authorize additional sources of water to be placed into the double-geomembrane lined (with leak detection) UDCP. These sources consist of groundwater, water pumped from operational workings, treated mine drainage water, stormwater from elsewhere on the site (including from stormwater BMPs), core cutting water, drilling water, and operational water from surface activities. See Part 2.3.2. Allowing these sources to be placed into the UDCP as needed will allow South32 the flexibility to operate the mine by moving water as needed.

None of these additional sources are expected to be of particularly poor quality, especially compared to other sources already authorized to be placed into the UDCP (most notably historic mine workings water). Moreover, as noted above, the UDCP is double-geomembrane lined with leak detection, which exceeds prescriptive BADCT criteria for non-stormwater ponds as articulated in the Manual. The placement of these additional sources does not necessitate any changes to existing BADCT control measures for the UDCP. Therefore, ADEQ is justified in allowing these sources to be placed into the UDCP as needed, and no associated permit modifications are needed.

**Publicly Voiced Concerns Do Not Warrant Modification or  
Rejection of Any Proposed Changes**

Comments on permit conditions not proposed to be modified are beyond the scope of this amendment proceeding, as are comments on permit terms previously litigated successfully by ADEQ. As an initial matter, only the conditions that ADEQ has proposed modifying or adding are the appropriate subject of public comment. Unchanged permit conditions were previously subject to public notice and comment when the permit was first issued or significantly amended and should not be subject to comment (and potential permit appeal) again during this amendment process.

As one example, no changes were proposed to the design and operation of Water Treatment Plant #2 (WTP2) except for increased discharge monitoring frequency. Therefore, assertions that the WTP2 treatment process does not constitute BADCT are inappropriate comments in this amendment process.

Similarly, ADEQ has already successfully litigated some permits conditions that were previously challenged. The WTP2 BADCT issue is one of these. Certain parties previously challenged whether the proposed treatment provided by WTP2 constitutes BADCT. ADEQ's decision that it does represent BADCT has been upheld by an administrative law judge,<sup>5</sup> the Water Quality Appeals Board,<sup>6</sup> and a Maricopa County Superior Court judge.<sup>7</sup> Any comments arguing that the plant was not designed to meet BADCT should be rejected for that reason as well.

Lack of EPA Involvement: The APP program is a purely state program, and EPA has no role in it. EPA does have and has exercised oversight authority with respect to the AZPDES program (a program delegated to the state under the Clean Water Act) and has reviewed the issuance and amendment of South32's AZPDES permit. EPA also has a role in the ongoing NEPA process, which addresses potential future expansion on federal land. However, EPA has no role in the APP process, although it may choose to submit comments to ADEQ using the same process as any member of the public.

Total Maximum Daily Load (TMDL) and Impaired Waters Issues: In AZPDES permitting, categorization of a water as impaired and the completion of a TMDL may be relevant in permitting decisions (and they have been considered, by both ADEQ and EPA in renewing South32's AZPDES permit). However, under the APP program, these considerations are irrelevant. TMDL and impairment issues are not included by statute or rule as a basis

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<sup>5</sup> *Chris Werkhoven and Patagonia Area Resource Alliance v. ADEQ*, Nos. 21-004-WQAB and 21-006-WQAB (ALJ decision filed June 21, 2022).

<sup>6</sup> *Chris Werkhoven and Patagonia Area Resource Alliance v. ADEQ*, Nos. 21-004-WQAB and 21-006-WQAB (Board decision affirming ALJ decision filed July 8, 2022).

<sup>7</sup> *Patagonia Area Resource Alliance v. ADEQ*, LC2022-000259-001 DT (September 8, 2023) (affirming Board decision).

for decision-making under the APP program. ADEQ may not base a permitting decision on a requirement or condition not specifically identified in statute or rule. See A.R.S. § 41-1030(B).

Effect of Ongoing Litigation: A few issues associated with South32's 2021 significant permit amendment are still in litigation, currently before the Arizona Court of Appeals.<sup>8</sup> Under state law, the permit as amended in 2021 is not automatically stayed during judicial appeals. See A.R.S. § 49-324; A.R.S. § 41-1092.08(H). The amended permit conditions would be stayed only if a party challenging the permit secured a stay or an injunction from a court. The plaintiffs/appellants in the pending litigation have never sought injunctive relief. They did request a stay from the Superior Court while their appeal to the Court of Appeals is decided, but that request was denied.<sup>9</sup> Therefore, the amended 2021 permit is in effect, and South32 is free to seek, and ADEQ is free to grant, amendments to that permit.

Groundwater Usage: Management of groundwater is necessary to allow the Hermosa Project to proceed. Public concern has been expressed over the amount of groundwater being pumped by South32. However, it is ADWR (under Title 45), and not ADEQ, that regulates groundwater use in Arizona. The APP statute and rules do not allow ADEQ to deny or condition an APP on the amount of groundwater pumped; therefore, the agency is affirmatively prohibited from doing so by A.R.S. § 41-1030(B).

Use of "Conceptual" Points of Compliance: The current South32 permit contains three "conceptual" point of compliance (POC) wells. Conceptual POCs are locations where monitoring wells may be required in the future if certain conditions are met but which are not immediately required. The lawfulness of conceptual POCs is currently before the Court of Appeals as part of the litigation mentioned above regarding the 2021 South32 permit amendment. ADEQ's use of conceptual POCs has been upheld by an ALJ, the WQAB, and a Superior Court judge, as noted above. Barring a reversal by the Court of Appeals before the pending permit amendment is issued, this issue has been judicially resolved in ADEQ's favor.

Furthermore, ADEQ is not proposing any changes to the number or locations of POCs (conceptual or otherwise) in the permit.<sup>10</sup> Therefore, this topic is not a proper one for public comment.

Permittee Self-Monitoring: South32 is aware that some have called for compliance monitoring to be conducted by ADEQ or a third party and not the permittee. As an initial matter, this may not be consistent with A.A.C. R18-9-A206, which refers consistently to requirements for monitoring and recordkeeping being imposed on the "permittee."

Moreover, self-reporting is the norm in all federal and state environmental permits. As noted in the response to comments on another recently issued mining APP, the ADEQ APP program administers over 450 permits statewide that require monitoring, and all involve self-monitoring and reporting.<sup>11</sup> Like most APPs, the South32 permit contains provisions requiring that monitoring be conducted in accordance with currently accepted

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<sup>8</sup> *Patagonia Area Resource Alliance v. ADEQ*, No. 1 CA-CV 23-0725 (appeal from Maricopa Superior Court judgement filed November 16, 2023).

<sup>9</sup> *Patagonia Area Resource Alliance v. ADEQ*, No. LC2022-000529-001 (minute entry dated April 1, 2024).

<sup>10</sup> The pollutant management area for this permit has been slightly expanded in the pending application to encompass the larger footprint of the TSF, but that does not call for a new POC location. Groundwater flow beneath the expanded footprint is still toward POC-2, a POC well downgradient of the TSF that is being actively monitored by South32.

<sup>11</sup> *Summary and Response to Comments, Copper World Operations, Permit No. 513690*, § 3.16.1 (August 29, 2024).

standards of professional practice, including chain-of-custody procedures, and that samples be certified at an ADHS-certified lab using methods with detection limits sufficient to assess compliance with permit limits. See Parts 2.5 & 2.5.6.

Finally, ADEQ has the authority to inspect a site at any time and collect samples if it feels that this is necessary.

Subsidence: Questions have been raised concerning potential for subsidence to affect the TSF. As discussed in the amendment application, there are no near surface historic workings below the TSF that could contribute to subsidence other than a single backfilled shaft. The TSF expansion design includes a remediation design for this shaft to prevent it from causing subsidence. See South32 APP significant amendment application (December 21, 2023), Attachment A, § 2.7.

### **Minor Permit Clarification Requested**

Part 2.3.2: The first sentence of Part 2.3.2 in the proposed permit is carry-over language from the current permit and should be deleted. It is encompassed within the remaining two sentences in that Part, which describe what may be placed into the UDCP.

Also, in that same Part, in the first line of p. 14, the word “and” should be deleted before “precipitation falling” because the phrase starting with “precipitation falling” is no longer the last item on a list.

Thank you for your consideration of these comments. Please contact Paul Nazaryk at (970) 903-1792 if you have any questions or require additional information.

Sincerely,

Brent Musslewhite  
Director, Environment and Permitting