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30 March 2021

By Email

To

Amy Selvaraj
Senior Project Officer
Planning Panels Victoria
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And To

All parties on the Evidence Distribution List

FOR THE ATTENTION OF NICK WIMBUSH, CHAIR

Dear Amy

Fingerboards Mineral Sands Project Inquiry and Advisory Committee (IAC)
Supplementary submission of East Gippsland Shire Council (Submitter 716) – Centrifuges

We continue to act for East Gippsland Shire Council (**Council**) in relation to the above matter.

We refer to:

1. the IAC's Direction 32, relating to supplementary submissions on the additional information provided by the Proponent on the use of centrifuges; and
2. your email dated 26 March 2021 confirming that the IAC had agreed to extend the deadline for the Council to make its supplementary submission to 10am Tuesday 30 March 2021.

Council thanks the IAC for the opportunity to make this supplementary submission in response to the additional material provided by the Proponent in respect of this critical change to the Project.

Consistent with its approach in respect of the exhibited EES, and to ensure its submissions are made on the basis of the best available information, Council sought external technical input in respect of the proposed use of centrifuges. It engaged Ausenco, an engineering firm, to undertake a technical review.

We now attach the Ausenco *Review of Centrifuges for Tailings Dewatering* dated 29 March 2021 (**Ausenco Review**).

The Ausenco Review and this letter should together be taken as the Council's supplementary submission.

The Ausenco Review identifies several respects in which the information provided by the Proponent in relation to the use of centrifuges as a component part of the Project is materially deficient. The Council notes that the Proponent now seeks to proceed on the basis that the Project incorporates centrifuges and not the TSFs proposed in the exhibited EES. In that context, the deficiencies

identified in the Ausenco Review in respect of the centrifuge proposal independently and together mean that:

(a) it is not possible for parties to understand or interrogate precisely what the Project will comprise and entail;

(b) it is not possible for the IAC to:

  (i) consider or report on the environmental effects of the project, or their significance and acceptability;

  (ii) identify any measures which may be necessary, or which could be effective, to avoid, mitigate or manage environmental effects of the Project, including any necessary modifications to the Project;

(c) ultimately, it is not possible for the Minister (or other decision makers) to assess the environmental effects of the Project.

The Ausenco Review further identifies uncertainties in relation to the benefits which the Proponent asserts centrifuges will offer.

We note that the Ausenco Review was necessarily limited in scope, having regard to the substantial additional costs Council (and other parties) have been put to as a result of this late change to the Project. While it does not evaluate the water balance or matters relating to noise, air quality, or rehabilitation, this should not be taken to indicate that Council considers those matters are satisfactorily addressed, or would involve acceptable environmental outcomes.

The matters raised in the Ausenco Review and this letter will be further explored through submissions and expert evidence.

If you have any queries, please contact me.

Yours sincerely

[redacted]

Darren Wong
Principal

[redacted]

Ausenco

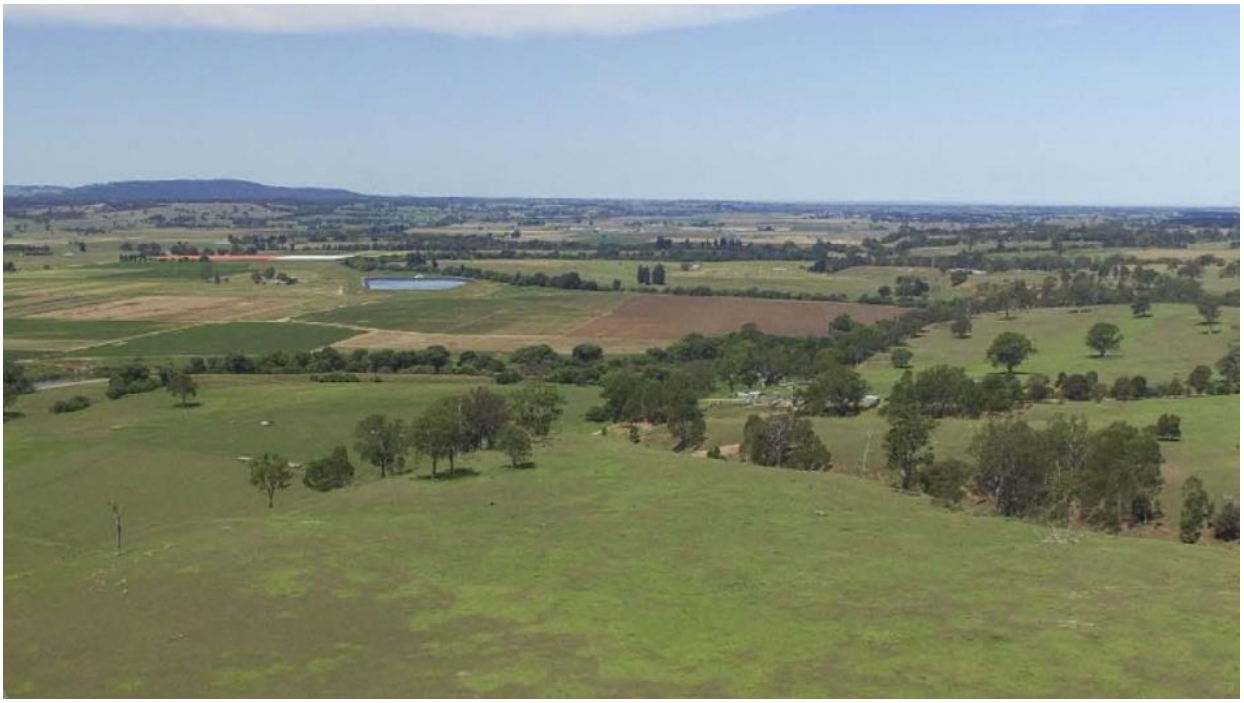
CRM2100459-RPT-0001
Revision Number B

East Gippsland Shire Council Fingerboards Project

Review of Centrifuges for Tailings Dewatering

March 2021

March 29, 2021



Ausenco

Revision Status

Revision	Date	Description	Author		Approver	
			Name	**Position Title**	**Name**	**Position Title**
A	28 March 2021	Initial Draft for Planology Comment	Matt Pyle	Director Technical Solutions	Matt Pyle	Director Technical Solutions
B	29 March 2021	Issued for Use	Greg Lane	Chief Technical Officer	Matt Pyle	Director Technical Solutions

Ausenco

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1 Introduction

1.1 Context

Ausenco has been engaged by the East Gippsland Shire Council to review documents related to the application of centrifuges to dewater fine tailings for the Fingerboards Minerals Sands Project ("Project").

The objective of the review was to:

- Assess the technical suitability of centrifuges to dewater fine tailings for the Project
- Identify key gaps in data and approach
- Assess risks and opportunities
- Recommend the next steps and/or further focus areas

This report presents the findings of the review based on Ausenco's judgement and experience to support the Inquiry and Advisory Committee (IAC) in their review of the Project.

1.2 Ausenco's Background

Ausenco's technical solutions group is focussed on the design and application of tailings dewatering solutions and interfacing with tailings storage facilities within minerals processing projects. Our focus is predominantly on base metal projects (i.e. copper, gold, lead, zinc) and precious metals (gold, silver) but we also develop mineral sands projects. In particular, the Alfa Laval P3 series of centrifuges has been a specific technology of interest for our technical solutions group due to design developments of the units arising from the application into oil sands and the consequent potential for improved dewatering performance in minerals applications compared to other technologies and centrifuges available on the market.

1.3 Supplied Information

The review is based on the following documents:

1. Document Ref. 0: Letter from White & Case to Mr Wimbush, 18 January 2021, Fingerboards Mineral Sands Project – Public Hearing
2. Document Ref. 43: Fingerboards Mineral Sands Project Inquiry and Advisory Committee Technical note, 18 January 2021.
3. Alfa Laval Australia Pty Ltd, *Laboratory Spin Test Report – Mineral Sands Slimes Tailings Dewatering test for Decanter Centrifuge*, Rev A, 8 October 2018.
4. Alfa Laval Australia Pty Ltd, *Slimes sample Y1Q2 Fingerboards Laboratory Spin Test Report – Mineral Sands Slimes Tailings Dewatering test for Decanter Centrifuge*, Rev A, 2 February 2021

2 Summary

The key comments from the review are as follows:

Centrifuge

- The Alfa Laval P3 centrifuges are a promising technology that have the potential to increase water recovery, reduce footprint and increase the speed of rehabilitation for the Project. For these reasons they are worthy of consideration.
- There is technical risk related to the sizing and application of centrifuges in this duty including:
    - The application of solid bowl centrifuges into the minerals processing industry is relatively recent. Therefore, there are no directly comparable operational benchmarks that Ausenco is aware of for this duty.
    - The sizing of the centrifuges appears to be based on solids mass loading rate, but in this application the capacity may be constrained by volumetric loading, particularly due to the dilute feed density required for effective flocculation (23% w/w solids). Based on an upper benchmark for volumetric loading rate of 80 m^3/h, approximately 15 x P3-10070 centrifuges would be required. If the feed is not diluted, less centrifuges would be acceptable but the fines capture would be at risk.
    - Scale-up from laboratory scale spin testing to full size throughput is indicative of potential dewatering performance but is not a demonstrated approach for robust equipment selection and performance prediction.
    - Increased proportion of fines due to variability within the deposit, different clay speciation, or poor classification within the circuit could lead to increased quantities of fines that may exceed the processing capacity of the centrifuges.
    - There may be poor recovery of ultrafines in the centrifuges, causing a recirculating load of ultrafines back to the process water ponds and further operational problems within the heavy mineral concentrator. Resolving this recirculating load may require high flocculant dosages and/or the introduction of coagulant(s) prior to centrifuging, or solids settling ponds that may still require scrolling with “Mudmasters” to dewater; both options increase operating cost and have environmental impacts.
    - Centrifuge operability issues may include excessive vibration, high wear, damage due to tramp material or other issues that impact the performance of the units

Fines Handling

- The technical application of Alfa Laval centrifuges has risks associated with dewatering performance and handling of the centrifuged product that warrant further work:
    - The centrifuged product is expected to seep once placed, and some liquefaction of the material during rehandling and trucking is likely.
    - The impact on groundwaters should be assessed.

Water Consumption

- The overall project water consumption is still dependant on the sitewide water balance, including the design and operation of all related equipment and water management structures.

Tailings Management Structures

- The temporary tailings storage facility may still be required to generate an initial mining void, or for settling ultrafines from the centrifuge effluent stream.

Centrifuge Relocation

- The cost of relocating the centrifuge facilities is expected to be high. It may be more cost effective to convey to intermediate transfer points which may also provide for reduced haul fleet emissions and dust generation.

3 Further Work

Further work should consider:

- Validating the centrifuge sizing with the vendor, based on the latest available test work (2 February 2021), and including potential volumetric limitations on the centrifuge sizing for diluted feeds (as required for effective flocculation).
- Conducting a full-size centrifuge trial (say with one skid-mounted centrifuge) treating similar material from other operations to validate the assumptions around centrifuge performance and centrifuged material properties. In particular, the relationships between feed density, flocculant and coagulant consumption, bowl speed, throughput, fines capture and product moisture should be examined.
- Conducting a testing program to determine the materials handling, truckability, geotechnical and hydrogeological (permeability) characteristics of the centrifuged product.
- Confirming the design for co-storage of fine and coarse tailings, including the required and expected mixing approach, required volumes and geotechnical basis.
- Conducting a variability program to understand the ranges of particle size and mineralogy and the impact these have on centrifuge throughput.
- Model the impact of ultrafines recirculation on the process, and the potential to retain a fines storage facility to enable settling of the ultrafines.
- Validation of the water balance, based on the above work.
- Assess the risk of groundwater mounding and the impact on geotechnical stability and seepage based on the above work.

4 Review of Letter from White & Case to Mr Wimbush, 18 January 2021

Table 4-1 presents commentary on the statements outlined in the White & Case letter, 18 January 2021.

Table 4-1 Commentary on White & Case letter, 18 January 2021

Statement	Review comments
The technical note indicates that there would be clear advantages for the Project if centrifuges are included.	The use of centrifuges in minerals processing and sand applications is limited. The benefits are therefore subject to the equipment working as per design and testwork scale-up to full size. Therefore, this technology has the potential to provide for several advantages compared to conventional wet storage of fines and scrolling, but these are yet to be demonstrated in practice.
1. Centrifuges would provide certainty about water recovery from the fine tailings that is independent of climatic and soil conditions.	Even with centrifuges included in the project there will continue to be uncertainty of the amount of water recovered, dependant on the climate and soil conditions as follows: a) the variable size distribution of the feed material, and the attrition and breakage of particles during the beneficiation process and efficiency of separation of coarse and fines will impact the proportions of coarse and fine tailings produced, required centrifuge throughput and the total water recovery b) the centrifuge discharge moisture and water losses to fine tailings will be a function of clay size distribution and speciation of clays and other minerals, the flocculant addition and centrifuge operating conditions (i.e. throughput, bowl speed, differential scroll speed, etc.). c) management of contact and non-contact water sources, including catchment areas, diversion structures, and variable moisture contents of dewatered fines and coarse sand will impact the amount of water recovered

Statement	Review comments
2. There is no need to construct the temporary tailings storage facility (TSF) or the in-pit fines TSFs if centrifuges are used, as they create a dry cake from fine tailings.	The centrifuge product will be discharged in a state that is close to fully saturated (most of the void volume between the solid particles will be filled by water). The centrifuge product will be expected to seep water after centrifuging and after placement. The amount of water that seeps from the centrifuged tailings is related to the flocculant addition, compaction of the cake under its own weight (self-consolidation) as well as compaction equipment (which may be required to improve trafficability, increase rainfall runoff and reduce rainfall erosion).
3. Centrifuges allow the continuous backfilling of the mined voids without the need to rip and remove the in-pit fine TSFs before the commencement of rehabilitation operations, which means that the disturbed mining area is smaller, and rehabilitation can occur sooner after the completion of mining in any particular area.	The amount and method of centrifuged fines storage will depend on the logistics of placing centrifuged fines. There may continue to be settlement of fines after placement under self-weight and compaction.
4. The continuous mining and backfilling operating significantly reduces overburden haul distance, which in turn reduces noise and dust generation.	It is probable that haul distance could be reduced. However, relocation of the centrifuge facilities is likely to incur high costs as well as interruption to operations. Use of modular systems may moderate the costs, downtime and duplication implications.
5. Any risk of seepage from fine tailings is removed as this material is fully dewatered to a state that will only retain capillary moisture that cannot seep to the environment.”	There will be ongoing risk of seepage. The centrifuged tailings will not be fully dewatered, and will contain up to ~35% w/w solids (35 percent of the total mass of water and solids will be water). This water is expected to seep from the centrifuged product with vibration (i.e. material handling and placement) and under compaction (under self-weight, or via compaction equipment).

5 Review of Technical Note, 18 January 2021

Table 5-1 presents commentary on the statements outlined in the Technical Note – Implementation of centrifuges for water recovery, 18 January 2021.

Table 5-1 Commentary on Technical note, 18 January 2021

Statement	Review comments
Section 1 – Introduction to Mineral Sand Tailings	
By mass, the fine tailings represent approximately 21% of the ore and the coarse sand approximately 74%. The remaining fraction is the HMC product.	The relative proportions of coarse, fines and HMC product will vary during the life of the mine, as the mine treats material with different size distributions and mineralogical proportions.
From the thickener underflow, the fine tailings are still a fluid slurry at approximately 30 – 35% solids content, as seen in Figure 1.	The basis for the solids content is not clear. Typically, this number would be reported as % w/w solids (weight of solids divided by total weight of solids + water). However, geotechnical engineers use a convention where moisture content is the mass of water divided by the mass of solids. The difference can be significant when managing water requirements across a project and aligning with geotechnical requirements. Alternatively, moisture can be reported on a volume (rather than weight) basis. The moisture basis should be clarified in all project documents. Presuming 30 – 35% w/w solids (weight of solids divided by total weight of solids + water), and based on the photo, the material likely has a high proportion of colloidal (electrostatically charged) clay particles.
Section 2 – Water Recovery from Tailings	
General	The comments in this section represent a reasonable summary of the likely water recovery from tailings.
Section 3 – Footprint Considerations	
General	The comments in this section represent a reasonable summary of the footprint considerations.

Statement	Review comments
Section 4 – EES Tailings Method – Fine Tailings Disposal Dams	
General	The comments in this section represent a reasonable summary of the likely process.
Section 5 – Alternative Option – Centrifuge Tailings	
Although the proposed TSFs can comply with relevant standards, the GSTM requires consideration of alternatives that minimize the volume of tailings and water placed in external tailings facilities.	In principle, including centrifuges in the project has the potential to minimise the volume of tailings and water placed in external tailings facilities. However, more work is required to validate the extent of the volume and water savings.
It is expected that, in the case of this project, the need for TSFs can be avoided altogether by the use of solid bowl centrifuges…	Even with the inclusion of centrifuges in the project, it is possible that a fines storage facility will still be required to: • Allow ultrafines to settle from the centrate water stream, to avoid an increasing recirculating load of ultrafine slimes that are not easily captured in the centrifuge, and/or • Generate void space in the mine to enable in-pit TSFs If ultrafines was managed through a settling pond, water clarification (i.e. in pinned bed or dynamic bed clarifiers) could be used to reduce the volumetric flow sent to the pond. Alternatively, the decant system could be designed to enable fines to settle, with periodic dredging.

Statement	Review comments
…which would produce dry cake from fine tailings.	The term “dry stack” has become a commonly used industry descriptor for projects that are moving away from conventional “wet” tailings deposition to dryer forms of storage. However, the term incorrectly implies that the material is “dry”. The centrifuged material will actually have a moisture up to and potentially exceeding ~35% w/w which means there will be a large amount of water in the centrifuged material. In practical terms a large proportion of this water will be chemically bound to the clays, as well as being retained within fine capillaries so the material may appear dry once discharged from the centrifuge. Nevertheless, some water may be released through vibration (shearing) and compression during rehandling, trucking, placing and compaction of the tailings. At an Argentinian operation, the centrifuged tailings produced at a similar moisture content of ~35% w/w (albeit with a different mineralogical composition) tends to flow downhill by gravity, behaving like a very viscous fluid, akin to a lava flow. It should be noted this is a deliberate operating strategy used to help deposit the tailings across variable topography at this site and dryer moistures could be achieved if required.
The centrifuge dewaters the cake to the absolute point of practical dewatering…	Filters typically remove a larger amount of interstitial water than centrifuges and achieve lower moistures than centrifuges, particularly if operated at high pressures and/or with membrane squeezing and/or air blow steps. Additionally, dewatering technologies (centrifuges included) can be configured to operate at higher throughputs and wetter product moistures (within limits). Therefore, centrifuges do not (and may not always) dewater the cake to the absolute point of practical dewatering.

Statement	Review comments
…and any remnant water will remain entrained due to the capillary action between the water and solid particles. This means that any water that remains in the cake will not drain freely from the material, even when it is deposited back into the void with overburden.	Centrifuge products approach saturation (all void spaces filled by water) and are generally thixotropic and compressible. Therefore, in the same way that a sponge can entrain water due to capillary action, once vibrated (by material handling or trucking) or once compressed/squeezed (by placing and covering with material, or consolidating under self-weight) the centrifuged material can become fully saturated and seep water back into surrounding soils. The “floccs” that form through the addition of flocculant prior to the centrifuging process can also degrade with shearing, placement and compaction, and time, increasing the amount of released water. It is important to note that saturated materials typically exhibit poor geotechnical strength and trafficability.
The risk of groundwater mounding from seepage is removed as the ability of water to seep from the fines into the underlying soil, at a rate greater than the vertical permeability of the underlying soil, is eliminated.	The risk of groundwater mounding may be reduced but is not removed and should be assessed considering the: • compressibility of the material • self-consolidation properties and compression from overburden • practical ability to mix coarse and fine material, given the methods of dewatering and placement, and • extent and rate of saturation
After being processed through the centrifuge, two products are produced. Firstly, a clear overflow water (called the centrate) containing very little suspended solids, and secondly a readily transportable solid cake.	The full-size operating centrifuges may produce a centrate that is “dirty” containing substantial suspended solids, and the solid cake may not be readily transportable due to high moistures approaching saturation and associated geotechnical characteristics. It is important to note that there are scale-up and operational factors that may prevent the full-size centrifuges from operating at the same conditions as the spin test. These include: • Machine design and hydrodynamics • Flocculant addition, mixing and residence time • Operating g-force, and machine limitations due to scrolling speeds, material clumping, vibration, or other factors

Statement	Review comments
Solid bowl centrifuge units are a proven technology and their application in tailings dewatering is not new, with multiple units being used globally in coal, tar sands, bauxite, iron ore, borax, gold, nickel tail dewatering applications.	Solid bowl centrifuges are not a new technology. Technology developments in recent years have improved the viability of these units due to lower flocculant consumption, reduced power, higher g-forces, improved hydrodynamics and reduced moistures. The advent of the technology into tailings dewatering duties is relatively recent and the market share of centrifuges in tailings dewatering projects is relatively small. Therefore these centrifuges are not proven in this duty. A recent coal project has had commissioning and ramp-up challenges due to a combination of factors related to the project, duty and material characteristics. Ausenco expects that these technical challenges could be resolved for this project through appropriate project development, scale-up/demonstration and engineering processes.
Centrifuges have previously been evaluated and successfully trialled, but not used, in mineral sands applications.	Ausenco is not aware of the specific trials of centrifuges in mineral sands duties, nor the specific reasons for not implementing them on the project where the trial occurred.
One of the main advantages of the centrifuge is that it provides certain and maximum water recovery within a controlled mechanical process, which is not affected by weather, evaporation rates or tailings deposition methods.	There remain uncertainties around the moistures achieved from centrifuges at full scale, at a range of machine configurations, material types and throughputs. Water recovery is a function of the sitewide water balance which includes climatic factors and would typically be validated through appropriate water balance modelling.
Also, because the product is a truckable solid cake, the need to store and dry the fines tails slurry in TSF dams is no longer necessary and the cake can immediately used for backfilling of the pit.	The truckability of the material will need to be confirmed. It is possible that the centrifuge product will be sloppy from time to time and will require some dessication (drying) prior to rehandling, trucking and placement. Trucking of centrifuged material will result in vibration and potentially release water from the coarse capillaries. An initial temporary storage facility for fines may still be required until the in-pit TSFs are established. A long-term storage facility for settling of “dirty” decant water and removal of ultrafine particles from recirculating loads may be required.

Statement	Review comments
The centrifuge cake will be transported during dayshift from the centrifuge facility to the active backfill area in the void, where it will be placed as backfill with the overburden. The benefit of this is that it ensures an even dispersal of the fines throughput the backfill profile, rather than concentrating the fines in in-pit TSF cells. In total, the fines cake will represent only 7% - 8% of the total overburden backfill volume and stability of the backfill is not compromised.	Deposition of fines and coarse through the backfill profile will need to be managed to achieve an even dispersal without compromising backfill stability. For example, coarse and fines are unlikely to mix unless actively blended, leading to pockets of fines and coarse. This means that local concentrations of fines may be much higher than the 7 – 8% average with resultant geotechnical implications. Other implications could include: • reduced water recovery from the coarse sands due to re-wetting of the centrifuged material and reduced permeability of the sand water through the backfill mix, and • increased total volumes, depending on the assumed mixed bulk density.
Avoidance of the need for TSFs would also reduce dust and noise generation by the proposed mining activities as it would reduce the active mining footprint and facilitate closer and more rapid backfilling and rehabilitation of mining voids.	In principle these comments are correct.
Section 6 – Centrifuge Plant Technical Details	
As the project entails two mining unit plants (MUP) in two separate areas, two centrifuge plants would also be required. Each plant would contain three operating units and one standby unit, with a throughput rate of ~55 tons solids per hour per unit and would be enclosed in a building that is approximately 23.5 m long, 13.5 m wide and 11.5 m high at the crest of the roof.	The proposed sizing for centrifuges is based on a solids capacity of 55 t/h/machine. However, in this application the solidbowl centrifuges are likely to be constrained by the volumetric loading (rather than solids loading). This is based on the February 2021 testwork by Alfa Laval that indicates the feed should be diluted to ~23% w/w solids to enable effective flocculation. Based on a volumetric loading rate of 80 m^3/h (which is considered optimistic in Ausenco's experience), approximately 15 x P3-10070 centrifuges would be required. This is approximately double the number of centrifuges proposed. Further work is required to clarify the limiting criteria for sizing of the centrifuges and the implications in terms of flocculant consumption, fines capture and moisture with changing volumetric throughput.

Statement	Review comments
The proposed building layout for each plant entails the four centrifuge units on the cladded top floor, a cake discharge conveyor below them, and an external cake stacking conveyor. The centrifuge plant would operate 24 hours a day, producing a fines cake which is discharged onto a stockpile. The trucking of the cake to the mine void, where backfilling is occurring, would take place during the day shift. During evening and night periods, the cake will accumulate on the stockpile for loading and haul to pit during the following dayshift. Ancillary equipment around the plant will be a flocculant mixing tank, electrical switchroom, transformer enclosure and a bypass sump.	In addition to the scope mentioned, the centrifuge building will likely require slurry storage tanks for flocculant addition, water services (tanks and pumps), a hardstand for the radial stacker and stockpile and drainage infrastructure and sumps/pumps to capture seepage from the stockpile. Slurry and water return pipelines and fire water services (tanks, pipes and pumps) may also be required.
The centrifuge plants would be located in close proximity to the mining area in order to reduce the overland haul distance of the centrifuge cake back to the mining void, and thereby minimise noise and dust generation. Based on the preliminary mine planning, it is anticipated that each centrifuge plant would be relocated to a new position every four to five years. The plant has been designed to be modular so that it can be dismantled and trucked to a new location, when required. The plant positions have been selected such that the average one-way haul distance from the plant to the mine void is an average of 750 m for all locations.	It may be preferable to convey centrifuged material to intermediate locations rather than relocating plant and equipment. The additional conveying could lead to reduced trucking distances with a reduction in dust and haul fleet emissions.
Section 7 – Water Recovery Comparison	
The centrifuges enable a significant increase in fine tailings dewatering to be achieved, as it employs the use of a flocculant and increased centrifugal forces to dewater the material to a degree that cannot be achieved in a conventional TSF.	It is important to make the distinction that the centrifuge will dewater the material rapidly to a high solids content (circa 65% w/w) and recover that water immediately to the process. The TSF may achieve higher solids contents after scrolling and desiccation. However, much of this water will be recovered slowly, lost to evaporation and not returned to the process.

Statement	Review comments
Based on centrifuge testwork results, the water recovery estimate shows that the 3 GL per annum water requirement remains achievable, with ~2.9 GL per annum required for a process plant operating at the maximum 1,500 tpa processing rate.	The water balance has not been evaluated as part of this review. However, the balance needs to consider a reasonable range of centrifuge product moistures and contingencies.
Section 8 – Noise Comparison	
General	The noise impact has not been evaluated as part of this review.
Section 9 – Air Quality Comparison	
General	The air quality impact has not been evaluated as part of this review.
Section 10 – Rehabilitation of Mining Areas	
General	The rehabilitation impact has not been evaluated as part of this review.
Section 11 – Centrifuge Costs	
Compared to the EES scenario, the centrifuge costs require increased upfront capital expenditure. The centrifuge cost is partially offset by the removal of the TSF construction, but not withstanding this offset, the additional investment is significant.	In principle these comments are correct. However, the additional capital costs may increase if the sizing criteria for the centrifuges (volumetric loading rather than solids loading), or full-size performance that is worser than design, increases the number of required units.
Compared to the EES, the direct tailings operating cost of the centrifuge is slightly greater but this is largely offset by the improved operational efficiency of the mining operations, the removal of TSF operating costs and the accelerated rehabilitation of disturbed mining land.	In principle these comments are correct. However, removal of the TSF requires sufficiently high recovery of ultrafines to mitigate a recirculating load via flocculant at a reasonable cost.
Section 12 – Advantages of Centrifuge Fine Tailings	
General	The advantages are repeated in the letter from White & Case to Mr Wimbush. Therefore, the comments outlined in Section 4 apply here.