

SUPPLEMENTARY SUBMISSION 831

CENTRIFUGES

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22 Mar 21

Good afternoon, Panel Members

I write to add to my Submission, sent late 2020, pertaining to the Fingerboards Mineral Sands Project at Glenaladale.

My first comment is that surely this can't be Standard Behaviour for Companies seeking a Mining Licence?

And by that, I refer to the addition of a significant change in the profile of the project, 'slipped on to the table' not long before a Panel Hearing process is scheduled to begin.

As Community Members, we are well versed in the behaviour of Kalbar and others whom are in their employ. And it's unrelenting and exhausting. Their quest appears to be to minimise risks and consequences, whilst embellishing the touted benefits of the project. And this is done by omissions and half-truths.

This approach has seemingly underpinned the formulation of EES reports (which Kalbar blithely asserted would be evidence based, best practise and grounded in scientific reality) and now extends to what's provided in the Technical Notes pertaining to the Centrifuge option.

I have, in my earlier Submission, discussed a range of Principles, such as 'Above the Line/Below the Line' behaviours, Ethical Decision Making in Government, societal norms and expectations within this Community, and 'whose needs are being met'.

I suspect the aim of Kalbar, with this Project, is to get it approved so the Mining Licence can be quickly on-sold, and the few Directors can walk away with an extraordinary amount of money. Leaving carnage behind.

Putting the Centrifuge option up now, post EES, and now boldly claiming it will absolutely replace the need for a Tailings Storage Facility, feels like a deft manoeuvre aiming to appease those with concerns about a TSF. And give the impression that the project is benign.

But, in seeking to present a 'more palatable' option for the project, Kalbar have failed in a number of areas.

## Communication

I attempted to gain information from Kalbar around the Centrifuges, via email to their 'contactus@' inbox, and again, it 'was like dragging teeth'. I was drip fed scraps of information, and all replies lacked timeliness. Not unlike when I had queries about the EES late 2020 and it took 3 weeks and multiple attempts to obtain a satisfactory reply. Indeed, regardless of when, slightly more timely replies only happened when I cc'd our State and Federal Members of Parliament in to the discussion.

I initially emailed Kalbar 25 Feb requesting the Centrifuge Specifications, then again 03 Mar (including MP's this time), reply on 04 Mar of a Brochure (the same as what's on the internet), on 08 Mar I asked for the Specs again, and on 09 Mar received a data sheet off a slide show and a Noise report – that noise report was undated and in Hz not dB. So measuring different outputs.

"The relationship between Hertz and decibels allows a listener to measure the frequency and perceived loudness of any sound. The frequency or amount of air pressure change vibration is measured in Hertz. The resulting change in air pressure created through the vibrating object is measured in decibels. Decibels, in effect, measure the loudness of a sound and Hertz measures the frequency of the sound."

<https://www.techwalla.com/articles/the-relationship-between-hertz-and-decibels>

Ultimately , the conversion from hZ to dB is not possible.

Further emails and on 13 Mar, a 'cut and paste' on Vibrations. Along with the comment

*"Hi Kerry,*

*What you are in fact requesting is closer to a detailed design, which is a stage we are not yet at.*

*Footing and hold down details will be developed during the detail design stage according to industry standard engineering design practices by a qualified structural engineer. The footings and the design approach are not unique to centrifuges...."*

Interestingly, this is different from the response from Alfa Laval on 12 Mar which states

*"Hi Kerry,*

*I apologise for the late reply, as I have been on annual leave....Technical details specific to the Fingerboards project have been supplied to Kalbar and should be obtained from them, as the details are based on specific project capacity requirements and mineralogy details...."*

I am yet to hear from Alfa Laval as to where Centrifuges are manufactured.

Only relatively recently have Kalbar taken down the 'Closed due to Covid' sign from their door. So during that time readily entering the building to ask a question in person hasn't been possible.

### **Centrifuge use**

Kalbar has drawn on those within the Mining industry to provide Expert Witness that Centrifuges have been used in mining. Which they have. But not in Mineral Sands Mining. It's been coal, nickel, borax and other substances.

So there's no precedent on which to draw which compares 'like for like'.

Kalbar initiated testing of Centrifuge viability 2 ½ years ago, as evidenced by the Alfa Laval report.

And there's serious questions which must be raised with the test results, undertaken in WA, from Oct 2018.

*"The results must only be considered as an indication (not a guarantee). In full scale equipment, there are a number of variables available which are not possible to test in a laboratory" pg 26.  
Tabled Doc 130*

*"The exact scope, detailed operating parameters that may be achieved in practice and economic implications on the Project can only be determined after detailed design and cost estimating work is complete". Pg 7, 4.2.4 TD 130,*

*"The actual dryness of the cake depends on the G force, which can be tested in the lab, but also some other factors which cannot be tested ... These include the differential speed of the machine, pond height, variations in feed dilution and additive dosing, pH adjustment and throughput" Pg 8, 5.2 TD 130*

There is no clear Chain of Custody with the sample provided from Kalbar in that testing. Alfa Laval cite in their report

*"The age and origin of the sample is unknown to Alfa Laval, but was tested within 24 hours of receipt. This sample supplied was a very thick paste and was diluted using potable Perth water for testing." Pg 24 TD 130*

And, given in 2018, Centrifuges were considered by Kalbar, why weren't they included in the EE? The parameters for the EES document includes the requirement that all alternatives be considered.

In the absence of information around Centrifuges, it was impossible for the Technical Reference Group to consider the implications of this aspect of the project.

I read the White & Case letter, pg 5 - 6, TD 141, which frames the move from TSF to Centrifuge as 'merely' a changing of one "element" of the project. They reference a 1979 court case, and "planning context" to confirm their interpretation of "transformative".

*“There is no plausible basis upon which the proposed modification of the Project can be described as a “transformation” to the extent that the term is understood in a planning context.*

*27. An area of fertile debate might exist as to whether or not the concept of “transformation” as generally understood in planning circles (emanating from the 12 February 2021 6 OFFICIAL decision in Addicoat v Fox (No. 2)<sup>4</sup> under very different legislation, and evolved over time) has any role to play in proceedings of this type, but given that the proposed modification could not be properly regarded as transformative of the Project, it is not necessary to deal with those matters here.”*

I suggest it is “transformative” as it introduces considerably greater financial outlay, ongoing costs and other components to the Project.

This is a hugely significant aspect that impacts a range of domains, including noise, vibration, financial viability, energy use and associated greenhouse gasses, hydrology, rehabilitation and much, much more.

Those same domains all feature within the framework of the EES and I’m at a loss as to why the Centrifuge hasn’t triggered, at the very least, a whole new EES.

This is not a change in leasing arrangements for equipment, or a review of staffing levels and skill mix. This is something so much greater.

White & Case provide this comment, which provides no assurances, specifically including “currently” when discussing what is being “contemplated”

*“FURTHER CHANGES 28. No further changes to the design of the Project are currently contemplated.”*

*(TD 141)*

Given circumstances to date, this provides no assurances that the Centrifuge option will remain the only one, and that the TSF plan won’t return to the fore. Changes to the Work Plan are not uncommon after a mine commences, and the track record of Kalbar proves the calibre of their moral/ethical framework.

## **Noise**

I watched the Hearings session, over Zoom, on 15 Feb 21 and it’s ironic that Mr Adrian Finanzio, SC for White & Case, was bothered by a passing Garbage Truck working in the background. Indeed, he had difficulty maintaining the conversation as a result. It’s ironic given White & Case represent Kalbar who are seeking to put considerable numbers of Double B trucks on the Road. And have noise generated by mining activities.

The noise levels provided by Kalbar, to date, around the Centrifuge use are, as expected from them, minimised and distorted.

What data was able to be 'extracted' from their office is limited. And what was provided, after repeated requests, contains gaps.

There's no mention of the holding capacity of each centrifuge or an estimate of the actual noise level (in dB) beyond the 'lightweight' housing structure proposed.

The information provided does not have the equipment operating at full speed, the inlet/outlet pipes are sealed and there's no evidence that tailings are actually within the equipment at the time.

Documents describe a two level structure, with the Centrifuge mounted on top, all encased in a lightweight, transportable structure. With passing reference to noise treatments which *might* reduce levels by 5dB.

Could it be plausible that Kalbar have refused to provide Specifications to the public as the noise from 6 operating Centrifuges is just too extreme?

### **Vibration : soil health / animals**

And with noise, there's Vibration. Again, limited data and no consideration of the impact of Vibration on soil structure, life forms within that soil, livestock and wild life.

We know that bacteria forms the basis of Life. And is essential for healthy soil. The effects on soil health by the introduction of Centrifuges hasn't been assessed. Not by a long shot!

*"Holistic study is particularly pertinent to an understanding of soil microbiology. Microorganisms are not only directly influenced by fundamental soil characteristics such as moisture, oxygen and chemistry but also by each other in both beneficial and predatory ways. By becoming holistically aware of the fundamental importance of soil organisms and then developing and understand how biological processes in soil are influenced by changes in the soil environment, we can learn how to manage soil in a way that enhances the benefits provided by soil organisms."*

<https://www.futuredirections.org.au/publication/living-soils-role-microorganisms-soil-health/>

A few handfuls of soil, spun to a fairly dry consistency, doesn't give any clarity around the impacts of the processing on the vital bacteria within, and how this translates in reality, and on a large scale.

The soils around Glenaladale are known to be prone to erosion, yet there's no rigorous or scientific study which gives clarity around how the vibrations of the centrifuges will effect the soil structure.

And there has been no consideration for the impacts of vibration on non human receptors. And that includes all from bacteria to more complex organisms.

*“Vibration plays a role in communication between animal species ranging from insects to elephants.<sup>21</sup> Vibration is important in predator–prey interactions, mother and young relationships, mate choice, and recruitment of food, suggesting that animals may be more sensitive to vibrations than are humans.”*

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3189668/#:~:text=Vibration%20plays%20a%20role%20in,ranging%20from%20insects%20to%20elephants.&text=Vibration%20is%20important%20in%20predator,to%20vibrations%20than%20are%20humans.>

*“In the study of the effects of anthropogenic noise on wildlife, one common sensory modality has been overlooked: the vibratory sense. Animals across a wide range of taxa utilize substrate-borne vibrations as an information source and the vibratory sense may be one of the most ubiquitous senses guiding behaviour in arthropods as well as in some vertebrate taxa”*

<https://nature.berkeley.edu/eliaslab/Publications/Wu%20and%20Elias%202014.pdf>

And, the absence of any reference to impacts around vibration on non human life seems to suggest that Kalbar are wanting this negative impact to 'slip under the radar'.

### **Rehabilitation / hydrology**

If Kalbar are actually and truly genuine and serious about Rehabilitation then how can the impacts of vibration on soil quality, including bacterial/fungal load, be ignored in the centrifuge option?

The documents put up by Kalbar funded experts fail to provide any scientific and balanced understanding of the impacts on rehabilitation strategy with the mining voids once the soil composition has changed.

Nor do the reports indicate issues with hydrology and how the altered soil structure will behave with filtering ground waters.

### **Water use**

Kalbar stated they have introduced the Centrifuge option in response to Submitter concerns about water use. And there's also the 'small' issue of them under-estimating water requirements. However, TD130 Nalco documents would suggest that Kalbar were well aware of the issue with water calculations quite some time before the EES was released.

Ivan Saracik states in his report that Kalbar

*“adopted a water recovery figure for the fine tailings that is more aggressive than could be achieved in practice”*

*He also notes “The Technical notes has not paid sufficient attention to the extent of TSF area and the time that would be required to recover all water that might drain naturally if a centrifuge wasn't used”*

Ivan Saracik mentions, TD 130, the development of Global Industry standards on tailings management GSTM which was launched in Aug 2020.

How is it plausible that Kalbar not know of this? Or did they, but choose to not include the centrifuge in the 2020 EES?

Regardless, the amount of water required for the centrifuge options (2.9 GL per year) isn't that far removed from the amount stated in the EES (3.0 GL per year). To claim that the Centrifuge reduces environmental impacts lacks credibility.

And should the Centrifuge not be pursued, (through a variation to the work plan) then the original (Nalco) calculations of 5 GL would be more the amount for the Tailings storage facility.

Extracting any vast amount of water for the project will have unacceptable impacts on flows in to natural waterways, including the Gippsland Lakes Ramsar wetlands.

The Climate Crisis, which we are now experiencing, will worsen this consequence.

### **Power Use and Greenhouse Gases**

We are not living in the 1950's. There is no sane reason why a project which will use 14,000 kVA should be approved. The jump in power consumption from 9,000 kVA is extraordinary enough, and then there's the consequences of increased Greenhouse Gas Emission.

### **Flocculent use and misuse**

There is no clear, scientific and independent report on the impacts of a significant increase proposed for the amount of Flocculent use. Currently, it is listed at 370g/tonne of tailings. Within this, there is a stark absence of relevant information about the impacts on the environment. Whilst documents describe (again in benign terms) the flocculent breaking down to the likes of ammonia and nitrogen, the effects of additional elements in the environment are not identified. New Zealand waterways are clear and distressing proof of what happens with heightened nitrogen levels in the waterways – algae blooms, toxic water and changes which prevent recreational use.

The available data sheet, which outlines some of the characteristics of the proposed flocculent, is dated 2009. This seems a rather long time ago and there's no evidence that Kalbar has sought an updated chart, if indeed one exists.

And, coming back to the absence of a precedent with centrifuges, mineral sand mining and this flocculent combined (on a real life scale), it's noted on the Nalco document (TD 30, Appx C, pg 3) that the

*“characteristics of Glenaladale slimes create a narrow band of conditions for effective flocculation such that feedwell design factors become critical to ensuring that design throughput can be maintained without excessive flocculent dosing”*

## **Finances**

Kalbar continue to avoid providing a business plan that illustrates they are able to identify/demonstrate the financial viability of this project.

It is abundantly clear from expert reports that Centrifuges are expensive. But how expensive isn't for public knowledge. Google doesn't help and Alfa Laval are yet to reply to my questions regarding manufacturing sites.

Regardless, this financial outlay is one reason why, for the Fingerboards project, the centrifuges haven't been considered in the past.

But now they are brought to the fore like a 'redeeming feature'.

Is this some slick marketing, presenting the centrifuges as 'benign' and 'conciliatory' to get the project passed by the Planning Minister?

We know centrifuges more or less double the operating costs associated with the treatment of fine tailings. (pg 3, TN14)

But, without a professional and all encompassing financial statement, Kalbar's project lacks credibility and heightens the risk that, once underway, financial pressures will lead to premature cessation of works and/or abandonment of the project.

Leaving Government, at all levels, to fund remediation works. With a sub optimal outcome.

There are endless examples of failed mining ventures, and the regulatory bodies which are meant to oversee mining lack 'punch'. Once a company walks from a mine site there is no redress for the Directors. Many of whom, in this case, are based overseas.

Biodiversity isn't on the shelves at Bunnings. Ancient aquifers don't feature on eBay. And Aboriginal Heritage is a topic which the mining industry seems to brush over. Rio Tinto are struggling to get it right, to cite just one large and experienced mining operation.

A centrifuge won't change any of that destruction.



## **Foundations**

Centrifuge foundations are massive, and from my emails with Kalbar, they are either declining to share information, or are 'making it up as they go along'.

There is a suggestion that Centrifuge structures will be 'transportable', and moved to accommodate the mining schedule.

What of the huge foundations? What is the impact of these on hydrology? And the dispersive soils?

## **Safety**

In much the same way the EES describes the risk of Tailings Storage Facility failure as 'Rare', even though it's not, there's no mention of the issue with failings of the Centrifuge. Centrifuge spin at enormous rates, and given Kalbar expect to have 3 functioning and 1 'spare' in each of the 2 banks of centrifuges, the risk of the units failing and flinging components is of particular concern.

I note the Nalco document from 2009 mentions issues with ignition of the flocculent, risks with inhalation and the like.

## **Human Health**

This has been largely dismissed when considering the implications of the centrifuge on the project. Whether this be the noise aspect or the overnight stockpiling of processed tailings. Wind still blows of a night time.

## **What we eat**

It's clear that, as a populated planet, feeding those who live here is a priority. And all that can be done to protect and develop reliable food supplies should be done. The proximity to Agriculture and Horticulture should be 'ringing alarm bells' loudly for Panel Members.

Food doesn't appear out of thin air like some sci-fi movie.

## **Conclusion**

With so many unanswered questions about the Centrifuges, what is the Government thinking when considering this project?

Surely it can't be about believing what's written down by Kalbar, who lack credibility and a track record as a 'fit and proper person' to hold a mining license.

My adolescent daughter summed it up nicely, I felt – she said "anything can look good if you ignore the bad parts".

Centrifuges are not the panacea for the project. They bring too many unanswered questions.

I urge the Panel Members to dismiss this project, protect our future (both in the short and longer term) and protect the planet. We have nowhere else to live. There is only one Earth. Humans rely on a healthy environment, and long gone are the days when we were arrogant enough to consider ourselves separate from the biology (at all levels) in which we live.

I'll finish up now, but will discuss more at the Panel Hearings.

I sigh deeply and consider at what point in this lengthy process the Panel Members identify the 'tipping of the scales'. That being where the weight of evidence which the Community provide, stating the obvious, is enough.

The project must be stopped now, and for all time.