

Submission Cover Sheet

Fingerboards Mineral Sands Project Inquiry and Advisory
Committee - EES

837

Request to be heard?: Yes

Full Name: Lionel Rose

Organisation:

Affected property:

Attachment 1:

Attachment 2:

Attachment 3:

Comments: See attached submission

Introduction

I have written this submission to express my concerns about Kalbar's proposals to develop a Mineral Sands Mine at the Fingerboards believing this to be a totally inappropriate development which should not be allowed to proceed.

I write as a forty year plus resident and farmer of the Fernbank Glenaladale area who lives in the area and owns property on both the north and south sides of where this mine is proposed to be established.

I do not write as a person who is opposed to mining as I realize that many products extracted by the mining process are essential to our daily lives but I write as a person who has a strong objection to a mine being established in an area where it will have a greater negative social, environmental and economic impact than a positive one.

I believe I have substantiated throughout my submission why the Fingerboards area fits this criteria and regardless of the fact that a resource exists here, this is an unsuitable location for a Mineral Sands Mine.

I would hope that a criteria for assessing the validity of Kalbar's Environmental Effects Statement is not its length, cost of creation nor the number of colour pictures and maps for if this is the case it is an extremely impressive document and certainly has succeeded in meeting those criteria.

Rather I would hope that much thought and effort is put into examining its content, accuracy and honesty for if this is the case then this EES falls far short of the mark.

Having read large extracts From Kalbar's Environmental Effects Statement, I have found many mistakes and inaccuracies which are far more than simple typographical errors (although there also are a number of them). The document is full of unsubstantiated statements, assumptions and incorrect facts.

These include

- drawing of incorrect and misleading conclusions from incomplete data as is demonstrated in the wind speed and direction analysis
- using incomplete and inaccurate data to model outcomes in dust deposition and air quality
- showing a total lack of understanding of community expectations and values by stating that the proponent will pay employees to join community voluntary emergency organizations where they would work alongside long term community members who are volunteering their time and the proponent not expecting that there would be friction.
- undertaking surveys during inappropriate times (drought conditions and before adequate recovery post 2014 fires) and over too short a time frame leading to large gaps in data as demonstrated in the aquatic and biodiversity sections
- suggesting risk mitigation measures that are not appropriate such as forming reference groups with the community

- contradiction in the presentation of data such as using data from a BOM weather station in one report but pointing out its inadequacies as a comparison in another as was done in the Horticulture and Agriculture reports.
- addressing issues with the response that a plan will be developed later during the life of the mine
- using inappropriate studies as examples such as impact of coal dust on cattle health
- citing the above study but not extrapolating information to deal with impact on other types of stock or wildlife
- using inappropriate data such as farm production for Omeo and Bruthen which has no relevance to Glenaladale
- underestimating farm production gross margins to strengthen their fallacious argument that the land is better suited to mining
- underestimating the value of vegetable production on the Lindenow Flats despite much more accurate and higher figure being available and quoted by the Local Member of Parliament and the Minister for Agriculture
- quoting short term success of erosion stabilization projects to demonstrate that tunnel erosion in disturbed country can be controlled when long term results from the same project point to failures
- claims that it has responded to community concerns when in many cases only lip service has been paid such as a failure to respond to community angst over the relocation of the Processing Plant closer to a number of residences
- production of maps which have important information omitted such as the map showing the proposed location of Kalbar's dams at the heads of gullies and not showing that there are farm dams further down those gullies which will be impacted
- not addressing the issues of the effect of water retention on the proposed mine site on springs and gully ecosystems further down those gullies
- claiming that monitoring bores have been sunk to monitor mining impact on groundwater when they are not appropriately located in relation to many farm bores, especially stock and domestic bores to the south of the project area
- underestimating the impact on the community of realigning major roads to better suit their own purposes
- assuming that planting tubestock trees to replace those paddock trees destroyed in the mining process will provide the same level of shelter for stock when the area is returned to agriculture
- underestimating the impact of East Coast Low events on water runoff and local flooding and assuming that these volumes of water can be adequately managed
- underestimating the time it will take to rehabilitate mined land despite advice from local farmers and contradictions in those time frames between reports with some stating three years from mining to return to agricultural production while other documents state five years.
- lack of understanding of vegetable production and the regulations that farmers must abide by in suggesting that they develop Quality Control certification which many already have
- lack of knowledge of the threat and danger of dust in crop contamination demonstrated in comments about the way certain vegetables such as cauliflower develop
- denying an impact on the vegetable growing industry by failing to admit the real impact of consumer reaction by trying to demonstrate that consumers are not concerned where their food is sourced from

- assuming that topsoils can be successfully stockpiled without destroying organic matter and causing them to become sterile
- assuming that topsoils can be successfully stockpiled without destroying soil structure
- despite local advice producing modelling which assumes that groundwater seepage can be controlled and that contaminated mine water will not find its way into the Perry or Mitchell systems shows a lack of knowledge of the way water and subsoils interact in wet years
- simply accepting that 80 B Double movements per day will increase the risk of accidents on local roads despite ongoing expressions of concern shown by local residents
- underplaying the amount of community stress that this project has and will cause by trying to demonstrate positive impacts on what are very selective sections of the community and failing to take into consideration the entire community
- failing to accept data presented by the community as to the number of people and residences that will be negatively impacted by this proposed project as demonstrated in the difference in the two maps produced, one by Mine Free Glenaladale and the other by the proponent showing the number of homes with two kilometres of the project area
- using inappropriate case studies of where mining and horticulture coexist as examples but failing to consider the life and size of the mine, topography, rainfall and types of horticultural production
- a lack of understanding of the amenity and liveability of the area by using legislation and regulation guidelines to demonstrate noise and dust levels during mining rather than understanding what the community now has and what it stands to lose
- a belief that monetary contributions to community groups will curry acceptance of Kalbar into the community showing a lack of understanding of community pride
- denial that there is no social licence for this project and underestimating the importance and necessity of such a licence in a small rural community

What is of concern, is for a person not familiar with the area, it would be simple to overlook these errors and omissions and accept them as correct. This would lead to inappropriate conclusions being reached about the negative impact of such a development on the area.

Kalbar is proud of its community consultation process detailing the number and type of meetings that it has held over the last six years. But what it does not detail is the lack of community support for this project as expressed in many questions asked and comments made during these meetings.

Many of these questions put to Kalbar at these meetings were met with the response that those issues will be dealt with in the EES. But just what do we find when we explore the EES to find those answers. We find far too many statements that these issues still have not been resolved advising that

- A Reference Group will be formed
- A detailed assessment will be made X years into the project
- A detailed plan will be developed X years into the project
- If basic mitigation measures fail then the situation will be reviewed

Risks that the community has expressed concerns about and considers as unacceptable, the proponent lists as low outlining mitigation measures which have failed in the past, while a

number of concerns such as the location of the Processing Plant have been totally ignored by the proponent.

There are also concerns with the way the proponent has denigrated the area to give the impression to an outsider that the agricultural industry on the plateau is struggling when in fact this is far from the truth as the area continues to produce quality product which meets consumer demand.

The heavy use of computer modelling using limited data by both the proponent and their consultants manages to conclude that the project is viable and that problems arising can be mitigated. In many instances not only does this modelling contradict local knowledge but the conclusions reached do so also.

I contend that the EES

- is manifestly inadequate being too reliant on computer modelling to enable accurate predictions to be made about the likely risk of certain events occurring which may be of threat to existing land use, the environment and the adjacent communities
- draws inaccurate conclusions and makes incorrect assumptions due to a substantial amount of data being either incomplete or inaccurate
- falls short of adequately and accurately demonstrating that significant environmental effects of the project can be acceptably managed
- fails to provide an objective and totally independent expert assessment of the project as a result of all consultants being employed by the proponent
- underestimates the severity of risks and their consequences and postures mitigation measures that are inappropriate or unworkable
- fails to answer questions that the community expected to be addressed in this document
- fails to adequately meet the Scoping Requirements by clearly stating that certain policies, actions and plans are yet to be developed
- fails to demonstrate that the proponent has the experiences to develop and operate this project in this environment.

These criticisms of the EES and its failure to convince the reader that the proponent is capable of making this project compatible with existing agricultural industries, making it environmentally sound, and socially acceptable with minimal disruption to the lives of nearby residents, let alone the liveability of the area are strong enough arguments to have the EES rejected and the proponent advised that this development cannot proceed any further.

L. Rose

Fernbank 3864

General Comments

Throughout the EES there appear statements that processes, plans and procedures are yet to be fully developed or statements made that do not reflect the true nature of events.

These include but are not limited to

- **Fire prevention** This aspect would seem of a high priority to the local community as attendance at such an incident would be reliant on attendance by volunteer members of the local CFA yet there is no clear fire prevention policy in the EES nor have local CFA Brigades been independently consulted.
- The comment in the Risk Register the Kalbar will encourage employees to become Emergency Services Volunteers is in itself admirable. However the addition that “Kalbar will pay employees for their time to attend training on behalf of these organizations” flies in the face of all these volunteer organizations stand for and is more than likely to cause conflict between members. As the Captain of the Fernbank CFA Brigade, I find this to be an unacceptable policy decision on Kalbar’s part and demonstrates once again the company’s lack of understanding of the community, its values and its organizations.
- **Species selection** for rehabilitation of pasture and bushland is yet to be finalized so there has been no data base drawn up to gauge the appropriateness or potential level of achievement that will be realized. There is also an admission by Kalbar that there is a knowledge gap in techniques for establishing and maintaining the grassy woodland vegetative community that it intends to establish over a 200 hectare area. Yet at the same time it is providing what can only be described as misleading information in the media where it gives the impression that this part of the project is totally under control.
- **Community Consultation** Although there have been numerous meetings with community and many questions have been asked and discussions taken place , it does not logically follow that the community is satisfied with the plans for this proposed project. If the community was becoming more at ease with Kalbar’s proposal, then these questions and comments would have become less negative. This has not been the case. In fact judging by conversations and media content, the community is becoming more concerned about the negative impact of this proposed project on the social, natural and economic environment of the area.

Kalbar’s response to this high level of criticism of their poor level of community consultation, the ongoing concerns being expressed by the community and the questioning of the risks associated with this project is to suggest that those people who support the project are being intimidated by an anti-mining group. Such a response demonstrates that this mining company is unable or does not want to understand the level of stress it is causing a large proportion of the community and has certainly been unable to reassure the community that it will not be severely damaged if this project goes ahead.

Usually community meetings do not draw numbers of the size that Kalbar nor Mine Free Glenaladale has drawn and on a regular basis. The fact that so many people have attended these sessions and the questions asked and comments made by the community is further testament to the lack of social licence that this project has and the apprehension the community has towards it proceeding.

The shifting of the Processing Plant is but one example of where community consultation should have but did not occur. Certainly Kalbar took notice of community concerns over the original location of this plant on a ridge between the Perry and Mitchell River catchments but shifted the plant to a location which they admitted better suited the mining company as the new location was off the mine path. But to shift it in the way it was done to near to a substantial group of houses without any consultation or discussion with those residents was antagonistic and belligerent move on Kalbar's part and certainly does not fit within the framework of community consultation.

There is a section in the Planning Scheme Amendment which highlights the fact that there are no residences in the vicinity of the haul roads and therefore mine traffic would have very little impact on residents. With that fact in mind maybe Kalbar should consider the residents who will be impacted by the controversial change in location of their Processing Plant from its original location to near a number of residences in the Limpyers Road and Fernbank-Glenaladale Road areas and think again whether there is a more appropriate location for this plant.

For Kalbar to claim the success of its community consultation plan by the number of meetings it has held is a fallacy. Community consultation has not worked. The community still has many concerns, the majority of which have not been placated by the publication of the EES as promised by Kalbar. In fact the community is now more concerned in that they can now see that Kalbar are constantly claiming that the risks of this project are generally low and are being underplayed.

Even at this point in the EES process where Kalbar in its document is highlighting its commitment to its Community Consultation Plan, its proposals to be in constant contact with impacted landholders and to form Community Reference Groups it is, based on past record, clearly demonstrating that these measures are only included in the EES to appease the community and the decision makers. In reality Kalbar is doing as little as possible to provide the community with relevant, accurate and up to date information.

As an example, a member of the community emailed Kalbar to ask for information about certain aspects of their weather data as well as their planned rehabilitation project. Having not received a reply this was followed up with a phone call to Kalbar who then in an email response only dealt with the weather data and it took another email to elicit a response about the rehabilitation. Kalbar response only directed the enquirer to the relevant section in the EES which was seen to be lacking in detail referring to Closure and Rehabilitation Plans as both "draft" and "conceptual". This being the original reason for the question meant that the community member was being fobbed off. In its latest Project Update of 23rd September Kalbar asked the community to send in questions that could be addressed in its upcoming Webinar. The community member sent in the same question about the rehabilitation making clear

that more detail was required especially considering that Kalbar in a number of radio interviews was using this 200 hectare rehabilitation project to create a Plains Grassy Woodland as a method of demonstrating their environmental consciousness. The response from Kalbar was clear that they were not prepared to accept this question for their Webinar again advising the community member that the issue had already been addressed in previous correspondence and would by implication not be discussed during the Webinar.

If this is what Kalbar sees as an acceptable level of community consultation then it can be expected that they are going to be extremely difficult to deal with in their community reference groups and that little can be expected to be achieved in favour of the community.

- **Road deviations and Upgrades** There are many members within the community who have properties on either side of the Fingerboards. The Fingerboards is a central point with community facilities on either side of that location. To change the road system in the way proposed will split the community and make access to various areas more difficult and time consuming. This seems of little concern to Kalbar.

Comment has been made by Kalbar on the "substandard" condition of local roads. This is a value imposed on the area by Kalbar. They assume that roads should be of the highest standard possible, a concept that needs to be challenged.

As a member of the CFA, I am called out to attend road accidents throughout the year. Usually local residents are not involved in these accidents. It is people from outside the area who have been travelling and are not familiar with these roads. Often these people have been driving for a considerable time and are suffering fatigue. To improve the roads will lead to an increase in traffic speed and consequently more accidents. This is not what the local population needs.

The roads in their current condition are suitable for purpose

A further issue with road realignment is that the realignment of the Lindenow Dargo Road will result in the modification of the contour of the area and will have ramifications for water runoff to the south reducing the flow into the catchment of Honeysuckle Creek which feeds into the Providence Ponds and Perry River systems. This is an issue which the EES fails to address.

- **Water Retention Dams on Gullies within Project Area** When we constructed a gully dam on our property we had to justify to Southern Rural Water before permission was granted that this infrastructure would not negatively impact on other landowners who had property further down that gully. It seems that this has not been the case with Kalbar as they have not approached us to discuss the impact of their water retention dams on the flows further down these gullies and the effect it will have on our dam to fill. Nor does it seem that they have anywhere in their documentation examined the impact that these dams of theirs will have on gully springs or the ecosystems that are reliant on them.

Dust and Liveability The arrogance shown by the proponent and consultants in comments pertaining to dust, that residents may expect more dust on their washing or may have to clean their homes more regularly but this dust deposition is still below health limits beggars belief and does very little to foster a good relationship let alone trust with the proponent.

- **Protection for Landowners if there are Engineering Failures** As much of the planning for this project has been done through computer modelling and as demonstrated large tracts of this modelling is suspect, protections need to be readily available and in place to protect the community in the event of there being a failure of Kalbar's systems or if it is found that their predictions are inaccurate and result in threats to the amenity and liveability of the area for nearby residents.

It has to be asked what Kalbar's response will be to protect the nearby sensitive receptors when noise levels exceed their predictions or when dust impacts potable water supplies, pasture or homes or when water flows into farm dams or bores is reduced. At present in the EES there seems to be no proactive policies for these areas.

While the Minister has declared a no mining zone in the Lindenow Valley it has to be asked whether there should also be declared a non-mining buffer zone of at least five kilometres around this area to protect it from dust and contaminated water runoff.

Further detail on these and other issues of concern are addressed in specific sections of this submission.

In the **Socio-Economic Impact Assessment** there is an admittance that *"residents adjacent to the project area have the greatest potential to experience a change in amenity from dust emissions...which in turn could lead to impacts on their lifestyle"*.

The suggestion that it may be necessary for some of these residents *"to keep their windows closed" ... "spend less time outdoors" "dry washing indoors"or.... "make greater lifestyle changes such as leaving their property"* shows a total contempt for the local population. If a neighbour was to be the cause of such nuisance and impact, council by laws or even police would become involved as all residents have a right to enjoy the amenity of their property without disturbance.

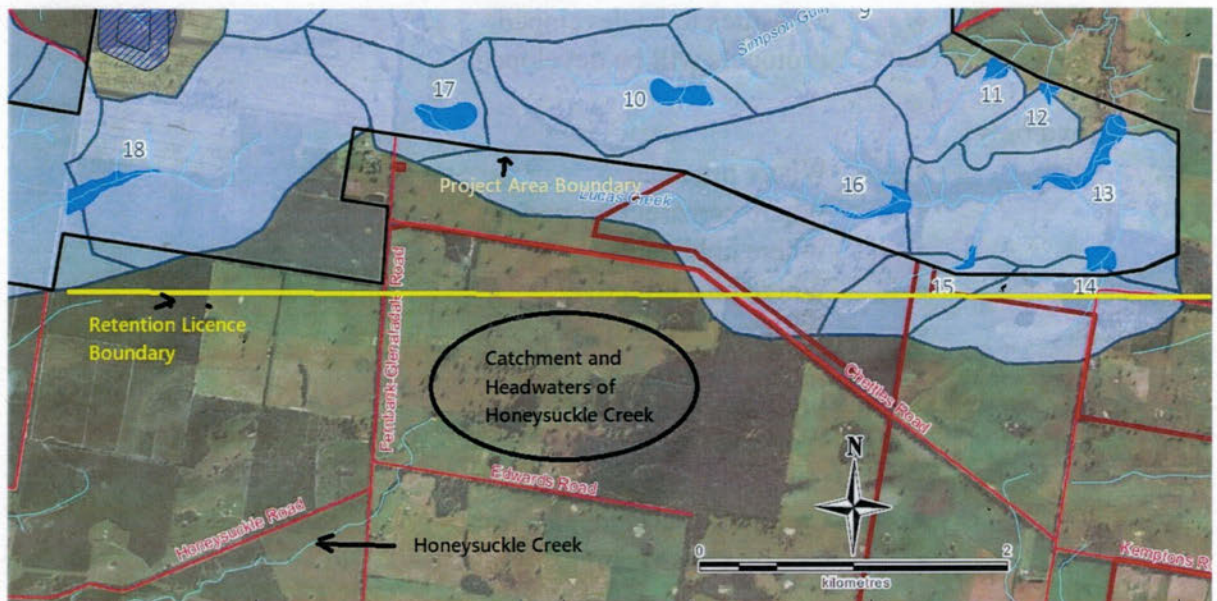
This is made clear in *East Gippsland Shire's Social Impact Assessment Guidelines*. However by Kalbar's standards, these ideals do not seem to apply and according to them it is up to the landowner to adjust to the impositions forced on them by Kalbar.

Along with this denial of responsibility is the lack of an apology or offer to assist in dealing with these issues. Elsewhere it has been suggested that mining companies could or have assisted with installing double glazing or air conditioners where these problems exist. But what we have here is a suggestion to stay inside, close your windows or sell up and move away. With this level of arrogance and conceit shown by the proponent it is completely understandable why the level of trust between them and the landowners is so low and that there is no social licence. If Kalbar thinks it can negotiate with landowners through committees and reference groups then comments such as those above need to be apologized for and a more positive and workable attitude needs to be implemented by the proponent.

Change in Topography of the Honeysuckle Creek Valley The Rehabilitation Report requires that the Honeysuckle Creek Valley at the end of the mine path will need to be broadened in order to reduce the amount of overburden required to fill the final mine void.

However the valley which feeds into Honeysuckle Creek and the valley through which Honeysuckle Creek flows are both well to the south of the Project Area and the Retention Licence Areas and as such are nowhere near the mine path.

Does this mean that the proponent is expecting to extract fill from outside of the licence areas to backfill the void or is it a legitimate mistake in the EES. Maybe it is the result of a lack of understanding of the hydrology and stream flows in the area? Whatever the reason it is a totally misleading and inaccurate statement and is unacceptable in a document of this type.



Map showing location of Honeysuckle Creek Valley in Relation to Project Area and Retention Licence Boundary

In too many instances Kalbar has suggested that community committees or reference groups be formed. As there is no detail provided on how these groups will be constituted, such as membership, how members are appointed, whether membership is by individuals or representatives from groups or whether it will be chaired by Kalbar or have an independent chairman or even the frequency of meetings, the effectiveness of such a process to resolve issues cannot be assessed. And as such the potential for successful and satisfactory outcomes cannot be assured. This being the case these measures have to be rejected as unacceptable actions until a satisfactory level of detail can be provided.

As has been stated previously, many questions asked at community meetings were met with the reply that these issues will be covered in the EES. But in only referring to the Risk Register it is clear that Kalbar is yet to complete many processes with too many plans still in draft stage or yet to be written.

These include:

- Rehabilitation sub plan
- Surface Water and Groundwater sub plan
- Cultural Heritage Management plan
- Traffic Management plan
- Environmental Management plan
- Fire and Emergency sub plan
- Labour Force strategy
- Community Engagement plan

Apart from these plans which are yet to be developed there are many other gaps which are yet to be filled

- Audits still to be completed
- Surveys to be conducted
- Trials to be conducted
- Measures to be developed
- Protocols will be developed

...and only

- Where practical
- Where construction permits
- Where applicable
- Where cost effective
- Will be discussed

And then there are the promised consultation groups

- Working Group
- Environmental Review Committee
- Community Reference Group
- One on One Meetings

What is obvious is that this document, the Environmental Effects Statement does not yet adequately address the effects that this project will have on the environment as many of these effects are yet to be fully examined. With such gaps there is no real guarantee that issues can nor will be addressed and mitigated, the demonstration of which is a primary purpose of this document. This being the case then, this EES does not fulfil its purpose and has to be rejected.

Risk Register

This document makes for some interesting reading. Not only does the print size in the hardcopy makes its deciphering almost impossible but the statistical breakdown of the identified Risks makes the project appear totally manageable with minimal impact socially, economically and environmentally.

The entire document identifies 172 individual risks, with 43% identified as Low/Very Low, 30% Moderate, 20% High and 6% Major.

This is not the conclusion that a community that lives in the area and is familiar with weather conditions, topography, social structure and industry would readily agree with.

My understanding of the Risk Register is for it to identify the likelihood of risks and the mitigation measures that will be taken to avoid, minimize, manage or offset these risks.

However many of the strategies offered for these identifiable risks do none of these

How the majority of these levels of risk can be assigned to such a large number of these issues is a quandary especially when it is clearly stated that a particular issue will need to be discussed with industry bodies or local knowledge drawn upon in order for it to be resolved. This suggests that both Kalbar and its consultants are lacking in knowledge of the issue and its severity and likelihood of impact.

There are far too many entries which as a mitigation measure relies on discussions with community or that a consultative committee be formed. While consultation and cooperation with community would be encouraged, however given Kalbar's record over the last six years in listening to and dealing with community concerns, offers of forming committees seems more of a platitude and a mitigation measure aimed at convincing the Panel that something can be achieved when in reality the local community would feel that it would be wasting its time in such a forum.

The Risk Register is also unacceptable in its dealings with a number of other issues in that it fails to provide the necessary answers and directives for action. During the Community Consultation sessions run by the proponent, many questions were responded to with "This will be dealt with in the EES". Now in the EES to say that the matter is yet to be discussed and decided upon is totally unsatisfactory. Until such time as these issues can be addressed and proactive mitigation strategies laid out, this section of the EES cannot be deemed as an adequate document which deals with the issues that it has a duty to examine.

While not all 172 individual identifiable risk have been addressed many of the comments made are applicable to risks of similar nature.

Damage to soils and crops by wind and water runoff

Mitigation measures listed will do very little to prevent deposition of mine sediment on river flats following heavy rain and wind events. Sediment washed into the river will be deposited where the river spreads out downstream on the flats as a result of the river losing energy and not being able to carry heavy sediment loads.

Many of the crops produced on the flats are not dust tolerant and are easily damaged by wind. The fall in elevation from the plateau to the river will cause a vortex effect transporting dust on to the flats. Propelled by wind crops are at risk of being sandblasted.

As the area of the mine increases and more areas are subject to rehabilitation especially as more areas will have limited vegetative cover this risk will increase.

Assessing the risk as Moderate is an understatement due to the potential value of the crops that stand to be lost and the cost of removing deposited sediment.

Changes in consumer perception of quality of produce from an area close to a Mineral Sands Mine

The mitigation measures do not directly relate to the issue. Where in the past there has been examples of crop contamination, involvement of industry bodies to allay public concerns about quality and safety have failed and have generally been seen as a media exercise. Examples include the E.coli contamination of crops to the west of Melbourne where all similar produce, regardless of where they were grown in the State saw a fall in sales.

Cooperation with and involvement of local industry bodies and horticultural producers should have been activated when the problem was first identified. A proactive approach is far more effective than a reactive one which is suggested as a response in the Risk Assessment

Increased competition for water

Allocation of additional water for horticulture has the potential to create far more long term sustainable jobs than does the allocation of that water to mining.

The release of stored fresh water from the mine storage into the Perry or Mitchell systems has the potential to cause environmental damage to aquatic flora and fauna due to change in temperature, change in pH and potential algae and bacterial build up during storage

Deterioration of water quality leading to potential damage to crops, machinery and processing plants

A plan to minimise runoff and discharge of stormwater is yet to be developed so the effectiveness of such a plan cannot as yet be ascertained. What can be ascertained though is that increased sediment finding its way into the river system and then into irrigation plants, vegetable washing systems and ice making machines will cause damage to machinery and ultimately crops that are being prepared for market.

Inability to achieve successful rehabilitation to return land to pre-mining productivity

Stockpiling of topsoil has the potential to render it sterile and therefore will require large amounts of both fertilizer and nitrogen to stimulate plant growth. If it is also Kalbar's intention to mix clay with the topsoil to enhance water holding capacity, again there is potential to create more chemistry problems in such soil due to the high sodium levels in local clays.

The use of irrigation to establish vegetation may in fact lead to the deterioration of planted species which may not survive after irrigation is ceased.

The suggestion that these actions will be done in consultation with local landholders using their experience again suggests a lack of preparation and knowledge on behalf of the proponent.

There is no mention of replacement of shade tree so essential for stock during summer except to state that gullies will be planted. This is not a satisfactory compromise. Planting of tubestock or saplings is not an alternative as it does not meet the same criteria as the lost shade trees.

Nor is there any guarantee that replacement of farm infrastructure such as fencing, dams, yards can be done successfully.

Removal or disturbance of items of cultural significance

By this stage of the EES such an important issue which Kalbar has been aware of for a number of years should have been resolved. To state that a salvage and management plan will be prepared at a later stage is not acceptable. These issues need to have been dealt with in the EES as this is one of the purposes of this document, to determine how items of cultural/environmental significance will be handled

Collapse of mined slope

Obviously given the simplistic mitigation measures outlined, neither the proponent nor its consultants have any real idea of the impact of runoff from this country during an East Coast Low. Local landowners can attest to sheet water running off the plateau into gullies with those gullies running over two meters deep. At the same time they can give examples of water percolating to the surface at the top of rises, water streaming out of the side of slopes and the soils turning to a thick sludge once the surface is broken. The mitigation measures outlined here are insufficient and in the event of a severe rain event will more than likely lead to a collapse of the pit. Hopefully there will be enough warning to shut down operations and that no lives will be lost. I cannot stress enough the lack of understanding shown by the proponent and their consultants in underestimating the propensity for severe and irreparable environmental damage to occur during such an event. The occurrence of such events and the long term damage that will result again support the contention that this is not an appropriate location for such a mining project.

Dispersive soils

This entry seems to have been omitted from the Risk Register yet is of vital importance. The high sodium content of the clays and therefore their dispersive nature will result in erosion of the mine slopes during rain events and these rain events do not necessarily have to be heavy. Observation of gullies in the area, for instance the banks of Moulin Creek show scouring from runoff as do a large number of the upstream sides of gully dams in the area. The solubility and transport of the clay subsoils will lead to erosion of disturbed areas of the mine, especially the walls making them unstable and therefore unsafe. Yet no engineering solutions have been offered for this problem in this section. (See Photo 1)



Photo 1 Erosion of Dispersive soils Moulin Creek

Groundwater

While much attention has been paid to the impacts on the deeper aquifers. Nothing shows here to address any issues that may arise from interference with the shallower stock and domestic bores in the area. Although Kalbar has sunk some test bores, none are near any stock and domestic bores which farmers are so reliant on during drier periods. Most of these bores are low capacity in the vicinity of 200-250 gph extracting water from soaks in deep fine sands. Any interference with these soaks caused by disturbing the strata that this water passes through has the potential to deprive farmers of this essential water supply. Kalbar has not established any effective way of monitoring its impact on these systems and this is far from acceptable.

Tailings seepage

Again the proponent fails to understand the geology of the underlying subsoils and strata. The clays in the area are gritty due to sand content and due to sodium content do not bind well. This allows water penetration and therefore a complete seal of the tailings dam cannot be assured. Even with the use of liners which have a limited life, and experience has shown are easily damaged by wildlife, a seal cannot be guaranteed. In a wet year where there is natural water movement through the sub soils seepage through the tailings dam is even more likely to occur. The location of the tailings dam will mean that seepage is likely to find its way into the Chain of Ponds, Providence Ponds and the Perry system. Given the ecological importance of this system and despite the proponent's assurance of mitigation measures the risk is much greater than suggested in the Register.

Loss or degradation of aquatic and terrestrial ecosystems from elevated levels of radionuclides in surface water runoff from stockpiled overburden

The mitigation measures listed use such terms as "much as possible" and "minimised". The implication here is that radiation cannot be completely controlled. The sheer number of protocols to be followed suggests, possibly for the first time, that there does exist a radiation issue that has the potential to impact on local ecosystems and that the risk has been totally underestimated.

Loss or degradation of aquatic and terrestrial ecosystems from stockpiled concentrate

Photos taken at mine sites in Western Australia show wind and water rills evident on stockpile mounds demonstrating that that HMC concentrate can be moved by both water and wind. Therefore even with the suggested mitigation measures no guarantee can be given that HMC from stockpiles will not find its way into the ecosystems. Again the risk has been underestimated. (See Photos 2 & 3).

The location of the Processing Plant on a gully which runs into Honeysuckle Creek and into Providence Ponds accentuates this risk to too great a level.





Photos 2 & 3 Water and wind movement on HMC stockpile Western Australia

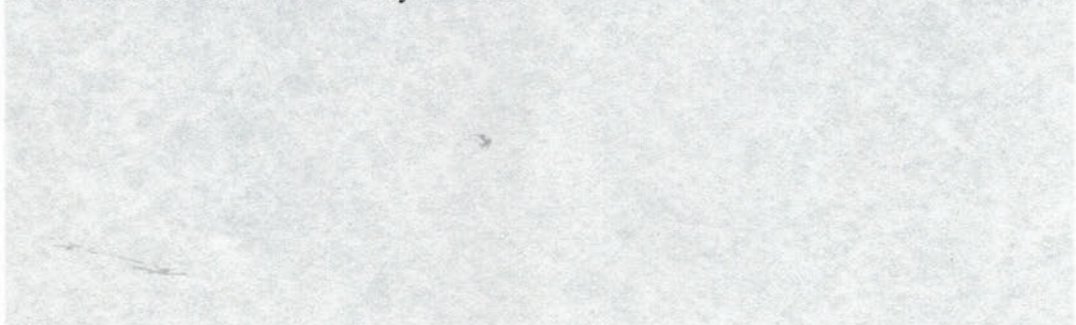
Adverse impacts on health of mine workers and public due to radiation

Education of workers may sound workable in theory. In terms of practical application no guarantee can be given that such practices will be stringently followed.

In terms of the general public, especially local residents, their health is at greater risk due to windblown dust. The Fingerboards is subject to severe and regular wind both from the north west and south west throughout the year. As shown there will be dust movement from the mine site. Local residents are on tank water collected from the roofs of houses and sheds. Dust settling on those surfaces will find its way into potable water supplies. This has been demonstrated at other Mineral Sands Mines in the west of the State.

Adverse health impact from inhalation of thoron and radon gas

The very fact that there is an admittance here of the possibility of radioactive gases should set off alarm bells. With 81 residences with 2 km of the project area the health of too many people will be put at risk. Gases cannot be controlled in the same way as liquids or solids and the time delay in replacing the tailing and overburden back into the mine void fails to provide total control of this situation. Any health risk caused by cancer causing materials needs to be more than minimized. It needs to be totally avoided.



Ingestion of dust from crops grown on the nearby Mitchell River Valley.

Because of the drop in elevation between the plateau and the river of some 90 meters and the winds experienced in the area, there is sufficient doubt established that despite all the mitigation measures that dust cannot be adequately controlled. The nature of certain crops grown on the flats, even after the thorough washing processes used, prevents the total removal of dust from the product. Therefore ingestion of this dust by consumers remains a real possibility.

Asian markets are testing more stringently so presence of mine dust and the contaminants it may contain put the export of Mitchell Valley produce at risk.

Erosion of stockpiles and rehabilitated areas

Successful rehabilitation to prevent erosion firstly depends on the proponent's ability to replace the overburden back in the pit at the correct depths, thicknesses and compaction rates. Failure to do this will result in subsidence which may not be immediate.

The sodic nature of the clays in the overburden will create a situation where tunnel erosion is a real possibility. Even the mixing of gypsum with these clays cannot completely overcome the problem in the long term. DPI testing suggests that control would require 15 tonne to the ha of gypsum and Kalbar is looking at excavating over 1000ha. The question has to be asked as to the practicality of sourcing a minimum of 15 000 tonnes of gypsum.

The simplistic attitude of the ease of rehabilitation is of concern. There seems to be a belief that planting vegetation in channels will be sufficient to prevent erosion. What is omitted is the fact that this vegetation will take years to establish suitable root systems to bind the soil, that it will take more time for the soil to develop the required fertility to support these plant colonies and even longer for a system to develop where there is enough vegetative litter built up to slow the water runoff.

Examination of the pattern of occurrence of the East Coast Lows which are responsible for extreme rain events shows that over the last forty years they can occur at any time during the year. So as statement that the proponent will rely on local experience for the timing of planting and seeding does not and will not offer a satisfactory outcome.

If an east Coast Low was to occur before these gullies were stabilised then any previous erosion mitigation measures would become null and void and the damage to that landform extremely severe and possibly irreparable.

Damage caused by grazing and pest animals

This aspect has been totally underestimated both in the standard and additional mitigation measures. Most pest animals responsible for damage to plantings will return to the same plants until they are total destroyed. The use of guards has been found to be ineffective unless they are higher and wider than the plant and continue to be so until the plant is of sufficient height to be sustainable. These guards must also be strong enough to withstand tearing and biting caused by these herbivores. The nature of the pest animals to be encountered ranges further than the "etc" used in the listing and the level and extent of damage varies from nipping off tubestock at the base of the stem to grazing on new growth until the plant dies.

The suggestion of the use of larger plants in sufficient quantities defies belief as it has been regularly demonstrated that the growth and survival rates of such plants is often lower than

that of tubestock. Further these larger plants will be less stable in wet soil and therefore less likely to initially slow erosion.

The use of electric fencing "where cost effective" will not be practical over such an expanse of country and electric fencing on its own in a standard type construction fence has been shown as ineffective in trials carried at Strathfieldsaye in the 1980's. Further the use of "irrigation" to support plant growth will lead to shallow rooting and instability.

Even the planting rates are extremely optimistic assuming that 20-30 trees per hectare can be thinned to 10-20 without multiple replacement plantings and is then even less than the densities described by Lunt in 1997 in Australian Geographical Studies.

The level of ignorance shown in this section is astounding and demonstrates not only a lack of understanding of rehabilitating large areas but also a lack of practical awareness of the soils, topography, weather conditions and flora and fauna of the area. Having read what is planned by the proponent in establishing this EVC, I would suggest that they make themselves familiar with the work of McIntyre et al in their book "Managing and Conserving Grassy Woodlands" before embarking on this project.

I would also go as far as suggesting that in order to successfully re-establish a permanent vegetative cover on a stable landscape will take a lot longer than the 3 to 5 years predicted by the proponent

Road Traffic and Transport Safety

Kalbar has identified far too many risks associated with the increase in traffic that this mine will create. The level of risk with High Likelihood, Extreme Consequences and Moderate, High and Major Risk threatens public safety on yet another level.

With Kalbar operating B Doubles, in the case of an accident it is most unlikely that the truck driver will be injured or killed but rather the driver/passengers of the smaller vehicle.

With road deterioration expected, there will always be time delays in completing repairs. Common damage that can be expected is the collapse of road shoulders which too often leads to loss of control of front wheel drive cars.

The roundabout planned for the new Fingerboards intersection is another potential point for accidents with traffic having to negotiate a right hand turn to stay on the main road in what appears to be a 100kph zone that will be lacking in lighting and also have traffic entering and egressing the mine site.

It has to be remembered that local volunteers both CFA and SES will be expected to attend any accidents and there is a very high chance that those in attendance will know the accident victims.

Major upgrades of roads to suit the road conditions required by mine operations does not necessarily fit in with the road conditions that are required by local traffic.

While School buses have been identified as a concern and mitigation suggested, there are many other buses that use these roads that have not been identified as a concern and no mitigation measures suggested to deal with them.

Real and useful modelling of Traffic Safety would have drawn upon current road use figures combined with predicted increases in population and traffic as well as current road accident statistics for the area and come up with a prediction of the number of crashes, injuries and deaths and costs to the community that could be expected over the life of the mine. But I have to assume that this is a projection that the proponents are too reluctant to explore.

Community Stress to adjacent landholders and those with 10 km of the Project Area.

The mitigation measures suggested are mere platitudes in much the same as the community being informed that it would be reassured through community consultation. Judging by the types of questions asked at these meetings, the answers given and those avoided little has been achieved in the last six years to alleviate community stress.

The more than subtle changes in plans to operate the proposed mine that the community has only become aware of through its own research, such as the increase in truck movements from 4 per day to 80, the relocation and increase in size of the project area, the increase in size of the tailings dam and the damming and backfilling of gullies has done nothing to increase the confidence of the community in regards to this mining company.

Comments made at public meetings by Kalbar's consultants that they will "follow the ore seam where ever it takes them" and if a landowner is "indirectly negatively affected by mining operations then they will have to pursue their claim through the court system" have done even less to instil confidence and reduce stress.

Stakeholder Engagement and Approvals Process is skewed against the community and leads to stress

From documentation produced which lists the number and type of meeting held, it appears that the important aspect is to hold these meetings but not report on the mood of these meetings nor the concerns of those present and how those concerns have been **successfully** addressed.

Kalbar have the resources and finances of a mining company behind them and have had six years to research and explore this project. Yet the community in expressing its concerns has 40 business days to respond to a 10 000 page EES and apart from \$40 000 grant it had to apply for has to finance experts through its own resources.

Fire Impact on Health and safety of the community

Despite the six years that Kalbar has been in the area and its ongoing failure to clean up its purchased properties at no stage has there been contact with local CFA brigades.

Given the length of time Kalbar has been in the area and the property it has purchased there is no reason why it has not yet drawn up a fire mitigation plan. This is a plan that is not relevant to Shire Councils except through the MFPC but needs to be done in consultation with the operational sections of the CFA which involves Mitchell Group and local brigades rather than the District 11 Office which appears to be the only section of the CFA which it has made contact with..

The fact that Kalbar has suggested that it will encourage its employees to join Volunteer Emergency Organizations is a step in the right direction. However having the audacity to

suggest that it will pay its employees to attend training shows a total lack of understanding of these volunteer organizations and will lead to friction within those groups.

Local community concerns over loss of lifestyle and amenity of the area

Mitigation measures suggested to deal with these issues are again nothing more than platitudes.

The real issues have been avoided by Kalbar. The quiet rural lifestyle, the increase in noise levels, residents being subject to the unnatural noises of heavy machinery, the reduction in property values and the change in landscape cannot be compensated for by forming a committee to discuss these issues.

People have invested heavily in this area due to the amenity it offers and a mine will change that permanently. The affinity with the land brought about by it being part of a family heritage or the years of work to create a family home is something that a mining company cannot understand as it only sees issues in economic terms.

Giving regular updates or creating a community reference group is not a substitute for what this community has created for itself and its families.

Loss of connection to the land

It is well documented that there are certain areas and land types that people will naturally be attracted to. These include areas close to lakes, waterways and rivers and rural areas including farming and bush environments. Industrial areas and mines are not included in this scenario.

Regardless of the way it is framed, a mine covering over 1675 ha of agricultural land that in the process of being constructed removes over 700 mature trees some of which are over 200 years old as well as many hectares of native vegetation cannot be justified by then stating that access tracks and areas of heavy vehicle movement will be located away from environmentally sensitive areas as many of these areas and the flora and fauna contained within will have already been destroyed and those saved will undoubtedly be in unconnected pockets rather than corridors.

Stress caused by concern that amenity will be lost to future generations

To suggest that this issue can be alleviated by representation on committees or by provision of information is a furphy. This fact remains and cannot be denied that the landscape will be changed permanently by this mining operation and assets lost be they personal property or environmental values such as old trees and habitat cannot and will not be replaced.

Decline in the quality of potable water

The local community enjoys high quality drinking and household water captured from the roofs of buildings and stored in tanks. The community is also extremely cognisant of the wind conditions of the area and sees regularly and first hand, especially during dryer times the amount of dust that is generated not only from fallow ground but also from dry pasture. It is therefore extremely sceptical and rejects any concept that Kalbar can reduce dust from its operations to such a level that this dust, different in chemical composition from surface dust, can be controlled to such an extent that it will not contaminate household supplies. The fine

nature of the silica sand particles that form part of the overburden are going to take copious quantities of water to prevent them blowing especially if they are anhydrous in nature

The calculations done by Coffey for the Human Health Risk Assessment to predict the build-up of dust in potable rainwater supplies is totally inaccurate in both the data it relies upon and the assumptions it makes.

As has been pointed out elsewhere transport of dust depends on wind strength and direction and as the data for this collated by Katestone has been shown to be inaccurate, dust deposition figures are therefore also unreliable and inaccurate.

To further distort the results, Coffey makes some questionable assumptions, the first being the capacity and base diameter of a rainwater tank which is nowhere near the standard 22 000 litre and 45 000 litre tanks used on the majority of rural properties. The second incorrect assumption is the area of roof catchment which is grossly underestimated as most rural properties also rely on catchment off sheds as well as houses

This makes their rainwater harvest estimate incorrect and as the dust deposition figures are also questionably underestimated due to the underestimation of roof catchment areas, the amount of dust predicted to find its way into resident's drinking water and therefore the quality of that water is far worse than the proponents would have the end users of that water believe.

Depletion and loss of Flora and Fauna

Removal of the quantities of native habitat as outlined cannot do anything else but lead to a reduction in the loss of flora and fauna. Fauna which moves through the landscape requires native habitat corridors which judging by the plans for this project will be destroyed. Other fauna rely on certain flora for food sources which will also be removed. This cannot be overcome simply with the provision of nest boxes. Transient fauna, especially some of the bird species, visit the area to feed on the fruit and seeds of native trees. Removing these trees will mean the end to these bird species in the area. The question also has to be asked, as we are advised that nest boxes need to be placed well above the ground and if trees are removed how will this be achieved?

Many plants live in a symbiotic relationship with other species so it can be expected that the disturbance or removal of one species will have a flow on effect within that plant community.

The change in water flows down gullies caused by the construction of dams will have serious implications for damp area and water dependant species.

This is a real issue and cannot be satisfactorily addressed with the simplistic mitigation measures suggested.

Loss of property values due to presence of mine

The suggestion that values will be monitored and consultation will be conducted with housing support agencies in no way explains how a landowner can be compensated for a loss if they have reason to sell their property and therefore falls short of being an adequate or reasonable mitigation strategy

Diminishing of value of tourist based business

It is already accepted that tourists are not attracted to mining areas and as such can be expected to turn away from the experiences such as bushwalking and four wheel driving that this area offers.

Employment and procurement guidelines giving preference to locals as suggested does not overcome the problem of losses to businesses through tourism to the area becoming less attractive.

Changed road conditions will have a negative impact on community connectivity and reduce farming efficiencies

Many landowners have a number of non-connected paddocks in the area. These properties were purchased with the road network taken into consideration to allow for efficient movement of stock and easy and efficient access between properties. The changed road network will reduce the efficiency of access and in a number of instances make stock movement dangerous as it will now entail movement along far busier traffic routes.

Negative impact of lighting on nearby residences

Regardless of measures taken light emissions cannot be eliminated and nearby residents will be subject to an increase in artificial lighting at night

Decline in community cohesion due to influx of mine workers.

This is a close knit rural community that is used to working together and supporting each other. It has already experienced some antagonistic incidents as a result of varying views of this mine. There is also evidence to suggest that mine workers will travel here to the area to work and as such will not form an integral part of the community. Naturally a small rural community with its established networks is cautious of any radical change and is sceptically reliant on Kalbar implementing the measures it has outlined in this section.

Community division between those who support and those who oppose this mine

This has already occurred and the damage done is not repairable in the short term. Mitigation measures as suggested should have already been implemented. To suggest them at this stage is far too late.

Kalbar's attitude as expressed to some community members that this division is not its problem set alongside the admission that this is an issue to be addressed seems extremely hypocritical now to be included in the EES.

Impact on wellbeing and lifestyle associated with mine noise

Just because machinery is to be maintained to manufacturers specifications does not mean local residents will not experience an increase in noise. People have invested and built their homes in this area because of the lack of industrialization and its associated noise. People are tolerant of natural noises, birds, animals, farm stock but are not so tolerant of machinery operating on a 24/7 basis.

Kalbar's position is that machinery noise will conform to EPA requirements may be legally correct but it is not ethically acceptable as it still will be heard and will detract from the liveability of the area

Impact on wellbeing and lifestyle associated with dust emissions

Community members should not have to sit on a committee to discuss these issues with the mining company. Kalbar has a duty of care to ensure that dust is not an issue for nearby residents.

Independent 24/7 dust monitoring at nearby sensitive receptors needs to be instigated to ensure that if dust becomes an issue that Kalbar takes responsibility for any subsequent damage.

With weather forecasting lacking the necessary level of accuracy it cannot always be predicted when adverse conditions will occur and as has been demonstrated in similar mines, such as at Donald, the proponent regularly underestimates the extent or severity of this issue on nearby homes and families.

If rescheduling of certain activities was to be planned for wind days then this section needs further clarification with Kalbar stating wind speeds and direction that would trigger cessation of activities

Damage to region's reputation as a producer of high quality agricultural product due to proximity to mine.

The mitigation measures suggested here do not address the issue of public perception. The public generally sees mining as a polluting industry and being close to an area that produces fresh vegetables, meat and dairy will be sceptical of purchasing product despite certification of growers.

It is not up to the growers to prove that their produce is of acceptable quality but up to the mining proponent to take responsibility for the image that mining has in the community.

Reduced water catchment size leading to less runoff into gullies and river systems

Apart from irrigators who access water from the Mitchell River, there are a number of farmers through whose properties gullies run. Stock dams have been built on these gullies and are reliant on flow to fill. Damming the heads of these gullies deprives farmers of this water.

I am such a person in this situation with a gully dam on my property. When applying for a permit to construct this dam I had to convince Southern Rural Water that it would have minimal impact on any properties downstream. This issue does not seem to have been addressed by Kalbar.

The reduction in flow through these gullies as a result of Kalbar's proposal to construct 20 dams on gullies in the Project Area will also have a significant impact on EVC's within those gully systems that are reliant on intermittent stream flow. This aspect does not seem to have been considered here. Even Kalbar's statement that it will release water into these gullies seems to be based on the premise that it will be done when it suits them rather than when it is necessary.

Groundwater drawn down affecting shallow aquifers accessed from bores used for stock and domestic needs

This is a serious issue as Kalbar has no way of monitoring impact on stock and domestic bores as it has failed to investigate the issue thoroughly enough. There are no groundwater monitoring bores in the vicinity of these stock and domestic bores to monitor flow or water quality.

As these bores are essential for farm survival when dams become too low or safe to access this issue needs further investigation.

Tailings dam seepage via groundwater or structural failure resulting in discharge into Mitchell and Perry systems

The history of tailing dams failures is substantial. With the soil types and the proposed size and location of Kalbar's tailings dam this issue does not seem to have been taken seriously enough by the proponent. The location of this infrastructure needs to be reassessed in the light of the potential damage that could be done not only to the Mitchell and Perry systems but to the Gippsland Lakes and the RAMSAR wetlands

Direct impact of vegetation removal on all flora and fauna listed in this section on Terrestrial and Aquatic biodiversity

The accompanying notes for this entry play down the actual area and extent of vegetation removal by not taking into account individual paddock trees or clumps of native vegetation or areas that are essential to form vegetation corridors.

The mitigation measures stated are far too simplistic. In essence native vegetation corridors which provides habitat and food sources for birds and small mammals will be removed. Depending on the time of year and care taken it can be expected that many of the young in nests and nocturnal mammals will not survive the felling of these trees. Kalbar then intends to establish nest boxes in other areas hopefully with the displaced populations relocating but to an area with a reduced food source and into areas that are already claimed by territorial species.

While the establishment of pre-existing vegetative communities following mining is encouraging, the time frame for this to be achieved, especially for tubestock trees to grow large enough to develop hollows (minimum 60cm DBH) is at least 50 years

Impact on Swift Parrot, Grey Headed Flying Fox and Giant Burrowing Frog and other associated species both flora and fauna

Regardless of mitigation measures put in place habitat is being destroyed. It is a naïve argument to suggest that these species can be captured and relocated successfully

The comment that the Giant Burrowing Frog was not located during survey should have been qualified with the length of time spent on the survey and the drought conditions at the time.

The suggestions through this section that these environments are of low quality but are suitable habitats for such species as Dwarf Kerrawang and Swamp Everlasting is subjective and lacks supportive evidence. These species have been found in these environments and had the survey been better timed and more thorough the results and comments may have been less subjective.

None of the vegetation mitigation measures suggested are applicable to most of the orchid species such as the state significant Purple Diuris due to the extent of soil disturbance that will occur.

Reduced runoff into ephemeral gullies caused by damming gully heads and retaining runoff water onsite

There should be no doubt that water stopped from flowing down gullies into the Mitchell River by mining activities should be directed down ephemeral gullies to the benefit of the ecosystems that exist within them. This reduced flow will impact farm dams as well as ecological communities within these gullies. The fact that during drought conditions these gullies provide a source of green feed for stock and that reduction in flow to the springs and soaks has not even been considered by the proponent.

Agriculture

- The use of statistics from the Local Agricultural Region which combines Bairnsdale with Bruthen and Omeo is inappropriate as a true investigative report would have extrapolated data for and concentrated on the Glenaladale-Fernbank-Stockdale areas
- The figure of 443 hectares removed from agriculture during the project lifetime is totally misleading for a number of reasons. (p12)
 1. The Project Overview states that 1 350 ha will be disturbed by mining and infrastructure over the life of the project
 2. It assumes a three year period from commencement of mining to full rehabilitation whereas elsewhere in other documents three to five years is expected for full rehabilitation to be achieved and this would be seen to be a conservative estimate based on rainfall distribution and climate conditions at the time.
 3. The Project Overview also states that 360 hectares will be disturbed at any one time so adding on areas for infrastructure this would come close to the 443 hectare figure

What this statement should say but doesn't is that a total of 443 hectares will be removed from agriculture at any one time during the life of the project and this will equate to a total of about 1 350 hectares over the life of the project. There is a vast difference in the implications for landowners when this is explained.

- The section on Climate uses the weather statistics for Mt Moornapa as an indicator of climate but Katestone in their Air Quality Assessments rejects this location as being inappropriate for comparison.
- The section headed land Type and Capability contains the statement that ***"Parts of the area are rocky which is a barrier to cultivation and cropping."*** To an outside reader this may seem like a criticism which makes the area unsuitable for farming. However this is not the case as long time farmers in the area realize the value of preserving the topsoils and their delicate crumb structure so cultivation and cropping is not appropriate. This does not mean that the land is not productive and cannot be used for grazing.
- The 2015-6 production figures are out of date and as admitted are based on self-reporting and therefore cannot be validated.
- Looking at Production Areas (p16) the term "unimproved pasture" is used. Although a common term, used here without appropriate definition or explanation, this term is misleading. Unimproved pasture has its place in farming in the area and local farmers are aware of its limitations and therefore farm it appropriately. Unimproved pasture will support merino sheep to produce fine wool and has done so in the area for a long time. Unimproved pasture also contains native grasses which hang on in drier conditions and provide high levels of nutrition to grazing stock.

Due to the leaching nature of the sandy soils copious quantities of fertiliser would have to be regularly applied to establish and maintain "improved pasture" which without irrigating or regular rain would soon revert back to the status quo. Attempts to establish "improved pasture" on the plateau have regularly failed due to lack of watering capabilities, often combined with poor farming knowledge by newcomers and with damage to the soil resulting from deep ripping which brings sand to the surface destroying the crumb structure and accelerating erosion during drier times.

However if the consultants had done their research more thoroughly they would have located the plans for the building of the Mitchell River dam at Angusvale, a project that was proposed and developed in the late 1960's and early 1970's but due to a change in government did not go ahead.

A component of this project was to pipe water from this dam through the Fingerboards out to the Princes Highway opening up large tracts of this sandy soil country for irrigation. The proponents of this project saw the potential of this country given an adequate and reliable water supply and an understanding of the capabilities of these soils with correct management.

So to imply the limited capabilities and potential for these areas for agriculture is extremely misleading especially now with improved and more efficient irrigation methods as is being demonstrated with vegetable production currently happening on the sandy soils of both Flaggy Creek and Munro. If unallocated winterfill was made available to farmers or licences could be acquired for bore water, there is no reason why there could not be enhanced long term and sustainable production outside of grazing in these areas. Such a use for these resources would be of greater benefit for the community ensuring local employment and a guaranteeing a higher multiplier effect for peripheral employment than would result from mining.

- The section on Key Challenges which should have been area specific is generic and can be applied to any farming enterprise throughout the country
- Dryland Grazing Enterprises reduces everything to money terms unsuccessfully trying to imply that this land would be better suited to mining. To do this it conveniently forgets the following
 1. Lifestyle is a very important factor in farming
 2. Many farmers in the area have off farm jobs or family members work off farm.
This in no way detracts from the importance or viability of their properties
- While it is appropriate to include Radiata Pine in the section on Forestry Production, to include Bluegum production and profitability is again misleading and goes a long way to demonstrating a lack of local knowledge and understanding of farming in the area.

Planting of bluegums in the area commenced in the late 1990's with the backing of the Commonwealth Government's 20/20 Schemes, a scheme to have planted 20 million trees in Australia by the year 2020. The scheme included many tax incentives and attracted investment companies using outside investors money to establish these plantations. Many of these investors were looking for tax write offs.

The local community met with Midway Plantations which was establishing and managing the local plantations for Macquarie Forestry Services while at the same time HVP was bulldozing experimental bluegum plantations that it had planted a few years earlier and deemed as failures. The locals told Midway that these plantations would fail as this area did not have heavy enough soils nor was the rainfall sufficient. During the life of these plantations many of these investment companies involved went into liquidation.

As predicted by the locals, the plantations in the Fernbank-Stockdale area failed to produce the size and quality timber that Midway expected. (Sound familiar?)

So to include an assessment and comparison of bluegum plantations in farming returns is again inappropriate and misleading.

- While vegetable production which is outside of the Project Area is examined in detail there is no examination of farming activities in other areas adjacent to the Project Area. To compare gross margins for dryland farming and irrigated crops in this way is misleading as there are many costs associated with vegetable production which would not have been considered. It would have to be asked whether capital costs such as the cost of the initial purchase of the land has been factored into these calculations, whether the cost of sinking bores or the purchase of machinery has also been allowed for. While there may be better returns for vegetable growing there is also a demand for meat and wool and to attempt to imply that if the returns for the latter fall short of the former then that land is better suited to mining is a contemptuous argument and should not even be considered.

- Much of the negative feedback and concerns expressed by local landowners through consultation is yet to be successfully addressed by the proponent. Even with the release of the EES which we were advised would address these issues there are still a lot of concerns.

There are absentee landowners and some older farmers who understandably would support this project especially if Kalbar wants to mine their property as it gives them an additional income or a way out of farming and a pathway into retirement.

For others who have an affinity with their land, see farming as a lifestyle or want to see their children inherit their properties with its aesthetic values there is strong opposition.

While there also is another group. Those landowners whose properties are outside of the project area and who will see no compensation but will have to put up with the dust, noise, loss of property values, inconvenience of road deviations etc.

Agriculture Victoria's comment on the coexistence of industries as long as one does not negatively impact on the other may sound fine in theory. However once such an impact does occur its effects cannot be immediately negated and will be long-term. The question has to be posed, with all these concerns which Kalbar has not been convincing in that it can manage them in practice, can such a risk be justified?

- The figure given for the impact on employment of taking this area out of primary production is extremely questionable in assuming that one person can manage over 6 000 DSE. Having spoken to a local wool buyer the figure has become even more disputed with an estimation that half that number of sheep would be the limit for day to day work and that contractors would still have to be employed for activities such as crutching, shearing

and marking. Participation is voluntary in The Victorian Monitoring Project, which is where Kalbar's consultant found these figures and has only some 70 farms state-wide participating so the data and should only be used as a rough guide.

While earlier in this agricultural assessment the consultant warned against a literal acceptance of ABS figures as participation is voluntary there is no such warning for these statistics.

- The first paragraph dealing with Impact on The Neighbouring Vegetable Industry (p29) immediately contradicts information published elsewhere. ***“At its closest point the Project Area Boundary is 500 -1 000 meters from the vegetable production areas.”***

Either it is 500 meters or 1 000 meters. There is a big difference between these distances. Regardless dust will easily be transported further than over the maximum distance quoted.

The other contradiction is that this dust will have an impact on cauliflower crops, the opposite of what is stated in the Horticulture document which claims that cauliflowers are protected by cover leaves which is incorrect.

The Horticulture documents also argue that few consumers are aware of the source of farm products and would not be aware of a nearby Mineral Sands Mine so this mine would have no or a limited impact on sales of product from the Lindenow Valley nor would it taint the “clean green image.” Comments from vegetable growers and the East Gippsland Food Cluster in this section are questioning this contention.

- A large proportion of this document simply identifies issues rather than resolves them failing to offer solutions or mitigation measures, often referring to other studies where they are discussed and often with solutions or mitigating measures which are also not convincing.

These issues include but are not limited to

1. Successful Rehabilitation There exists a great deal of scepticism about this area as attempts to control erosion have in the past failed and promises made to rehabilitate certain specific areas are now described in the EES as Conceptual Plans.
2. Disruption to Individual Agricultural Enterprise has been underestimated being based on the area of land taken out of production. The assessment fails to take into account that not all paddocks are equal, some have better of more reliable water supplies, are protected from the weather and are essential for lambing or calving and off shears sheep while others provide water catchment and runoff to the neighbouring gullies and dams.
3. For farmers to sell of bloodlines that they have developed over many generations while their paddocks are being mined is an insult for it to be even considered.
4. Restriction on Property Sale, or Development is also an area that is underestimated in its importance. Landowners have already put off developments that were necessary following the 2014 fires. To further do so could lead to farms becoming unviable and is an imposition that could have implications well beyond the life of this proposed mine.

5. Loss of Infrastructure. The figure of \$10 metre for fence construction is totally inaccurate. In fact if the proponent can find a reputable fencing contractor who will construct an 8 wire fence with a post every 10 meters and two droppers to each section for this price, I am positive that they can be assured of a lifetimes work in the area.
6. Severance of Properties. While not expected to cause significant delays in travel between properties, the increase in traffic caused by the need to realign the Lindenow Dargo Road will be an issue especially for those of us who have to move stock on what is at the moment a quieter road network
7. Project Traffic. ***“No more than 40 trucks containing concentrate are expected to leave the project area per 24 hours”*** is a throwaway line. These trucks are B doubles and their return to the project area means 80 truck movements in that time period. This is a substantial increase in heavy traffic on these roads.
8. Community Cohesion. Surveying of the community has shown that there is more opposition to this projects than Kalbar is prepared to admit to with 82% of directly affected landowners not wanting this mine on their property, 75% of vegetable growers speaking out against this project, 85% of residents within a 2 km of the project area in opposition and a petition of over 4 000 signatures presented to State Parliament.
Even with Technical Studies and the EES completed opposition does not seem to have abated.
9. Environmental Concerns although addressed in the EES have failed to offer real answers to the concerns raised. The mine can only be physically hidden and old trees which give the area character cannot be replaced in our lifetimes. Potential damage to the rivers and waterways are a long time being repaired if there is a failure to contain contaminated water runoff.

- Landholder Compensation is a contentious issue if a directly affected landowner has to take the proponent to VCAT. There is also no direct compensation available to indirectly affected landowners who have to take Kalbar's promises at face value that dust, noise, water contamination etc will not be an issue.
- Land Rehabilitation. Information from landowners who have been escorted to other Mineral Sands Mines by Kalbar to see rehabilitation works has been passed on to the community. Generally the consensus is that the size and scale of the mining operation, the topography and surrounding land uses were not comparable and in many cases the rehabilitation was only partially complete and not reflective of the previously existing countryside.
- Handover and Return of Land to Agricultural Practices. It has been demonstrated that there is the potential for degradation of mined and rehabilitated land years after rehabilitation has been completed due to settlement and subsidence. For a mining company to then carry out further rehabilitation would not only be time consuming but also expensive and probably would involve legal expenses. This is a risk that farmers should not have to take and a position they should not be put in. Any promise that Kalbar makes or will make for restitution after hand back to landowners should be met with extreme caution.

- The section on Potential Improvement in Agricultural Productivity uses too many clichés such as “*it may be possible and “there is scope”.*”, “*potential*”, “*could include*”. There is nothing definite in this section to demonstrate that these objectives either can or will be achieved by the proponent as part of the rehabilitation process.

The final section refers to the Tunnel Erosion Trials at Glenaladale. Obviously the consultants never followed up on the long term results. Certainly pasture production was improved in the short term but now this tunnel erosion is returning and the country is as badly off, if not worse than it was before.

- Potential Off River Storage. This information is out of date as the Stony Creek concept has been abandoned. To include it here in the EES is another demonstration of the fact that the proponent and consultants are not providing accurate and up to date information
- Impact of Dust on Livestock. While the study quoted found that the palatability of dusty pasture was not an issue, the consultants fail to address the following issues in relation to dust
 1. What impact did the consumption and ingestion of dust have on the cattle’s health?
 2. Did the consumption and digestion of dust have an impact on their growth rates?
 3. If growth rates were impacted, what did this mean for stocking rates and additional feeding to get these animals up to either selling or breeding weights?
 4. What effect did the grazing of dusty pastures have on the stock’s teeth and their ability to chew and process pasture?
 5. Did the ingestion of dust shorten the life expectancy of these stock?
 6. Were there any reports of sand colic from consuming dusty pastures?
 7. Were similar studies carried out for other types of livestock?

Remembering that the meteorological data for wind speed is suspect, this will have implications for the amount of dust that will be transported and deposited on pasture.

The conclusion from reading this Assessment is again that there are still too many unanswered questions, too many mitigation measures that are unconfirmed as going to be successful, too many conflicting responses and that too great a trust and reliance has to be put in the proponent to ensure that these conditions are met.

Again the risk is far too great and the recommendation should be that this proposed Mineral Sands Project at the Fingerboards be abandoned.

Horticulture

Background

While currently accurate Kalbar's figures **4 700 ha** under irrigated vegetable production does not allow for the current expansion into Calulu, Flaggy Creek, Hillside and Munro. Nor does it allow for further intensification of production that will occur as a result of the government and private investment in the Lindenow Valley's Water Assurance Program

Kalbar uses extremely conservative estimates for value of produce at Farm Gate at over \$62m while Tim Bull, the local MP, has quoted that value at \$150m and Minister Jaclyn Symes is quoted as valuing production at over \$100m/year

Dust

"In overhead irrigation crops, like most crops in the Region, dust is expected to be washed off by irrigation" This would of course depend on the length of time between the last irrigation event and harvesting so does not guarantee the produce to be dust free.

Contaminants in dust

Based on the adoption of comprehensive passive radon and thoron monitoring by the Project, and adherence to dust mitigation protocols recommended in the air quality and greenhouse gas assessment report, contamination of vegetables and soils has been assessed as being unlikely.

This statement fails to take into consideration public/consumer perception of risk. It is shown in that consumers are becoming far more conscious of the source of their foods, production methods and protection from contamination. This was clearly demonstrated when Patties Foods had a contamination incident with their product and both sales and share values fell dramatically.

Quality of Water Runoff

Risk may be minimized with stormwater management plan.

However the risk has not been eliminated in the mitigation measures. It will only take one event to contaminate a crop which will lead to a period of market loss until confidence is re-established in the product and a possible loss of Quality Assurance certification

Road Safety

Even though there are plans to upgrade roads to be used for HMC transport, the Risk Register shows the risk of accidents involving mine transport as MAJOR

Competition for Labour

The statistic presented that 40% of farm workers have completed tertiary education although not a major issue has to be questioned for its accuracy

Concern About Clean Green Image

Potential financial losses to landholders or in the supply chain based on 'image' or actual crop losses cannot be predicted due to the complexity of supply chains and markets, and volatility of costs and prices. Generally, direct losses would only occur, and mainly affect producers, if an incident happened that caused contamination of crops, water or soil due to the operation of the mine. If a direct offsite impact from the Project was to occur, such as dust or run-off water affecting fresh produce quality and safety, this could have an economic effect on producers in the region, as they could not sell the affected produce. This would especially apply to fresh produce that is sold unwashed and is eaten raw. There could be a longer term impact of such an incident if buyers would look for alternative suppliers and they may continue to buy from these new sources. However, given the independent technical assessments related to dust and water quality, the risk of serious direct offsite impacts is considered to be low.

The point here is that a loss will be incurred and it is irrelevant whether or not the extent of that loss can be predicted. The document later goes to speculate about instability in price movements for horticultural produce which in itself strengthens the argument that any risk to the product image due to the proximity to a mine or an incident has to be more than mitigated through contingency plans but has to be eliminated from becoming a possibility. This cannot be done and in itself is a strong argument against the location of this mine.

While the independent Technical Assessments state that the possibility of an incident is low, two questions need to be posed. One, how independent is an assessment done by a company that relies on its existence by consulting for mining projects and two, how accurate is their modelling?

There are other comments in this section that also need to be examined.

"Consumers appear to be mainly concerned about production practices on farm and the effect this has on food safety, the environment and people."

Media coverage shows this to be generally incorrect with these astute consumers also taking note of the surrounding areas. The very fact that "environment" is mentioned in the statement would draw attention to the Mitchell River as a source of irrigation water and water for washing vegetables and making ice for packing and transport. As the mining industry does not have a clean image, concerns are easily raised about potential contamination of nearby waterways.

While provenance is used as a marketing tool for higher value prepacked and processed products, most consumers do not know, through observation, inquiry, or information, the production region where the fresh fruit and vegetable commodities they are purchasing are coming from. The vast majority of consumers purchasing vegetable commodities from the region are living outside of the region.

Even though the vast majority of consumers are living outside the region, produce in stores is becoming more commonly branded with location of production and consumers are becoming more aware of the geography and surrounds of these locations. This is also now being stressed by larger supermarkets which are showing these locations in product advertising. Combined with the resurgence in tourist based programs on the television, people are becoming more aware of the regions of this country and its industries. This evidence then suggests that a negative impact would have retailers shifting away from sourcing produce from the Lindenow Valley

Producers and value adders are more and more frequently labelling their product with the area of production in order to promote the region and their product in a competitive market.

With the growth of Food and Beverage Trails and the advertising and promotion associated with their development more and more consumers are travelling to experience local produce. They are visiting not just for the food experience but to experience the region as a whole. This is reflected in market data with the growth of overnight stays in the area and the demand for accommodation outside of the traditional caravan and camping parks.

A negative impact on horticulture from this mine has the potential to also impact on this section of the tourist industry. There are still further implications that may impact on producer's expansion of their market to the areas where these people are travelling from to ensure that this produce is more readily accessible.

The statement that "*Comparative studies do not report a loss of Regional reputation*" is immediately qualified by a declaration about the difficulties of accurate comparison. This becomes acutely clear in the inappropriate comparison between the Lindenow Valley, Busselton and Wemen.

The extent of potential impact on organically produced vegetables over conventional produced ones may be greater if produce was sold locally and given the expectations many consumers may have of the place of production for organic produce. If organic vegetables were sold outside the region via major retailers and without geographic identifiers, the potential impact of the vicinity of a mine would most likely be the same as that for conventional vegetables.

This is really demonstrating a lack of understanding of the exponentially growing demand for organic produce. While the larger retailers are expanding their organic sections this is still an area of specialist retailers and these people usually have a regular clientele who have a strong interest in the history of the movement of the product from paddock to plate. This is shown in surveys of organic shoppers where the major factors for the decision were based on personal health and community and planetary wellbeing. To achieve this they develop a knowledge of the areas where their consumable product comes from. These are the type of people that if they were to find that a Mineral Sands Mine was being built in the area would research the subject and given the mining industry's image (despite advertising by the Minerals Council) and would be more likely to source their organic produce from elsewhere. The fact that one of the largest organic producers in Australia is located in the Lindenow Valley would not go well for that business.

Reference throughout this chapter is to a "Sand Mine" This is misleading. This project is not a sand mine, it is a Mineral Sands Mine and to call it as such is to hope that consumers will compare it to a beach or sand pit. If this is the slant that the mining industry is portraying then it is deliberately misleading and makes it more understandable why the mining industry has the public image that it does.

The way the Project and a coexistence with farming is communicated to the customers and the general public can have a major influence on how customers and consumers will perceive a potential impact on fresh produce. It is therefore essential to base public communication about the mine and the practices in the vegetable industry on facts. This could include messaging about sustainable practices on vegetable farms e.g. as certified via EnviroVeg as well as sustainable practices applying to the mine. This aspect is especially important given that public media often sensationalise stories, including negative stories about agriculture itself and mining.

It is no wonder that the media sensationalize the negative impact of mining when this document attempts to like this project to a beach or sandpit and then suggest that farmers improve their image by attaining Quality Assurance Certification which they already have. Miners have a reputation, deserved or not, to take short cuts and to accept the fines as they are usually small in relation to the profits that are at stake.

If the mining companies want to discuss their attitude and approach to sustainable practices and care for the environment all we need to do is to look at the damage that has been done recently to private property during a recent exploratory drilling program and the fact that after a number of weeks no attempt has been made to repair that damage.



Landholder Engagement

The recommendations here have had six years to be implemented. During that time questions asked by landholders have regularly been met with the response that the answer will be in the EES. Much time has been wasted by the proponents and a lot of distrust developed. It may be too late to implement these measures now when it suits the proponent, measures that seem more like a publicity exercise to repair already done damage.

Even comments like “the sharing of data” have to be dealt with with scepticism. One example of concern is windblown dust, yet examination of the data from Air Quality and Greenhouse Gas Assessment shows that there was a failure to collect data for 23% of the time. That has affected the accuracy of the data presented totally underestimating both average and maximum wind speeds leading to the conclusion that when local knowledge was applied this equipment was not functioning during the more severe weather conditions.

Impact Assessment

The following values and hazards causing potential risks to horticultural production were assessed:

Value – Hazard:

- Fertile soils – Contaminants transported by air (dust) or water.
- Stable landforms – Water and wind erosion of soil from the Project's site.
- Livelihoods of landholders – Proximity of mine and associated infrastructure to production region.
- Crops – Contaminants deposited by air (dust) or water.
- Local employment – Pressures on regional infrastructure and availability of labour for horticulture as a result of employment for mine operations.
- Landscape – Altered landscape close to a horticultural production region.
- Regional reputation – Proximity of a mine and associated infrastructure to the production region.
- Efficient road network and safe roads – Movement of additional vehicles, mobile plant and equipment.
- Adequate water supply – Water availability for all users and competition for water licences.
- Adequate water quality – Damage to crops and / or equipment on farms by substandard quality water.

The risk assessment determined low residual risks of impacts on the horticulture industry after applying full mitigation to the identified key values of horticulture production within the Lindenow Valley.

These assessments were based on modelling and of course would have to show a low level of risk. Compare this modelling to what these farmers have experienced, some for a number of generations, seeing how the country responds when land is disturbed using poor farming practices and how it responds after drought. Based on the accumulation of this knowledge there is a strong belief that the modelling does not reflect observation. The consensus of opinion is that it will only take one incident to do irreparable damage to the river flats and the industry as a whole. This is not an acceptable position for a \$150m/year industry that currently employs over 2000 people.

Stakeholder Consultation

Ten horticultural businesses (vegetable and viticulture) and one key industry stakeholder were consulted during one site visit to the Lindenow Valley between the 27 – 30 August 2018. The consultation included semi-structured interviews to ascertain the extent of horticulture production and identify perceived issues and actual risks from the project.

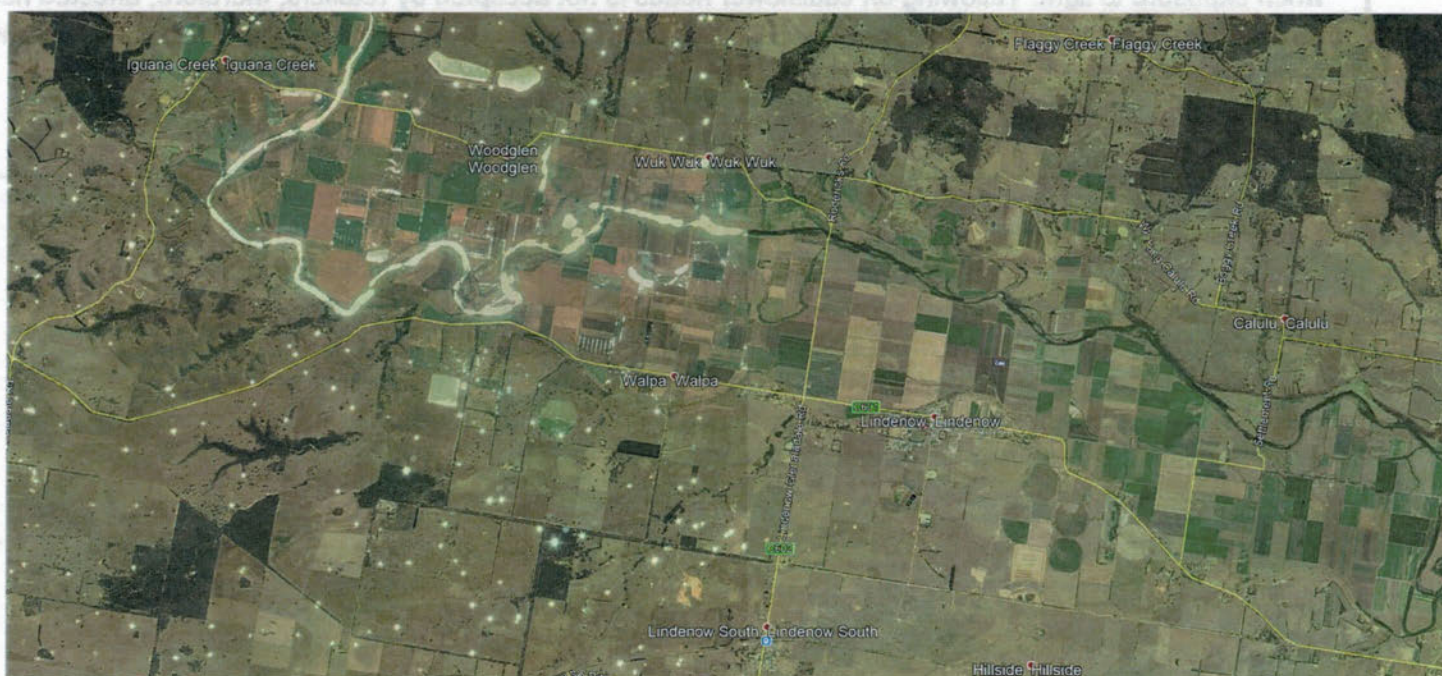
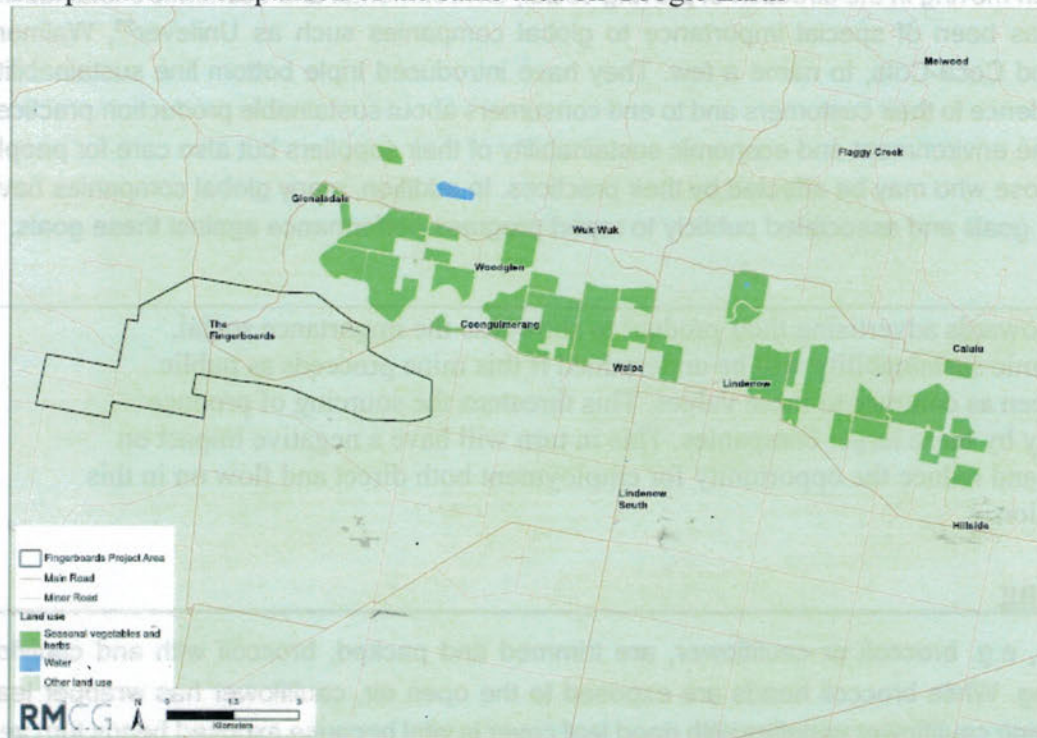
Notice that this consultation was undertaken over two years ago. During that time many modifications and alterations have taken place and as a result many stakeholders may have been provided with what is now obsolete information. This certainly is not good community consultation and community consultation is continually being pushed by the proponent as a very important aspect of the success of this project.

Value Adding

The correlation between the amount of water consumed in agriculture and the amount of jobs it creates is an extremely creative use of statistics but if the proponent chooses to use this statistic then regardless its accuracy and underestimation has to be examined. Dividing the number of full time employees on a farm by the amount of water its uses using a number of local farms as an example shows the proponent's calculations to be a gross underestimation of the real situation.

Comparative Analysis

The map showing area under vegetable production in the Lindenow Valley is extremely misleading compared to a comparison of the same area on Google Earth



Google Earth shows the area under crop as continuous rather than as a patchwork shown by the proponent.

Agricultural Production

The statistics quoted are at least three years out of date at \$91.9m and do not allow for expansion of irrigated cropping into Flaggy Creek, Hillside, Calulu and Munro. Even the local MP is quoted as stating the value of production is around \$150m/year while the ABC on a recent Landline program quoted one farm's farm gate output at \$40m/year.

The global trend has been moving in the direction of proving social, environmental and economic sustainability for many years. This has been of special importance to global companies such as Unilever²⁵, Walmart, MacDonald, PepsiCo and Coca-Cola, to name a few. They have introduced triple bottom line sustainability standards to provide evidence to their customers and to end consumers about sustainable production practices that not only look after the environment and economic sustainability of their suppliers but also care for people working for them, and those who may be affected by their practices. In addition, many global companies have formulated sustainability goals and associated publicly to report progress performance against these goals.

Global companies move towards advertising their product to showcase the importance social, environmental and economic sustainability will be undermined if this mine proceeds as public perception of mining is seen as contrary to these values. This threatens the sourcing of produce from the Lindenow Valley by these larger companies. This in turn will have a negative impact on the future of the industry and reduce the opportunity for employment both direct and flow on in this sector of primary production.

Post-Harvest Handling

Head type vegetables, e.g. broccoli or cauliflower, are trimmed and packed, broccoli with and cauliflower usually without washing. While broccoli heads are exposed to the open air, cauliflower has wrapper leaves around the head. Growing cauliflower varieties with good leaf cover is vital because exposed heads turn yellow when exposure to light. Yellowing on cauliflower heads is not accepted by retailers; therefore, affected heads never go to the market. The wrapper leaves also protect cauliflower heads from dirt (e.g. rain or overhead irrigation splash) and dust (e.g. generated by tillage machinery or vehicles on farm tracks).

Whoever wrote this section shows a lack of understanding of how a cauliflower grows. The premise that wrapper leaves protect the flower from dust is incorrect. While the flower is wrapped while it forms, the wrapper leaves open up for at least one to two weeks before the plant is harvested. This would allow plenty of time for dust settlement especially in autumn, winter and spring when the crop may be damp from dew and mist. The variation in length of time between the final irrigation and harvest does not guarantee that this dust will be removed through the watering systems. As cauliflowers are not washed the information provided by the consultant as to the probability of dust being an issue on this crop is totally misleading and inaccurate.

The concern, particularly for horticulture producers closer to the Fingerboards mine location, is that the mine will generate excessive amounts of dust that will not be contained on the site. Three major reasons mentioned for this concern are:

1. The location of the mine in the west of the valley, meaning prevailing south-westerly winds could blow dust across the valley.
2. The soil being excavated on the site is generally lighter, finer, clay soil that is susceptible to dust generation.
3. The size of the site and the ability to contain dust within the boundary of the site.

These concerns become more real when the meteorological data is examined and it can be concluded that the wind speeds experienced at the Fingerboards station have been grossly underestimated through the station being non-functional at critical times thereby failing to record the more extreme events.

When it is also realized that many of these crops especially baby leaf salad are susceptible to damage from sandblasting the risk to the industry becomes greater.

While the proponent continually argues that dust area will be sprayed and that the HMC is heavy so will not blow they fail to take into account the fine silica sands that will be exposed during the excavation process and that these sands will be subject to wind movement.

To put that concept into perspective there are a number of examples where the fire towers at Mt Moornappa and Mt Taylor have reported what they thought was smoke in the Fingerboards area but turned out to be dust generated by machinery digging dams. So the assumption that dust is controllable and will not be an issue has to be seriously challenged.

The question also has to be asked what the trigger point is that will cause certain dust generating activities to cease and how these adverse weather conditions will be monitored especially in the light of Kalbar's unreliable weather station and the unique weather patterns experienced at the Fingerboards due to its elevated location above the Lindenow Valley.

Kalbar has stated that it will work with growers to determine the extent of damage and actions to mitigate a reoccurrence of such an event. To the sceptical reader this appears to be an admittance of the possibility of such an event occurring and to investigate mitigating actions at that point would be too late to do anything except to negotiate compensation for the growers involved to cover their loss of crops and ongoing potential for market share loss.

Radionuclides

The radiation survey is misleading in stating that radionuclides are found in the surface soil as the ore body is exposed in some surface areas. This as a fact may be true but is also misleading as it ignores the logical probability that exposing more of the ore body will expose further radionuclides.

If radionuclides are not of concern to the proponent it may be judicious to ask why radiation levels have been found to be higher in farm water tanks near Mineral Sands Mines.

Radionuclides in Vegetables and Crops

While the studies conclude that washing vegetables at the farm and again prior to consumption reduces the potential for the uptake of radionuclides it does not state that it will eliminate them. Nor does it take into consideration the handling by farm workers in picking and packing these items and their exposure. Nor does it consider that not all vegetables are washed prior to packing and shipping.

Exposure to Airborne Dust

While the risk of exposure to dust in the ore body is reduced by wet processing, no consideration is given to the dust generated in the dry silica based fine sands that will have to be exposed and relocated to get to the ore body. These sands also pose a substantial health risk. As they are made up of fine particles it can be expected that they will travel distances from the mine site on the wind and therefore be of concern to the health of local residents and farm workers. All farmers have a duty of care to their workers and exposure to excessive or dangerous dust could mean that this duty of care has been breached. Illness and disease which may result years later to farm workers and residents from ingestion or breathing this dust is an issue that has been readily dismissed by the proponent.

Water Quality

Even with the planned mitigation measures to control the flow of water on the mine site there is no guarantee that this can be achieved especially with the nature of the soils and the ability of water to percolate through the ground and into the surrounding gullies. Such events would compromise the horticultural industry's ability to meet certification specifications.

To suggest that if this were to occur that the horticultural industry would need to upgrade its sanitation systems is an example of the mining industry not taking responsibility for a problem that it is creating and is a further example of its inability to see issues from the perspective of other existing long term and sustainable industries in the community.

When the Technical Reports refer to the possibility of 100mm of rain falling in a 24 hour period it appears that the consultants cannot visualize the amount of water involved or the way it flows through the landscape if they think that the mitigation measures they have outlined will be sufficient.

Irrigation and Water Availability

Data from the consultants suggests that the mine would not be given priority for winterfill if and when the six gigalitres of non-allocated water is released. However if this water is put up for auction despite the admittance that it would be of greater benefit to the horticulture industry, the farmers could easily be outbid.

The phot on Page 39 of the Report is interesting in that it purports to show erosion on the southern side of the Mitchell River near the proposed mine site. While the track is clearly visible the leaching from the wombat holes in the side of hill is obscured by trees.



The second photo gives a far better indication of the situation.



While the Impact Study did not investigate current consumer perception of produce coming from the Lindenow Valley near a Mineral Sands Mine, it is blatantly clear that any contamination event, whether real or perceived would have an effect on the marketability of produce from the area. This would have flow on effects on to the labour force.

Avoidance Management and Mitigation Measures

The proponent has had six years to develop a working rapport with stakeholders but for various reasons but mainly a lack of trust through failure to answer questions with reasonable answers a situation has developed where stakeholders are sceptical of Kalbar. So to suggest that community reference groups be formed to discuss issues is a measure which may sound viable to an outsider but to the local community which has a practical knowledge of the environment in which it lives and understands why a mine is inappropriate in this area provides yet another example of why the proponent has again failed to read this community and its views accurately.

With over 80% of both directly impacted landowners and residents within 2 km of the Project Area objecting to this mining project, there is no social licence and without a social licence and despite beliefs to the contrary by the proponent, community reference groups will be a failure.

Hiding the mine behind vegetation screens to obscure it from tourist vantage points is a rather ridiculous suggestion as all that does is obscure the mine without addressing the negative issues that it raises.

While returning the land to its former land use or native vegetation is a positive step, the fine print in the Draft Works Plan states that the 200 hectares that Kalbar has been spruiking to the community that it will rehabilitate as the endangered Plains Grassy Woodland turns out to be a conceptual idea that is yet to be fully explored. It is no wonder then that the more the community studies the EES the more sceptical it is becoming about this project and its proponent.

When an organization such as the East Gippsland Food Cluster makes a public statement that it ***“is not in support of any form of mining activities that pose a threat to prime agricultural land, waterways or aquifers in East Gippsland”*** the lack of support for this project becomes manifestly obvious.

The use of selective and general data does little to give confidence in the viability of Kalbar's argument that this mine is a worthwhile project. The use of three to four year old figures for Victoria rather than for the Lindenow Valley can only give a skewed interpretation of the facts. By simply stating that average vegetable farm income fell by 23% in 2016-17 says very little and the question has to be asked why as there may be multiple reasons for this.

It may be because of drought or that 2015-6 was an exceptionally good year with high prices and then the market came back to normal or that it was a normal fluctuation in primary production income which has always fluctuated due to the very nature of the industry which is more reliant on buyers setting prices rather than sellers. Whatever the reason the fallacious argument cannot be used in any way to suggest that mining should be given priority over horticulture as it commands higher prices for its product.

Regardless of where the population lives it does not necessarily follow that ***“their understanding of farming practices is becoming progressively poorer.”*** In fact some would be prepared to argue with social media, the popularity of tourism and cooking programs in the media that farming practices and reasons for them are becoming better understood by the metropolitan consumer.

The quote that ‘vegetables as a commodity are not commonly sold by geographic location’ also has to be challenged. With the growth of Agro tourism, farm stay accommodation and Food and Wine Trails, producers are becoming far more inclined to identify the source of the produce they consume. This fits in with the Nielsen study which points to consumer preference for natural and

minimally processed foods and that the environment in which they are grown is an important factor in decisions to purchase. Again the image of the mining industry is an environmental detraction and a consumer knowing that fresh produce was grown near a mine is more than likely to have second thoughts about going ahead with the purchase. This will also have flow on implications to any branding which identifies the location in which a product was produced.

Case Studies

Earlier in the document there was reference made to Case Studies and the difficulty of comparison. Yet the author of this Horticultural Impact Assessment has chosen to pursue this approach.

The comparison with Wemen is inappropriate due to the flat topography and drier climate. The mine size and life is disproportionate to that of the proposed Fingerboards development and the company operating the mine has had far more experience than the proponent of the Fingerboards.

One farmer who was interviewed says there were no issues with dust because of the heavy watering of the carrot crops, a crop incidentally not grown in large quantities in the Lindenow Valley. In fact very few root vegetables are grown there in the Lindenow Valley so the comparison is even less valid.

The second farmer could not even remember what crops he grew at the time. (He would make an excellent witness for the mining company). He states that the soil in the rehabilitated area has low pH and phosphorus but does not know why. It is more than possible that this is because of the deterioration of the organic material in the topsoil and a failure to adequately re-establish and renovate that topsoil.

The comparison with Busselton makes an even better comparison with a mined area of 30ha compared to Fingerboards of 1675ha. The second farmer who is described as a dairy, beef and vegetable producer instantly admits that none of his vegetables were grown on the property near the mine.

He goes on to state that there was not a water runoff issue as the mine was in a depression. Compare that to the location of the Fingerboards at the top of a plateau.

Conclusion

In July 2019 the Victorian Resources Minister Jaclyn Symes declared the floodplain along the Mitchell River from Glenaladale to Hillside be protected from mining. While this is the first positive step in banning active mining, the next steps have to be to prevent the effects of mining from impacting on this valuable area of fresh food production. This means protecting the area from the impacts of water contamination and dust. While a line can be successfully be drawn on a map to prevent mining within a zone, the same line cannot prevent the intrusion of dust and contaminated water. This would require a further exclusion or buffer zone and this must be considered. If such a buffer zone cannot be established then the risks to the horticulture industry will not be mitigated and the risk becomes too great to allow this project to proceed any further.

There are far too many factors that are still unresolved and therefore there exists too great a risk to allow this project to proceed. The impact on the Horticultural industry that would result through ineffective and inappropriate mitigation measures that are numerous and outlined above is a situation that would have an enormously negative multiplier effect on the local economy.

The only valid conclusion that can be reached in studying this and the accompanying documents that form the EES is that this project is totally untenable and should not be allowed to proceed.

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One farmer who was interviewed says there were no issues with dust because of the heavy watering of the carrot crops, a crop incidentally not grown in large quantities in the Linderoth Valley. In fact very few root vegetables are grown there in the Linderoth Valley so the comparison is even less valid.

The second farmer could not even remember what crops he grew at the time. (He would make an excellent witness for the mining company). He states that the soil in the rehabilitated area has low pH and phosphorus but does not know why. It is more than possible that this is because of the deterioration of the organic material in the topsoil and a failure to adequately re-establish and renovate the topsoil.

The comparison with Busseton makes an even better comparison with a mined area of 30ha compared to Fingerboards of 165ha. The second farmer who is described as a dairy, beef and vegetable producer (recently admits that none of his vegetables were grown on the property near the mine.

He goes on to state that there was not a water runoff issue as the mine was in a depression. Compare that to the location of the Fingerboards at the top of a plateau.

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Air Quality

One of the main concerns expressed by the community during many Community Consultation Meetings was that of Air Quality and Kalbar's ability to control airborne dust.

The ability to accurately model dust control was heavily reliant on accurate data derived from Kalbar's Weather Station at the Fingerboards. Any failure to collect and accurately interpret that data would have an impact on other studies which relied on this data. These would include but not be necessarily restricted to

- Horticulture
- Agriculture
- Socio Economic Impact
- Health Risk
- Air Quality
- Landscape and Visual

Most of the weather information is found in the Air Quality and Greenhouse Gas Assessment and one does not have to read very far into this document before alarm bells begin to ring about the accuracy and reliability of the data.

The first serious concern is the location of the monitoring station to the south east and below the highest point on the property and noticeably in the lee of that hill. (Hill height above sea level 140m and Station Height 125m). The next point is derived from local knowledge and that is the monitoring station is located in an area where previously cattle would shelter in inclement weather. These two factors should raise doubts about the suitability of the location to record accurate data.

The next concern was that wind data (speed and direction) was only captured for 77.3% of the twelve month period, that is for nearly one quarter of the time or the equivalent of three months, there was no accurate data. The explanation is a hypothesis unsupported by evidence and therefore has no place in a scientific document. ***"Equipment faults, possibly due to lightning strikes, are thought to be the cause of the majority of the data loss during this time."*** (p120) For such a statement to be accepted it should be supported by demonstrating that there was a correlation between the times of lightning strikes and data loss.

Just as plausible an explanation would be to argue that the missing data is due to malfunctions of equipment caused by more extreme weather conditions. This could be supported from evidence available from nearby BOM stations which show average wind speeds and maximum wind speeds well above those detected at the Fingerboards site. If this is the case and the higher wind speeds have not been logged then the data does not reflect the true conditions experienced at the site over the monitoring period.

Having checked the qualifications of the authors of this report who all have tertiary science qualifications, they should be aware that such a throwaway line has no place in a document of this nature.

There are also gaps in the dust monitoring data. ***"On a total of 28 days for PM10 and 26 days for PM2.5 twenty four hour averages were not recorded. Data gaps ranged from a single day to at most eleven days. On 14 days 24 hour average data for both PM2.5 and PM10 was not available."*** (p28). These gaps were filled in using probability and random number generation. The conclusion drawn by the consultant is that ***"the generated data is a reasonable representation of***

the measured data.” The accuracy of such a statement and therefore the validity of the data let alone the conclusions drawn from it are based on statistical assumptions rather than measured data and for such an important issue cannot be relied on for their correctness.

This in turn has to throw into doubt the credibility and accuracy of any modelling done using this data and the implications it has where it has been used in other studies.

Whether this lack of data has led to an interpretation that **“winter winds are predominantly from the North-west and summer winds are most frequently occur from the South-East and South-West”** is completely unclear and inaccurate. In fact it is the opposite which is the case as any landowner will be more than happy to tell you that the bushfires that threaten the area in summer come from the north-west and are driven by north-westerly winds which are the predominant summer winds and as a result of this and a number of other factors there is a bushfire overlay on the area. For such a basic error to be made and not corrected at any stage in the process up until now has to mean that the credibility of this consultant in is question.

There is also concern about the statement that there **“was no clear relationship identified between dust concentrations and rainfall during the year.”** This statement flies in the face of basic observation and what should be common knowledge to these expert consultants, that it is the small dust particles in the atmosphere that water vapour condenses on to form raindrops. When these drops fall to earth they deposit that dust on the surface they fall on. This will increase the amount of dust that the local sensitive receptors will be subject to.

Such errors and oversights suggest that the consultants who have prepared this report have done so by taking the data at face value and without question. They obviously lack the local knowledge and therefore the ability to question the validity of the data that has been produced. It appears in this case that quantitative data collected over a limited time takes precedence over empirical observation collected over many years.

There are also far too many assumptions made that lack credible evidence of how they were arrived at. Examples include but are not limited to

- How gaps in wind data were accurately calculated
- Levels of dust deposition in tank water being based on inaccurate catchment areas
- Size and number of domestic water tanks on properties
- Quantity of water harvested each year from rainfall
- Assuming that farm properties have first flush mechanisms on their water catchment systems
- Assumes that all sediment will settle and will not be stirred up during heavy rain events or if tank level is low
- Fails to take into consideration damage done by suspended sediments to pressure pumps as well as blocking filters
- Dust deposition rates were based on minimums rather than average or worst case scenario
- Wind speed measurements were accurate despite being compromised by the location of the monitoring station being protected by a hill some meters higher than the anemometer

The fact that these are assumptions is demonstrated in the Human Health Assessment where Katestone provided the data to Coffey..... **“Based on the assumed parameters...”** (p81)

The period in which this data was recorded had a total rainfall of 541 mm (Reading taken 1.5km south of Project Area Boundary) which would make put it in the lower 20% of rainfall years for all years since 1982 up until the present. Again local knowledge shows that in drier years not only are strong winds more frequent but they tend not to die off after nightfall. This does not seem to be a fact that has been extracted from the data collected by Kalbar's consultants.

The average wind speed recorded during this period of 2.62m/s (9.4kph) and maximum speed of 11.5mps (41 kph) has to be really questioned for its accuracy. These figures equate on the Beaufort Scale to a light and strong breeze. The fact that no gale force winds were detected over this twelve month period especially as it was during a lower rainfall period and therefore subject to higher wind speeds is hard to believe and has to again lead to the questioning of the data.

Delving further into these figures reveals that the figure of 11.5 mps (41 kph) is not the maximum wind speed recorded. In fact nowhere in the document is the maximum wind speed stated. This figure of 11.5 mps is the maximum average wind speed over a one hour period. By using this figure in this way the real wind speeds, gusts and bullet winds can be totally under estimated to deliberately give a false indication of the potential for dust movement from the project site to adjacent areas. The implication of using this statistic in this way is an abuse of the system as it fails to give a true indication of wind potential and its impact offsite. Again when these inappropriate statistics are transposed for use in other studies, their conclusions have to be drawn into question.

Perusal of any of the BOM stations data for current and gusting wind speeds shows that gusts can be up to three times faster than the current speed. The faster the gust, the more energy it has and therefore the larger the volume of dust it can support, the larger the particle size it can move, the greater the turbulence, the higher into the atmosphere this dust can be transported and therefore the further this dust can be transported.

The higher the wind speed the more energy involved so the more dust can be lifted into the atmosphere. So it becomes even more important to document these higher wind speeds even though they may blow for a short period of time. When this is combined with the topography where there is a drop from 125 meters above sea level to 35 meters at the river the turbulence over the escarpment when under the influence of a south westerly wind will result in far more dust being deposited along the vegetable growing flats of the river valley than the data provided in the EES suggests.

Conversely, under the influence of north westerly winds the dust will be blown further towards the residences to the south and east and towards the Fernbank township.

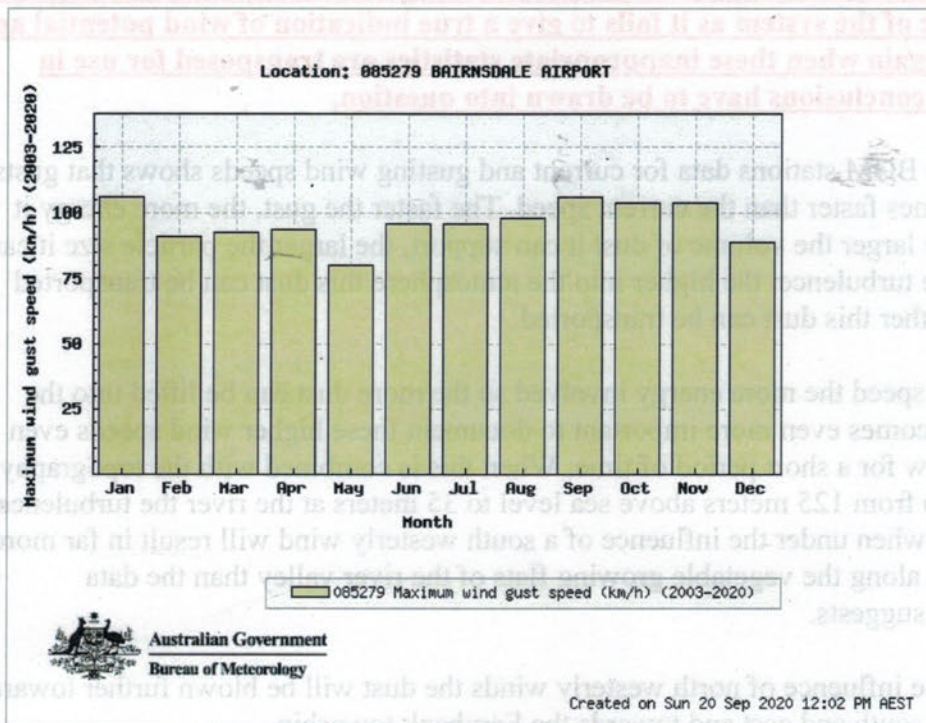
While Kalbar failed to provide data for maximum wind gusts, a comparison between actual wind speed and gusts at the nearest BOM stations shows significant differences in the two sets of measurements clearly demonstrating the importance of taking into consideration the maximum wind speeds rather than the average wind speed or maximum hourly average in order to ascertain the true energy of the wind and therefore its dust carrying capacity.

(While we can argue the comparative merits of the accuracy of using nearby weather station data, there is no real relevance in actually doing so as the point here is to show that the important data is gust speed rather than average wind speeds.)

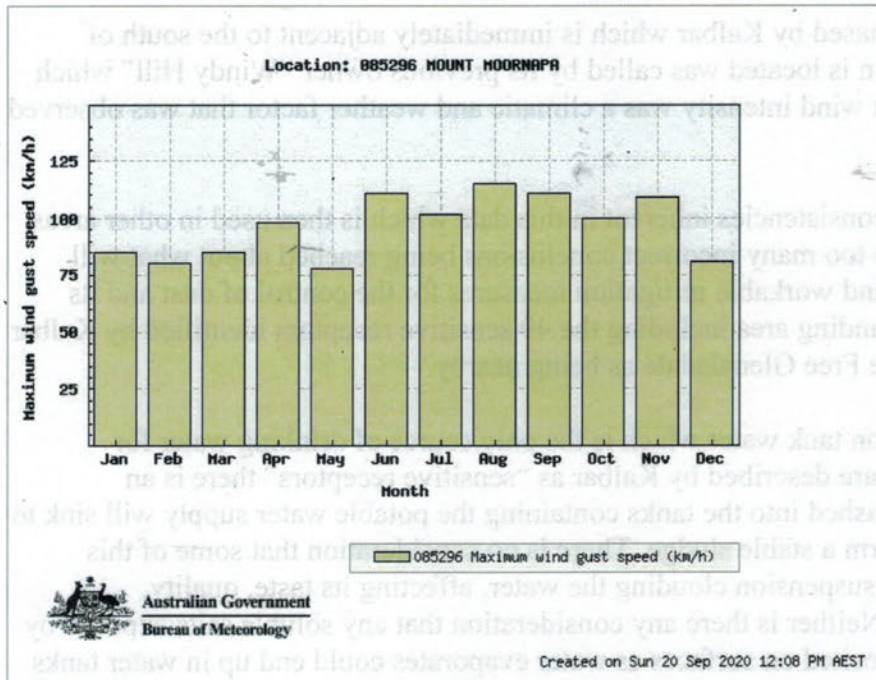
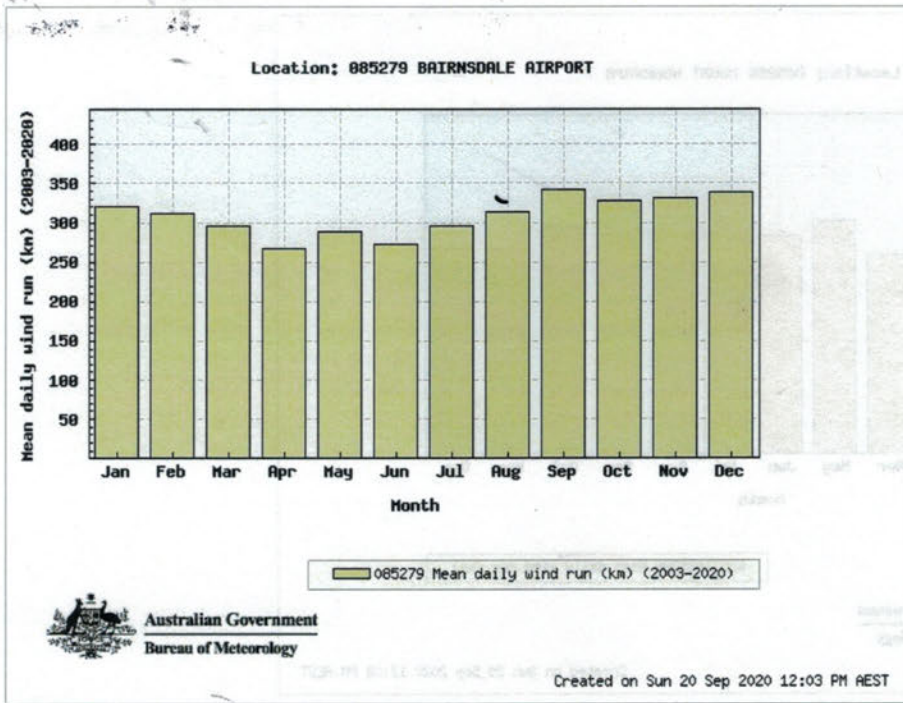
Date	Time	Location			
		Bairnsdale		Mt Moornapa	
		Speed kph	Gust kph	Speed kph	Gust kph
3/10	5.00pm	15	46	26	63
4/10	11.00am	11	37	22	46
5/10	10.00am	26	48	9	33
6/10	11.00am	9	15	0	6
7/10	2.00pm	0	13	0	7
8/20	10.30am	8	28	9	25

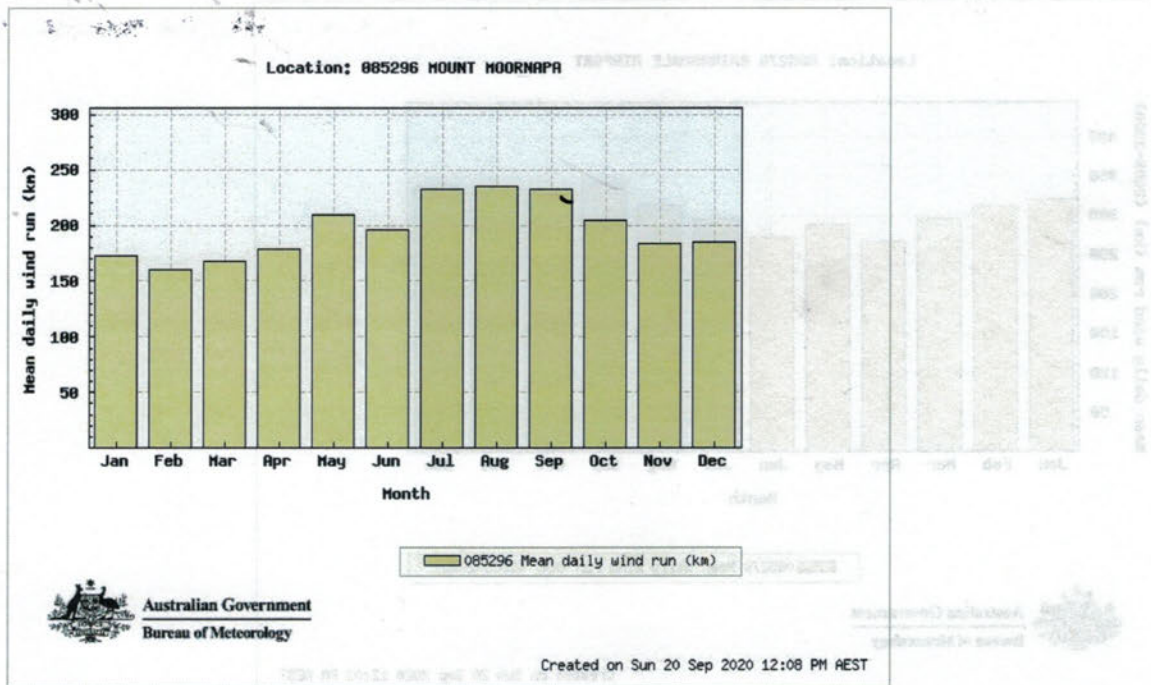
Difference between Wind Speed and Wind Gust at two nearest BOM Weather Stations

Had the consultants taken a closer look at the available statistics, they would have seen the weakness in the use of their data for even though the nearest BOM stations are not totally comparable they demonstrate not only much higher maximum and average wind speeds but also gust speeds which should have led to immediate questioning of the data from the Fingerboards site, putting into doubt the relevance of conclusions drawn from using this data in this and other studies.



While Kasper failed to provide data for maximum wind gusts, a comparison between actual wind speed and gusts at the nearest BOM stations shows significant differences in the two sets of measurements clearly demonstrating the importance of taking into consideration the maximum wind speeds rather than the average wind speed or maximum hourly average in order to ascertain the true energy of the wind and therefore its dust carrying capacity. (While we can argue the comparative merits of the accuracy of using nearby weather station data, there is no real relevance in actually doing so as the point here is to show that the important data is gust speed rather than average wind speeds.)





The property recently purchased by Kalbar which is immediately adjacent to the south of where the monitoring station is located was called by its previous owner "Windy Hill" which in itself should indicate that wind intensity was a climatic and weather factor that was observed at that location.

The implications for the inconsistencies inherent in this data which is then used in other areas of assessment has to lead to too many incorrect conclusions being reached about what will constitute both acceptable and workable mitigation measures for the control of dust and its consequences for the surrounding area including the 49 sensitive receptors identified by Kalbar or the 81 identified by Mine Free Glenaladale as being nearby.

When dealing with impact on tank water which is the only source of drinking water for families at locations which are described by Kalbar as "sensitive receptors" there is an assumption that any dust washed into the tanks containing the potable water supply will sink to the bottom of the tank to form a stable sludge. There is no consideration that some of this contaminant will remain in suspension clouding the water, affecting its taste, quality, appearance and useability. Neither is there any consideration that any soluble salts exposed by the mining process and deposited on surfaces as water evaporates could end up in water tanks in solution. Nor is there any consideration to the fact that this sludge will be stirred up where there is large volumes of water pouring into tanks during heavy rain especially where water levels in the tanks may be low.

It is obvious that the issue of potential contamination of drinking water and its effects on human health have not been adequately examined and maybe this is due to the consultants not having a practical knowledge of rainwater collection for domestic use in rural areas. Maybe because of where they are based they are too used to just turning on a tap and assuming that the water has been adequately treated and is suitable for use. This is not so in rural areas where more precautions must be taken at the domestic level for the capture and storage of potable water. The question has to be asked of what is the intended source of drinking water for mine workers and whether it will be collected from roofs of mine buildings and stored in tanks. The

original Referral Documents stated that workers would be provided with bottled water. Yet the proponent contends that it will be safe for nearby residents to continue consume their tank water as they currently do.

If further evidence is required of the incompetence of Kalbar's consultant to produce a professional document the following extract from page 79 of their Air Quality Assessment should suffice

Dust deposition monitoring is recommended by the PEM as an ongoing indicator of the effectiveness of site management practices and the potential for off-site nuisance. Locations should be considered that are both upwind and downwind of activities, to reflect the impact of the Project during predominant wind conditions. As per Section 4 of the PEM, dust deposition monitoring results should not exceed 4g/m²/month (no more than 2g/m²/month above background) as a month average. Dust deposition levels above these values should be used as a **trigger** to review dust management practices to ensure nuisance dust impacts can be addressed in a timely manner.

It is noted that the PEM requires emissions to heavy metals to be managed such that any impact on wank water in nearby residences does not lead to exceedances of the NHMRC drinking water guidelines for these substances.

Kalestone Environmental Pty Ltd
 D16070-72 Kalbar Operations Pty Ltd – Stage Two Air Quality and Greenhouse Gas
 Assessment for the Fingerboards Mineral Sands Project – Final

21 August 2020
Page 79

Kalbar's commitment to testing rainwater tanks in the vicinity of the Project prior to construction and during operations is detailed in the Human Health Risk Report, Section 9.3.2.

As a resident of over forty years in this area, living within 1.6km of the Project Area Boundary, I have to express my dismay at the inaccuracy of this data and have to suggest that if it is accepted with all its errors then the outcome of this project will not be as predicted with there being severe negative social, economic and environmental impacts on the surrounding areas.

I would go as far as to suggest that the implications of this incorrect data put into serious doubt the credibility of the EES document and on that basis believe that the document cannot be accepted in its current form and should either be rejected or returned to the proponent for a complete proof reading, fact checking and rewriting.

Noise

I have always been a firm believer that the results of practical observation far outweigh the outcomes of theoretical surmising and computer modelling in terms of accuracy. And such is the case on examining Kalbar's conclusions on the impact that noise from their proposed mine will have on nearby "sensitive receptors" which is their term for local families' homes.

I live a little less than 1.5 kilometres in a direct line from the southern limit of Kalbar's Project Area.

Between my house and that Project Area boundary there is directly to the north and on my own property is 9.5 Ha of sparse native vegetation, to the north-west 27 Ha of recently planted Pine Plantation and 68 Ha of also sparse Native Vegetation. Within Kalbar's Project Area there is a further 105 Ha of Blue Gum Plantation.

Despite this expansive vegetation shield I can still hear from my house the machinery being operated by a commercial firewood contractor on Kalbar's Steinholdt Plantation more than 3 km away. That is the result of practical observation, that a single machine can be heard over that distance.

I have to wonder then how Kalbar can conclude that the noise that will be emitted from multiple machines operating in that area as well as trucks and the operational noise from their proposed Processing Plant will not exceed the permissible levels.

Kalbar have stated that the Blue Gum Plantation in which the Processing Plant is intended to be located will in itself create a noise shield for that area. Yet by practical observation of this plantation a number of facts become immediately obvious:

1. The rows of trees are 5.5 meters apart
2. The trees within each row are 2.5 meters apart
3. The DBH of the trunks of these trees ranges from 130 mm to 230 mm
4. The average base of the canopy height above ground is 10 meters
5. The average tree height is 16 meters
6. There is no understorey throughout this plantation.





The two photos show the lack of understory and therefore the inability of this plantation to suppress noise emitting from the Processing Plant and associated operating machinery

The practical observation that this vegetation will do little to suppress noise output is strongly supported by evidence provided by the South Australian Government's Department of Planning, Transport and Infrastructure **Noise Mitigation Manual (2015)** where they examine various natural and man-made structures for the purpose of suppressing traffic noise. As the source of traffic and mine noise are both created mainly by machinery, the comparison is viable.

The document clearly states "*The installation of vegetation between a road and a sensitive receptor will **not** normally result in noticeable noise mitigation.....Approximately 30 meters of dense vegetation are required to achieve a just perceptible reduction....of 3 dB(A)*" (p28)

The obvious conclusion is that the noise suppression capabilities of this plantation is extremely limited and in fact is incapable of suppressing noise to the extent claimed by Kalbar through their computer modelling.

While vegetation shields are supposedly to be supported by soil bunds, the question has to be asked that, as demonstrated through observation, that as these vegetation barriers have very poor sound suppression capabilities, can these bunds then adequately absorb the noise that the vegetation barriers will fail to protect the local "sensitive receptors" from?

The same document in discussing Earth Bunds makes the following observations.

- For an Earth Bund to be effective it needs to be located close to both the source and the receptor.
- In Rural Areas it is not possible to locate bunds near the receptor therefore the effectiveness of the bund is reduced
- Traffic and machinery noise are generally low frequency and low frequency noise is harder to block

In a paper published on **Noise Management in the NSW Coal Industry** (Tim Procter, Deanna Tomerini and A.L. Brown 2016) a case study is quoted where noise output of machinery

similar to that which could be expected to be in use in this project, namely front end loaders, excavators and haul trucks reached levels of 137dB (A) and had the potential to exceed 142 dB (A). Similar results were quoted for other mining projects. Added to this the output from the processing plant, bulldozers, scrapers and two mining unit plants, any suggestion that noise levels will be below EPA requirements at sensitive receptors has to be seriously questioned.

Using the Keysbrook mine in Western Australia as another example, the mine operator is required to have prepared an independent quarterly report on noise compliance. What is immediately striking from an initial perusal of this document is that it was necessary to write a revised Noise Monitoring Plan as the proponent developed "*an improved understanding of the local noise environment*". (Exec Summary Keysbrook Mineral Sands Mine Environmental Noise Compliance Report Q12 2018)

Combining practical observation and the quoted documents, Kalbar's modelling that noise emissions as predicted in their computer modelling will fall within the limits stipulated has to be questioned.

In the documentation, Kalbar appears to concentrate on the noise level in decibels predicting that it will fall within acceptable limits. There is a total failure here to understand the social environment in which they hope to establish their mine and a failure to understand the current amenity and liveability of the area. Apart from large working farms, the area consists of smaller farmlets and life style properties. People living here accept rural background noises as part of the lifestyle even though some of this noise can be somewhat loud at times. They accept natural noise from the environment and domestic animal noises. However to expect them to tolerate a background noise of machinery operating on a 24/7 basis is unacceptable. To establish this mine in this environment undermines the quality of lifestyle that the local residents currently have.

A comment was made by one of Kalbar's former CEO's at an early community meeting that Kalbar would never do anything "**that would be of detriment to the local community**". Yet the destruction of rural nature and liveability of this area in the establishment of this mine would be precisely what would happen.

In its modelling Kalbar predicts that during the construction stage of the project noise levels during the evening period would exceed acceptable levels at nine sensitive receptors as well as being audible inside six of these. And by "sensitive receptors" Kalbar means people's homes. If the relevant legislation states maximum permissible levels, it has to be questioned how Kalbar can make such a statement that these limits will be exceeded and how the responsible statutory authority has allowed that statement to go through the Technical Reference Group and review processes without question.

In examining the Noise Mitigation Strategies relevant to the above comment, statement such as "informing potential noise affected neighbours", "giving early notice" and "appointing a contact person" does nothing to reduce these noise levels at sensitive receptors and in so doing fails to provide a suitable mitigation strategy. For a start it has to be suggested that at all sensitive receptors independent monitoring is carried out on a 24/7 basis for the life of the mine.

The issue which arises from this scenario is what protection is then offered to the residences and the families who will be subject to excessive noise from this proposed project, a situation that could easily be exacerbated when Kalbar's modelling is found to be inaccurate?

Those in the area have worked the land in this area and are acutely aware of two important factors firstly the dispersive nature of the underlying clays and secondly the fragile nature of the top soil which contrary to what appears in the EES is certainly not 300 mm deep.

In order to minimize erosion, especially tunnel erosion, those who farm in the area realize the importance of preserving the crumb structure of the sandy topsoils as well as the organic matter that it contains.

Experience has shown in a number of locations where deep ripping or deep ploughing has been carried out and coarse sand and clay has been brought to the surface pasture reestablishment is extremely difficult in this destroyed soil structure leading to wind and water erosion of the soil.

In a number of areas where water penetration into the dispersive clays has led to excessive tunnel erosion which is both difficult and expensive to repair. Generally farmers in the area have adapted their farming techniques and stock grazing regimes to suit the soil types and climatic variables at the time.

What has also been observed where soils have been worked, heavily fertilized and improved pasture established is that without continued application of fertilizer and adequate rainfall these pastures will revert back to native species.

A significant number of solutions that Kalbar is suggesting in the EES about replacing and rehabilitating the soils remains untested and yet "to be investigated". Therefore the impression is that the risk of successful and long term stabilization after rehabilitation is not assessed.

It is doubtful how these large areas can be stripped of their topsoil then topsoil stockpiled and later replaced without damage to its physical structure, organic, microbe and bacteria content even if the stockpiles are vegetated.

The suggestion that the sand topsoils be mixed with clay to improve water holding capacity may on the surface appear sound but where this concept fails is in that these clays are high in sodium and therefore subject to dispersion. The mixing of gypsum or lime into these newly created compounds will result in the pH of the soil being changed to the detriment of the ability to sustain long term grass species. If the soil does remain in the short term reasonably stable there is potential for it to become more acidic as these improved grass species deteriorate. The best end result to hope for in any case will be the gradual return of the soil to its original condition and hopefully, but cannot be guaranteed, the reestablishment of traditional grasses but more than likely the process will result in degraded and damaged soil incapable of supporting any viable form of agriculture.

Soils

Even though Kalbar, through its various consultants has carried out a series of intensive studies of the nature and variability of both the soils and subsoils, these studies leave a number of questions unanswered.

Those of us who have worked the land in this area are acutely aware of two important factors, firstly the dispersive nature of the underlying clays and secondly the fragile nature of the top soil which contrary to what appears in the EES is certainly not 300 mm deep.

In order to minimize erosion, especially tunnel erosion, those who farm in the area realize the importance of preserving the crumb structure of the sandy topsoils as well as the organic matter that it contains.

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To try to maintain long term these improved species will require continual applications of fertilisers and ongoing watering. Given East Gippsland's propensity for extremes from flood to drought it may only be possible in theory to sustain this "improved" pasture.

Any attempt to rehabilitate and stabilize the topsoils to allow grazing to be resumed depends on the ability Kalbar to re-establish the lower soil and subsoil horizons at their original depths, thicknesses and densities. This cannot be guaranteed.

A failure to achieve this will change the hydrology of the area by either not allowing water penetration resulting in too much surface water or the corollary which is too much water seeping into the sodic clay layers leading to serious tunnel erosion.

There is at present a fine balance in the Fingerboards area between water penetration into the recharge areas and aquifers for the shallow stock and domestic bores and runoff into the gullies and alteration of this hydrology will have serious consequences which may not become obvious for a number of years after what may appear to be on the surface successful rehabilitation.

There is a suggestion in this section of the EES that lime/gypsum be added to the clay subsoils to displace the sodium responsible for the dispersive nature of the clays. However reference to a DPI document, "Tunnel Erosion in East Gippsland" suggests that this is neither a long term nor simple solution with erosion reappearing in the years following the trials. The laboratory testing done in these trial suggests that somewhere in the vicinity of 15 tonne/hectare needs to be applied to suitably stabilize the soils. This amount of lime/gypsum would have to its own negative consequences in preventing the flow of water, even if minus its clay particles, into the seepage areas and eventually into the aquifers.

What Kalbar through its consultants is suggesting as a way of returning the removed soils to a suitable state for grazing remains on a theoretical basis and as being an untested hypothesis has the potential to permanently damage the area for future agricultural use.

The risk therefore remains too great to allow this project to proceed any further.

Rehabilitation Part 1

While it may be both practical and possible to rehabilitate some areas of Kalbar's proposed mine site back to pasture, the company's promise to create 200ha of Plains Grassy Woodland may be a promise that it cannot keep. It is not entirely clear just what the proponent intends to do on this 200 hectare site as messages are mixed.

In some instances it is stated that it will be converted into Plains Grassy Woodland and will be the biggest restoration project in Australia, yet on the other hand in the Draft Work Plan it clearly states that this may not be the case and very little is yet formalized. To paraphrase what is stated there is that "***The Draft Rehabilitation Plan is conceptual with a more detailed rehabilitation and closure plan to be written within two years of project commencement.***"

The document also states that the proponent has "***identified a block on which to establish a native vegetation system similar to the Plains Grassy Woodland (EVC 55)***"

I write with more than a little expertise on the difficulties of rehabilitation of cleared and native bushland having lived in and observed the area for over forty years. During that time I have paid attention to various EVC's including Plains Lowland Forest, Plains Grassy Woodland and Herb Rich Damp Sands.

I have seventy acres of native vegetation on my property which was covenanted twenty years ago. During that time I have been actively involved in re-establishing an understory and improving the species diversity.

I have also undertaken a replanting and soil stabilization program on another section of the property in order to prevent erosion into Moulin Creek.

My contention here is that although Kalbar may be able to successfully plant and grow some species that exist in a Plains Grassy Woodland environment, it will never be able to recreate a Plains Grassy Woodland EVC which is what it has promised to do.

The almost instantaneous establishment of a Plains Grassy Woodland will fail because this EVC can only occur within a narrow band of parameters. The soil must meet specific conditions in terms of compaction, clay content, drainage, organic matter, soil microbes and bacteria as well as a variety of other factors.

There are two examples that can be used to prove this concept. The change from Plains Lowland Forest to Plains Grassy Woodland as demonstrated on the Fernbank property in the photo is sudden yet there are only subtle changes in the physical conditions of the area. These changes are subtle enough to replace stringybark species with redgums.



Subtle changes in soil results in radical change in vegetation type from Plains Grassy Woodland (left) to Plains Lowland Forrest (right)

The second example was demonstrated during the application for and the implementation of a BushTender Contract with DSE. On the property in question there was a shallow gully/depression about 20 meters wide in which no trees were growing. There was no perceptible difference in soil on either side of the gully and the DSE representative wanted as part of the contract to plant the area with yellow box trees. Despite having it explained that there was a reason that no trees were growing in that depression, it was required that it be planted. In the following two years more than thirty trees were planted there with only one scrawny sapling surviving at the end of the contract. The lesson to be learned is that all conditions must be favourable for a rehabilitation planting to be successful.



Change of soil type in gully depression results in lack of vegetation. View to East into Plains Grassy Woodland



Same Gully Depression looking west into Plains Lowland Forrest

The creation of suitable conditions can only happen over time with the plant species colonizing the area and changing nitrogen and pH levels as new species find the conditions suitable to establish

Again this concept can be demonstrated. In establishing an understorey in a Plains Lowland Forest environment a number of species were planted which were initially found to be absent but according to records should have been present. After a period of years and despite a variety of seasons during which these plants both flowered and produced seeds, no new plants were observed. The conclusion reached was that conditions were not suitable for regeneration at that particular time.

Just because a plant naturally exists in this EVC does not mean that it can be planted and grown there either from seed or tube stock. Many plants live in a symbiotic relationship with other plants and mycorrhizal fungi so initial establishment will be difficult.

Observation over many years has demonstrated that some plants will do well in a particular year with average rainfall while in other years with the same amount of rainfall plantings will fail dismally. This can be attributed not to the total rainfall but to its distribution through the growing season. This is a factor that those responsible for this large area of rehabilitation will have no control over. Even the suggestion that manual watering will not overcome these issues over such a large area and any use of machinery to cart water in will result in soil compaction which is detrimental to growth.

One aspect of this EVC that will be impossible to recreate is the diversity in age of not only shrubs but more importantly trees. The presence of large mature trees with hollows is essential to promote the presence of small mammals and birds so essential in this environment.

The insect life also essential in working the soil and processing organic matter will only appear after many years when conditions are suitable, probably well beyond the life of this project.

Also difficult to introduce will be insects specific for pollination of the orchids and forbes which will mean that these plants will not reproduce beyond their initial plantings.

Grazing pressure by kangaroos, wallabies, wombats and deer always present a problem with rehabilitation. Various guards have been tried in the area and most fail requiring ongoing planting and vermin control. In an area of this size this is an issue that needs to be satisfactorily addressed.

As most farmers are aware, the subtle change in soil compaction caused by farm utes driving along sand ridges can have a serious impact on bracken and some species of grass regrowth for a number of years.

And then when the history of the area that Kalbar intends to return to Plains Grassy Woodland is examined, it becomes blatantly obvious that more than just the soil conditions have changed since the time that the area was covered with native vegetation. Since being cleared this parcel of land has been grazed by both sheep and cattle, been sown to canola and been deep ripped and transformed into a bluegum plantation. Kalbar's current proposal to mine the area as well as establishing a 90 hectare tailings dam will further change the soil characteristics, drainage and topography.

The other important area that needs to be examined is the suitability of establishing 200 hectares of native vegetation immediately adjacent to farmland.

Issues arise with who will be responsible for maintain the area and controlling wildlife and vermin. Where will the necessary funds be derived from for this work? Will it be handed over to the local LandCare group, assuming they have the members and time available: will DWELP be the responsible body, they have enough problems managing the land already under their jurisdiction? Will Trust For Nature which is always asking for donations be given the responsibility of management? Will the local CFA brigades then have additional risks to deal with during the summer fire period?

While the concept on the surface seem admirable, the practicalities not only of success but of ongoing management have not been fully explored and until that issue is addressed it has to be questioned that even though less than 5% of Plains Grassy Woodland survives, is this a practical use for this land post mining or is it a further imposition on an already stressed community and a promise that cannot be kept by the mining proponents.

Rehabilitation

Part 2

If further evidence is required of the difficulty of converting disturbed land into this Plains Grassy Woodland EVC is required, it can be demonstrated by looking at an area about three kilometres south of where Kalbar proposes to turn its filled in mine voids and tailings dam into EVC 55.

This area is only about two hectares in size compared to Kalbar's 200 hectares and was cleared twenty years ago and then roughly ploughed up and left.

With support and advice from both Trust for Nature and Greening Australia a project was embarked upon to rehabilitate it to the state it was in before clearing.



Plains Grassy Woodland Vegetation cleared showing sucker regrowth 2000

Unlike Kalbar's area the damage was not severe enough to prevent eucalypt suckers from emerging and these were allowed to continue to grow.

The area was lightly harrowed and rolled to smooth out the ground and over the next two seasons was sown with native grasses. These native grasses grew initially but after a couple of years failed to regerminate.

The area was also planted with a selection of understorey species including hakea, acacia, callistemon and bursaria as well as a number of tree species including sheokes and eucalypts.



Planting as part of rehabilitation process early 2000's

On the positive side some species such as rough barked honey myrtle was observed to self-germinate as well as black wattle while the negative aspect showed an invasion of Yorkshire fog grass competing with the native grasses which were thinning out.



Spraying invading Yorkshire Fog Grass

As the grasses thinned weeds such as thistles became an ongoing problem especially after the 2014 Mt Ray Fires. Probably the only advantage of this fire was that it caused hakea and acacia seed from plants from the earlier tubestock planting to germinate.

Today, after twenty years, what can be observed is a very sparse groundcover lacking in adequate topsoil and organic matter with the variety of species nowhere near as comprehensive as it should be for this EVC and certainly not in any way reflective of adjacent undisturbed areas.



Bare ground at southern end of area

It can be expected that it will take a considerable time for the mosses and organic matter to decompose sufficiently and for the insects to turn the soil to create a suitable environment for the relevant species, whether planted or self-germinating to establish.

In a limited area there is however some signs of colonization by lomandra and gahnia but the area has never been subjected to the same degree of disturbance as Kalbar's 200 hectares will be so in their case recolonization to this stage must be expected to take a lot longer



Lomandra and gahnia colonization after twenty years



The area immediately adjacent which was left undisturbed.

There is a vast difference between this undisturbed area and the cleared areas and it can be more than assumed that it will take an extremely long time for the disturbed areas to catch up.

And it certainly won't be achieved with by methods such as scalping or top stripping of soil as Kalbar tried to demonstrate with examples from NSW farmland in a recent community presentation especially considering the history of the area which has been subjected to grazing, cropping, used for a tailings dam and then mined.



Scalping and top stripping of soil on Farmland for seeding...Kalbar Community Presentation

Even light disturbance caused by clearing can have a long term impact on revegetation as the background of this next photo shows.



The area in the background was cleared over twenty years ago whereas the foreground was left undisturbed. The difference in vegetation cover and species is obvious.

Using this area for comparison, an area which underwent far less disturbance than the Fingerboards has and will undergo before rehabilitation, anyone with any experience of restoring native vegetative communities to the point that they will support the variety of flora

required and that this flora will be able to self-regenerate has to be extremely sceptical of Kalbar's promises.

What is also of concern is the length of time that it will take for this project to be achieved, whether Kalbar will still be operating at this time or whether they will pass it off to an unsuspecting organization when it appears partially established for them to deal with the ongoing management which will require extensive resourcing.

The best Kalbar can hope to achieve is to plant a number of species which are found in this EVC which is far from their promise of recreating a Plains Grassy Woodland EVC

To a person who has had experience in rehabilitation of Plains Grassy Woodland, despite reading what Kalbar hopes to achieve the reality is that they are underestimating the size of this project, how difficult it will be to achieve and the mess it will leave in the community when it fails.

To make such an unachievable promise is another reason to question the credibility of this mining company.

Process Report

Conclusion

Kalbar certainly has produced an impressive document which by its size and professional looks could easily convince persons not conversant with the Glenaladale area that this project is the best thing that could happen to East Gippsland in the current economic climate.

Just as easily its content, taken without question, could be used by politicians to claim that they are in a position to create jobs and stimulate a rural economy to the benefit of all concerned.

Unfortunately this is not the case. The document is riddled with incorrect and incomplete data on which dubious conclusions are drawn. Mitigation measures suggested to minimize risk in many cases are inappropriate and in others will not work.

The risks of environmental, social or economic damage being done to the community are continually downplayed and underestimated.

While the EES contains many comparisons and case studies, the appropriateness and relevance of those studies to this project and this particular location are in question.

In a lot of instances the proponent has relied on computer modelling to predict outcomes rather than taking notice of the knowledge of landowners who are familiar with the local environment and who have witnessed fires, floods, drought and both poor land good management practices over generations.

The statement has been made on a number of occasions by the proponent that the community knows very little about mining. That may have been so six years ago but in the past six years the community has gone out of its way to learn as much as possible. Unfortunately the proponent and their consultants have not done the same to develop a practical knowledge of farming, the local land and the local environment.

As a result the EES is written with a strong bias towards the mining industry and risks to existing horticulture, agriculture and the amenity and liveability of the area if not ignored are denied.

As a local resident of the last forty years I strongly believe and recommend that this proposed Mineral Sands Mine Project is not permitted to proceed due to the economic, social and environmental risks that the community has identified and that the proponent has failed to adequately demonstrate that it can neither mitigate nor control.

Llover Rose