Fingerboards Mineral Sands Project Inquiry and Advisory Committee
Technical note

TN No: TN 004
Date: 23 February 2021
Subject: Response to IAC Request for Information – Part 2.8, questions 23 and 24

INTRODUCTION

The IAC's request relevantly provides:

> **2.8 Sensitive receptors**
>
> **(i) Reference**
> Submission 813. Submission 813 asserts at pages 476 - 477 that the EES identified only 60% of sensitive receptors and failed to identify:
>
> - the Woodglen School as being a sensitive receptor within approximately 2kms of the Project Area; and
> - a golf club, several recreation reserves, CFA sheds, schools/kindergartens and local community halls that are within 5kms of the Projectboundary.
>
> **(ii) Request**
> The Proponent should:
>
> 23. Clarify the number and type of sensitive receptors that are within: (a) 2kms; and (b) 5kms of the Project boundary, including the proposed haul road and proposed Fernbank rail siding footprint.
>
> 24. To the extent that additional sensitive receptors are identified that were not included in the EES, provide updated impact assessments on the following issues for each of these receptors:
>
> a. Air quality
> b. Noise and vibration
> c. Traffic and transport
> d. Landscape and visual
> e. Agricultural and horticultural (as relevant)
> f. Socioeconomic
> g. Human health risk.

RESPONSE

Question 23

Table 1 and Figure 1 below show receptors that are within 2km of the Project boundary (including the Project Area, proposed haul road, Fernbank East rail siding and Mitchell River Pump Station). The

receptors identified with a blue dot on Figure 1 are within 2km of the Project Area whereas receptors identified with a pink or green dot on Figure 1 are within 2km of only the haul road, rail siding or pump station.

Table 1: Sensitive receptors within 2km of the Project

Type of sensitive receptor	Number of sensitive receptors within 2km		
	Within 2km of Project Area	Within 2km of only the haul road, rail siding or pump station	Total within 2km
Residences	37	27	64
Glenaladale CFA	1		1
Glenaladale Recreation Reserve and Hall	1		1
Woodglen Primary School	1		1
Total	**40**	**27**	**67**

We note that Figure 8.25 in Chapter 8 of the EES displayed 62 potential sensitive receptors for the project area, proposed haul road and Fernbank East rail siding - some of which were beyond 2km. Figure 8.25 identified only residences, not other sensitive receptors.

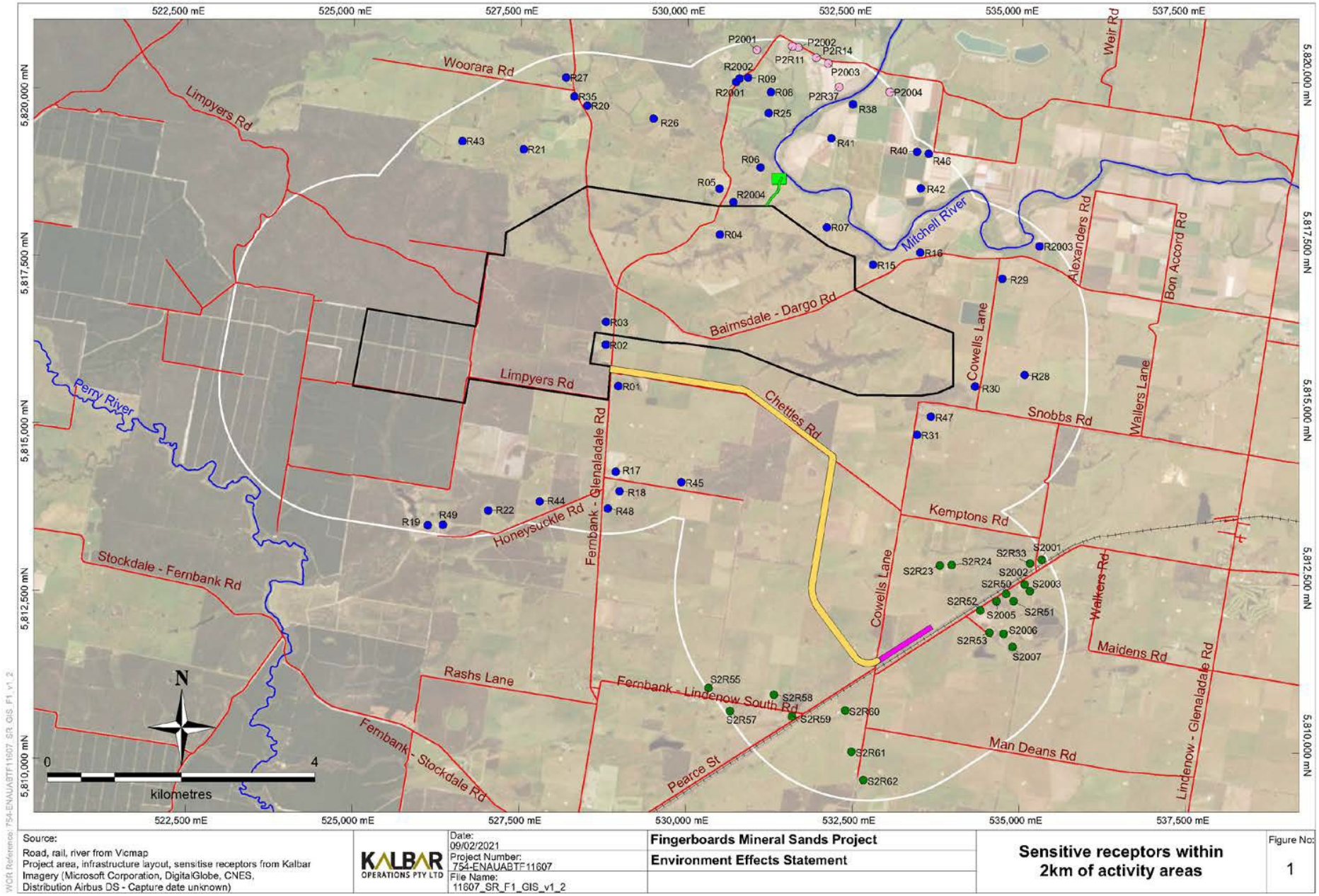
The review undertaken by Kalbar in response to the IAC's question number 23:

- disclosed two further residences (R2003 & R2004) and removed one (R36 - demolished) within 2km of the Project Area
- includes Glenaladale CFA (R2001) and Glenaladale Recreation Reserve and Hall (R2002) as receptors
- excludes receptors within the vicinity of East Gippsland Water's Glenaladale pump station option, which is no longer being pursued by Kalbar
- includes receptors within 2km of the Mitchell River Pump Station and in doing so, has included four further residences (P2001, P2002, P2003, P2004)
- includes receptors within 2km of the haul road and rail siding and in doing so, has included six further residences (S2001, S2002, S2003, S2005, S2006, S2007)

Figure 1 below depicts the location of the sensitive receptors identified in Table 1. Receptor prefixes provided on Figure 1 are:

R – within 2km of project area
S – within 2km of proposed haul road and Fernbank East rail siding
P – within 2km of Mitchell River pump station

Figure 1: Sensitive receptors within 2km of the Project



Source: Road, rail, river from Vicmap Project area, infrastructure layout, sensitise receptors from Kalbar Imagery (Microsoft Corporation, DigitalGlobe, CNES, Distribution Airbus DS - Capture date unknown)	KALBAR OPERATIONS PTY LTD	Date: 09/02/2021 Project Number: 754-ENAUABTF11607 File Name: 11607_SR_F1_GIS_v1_2	Fingerboards Mineral Sands Project Environment Effects Statement	Sensitive receptors within 2km of activity areas	Figure No: 1

WOR Reference: 754-ENAUABTF11607_SR_GIS_F1_v1_2

Table 2 and Figure 2 below show receptors that are located greater than 2km but less than 5km of the Project boundary (including the Project Area, proposed haul road, Fernbank East rail siding and Mitchell River Pump Station). The receptors identified with a green dot on Figure 2 depict the receptors that are within 2-5 km of only the haul road, rail siding or pump station.

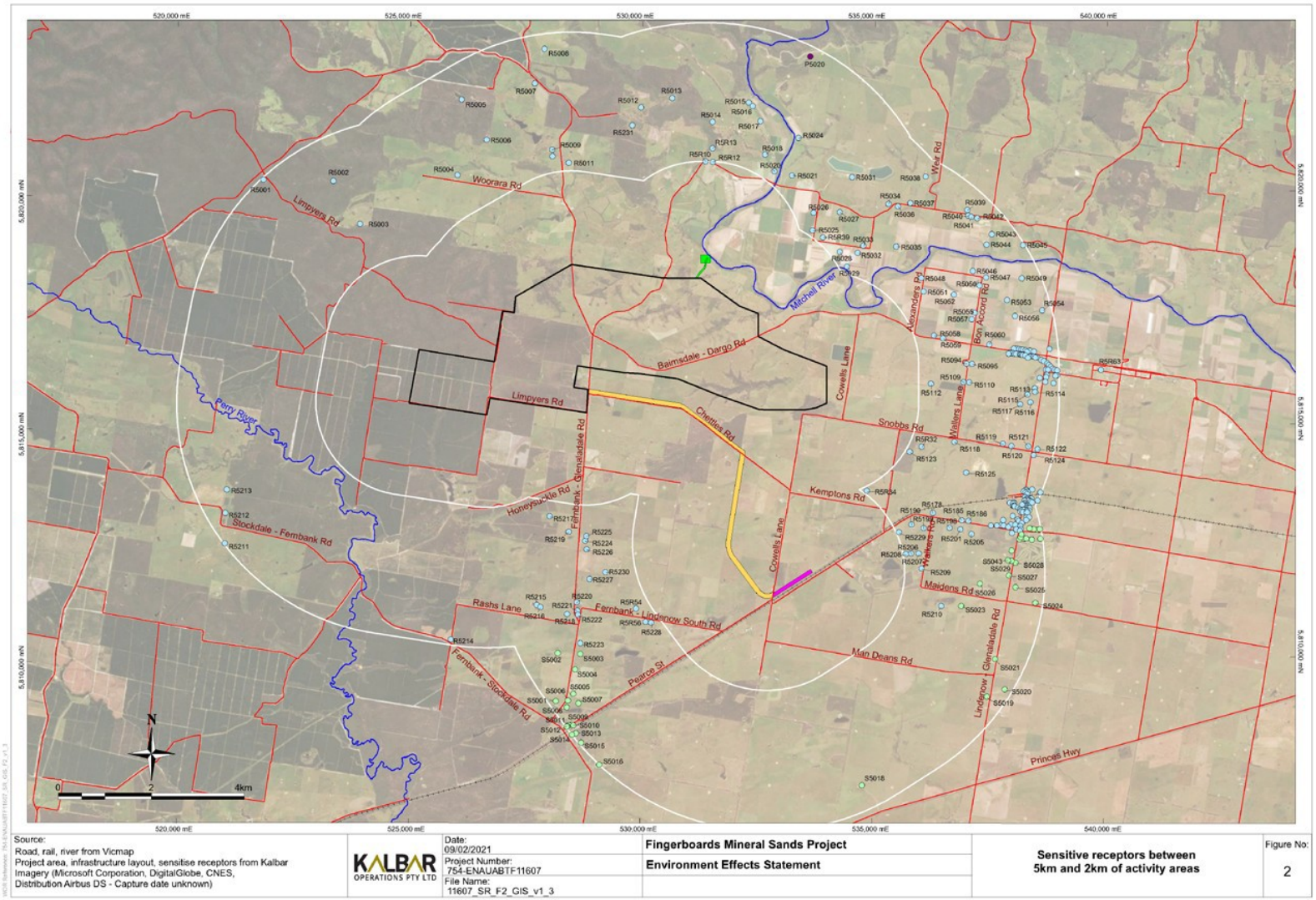
Table 2: Sensitive receptors within 2-5km of the Project

Type of sensitive receptor	Number of sensitive receptors (2 – 5km)		
	Greater than 2km, less than 5km of project area	Greater than 2km, less than 5km of haul road, rail siding or pump station	Total 2 - 5km
Residences/Receptors	233	41	274
Lindenow South Recreation Reserve	1	0	1
Lindenow South Primary School	1	0	1
Lindenow South Golf Club	0	1	1
Woodglen Reservoir (EGW)	1	0	1
Total	**236**	**42**	**278**

The location of the sensitive receptors listed in Table 2 is depicted on Figure 2 below.
Receptor prefixes provided on Figure 2 are:

R5 – greater than 2km, less then 5km of project area
S5 – greater than 2km, less then 5km of proposed haul road and Fernbank East rail siding
P5 – greater than 2km, less then 5km of Mitchell River pump station

Figure 2: Sensitive receptors between 2km and 5km of the Project



Question 24

The identification of additional receptors does not change the traffic and transport, agricultural, horticultural or socioeconomic impact assessments. Refer to Appendices 1-3 for air quality, noise and vibration, and landscape and visual impact assessments undertaken for the additional receptors identified 2km of the Project boundary. Given the modelling of particulate matter and contaminants in air set out in Appendix 1, the identification of additional receptors does not change the outcomes of the human health risk impact assessment.

katestone
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22 February 2021

Attn: Chris Cook

Kalbar Resources Pty Ltd
48 Bailey Street
Bairnsdale, Victoria 3875

Email: [redacted]

Re: Air Quality Results Summary for Additional Receptors

Dear Chris,

Subsequent to the preparation of the EES air quality assessment, eight additional receptors have been identified within 2km of the Project boundary: R2001, R2002, R2003, R2004, P2001, P2002, P2003 and P2004, and six additional receptors within 2km of the proposed product haul route and rail siding: S2001, S2002, S2003, S2005, S2006 and S2007.

Seven of the eight additional receptors within 2km of the Project boundary and all six of the additional sensitive receptors near the haul route and rail siding are in similar proximity to, or further from the Project than receptors that were explicitly included in the EES air quality assessment. Concentrations of air pollutants and dust deposition rates at these locations will be similar to or lower in magnitude to predictions at receptors presented in the EES air quality assessment. The EES air quality assessment demonstrated that it is feasible to control and manage dust emissions from the Project using a range of standard and additional mitigation measures, which would ensure that adverse impacts would not occur at sensitive receptors.

One of these receptors (R2004) is approximately 200m closer to the northern Project boundary than receptor R05, which was considered in the EES air quality assessment. In relation to R5, the EES air quality assessment demonstrated that it is feasible to control and manage dust emissions from the Project using a range of standard and additional mitigation measures, which would ensure that adverse impacts would not occur. By implementing the same or similar mitigation measures, adverse impacts at R2004 would similarly be avoided.

To investigate this further, the receptor R2004 has been added as a discrete receptor to the EES air quality assessment dispersion model and to the centrifuge dispersion model, which is described in the Expert Witness Statement of Simon Welchman (dated 9 February 2021). Ground-level concentrations of air pollutants have been predicted at R2004 and assessed against the PEM criteria. The results of the assessment at R2004 are presented in the Attachment.

The dispersion modelling at R2004 shows that the mitigation measures proposed in the EES air quality assessment and the subsequent work detailed in the Expert Witness Statements of Simon Welchman (dated 2 February 2021 and 9 February 2021) will ensure compliance with the PEM criteria and SEPP AAQ objectives at R2004.

Please contact the undersigned on [redacted], if you would like to discuss.

Yours sincerely,

Simon Welchman - Director

A1 DISPERSION MODELLING RESULTS FOR R2004

A1.1 PM_{10} Dispersion Modelling Results

A1.1.1 Assessment against PEM criterion

Table 1 shows the maximum 24-hour average ground-level concentration of PM_{10} due to year 5 operations (for the EES and centrifuge scenarios) at R2004 and shows that the results comply with PEM criterion of 60 µg/m^3. The dispersion modelling results are similar to but lower than those predicted in the EES air quality assessment for receptor R5. Table 2 shows that with standard mitigation measures there is one predicted exceedance of the PEM criterion and that by adopting additional mitigation measures there are no exceedances of the PEM criterion.

Table 1 Predicted maximum 24-hour average ground-level concentrations of PM_{10} due to Year 5 operations for EES scenario vs centrifuge scenario

Receptor	Maximum 24-hour PM_{10} (µg/m^3) – EES Scenario		Maximum 24-hour PM_{10} (µg/m^3) – Centrifuge Scenario	
	Project	Cumulative	Project	Cumulative
R2004	31.2	59.0*	28.5	59.0*

Table notes:
* Includes additional dust mitigation measures

Table 2 Number of exceedance days for R2004 with 24-hour average concentrations of PM_{10} above 60 µg/m^3 due to Year 5 operations, EES scenario vs centrifuge scenario

Receptor	Number of exceedance days – EES Scenario		Number of exceedance days – Centrifuge Scenario	
	Standard mitigation	Standard and additional mitigation	Standard mitigation	Standard and additional mitigation
R2004	1	0	1	0

Table 3 shows the maximum 24-hour average ground-level concentration of PM_{10} due to year 12 operations (for the EES and centrifuge scenarios) at R2004 and shows that the results comply with PEM criterion of 60 µg/m^3. The dispersion modelling results are similar to but lower than those predicted in the EES air quality assessment for receptor R5. Table 4 shows that with standard mitigation measures there is one predicted exceedance of the PEM criterion and that by adopting additional mitigation measures there are no exceedances of the PEM criterion.

The adoption of additional mitigation will ensure that the PEM criterion is achieved at R2004 in both the EES and centrifuge scenarios in Year 5 and 12. The EES air quality assessment demonstrated that concentrations of particulate matter due to Year 8 were lower than Year 5 and 12 and, therefore, compliance with the PEM criteria would also be achieved during Year 8 for PM_{10}.

Table 3 Predicted maximum 24-hour average ground-level concentrations of PM_{10} due to Year 12 operations for EES scenario vs centrifuge scenario

Receptor	Maximum 24-hour PM_{10} (µg/m^3) – EES Scenario		Maximum 24-hour PM_{10} (µg/m^3) – Centrifuge Scenario	
	Project	Cumulative	Project	Cumulative
R2004	30.8	59.4*	29.0	59.4*
Table notes: * Includes additional dust mitigation measures				

Table 4 Number of exceedance days for R2004 with 24-hour average concentrations of PM_{10} above 60 µg/m^3 due to Year 12 operations, EES scenario vs centrifuge scenario

Receptor	Number of exceedance days – EES Scenario		Number of exceedance days – Centrifuge Scenario	
	Standard mitigation	Standard and additional mitigation	Standard mitigation	Standard and additional mitigation
R2004	1	0	1	0

A1.1.2 Assessment against SEPP AAQ objective

The submission of EPA Victoria suggests that the results of dispersion modelling should also be compared to the State Environment Protection Policy (Ambient Air Quality) (SEPP AAQ) objectives. The objectives that are specified in the SEPP AAQ are equivalent to that specified in the Proposed Final Environment Reference Standard (ERS) that is intended to be made under the *Environment Protection Act 2017*.

The Expert Witness Statement of Simon Welchman (2 February 2021) investigated the additional mitigation measures that could be implemented so the Project achieves compliance with the objectives of SEPP AAQ. This investigation was completed to address the submissions EPA Victoria and others.

The investigation considered the following control scenarios and found that the SEPP AAQ objectives could be achieved at all sensitive receptors:

- Scenario 1:
    - The EES air quality assessment assumed that overburden would be extracted using scrapers. This scenario investigates the use of truck and shovel to extract overburden rather than scrapers. Kalbar has determined that extraction of overburden by truck and shovel is viable.
    - The EES air quality assessment assumed that grading would occur continuously 24-hours per day. This scenario investigates grading for 12 hours of the day from 6am to 6pm (at the EES activity rate). This control measure is required from a noise abatement perspective.
    - The EES air quality assessment assumed that product haulage would occur 24-hours per day. This scenario investigates product haulage for 11 hours of the day at 2.2 times the EES activity rate. This control measure is required from a noise abatement perspective.
- Scenario 2: The EES air quality assessment assumed that overburden extraction would occur 24-hours per day. The assessment found that for nine days in Year 5, three days in Year 8 and 37 days in Year 12, additional mitigation measures in the form of ceasing certain activities was required to achieve compliance with the PEM objectives. This scenario adopts the mitigation measures described

in Scenario 1, and also ceases overburden extraction during the night as a reactive control to be implemented in the event of elevated dust to achieve compliance with the SEPP AAQ environmental quality objectives for PM_{10}. As part of this scenario, the overburden extraction could occur at twice the normal rate during the day (6am to 6pm).

- Scenario 3: The EES air quality assessment assumed that overburden haulage and grading would occur 24-hours per day in the east and west pits. The assessment found that for nine days in Year 5, three days in Year 8 and 37 days in Year 12, additional mitigation measures in the form of ceasing certain activities was required to achieve compliance with the PEM objectives. This scenario adopts the mitigation measures described in Scenario 2 and further, ceases overburden haulage in the east pit and ceases grading in the east and west pits during the day as a reactive control to be implemented in the event of elevated dust to achieve compliance with the SEPP AAQ environmental quality objectives for PM_{10}.

The inclusion of the additional eight receptors within 2 km of the Project boundary does not change these outcomes. Table 5 summarises the outcomes of additional work that includes consideration of the additional eight receptors within 2 km of the Project boundary. The application of additional mitigation measures described above is predicted to result in compliance at all receptors including the eight additional receptors. Results for Scenario 3 are not presented for Year 8 or Year 12 as the modelling predicts compliance would be achieved due to the measures included in Scenario 2.

Table 5 Additional control measures to achieve compliance with SEPP AAQ Environmental Quality Objectives for PM_{10}

Year	Mitigation scenario	Complies with SEPP AAQ[1] objective for annual average concentrations of PM_{10}? (Y/N)	Complies with SEPP AAQ[1] objective for 24-hour average concentrations of PM_{10}? (Y/N), additional exceedance days
Year 5	EES	N	N, 9
	1	Y	N, 1
	2	Y	N, 1
	3	Y	Y, 0
Year 8	EES	N	N, 3
	1	Y	N, 1
	2	Y	Y, 0
Year 12	EES	N	N, 37
	1	Y	N, 1
	2	Y	Y, 0

Note
[1] The SEPP AAQ objectives for PM_{10} are equal to the objectives contained in the Proposed Final Environment Reference Standard

A1.1.3 Dispersion Modelling Results for Other Pollutants

Table 6 and Table 7 show predicted ground-level concentrations of all key indicators at R2004, the closest of the new receptors to the project, due to Year 12 operations (EES scenario). Ground-level concentrations of all air pollutants and dust deposition rates comply with the relevant air quality criteria. This will also be the case for Year 5 and 8, and for the centrifuge scenarios.

Table 6 Predicted concentrations of $PM_{2.5}$, RCS and dust deposition rates for R2004 due to Year 12 operations EES scenario

Receptor	Maximum 24-hour $PM_{2.5}$ ($\mu g/m^3$)		Annual average $PM_{2.5}$ ($\mu g/m^3$)		Annual average respirable crystalline silica ($\mu g/m^3$)		Monthly maximum dust deposition ($mg/m^2/day$)		Annual average dust deposition ($g/m^2/month$)	
	Project	Cumulative	Project	Cumulative	Project	Cumulative	Project	Cumulative	Project	Cumulative
R2004	9.1	20.0	2.1	5.5	0.4	0.7	8.9	62.2	0.12	1.0
Ambient background included	-	Time-varying background		3.3	-	0.34	-	53.3	-	0.89
Air quality criteria	**-**	**25 ***	**-**	**8 ***	**-**	**3**	**-**	**120**	**2**	**4**

Table note:

* Proposed Final ERS and SEPP AAQ standards

Table 7 Predicted ground-level concentrations of heavy metals at R2004 due to Year 12 operations EES scenario

Parameter	1-hour average			Annual average		
	Concentration at R2004 due to Project (µg/m^3)	Air quality design criteria (µg/m^3)	% of air quality criteria	Concentration at R2004 due to Project plus background (µg/m^3)	Air quality design criteria (µg/m^3)	% of air quality design criteria
Arsenic	0.021	n/a	-	0.0014	0.003	48.2%
Cadmium	0.0026	5.4	0.005%	0.00022	0.0033	6.5%
Cobalt	0.0044	0.21	2.1%	0.0012	0.0017	68.7%
Chromium	0.032	3.6	0.9%	0.0045	0.041	10.9%
Copper	0.0051	10	0.05%	0.0018	1	0.1%
Lead	0.0033	0.15[1]	2.2%	0.0025	0.50[6]	0.5%
Manganese	0.075	2.7	2.8%	0.0038	0.25	1.5%
Nickel	0.0095	0.33	2.9%	0.0014	0.059	2.5%
Selenium	0.00026	2	0.01%	0.0022	0.2	1.1%
Tin	0.0018	20	0.009%	0.0047	2	0.2%
Thorium[4]	0.005	n/a	-	0.0012	-	-
Titanium	2.8	50	5.6%	0.064	5	1.3%
Uranium	0.0012	2	0.06%	0.0021	0.2	1.1%
Vanadium	0.048	20	0.2%	0.0019	2	0.1%
Tungsten	0.0011	50	0.002%	0.0061	5	0.1%
Zinc	0.017	20	0.08%	0.060	2	3.0%
Zinc Oxide	0.017	20	0.08%	0.23	2	11.6%
Zirconia	0.075	50	0.15%	0.0017	5	0.03%
Bismuth	0.00026	50	0.0005%	0.000012	5	0.0001%
Cerium [5]	0.025	50	0.05%	0.0012	5	0.01%
Lanthanum	0.013	50	0.026%	0.00058	5	0.0057%
Magnesium oxide	1.8	40	4.6%	0.041	4	1.0%
Zirconium (elemental)	0.075	50	0.15%	0.0017	5	0.03%

Table note:

[1] Lead design criteria applies to a rolling 3-month average but is compared here to maximum 1-hour concentrations.

[2] 24-hour average

[3] Iron is not presented here as compliance is determined through the assessment of PM_{10}

[4] There is no air quality criteria for thorium in the PEM or the TCEQ database. Dispersion modelling results are presented for completeness.

[5] Assessed against the ESL for cerium oxide

[6] Proposed Final ERS

A2 RECEPTORS WITHIN 2KM OF THE HAUL ROAD AND RAIL SIDING

The additional receptors S2001, S2002, S2003, S2005, S2006 and S2007 are located at least 1km from the proposed product haul route and/or rail siding and are further from mining operations than any of the receptors assessed in the EES air quality assessment.

Emissions to air from transport along the haul road to the rail siding will be minimal. Emissions due to transport of materials typically occur due to spillage, tyre wear, resuspension of material on the transport route, and exhaust emissions due to fuel combustion. Concentrates are containerised at the Project site, so spillage is unlikely. Emissions to air from activities at the rail siding are also likely to be minimal. Concentrates remain containerised during transport to and from the rail siding or during unloading/loading at the rail siding. Emissions to air will occur from tyre wear and fuel combustion due to incoming trucks, and exhaust emissions from trains.

The Air Quality Assessment quantified emissions due to product transport, including exhaust emissions for the portion of proposed product haul route towards the east of the Project site that was within the model domain. For key indicators such as particulates, this included wheel generated dust (to account for tyre wear, resuspension of ambient dust etc). Compliance with the PEM objectives was predicted at all sensitive receptors in the model domain due to mining activities including product transport, including the receptors to the east of the Project area that are located 80m – 300m from the product haul route. The additional receptors are located at least 1km from the proposed product haul route and therefore concentrations of air pollutants are expected to be lower than those predicted at receptors within the model domain, and compliance would be expected.

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22 February 2021

Kalbar Operations Pty Ltd
48 Bailey Street
Bairnsdale VIC 3875

Attention: Chris Cook

Dear Chris

FINGERBOARDS MINERAL SANDS PROJECT
ADDITIONAL NOISE SENSITIVE RECEPTORS

INSTRUCTIONS

As requested by Kalbar Operations Pty Ltd (Kalbar) by email on 9 February 2021, this letter, to be attached to Technical Note TN 004, presents an assessment of construction and operations noise levels for additional sensitive receptors in the vicinity of the Fingerboards Mineral Sands Project (the Project).

DESCRIPTION

Kalbar has identified a number of additional sensitive receptor locations in the vicinity of the Project.

Details of the additional sensitive receptor locations are provided in Technical Note TN 004 with the stated subject being *Response to IAC Request for Information – Part 2.8, question 23.*

The Technical Note provides the following summary of changes to the identified receptor locations:

> *The review undertaken by Kalbar in response to the IAC's question disclosed:*
>
> - *two further residences (R2003 & R2004) and removed one (R36 - demolished) within 2km of the Project Area*
> - *includes Glenaladale CFA (R2001) and Glenaladale Recreation Reserve and Hall (R2002) as receptors*
> - *excludes receptors within the vicinity of East Gippsland Water's Glenaladale pump station option, which is no longer being pursued by Kalbar*
> - *includes receptors within 2km of the Mitchell River Pump Station and in doing so has included four further residences (P2001, P2002, P2003, P2004)*
> - *includes receptors within 2km of the haul road and rail siding and in doing so has included six further residences (S2001, S2002, S2003, S2005, S2006, S2007)*

A revised sensitive receptor map provided by Kalbar is reproduced in Appendix A.

ASSESSMENT

The MDA report[1] and my evidence statement[2] are based on assessing representative locations that are nearest to the Project. The basis to this assessment approach is that noise levels from construction and operation of the Project will be lower at receptors that are further from the project, and, therefore, an assessment of compliance for the nearest receptors is representative for other more distant receptors.

The majority of the additional sensitive receptor locations identified by Kalbar are located further from noise generating activities associated with construction and operation of the Project. Specifically, the following additional receptors are all located further from the Project than the receptors accounted for in the MDA report and my evidence statement:

- R2001 and R2002

  Note: These locations are not *noise sensitive areas* as defined in NIRV (see Appendix D1.2 of the MDA Report) and, as such are not considered in the noise assessment

- R2003
- P2001, P2002, P2003, P2004
- S2001, S2002, S2003, S2005, S2006, S2007.

Accordingly, the compliance outcomes presented in the MDA report and my evidence statement remain applicable to the additional receptors listed above.

The one additional receptor location that is nearer to the Project is receptor R2004, located adjacent to the northern boundary of the Project. R2004 is located approximately 280 m to the southeast receptor R5 which was the nearest receptor to the northern boundary of the Project considered in the MDA report and my evidence statement.

While receptor R2004 is closer to the Project boundary than receptor R5, operational noise levels are predicted to be comparable to those of receptor R5, on account of the location and arrangement of noise sources around the Project site. This is evident from the predicted noise contour maps presented in Appendix H of the MDA report Rp 001 R12 20170182 which indicates noise levels may be slightly lower or higher than at the location of receptor R5, depending on the year of operation. Importantly, the location of receptor R2004 on the noise contour maps is well outside the noise contour lines which correspond the NIRV recommended levels for the day, evening and night. Predicted noise levels at receptor R2004 would therefore be well below the NIRV recommended levels for all scenarios and time periods.

Notwithstanding the above, for completeness, the noise model has been recalculated for:

- the day, evening and night periods
- the four (4) different scenario years assessed in the MDA report
- with and without the proposed centrifuge option addressed in my previous addendum[3].

The results are presented in Table 1 and Table 2 on the following page, and confirm that predicted noise levels are below the recommended day, evening, and night levels for all of the assessed scenarios.

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1 MDA Report Rp 001 R12 20170182 *Fingerboards Mineral Sands – EES Noise and Vibration Assess*ment dated 25 August 2020

2 Ev 001 R01 20200942 *Fingerboards Mineral Sands - Acoustic evidence* dated 30 January 2021

3 MDA letter Lt 001 20200942 *Fingerboards Mineral Sands - Noise Evidence - Addendum for Centrifuge Option* dated 9 February 2021

Table 1: Receptor R2004 – predicted operational noise levels, dB L_{eff} – day and evening periods

Description	Year 1	Year 5	Year 8	Year 12
TSF option	37	36	36	30
Centrifuge option	37	36	36	31
NIRV day/evening criteria	46/41	46/41	46/41	46/41

Table 2: Receptor R2004 – predicted operational noise levels, dB L_{eff} – night period

Description	Year 1	Year 5	Year 8	Year 12
TSF option	27	28	32	27
Centrifuge option	29	30	32	29
Night criterion	36	36	36	36

In relation to the construction stage of the project, based on the information shown in the noise contour map presented as Figure 52 in Appendix H of the MDA Report Rp 001 R12 20170182, predicted noise levels are expected to be higher at R2004 compared to R5 during the day and evening periods. This is a result of receptor R2004 being located nearer to construction activity occurring to the southeast of the Project. However, during the night period, predicted construction noise levels at receptor R2004 would be lower than at R5, due to the night period construction activities being located to the west-southwest of R2004 and R4.

Accordingly, the noise model for the construction stage of the Project has also been recalculated for receptor R2004. The results and an assessment of the predictions are presented in Table 3.

Table 3: Receptor R2004 – predicted construction noise levels, dB L_{Aeq}

Time period	Predicted noise level
Evening	36
Night	21

Consistent with the findings presented in the MDA report for other receivers around the project, the predicted noise levels during the evening period are likely to be higher than the EPA Publication 1254 criterion when background noise levels are low and when the wind is directed from the construction activity to the receptor (approximately 31 % of the time, per the information presented in Table 23 of the MDA report).

In relation to the night period, the predicted construction noise level is not likely to be audible inside the dwelling (accounting for an outdoor to indoor reduction of 10 dB for a partially open window, as described in the MDA report and my evidence statement), and therefore achieves the EPA 1254 guideline.

As an additional contextual reference, it is noted that the predicted construction noise levels for the evening and night period are below the NIRV recommended levels which apply to the longer-term noise associated with operation of the Project. This is particularly relevant in this context given the similarity of the equipment associated with the construction and operation stages of the project.

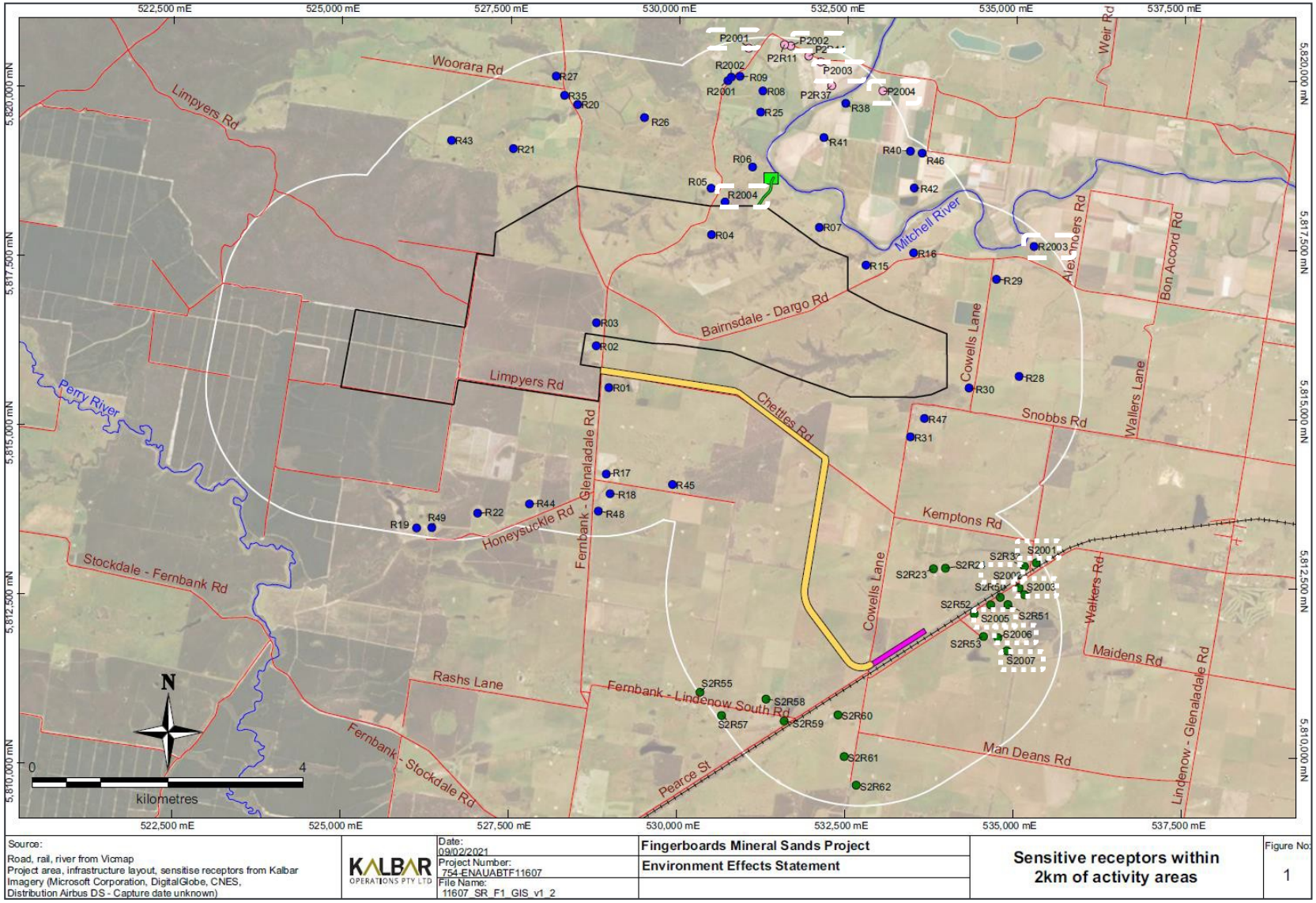
Christophe Delaire

Signed .....

Dated 22 February 2021

APPENDIX A REVISED RECEPTOR LOCATIONS MAP PROVIDED BY KALBAR

Figure 1: Revised receptor location map provided by Kalbar 9 February 2021 – additional receptors circled



URBIS

FINGERBOARDS MINERAL SANDS PROJECT EES

LVIA - SUPPLEMENTARY MATERIAL – ASSESSMENT OF ADDITIONALLY IDENTIFIED RECEPTORS

17th February 2021

In response to RFI #24, the following additional supporting material is provided.

Main Project Area

Receptor No.	Landuse	Distance from closest project component	Closest Assessed VP	Distance to closest assessed VP	Visible in ZVI	Vegetation Screening proximate to VP	Potential Visual Impact (H=High, M+ Moderate, L= Low)	Discussion
R2001	CFA – Not considered sensitive	N/A	N/A	N/A	N/A	N/A	N/A	Although within a recreation reserve which is considered to be a sensitive use, the CFA station is not considered to be a sensitive use.
R2002	Recreation	1.9km	VP11	1.8km	Yes	Fully	Low	Vegetation around the perimeter of the reserve and along Fernbank Glenaladale Road screen views to the Project
R2003	Residential	1.8km	VP14	1.7km	Yes	Minimal	Low	Views towards the project area will be mostly screened by intervening vegetation as well as localised rises in the undulating topography between the viewpoint and the Project
R2004	Residential	40m	VP22	285m	Potentially	Minimal	High	Proximity to the Project and lack of surrounding and intervening vegetation will result in a high visual impact for this viewpoint.

Infrastructure Area - Haul Road and Rail Siding

The additional receptors assessed below are proximate to the rail siding, which is a low-profile element within the landscape.

Receptor No.	Landuse	Distance from closest project component	Closest Assessed VP	Distance to closest assessed VP	Visible in ZVI	Vegetation Screening proximate to VP	Potential Visual Impact (H=High, M+ Moderate, L= Low)	Discussion
S2001	Residential	1.9km	VPRS1	2.9km	No	Fully	No to Low	Dense vegetation adjacent to the residence and in the intervening landscape, block views to the Project.
S2002	Residential	1.5km	VPRS1	2.5km	Yes	Fully	Low	Dense vegetation adjacent to the residence and in the intervening landscape, block views to the Project.
S2003	Residential	1.5km	VPRS1	2.6km	Yes	Fully	Low	Dense vegetation adjacent to the residence and in the intervening landscape, block views to the Project.
S2005	Residential	1km	VPRS1	2.1km	Yes	Fully	Low	Dense vegetation adjacent to the residence and in the intervening landscape, block views to the Project.
S2006	Residential	1km	VPRS1	2.0km	Yes	Minimal	Low	Although the residence does not have immediately adjacent surrounding vegetation, dense intervening vegetation within the landscape block views to the Project.
S2007	Residential	1.2km	VPRS1	2.1km	Yes	Fully	Low	Dense vegetation adjacent to the residence and in the intervening landscape, block views to the Project.

Mitchell River Pump Station

Residences located on the intensive horticultural areas of the Mitchell River Floodplain are set within a landscape which is subject to significant annual visual change to the landscape. In most instances, the horticultural landscape will be dominant in the foreground of views to the Project. This is a consideration in the assessment of visual modification levels.

Note – the levels of sensitivity, which are dependent on distance from the Project, have been determined based on the scale of the proposed core mining and processing facilities.

The smaller scale elements of the Project, such as the pump station, will result in a more rapid drop in sensitivity as distance from the Project increases. A high level of sensitivity would drop to a moderate level beyond 500 metres.

The following viewpoint assessment considers the impact of the Project as a whole, including the pump station which, in itself, is a relatively small element, not dissimilar from other sheds or utility buildings in the surrounding rural landscape.

Receptor No.	**Landuse**	**Distance from closest project component**	**Closest Assessed VP**	**Distance to closest assessed VP**	**Visible in ZVI**	**Vegetation Screening proximate to VP**	**Potential Visual Impact** (H=High, M+ Moderate, L= Low)	**Discussion**
P2001	Residential	1.8km	VP11	1.5km	Yes	Partial	Low to Moderate	The viewpoint is a similar distance from the Project as VP11. However, VP11 has the visual sensitivity level of a local road, which is low. The residential viewpoints are rated of a high visual sensitivity. In the context of a low visual modification level, the visual impact for this viewpoint would be low to moderate.
P2002	Residential	1.9km	VP11	960m	Yes	Minimal	High	The viewpoint is a similar distance from the Project as VP11. However, VP11 has the visual sensitivity level of a local road, which is low. The residential viewpoints are rated of a high visual sensitivity. In the context of a moderate to high visual modification level, the visual impact for these viewpoints would be moderate to high.
P2003	Residential	1.7km	VP11	495m	Yes	Partial	Moderate	As above
P2004	Residential	2.0km	VP11	620m	Yes	Partial	Moderate	As above