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Department of Planning and Environment
GPO Box 39
SYDNEY NSW 2001

Via email to: genevieve.seed@planning.nsw.gov.au

14 February 2019

Dear Ms Seed

**Brandy Hill Quarry Expansion Project SSD 5899
Comments on the Response to Submissions Revised Air Quality Impact Assessment**

Reference is made to your email to the Environment Protection Authority (EPA) dated 23 January 2019, seeking the EPA's comments and/or advice on the revised Air Quality Impact Assessment (AQIA) submitted to the Department of Planning and Environment (DPE) for the Brandy Hill Expansion Project, SSD 5899. The revised AQIA was prepared by the proponent in response to the EPA's comments on the Response to Submissions in October 2018.

The EPA's previous concerns were largely related to the technical issues that needed to be satisfactorily addressed with the AQIA, exceedances of the PM₁₀ 24-hour particulate criteria and enclosure of the processing plant.

Review of the revised AQIA showed that some of the EPA's concerns have been resolved, specifically regarding the enclosure of the screens and crushers from Stage 1, justification of the representativeness of meteorological data, and emissions from the concrete batching plant and associated processes.

However, there are several outstanding issues that have been inadequately addressed or justified. In its current form, the revised AQIA is insufficient in quantifying and delineating the impact of the project. The EPA still has outstanding concerns regarding:

- Inconsistent or inaccurate data in the emissions inventory;
- Model assumptions underestimating emissions;
- Comparison of CALMET data to observational data;
- Validation of CALMET model using the same data to drive TAPM;
- Practicality of measures in the Air Quality Management Plan; and
- Justification of removing exceedances of the background 24-hour average PM₁₀ data.

Based on the current assessment the EPA notes that the incremental air impacts are significant, and are above 15 µg/m³ at some receptors. Additionally, the maximum 24 hour average PM₁₀ concentration predicted at receptor R12 (49.6 µg/m³) only marginally complies with the EPA's impact assessment criterion of 50 µg/m³. Resolving the inconsistencies with the emissions inventory may increase predicted impacts.

As such, the EPA continues to decline to provide recommended conditions of consent until the air issues in the revised AQIA are satisfactorily addressed.

The EPA has provided detailed comments on the revised AQIA in Attachment A.

If you require any further information regarding this matter, please contact Jessie Hayne on 4908 6851 or by email to hunter.region@epa.nsw.gov.au.

Yours sincerely

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Attachment: EPA Comments on the Revised AQIA

ATTACHMENT A – EPA COMMENTS ON THE REVISED AIR QUALITY IMPACT ASSESSMENT

1. Meteorological Data

CALMET data extracted at the site was compared with monitored data at Patterson AWS located approximately 9 km northwest of the project. The differences between the two data sets were explained as due to the topological differences between the two sites. The quarry site is described as “in a ‘bowl’ with the mountains on the west, north and east”.

CALMET data should be validated at the same site as measured data. Further, since Patterson AWS data was assimilated into TAPM, it should not be used for validation purposes. CALMET data extracted at the location of another meteorological station within the 55 km x 55 km domain should have been used for validation against measured data at that station.

The EPA recommends the proponent validates the CALMET data at the site of another meteorological station within the CALMET domain.

2. Emission Estimation

Emissions from four scenarios were modelled including existing operations and Stage 1, Stage 2 and Stage 4 of the proposed expansion. The AQIA does not provide explanation for the three stages selected out of the proposed five stages of expansion discussed in the AQIA. It is unclear if the scenarios modelled captures the potential worst-case emissions over the life of the project (e.g. year with largest exposed area and/or longest haul road). It is also unclear whether peak daily emissions were modelled for each scenario.

The EPA recommends the proponent resolves the issues with the emissions inventory, including reviewing and providing calculations for emissions. Further, the scenarios assessed should be justified and include the worst-case emissions over the life of the project. Peak daily emissions are to be modelled for each scenario. The AQIA should be revised accordingly.

3. PM₁₀ Impacts

Background concentrations for cumulative analysis was obtained from the OEH Beresfield station. Concentrations above the 24-hour average PM₁₀ criterion of 50 µg/m³ in the background data were removed. There was no rationale provided for removing data from the background dataset. The contemporaneous method was used in assessing 24-hour average PM₁₀.

The dispersion modelling should include all days that had background exceedances. Results on these days should then be discussed within this context. Days where background exceeds the criterion should not be removed from the modelling set.

4. Cumulative concentrations at the plots of vacant land were not provided

In accordance with the Approved Methods, all receptors and likely future receptors should be included in the modelling. Cumulative impacts at the blocks of vacant land (which could be future receptors) were not provided.

The revised assessment should provide cumulative 24-hour average PM₁₀ and PM_{2.5} results at the blocks of vacant land.

5. Emissions inventory

The EPA has identified the following issues with the emissions inventory:

a) Haul truck movements

The production rate, length of haul road and total haul emissions at each stage of the project is shown below.

Stage	Current	Stage 1	Stage 2	Stage 4
Production Rate	0.7 Mtpa	1.5 Mtpa	1.5 Mtpa	1.5 Mtpa
Length of Haul Rd	4.7 km	3.3 km	4.9 km	2.6 km
Haul road TSP emissions	38.6 tpy	21.5 tpy	37.1 tpy	23.1 tpy

- i. Haul road emissions are unable to be replicated.
- ii. Haul Road emissions in g/s listed in Appendix B do not correlate to emissions in tonnes per year in Tables 8-3 to 8-5.
- iii. Table B-2 specifies Level 2 (75%) watering on haul roads. However, the emission estimate tables in Appendix B list a control factor of 50% for Current and Stage 1, and 86% control for Stages 2 and 4. Further, it is unclear what the 86% control factor is based on.
- iv. Dispersion modelling assumes watering occurs for all hours. However, the air quality management plan states that watering will only be undertaken on dry windy days. The modelling should be revised so that controls are only applied when watering is proposed to be undertaken.

The EPA recommends that haul truck road emissions are reviewed to address the above issues and detailed calculations (including haul truck movements and VKT calculations) be provided. The level of watering proposed to be applied should be confirmed. Watering should only be modelled during hours when it will be implemented. Modelling should be revised using the updated emissions inventory.

b) Wind erosion of pits

- i. Wind erosion pit emissions increase as the project progresses, as expected. This is because the exposed area to wind erosion increases with the stage of the project, as shown below.

Stage	Current	Stage 1	Stage 2	Stage 4
Erosion area	10.6 Ha	15.2 Ha	22.0 Ha	33.4 Ha
Wind erosion TSP emissions	26.8 tpy	34.0 tpy	48.2 tpy	72.0 tpy

- ii. Since wind erosion emissions vary linearly with exposed area, these results are inconsistent. For example, the area increases by a factor of 1.43 between current and Stage 1, however the emissions only increase by a factor of 1.27.
- iii. Further, the emissions have not been able to be replicated. For example, TSP emissions in the current stage are calculated using an emission factor of 0.4 kg/Ha/hr (as stated in Table B-3) to give 1.18 g/s (37.2 tonnes per year (tpy), assuming no controls from water spraying). Table B-6 and Table 8-3 lists emissions due to wind erosion as 0.698 g/s and 26.8 tpy respectively.
- iv. Table B-3 specifies the PM₁₀/TSP emission factor ratio is 0.5, which is consistent with NPI. However, the ratio of PM₁₀ to TSP emission rates in Table B6-B9 is 0.3. Hence PM₁₀ emission rates in Tables B6-B9 are likely underestimated. Conversely, the ratio of PM_{2.5} to TSP emission

rates in Table B6-B9 is 0.067 compared to 0.02 listed in Table B-3. Thus PM_{2.5} emission rates in Tables B6-B9 are likely overestimated.

- v. Table B-3 specifies that water is used to control emissions due to wind erosion from pits, however, Tables B-6 to B-9 specify no controls.

The EPA recommends pit wind erosion emissions should be reviewed and detailed calculations provided. Emissions should be reviewed to ensure there are no inconsistencies, and modelling should be revised accordingly. The proposed control for pit wind erosion should be explicitly stated and should be consistent with what is modelled.

c) Conveyors

- i. Emissions from conveyors have been unable to be replicated.

The EPA recommends that conveyor emission calculations should be reviewed, and detailed calculations provided.

d) Product trucks

- i. Emissions from product truck movements have been unable to be replicated.

The EPA recommends that product truck emission calculations should be reviewed, and detailed calculations provided.

e) Blasting and drilling

- i. Modelling of blasting and drilling assumes emissions are averaged over every hour of the year. However, blasting and drilling are discrete events and take place once/week and once/day respectively. The impact of emissions from blasting and drilling have therefore been underestimated.

The EPA recommends that the modelling is revised to model emissions from blasting and drilling as discrete events.

f) Mobile plant

- i. Table 8-2 lists mobile plant as including dump trucks, a mobile crusher and grader. However mobile plant emissions in current and Stage 1 appears to only account for emissions from the excavator and front-end loader. Further, it does not appear that emissions from the mobile crusher have been included at any stage of the project.

The EPA recommends that the emissions inventory is reviewed to include all sources of mobile plant emissions. Mobile plant emission calculations should be provided.