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Attention: Carl Dumpleton

**EPA Advice on Environmental Impact Statement
Marulan Quarry (SSD-65146459)**

Dear Mr Dumpleton

I am writing in response to your request for the Environment Protection Authority (EPA) to review the Environmental Impact Statement (EIS) for the proposed Marulan Quarry (Application <SSD-65146459>) at 16501 Hume Highway, Marulan NSW 2579.

The EPA has reviewed the following documents:

- Marulan Quarry Greenhouse Gas Assessment – GHD 6 November 2024
- Marulan Quarry Water Assessment Report – GHD – 6 November 2024
- Marulan Quarry EIS Air Quality Impact Assessment – GHD – 6 November 2024
- Marulan Quarry Noise and Vibration Impact Assessment – GHD – 8 November 2024
- Marulan Quarry Environmental Impact Statement – GHD – 12 November 2024

The EPA understands Global Quarries Australia Pty Ltd seeks planning approval to establish a quarry that would produce up to 500,000 tonnes per annum of hard rock.

Based on the information provided, if approved, the proposal will require an environment protection licence under the *Protection of the Environment Operations Act 1997* (POEO Act) for extractive activities (Clause 19) and crushing, grinding and separating (Clause 16) of Schedule 1 of the POEO Act.

The EPA has reviewed the documents referred to above and provides comments and recommendations in **Attachment A**.

If you have any questions about this matter, please contact Jiaqian Ling on (02) 6659 8231 or at info@epa.nsw.gov.au.

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Yours sincerely

A handwritten signature in black ink that reads "Janine Goodwin". The script is cursive and fluid, with the first name "Janine" being more prominent than the last name "Goodwin".

Janine Goodwin

Unit Head

Central West and Southern Coast & Tablelands

Attachment A – Detailed EPA comment on Environmental Impact Statement – Marulan Quarry SSD-65146459

Matters to be addressed prior to determination

1. Noise and Vibration Impact Assessment

The EPA is unable to confirm the presented project noise trigger levels and the construction noise management levels (i.e. assessment criteria) presented in the Noise and Vibration Impact Assessment (NVIA), and therefore is unable to assess potential noise impacts due to the concerns with the background noise data.

a. Background Noise Levels

The NVIA states that noise logging was conducted between Thursday 7 May 2024 to Thursday 26 May 2024 to provide monitoring data reflective and further from the Hume Highway (noise monitoring locations M1 and M2 respectively). The noise monitoring presented in Appendix B presents monitoring between Thursday 13 June 2019 and Friday 21 June 2019. The Applicant should confirm the correct monitoring dates. If monitoring was conducted in 2019, the Applicant should provide justification why such old data has been used.

The Noise Policy for Industry (NPfI - EPA, 2017) requires a minimum of 7 days data to determine the rating background noise level. The NPfI also stipulates that data affected by weather be excluded from the data set used to determine the RBL and the resulting data set satisfies the minimum 7-day requirement. The NPfI provides data exclusion rules for background noise in Facts Sheets A and B.

The background noise monitoring data presented in the NVIA in Appendix B identifies significant periods of weather affected data for the relevant daytime period. It appears unlikely that the remaining data will satisfy the minimum 7-day data requirement of the NPfI.

The EPA recommends that the Applicant be required to demonstrate that the weather affected data exclusion requirements of the NPfI have been followed and that the resulting data meets the minimum requirements of the NPfI. Additionally, the derived assessment background noise levels (ABL's) and rating background noise levels (RBLs) should be presented for all monitoring locations as required by the NPfI and confirm the method used to derive them.

Without this data the EPA is unable to confirm the presented noise trigger levels and the construction noise management levels (i.e. assessment criteria) presented in the NVIA.

b. Operational Noise Modelling and Assessment

As the project noise trigger levels cannot be confirmed, the potential noise impacts cannot be assessed by the EPA.

However, the EPA advises that the operational sound power levels and scenarios modelled appear reasonable.

Figure 1.2 and Section 5.2.1.5 presents approximate locations of plant and quarrying landform scenarios, respectively. The Applicant should provide maps showing all point, line and area source locations used for each scenario modelled.

It is noted that the NVIA uses a usage factor for the sound power levels (Section 2.2.2). The Applicant should be aware that compliance with noise limits in Licences and consents, if the project were to be approved, would be based on a LAeq 15minute period.

As such the EPA advises it might be prudent to model a reasonably worst-case scenario in a 15minute period.

c. Construction Noise Modelling and Assessment

The EPA has conducted a construction noise assessment and advise it is commensurate for a state significant development NVIA.

As the construction noise management levels cannot be confirm, currently, the potential noise impacts cannot be assessed by the EPA.

2. Air Quality Impact Assessment

a. Site operational production rates and assumptions unclear for assessment of worst case scenario

The Air Quality Impact Assessment (AQIA) seeks approval for the extraction of up to 500,000 tonnes of hard rock per year, with a maximum of 2,000 tonnes per day (tpd) to represent worst case operations. the AQIA the adopts 2,500 tpd in the inventory and subsequent modelling to represent the worst-case day.

The number of truck movements (return trips) has been identified as 50 per day and is based on 40 tonne truck and dog movements based on the 2,000 tpd extraction rate (2,000 tpd / 40 tonnes = 50 movements). The AQIA has also identified that there would be an average 34 tonne load for the trucks, which would equate to 59 trucks per day at the 2,000 tpd extraction rate or 74 tpd extraction rate.

It is unclear to the EPA the production and the number of trucks in which approval is being sought. This inconsistency is also reflected in the EIS.

The EPA recommends the proponent clarifies the truck capacity and movement numbers. Any updated numbers should be included in the air emissions inventory and dispersion modelling.

b. Emission inventory assumptions require clarification.

The AQIA references the *National Pollutant Inventory Emission Estimation Technique Manual for Mining Version 3.1* (NPI, 2012) and *National Pollutant Inventory Emission Estimation Technique Manual for Mining and Processing of Non-Metallic Minerals Version 2.1* (NPI, 2014) for the fugitive dust emission equations. The EPA has reviewed the air emission inventory information presented in the AQIA. The EPA requires clarification/justification of the following:

- i. The AQIA states that the emission factors have been taken from NPI (2012) Table 2. The EPA has reviewed the emission factor equations used in the AQIA and note that that the loading equation was for "Excavators/Shovels/Front-end loaders (on coal)" rather than for overburden. No justification for using the coal loading equation has been included in the AQIA.
- ii. For hauling on unpaved roads the AQIA has opted for the default emission factors from NPI (2012) Table 2. The EPA agrees with this approach as there is no site specific information available and provides a conservative estimate. However, the EPA is

concerned that the mass emission rates have not accounted for the return trip of the haul trucks in the mass emissions provided in the AQIA. For example, for the entry road there are 50 trucks, frequency of 2 per day over 11 hours, distance of 0.745km, and 75% control which equates to a mass emission of 1.989g/s, double that provided in the AQIA.

- iii. There is no discussion of the use of a conveyor in the AQIA. The EPA notes that a conveyor is referenced in both the noise assessment and the Environmental Impact Assessment (EIS). The EPA notes that the 'Truck load: conveyor crush stone' emission factor from Table 17 of the NPI (2014) has been used. The EPA is concerned that there may be additional transfers that have not been accounted for in the emissions.
- iv. The EPA notes that no site specific silt content, moisture content and percentage of silica of the materials and haul roads have been measured at the proposed site. The EPA appreciates that this is not yet feasible as the site is greenfield. The EPA sees this as a limitation of the air emissions inventory and would benefit from site specific information to reduce uncertainty in the emissions.
- v. The air emissions inventory has not acknowledged exhaust emissions from equipment on site. The EPA considers that impacts would likely be low, however these emissions should be addressed.
- vi. Blasting emissions are limited to particulate matter. Oxides of nitrogen (NO_x) are also a key pollutant released to the atmosphere during blasting events.

The EPA recommends the proponent reviews the air emissions inventory to clarify:

- i. Loading equations;
- ii. Haul road assumptions;
- iii. Conveyor use;
- iv. Exhaust emissions; and
- v. NO_x emissions from blasting.

If required, the dispersion model and results are to be updated accordingly.

c. Meteorology is not representative of calm winds characteristic of the site

The AQIA has stated that site-representative meteorological data was used in the assessment. The AQIA included a review data from the Bureau of Meteorology's (BoM) automatic weather station (AWS) at Goulburn Airport (17km away). This dataset was assimilated into "The Air Pollution Model" (TAPM) for the assessment year 2023. No information on the radius of influence and number of levels to assimilate was included in the AQIA.

At Goulburn Airport AWS the annual percentage of calms was 11.8% for the 2019-2023 period with an annual average windspeed of 4.1 m/s. The percentage of calms increased to 17% for the months of autumn for the corresponding period.

The CALMET verification in Appendix B of the AQIA compares the annual wind roses from the Goulburn Airport observations with those extracted from CALMET at the same location for the model period (2023). The observational data has a percentage of calms being 10.5%, while the simulated dataset is only 1.6% of the time. The percentage of calms is further reduced for the CALMET extract from the site indicating only 0.8% of the year calm wind speeds are predicted.

The EPA is concerned that the percentage of calms has been underestimated in the meteorological modelling and is therefore not site representative. Underestimating calms can result in an underestimation of fugitive dust impacts as dispersion is limited.

The EPA recommends the proponent completes a meteorological analysis of the prevalence of calm wind conditions that include the frequency and magnitude of fugitive dust emissions from the site. The EPA recommends that the proponent demonstrate that the meteorological data is site representative or update the meteorological model to improve performance.

d. Configuration of CALMET

The AQIA has adopted a meteorological modelling approach consistent with the No-Obs mode as described in *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (EPA, 2011). In accordance with the Calpuff Guidance 'If good quality gridded prognostic meteorological data are available, CALMET No-Obs mode is recommended as the preferred method for regulatory screening modelling'. The TAPM source code is not available to allow the user to understand the conflicts in wind speed and direction that can occur between observations and the numerical simulations. Therefore, the data assimilation within TAPM cannot be evaluated for divergence issues. The EPA recognises that No-Obs is a simpler approach requiring less potential for human error in generating the surface, upper air and seven critical parameter settings.

In No-Obs mode no surface station or upper measurements are input into CALMET, rather surface data (from Goulburn Airport AWS only) have been assimilated into TAPM to generate the three-dimensional wind field. This approach relies on only the terrain radius of influence (TERRAD) as input to CALMET.

The AQIA states that terrain radius of influence was set to 2km with no information to demonstrate that the value is appropriate. EPA (2011) recommends this setting between 5-15km. The AQIA has not demonstrated or justified the use of TERRAD below the recommended range.

The EPA understands that there may be other weather stations in the area that could be used in the dataset. The EPA considers that incorporating these data into the meteorological modelling may be of benefit.

The EPA recommends the proponent review the meteorological model settings and inputs and update the meteorological modelling to ensure calms are more effectively captured by CALMET at the site. This may include as a minimum, but not limited to, including the Goulburn Airport AWS data and running CALMET in the refined Hybrid mode. The proponent must validate the modelled calm winds against meteorological data in the Marulan area. Wind field graphics should be included to demonstrate slope flows are effectively simulated by the model.

e. CALPUFF settings

The AQIA states that the dispersion coefficients (MDISP) have been computed based on PG dispersion coefficients (MDISP = 3), inconsistent with the preferred method described in *Generic Guidance and Optimum Model Settings for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (EPA, 2011). No justification for deviation from the Calpuff Guidance is provided in the AQIA. The EPA notes that the Calpuff Guidance states "but best science practice and model evaluation studies indicate MDISP=2 performs better".

The EPA recommends the proponent justify the CALPUFF settings.

f. Cumulative assessment of other sources in the local air shed

The AQIA has identified Lynwood Quarry and Marulan Solar Farm as potential emission sources within a 10km radius of the proposed site. These sources have not been included in the modelling. The EPA agrees that Marulan Solar Farm solar farm would have limited cumulative air impacts. However, Lynwood Quarry is still operating and recommend that information from the Planning Portal is a more reliable source than the NPI Emissions Inventory for 2022/2023. The EPA notes that Lynwood Quarry is located 5 km northeast of the proposed Marulan Quarry and would have potential to result in cumulative emissions. The EPA also identifies Marulan South Limestone Mine and Boral Quarries, both located 10km east.

The adopted background data used in the cumulative data from DCCEE's monitoring station at Goulburn. The Goulburn data is 16 km from the proposed site and is well removed from capturing nearby cumulative dust sources.

The EPA recommends the proponent reviews nearby sources of dust emissions that have the potential to result in cumulative impacts and include these sources in the cumulative assessment.

g. Source location and parameter information not included

The AQIA has not included source coordinates or maps identifying the location of the emission sources used in the dispersion modelling. No information has been provided on the source characteristics.

The EPA recommends the proponent must update the assessment to include coordinates of all sources and sources characteristics included in all modelling scenarios.

h. Water availability

The AQIA indicates that the proponent will commit to use water to control dust emissions from activities undertaken at the premises. The AQIA states "water will be sourced from the water storage dam or sediment basins". There is, however, no information to clearly demonstrate that adequate evaluation of water availability has been undertaken or describes the risk (i.e. high or low) of having insufficient water availability in the context of the proposed life of the quarry.

Failing to achieve in practice the assumed levels of control will increase the risk of adverse air quality impacts due to the proposed operations, and therefore, it is pertinent that the proponent ensures the diligent and ongoing implementation of the proposed controls and mitigation measures as assumed in the AQIA. That is, the proponent needs to commit to achieving the proposed level of control regardless of the availability of water.

The EPA recommends the proponent confirms the design of the project has adequately accounted for the water demand associated with the implementation of the mitigation measures as assumed in the AQIA.

i. Dust management and best practice measures

It is important for the proponent to understand that if approved, it will be the proponent's responsibility to comply with Section 128 of the Protection of the Environment Operations (POEO) Act. This Section requires that any activities at a Licensed premise must be

undertaken by such practicable means as may be necessary to prevent or minimise air pollution.

It is noted that the meteorological data used in the modelling is not site specific. Whilst it is acknowledged that the adopted approach (i.e. use of prognostic data) is in line with the requirements under the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW, this adds uncertainty to the results. Further, it should be highlighted that there is considerable uncertainty inherent in using dispersion models to determine impacts. Thus, compliance with the assessment criteria is just one tool that provides an indication of the potential impacts due to the proposal.

The EPA notes that the incorrect units for haul road watering is referenced in the mitigation and management section of the AQIA. The AQIA should be updated to be >2 litres/m²/hour to achieve 75% control on unpaved haul roads.

The EPA recommends the proponent provides additional information to robustly and transparently demonstrate that they have evaluated and committed to the implementation of all reasonable and feasible mitigation measures to prevent and minimise air pollution from the proposal. This is to include alternatives for dust suppression should there be water availability issues and a trigger action response plan to minimise emissions and manage potential offsite impacts.

j. Monitoring recommendations

The AQIA includes a range of dust monitoring measures that have been included in the assessment. The EPA considers that deploying four dust deposition gauges would be of limited benefit and that real-time monitoring coupled with a trigger action response plan (TARP) and linked to a management system is a more effective tool for managing dust. The EPA supports that a site-specific weather station is to be installed.

The EPA recommends the proponent includes real-time monitoring coupled with a trigger action response plan (TARP) and linked to a management system, to manage potential offsite dust impacts. Consideration of the EPA's "Ambient air monitoring guidance note" may support the development of an ambient air monitoring program, should approval be granted.

k. Assessment of respirable crystalline silica

The AQIA has not assessed the potential air quality impacts of respirable crystalline silica (RCS). As part of the wider EIS a risk assessment of RCS emissions was undertaken as part of a separate quantitative human health risk assessment (HHRA) (GHD, 2022). The AQIA makes reference to the results of the HHRA where the outcomes 'indicate that the silica content of the dust emissions from the project represent a low risk to the health of the community living in the area surrounding the project site'. On that basis, RCS emissions were not assessed in the AQIA. The EPA considers it is appropriate for the AQIA to include an assessment of the RCS emissions that would be introduced into the local air shed.

The EPA recommends the proponent updates the AQIA to include an assessment of RCS.

Matters to be addressed with conditions.

1. Water Quality

If the application is approved, the EPA recommends the following matters are considered by DPHI in the conditions of approval.

- a. **The EPA recommends** the inclusion of the following condition of consent: “Except as may be expressly provided in an Environment Protection Licence for the premises, the licensee must comply with section 120 of the *Protection of the Environment Operations Act 1997*.”
- b. **The EPA recommends** inclusion of a condition requiring a Soil and Water Management Plan and Trigger Action Response Plan be prepared and implemented. The plan should describe the measures that will be used to minimise soil erosion and the discharge of sediment and other pollutants to lands and waters for the life of the project, and be prepared in accordance with the guidance in *Managing Urban Stormwater: Soils and Construction*, particularly Volume 2E: Mines and quarries (available at <http://www.environment.nsw.gov.au/stormwater/publications.htm>).

2. Importation of material

- a. The EPA recommends the inclusion of a condition of consent advising that the importation of material must comply with the *Protection of the Environment Operations Act 1997*, the *Protection of the Environment Operations (Waste) Regulation 2014*, and relevant orders or exemptions under the regulation.

Other matters

Water Quality

- a. **The EPA recommends** that the location, type and frequency of the water quality monitoring program be developed in consultation with the EPA.

The EIS notes that the EIS states that following a rainfall event, sediment basins would be dewatered to restore the design storm capacity, with a concentration of suspended solids below 50mg/L for controlled discharges. The EPA advises discharge criteria of 50 mg/L total suspended solids criteria from *Managing Urban Stormwater – Soils and Construction, Volume 1* (Landcom, 2004) is dated and no longer consistent with best practice.

The EPA recommends should approval be granted that a discharge impact assessment be prepared (in consultation with the EPA) to develop discharge criteria for dewatering activities. The assessment should be undertaken with consideration of EPA guidelines <https://www.epa.nsw.gov.au/your-environment/water/managing-water-pollution-in-nsw/environment-protection-licensing/water-pollution-discharge-assessments>) and should be:

- i. commensurate with the potential risk
 - ii. consistent with the Australian and New Zealand guidelines for fresh and marine water quality (ANZG, 2018), including ANZECC (2000) guidelines for turbidity (ANZG (2018) refers to ANZECC (2000) for default guideline values for physical and chemicals stressors such as turbidity).
 - iii. consistent with section 45 of the *Protection of the Environment Operations Act 1997*.
- b. Sediment Basin capacity**
- The planning application assessments water balance places reliance on access to reliable groundwater reserves. The EPA encourages the applicant to fully consider the premises

sediment basin capacity to accommodate impacts on accessibility of groundwater and ensure sediment basin capacity facilitates reuse to limit discharges to waters and ensure compliance with section 120 of the *Protection of the Environment Operations Act 1997*.

c. NTU-TSS correlation

If the application is approved, the applicant may be required to demonstrate to the EPA that the statistical correlation between TSS and NTU is robust for the purposes of demonstrating compliance with the relevant condition. This includes demonstrating the relationship is robust of the range of values that may be typical of sediment related discharges, e.g. 10 - 100 mg/L TSS.

The NTU-TSS correlation method that EPA generally refers licensees to is attached and at this link: <https://clu-in.org/download/contaminantfocus/sediments/Turbidity.pdf>. It is not a required method but provides guidance on how to derive the relationship.

One option, if there is limited initial data for a robust correlation, may be to apply a safety factor on the proposed NTU limit until an adequate site-specific relationship is developed.

d. Sediment Settling Agents

Where a chemical has potential to have non-trivial impacts on the environment, it is the responsibility of the person using that chemical to ensure that the potential impacts are fully identified, managed and mitigated. The EPA advises that careful consideration must be given to any sediment settling agents.

The EPA recommends that the proponent consult with the EPA to ensure any proposed chemical agents potential toxicity is fully assessed, so that appropriate discharge requirements and management measures can be put in place or alternative approaches developed.

Greenhouse Gas Emissions

The estimated emissions provided in the greenhouse gas assessment show the proposal will generate less than 25,000 tonnes per annum of scope 1 and scope 2 greenhouse gas (GHG) emissions. Therefore, the modification does not trigger additional requirements in the Draft NSW EPA Guide for Large Emitters (large emitters guide).

For future applications or modifications for which GHG emissions are predicted to be above the 25,000 tpa CO₂-e threshold, the applicant should ensure consistency with the assessment principles in the most recently available large emitters guideline. If the applicant considers that certain requirements of the large emitters' guideline are not applicable, this can be specified but must be justified with supporting evidence.