Department of Planning and Environment

OUT22/44

James McDonough
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NSW Department of Planning and Environment

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Dear Mr McDonough

Dalswinton Sand and Gravel Quarry (SSD-9094) – EIS

I refer to your email of 22 December 2021 to the Department of Planning and Environment (DPE) Water and the Natural Resources Access Regulator (NRAR) about the above matter.

Rosebrook Sand and Gravel Pty Ltd (RSG) proposes to expand their existing sand and gravel quarry operation at Dalswinton Quarry (DQ). The proposed development will occur across 89 hectares of the site including expansion towards the east in an area of approximately 39 ha as well as reworking of the previously extracted areas to recover the discarded fines and larger aggregates in the currently approved foot print. The operation will have a maximum production capacity of 500,000 tonnes per annum over an expected 25 years of operational period. The proposed quarry expansion will involve up to 5 hectares of excavation area at any given time.

The proponent will need to provide further details for water take and determine if any water licences are required. Additionally, there are a number of recommendations regarding groundwater and surface water impact assessment and management. Details are provided in Attachment A.

Any further referrals to DPE Water and NRAR can be sent by email to water.assessments@dpie.nsw.gov.au. or to the following coordinating officer within DPE Water:

Simon Francis – Senior Project Officer
E: simon.francis@dpie.nsw.gov.au
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Yours sincerely

Liz Rogers
Manager Assessments
Department of Planning and Environment: Water
3 March 2022

Attachment A

Detailed advice to DPE Planning & Assessment regarding the Dalswinton Sand and Gravel Quarry (SSD-9094) – EIS

1. Water Take and Licensing

Recommendations – Prior to Determination

1.1 The proponent should provide clarification of the maximum groundwater and surface water take, site water demands and the ability to obtain additional water entitlement where required for the project.

Recommendations – Post Approval

1.2 The proponent should ensure that:

a. sufficient water entitlement is held in a Water Access Licence/s (WAL) to account for the maximum predicted take for each water source prior to take occurring during the project operational period and post closure unless an exemption under the Water Management (General) Regulation 2018 applies.

b. relevant nomination of work dealing applications for WALs proposed to account for water take by the project have been completed prior to the water take occurring.

Explanation

- Uncertainty exists as to the predicted groundwater take for the project. The water balance in the surface water assessment notes there will be 131.4ML of pit seepage, but the groundwater assessment notes there will be 14.6ML. Groundwater take in the pit needs to be based on maximum groundwater inflow predictions and the proponent needs to demonstrate the ability to acquire sufficient entitlement to account for the water take.
- Additional water entitlement has been identified as being required in the Hunter Regulated River Alluvial Water Source to account for an average entitlement exceedance of 1.3ML. It is expected the maximum exceedance would be significantly higher and may vary based on the previous point. Clarification is requested on all water take and site water demands. It should also be noted that entitlements must be held for maximum predicted water take before take occurs. The EIS provides average take from groundwater over the 25 year period rather than the maximum annual take that is required.
- The groundwater impact assessment refers to water supply work approval 20WA201001 which does not have a linked Water Access Licence. NRAR advises relevant water dealing applications need to be completed prior to any water take.
- Clarification is also requested as to whether any water take is to occur from the 3rd order watercourse which runs along the northern part of the site. The maximum annual water take from a third order or higher watercourse would need to be quantified and the ability to obtain sufficient entitlement demonstrated.

2. Groundwater Impact Assessment and Management

Recommendations – Prior to Determination

2.1 The proponent should:

a. Review the conceptualisation and how the conceptualisation is transferred to the numerical model to ensure aquifer interference activities and their impacts are represented in the groundwater model and have the ability to predict potential impacts on the river and aquifer (and other groundwater values) during and post closure of the quarry operation.

b. Assess the proposal against the Aquifer Interference Policy (AIP) requirements and include the summarised responses using the Aquifer Interference Assessment

Framework Tool. (https://www.industry.nsw.gov.au/__data/assets/pdf_file/0007/171097/Aquifer-Interference-Assessment-Framework.pdf).

c. Review groundwater inputs to include the volume of groundwater take that includes: evaporative groundwater loss from the voids; incidental take with quarried aggregates; and dewatering and take for processing demands.

   This would also include the need to clarify whether post closure void (landform) intercepts aquifers, and if so, estimate the ongoing groundwater take post closure.

d. Base the groundwater model on a complex modelling platform that is consistent with the Australian Modelling Guidelines; independently reviewed; and determined to be robust and reliable, and deemed fit for purpose.

Explanation

Groundwater model

The model comes with some limitations which result in low confidence in the model prediction. Uncertainty prevails on the model prediction due to underestimated groundwater take, inability to account river and aquifer seepage into the quarry pit, and low confidence on model predictions. For example, the (steady state) model uses constant head boundaries on both ends of the river, this doesn't allow for estimation of impact on the river considering the extraction is proposed to the depth of bedrock and below the river bed elevation adjacent to the Hunter River. Furthermore, evaporation from the pit as a result of river and aquifer seepage, and groundwater take with aggregates are not considered as model input.

The steady state groundwater model is only self-assessed as reliable and fit for the purpose, although AIP requires the groundwater inflow estimate and the predicted impacts associated with the aquifer interference activity to be based on complex modelling platform that is independently reviewed and determined to be robust and reliable and deemed fit for the purpose. A third party peer review and relevant work would support a higher level of confidence on prediction as well as satisfy the requirements of the AIP.

There is no baseline temporal groundwater data collected or used in the model calibration. Hence, it appears that 2 years of baseline data is not available for this model calibration. The model is calibrated to only one off water levels reported at the time of drilling in the bores, hence the model prediction level is expected to be low. Model confidence level is not reported in the EIS.

Evaporative groundwater loss is predicted using 25 pit cells in the model to represent each year of operation. The assumption is that each pit will be rehabilitated immediately after completion of extraction of aggregates. However, in reality the majority of rehabilitation of the voids takes place at the end of 25 year operational period. As such, the pit voids will drain groundwater and the evaporative losses increase over the time. Therefore, the model predicted evaporative groundwater loss is an underestimation.

The model failed to include stress components such as groundwater take from the pits for processing/dewatering, groundwater take with quarried aggregates and maximum evaporative losses from the pit until rehabilitation.

Assessment of impact

The impact of the proposal on groundwater and its receptors is reported to be minor and within the limits of level 1 minimum impact considerations of the AIP. However, this is based on the predictions of a steady state groundwater model that has many shortcomings as described above.

The proposal is an aquifer interference activity that requires an assessment against the AIP minimum impact considerations. Although many requirements of the AIP could be found in the EIS and Appendix U (Groundwater Impact Assessment), the absence of a summarised response to AIP requirements using the AIP Assessment Framework tool hinders the comprehensive adequacy assessment of the proposal against the AIP requirements.

Post closure, the final void would be shaped to a dam and over flow water will be discharged into the Hunter River. However, inadequate information is available in the EIS to determine whether the final void would intercept aquifers. If the final void intercepts aquifers, post closure groundwater take must be estimated and appropriately licenced.

Recommendations – Post Approval

2.2 The proponent should:

a. Develop a monitoring plan to measure the groundwater inflow into the quarry to confirm take predictions, and the adequacy of mitigating measures and compliance for water take.

b. Review annually the measured groundwater inflow into the quarry pits after quarry operation deepens into aquifers. This will ensure sufficient entitlement is held in the WAL prior to take.

c. Develop a water management plan that follows the Guidelines for Groundwater Documentation for NSW Major Projects (soon to be published on the DPE Water website).

   This should include the construction & placement of new monitoring bores, frequency of monitoring, water quality analyte suites and trigger action response plan. Performance against this plan should be reported annually.

Explanation

The proposed water management suggests placement of new monitoring bores upstream and downstream of the operation, but it lacks details. The proponent must ensure that the new sites are strategically selected, and monitoring bores are appropriately installed to monitor the potential groundwater impact of the proposal.

DPE Water notes that a trigger action response plan is yet to be developed for the project. It also notes that the EIS proposes to maintain environmental performance records in a logbook but reporting should be through formal reporting mechanisms such as Annual Environmental Management Reports.

3. Surface Water Impact Assessment and Management

Recommendations – Prior to Determination

3.1 The proponent should:

a. Detail whether or not there is a risk of erosion to the existing or final form of the quarry and if this will impact any watercourses, riparian land or water quality.

b. Detail whether or not a failure of the levee/bund would lead to an increased risk of erosion or diversion of flow from the current watercourse and any associated impacts to watercourses, riparian land or water quality.

c. Clarify the flow path of watercourses on site and clarify whether the proposed work area is to cause any impacts to the third order watercourse (that runs along the northern part of the site) and how these would be mitigated.

d. Show consideration to the NRAR Guidelines for Controlled Activities including setbacks.

Explanation

The EIS (6.15 p.71) and Flood Impact Assessment (Appendix M – 1.3, p.2-3) note that its objectives (appropriately) include;

- *Risk of erosion in the quarry due to flooding.*
- *Risk of the river diverting its current course should the quarry be subject to flooding and erosion.*

The flood impact assessment presents no assessment of the risk of erosion to the existing or final form, particularly the unvegetated and more erosive active working areas and if this will impact any watercourses, riparian land or water quality.

Details on the erosion associated to the likely levee/bund failure are not discussed other than to note that if a failure is unacceptable then it should be armoured, or the levee's height increased. The assessment should identify whether or not the erosion and conveyance of the sediment of the levee/bunt will have any adverse impacts on watercourses, riparian land or water quality. The assessment should also detail whether or not such an event would lead to an increased risk of erosion in the operational area, or diversion of flow from the current watercourse and any associated impacts to watercourses, riparian land or water quality.

There are two mapped watercourses on site, a 2nd order in the north eastern corner and a 3rd order running the northern part of the site, but the exact flow path of these is unclear. The flow path of the 3rd order watercourse is particularly unclear within the site, and potentially will run through a works zone.

Consideration of the NRAR Guidelines for Controlled Activities is requested (including setbacks), available at: https://www.dpie.nsw.gov.au/nrar/how-to-apply/controlled-activities/guidelines-for-controlled-activities.

End Attachment A