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20 November 2025

Our Ref: HW2020/1025

Resource Assessments Team
Department of Planning & Environment
Locked Bag 5022
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Attention: Allison Sharp
via Major Projects Planning Portal

Dear Ms Sharp

HOLCIM SALT ASH SAND OPERATIONS – SSD-9099356 – Submissions Report

Thank you for the opportunity to comment on the Submissions Report prepared in response to submissions received in relation to the Environmental Impact Statement (EIS) for the above state significant development project application to expand sand extraction and processing operations at Holcim's Salt Ash sand quarry.

Hunter Water Corporation's (Hunter Water's) primary interest in the proposal is ensuring the protection of water reserves and water quality in the North Stockton Catchment Area, a gazetted special area under the Hunter Water Act 1991. The project area is located in the northern part of the Stockton Groundwater Source to the immediate north and west of the North Stockton Catchment Area.

The Submissions Report and relevant accompanying revised technical studies prepared in support of the application have been reviewed and the following comments are provided.

Hydrology

While more a regulatory issue for the DCCEE Water division, Hunter Water maintains a keen interest in the management of the North Stockton aquifer given the land immediately adjacent to the proposed development is a gazetted special area under the Hunter Water Act 1991. The special area reservation provides for the operation of an emergency borefield by Hunter Water to supply potable water to the Lower Hunter population in times of extreme drought, should it be required. This is acknowledged in the proposal and included in the assessment of impacts, including in the revised groundwater impact assessment provided in Appendix K of the Submissions Report.

Hunter Water acknowledges that the hydrological assessment indicates that, while there would be a drawdown impact in the vicinity of the site as a result of the proposed activities, the impact on the potential emergency borefield operation would be low. The impacts associated with operating the emergency borefield are also acknowledged, based on the conceptualised modelling results.

Hunter Water defers to the DCCEE Water division regarding comments on other aspects related to the magnitude of impacts on the hydrology of the Stockton aquifer and related regulatory matters.

Groundwater Water Quality

The proposal is considered to pose a long-term risk to the quality of groundwater in the North Stockton aquifer, or at least introduces a high level of uncertainty around these risks, albeit downgradient of the potential Hunter Water emergency borefield location. This is due to acid generation and other chemical processes resulting from the oxidation of naturally occurring minerals in the soil deposits as a consequence of the extraction methods to be employed. The main result of these mechanisms is the release and mobilisation of metals and an increase in salinity in the groundwater system.

The proponent proposes to manage these impacts while they are operating at the site, including the neutralisation of acid generation, separation of Acid Sulphate Soil (ASS) fines from quarry products and backfilling the concentrated fines in the proposed dredge pond. However, given the characteristics of the materials, the practicalities associated with effective industrial scale management and the related chemical processes involved, the impacts may continue in-situ long after the proposed extractive operations are completed and may both exacerbate groundwater pollution (through the deposition and/or liberation and mobilisation of other metals) and extend beyond the site in migrating groundwater.

The proposed groundwater management is reliant on monitoring and reactive management if required, however, the risk extends well beyond the term of the proposed management. The risk of ongoing impact is identified in the preliminary risk assessment provided in section 11 of Appendix B of the Submissions Report, which states *“Based on the analysis, concentrations of the identified CoPC in groundwater are likely to increase if oxidation of acid sulfate soils occurs within the extraction void, or in soils adjacent to the extraction void through the disturbance caused by the dredge processes or increased oxygen mixing within the extraction pond. The effect may be reduced with suitable acid sulfate soils management but may also require additional management measures if some degree of acid generation and metals mobilisation occurs even with the application of ASS management.”*

The conceptual site model provided in section 12 of Appendix B also states *“geochemical processes can occur with or without the presence of ASS, however the effects can be exacerbated in the presence of ASS. In the context of a dredge pond, there are operational activities with the potential to enhance these release mechanisms resulting in generation of acid and salinity (through mobilisation of trace elements from solid to dissolved phase).”*

Additionally, the revised groundwater management options report provided in Appendix C of the Submissions Report states *“Management measures to address in-pond water quality, and for management of groundwater quality downgradient from the dredge pond, are contingencies in the event that some degree of ASS oxidation occurs either during internment of the fines waste stream in the dredge pond or as a result of oxidation processes in the formation immediately surrounding the dredge pond. Whilst these are considered contingency options, given the scale of the proposed dredging operations and the volume of ASS that will be disturbed, it is not unreasonable to assume that one or more contingencies will need to be implemented during the course of the operations. The evaluated management measures all have benefits and limitations, and the optimal environmental outcome will likely require a combination of management measures to limit the potential for off-site migration of impacted groundwater and prevent unacceptable impacts to downgradient receptors,”* If that is the case it is also highly likely to extend beyond the term of the extractive operations and management by the proponent.

Based on the above statements and despite the proposed management, it seems likely that the chemical processes associated with deposits of concentrated ASS fines and other soil-water chemistry aspects can be expected to result in further impacts, or as a consequence of future activities at the site based on the proposed long-term land use. The timeframes for water quality monitoring and remedial action by the proponent are

likely to be inadequate in the event of additional or sustained impacts being realised and significant uncertainties remain around the complexities and effectiveness of such remedial action in any case.

Leachability tests and analysis results from sediment sampling in existing process water ponds indicate a high risk of metal mobilisation from the proposed activities. Such impacts have been experienced at other locations in the region as a result of similar activities, where it has been demonstrated that unforeseen impacts can extend for decades and are untreatable, so a precautionary approach should be adopted.

The proposal is therefore considered to present a high risk of an unacceptable impact to the environment and surrounding users that contravenes the objectives of both planning and environmental protection legislation and cannot be supported by Hunter Water on that basis. Hunter Water recommends that the safest approach to manage the risk of groundwater pollution in the aquifer from quarrying activities is to limit the extraction depth to above the maximum predicted groundwater level, as is the case for other approved sand extraction operations in the area.

Site Rehabilitation and Future Land Use

Hunter Water acknowledges that the earlier proposal to backfill the proposed final dredge pond with imported materials has essentially been abandoned following further investigation of its feasibility, and the extent of extraction has been reduced to some extent to lower the risk of impacts to adjoining land. The changes are welcomed by Hunter Water given the risk of contamination associated with backfilling (irrespective of certification) and other risks presented by the original approach, although it is noted that section 5 of the revised site rehabilitation strategy still identifies backfilling the pond as an option to mitigate water losses.

In addition to expected impacts on the water source from evaporative losses and associated aquifer drainage, and the identified water quality impacts and risks, the plan to leave an open water pond comprising 30 hectares of the total project area of 35.4 hectares will result in a significant change in the land condition and capability and will effectively sterilise potential future uses of the land. It is also expected to contribute to the risk of ongoing water quality impacts.

The project's supporting documentation states *the final land use value of the pond would be for ecotourism attraction or environmental conservation purposes, or a combination of the two*. The acceptability and demand for such future use in the location and under the circumstances is untested and hypothetical. This is especially the case given the site's proximity to attractive natural waterways in the local area (in the former case) and both the unnatural origin of the pond and its configuration (in the latter case).

While the creation of an open pond would clearly maximise the extraction of sand resources from the site, Hunter Water maintains that the proposed approach is an unacceptable outcome from a land use sustainability perspective and in relation to the future risks to water quality in the Stockton aquifer. Hunter Water has embraced the United Nations Sustainable Development Goals in its corporate strategy and it is considered that the proposal does not reflect these goals so should not be supported on that basis.

Instead, Hunter Water supports the approach adopted for other sand quarries in the region, being extraction that requires the final landform at the site to be one metre above the maximum predicted groundwater level. This approach allows for subsequent land uses that are compatible with the surrounding area, eliminates the impact of ongoing water loss and aquifer drainage, and minimises the long-term risks related to contamination of the water source.

Should the project be approved, a revised rehabilitation plan should be prepared for approval prior to commencement (as proposed in the quarry rehabilitation strategy).

Some of the identified rehabilitation methods and outcomes presented to date are considered to warrant review, including important aspects such as the depth of topsoil stripping, the management of vegetation cleared from the site to be use for erosion control, revegetation details and site rehabilitation success criteria and risk mitigation.

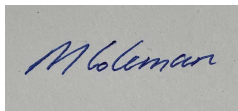
Summary

Hunter Water acknowledges that substantial additional investigations and studies have been undertaken by the proponent to better understand the characteristics of the site, assess anticipated impacts from the proposed development and to assist in designing suitable management plans to mitigate these impacts.

Overall, the additional work has reinforced the likelihood of the anticipated impacts and the complex nature of the management issues associated with the proposed activities. Impacts associated with the oxidation of acid sulphate soils and other soil constituents are generally well understood and the additional work has demonstrated that there would be a high reliance on management controls to mitigate the impacts, a high level of uncertainty around the effectiveness of some aspects of the proposed management controls and a high level of uncertainty around the extent and duration of the impacts, should the proposal be approved. It is likely that the impacts associated with the proposed development would extend well beyond the term of the quarry's operations and proposed management by the proponent and may possibly also extend beyond the site.

Based on this assessment it is recommended that a precautionary approach should be adopted and sand extraction at the proposed development should be limited to above the maximum predicted groundwater level, similar to other approved quarry operations in the region.

Yours sincerely,

A rectangular box containing a handwritten signature in blue ink. The signature appears to read 'M Coleman'.

Mark Coleman
A/Manager Water Planning