

8 October 2021

Hanson Construction Materials Pty Ltd
10 The Boulevard
Brisbane Airport QLD 4008

Attention: Murray Graham – Development Manager

Dear Murray,

Re: Response to Hanson Tweed Sand Plant Expansion (SSD-10398) Environmental Impact Study submissions

Hanson Construction Materials Pty Ltd (Hanson) commissioned Gilbert & Sutherland (G&S) to consider and respond to matters within our areas of expertise arising from public submissions it received following exhibition of its Environmental Impact Study (EIS) for the Hanson Tweed Sand Plant (TSP) Expansion (SSD-10398). Submissions requiring a response from G&S were received from:

- Gales Kingscliff Pty Ltd;
- The New South Wales Department of Primary Industries (NSW DPI) Agriculture;
- Cheryl L Cooper;
- The Department of Planning, Industry and Environment (Biodiversity and Conservation Division of the Biodiversity, Conservation and Science Directorate within the Environment, Energy and Science Group);
- Tweed Shire Council (TSC);
- The New South Wales Environment Protection Authority (NSW EPA); and
- The Department of Planning, Industry and Environment: Water (DPIE Water).

This correspondence provides G&S' response to each of these submissions other than the DPIE Water/NRAR submission. Our response to that submission is addressed by a set of supplementary reports and is provided under separate cover.

For ease of reference, relevant aspects of each submission are reproduced below (in indented *italic* text), followed by our response (in plain text).

Gales Kingscliff Pty Ltd submission

E Matters for Which Clarification / Commitment Is Sought

In situ Bulk Density

Previous and current assessment reports specify an in situ bulk density of 1.95t/m³ for the sand resource. However, the basis for bulk density is not clear. It is requested that the report clarifies the basis for the sand resource in situ bulk density of 1.95t/m³.

Summary of information / clarifications requested

7. The basis for the sand resource in situ bulk density of 1.95t/m.

The insitu bulk density for wet sand was adopted from the 'Field Geologists Manual' (Fourth Edition, Monograph No. 9, published by The Australasian Institute of Mining and Metallurgy 2001). The reference can be found in Section 7.3.4 'Bulking factors for expansion of common rock materials (page 295)' of that text. The insitu bulk density is stated as 1.95g/cm³, which equates to 1.95t/m³.

**The New South Wales Department of Primary Industries (NSW DPI)
Agriculture submission**

DPI understands that DPIE is seeking advice with respect to matters it should consider in determining this Major Project. NSW DPI would like DPIE to note that the area is mapped as 'regionally significant farmland' under the Northern Rivers Farmland Protection Project.

While the classification of 'regionally significant farmland' is given weight with respect to agricultural land being rezoned for urban or rural residential purposes, this proposal sets a precedent for development of a highly important agricultural resource that both the government and community have indicated should be protected for primary production purposes into the future.

The Agricultural Land Capability Assessment (ALCA) included in Appendix M of the EIS includes a review of the Northern Rivers Farmland Protection Program (NRFPP) mapping and its application to the subject site. We note that the majority of the site has been mapped as 'regionally significant farmland' based on its potential to support sugar cane production. A small portion of the site in the south is mapped as 'Other Rural Land'.

Section 5.9 of the ALCA compared the NRFPP mapping to the soil conditions recorded on site, based on soil sampling undertaken for the TSP expansion proposal. The onsite assessment identified tenosols and podosols (Section 6.1.13 of the ALCA) on the subject land, indicating that the site does not meet the attributes of significant farmland as stated by the NRFPP program.¹

¹ Department of Primary Industries, 'Northern Rivers Farmland Protection Project', (2005), p11.

The proposed expansion area is a low-lying coastal floodplain which is currently subject to tidal inflows from the Tweed River across part of the site. The predicted sea level rise in this area² will, over time, exacerbate the tidal inundation and impede the site's drainage, leading to increased water-logging and salinisation of soils. As time progresses the site (and indeed the adjacent land uses on the same landform) will degrade further with a consequent reduced capacity to support agricultural production, including sugar cane.

Cheryl L Cooper submission

The proposed doubling of noxious Hanson extraction and haulage activities would complete the isolation of my rural property within a ring of non-agricultural enterprises permitted in recent years.

Those boundary encroachments include sand miners (Hanson and Gales), one landscape haulage depot (O'Keeffe), Tweed Sewerage works, a busy golf course, and a proposed nationally televised greyhound racing venue.

My right to exploit my holding in compliance with its current Rural 2 classification will be made meaningless by Hanson expansion, since my permitted options specify consistency with an "agricultural landscape." Clearly, there would be no agricultural landscape left to conform to.

I am further hamstrung by the very opposite forces of industry – conservation – with recent flood mitigation plans prohibiting new building in areas of otherwise value-adding potential to me.

My lifetime of sympathetic stewardship will be rewarded by my land becoming the local default carbon sink, assaulted from dawn to dusk by acoustic, olfactory and air-particle pollution for the next 30 years.

Every boundary of my property will be impacted by non-agricultural enterprise if the Hanson expansion proceeds.

Our residence fronting Tweed Coast Road is already impacted daily by Boral and Hanson trucks parking outside from 6.30am (photos available), with their jarring compression brakes and clang of trailer linkages. This is 500m before their Altona Road access turn-off.

My property comprises two portions: a long thin section from Tweed Coast Road to the Tweed Sewerage works, and then a square portion of approximately 60 acres immediately beyond this. We use the front section for equine activities and other recreation, and the rear 60 acres for cattle agistment and proposed horse agistment. If a highway interchange link goes ahead, I foresee major impacts on my use of this adjacent rear 60 acres. If Altona Road is re-routed closer to my property as planned, it will vastly reduce my options for sympathetic development along its entire length.

The issues raised by this submitter may be summarised as follows:

² TSC's Climate Change Management Policy adopts a sea level rise of 0.4 m by 2050 and 0.9 by 2100 (above 1990 mean sea levels).

- rural land fragmentation;
- meeting the objectives of the RU2 zone under the Tweed Local Environment Plan (LEP) 2014;
- noise, odour and dust concerns; and
- trucks parking outside the property – using compression brakes and noise from trailer linkages.

The comments relating to the second, third and fourth points are addressed by others (relevant planning, noise or air quality consultants). In respect of rural land fragmentation we note that, in accordance with relevant statutory requirements, a land use conflict risk assessment (LUCRA) was completed as part of the ALCA contained in Appendix M of the EIS. Drawing 12035_306 (in Appendix 1 of the ALCA) showed an aerial image of the subject site and surrounding lands including the land located at 200 Tweed Coast Road, Chinderah (formally described as Lot 1 DP1186419) referred to in this submission. That drawing indicated that Lot 1 DP1186419 was bordered by primary production (RU1), rural landscape (RU2) and infrastructure (SP2 – public utility undertaking) land use zones and that the proposed Hanson expansion did not alter the zoning on those adjacent properties. Regardless of the proposed expansion, Lot 1 DP1186419 would remain contiguous with other rural land uses including agricultural grazing land immediately to the north.

Department of Planning, Industry and Environment (Biodiversity and Conservation Div., Biodiversity, Conservation and Science Directorate, Environment, Energy and Science Group) submission

Other issues

The BDAR suggests there may also be impacts arising from groundwater lowering on groundwater dependent ecosystems (GDEs) through lowering of the water table, such as a drawdown of up to 0.5m which is predicted to occur within a small portion of the Low Potential GDE, as mapped on the southern boundary of the expansion footprint west of Lot 1 DP1250570. It finds that because this GDE is already highly modified, it is unlikely to be significantly impacted by the groundwater draw down. Again, this finding is not substantiated. We note however that the groundwater assessment states that detailed groundwater balance modelling would be required to estimate groundwater exchange based on dynamic (rather than assumed static) groundwater levels.

The EIS does not appear to give adequate consideration to the cumulative impacts arising from this and other adjacent extractive land uses. For example, under Section 6.13 there are two paragraphs in total. The SEARs required an assessment of likely cumulative impacts of the proposed quarry, operating in combination with other established quarries in the locality, paying particular attention to likely impacts on water resources, land capability and potential implications for strategic land use planning in the region. Table 32 references Cumulative Impacts being discussed in Section 5.1.13 of the EIS but this section is not provided.

Despite stating the groundwater modelling predicts that the groundwater level throughout the expansion area and throughout the model domain will increase by a minimum of 0.1 m up to a maximum of 1.0 m, and that the predicted sea-level rise will exacerbate tidal inundation and impede the site's drainage leading to increased waterlogging of soils, there does not appear to be an assessment of the impact this will have in the longer term on the lake systems and the proposed rehabilitation areas. If the rehabilitation areas are, for example, only 10m wide we question when and how often these could be inundated.

BCD Recommendation

4. The EIS and BDAR must include greater consideration of the cumulative impacts of this and adjacent extractive operations, including impacts on groundwater, particularly in consideration of predicted sea level rise.

A number of matters are raised in this section of BCD's submission including:

- The extent of impact of groundwater drawdown on the mapped low-potential GDE on the southern boundary of the expansion footprint west of Lot 1 DP1250570;
- The potential for dynamic groundwater balance modelling to alter the predictions of groundwater level impacts in the context of their impacts on this GDE;
- Cumulative impacts on water resources, land capability and potential implications for strategic land use planning in the region; and
- Impact of predicted sea level rise on lake system.

The direct impacts of the potential groundwater drawdown on the mapped low-potential GDE (*southern boundary of the expansion footprint west of Lot 1 DP1250570*) with respect to the form and function of the vegetation is discussed in further details by JWA Ecological Consultants in their response report.

The second item takes issue with the following comment in the Surface Water Assessment (Appendix B of the EIS):

'The surface water balance model undertaken for the lake gives a limited and rudimentary picture of surface water-groundwater exchange within the lake. Detailed groundwater balance modelling would be required to estimate groundwater exchange based on dynamic (rather than assumed static) groundwater levels. Nonetheless, based on the modelling undertaken, Table 6.7.4.1 provides a summary of the modelled volumetric exchange of seepage into and out of the lake.

The results indicate, that on average, both lakes behave as a groundwater recharge window, rather than a groundwater extraction.

For clarity, this comment was contained in the site water balance assessment and is unrelated to the assessment of groundwater drawdown and associated impacts on GDEs. However, a Revised Water Balance Modelling report has been prepared as part of the response to this and other submissions received on the EIS. The revised water balance model includes additional consideration of dynamic groundwater behaviour and

has been verified against extraction lake level logging and potentiometric surface modelling to ensure it is a robust representation of the highly connected surface and groundwater environment that is characteristic of the site.

The numerical MODFLOW groundwater model (refer to the Groundwater Assessment – Appendix C of the EIS) was used to assess groundwater drawdown and potential GDE impacts. At the request of DPIE Water/NRAR, the numerical MODFLOW groundwater model included in the EIS has since undergone a peer review by an experienced hydrogeologist. The review concluded that the model was ‘fit for purpose’, noting that additional information regarding the model’s set-up and calibration should be included in a supplementary groundwater model report to address the DPIE Water/NRAR concerns. A Supplementary Groundwater Model Report, prepared in accordance with the review findings, resulted in no changes in the model’s predictions for groundwater impacts and associated impacts on GDEs.

With respect to the impacts of sea level rise on the lake system, we note that the groundwater level within the expansion area and throughout the model domain will increase by a minimum of 0.1 m up to a maximum of 1.0 m as a result of sea level rise for both the 2050 (0.4 m) and 2100 (0.9 m) sea level rise predictions.³ As anticipated by TSC’s Climate Change Policy, the predicted sea-level rise will exacerbate tidal inundation and impede the site’s drainage leading to increased waterlogging of soils.

Rehabilitation works at the site will necessarily include species that are tolerant of periodic waterlogging and can withstand the predicted rise in groundwater elevations. More detail of the site’s rehabilitation, including species selection is contained in the site’s Concept Rehabilitation and Landscape Management Plan prepared by JWA Ecological Consultants.

Tweed Shire Council submission

5. Environmental Health

5.1 Acid Sulfate Soils

The application identifies the subject site as Class 2, 3 and 5 Acid Sulfate Soil. Disturbance of such soil has the potential to result in adverse environmental impacts. Any investigations and management plans, or similar, should be prepared in accordance with NSW Acid Sulfate Soils Management Advisory Committee (ASSMAC) guidance documents.

The application indicates the development is a ‘scheduled activity’ under the Protection of the Environment Operations Act 1997, and an Environment Protection Licence issued by the NSW Environment Protection Authority (EPA) will be required to carry out works at the premises.

³ The Gilbert & Sutherland (October 2021). Supplementary Groundwater Model Report should be referred to for additional detail on these impacts.

It is likely management of acid sulfate soils/waste will be regulated under the Environment Protection Licence. Comments and potential conditions to be recommended by EPA and potentially other State Agencies will be critical.

An Acid Sulfate Soils (ASS) investigation throughout the area of the proposed expansion was reported in the 'Acid Sulfate Soils Assessment, Tweed Sand Plant Expansion, Cudgen, New South Wales, January 2021 (ASSA) contained in Appendix K of the EIS. The investigation was prepared with reference to the requirements of the ASSMAC Guidelines and included a total of 50 boreholes within the expansion area including six groundwater monitoring wells (sampled for ASS purposes) and 44 dedicated ASS boreholes. The total depth within each bore reached one metre below the full depth of the sand resource (i.e. approximately 20 metres below ground level (mbgl)). All soil logging and sample collection was undertaken by qualified G&S staff. A total of 1597 samples were recovered, with all samples sealed in plastic geological sampling bags and frozen prior to being forwarded to ALS Laboratories for field screening (pH_{Field} and pH_{Fox} testing) and analysis via the Chromium Suite (Method 22B).

Acid Neutralising Capacity (ANC) levels varied throughout the samples analysed, ranging from 0.02 % CaCO₃ up to 15.4% CaCO₃ with an average level of 2.75% CaCO₃. Such high ANC concentrations in comparison to the materials' acid generating potential (i.e. SCR% results) indicated that the material was essentially self-neutralising. This was confirmed by the Net Acidity results, which averaged 0.14% CaCO₃ with approximately 67% of results less than the 0.3 %S Action Threshold.

Based on the laboratory results, 76% of materials to be extracted at the site are Category 6 (requiring no lime treatment). A further 14% require a low level of treatment whilst the remaining 10% require moderate to high levels of treatment.

The report concluded that the similarity of the materials encountered in the expansion to those encountered throughout Phases 1 to 4 of the existing TSP operation is significant. Given this similarity, the ASS Management techniques employed for current operations will be adopted for operations within the proposed expansion area. This methodology has proven successful over the life of the TSP operations with stable pH levels maintained in the lake and no evidence of acidic reactions in the insitu material surrounding the lake, the reinterred fines or the sands exported from the site.

Details of the ASS management approach to be adopted for the proposed TSP expansion were provided in the Soil and Water Management Plan provided in Appendix E of the EIS. It is understood that ASS management would also be regulated through provision of an Environment Protection Licence.

5.3 Contaminated Land

The application includes a Preliminary Site Investigation (PSI) prepared by Gilbert + Sutherland. A detailed review of the PSI has not been carried out, however the below summary is noted.

The potentially contaminating activities/potential contaminants associated with the site are typical of land where agricultural activities have historically been undertaken and were limited to small areas of the site as identified on Drawing 12035-416 in Appendix 1.

Should the proposed expansion be approved, a detailed investigation would be undertaken to inform the preparation of a Remediation Action Plan (RAP) for the relevant areas of the site.

In many instances, remediation requirements are likely to be straightforward and simply require the removal of identified wastes with selected areas also requiring soil testing. These activities would be undertaken in accordance with an approved RAP and scheduled to occur on a lot by lot basis prior to the commencement of extraction within the relevant allotments. This staged approach is supported by State Environmental Planning Policy (SEPP) 55 which provides that detailed assessments need not be undertaken immediately following the preliminary investigation but should be undertaken prior to commencement of the new land use.

It is proposed that detailed investigations, preparation of the RAP and any subsequent remediation of the identified areas could reasonably form a condition of approval for the proposed expansion.

The approach of 'approval without knowing contamination conditions' is contrary to Council's understanding of the intent of SEPP 55 and contaminated land legislation, whereby detailed investigations and RAP (as necessary) are undertaken prior to determination in order to comply with the provisions of clause 7 of SEPP 55. Accordingly, the proponent's current approach to contamination is not supported.

The 'Preliminary Site Investigation – Tweed Sand Plant Expansion, Cudgen New South Wales, January 2021', prepared by G&S (the PSI) and included in Appendix L of the EIS, detailed the findings of the preliminary site investigation for the proposed TSP expansion area. Potentially contaminating activities/contaminants found to be associated with the site included:

- Demolition wastes (bricks, timber, concrete and metal) and other wastes including scrap metal, empty chemical/oil drums and containers, old cars and soil stockpiles associated with the treed area on Lot 51 DP1166990 (Note: Removal of this waste has commenced since preparation of the EIS).
- Two small soil stockpiles with some bonded asbestos containing material (ACM), other imported soil stockpiles and demolition waste (concrete slabs) associated with the remainder of Lot 51 DP1166990.
- Several stockpiles of imported soil and rock rubble, an empty above ground fuel storage tank and one empty disused drum of endectocide associated with Lot 2 on DP1192506 and Lot 1 DP250570.

Whilst no obvious CoPC were identified on Lots 22 DP1082435 and Lot 23 DP1077509, the likelihood of historic pesticide use associated with commercial tea tree cropping was necessarily considered.

The PSI recommended that further detailed inspection/assessment of the site be undertaken on a lot-by-lot basis prior to the proposed expansion works. This would include a soil sampling program to sample any of the identified potential areas of contamination including: soil stockpiles within all lots; soils within the rows and headers of the currently cropped tea tree on Lot 22 DP1082435 and Lot 23 DP1077509; the current cattle pen/stockyard and surrounds and AST on Lot 1 DP1250570; and, the treed area and surrounds on Lot 51 DP1166990. In particular, it was recommended that the identified wastes within the treed area on Lot 51 DP1166990 would require further assessment and removal, followed by a detailed assessment of the underlying soils.

Subclauses 2 and 3 of Clause 7 of SEPP 55 state the following:

‘(2) Before determining an application for consent to carry out development that would involve a change of use on any of the land specified in subclause (4), the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned carried out in accordance with the contaminated land planning guidelines.

(3) The applicant for development consent must carry out the investigation required by subclause (2) and must provide a report on it to the consent authority. The consent authority may require the applicant to carry out, and provide a report on, a detailed investigation (as referred to in the contaminated land planning guidelines) if it considers that the findings of the preliminary investigation warrant such an investigation.’

Given the nature of potential contamination identified by the PSI (i.e. mainly associated with imported fill and demolition/discarded waste materials) remediation measures would generally include:

- removal from the site of the potentially contaminated materials within the treed area of Lot 51 DP1166990, with validation of underlying surfaces; and
- testing of fill materials identified on all lots prior to disposal offsite (or re-use on site if suitable) with validation of cleared surfaces.

No onsite treatment of potentially contaminated material is proposed. Therefore any detailed investigation could be undertaken as part of a remediation action plan (RAP) prior to works and as a condition of approval. This is in line with the intent of Section 4.3 of the Planning Guidelines for Category 2 remediation work, which states:

‘if the remediation may be carried out without consent under SEPP 55 (category 2 work):

- imposing conditions on the development consent for the use, requiring remediation to be carried out and validated either before other work commences or before occupation of the site, or
- issuing a deferred commencement consent for the use, and requiring remediation to be carried out and validated before other work commences.’

Whilst it is clear that SEPP 55 supports the conditioning of deferred detailed assessment and remediation for Category 2 works such as these, it also recognises the practicality of a 'phase-by-phase' clearance approach for developments with long operational timeframes (in this case some 30 years). In such cases it is important to align the timing of detailed investigation and remediation activities with the timing of the commencement of works to avoid the potential for remediated lands to be inadvertently re-contaminated (e.g. through illegal dumping or similar, or new or different potentially contaminating land uses) in the years between clearance of a Phase and commencement of extraction.

Accordingly, the PSI provides sufficient information for the approval authority to apply the Provisions of SEPP 55 and apply conditions that would require the Proponent to undertake further detailed assessment and remediation (if necessary) of the site on a phase-by-phase basis as works progress throughout the expansion area.

5.5 Groundwater and Dewatering

The application indicates that due to the excavation process used, dewatering is not required.

The proposed development has the potential to impact on groundwater quality. An Environment Protection Licence will be required to carry out works at the premises. Comments and potential conditions recommended by EPA will be critical.

Noted. It is proposed that groundwater management be undertaken in accordance with the provisions of the Soil and Water Management Plan included as Appendix E of the EIS. It is also noted that groundwater management/monitoring provisions would form part of the Environment Protection Licence issued for the expansion proposal.

5.6 Land Use Conflict

Living and Working in Rural Areas (NSW DPI, 2007) recommends a minimum buffer of 500m between 'mining, petroleum, production and extractive industries' and 'residential areas and urban development' and 'rural dwellings'.

The application indicates such a buffer will not be provided.

It is noted an Agricultural Land Assessment has been included in the application.

A detailed review of the Agricultural Land Assessment has not been carried out.

G&S completed a LUCRA with the results provided in the ALCA provided in Appendix M of the EIS. A LUCRA is a system to accurately identify and address potential land use conflict issues and risk of occurrence. The assessment was based on the current and potential land use permitted in the relevant land zoning.

The assessment indicated that the potential for land use conflict between agricultural land uses and the expansion of this extractive industry (which has been in operation since the 1980's) is unlikely to arise. The assessment considered land use conflict from the perspectives of each land-use and their potential to adversely impact upon each other.

The assessment identified that the impact of adjacent agricultural activities on the proposed sand extraction development was unlikely to occur because the development was an extractive industry comprising predominantly of a large lake with no residences and with human occupied areas limited to a site office located remote from agricultural activities. Thus conflicts are unlikely to arise and the presence of the sand extraction operation would not limit the ability for agricultural activities to continue on adjacent lands.

A further consideration may be the impact of the sand operation on the surrounding land users. Although the proposed sand extraction is an extractive industry it does not have the same impacts as other extractive industries such as hard rock quarries where blasting, crushing and screening may be undertaken. The extract of the Tweed Shire DCP in relation to buffers around extractive industries demonstrates the issue;

'Extractive Industries

Extractive industries involve the use of an extensive range of plant and equipment which creates noise and dust as material is won from the quarry face and then crushed and screened for loading and transport. In some cases, blasting is necessary to extract the material. Quarrying activities are incompatible with many land uses, particularly those of a residential nature. It is therefore desirable to provide a buffer area around quarries to minimise land use conflicts and safeguard quarry resources which could be sterilised as a result of encroachment by residential land uses.

The extent of the buffer requirement depends on the size of the quarry, whether blasting is utilised, the nature of production methods, the extent of crushing and screening operations, topography and site conditions and the intensity of surrounding development and land uses. A two level buffer standard is recommended with the primary and secondary buffer as follows⁴:

Type of Quarry	Primary buffer	Secondary buffer
Large quarries (> 10,000m ³ pa)	500	800
Medium quarries (5,000m ³ - 10,000m ³ pa)	400	600
Minor quarries (< 5,000m ³ pa)	300	400

Urban/village residential, rural residential development and tourist development are excluded from both the primary and secondary buffer areas. Single dwellings on agricultural holdings may be permitted in the secondary buffer (but generally not in the primary buffer) if no alternative suitable location is available.'

Although the proposal may be classified as a 'large quarry' based purely on extraction volume, it does not undertake any of the activities (such as blasting or crushing)

⁴ Tweed Shire Council Subdivision Manual - Tweed Development Control Plan, Section A5 Page A5-120.

identified in the DCP that result in a buffer being required. Aspects relevant to the specific activities of the proposed operation that have the potential to cause nuisance or conflict with adjacent land users have each been considered in stand-alone detailed assessments as follows:

- Visual Impact Assessment – Appendix O of the EIS.
- Noise Assessment – Appendixes F1 and F2 of the EIS.
- Air quality assessment – Appendix G of the EIS.

These assessments also conclude that buffers or set-back distances are not required for the prevention of nuisance on neighbouring lands.

5.11 Water Pollution

The below statement is included in the application:

- *The data set demonstrates that surface water quality within the current TSP dredge lake has remained mostly compliant with the site's water quality objectives since issue of the Development Consent in 2006. With respect to cyanobacteria, long-term results indicate the ongoing presence of a seasonal algal bloom with the potential to produce algal toxins. The characteristics of the lake's cyanobacteria population have been extensively analysed and expert advice sought to determine appropriate hazard and risk management techniques. Recent results have been encouraging with a significant reduction in algal cell numbers since 2017.*
- *Groundwater quality at the cessation of sand extraction, including any implications to the proposed end-use(s) of the site as informed by an assessment of risks to the environment and human health.*
- *The above suggests ongoing management of surface water will be required. An Environment Protection Licence will be required to carry out works at the premises. Comments and potential conditions recommended by EPA will be critical.*

As stated, it is possible substantial resources will have to be allocated to maintaining water quality at a primary contact recreation standard. Correction of pH may be required due to acid sulfate soil conditions. Algae growth may need to be addressed. Further information is required regarding end use and long-term management/control/ownership of the lakes.

It is recommended that the Department consider engaging the services of an experienced hydrogeologist to review the proposed development in terms of management of water quality in perpetuity.

The surface water quality data set for the existing Hanson TSP extraction lake is comprehensive, spanning some 20 years and including more than 20 analytes. As noted in the Surface Water Assessment (SWA) completed for the expansion proposal (Appendix B of the EIS), the data set demonstrated long term stability and compliance with the site's water quality objectives, indicating that water quality conditions are well understood, stable and have been well managed throughout the ~38 years of sand extraction operations at the site.

A review of lake water quality performance against the ANZECC Guidelines and Tweed River Water Quality Objectives⁵ was also undertaken as part of the SWA. The review concluded that for the key indicators of pH, dissolved oxygen, aluminium, iron, nitrogen, phosphorus and faecal coliforms the TSP lake was compliant with the guideline targets and/or was consistent with (or better than) the water quality recorded in the nearby Tweed River.

A comprehensive Soil and Water Management Plan was prepared for the site (Appendix E of the EIS). It included commitments regarding ongoing monitoring and management of surface and groundwaters at the site to ensure the existing water quality would be maintained and (where possible) improved throughout the course of the development. Those commitments also included water quality monitoring post cessation of extraction.

We note that the Proponent has also committed to implementing the requirements of a comprehensive Rehabilitation and Landscaping Management Plan. The Rehabilitation Plan included the creation of stable lake banks supporting the revegetation of a minimum 10 metre wide, and in some areas up to 50 metre wide, riparian planting zones.

Given the long-term performance of the existing TSP lake and the Proponent's commitment to implementation of comprehensive soil and water management provisions and rehabilitation requirements, the need for intensive/expensive interventions to control or correct lake water quality are considered unlikely. Nonetheless, we note the Hanson will retain ownership of the site following completion of sand extraction and is committed to implementing the ongoing (post cessation of extraction) requirements outlined in the SWMP, including any necessary interventions to ensure suitable water quality for any potential end use.

Given that the end-use will not be realised for some 30 years from the date of approval, it is considered practical for the specifics of any subsequent end-use to be determined and assessed via the regulations in place at that time.

7.2 Loss of Agricultural Land

Concern is raised with regard to the suitability of the proposed development and the impact of sterilizing the land for future uses and loss of agricultural land. The cumulative impact of the subject site and adjoining land being utilised for similar sand extraction industries has not been suitably addressed, in terms of the strategic importance of the land, given its identification as being regionally significant farmland. If the proposed development is granted approval, the agricultural use of the land will be lost in perpetuity.

⁵ Published online at: <https://www.environment.nsw.gov.au/ieo/Tweed/report-02.htm>

The site's characterisation as 'regionally significant' farmland under the NREPP was discussed in detail in the ALCA included in Appendix M of the EIS. The applicability of this mapping to the specific soil and drainage conditions which occur throughout the expansion area was included above in the response to the New South Wales Department of Primary Industries (NSW DPI) Agriculture submission.

Based on the characteristics of the land, the ALCA indicated that sugar cane production would be the highest and best agricultural use of the subject lands. As such, the ALCA included an assessment of the cumulative impact of the loss of agricultural use of this land for the sugar industry. That cumulative impact assessment used historical data from the Condong Mill (from 2000 to 2019) to describe the cane areas, yields, sugar content and income per hectare for each year. The amount of sugar cane farmland over that period showed a decline from 8131.7 ha in 2000 to 6557.8 ha in 2019, equating to a loss of some 1574 ha of cane farm land being converted to alternate purposes. Whilst the area farmed seems to have stabilised in recent years at about 6550 ha, the loss of cane farmland can be attributed to many factors including:

- encroachment from non-rural activities, but mainly due to landholders leaving the industry and pursuing alternate land use such as grazing and horticulture (on sites less constrained than the proposed development site); and
- the changing age distribution of farmers and the realignment of these farmers to activities less intensive than cane farming.

The lands subject to the proposed expansion of TSP have not been in cane production for more than a decade and thus the redeployment of this land to alternate uses (such as grazing and non-agricultural uses) has already occurred. Given the soil and drainage constraints exhibited by this parcel of land and the TSC policy indications that the drainage characteristics will worsen over time, it is unlikely that significant cane production will be viable on these lands in future.

As these lands have already been re-deployed away from their highest and best agricultural use of sugar cane production, the loss of this land for the purpose of sand extraction will have no additional impact on the cane industry.

8. Request for Further Information

8.5 Groundwater Dependent Ecosystems

Further investigation and assessment should be undertaken with regard to the impact of the proposal on Groundwater Dependent Ecosystems by a suitably qualified specialist in the field.

The Groundwater Assessment contained in Appendix C of the EIS was prepared by suitably qualified specialists with a demonstrable record of assessing hydraulic and hydrologic changes capable of affecting Groundwater Dependent Ecosystems (GDEs). The report provided a detailed assessment of the proposed expansion's potential

impacts on GDEs and included a review of the following data sources to investigate the presence and characteristics of wetlands and GDEs located within and nearby the proposed expansion footprint:

- NSW Wetlands vector dataset, Office of Environment and Heritage, State Government of NSW and Department of Planning, Industry and Environment 2010;
- State Environmental Planning Policy (Coastal Management) 2018; and
- NSW Environmental Data, the Bureau of Meteorology's Groundwater Dependant Ecosystems Atlas.

G&S drawings numbered 12035-101 to 12035-104 contained in the Supplementary Groundwater Model Report show the site in its regional context and its proximity to these environmental features. This mapping exercise indicated:

- The NSW Wetlands Vector data set mapped wetlands within the centre of the existing TSP extraction lake and within two isolated locations outside the boundaries of the site to the south (Drawing 12035-101).
- There were no Coastal Wetlands within the boundary of the subject site, which is outside of the Coastal Wetland Proximity Area (a 100 m zone plotted around the outer extent of the mapped Coastal Wetlands, see Drawing 12035-102).
- The Bureau of Meteorology Groundwater Dependant Ecosystems Atlas identifies a High-Potential Terrestrial (Paperbark) GDE was located on the northern perimeter of the proposed expansion area (see Drawing 12035-103).
- An area of low-potential Terrestrial GDEs were mapped on the southern perimeter of the proposed expansion area (refer to Drawing 12035-103).
- The closest high-priority GDE's to the site mapped under the 'Water Sharing Plan NCCSGS' are the 'Blacks Creek Swamps' to the south being approximately 2 km away, and the 'Cudgen Creek Swamps' to the east being approximately 5 km from the site (refer to Drawing 12035_104).

The groundwater impacts associated with the proposed expansion were assessed through the preparation of a numerical MODFLOW groundwater model. At the request of DPIE Water/NRAR, the numerical MODFLOW groundwater model included in the EIS was peer reviewed by an experienced hydrogeologist. The review concluded that the model was 'fit for purpose' and that the matters raised by DPIE Water/NRAR could be addressed by including additional information regarding the model's set-up and calibration in a supplementary groundwater model report. A Supplementary Ground Water Model report, prepared in accordance with the review, indicates:

- Localised and minor changes to pre-development groundwater flow regimes in the vicinity of the lake that would be largely contained within the development footprint.
- The High Potential Terrestrial GDE located on the northern perimeter of the expansion area was partly within the designated footprint of the ultimate dredge lake.

As such it is likely that part of this GDE would be removed within years 23 to 26 of the progression of the development.

- With respect to the Low Potential GDE (Drawing No. 12035-103) adjacent the southern boundary of the expansion footprint west of Lot 1 on DP1250570, the revised groundwater model incorporates an increased buffer distance of ~50 m between the limit of extraction and the site boundary. Whilst groundwater drawdown is still predicted to occur within this area, the increased buffer distance has reduced the lateral extent of offsite drawdown from 170 m to 155 m and reduced the magnitude of drawdown to between 0.1 m and 0.5 m. The footprint of offsite drawdown in this area has also reduced by ~4,300 m². As the change in groundwater table predicted in this area is within the range of natural seasonal fluctuation, it is unlikely that the swamp sclerophyll forest (*Casuarina Glauca*) present in this area will experience negative impacts as a result of the localised change in groundwater conditions. This has been confirmed by JWA Ecological Consultants.

New South Wales Environment Protection Agency (EPA) submission

Soil and Water

Appendix B – Surface Water Assessment & Appendix C – Ground Water Assessment both mention surface and ground water monitoring being conducted over a seven-month period across the proposed expansion area to establish baseline conditions and determine similarities and differences between the expansion and current TSP site.

The establishment of baseline conditions is essential for the proposed expansion area. The EPA recommends that if the expansion is approved that baseline monitoring for both surface and ground water across the full expansion area continue on an ongoing basis (taking into account seasonal variability) from Phase 5 onwards.

As with the existing EPL, groundwater and surface water monitoring will be required and expanded to the proposed areas if approved formalised through a specific licence condition(s).

Noted. The requirement to undertake ongoing monitoring in the expansion area could reasonably form a condition of approval and it is noted that the existing EPL would necessarily include updated conditions to reflect additional monitoring requirements across the expansion area.

Acid sulfate soils (ASS)

The EIS states that:

- *the existing approach to ASS Management will also be adopted for operations within the proposed expansion area.*
- *The Potential ASS fines from the extracted sand are returned to the dredge lake to a deposition depth of at least 8 metres, via a hydraulic separation and fines reinternment methodology.*

As with the existing EPL the assessment and management of ASS and PASS will be formalised through a specific licence condition(s).

Noted. It is proposed that ASS management be undertaken in accordance with the provisions of the Soil and Water Management Plan included as Appendix E of the EIS. It is also noted that ASS management/monitoring provisions would form part of the Environment Protection Licence issued for the expansion proposal.

Erosion and Sediment Control Plan (ESCP)

Management of sand extraction

The Erosion and Sediment Control Plan (ESCP) states that HTSP must provide calendar year annual production data to the DPIE Division of Natural Resources and Geosciences, and include a copy of the form in the HTSP Annual Review. As with the existing EPL the volume of: material extracted; and, extracted material transported, from the quarry will be formalised through a specific licence condition(s).

Release of surface waters

The EPA notes the detail re rainfall events that may require release of surface waters outside of EPL licence conditions.

Noted.

Contaminated Lands

A number of potentially contaminating activities/potential contaminants have been identified with the site through a Preliminary Site Investigation (Appendix L – Preliminary Site Investigation). Detailed investigations will need to be undertaken, and a Remediation Action Plan (RAP) prepared for a staged approach to investigation and remediation.

Noted. This approach aligns with the proposed approach contained in the Preliminary Site Investigation (Appendix L of the EIS) and the relevant provisions of SEPP 55 (described in detail earlier in this response).

Material Import

The EPA notes from the EIS that the project would import 60,000 tonnes per annum of Virgin Excavated Material (VENM) including rock.

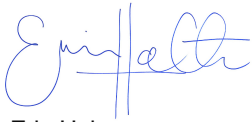
HTSP need to ensure that any material (e.g. VENM) received on-site has been classified/certified accordingly (including testing requirements). VENM is defined in the Protection of the Environment Operations Act 1997 (POEO).

For example, Potential Acid Sulfate Soil (PASS) is a waste as per the waste classification guidelines. If this HTSP was processing or storing this material on site exceeding those volumes in Schedule 1 of the POEO at any one time the activity would require an EPL for waste processing.

The importation of any materials would comply with the relevant Resource Recovery Orders and Exemptions. No ASS materials would be imported onto the site or disposed of offsite and thus there is no requirement for an EPL for waste processing.

We trust this is acceptable. Please do not hesitate to contact this office if you require any further details or elaboration.

Yours sincerely,



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