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Integrated Designated Development Application No. 18/2015, Proposed Sand Extraction Extension at 44 Buckleys Rd, Dunmore

To whom it may concern,

The Environmental Impact Statement (EIS) for the Dunmore Sand Extraction Proposal was placed on exhibition between late 30 January and 2 March 2015, in accordance with Section 79 (1)(a) of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

In accordance with Schedule 4 of the EP&A Act, the Proposal was submitted to the Southern Joint Regional Planning Panel (SJRPP) for determination as the proposal is classified as designated development under Clause 32, Schedule 3 of the Environmental Planning and Assessment Regulation 2000. The Environment Protection Authority (EPA) provided a submission dated 9th June 2015 recommending that SCC clarify what noise mitigation measures they propose to implement at the site.

This letter has been prepared in response to a request by the Joint Regional Planning Panel on the 17th March 2016 to provide the following additional information:

- Specific details of the noise mitigation measures required to meet the Project Specific Noise Levels (PSNL) limits outlined in EPA correspondence dated 9th June 2015
- Identify actual measures or combination measures, location, height and width of any mounds or acoustic barriers and any impacts on retained vegetation and visual impacts.

The EPA proposes the PSNL noise limits shown in Table 1, and notes that Shellharbour City Council will need to implement additional noise mitigation measures to achieve these limits.

Table 1: EPA PSNL in dBA(A) for Dunmore sand extraction proposal

		Noise Limits dB(A)
Locality	**Location**	**Day**
		$L_{Aeq\ (15\ minute)}$
R1, R2, R3, R7 & R8	1, 21 & 51 Dunmore Road, Dunmore and isolated residences on Swamp and James Road	45 dB(A)
R4	21 Buckleys Road Shell Cove	42 dB(A)
R5	North East receivers along Augusta Parkway Shell Cove	41 dB(A)
R6	Killalea State Camp Site	50 dB(A) $L_{Aeq,\ 1hr}$ when in use

This letter has been provided to specifically address additional requirements concerning noise assessment, proposed mitigation and ancillary impacts. Additional noise modelling and assessment and proposed mitigation presented in this response has been undertaken by noise consultant

Project Background

Shellharbour City Council (SCC) is proposing to undertake works for the purpose of sand extraction within the Dunmore Recycling and Waste Disposal Depot site (DRWDD), at Dunmore (the Proposal). The Proposal would involve the extraction of sand from a portion of Lot 21 DP 653009 for sale and the rehabilitation of the extraction area, once the sand resource has been removed. Backfilling of the extraction pit to achieve a stable landform would be undertaken with a combination of potential acid sulphate soils (PASS) and virgin excavated natural material (VENM) so as to achieve a stable landform.

The Proposal is classified as 'designated development' under the EP&A Act as it constitutes 'extractive industries' and would involve extraction, for the purposes of sale, of more than 30,000 m^3 of sand per annum and 'waste management' facilities for the emplacement of PASS material in the extraction pit formed.

An EIS (dated January 2015) was prepared by Arcadis (formerly Hyder) on behalf of SCC, to address Secretary's Environmental Assessment Requirements (SEARs) which were provided for the Proposal. The EIS provided a comprehensive assessment of all issues, including noise identified in the SEARs. The EIS also identified a number of mitigation measures to address any identified potential environmental impacts associated with the Proposal.

Proposal Overview

The Proposal would involve three key phases, including site establishment, sand extraction and rehabilitation. A summary of key elements of the Proposal is provided below:

- Relocation of a portion of an existing power line – a power pole is currently located within the area proposed to be excavated, and would be diverted around the site.
- Identification and marking of the sand extraction area.
- Installation of erosion and sedimentation controls, including the installation of a diversion bund and overland flow channel around the up side perimeter of the Site.
- Formation of a new drainage channel around the perimeter of the sand extraction area and diversion of the existing drainage channel.
- Excavation of topsoil and to a depth of 0.4 m. This material would be stockpiled to a height of not more than 5 m at the DRWDD for reuse at the DRWDD site and/or future rehabilitation of the sand extraction area.
- Construction of an access road and causeway over the drainage channel. Culverts would be installed within the causeway to convey minor flows.
- Removal of existing vegetation using an excavator and/or bull dozer.
- Formation of a levee bank to RL 1.8 m at the southern extent of the sand extraction area.
- The levee bank would be vegetated with low growing, native shrubs and grasses to provide bank stability and reduce erosion.
- Excavation of a pit within the excavation area to a depth below the standing water table, using a backhoe or excavator.
- A cutter suction barge would be transported to the excavated pit, once there is sufficient water within the excavation pit to float the barge.
- Installation of a pipeline between the new sand extraction area beneath the access road for conveyance of sand to the existing sand washery.
- A barge-mounted cutter suction dredge would be used to extract sand from the new sand extraction area and transfer it to the sand washery that is located within the footprint of the existing sand extraction area.
- Following completion of sand extraction activities the Site would be rehabilitated. While a number of potential rehabilitation options are available the worst case scenario involving the establishment of a stockpile site has been assessed in the EIS.

Noise Assessment and Mitigation Proposed in EIS

The EIS document includes a Noise and Vibration Impact Assessment (NVIA), prepared by Wilkinson Murray as Appendix H to the EIS and summarised in Section 8.6 of the EIS. The closest and potentially most exposed noise sensitive receivers were described in the Dunmore Sand Extraction EIS (Section 8.6) and are reproduced in Table 2 and identified in Figure 1. The identified receivers and PSNL are consistent with those identified in the letter from the EPA dated 9 June 2015.

All houses located within Dunmore Village were identified by three (3) receiver locations shown in Figure 1.

Table 2 Closest & Most Exposed Noise Sensitive Receivers

Receiver ID	Receiver Address	Description	PSNL (EIS)
R1	1 Dunmore Road, Dunmore	Dunmore Village residential receiver located directly to the north of the proposed sand extraction area on Dunmore Road, approximately 85m away.	45
R2	21 Dunmore Road, Dunmore	Residential receiver located in the centre of Dunmore Village.	45
R3	51 Dunmore Road, Dunmore	Dunmore Village residential receiver located adjacent to Buckleys Road.	45
R4	21 Buckleys Road, Shell Cove	Isolated residential receiver located to the north of the Proposal, within the Shellharbour Links Golf Course.	42
R5	-	Residential receivers located along Augusta Parkway within the Shell Cove suburb located to the north-east of the subject site.	41
R6	-	Killalea State Park Campsite, located to the SW of the site.	50 (when in use)
R7	-	Isolated residence located to the west of the Princes Highway, on Swamp Road.	45
R8	-	Isolated residence located to the west of the Princes Highway, on James Road.	45

Figure 1 Closest & Most Exposed Noise Sensitive Receivers

Noise emissions from the Proposal are expected to comply with the relevant criteria, including the PSNLs identified in the EPA correspondence of 9 June 2015, at all identified receivers except for R1. At R1 there would be possible exceedances of the PSNLs for all stages of sand mining, including site establishment, sand extraction and site rehabilitation.

As R1 represented a locality of houses the NVIA noise predictions indicate that noise emissions from the Proposal could exceed criteria at the following individual receivers during each stage of the Proposal:

Proposal phase	Site Establishment	Sand Extraction	Site Rehabilitation
Receiver(s) impacted	1 Dunmore Road	1 Dunmore Road 5 Dunmore Road 7 Dunmore Road 9 Dunmore Road 11 Dunmore Road 19 Dunmore Road	1 Dunmore Road 5 Dunmore Road 7 Dunmore Road 9 Dunmore Road 11 Dunmore Road 19 Dunmore Road

The noise assessment presented in the Dunmore Sand Extraction EIS considered the following noise mitigation options and recommended these should be considered at the detail design stage:

- Negotiated agreement with the six (6) residences identified above. Such agreement would address architectural treatment and noise barrier 'at receiver' (along residential boundary fence fronting the site); and/or
- Treatment of suction dredge (sand extraction); and/or
- Treatment of long armed excavator (site rehabilitation); and/or
- Barrier treatment of barge (i.e. to shield noise generated by plant on board); and/or
- Noise barrier 'at source' (along the northern boundary of the proposed extraction area).

The noise assessment also stated that a 4m high noise barrier (relative to the natural ground topography) running along the northern boundary of the proposed extraction area would ensure compliance with the criteria with the possible exception with a negligible 1dB exceedance at R1 during site rehabilitation. The preferred noise treatment option has now been resolved as demonstrated by the refinements to proposed mitigation and additional noise assessment below.

Additional Noise Modelling

To respond to the JRPP's concerns more detailed noise modelling, which included consideration of detailed topography and buildings, has been conducted at the closest individual residential receivers to the site (as designated by R1). The noise modelling assessed the effect of the proposed noise barrier during the sand extraction and site rehabilitation phases of the Proposal, with the noise barrier located on the northern side of the site. Figure 2 below shows the site and the closest individual residential receivers with the addresses identified.

Figure 2: Site and closest residential receivers.

The location of the proposed noise barrier is shown in Figure 3.

The noise barrier could be constructed in a number of different ways, namely:

- 4 metre bund on top of the natural topography behind the northern tree line; or
- 4m Hebel concrete noise wall; or
- 2m high bund with a 2 m Colourbond / wood fence on top.

A review of potential ancillary impacts from aspects including flooding, decreased visual amenity, loss of habitat and encroachment on sand extraction area, have come to the conclusion that the most reasonable and feasible barrier would be a 4m Hebel concrete noise wall. For installation of a Hebel concrete wall a construction footprint of approximately 4m width would be required.

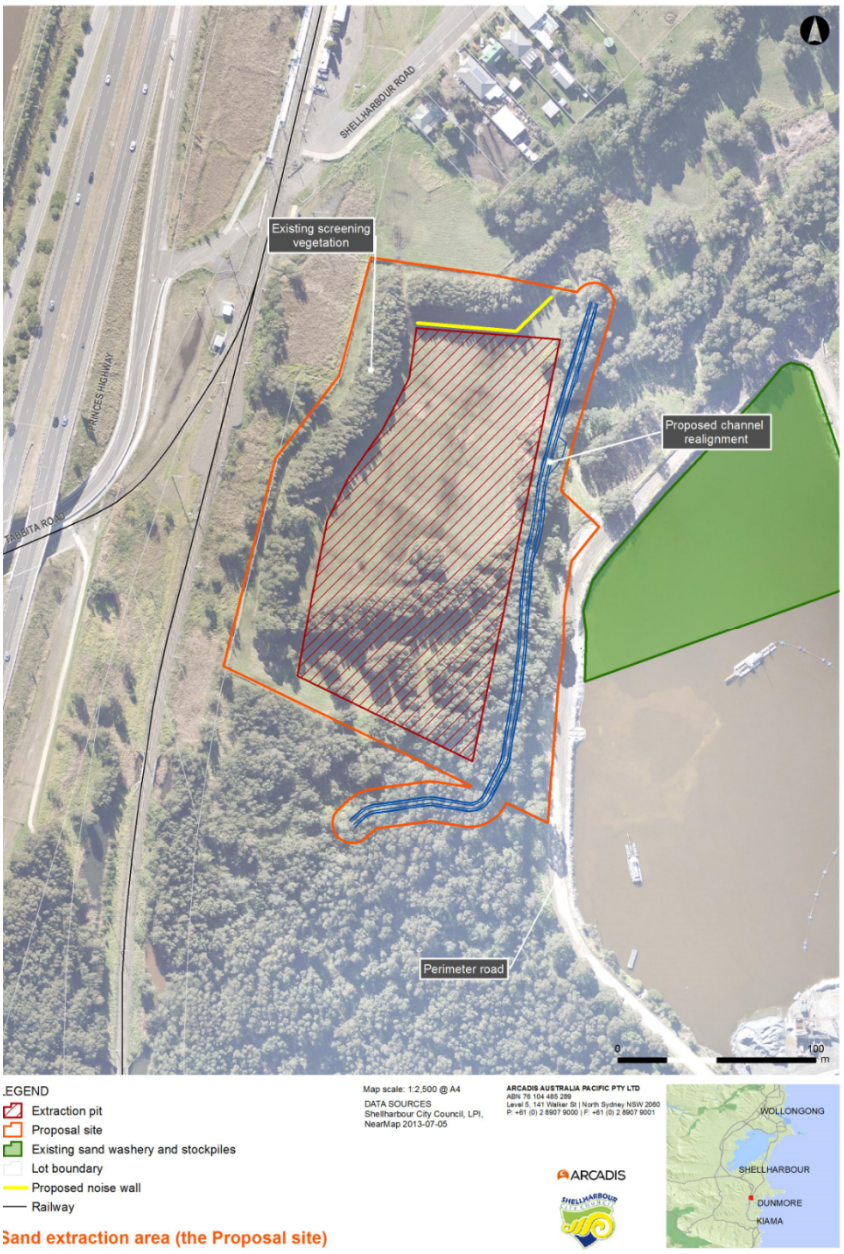

Figure 3: Proposed noise barrier location.

The predicted noise levels for sand extraction with and without the 4m Hebel concrete noise wall is presented in Table 3.

Table 3: Noise Predictions for Sand Extraction

Location	Predicted Noise level		Criteria	Complies with Criterion
	No mitigation (dBA)	With noise wall (dBA)		Yes/No
R1 - 1 Dunmore Rd	48.5	44.2	45	Yes
R1 - 5 Dunmore Rd	48.5	44.8		Yes
R1 - 7 Dunmore Rd	44.4	43.2		Yes
R1 - 9 Dunmore Rd	43.1	41.8		Yes
R1 - 11 Dunmore Rd	42.8	42.6		Yes
R1 - 19 Dunmore Rd	44.9	42.7		Yes
R1 - 21 Dunmore Rd	44.3	42.4		Yes
R1 - 23 Dunmore Rd	43.6	42.0		Yes

As can be seen the predicted noise levels with the barrier for sand extraction comply with the noise criterion (PSNL).

The predicted noise levels for the site rehabilitation with and without the barrier is presented in Table 4.

Table 4: Noise Predictions for Site Rehabilitation

Location	Predicted Noise level		Criteria	Complies with Criterion
	No mitigation (dBA)	With noise wall (dBA)		Yes/No
R1 - 1 Dunmore Rd	53.3	46.0	45	No
R1 - 5 Dunmore Rd	51.1	45.9		No
R1 - 7 Dunmore Rd	45.6	43.3		Yes
R1 - 9 Dunmore Rd	44.3	42.9		Yes
R1 - 11 Dunmore Rd	43.2	42.9		Yes
R1 - 19 Dunmore Rd	44.9	42.8		Yes
R1 - 21 Dunmore Rd	44.4	42.6		Yes
R1 - 23 Dunmore Rd	43.7	41.7		Yes

The predicted noise levels with the barrier for site rehabilitation complies at all receivers except at 1 Dunmore Rd and 5 Dunmore Rd where a negligible 1dB exceedance occurs. The exceedance of 1 dB for the site rehabilitation could be avoided if the long armed excavator were to have its source noise level reduced by 1dB. The predicted noise levels for the site rehabilitation with the barrier and a long armed excavator noise level reduced by 1 dB is presented in Table 5. This could be achieved by engine covers are closed, equipment is well maintained and silencers/mufflers are applied to the long arm excavator.

Table 5: Noise Predictions for Site Rehabilitation with a noise barrier and the long armed excavator noise level reduced by 1 dB.

Location	Predicted Noise level With noise wall (dBA)	Criteria	Complies with bund Yes/No
R1 - 1 Dunmore Rd	45	45	Yes
R1 - 5 Dunmore Rd	44.9		Yes
R1 - 7 Dunmore Rd	42.3		Yes
R1 - 9 Dunmore Rd	41.9		Yes
R1 - 11 Dunmore Rd	41.9		Yes
R1 - 19 Dunmore Rd	41.8		Yes
R1 - 21 Dunmore Rd	41.6		Yes
R1 - 23 Dunmore Rd	40.7		Yes

As can be seen, the predicted noise levels with the 4 m Hebel concrete noise wall and the long armed excavator noise mitigated by 1 dB for site rehabilitation comply with the noise criterion.

Ancillary Impact Assessment

Residents located on Dunmore road at R1 would have a low sensitivity to the proposed noise wall given vegetation planted along the northern site boundary screens the Proposal site from view and will minimise visual impacts resulting from the Proposal. This vegetation would be maintained throughout the Proposal life and the final rehabilitation of the Proposal site would include re-vegetation of the site, leading to improved visual outcomes.

A cross section of the proposed noise wall, presented in Figure 4 demonstrates that vegetation screening to the north of the sand extraction area along the northern proposal site boundary provides a visual barrier to the proposed noise wall. As such the visual impacts associated with the proposed noise wall are considered low.

Figure 4: Cross section between dredge and sensitive receptors, including location of the proposed noise wall

The installation of the noise wall along the northern boundary of the extraction pit is unlikely to adversely impact ecological values of the proposal site and surrounds. The location of the wall has been selected to avoid the need for vegetation removal, and subsequently will not fragment or isolate habitat adjoining the extraction pit. The location of the wall does not compromise the habitat connectivity offered by the existing

screening vegetation, located along the northern and western boundaries of the proposal site.

The noise wall is not expected to form a drainage barrier behind which water would accumulate. Runoff approaching the wall generally originates from the north (the residential area fronting onto Dunmore Road) and is expected to escape past the wall to the west – closer to the rail corridor embankment. Ponding in the area behind the wall is expected to be insignificant.

The change to flooding in this area and the risks / hazards introduced by or exacerbated by the installation of this noise wall are expected to be insignificant. The rail corridor and the residences are typically 2.5m in elevation higher than the extraction pit area and including the noise wall.

The installation would not introduce a low point behind the wall as a result of activities in which water could accumulate. A new, small open drain is recommended to be placed between the toe of the wall and the vegetation that follows the slope of the land and falls to the west. This is intended to further guide flows away to the west and to minimise impacts from flood waters to the noise wall itself as a result of runoff.

Summary and conclusion

SCC has committed to the development and implementation of a noise mitigation strategy for the Proposal during development of a Noise Management Plan (NMP), which will be implemented throughout all phases of the Proposal. As such it was expected that the consent would include the PSNL identified within the EIS document and a requirement to achieve those limits through the noise management plan process. This process was preferred by SCC as it provided flexibility to confer with the impacted stakeholders during development of the noise mitigation strategy.

It should be noted that the noise wall is not the only mitigation option available. Treating the dredge and the long armed excavator for placement of the rehabilitation material would be possible as the noise levels from the dredge and long armed excavator are the main reason for exceedances at the residences located at R1. Modifying dredging activities so that the dredge can operate further to the south of the extraction pit may also be feasible and would be considered as part of the development of the Operational Noise Management Plan.

Communication with the impacted residents and identification of alternative noise mitigation strategies including:

- ‘at receiver mitigation’ (e.g. glazing improvement and providing air conditioning if they don’t have it so they can keep their window shut)
- site fencing improvements
- identification of hours of operation that would suit them (e.g. when they’re at work)

are also options that SCC would consider during development of the NMP. As there are only two residences impacted by the Proposal, applying ‘at receiver’ treatments is likely to more cost effective than the installation of a noise wall.

The EIS and the assessment presented above has demonstrated that it will be possible for the Proposal to achieve the PSNL (as presented in the EIS and confirmed with the EPA) through the implementation of mitigation strategies. The requirement for the Proposal to comply with the PSNLs and to develop and implement a NMP, in consultation with the impacted receivers, is sufficient and appropriate to manage

potential noise impacts associated with the Proposal, without prescribing the specific measure(s) to be implemented. It should be noted that the NMP process should include a possible exemption of the noise limits if at receiver mitigation is negotiated post project approval.

Yours sincerely

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