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Summary of noise and vibration impacts associated with modification 33

Dear John,

This letter summarises the noise and vibration impacts associated with the construction and operation of the DDG dryers 4 and 5 heat recovery system, as previously assessed under Modification 31 (MOD31) as described in the report *Shoalhaven Starches Modification 31 Noise and Vibration Impact Assessment* (GHD, 2025).

Shoalhaven Starches is seeking separate approval for the DDG dryers 4 and 5 heat recovery system, under Modification 33 (MOD33). As MOD33 comprises equipment already assessed under MOD31, no additional noise sources are introduced.

Operational equipment overview

The plant and equipment associated with the DDG dryers 4 and 5 heat recovery system consists of several pumps and a booster fan at each dryer. Further detailed design has refined the required equipment and noise levels. Some of the proposed equipment will be on standby and not operate simultaneously. A comparison of equipment considered in the MOD31 NVIA and what is required based on the detailed design is presented in Table 1.

The MOD33 detailed design requirements shows that:

- Less equipment is required to be operational simultaneously, as was considered in the MOD31 NVIA.
- The sound power levels of the equipment are equal or lower than what was considered in the MOD31 NVIA, with the exception of the process condensate pumps. However, this is more than compensated for by the reduced number of process condensate pumps operating simultaneously.

Table 1 DDG dryers 4 and 5 heat recovery system noise sources

Plant and equipment	MOD31 NVIA		MOD33 detailed design	
	Number of items operational	Sound power level per unit (dBA)	Number of items operational	Sound power level per unit (dBA)
CIP pump	1	82	1	82
Recirculated hot water pump	2	90	1 ¹	88
Process condensate pump	4	75	2 ²	76
Wet scrubber outlet booster fan	2	87	2	86
Seal water pump	2	75	2	75

Note 1: One recirculated hot water pump will be operational, with the other being a standby unit (i.e. they cannot operate simultaneously).

Note 2: Two of the recirculated hot water pumps will be operational, with the other two being standby units.

Construction noise compliance

Construction noise management levels (NMLs) at residential receivers were set at 10 dB above the rating background noise levels (RBLs) in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) (ICNG). The RBLs were derived in absence of noise from the Shoalhaven Starches site, which is considered to be a conservative approach.

Noise modelling undertaken for construction of MOD31 demonstrated that construction noise levels at receiver R2 (45 Ferry Lane, Terara) are at most 1 dB above the NMLs during piling activities. The other construction activities are predicted to result in construction noise levels below the NMLs. Therefore, construction noise impacts are only anticipated during piling activities and the exceedance would be very minor.

Piling is not required for MOD33, therefore noise levels during construction of MOD33 are anticipated to be below the NMLs at all sensitive receivers. The mitigation measures outlined in section 7.1 of the MOD31 NVIA report will be incorporated into the construction noise management plan.

Operational noise compliance

The operational design noise goals for MOD33 were set at **15 dB below the noise limits** of the Environmental Protection Licence (EPL) number 883 and Development Consent 06_0288 Schedule 3 condition 12. This is to minimise noise contribution from the modification to the overall site-wide noise emissions.

Noise modelling conducted for MOD31 indicates that operational noise levels are at minimum 1 dB below the design noise goals at all sensitive receivers during both neutral and noise-enhancing meteorological conditions.

The predicted operational noise levels for MOD31 are presented in Table 6.6 of the MOD31 NVIA report. The noise modelling confirms that, even under noise-enhancing meteorological conditions, the operational noise from MOD31 is predicted to be below the design noise goals at all sensitive receivers.

Furthermore, the analysis for annoying noise characteristics shows that MOD31 does not trigger tonal or low frequency noise corrections as per the *Noise Policy for Industry* (EPA, 2017).

As the equipment associated with MOD33 (DDG dryer 4 and 5 heat recovery system) is part of the equipment considered in MOD31, the predicted operational noise levels from MOD33 individually would also achieve the design noise goals at all sensitive receivers.

The predicted noise levels for the equipment associated with MOD33 are presented in Table 2, alongside the noise levels of the existing DDG dryer 4 and 5, as well as the overall site. The predicted noise levels indicate that the proposed MOD33 equipment comply with the design noise goals by a minimum of 3 dB. Furthermore, the noise contribution from MOD33 is minimal when compared to that generated by the existing DDG dryer 4 and 5 or the overall site.

Table 2 Noise contribution of MOD33, existing DDG dryer 4 and 5 and existing site

Receiver ID	Address	Modification design noise goal (dBA)	Predicted noise level (dBA) ¹		
			MOD33	DDG dryer 4 and 5 ²	Existing site
R1	135 Terara Road, Terara	23	8	16	42
R2	45 Ferry Lane, Terara	23	18	31	48
R3	41A Meroo Street, Bomaderry	27	20	32	49
R4	1-3 Meroo Street, Bomaderry	27	17	33	48
R5	Burruga Island	25	8	22	47
R6	39 Hanigans Lane, Bolong	25	<5	8	39
R7	19 Meroo Street, Bomaderry	27	17	34	47
R8	1 Nobblers Lane, Terara	23	8	14	42
R9	2 Tarawara Street, Bomaderry	27	22	25	49
R10	10 Tarawara Street, Bomaderry	25	10	20	44
R11	17 Coomea Street, Bomaderry	25	21	31	46
R12	6 Birriley Street, Bomaderry	25	16	31	45
R13	1 Coomea Street, Bomaderry	25	15	31	46

Note 1: Excluding penalties for low frequency noise.

Note 2: After implementing DDG dryer 4 and 5 mitigation measures described below.

Mitigation measures

The mitigation measures outlined in Table 3 will be implemented to proactively manage and minimise noise emissions from MOD33. Operational noise of the equipment will be validated prior to construction, as well as once the modification is operational.

Table 3 Operational noise mitigation measures

Component	Action required	Details
Further detailed design		
DDG dryer 4 and 5 heat recovery system	Equipment selection	The sound power levels of the equipment should be equal or lower than those presented in Table 1.
	Positioning of equipment	Equipment should be positioned during detailed design to maximise shielding by existing structures where reasonably possible.
Pipelines and ducts	Insulation and lagging	Insulating and lagging of pipelines is recommended to reduce pipeline noise, particularly in areas where fluid or gas flows cause vibration or turbulent flow noise.
Noise validation		
All components	Noise validation report prior to construction	In accordance with Development Consent condition 14M, a noise validation report will be prepared prior to construction, to demonstrate compliance with the design noise goals can be achieved based on the detailed design. If required, mitigation measures to reduce noise levels to achieve the design noise goals should be provided in the noise validation report.
All components	Noise validation report during operation	Once the proposed modification is operational, a noise validation assessment would be undertaken to confirm if noise levels comply with the predictions detailed in the noise validation report.

Existing DDG dryer 4 and 5 mitigation measures

Additional mitigation measures were investigated for the existing DDG dryer 4 and 5. As most noise from the DDG dryers 4 and 5 is emitted via the openings in the eastern façade of the buildings, measures to

reduce this noise were investigated. The following key noise sources within the buildings were identified and mitigation measures will be implemented:

- Vapour fan casing and connecting pipework: equipment and pipework will be lagged with rockwool and stainless steel, which is estimated to reduce noise levels by about 5 dBA
- Scrubber tank pump: alternative valving will be implemented. If required, an enclosure would be installed around the pump to reduce the equipment noise level by about 5 dBA.

The above measures are anticipated to reduce noise emitting from the DDG dryer 4 and 5 building openings by up to 3 dBA. Additionally, once MOD33 is operational, the cooling demand for the DDG dryer 4 and 5 process will be reduced. Fan speeds of the cooling towers can be reduced to 60% (currently 100%) which reduces the overall cooling tower noise levels by 4 dBA.

Regards

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