



Adelaide Brighton Cement Ltd

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Adelaide Brighton Cement Ltd
ABN 96 007 870 199
PO Box 229
Angaston SA 5353
+61 8 8561 3100

ANNUAL NOISE MANAGEMENT REPORT FOR ANGASTON WORKS

COMPLIANCE DATE: 31/10/2021 – Annual Report - 2021 EPA Licence 35: Noise Prevention (S-265)

Licensed site: Adelaide Brighton Cement, Angaston Works

845 Stockwell Road, Angaston SA 5353

Date of Submission: 29 October 2021

Version Number: 1

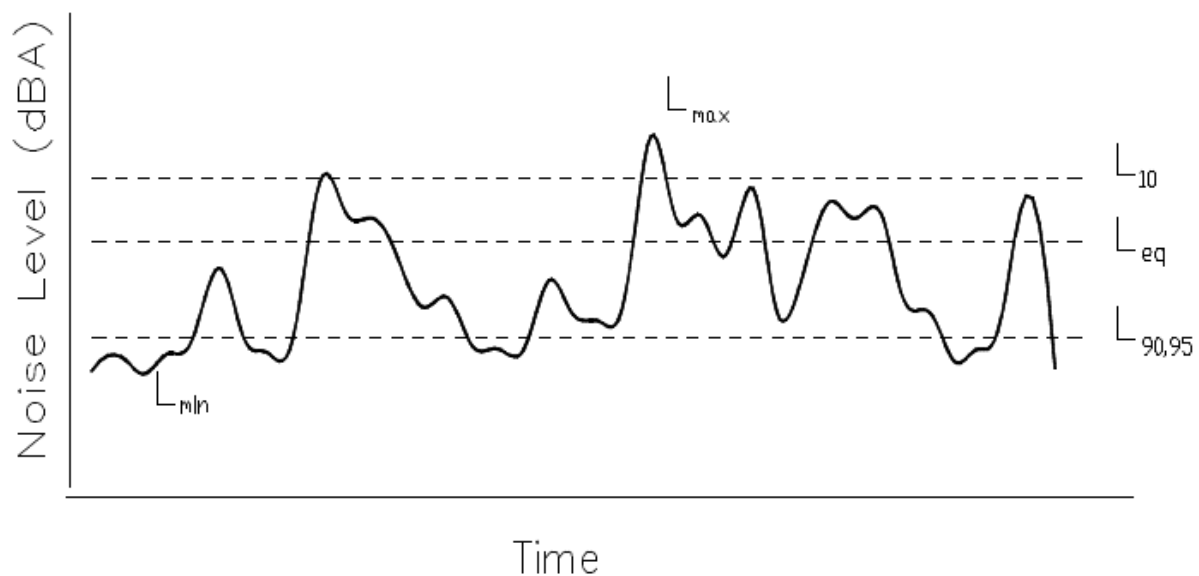


Report Submitted by: Advisor Environment - C&L (SA/NSW/NT)

I certify that to the best of my knowledge and ability all the information in this report is a true and accurate reflection of the regulatory monitoring performed.

Glossary of acoustic terminology

dB(A)	A unit of measurement, decibels(A), of sound pressure level which has its frequency characteristics modified by a filter ("A-weighted") so as to more closely approximate the frequency response of the human ear.
L₁	The noise level which is equalled or exceeded for 1% of the measurement period. L ₁ is an indicator of the impulse noise level, and is used in Australia as the descriptor for intrusive noise (usually in dBA).
L₁₀	The noise level which is equalled or exceeded for 10% of the measurement period. L ₁₀ is an indicator of the mean maximum noise level, and is used in Australia as the descriptor for intrusive noise (usually in dBA).
L₉₀	The noise level which is equalled or exceeded for 90% of the measurement period. L ₉₀ is an indicator of the mean minimum noise level, and is used in Australia as the descriptor for background or ambient noise (usually in dBA).
L_{eq}	The equivalent continuous noise level for the measurement period. L _{eq} is an indicator of the average noise level (usually in dBA).
L_{max}	The maximum noise level for the measurement period (usually in dBA).



Note: *The subjective reaction or response to changes in noise levels can be summarised as follows:*

A 3 dB(A) increase in sound pressure level is required for the average human ear to notice a change; a 5 dB(A) increase is quite noticeable and a 10 dB(A) increase is typically perceived as a doubling in loudness

Monitoring Objective	<p>Annual reports will include where applicable:</p> <ul style="list-style-type: none"> • Details of noise complaints (excluding complainant name and identifying address details for reasons of confidentiality), received during the year, including outcomes of the complaint investigation and where applicable corrective actions implemented • Details of noise attenuation projects including effectiveness • Details of noise monitoring reports • Details of other noise minimisation activities • Assessment of the effectiveness of this noise management plan
Monitoring Plan	<p>This monitoring report complies with the Noise Management Plan approved on 25 October 2019 by the SA EPA.</p> <p>The Plan is available on the ABC Angaston Community Website: https://www.angastoncommunity.com.au/</p>

Noise Monitoring Reports

Vipac Acoustic Engineers & Scientists conducted noise monitoring in May 2021. The Vipac “Angaston Attended Noise Survey”, May 2021, 50B-21-0128-TRP-11983-2, 18 October 2021 report is summarised below

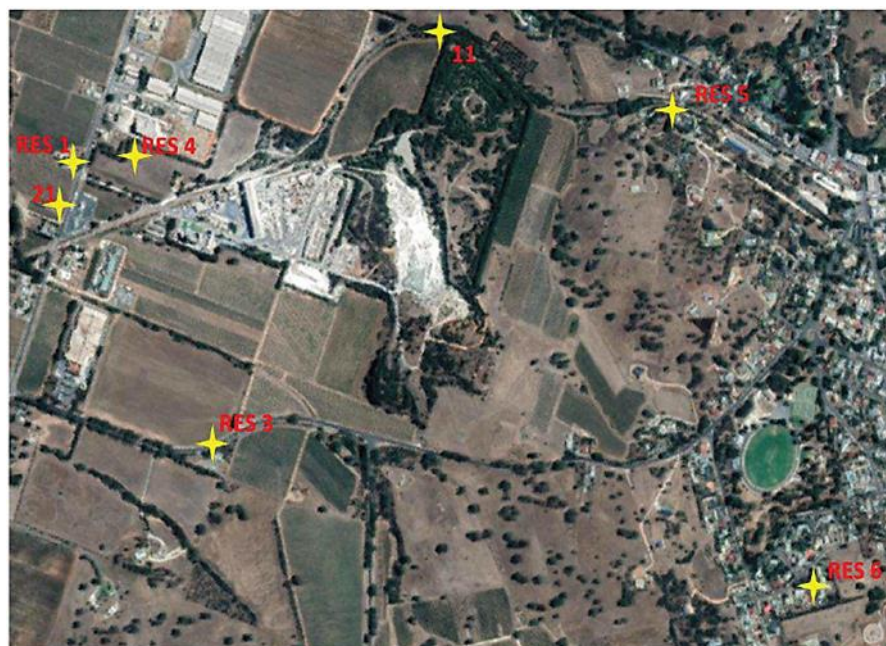
Site Noise Criteria

Noise from the activities undertaken at the ABC Angaston site is subject to the provisions of the Environment Protection (Noise) Policy 2007 (Noise EPP). The Noise EPP outlines Noise Goals which provide one method for demonstrating compliance with the General Environmental Duty under Section 25 of the Environment Protection Act 1993 (the Act).

ABC uses acoustic engineers, Vipac, to undertake attended noise monitoring surveys in the community to gain an understanding of how noise from the site impacts the community. Attended measurements have been conducted during the day-time and night-time periods (as defined by the Noise EPP), and defined measurement positions have been established allowing for trends in noise levels at each location to be established over time.

Location of attended noise measurements

Location ID	Location Description
Resident 1 (#20a)	Stockwell Rd opposite ABC main entrance at the Fibiger property (830-846 Stockwell Rd)
Resident 3 (#27a)	At resident’s house 300m west of the intersection of Crennis Mines Rd and Long Gully Rd
Resident 4 (#18)	Corner fence post on ABC boundary fence opposite large shed of neighbouring manufacturing firm, adjacent house
Resident 5	53 Fife Street (rear lawn facing Angaston) ¹
Resident 6	3 Hague Street, Angaston
#11	Near ABC plant entrance gate at the most northerly point of the boundary fence, alongside old railway line
#21	Stockwell Rd opposite the Gas distribution facility – next to ‘stobie’ pole



The following Indicative Noise Levels (INLs) apply to ABC's operations:

Receivers	Indicative Noise Levels (L_{eq} , dB(A))	
	Day-time (7am to 10pm)	Night-time (10pm to 7am)
Resident 1	60	52
Location #11	64	55
Location #21	60	52
Resident 3	60	52
Resident 4	62	54
Resident 5	55	47
Resident 6	52	45

Noise monitoring was undertaken by Vipac, 04 - 05 May 2021

The noise results for the daytime and night-time monitoring periods are shown in the following tables:

Day-Time Environmental Noise Survey Results

Receiver Location	Measured Noise Levels dB(A)		Comments	Assessment Criterion (Day-Time) dB(A)	Compliance
	L_{Aeq}	L_{A90}			
Resident 1 (02:55PM)	56	52	<ul style="list-style-type: none"> - Heavy influence due to traffic movements (dominant source) - Noise influence from road works on Stockwell Road - High noise influence from APA Compressor Station (continuously audible) - Plant just audible due to high extraneous noise (APA Station and traffic) 	60	<i>Complies</i>
Resident 3 (03:45PM)	71	42	<ul style="list-style-type: none"> - Very high traffic volumes observed, which influenced the measurements, as seen in the L_{Aeq} and L_{A90} measurements - Vipac considers L_{A90} to be an appropriate descriptor of noise from ABC plant, due to traffic noise influence - Where possible Vipac paused measurement during truck pass by, however, not paused for cars/utes pass-by. - Plant was inaudible 	60	<i>Does not comply</i> (Acceptable)

Receiver Location	Measured Noise Levels dB(A)		Comments	Assessment Criterion (Day-Time) dB(A)	Compliance
	L _{Aeq}	L _{A90}			
Resident 4 (02:35PM)	53	49	- Minor traffic noise and road works noise influenced the measurements - Plant slightly audible - Bird noise influence	62	<i>Complies</i>
Resident 5 (03:20PM)	46	38	- Minimum traffic noise influence - Dog barking at nearby property - Plant not audible - No tones detected	55	<i>Complies</i>
Resident 6 (04:40PM)	42	37	- No traffic noise influence - Plant not audible - Bird noise and dog barking influence	52	<i>Complies</i>
#11 (02:03PM)	41	35	- Traffic noise influence from nearby roads - Plant not audible	64	<i>Complies</i>
#21 (04:16PM)	65	47	- Very high traffic volumes observed, which influenced the measurements, as seen in the L _{Aeq} and L _{A90} measurements - Vipac considers L _{A90} to be an appropriate descriptor of noise from ABC plant, due to traffic noise influence - Where possible Vipac paused measurement during truck pass by, however, not paused for cars/utes pass by. - Noise influence from APA Compressor Station (continuously audible) - Plant was inaudible.	60	<i>Does not comply</i> (Acceptable)

With reference to the results presented above and the graphs presented in Appendix A, and the graphs presented in Appendix A of the Vipac report, Vipac notes makes the following comments:

- No tonal characteristic, resulting due to ABC plant operation, was observed at any NSR.
- The stipulated day-time criterion was achieved at all NSR's except **Resident 3** and **Location 21**.

- **Resident 3**
 - Noise due to traffic movements affected the day-time measurements at Resident 3. Therefore, L_{A90} descriptor was considered more appropriate to measure noise influence from ABC plant. Vipac notes that the L_{A90} levels were well below the day-time limits.
 - In addition to above, no audible noise from ABC plant was noted at this location.
 - As such, Vipac considers the noise influence from ABC to be **compliant** at this location.
- **Location #21**
 - Noise due to traffic movements on Stockwell Road and continuous operational noise from APA Station (pump/generator noise) affected the day-time measurements at Location 11.
 - Therefore, L_{A90} descriptor was considered more appropriate to measure noise influence from ABC plant. Vipac notes that the L_{A90} levels were well below the day-time limits.
 - In addition to above, no audible noise from ABC plant was noted at this location.
 - As such, Vipac considers the noise influence from ABC to be **compliant** at this location.

Overall, due to extraneous noise influence (traffic noise, APA Station noise, etc.) at most of the NSR locations, Vipac considers the L_{A90} descriptor to be more appropriate to measure noise influence from ABC plant for day-time measurements.

Night -Time Environmental Noise Survey Results

Receiver Location	Measured Noise Levels dB(A)		Comments	Assessment Criterion (Day-Time) dB(A)	Compliance
	L_{Aeq}	L_{A90}			
Resident 1	53	51	<ul style="list-style-type: none"> - Major noise influence from APA Compressor Station (dominant source). - The noise seemed to be continuous generator/pump noise from APA Station. - Plant slightly audible. 	52	<i>Minor Non-Compliance</i> (Acceptable)
Resident 3	39	36	<ul style="list-style-type: none"> - Minor influence due to distant traffic movements - ABC plant slightly audible - Some noise influence from CAPRAL plant due to internal car/truck movements. 	52	<i>Complies</i>

Receiver Location	Measured Noise Levels dB(A)		Comments	Assessment Criterion (Day-Time) dB(A)	Compliance
	L _{Aeq}	L _{A90}			
Resident 4	49	47	<ul style="list-style-type: none"> - Major noise influence from APA Compressor Station (dominant source). - The noise seemed to be continuous generator/pump noise from APA Station. - Plant slightly audible. 	54	<i>Complies</i>
Resident 5	42 ¹	29	<ul style="list-style-type: none"> - Plant not audible - Traffic noise slightly audible - 50Hz tone observed 	47	<i>Complies</i>
Resident 6	40	36	<ul style="list-style-type: none"> - The hydrator was operational at that time - Tree noise - Plant not audible - Distant traffic movements audible 	45	<i>Complies</i>
Resident 6 <i>(without hydrator working)</i>	40	36	<ul style="list-style-type: none"> - Hydrator was not operational during this measurement - Tree noise - Plant not audible - Distant traffic movements audible 	45	<i>Complies</i>
#11	42	37	<ul style="list-style-type: none"> - Distant traffic movement noise - Tree noise - Plant inaudible 	55	<i>Complies</i>
#21	45	43	<ul style="list-style-type: none"> - Major noise influence from APA Compressor Station (dominant source). - The noise seemed to be continuous generator/pump noise from APA Station. - Plant slightly audible. 	52	<i>Complies</i>

² 8 dB(A) penalty included for 2 noise characteristics. Discussed in sections below.

With reference to the results presented above and the graphs presented in Appendix A, Vipac notes makes the following comments:

- The stipulated night-time criterion at each residential receiver was achieved, except **Resident 1**, which showed minor-noncompliance (~1dB(A)).
- No tonal characteristic, resulting due to ABC plant operation, was observed at any NSR, except Resident 5 (50Hz tone). This is further discussed in **Section 5.3** of Vipac report.

- **Resident 1**
 - Major noise influence from APA Station across the road from Resident 1 was observed during the survey. Continuous generator/pump type noise was audible and was observed to be major noise source. The actual noise from ABC plant was not audible due to noise from APA station noise.
 - As such, the noise impact due to ABC plant operation is negligible as compared to noise impact due to APA Station. Therefore, Vipac considers ABC to be **compliant** against the night-time noise criterion at Resident 1 location.
- **APA Pump Station Noise Influence**
 - Compared to day-time noise survey, major noise influence from APA Station was observed during the night-time survey.
 - At the following locations, the APA Station was observed to be the dominant noise source
 - Resident 1
 - Resident 4
 - Location #21
 - At each of the above locations, a tonal component of 50Hz was also observed, which was associated with the APA Station. This was confirmed by an additional noise measurement conducted at 2m away from the APA Station boundary (L_{Aeq} 59 dB(A), L_{A90} 58 dB(A), with tonal component at 50Hz).
 - Based on our subjective observation, the Station noise sounded similar to characteristic pump and generator noise.
- **Resident 6**

Based on the information provided by ABC in regard to noise issues in the areas around Resident 6, Vipac conducted 2-sets of measurements at this location, one with the hydrator on and one without the hydrator operational.

 - The measurements showed no apparent difference between the noise levels with and without the hydrator operational.
 - There was no difference in the measured L_{Aeq,15min} and L_{A90} noise level descriptors.
 - No tonal or low frequency components were observed in both cases.
 - The octave-band data is presented below. The Octave band data shows no significant change in the levels. 16Hz frequency shows a decrease in levels once the Hydrator was switched ON, which may have been associated with the ambient noise sources.

Octave band data for Resident 6 measurements

Resident 6	L _{Aeq,15min} Octave Band Data										
	16H z	31.5 Hz	63H z	125 Hz	250 Hz	500 Hz	1kH z	2kH z	4kH z	8kH z	16kH z
Hydrator OFF	57	48	44	39	37	35	35	31	29	25	18
Hydrator ON	51	44	42	39	37	36	35	32	30	25	17

Vipac notes that the ABC has installed an attenuator (silencer) on the hydrator to ensure the noise levels are kept to the minimum. Since installed (10+ years), the attenuator is maintained regularly, including regular cleaning and unblocking any material build up in the attenuator. Also, considering the separation between the hydrator and Resident 6, it is considered unlikely that the Hydrator or any other equipment/machinery at ABC would be audible at this location. However, unfavourable wind conditions (high wind speeds blowing from ABC towards Resident 6) may result in faint noise influence at this location, which is not expected to occur more than a few times a year.

As such, considering the factors discussed above and summarised below, Vipac believes that ABC have implemented all reasonable and practicable measures to reduce the noise impact to the resident, and hence, satisfies the General Environmental Duty applicable under Section 25 of the Act **Error! Reference source not found..**

- Installation of an attenuator.
- Regular maintenance of the attenuator and the hydrator fan
- Large separation between the resident and the ABC plant
- Few events of minimal noise influence observed at that location during unfavourable wind conditions (possibly). Vipac believes that the noise experienced by the resident may be associated with a different source.
- No difference in noise levels observed by Vipac with and without the hydrator operating.

Summary of Results:

The monitoring results confirm that noise levels from the site operations comply with the indicative noise levels for:

- Day-time periods for all sensitive noise receivers except for two locations which are impacted by heavy traffic and other sources: Resident 3 (Traffic) and location 21 (Traffic and APA station).
- Night-time periods for all receivers.

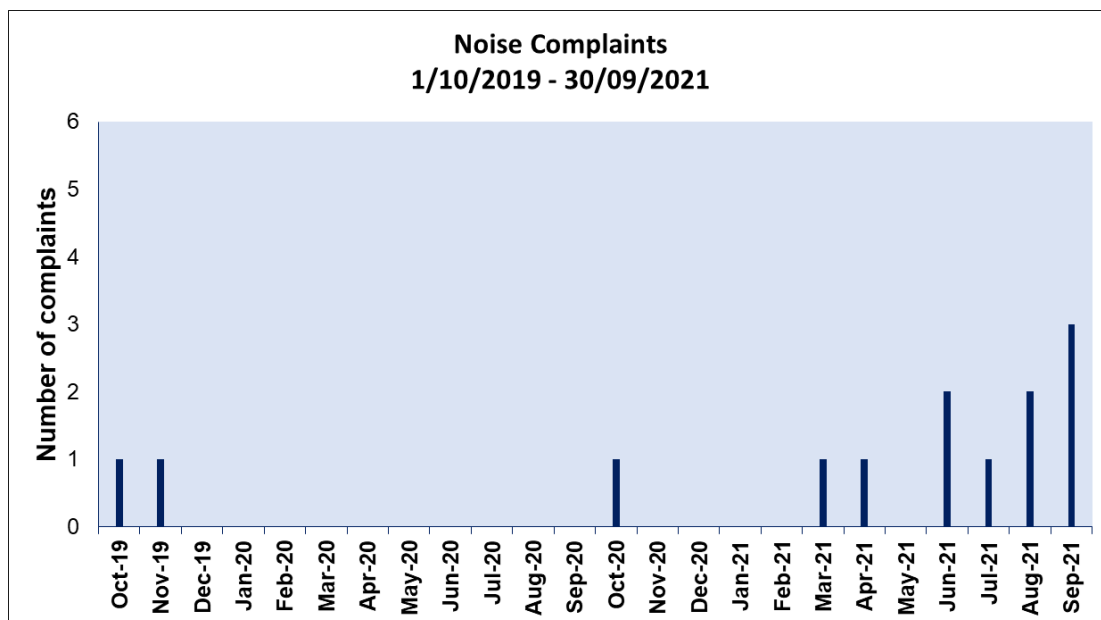
Noise complaints

Details of noise complaints for the reporting period (1/10/2020 – 30/9/2021) are summarised in the table below:

Date	Location	Description	Action Taken
14/10/2020 20:00	Smith Street Angaston	Noise - sounds like a jet engine taking off	Site inspection - no abnormal plant noise - hydrator shutdown in progress. Follow up call to resident after hydrator shutdown - noise was still present. Resident said noise was still present following morning at 7.40 am. Source unlikely to be ABC
12/03/2021 23:30	Hague Crescent Angaston	Loud deep rumbling or drumming noise	Resident sent email 2 days after the complaint. Noise started 11.30 pm - 1.45 am. A power dip tripped plant at 6.45 pm on 12/3/21. Plant was restarted from 6.45 pm to 11.45 pm. Noise may have been associated with plant starting up - unable to confirm if this was the source.
17/04/2021 00:30	Stockwell Road Angaston	Loud Banging noise	Investigated - possibly related to clearing blockages in Kiln-3 doing (ring shoots)
07/06/2021 03:00	North street Angaston	Resident upset about a noise she could hear	Resident and employee went to main street of Angaston (bottom pub car park) to listen to the noise. Noise may be related to hydrator running. Resident is located as the crow flies, about 2.6km, almost due East from the site Conditions at the time indicate the light winds were not blowing towards the resident. Recent Vipac noise survey indicates noise from plant operations is compliant with the night-time EPA noise policy guidelines
26/06/2021 20:25	North street Angaston	Droning noise, can be heard inside home	Investigation at the time of the complaint found a very faint noise could be heard near the resident's property - sounded like the hydrator. Noise was not audible in main street of Angaston (much closer to the plant). Recent Vipac noise survey indicates noise from plant operations is compliant with the night-time EPA noise policy guidelines
27/07/2021 21:26	Hauge Crescent Angaston	Droning noise	Complaint received via email after the event. Normal plant operation and Hydrator was running steadily at the time of the complaint
07/08/2021 11:45	Anonymo us	Droning noise	Hydrator was in the process of being run out and turned off. Asked resident to ring back in half hour if he could still hear the noise. Resident rang back to inform that the noise had gone.
28/08/2021 21:55	North street Angaston	Noise from plant very loud last night - could not sleep and loud again tonight	Hydrator was running between 3 am on the 28/8/21 to 1.30 am 29/9/21. On both nights the wind was not blowing across the plant towards the resident. Recent Vipac noise survey indicates noise from plant operations is compliant with the night-time EPA noise policy guidelines

Date	Location	Description	Action Taken
01/09/2021 19:45	Hauge Crescent Angaston	Complaint about noise from plant	Normal plant operation at the time. Hydrator was running steadily and in normal operation.
08/09/2021 16:50	Fife Street Angaston	Droning noise over last 3 weeks	Normal plant operation at the time. Hydrator is running steadily and in normal operation.
30/09/2021 12:10	Fife Street Angaston	Dull Drone noise	Travelled to location and assessed noise. Noise was present, however, faint, and intermittent. Hydrator was running Recent Vipac noise survey indicates noise from plant operations is compliant with the EPA noise policy guidelines

Complaints for the last two reporting years are shown in the graph below.



The complaint data indicates that some of the noise complaints may possibly be related to the operation of the hydrator.

Independent noise monitoring confirms that the site is compliant with Environment Protection (Noise) Policy 2007.

Independent noise assessment also indicates there is no apparent difference between the noise levels with and without the hydrator operational.

**Noise
Abatement
Projects**

No noise abatement projects have been identified as noise measurements confirm, noise levels from the site comply with the day-time and night-time criterion applicable under the Noise EPP, for all noise sensitive receivers.

<p>Noise Minimisation Activities</p>	<p>ABC developed a Noise Management Plan for the Angaston site, which was approved on 25 October 2019 by the SA EPA.</p> <p>The plan outlines how ABC assesses and manages the impacts of noise generated at the Angaston site, with the aim of ensuring that</p> <ul style="list-style-type: none"> • Noise impacts are considered as part of routine operations • Noise emissions are controlled at source by good operational practices, physical and management controls • Appropriate, reasonable and practicable measures are taken to reduce noise emissions from the site and the impact on nearby receptors in the local community <p>Ongoing daily management of operational activities to minimise the impact of noise emissions on sensitive receptors includes:</p> <ul style="list-style-type: none"> • Maintenance of plant and equipment to minimise unnecessary noise emissions • Employees and contractors are aware of site noise requirements and their responsibilities to take action to minimise and prevent noise complaints • Ensuring that potential noise impacts are assessed and mitigated when plant modification and equipment changes are made • Investigation of noise complaints and implementation of corrective/preventative action <p>Given the occasional noise complaints that appear to be possibly related to the operation of the hydrator, ABC is investigating if there are additional, reasonable and practical noise attenuation options that may be able to be applied to the already installed attenuator and muffler box to further attenuate noise emissions from the hydrator.</p>
<p>Plan Effectiveness</p>	<p>Noise levels from the site operations comply with the indicative noise levels for:</p> <ul style="list-style-type: none"> • Day-time periods for all sensitive noise receivers except for two locations which are impacted by heavy traffic and other sources; Resident 3 (Traffic) and location 21 (traffic and APA station) • Night-time periods for all noise sensitive receivers. • The continuous improvement approach to managing noise emissions embodied in the Noise Management Plan is effective.
<p>Appendix</p>	<p>Vipac “Angaston Attended Noise Survey”, May 2021, 50B-21-0128-TRP-11983-2, 18 October 2021 . Report is provided as an attachment.</p>