

ATTACHMENT 12

NOISE REPORT

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ANNUAL NOISE COMPLIANCE TESTING OF PF FORMATION PTY LTD EXTRACTIVE INDUSTRY OPERATIONS

HITCHCOCK ROAD SAND PROJECT (JULY 2021 - APRIL 2022)

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1.0 CONSULTANT'S BRIEF

Koikas Acoustics Pty Ltd was engaged by PF Formation Pty Ltd to undertake noise compliance testing during the sand extraction operations for Hitchcock Road Sand Project in Maroota.

The assessment provides the following:

- a discussion of the applicable noise criteria at each site, and
- attended noise monitoring survey results.

Sand extractions have been undertaken in this area for many years. Koikas Acoustics has been advised that there have been no noise complaints received from the local community regarding the sand quarrying extraction works since periodic noise surveys commenced.

All monitoring procedures were done as per the requirements of the Project Approval of 3rd February 2009 and EPA Licence 3407.

Some measurements of sleep disturbance could not be taken 1 metre from a bedroom window. Sound level measurements were taken from the boundary. Measurements taken from the boundary were closer to the noise source and therefore louder compared to if measurements had been taken outside a bedroom window.



2.0 SITE DESCRIPTION

2.1 SITE LOCATION

The Hitchcock Road Sand Project site is bounded by:

- Old Northern Road along the East;
- Wisemans Ferry Road to the West (intersecting with the Old Northern Road to the North),
and
- Other rural properties to the South.

Refer to Figure 1 below for the project site extraction area.



Figure 1. Hitchcock Road Sand Project Site Area

2.2 HOURS OF OPERATION

The hours of operation are specified in the development consents and EPL's as shown in Table 1 below.

Table 1. Hours of Operation		
Activity	Day	Time [Hours]
Construction	Monday to Friday	0700 – 1800
	Saturday	0800 – 1300
	Sunday and Public Holiday	None
Quarrying and processing including overburden removal	Monday to Saturday	0700 – 1800
	Sunday and Public Holiday	None
Product Transportation	Monday to Saturday	0600 – 1800
	Sunday and Public Holiday	None
Maintenance	Monday to Saturday	0700 – 1800
	Sunday and Public Holiday	None

2.3 AMBIENT NOISE PROFILE OF THE NOISE MONITORING SITES (RECEIVERS)

The assessment site is located in a rural residential area. The main roads passing through this area being Old Northern Road and Wisemans Ferry Road carry light and heavy vehicles.

During the daytime, the perceived intrusiveness of noise from vehicles traversing along these roads whilst residents are inside or outside their homes is expected to be significantly greater compared to the noise of sand quarrying extraction activities.

2.4 MONITORING LOCATIONS

Noise monitoring was conducted in the Maroota area at the following locations:

1. Tornatola property Hitchcock Road (driveway);
2. Pignataro property (corner of Wisemans Ferry Road and Old Northern Road);
3. 4369 Old Northern Road, and
4. Maroota Public School (rear of school).

Jurds house (previously referred to as Location 3) has since converted from residential to commercial use only during business hours. As such, the nearest most sensitive residential receiver is location at 4369 Old Northern Road. The neighbours at 4360 Old Northern Road was considered a non-sensitive receiver by agreement.



3.0 NOISE CRITERIA

The noise criteria are specified in the project approval, EPA Licence 3407 and approved Noise Management Plan.

3.1 BACKGROUND NOISE

The noise criteria have been derived from previous noise surveys by undertaking long term ambient noise level measurements at a representative site. The background noise level was determined over consecutive 15 minute periods for one week. From this data of $L_{100,15 \text{ minutes}}$ noise levels, the 10 percentile lowest background noise levels were determined for each of the days. The rating background level was then determined by calculating the median value of the daily 10 percentile background noise levels for each of the three specific periods: daytime, evening and nighttime.

The rating background level result is used to determine the noise criteria applicable to the surrounding residential properties as per the Environment Protection Authority's (EPA) Noise Policy for Industry (NPfi) October 2017 assessment procedures.

The background noise level $L_{100, 15 \text{ minutes}}$ is normally determined in the absence of extraneous noise such as traffic, wind, rain, conversation, birds chirping, insect noise and unnatural increases in noise from distant sources due to local air movement. The EPA defines such sources as incidental noise which can cause the masking of offensive noise from a specific source. When traffic or other incidental noises cannot be excluded, then it is considered that these noise sources are part of the background noise.

3.2 EPA NOISE POLICY FOR INDUSTRY

Noise emission design targets have been referenced from the NSW Environmental Protection Authority Noise Policy (EPA) for Industry (NPfi). The NPfi replaces the former Industrial Noise Policy, also prepared by the EPA.

The NPfi is designed to assess environmental noise impacts associated with scheduled activities prescribed within the Protection of the Environment Operations Act 1997, Schedule 1. It is also used as a reference tool for establishing suitable planning levels for noise generated by mechanical plant and equipment and noise emission from commercial/industrial operations.

The guideline applies limits on the short-term intrusive nature of a noise or noise-generating



development (project intrusive noise level), as well as applying an upper limit on cumulative industrial noise emissions from all surrounding development/industry (project amenity noise level). The most stringent of the project intrusive noise level and project amenity noise level is applied as the **project noise trigger level**, which is a noise emission from a source or development site that would trigger a management response.

To determine which of the intrusive and amenity noise criteria is more stringent, the underlying noise metrics must be the same. As the intrusive noise level is defined in terms of an $L_{Aeq, 15 \text{ minutes}}$ and the amenity noise level is defined in terms of an $L_{Aeq, \text{Period}}$, a correction +3dB correction is applied to the project amenity noise level to equate the $L_{Aeq, \text{Period}}$ to $L_{Aeq, 15 \text{ minutes}}$.

3.3 NOMINATED NOISE CRITERIA

As per the approved Noise Management Plan June 2022, the following noise criteria were adopted:

Noise assessment location	Other locations covered	Day	Night 1	Night 1
		$L_{Aeq} (15 \text{ minute})$	$L_{Aeq} (15 \text{ minute})$	$L_{A1} (1 \text{ minute})$
1. R9 – Young, Hitchcock Road	R10 Tornatola	39	35	45
2. R5 - Pignataro	R6 Camilleri	42	35	45
3. R3 – Fire station/Jurd	R1 Hammond and R2 Hitchcock	40	35	45
4. R7 – Marrofa Public School	R6 Camilleri and R8 Portelli	36($L_{Aeq}(1 \text{ hour})$)	N/A	N/A

Note 1: Night time is defined as the period between 10.00pm and 7.00am. Activities on the site start at 6.00am and are completed by 6.00pm. There is no activity on the site during the evening period.



4.0 NOISE SURVEYS

4.1 NOISE MONITORING PROCEDURES

All noise methodologies and equipment used, comply with the following Australian Standards:

- *AS1259.2-1990 "Acoustics - Sound Level Meters - Integrating - Averaging", and*
- *ISO 1996.2-2007 "Acoustics – Description, measurement and assessment of environmental noise" Part 2: Determination of environmental noise levels.*

All sound and noise level measurements were 'A' frequency weighted and 'Fast' time response.

4.2 ATTENDED NOISE MONITORING

Attended noise monitoring was conducted on the following days at each monitoring location below:

At Location 1 Tornatola Property Hitchcock Road (@ driveway)

21 st July 2021	Night-time hours
20 th July 2021	Daytime hours
19 th Oct 2021	Night-time hours
19 th Oct 2021	Daytime hours
21 st January 2022	Night-time hours
21 st January 2022	Daytime hours
20 th April 2022	Night-time hours
20 th April 2022	Daytime hours

At Location 2 Pignataro Property (corner of Wisemans Ferry Road and Old Northern Road)

21 st July 2021	Night-time hours
20 th July 2021	Daytime hours
19 th Oct 2021	Night-time hours
19 th Oct 2021	Daytime hours
21 st January 2022	Night-time hours
21 st January 2022	Daytime hours
20 th April 2022	Night-time hours
20 th April 2022	Daytime hours

At Location 3 - 4369 Old Northern Rd

21 st July 2021	Night-time hours
20 th July 2021	Daytime hours
19 th Oct 2021	Night-time hours
19 th Oct 2021	Daytime hours
21 st January 2022	Night-time hours
21 st January 2022	Daytime hours
20 th April 2022	Night-time hours
20 th April 2022	Daytime hours

At Location 4 Maroota Public School (rear of school)

20 th July 2021	Daytime hours
19 th Oct 2021	Daytime hours
21 st January 2022	Daytime hours
20 th April 2022	Daytime hours

The noise measurements taken from July 2021 to April 2022 were conducted with a Class 1 Svan 971 S/N 40412 Sound Level Meter and calibrated with a Svantek SV 33 Class 1 Acoustic Calibrator.



5.0 NOISE SURVEY RESULTS

Tables 2, 3, 4 and 5 refer to measured noise levels taken at locations 1, 2, 3 and 4 respectively for each monitoring period. At all sites, the measured L_{Aeq} was predominantly environmental sound sources. Quarry activities were generally either inaudible or barely audible. Exceeding levels were generally not from quarry activities.

Table 2. Location 1 Tornatola Property Hitchcock Road - Noise Survey Results [dB]					
Date	Applicable Criterion	Measured Noise Level	Measured LA90	Exceeding Criterion	Note
21 st July 2021 Night-time hours	35 $L_{Aeq,15min}$	51 $L_{Aeq,15min}$	45	16	Truck movements and other road traffic dominate background noise. Rustling leaves, Birds calling nearby
	45 $L_{A1,1min}$	63 $L_{A1,1min}$	49	18	
20 th July 2021 Daytime hours	39 $L_{Aeq,15min}$	53 $L_{Aeq,15min}$	44	14	Traffic noises including cars and trucks. Quarry noise not audible.
19 th Oct 2021 Night-time hours	35 $L_{Aeq,15min}$	54 $L_{Aeq,15min}$	43	19	Birds calling nearby. Background noise dominated by traffic including cars and trucks.
	45 $L_{A1,1min}$	59 $L_{A1,1min}$	40	14	
19 th Oct 2021 Daytime hours	39 $L_{Aeq,15min}$	51 $L_{Aeq,15min}$	42	12	Birds calling nearby. Background noise dominated by traffic including cars and trucks. Quarry noise audible between traffic lulls.
21 st January 2022 Night-time hours	35 $L_{Aeq,15min}$	53 $L_{Aeq,15min}$	39	18	Traffic dominates background noise including cars and trucks.
	45 $L_{A1,1min}$	59 $L_{A1,1min}$	42	14	
21 st January 2022 Daytime hours	39 $L_{Aeq,15min}$	47 $L_{Aeq,15min}$	36	8	Traffic including cars and trucks. Birds calling nearby. Dogs barking nearby. Quarry noise not audible.
20 th April 2022 Night-time hours	35 $L_{Aeq,15min}$	54 $L_{Aeq,15min}$	45	19	Traffic dominates background noise including cars and trucks. Birds calling nearby.
	45 $L_{A1,1min}$	60 $L_{A1,1min}$	44	15	
20 th April 2022 Daytime hours	39 $L_{Aeq,15min}$	53 $L_{Aeq,15min}$	41	14	Traffic including cars and trucks. Quarry noise not audible.

Table 3. Location 2 Pignataro Property - Noise Survey Results [dB]					
Date	Applicable Criterion	Measured Noise Level	Measured LA90	Exceeding Criterion	Note
21 st July 2021 Night-time hours	35 $L_{Aeq,15min}$	57 $L_{Aeq,15min}$	45	22	Trucks and other vehicle traffic dominate background noise. Rustling of leaves.
	45 $L_{A1,1min}$	67 $L_{A1,1min}$	42	22	
20 th July 2021 Daytime hours	42 $L_{Aeq,15min}$	57 $L_{Aeq,15min}$	46	15	Dogs barking nearby. Powertools being used nearby. Traffic noises including cars, trucks and motorbikes. Quarry noise barely audible between traffic noise.
19 th Oct 2021 Night-time hours	35 $L_{Aeq,15min}$	62 $L_{Aeq,15min}$	47	27	Birds calling nearby. Background noise dominated by traffic including cars and trucks.
	45 $L_{A1,1min}$	50 $L_{A1,1min}$	41	5	
19 th Oct 2021 Daytime hours	42 $L_{Aeq,15min}$	58 $L_{Aeq,15min}$	43	16	Background noise dominated by traffic including cars and trucks. Quarry noise audible between traffic lulls.
21 st January 2022 Night-time hours	35 $L_{Aeq,15min}$	69 $L_{Aeq,15min}$	42	34	Traffic dominates background noise including cars and trucks. Birds and insects calling nearby. Quarry activities were barely audible, not measurable.
	45 $L_{A1,1min}$	77 $L_{A1,1min}$	40	32	

21 st January 2022 Daytime hours	42 $L_{Aeq, 15min}$	61 $L_{Aeq, 15min}$	37	19	Traffic dominates background noise including cars and trucks. Birds calling nearby. Quarry noise audible between traffic noise.
20 th April 2022 Night-time hours	35 $L_{Aeq, 15min}$ 45 $L_{Aeq, 15min}$	67 $L_{Aeq, 15min}$ 80 $L_{Aeq, 15min}$	44 50	22 35	Traffic dominates background noise including cars and trucks. Quarry activities were inaudible.
20 th April 2022 Daytime hours	42 $L_{Aeq, 15min}$	64 $L_{Aeq, 15min}$	43	22	Truck and other vehicle traffic dominate background noise. Quarry noise barely audible in background.

Table 4. Location 3 - 4369 Old Northern Rd - Noise Survey Results [dB]

Date	Applicable Criterion Level	Measured Noise Level	Measured L_{Aeq}	Exceeding Criterion	Note
21 st July 2021 Night-time hours	35 $L_{Aeq, 15min}$ 45 $L_{Aeq, 15min}$	57 $L_{Aeq, 15min}$ 52 $L_{Aeq, 15min}$	44 44	22 7	Truck and other traffic dominate background noise. Birds calling nearby. Rustling of leaves
20 th July 2021 Daytime hours	40 $L_{Aeq, 15min}$	57 $L_{Aeq, 15min}$	44	17	Quarry noise barely audible. Traffic noise including cars and trucks.
19 th Oct 2021 Night-time hours	35 $L_{Aeq, 15min}$ 45 $L_{Aeq, 15min}$	57 $L_{Aeq, 15min}$ 73 $L_{Aeq, 15min}$	40 45	22 28	Birds calling nearby. Background noise dominated by traffic including cars, motorbikes and trucks. Ride on mower started for 3-4 minutes nearby.
19 th Oct 2021 Daytime hours	40 $L_{Aeq, 15min}$	59 $L_{Aeq, 15min}$	39	19	Birds calling nearby. Background noise dominated by traffic including cars and trucks. Quarry noise slightly audible between traffic lulls.
21 st January 2022 Night-time hours	35 $L_{Aeq, 15min}$ 45 $L_{Aeq, 15min}$	61 $L_{Aeq, 15min}$ 63 $L_{Aeq, 15min}$	37 42	26 18	Traffic dominated background noise including cars. Birds calling nearby.
21 st January 2022 Daytime hours	40 $L_{Aeq, 15min}$	58 $L_{Aeq, 15min}$	37	18	Traffic dominates background noise including cars and trucks. Birds calling nearby. Quarry noise audible between traffic noise.
20 th April 2022 Night-time hours	35 $L_{Aeq, 15min}$ 45 $L_{Aeq, 15min}$	60 $L_{Aeq, 15min}$ 73 $L_{Aeq, 15min}$	42 44	25 28	Traffic dominated background noise including cars and trucks.
20 th April 2022 Daytime hours	40 $L_{Aeq, 15min}$	61 $L_{Aeq, 15min}$	40	21	Traffic noise including cars and trucks. Quarry noise barely audible in distance.

Table 5. Location 4 Maroota Public School - Noise Survey Results					
Date	Applicable Criterion Level	Measured Noise Level	Measured LA90	Exceeding Criterion	Note
20 th July 2021 Daytime hours	36 L _{day,even}	57 L _{day,even}	49	21	Quarry noise audible. Sounds like hammering possibly coming from Dixon sandstone quarry. Traffic noise in background. Birds calling nearby.
19 th Oct 2021 Daytime hours		48 L _{day,even}	38	12	Bell Birds calling nearby. Traffic noise including cars and trucks. Quarry noise audible in background.
21 st January 2022 Daytime hours		52 L _{day,even}	47	16	Traffic dominates background noise including cars and trucks. Birds calling nearby. Quarry noise audible. Insects began calling nearby.
20 th April 2022 Daytime hours		50 L _{day,even}	44	14	Traffic noise includes cars and trucks. Quarry noise audible.

On account of the large distances between the sand quarrying extraction activities to the surrounding residential premises and the distant vehicular and other environmental sound sources, quarry activities are either inaudible or barely audible. When the noise in question is inaudible or barely audible, it is not possible to quantify the contribution of the noise source at those receiver locations. The noise criteria nominated by EPA Licence 3407, Minister of Planning approval and Table 9.1 of the approved Noise Management Plan June 2022 for the hours of operation were therefore not exceeded with the exception at 4 Maroota (Public School) on 20th July 2021.



6.0 CONCLUSIONS

Koikas Acoustics was requested to undertake noise measurements around the Hitchcock Road Sand Project sand quarrying extraction and processing quarry (from July 2021 to April 2022) and ascertain whether the quarry activities, (which include the extraction and processing works), exceed the nominated noise criteria as nominated by EPA licence 3407 and the project approval.

The results of the noise surveys show that the subject site extraction works generally complied with the nominated noise criteria.

At most receiver site locations, quarry activities are either barely audible or inaudible. The noise emanating from the quarry activities were not measurable on account of the higher noise contribution of environmental noise (birds chirping, insects, the rustling of leaves) and unnatural noise sources (distant cars and trucks traversing along the main roads).

Noise mitigation measures are therefore not warranted to be implemented for the subject quarry sites.

Koikas Acoustics, therefore, certifies that the subject Maroota Hitchcock Road Sand Project currently complies with the nominated noise criteria.



ATTACHMENT 13

AIR QUALITY REPORT

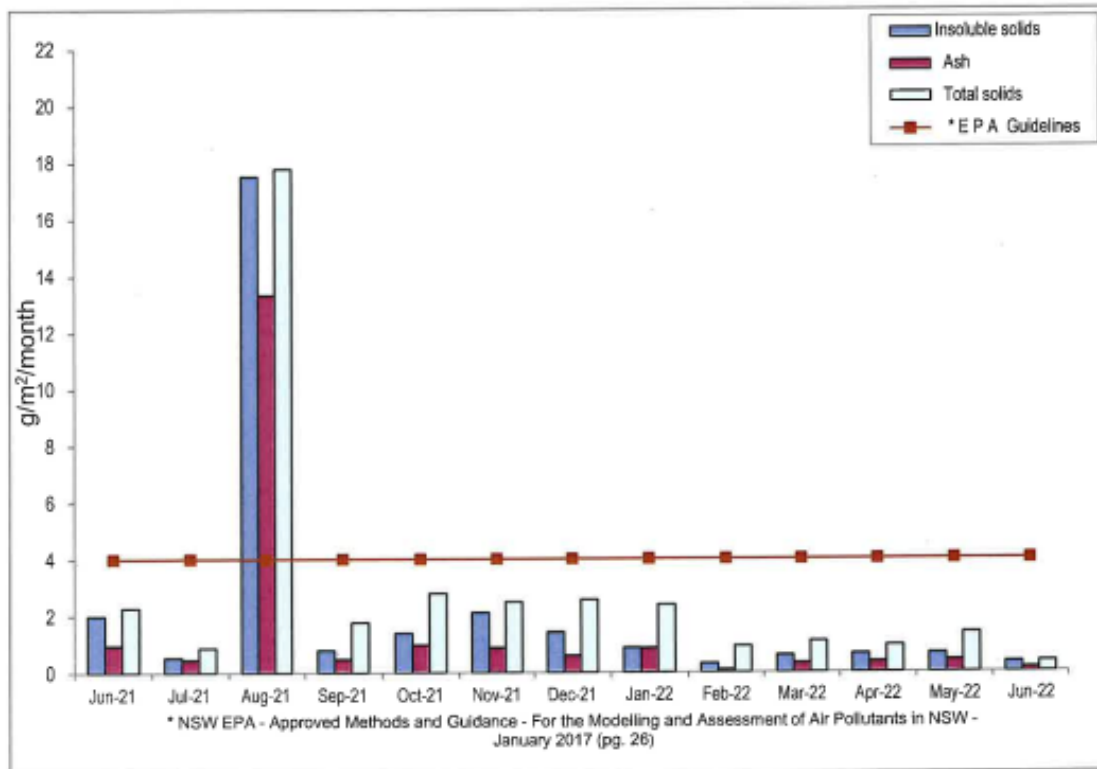


Boral Construction Materials
Boral Materials Technical Services

Dust Monitoring

P.F. Formation - Maroota Site 1
Maroota Public School

	Insoluble solids	Ash	* E P A Guidelines	Total solids
Jun-21	2.00	0.96	4	2.28
Jul-21	0.54	0.46	4	0.87
Aug-21	17.52	13.33	4	17.79
Sep-21	0.79	0.49	4	1.77
Oct-21	1.40	0.98	4	2.79
Nov-21	2.12	0.88	4	2.49
Dec-21	1.43	0.60	4	2.57
Jan-22	0.87	0.86	4	2.38
Feb-22	0.31	0.09	4	0.92
Mar-22	0.60	0.33	4	1.10
Apr-22	0.65	0.37	4	0.95
May-22	0.67	0.43	4	1.40
Jun-22	0.36	0.15	4	0.37



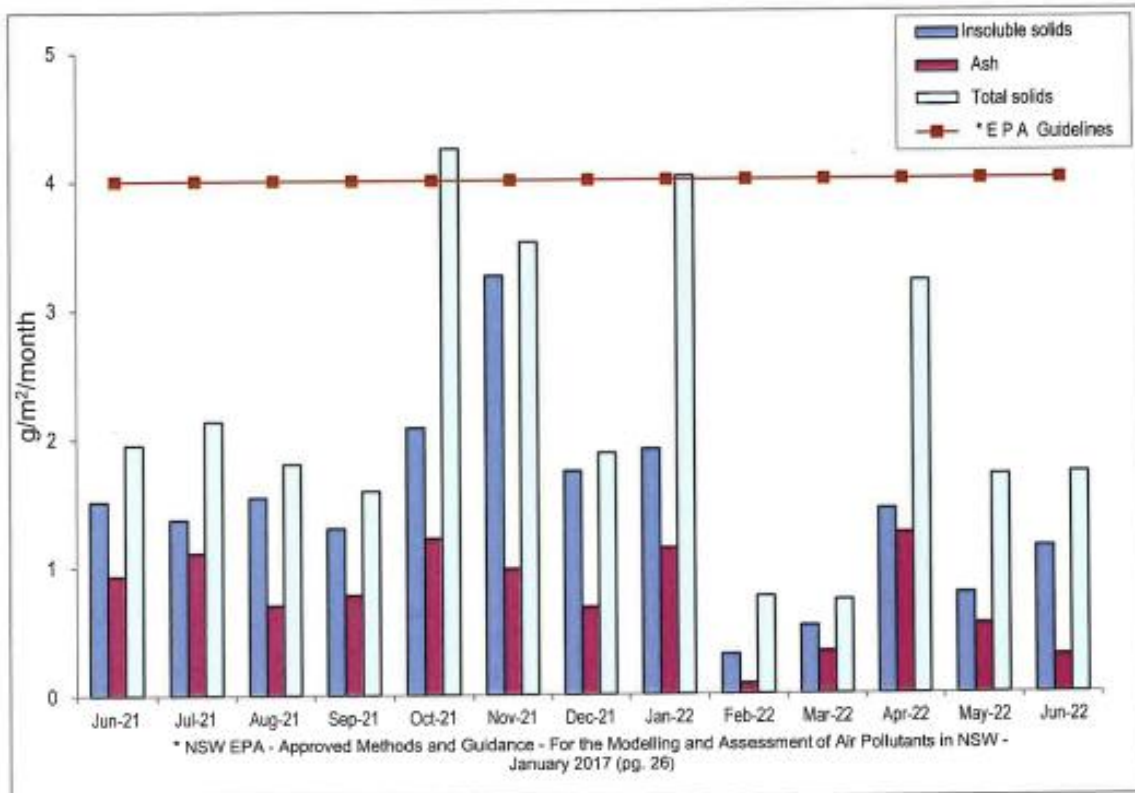


Boral Construction Materials
Boral Materials Technical Services

Dust Monitoring

P.F. Formation - Maroota Site 2
Hitchcock Road

	Insoluble solids	Ash	* E P A Guidelines	Total solids
Jun-21	1.51	0.93	4	1.95
Jul-21	1.37	1.11	4	2.13
Aug-21	1.54	0.70	4	1.80
Sep-21	1.30	0.78	4	1.59
Oct-21	2.08	1.22	4	4.25
Nov-21	3.26	0.98	4	3.52
Dec-21	1.74	0.68	4	1.88
Jan-22	1.91	1.14	4	4.03
Feb-22	0.31	0.08	4	0.76
Mar-22	0.53	0.33	4	0.73
Apr-22	1.44	1.25	4	3.21
May-22	0.78	0.54	4	1.70
Jun-22	1.14	0.29	4	1.71



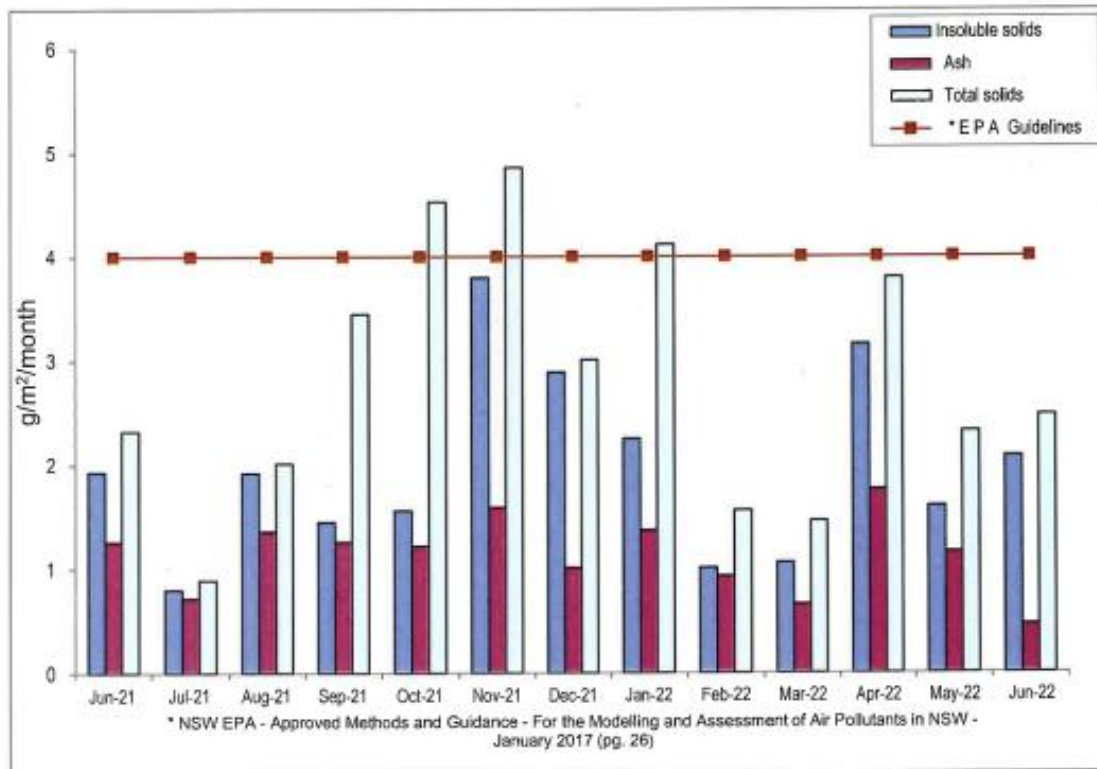


Boral Construction Materials
Boral Materials Technical Services

Dust Monitoring

P.F. Formation - Maroota Site 3
Jurd's House

	Insoluble solids	Ash	* E P A Guidelines	Total solids
Jun-21	1.93	1.26	4	2.32
Jul-21	0.80	0.72	4	0.89
Aug-21	1.92	1.36	4	2.01
Sep-21	1.45	1.26	4	3.45
Oct-21	1.56	1.22	4	4.53
Nov-21	3.80	1.59	4	4.86
Dec-21	2.89	1.01	4	3.01
Jan-22	2.25	1.37	4	4.12
Feb-22	1.01	0.93	4	1.56
Mar-22	1.06	0.66	4	1.46
Apr-22	3.16	1.76	4	3.80
May-22	1.60	1.16	4	2.32
Jun-22	2.08	0.47	4	2.48



ATTACHMENT 14

**GROUND WATER
MANAGEMENT REPORT**