

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 2022 - JULY 2023)

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ANNUAL NOISE COMPLIANCE TESTING
OF PF FORMATION PTY LTD EXTRACTIVE INDUSTRY OPERATIONS
HITCHCOCK ROAD SAND PROJECT
(JULY 2022 – JULY 2023)

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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 the 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.

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.

The site locations are shown below in Figure 2.



Figure 2. Monitoring site locations (image source – Google Maps)

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 2
		$L_{Aeq} (15 \text{ minute})$	$L_{Aeq} (15 \text{ minute})$	$L_{A1} (1 \text{ minute})$
1. R9 – Young, Hitchcock Road	R10 Tomatola	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 – Maroota 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 2022	Night-time hours
21 st July 2022	Daytime hours
21 st Oct 2022	Night-time hours
21 st Oct 2022	Daytime hours
30 th Jan 2023	Night-time hours
30 th Jan 2023	Daytime hours
27 th April 2023	Night-time hours
27 th April 2023	Daytime hours
18 th July 2023	Night-time hours
18 th July 2023	Daytime hours

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

21 st July 2022	Night-time hours
21 st July 2022	Daytime hours
21 st Oct 2022	Night-time hours
21 st Oct 2022	Daytime hours
30 th Jan 2023	Night-time hours
30 th Jan 2023	Daytime hours
27 th April 2023	Night-time hours
27 th April 2023	Daytime hours
18 th July 2023	Night-time hours
18 th July 2023	Daytime hours

At Location 3 - 4369 Old Northern Rd

21 st July 2022	Night-time hours
21 st July 2022	Daytime hours
21 st Oct 2022	Night-time hours
21 st Oct 2022	Daytime hours
30 th Jan 2023	Night-time hours
30 th Jan 2023	Daytime hours
27 th April 2023	Night-time hours
27 th April 2023	Daytime hours
18 th July 2023	Night-time hours
18 th July 2023	Daytime hours

At Location 4 Maroota Public School (rear of school)

21 st July 2022	Daytime hours
21 st Oct 2022	Daytime hours
30 th Jan 2023	Daytime hours
27 th April 2023	Daytime hours
18 th July 2023	Daytime hours

The noise measurements taken from July 2022 to July 2023 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.

Date	Applicable Criterion	Measured Noise Level	Measured L_{Aeq}	Exceeding Criterion	Note
21 st July 2022 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	48 $L_{Aeq,15min}$ 44 $L_{A1,1min}$	33 34	13 -1	Background noise includes cars and trucks, planes overhead and dogs barking in the distance
21 st July 2022 Daytime hours	39 $L_{Aeq, 15min}$	53 $L_{Aeq, 15min}$	39	14	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise is barely audible in the distance between traffic noise.
21 st Oct 2022 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	52 $L_{Aeq,15min}$ 52 $L_{A1,1min}$	39 40	17 7	Background noise is predominantly traffic including cars and trucks. Birds calling nearby
21 st Oct 2022 Daytime hours	39 $L_{Aeq, 15min}$	52 $L_{Aeq, 15min}$	37	14	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise is not audible.
30 th Jan 2023 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	57 $L_{Aeq,15min}$ 58 $L_{A1,1min}$	48 48	22 13	Background noise is predominantly traffic including cars and trucks. Birds and insects calling nearby
30 th Jan 2023 Daytime hours	39 $L_{Aeq, 15min}$	50 $L_{Aeq, 15min}$	41	11	Background noise is predominantly traffic including cars and trucks
27 th April 2023 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	51 $L_{Aeq,15min}$ 46 $L_{A1,1min}$	40 40	15 1	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise is audible in the background.
27 th April 2023 Daytime hours	39 $L_{Aeq, 15min}$	50 $L_{Aeq, 15min}$	40	11	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise is audible in the background.
18 th July 2023 Night-time hours	35 $L_{Aeq,15min}$ 45 $L_{A1,1min}$	51 $L_{Aeq,15min}$ 53 $L_{A1,1min}$	40 46	16 8	Background noise including cars and trucks
18 th July 2023 Daytime hours	39 $L_{Aeq, 15min}$	54 $L_{Aeq, 15min}$	44	15	Background noise is predominantly traffic including cars and trucks. Birds calling nearby.

Table 3. Location 2 Pignataro Property - Noise Survey Results [dB]					
Date	Applicable Criterion	Measured Noise Level	Measured LA90	Exceeding Criterion	Note
21 st July 2022 Night-time hours	35 LAeq,15min 45 LA1,1min	66 LAeq,15min 62 LA1,1min	42 44	31 17	Background noise including cars and trucks. Birds calling nearby. Frogs calling nearby
21 st July 2022 Daytime hours	42 LAeq,15min	71 LAeq,15min	49	18	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise is barely audible in the distance between traffic noise.
21 st Oct 2022 Night-time hours	35 LAeq,15min 45 LA1,1min	63 LAeq,15min 47 LA1,1min	41 47	28 12	Background noise is predominantly traffic including cars and trucks. Birds calling nearby.
21 st Oct 2022 Daytime hours	42 LAeq,15min	61 LAeq,15min	42	19	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. A tractor was working in the nearby paddock. Quarry noise was barely audible between traffic lulls.
30 th Jan 2023 Night-time hours	35 LAeq,15min 45 LA1,1min	65 LAeq,15min 56 LA1,1min	43 43	20 11	Background noise is predominantly traffic including cars and trucks. Birds and insects calling nearby
30 th Jan 2023 Daytime hours	42 LAeq,15min	66 LAeq,15min	44	24	Background noise is predominantly traffic including cars and trucks. Quarry noise was audible in the background.
27 th April 2023 Night-time hours	35 LAeq,15min 45 LA1,1min	68 LAeq,15min 65 LA1,1min	41 44	30 23	Background noise is predominantly traffic including cars and trucks. Birds calling nearby.
27 th April 2023 Daytime hours	42 LAeq,15min	65 LAeq,15min	48	23	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise was audible in the background.
18 th July 2023 Night-time hours	35 LAeq,15min 45 LA1,1min	67 LAeq,15min 60 LA1,1min	44 38	32 15	Background noise including cars and trucks. Birds calling nearby
18 th July 2023 Daytime hours	42 LAeq,15min	65 LAeq,15min	46	26	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise was barely audible in the distance between traffic noise.



Table 4. Location 3 - 4369 Old Northern Rd - Noise Survey Results [dB]					
Date	Applicable Criterion Level	Measured Noise Level	Measured LA90	Exceeding Criterion	Note
21 st July 2022 Night-time hours	35 L _{Aeq,15min} 45 L _{A1,1min}	62 L _{Aeq,15min} 55 L _{A1,1min}	40 34	37 10	Background noise is predominantly cars and trucks. Birds calling nearby.
21 st July 2022 Daytime hours	40 L _{Aeq,15min}	61 L _{Aeq,15min}	37	18	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Plane overhead. Quarry noise was barely audible in the distance.
21 st Oct 2022 Night-time hours	35 L _{Aeq,15min} 45 L _{A1,1min}	62 L _{Aeq,15min} 54 L _{A1,1min}	36 34	27 9	Background noise is predominantly traffic including cars and trucks.
21 st Oct 2022 Daytime hours	40 L _{Aeq,15min}	58 L _{Aeq,15min}	38	19	Background noise is predominantly traffic including cars and trucks. The quarry noise was not audible.
30 th Jan 2023 Night-time hours	35 L _{Aeq,15min} 45 L _{A1,1min}	60 L _{Aeq,15min} 44 L _{A1,1min}	40 41	15 -1	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise was barely audible
30 th Jan 2023 Daytime hours	40 L _{Aeq,15min}	60 L _{Aeq,15min}	41	21	Background noise is predominantly traffic including cars and trucks. Quarry noise was barely audible.
27 th April 2023 Night-time hours	35 L _{Aeq,15min} 45 L _{A1,1min}	60 L _{Aeq,15min} 60 L _{A1,1min}	37 41	25 15	Background noise is predominantly traffic including cars and trucks. Birds calling nearby.
27 th April 2023 Daytime hours	40 L _{Aeq,15min}	59 L _{Aeq,15min}	41	20	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise was audible in the background.
18 th July 2023 Night-time hours	35 L _{Aeq,15min} 45 L _{A1,1min}	62 L _{Aeq,15min} 80 L _{A1,1min}	42 44	45 17	Background noise including cars and trucks. Birds calling nearby. Quarry noise was audible from Roberts Road Quarry.
18 th July 2023 Daytime hours	40 L _{Aeq,15min}	60 L _{Aeq,15min}	44	21	Background noise is predominantly dominated by traffic including cars and trucks. Birds calling nearby. Quarry noise was audible



Table 5. Location 4 Maroota Public School - Noise Survey Results					
Date	Applicable Criterion Level	Measured Noise Level	Measured L ₉₀	Exceeding Criterion	Note
21 st July 2022 Daytime hours	36 L ₉₀ , 6-hour	45 L ₉₀ , 6-hour	41	9	Quarry noise audible. Traffic noise made up the background. Birds and frogs calling nearby.
21 st Oct 2022 Daytime hours		48 L ₉₀ , 6-hour	41	12	Traffic noise included cars and trucks. Birds calling nearby. School noise from children moving between classrooms. Quarry noise audible in the background.
30 th Jan 2023 Daytime hours		53 L ₉₀ , 6-hour	48	17	Quarry noise audible. Traffic noise included cars and trucks. Birds were calling nearby. School bell (music) and children yelling.
27 th April 2023 Daytime hours		48 L ₉₀ , 6-hour	40	12	Background noise is predominantly traffic including cars and trucks. Birds calling nearby. Quarry noise was audible in the background. Music playing within the school grounds
18 th July 2023 Daytime hours		55 L ₉₀ , 6-hour	45	19	Quarry noise was audible. Traffic noise included cars and trucks. Birds calling nearby.

On account of the large distances between the sand extraction activities to the surrounding residential premises, quarry noise activities are often not measurable because noise is either less than the prevailing background noise or, even when there are lulls in vehicular traffic, quarry activities were inaudible. Although the quarry activities were audible, this noise is expected to comply with the EPA-nominated noise criteria. Measured noise levels (predominantly that of traffic and other natural sound sources) are currently producing sound levels above the nominated noise criteria.

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 2022 to July 2023) 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 site extraction and processing work complies with the EPA-nominated noise criteria.

At most sites, quarry activities are either barely audible or inaudible and in most cases, the noise emanating from the site was found not to be measurable on account of the ambient background noise. The ambient background noise included birds chirping, insects singing, the rustling of leaves, cars and trucks traversing along the main roads, machinery utilised by residents and other domestic activities.

Based on the survey results and observations, there are no noise mitigation measures necessary to be implemented for any of the subject quarry sites.

Koikas Acoustics, therefore, certifies that the subject quarries currently comply with the EPA-nominated noise criteria despite that the measured noise levels (predominantly that of traffic and other natural sound sources) are currently producing sound levels above the nominated noise criteria on most days.



ATTACHMENT 13

AIR QUALITY REPORT

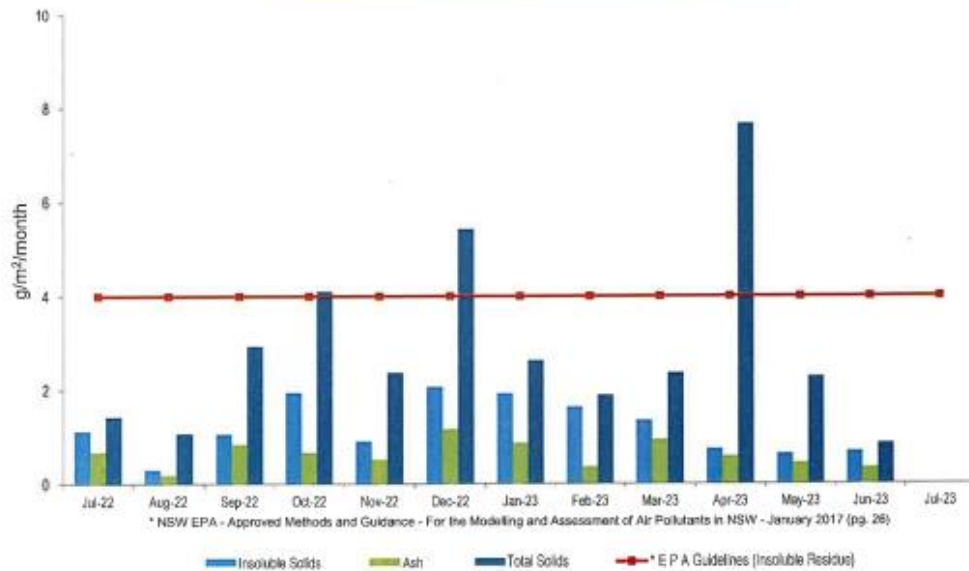


Boral Construction Materials
Boral Materials Technical Services

Dust Monitoring

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

Month	Insoluble Solids	Ash	* E P A Guidelines (Insoluble Residue)	Total Solids
Jul-22	1.12	0.68	4	1.43
Aug-22	0.30	0.19	4	1.07
Sep-22	1.06	0.84	4	2.93
Oct-22	1.95	0.67	4	4.10
Nov-22	0.91	0.52	4	2.37
Dec-22	2.07	1.16	4	5.42
Jan-23	1.93	0.87	4	2.63
Feb-23	1.64	0.38	4	1.89
Mar-23	1.35	0.94	4	2.36
Apr-23	0.74	0.59	4	7.67
May-23	0.64	0.44	4	2.28
Jun-23	0.69	0.34	4	0.86
Jul-23	0.00	0.00	4	0.00



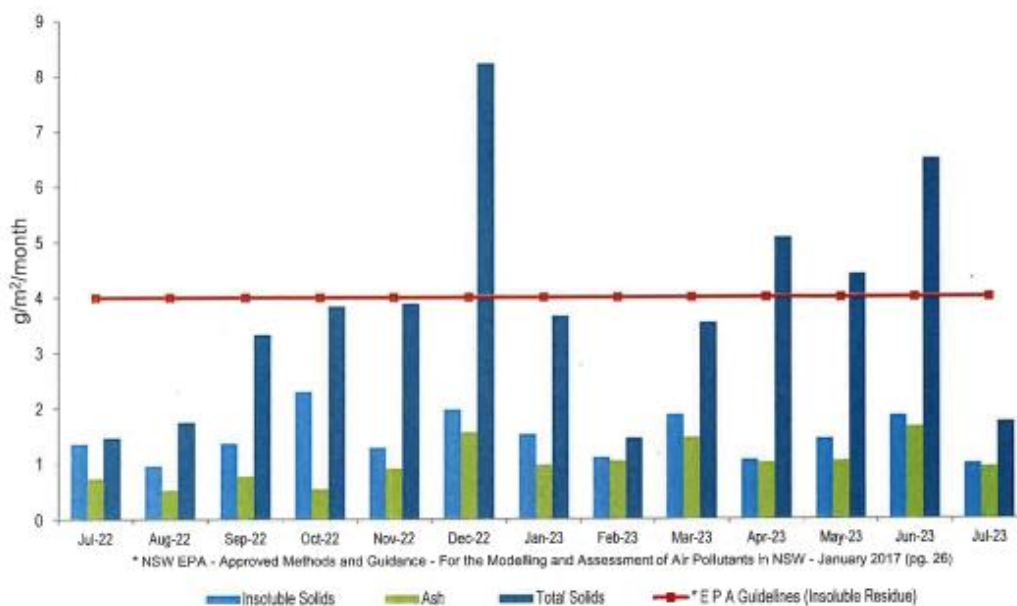


Boral Construction Materials
Boral Materials Technical Services

Dust Monitoring

P.F. Formation - Maroota
Hitchcock Road
Site 2

Month	Insoluble Solids	Ash	* E P A Guidelines (Insoluble Residue)	Total Solids
Jul-22	1.35	0.73	4	1.46
Aug-22	0.95	0.52	4	1.74
Sep-22	1.36	0.77	4	3.32
Oct-22	2.29	0.54	4	3.83
Nov-22	1.28	0.91	4	3.88
Dec-22	1.96	1.56	4	8.22
Jan-23	1.52	0.97	4	3.65
Feb-23	1.10	1.04	4	1.45
Mar-23	1.87	1.47	4	3.53
Apr-23	1.06	1.01	4	5.07
May-23	1.44	1.05	4	4.41
Jun-23	1.85	1.66	4	6.49
Jul-23	0.99	0.93	4	1.74



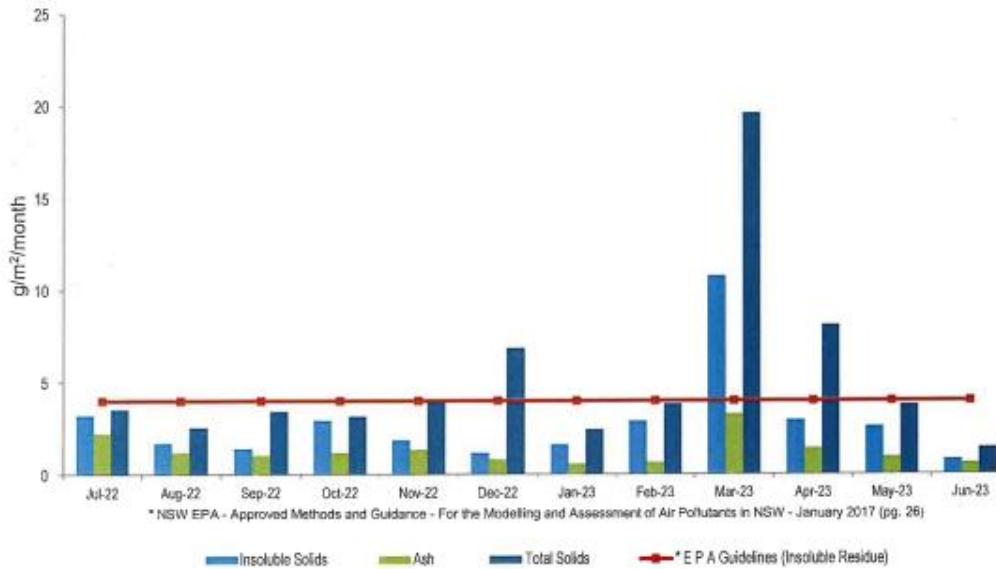


Boral Construction Materials
Boral Materials Technical Services

Dust Monitoring

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

Month	Insoluble Solids	Ash	* E P A Guidelines (Insoluble Residue)	Total Solids
Jul-22	3.19	2.21	4	3.51
Aug-22	1.68	1.20	4	2.53
Sep-22	1.38	1.03	4	3.42
Oct-22	2.93	1.18	4	3.14
Nov-22	1.85	1.34	4	3.94
Dec-22	1.16	0.81	4	6.84
Jan-23	1.60	0.58	4	2.43
Feb-23	2.88	0.65	4	3.81
Mar-23	10.77	3.26	4	19.6
Apr-23	2.94	1.41	4	8.10
May-23	2.60	0.60	4	3.76
Jun-23	0.79	0.60	4	1.43
May-23	1.65	0.95	4	1.77



ATTACHMENT 14

GROUND WATER MANAGEMENT REPORT