



# Boral Marulan Works POELA Act 2011 Monitoring Data for the 2017 calendar year

## Boral Cement Marulan, NSW

### Environmental Protection Licence No. 944

Explanation of units of measure:

mg/m<sup>3</sup> = milligrams per cubic metre

g/m<sup>2</sup>/month = grams per square metre per month

µg/m<sup>3</sup> = micrograms per cubic metre

mg/L = milligrams per litre

*Marulan South Lime Plant and Limestone Mine's webpage became live in July 2015. The monitoring data has been uploaded to the internet for public use first time in July 2015 (including historical data back to April 2012. Data is updated monthly.*

Record updated on 6<sup>th</sup> September 2017

**Compliance Summary:** The site is currently compliant with the Licence limits.

### 1. Annual Stack Monitoring

2016-17: Date of Kiln stack testing: 18 August 2016; Date of Hydrator stack testing: 1 September 2016; Report received: 21 September 2016; Date published: 10 November 2016

Assessable Parameter (mg/m <sup>3</sup> )	Licence Limit	2015-16	2016 -17		
<b>Emission Source: Kiln Stack (EPA identification Number: 11)</b>					
Solid Particulates	<b>100</b>	45	0.017		
Nitrogen Oxides	<b>2,000</b>	270	0.25		
<b>Emission Source: Hydrator Stack (EPA identification Number: 12)</b>					
Solid Particles Particulates	<b>100</b>	7.4	0.0028		

**Compliance summary:** Marulan plant is compliant with the Licence stack emission limits.

## 2. Ambient air monitoring

### 2.1 Dust Deposition Gauges: Total Insoluble Matter (g/m<sup>2</sup>month)

This test measures the levels of the coarse dust (generated mostly from unsealed roads, raw material handling, open stockpiles, etc.). It is a measure of dust *nuisance* (dust on cars, washing, window panes) in the immediate vicinity of the source, as the heavy dust settles quickly and doesn't travel far. It is not an indication of potential health problems as it doesn't penetrate into the respiratory system due to a large size of dust particles.

**Licence limit:** Not specified.

The NSW State guideline of 4 g/m<sup>2</sup>/month (presented as 12-month rolling average) was adopted as an internal indicator of site performance.

Date published: N/A

Report received on	For the month of	Report published on	Dust Deposition Gauges (g/m <sup>2</sup> /month as 12-month rolling average)	
			EPA ID No. 1 (Nearest Residence)	EPA ID No. 16 (Stores Paddock Hill)
N/A	January 2015	N/A	1.72	3.72
N/A	February 2015	N/A	1.61	3.38
N/A	March 2015	N/A	1.81	3.33
N/A	April 2015	N/A	1.83	3.40
N/A	May 2015	N/A	1.96	3.44
17/7/15	June 2015	10/08/15	2.16	3.59
21/8/15	July 2015	07/09/15	2.20	3.56
22/9/15	August 2015	06/10/15	2.15	3.34
23/10/15	September 2015	09/11/15	2.11	3.32
20/11/15	October 2015	10/12/15	2.30	3.33
21/12/15	November 2015	11/01/16	2.15	3.38
21/1/16	December 2015	08/02/16	2.53	3.95
19/2/16	January 2016	2/3/16	2.53	3.7
18/3/16	February 2016	29/3/16	2.50	2.88
22/4/16	March 2016	22/4/16	2.51	3.82
20/5/16	April 2016	20/5/16	2.43	3.7
24/6/2016	May 2016	24/6/16	2.25	3.9
27/7/16	June 2016	27/7/16	2.07	3.8
23/8/16	July 2016	23/8/16	2.12	3.8
2/9/16	August 2016	2/9/16	2.23	4.14
28/10/16	September 2016	28/10/16	2.33	4.3
23/11/16	October 2016	23/11/16	2.21	4.2

Report received on	For the month of	Report published on	Dust Deposition Gauges (g/m <sup>2</sup> /month as 12-month rolling average)	
21/12/16	November 2016	21/12/16	2.4	4.5
25/1/17	December 2016	25/1/17	2.5	7.50
21/2/17	January 2017	21/2/17	2.77	7.52
24/3/17	February 2017	24/3/17	2.88	7.70
20/4/17	March 2017	20/4/17	2.86	7.64
17/5/17	April 2017	17/5/17	2.94	7.85
20/6/17	May 2017	20/6/17	3.10	7.63
19/7/17	June 2017	19/7/17	3.26	8.15
22/8/17	July 2017	22/8/17	3.24	8.68

**Compliance Summary:** The site is not currently compliant with the adopted State Guideline, at EPA ID no.16 dust gauge. This gauge is located on the limestone premises and is used as an indicator to manage dust from operations. Further analysis of the dust has revealed that the majority of material was organic and likely to have been from windblown paddock grasses and bird depositions.

Dust Gauge EPA ID NO.1 at the nearest residence is compliant.

## 2.2 High Volume Air Sampling: PM<sub>10</sub> dust fraction

This test measures the levels of the fine dust suspended in the air (generated mostly from stack emissions). It is a measure of potential *health effects* (irritation of the respiratory track) as the small particles can penetrate into the airways and the lungs. Fine dust can persist in the atmosphere for days or even months before it settles and can travel some distance.

**Licence limits:** Not specified.

In absence of licence limits, the following guideline value was adopted:

- 24hr mean for PM<sub>10</sub> of 50 µg/m<sup>3</sup>, as per *National Environment Protection (Air Quality) Measure 2003*.

Date published: Not applicable (until end June 2015)

Sampling date	3/01/15	9/01/15	15/01/15	21/01/15	27/01/15	2/02/15	08/02/15	14/02/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	Motherboard failure	Motherboard failure	Motherboard failure	Motherboard failure	10.62	27.6	6.92	5.88

Sampling date	20/02/15	26/02/15	04/03/15	10/03/15	16/03/15	22/03/15	28/03/15	03/04/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	29.64	16.44	31.49	33.22	32.41	20.06	22.57	8.94

Sampling date	09/04/15	15/04/15	21/04/15	27/04/15	03/05/15	09/05/15	15/05/15	21/05/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	12.84	17.38	2.34	3.18	2.54	4.5	10.05	2.7

Sampling date	27/05/15	02/06/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	11.42	4.38

Data received from July 2015:

Sampling date	8/6/15	14/6/15	20/6/15	26/6/15	2/7/15	8/7/15	14/7/15	20/7/15
Report date	10/7/15	10/7/15	10/7/15	10/7/15	10/7/15	11/8/15	11/8/15	11/8/15
Upload date	10/8/15	10/8/15	10/8/15	10/8/15	10/8/15	07/09/15	07/09/15	07/09/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	4.51	19.19	2.35	4.98	3.02	152.41	42.03	4.40

Sampling date	26/7/15	1/8/15	7/8/15	13/8/15	19/8/15	25/8/15	31/8/15	6/9/15
Report date	11/8/15	11/8/15	11/9/15	11/9/15	11/9/15	11/9/15	11/9/15	20/10/15
Upload date	07/09/15	07/09/15	06/10/15	06/10/15	06/10/15	06/10/15	06/10/15	07/09/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	2.4	1.38	6.84	3.02	20.65	1.37	6.39	4.76

Sampling date	12/9/15	18/9/15	24/9/15	30/9/15	6/10/15	12/10/15	18/10/15	24/10/15
Report date	20/10/15	20/10/15	20/10/15	20/10/15	20/10/15	20/10/15	9/11/15	9/11/15
Upload date	07/09/15	09/11/15	09/11/15	09/11/15	09/11/15	09/11/15	10/12/15	10/12/15
PM <sub>10</sub> (µg/m <sup>3</sup> )	10.08	8.89	10.68	20.47	22.53	8.98	21.32	23.79

Sampling date	30/10/15	5/11/15	11/11/15	17/11/15	23/11/15	29/11/15	5/12/15	11/12/15
Report date	9/11/15	21/12/15	21/12/15	21/12/15	21/12/15	21/12/15	21/12/15	15/01/16
Upload date	10/12/15	11/01/16	11/01/16	11/01/16	11/01/16	11/01/16	11/01/16	08/02/16
PM <sub>10</sub> (µg/m <sup>3</sup> )	49.62	12.33	35.78	20.00	101.65	20.35	158.27	76.01

Sampling date	17/12/15	23/12/15	29/12/15	4/1/16	10/1/16	16/1/16	22/1/16	28/1/16
Report date	15/01/16	15/01/16	15/01/16	15/01/16	9/2/16	9/2/16	9/2/16	9/2/16
Upload date	08/02/16	08/02/16	08/02/16	08/02/16	10/3/16	10/3/16	10/3/16	10/3/16



PM <sub>10</sub> (µg/m <sup>3</sup> )	63.88	44.76	44.31	33.85	36.94	6.13	19.44	19.94
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Sampling date	3/2/16	9/2/16	15/2/16	21/2/16	27/2/16	4/3/16	10/3/16	16/3/16
Report date	9/2/16	14/3/16	14/3/16	14/3/16	14/3/16	19/4/16	19/4/16	19/4/16
Upload date	10/4/16	10/4/16	10/4/16	10/4/16	10/4/16	10/5/16	10/5/16	10/5/16
PM <sub>10</sub> (µg/m <sup>3</sup> )	25.18	34.7	38.28	16.97	9.83	34.41	49.13	10.48

Sampling date	22/3/16	28/3/16	3/4/16	9/4/16	15/4/16	21/4/16	29/4/16	3/5/16
Report date	19/4/16	19/4/16	19/4/16	19/4/16	13/5/16	13/5/16	13/5/16	13/5/16
Upload date	10/5/16	10/5/16	10/5/16	10/5/16	10/6/16	10/6/16	10/6/16	10/6/16
PM <sub>10</sub> (µg/m <sup>3</sup> )	3.92	16.95	21.54	29.43	28.66	16.16	23.33	6.69

Sampling date	9/5/16	15/5/16	21/5/16	27/5/16	2/6/16	8/6/16	14/6/16	20/6/16
Report date	22/6/16	22/6/16	22/6/16	22/6/16	22/6/16	22/6/16	19/7/16	19/7/16
Upload date	13/7/16	13/7/16	13/7/16	13/7/16	13/7/16	13/7/16	10/8/16	10/8/16
PM <sub>10</sub> (µg/m <sup>3</sup> )	2.96	9.68	58.18	2.28	5.66	1.01	15.04	1.86

Sampling date	26/6/16	2/7/16	8/7/16	14/7/16	20/7/16	26/7/16	1/8/16	7/8/16
Report date	19/7/16	19/7/16	19/7/16	12/8/16	12/8/16	12/8/16	12/8/16	13/9/16
Upload date	10/8/16	10/8/16	10/8/16	10/9/16	10/9/16	10/9/16	10/9/16	10/10/16
PM <sub>10</sub> (µg/m <sup>3</sup> )	10.05	4.61	10.50	3.41	1.75	2.78	1.83	15.59

Sampling date	13/8/16	19/8/16	25/8/16	31/8/16	6/9/16	12/9/16	18/9/16	24/9/16
Report date	13/9/16	13/9/16	13/9/16	13/9/16	13/9/16	28/10/16	28/10/16	28/10/16
Upload date	10/10/16	10/10/16	10/10/16	10/10/16	10/10/16	10/11/16	10/11/16	10/11/16
PM <sub>10</sub> (µg/m <sup>3</sup> )	7.38	25.42	4.46	9.10	22.52	15.06	12.76	6.93

Sampling date	30/9/16	6/10/16	12/10/16	18/10/16	24/10/16	30/10/16	5/11/16	11/11/16
Report date	28/10/16	28/10/16	28/10/16	28/10/16	18/11/16	18/11/16	18/11/16	18/12/16
Upload date	10/11/16	10/11/16	10/11/16	10/11/16	20/12/16	20/12/16	20/12/16	20/12/16

PM <sub>10</sub> (µg/m <sup>3</sup> )	3.34	7.61	2.23	3.96	9.09	15.24	16.36	23.98
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Sampling date	17/11/16	23/11/16	29/11/16	5/12/16	11/12/16	17/12/16	23/12/16	29/12/16
Report date	18/12/16	18/12/16	18/12/16	18/12/16	20/1/17	20/1/17	20/1/17	20/1/17
Upload date	20/12/16	20/12/16	20/12/16	20/12/16	10/2/17	10/2/17	10/2/17	10/2/17
PM <sub>10</sub> (µg/m <sup>3</sup> )	23.3	18.51	24.14	50.68	27.27	13.18	34.22	17.81

Sampling date	4/1/17	10/1/17	16/1/17	22/1/17	28/1/17	3/2/17	9/2/17	15/2/17
Report date	20/1/17	20/1/17	20/1/17	13/2/17	13/2/17	13/2/17	21/3/17	21/3/17
Upload date	10/2/17	10/2/17	10/2/17	10/3/17	10/3/17	10/3/17	10/4/17	10/4/17
PM <sub>10</sub> (µg/m <sup>3</sup> )	12.44	20.87	51.24	27.25	32.54	33.17	43.81	64.66

Sampling date	21/2/17	27/2/17	5/3/17	11/3/17	17/3/17	23/3/17	29/3/17	4/4/17
Report date	21/3/17	21/3/17	21/3/17	21/3/17	11/4/17	11/4/17	11/4/17	11/4/17
Upload date	10/4/17	10/4/17	10/4/17	10/4/17	10/5/17	10/5/17	10/5/17	10/5/17
PM <sub>10</sub> (µg/m <sup>3</sup> )	52.19	38.37	26.36	61.15	2.74	5.44	18.92	2.02

Sampling date	10/4/17	16/4/17	22/4/17	28/4/17	4/5/17	10/5/17	16/5/17	22/5/17
Report date	16/5/17	16/5/17	16/5/17	16/5/17	16/5/17	13/6/17	13/6/17	13/6/17
Upload date	10/7/17	10/7/17	10/7/17	10/7/17	10/7/17	10/7/17	10/7/17	10/7/17
PM <sub>10</sub> (µg/m <sup>3</sup> )	4.77	12.83	20.70	5.22	20.45	47.86	8.90	7.26

Sampling date	28/5/17	3/6/17	9/6/17	15/6/17	21/6/17	27/6/17	3/7/17	9/7/17
Report date	13/6/17	13/6/17	12/7/17	12/7/17	12/7/17	12/7/17	12/7/17	14/8/17
Upload date	10/7/17	10/7/17	10/8/17	10/8/17	10/8/17	10/8/17	10/8/17	10/9/17
PM <sub>10</sub> (µg/m <sup>3</sup> )	5.69	17.58	3.53	14.01	6.5	27.67	17.7	3.15



Sampling date	15/7/17	21/7/17	27/7/17	2/8/17	8/8/17			
Report date	14/8/17	14/8/17	14/8/17	14/8/17	14/8/17			
Upload date	10/9/17	10/9/17	10/9/17	10/9/17	10/9/17			
PM <sub>10</sub> (µg/m <sup>3</sup> )	6.73	15.97	26.88	8.04	3.87			

**Compliance Summary:** The plant does not have a Licence limit for air-suspended particulate. It is however compliant with the adopted National guideline value, except on 4 occasions, in December 2015. The source of the higher results is not related to the Marulan South Limestone quarry operations and on further investigations appears to be associated with specific local truck movements.

Results for 2016 are in compliance with the exception of 2 samples taken in March 2016 as well as a sample taken on the 21 May 2016 which exceeds the daily National Guideline value. A sample taken on the 5<sup>th</sup> December 2016 has also just exceeded the criteria. The weather conditions show that Marulan south is not likely to be the source.

Results for 2017 are in compliance with the exception of samples taken on the 16<sup>th</sup> January, 15<sup>th</sup> February, 21<sup>st</sup> February and 11<sup>th</sup> March 2017. The weather conditions show that Marulan South is not likely to be the source. Further investigation is continuing.

### 3. Water monitoring: North Pit Bore

Current Licence requirements cover quarterly monitoring of groundwater quality in the North Pit Bore (EPA Identification No. 13).

**Licence limits:** Not specified.

The NSW State guidelines: Typical discharge limits are as follows:

Oil and Grease: 10 milligrams per litre

Total Suspended Solids: 30-50 milligrams per litre.

Sampling date	Report received on	Report published on	Oil and Grease (mg/L)	Total Suspended Solids (mg/L)
24/03/15	01/04/15	N/A	6	42
23/06/15	08/07/15	08/07/15	<5	<5
02/09/15	28/09/15	06/10/15	<5	<5
01/12/15	22/12/15	11/01/16	<5	14
31/3/2016	14/4/16	10/5/16	<5	<5
30/6/16	12/7/16	10/8/16	<5	<5
9/9/16	28/9/16	28/9/16	<5	<5
13/12/16	16/1/17	10/2/17	<5	15



31/03/17	21/04/17	10/5/17	<1	156
26/6/17	13/7/17	10/8/17	<1	99

**Compliance Summary:** The plant does not have Licence limits for water parameters. It is however compliant with the adopted NSW guideline values.

**REPORT ENDS**