



# Opal Australian Paper Energy from Waste Feasibility Study – Air Quality Modelling Results

Update: 07/2021



## Air Quality Monitoring Results

This table details the results of the air quality impact assessment undertaken as part of the feasibility study into the adoption of Energy from Waste technology at Opal Australian Paper's Maryvale Pulp and Paper Mill. A separate Air Quality fact sheet explaining key aspects of the assessment is also available.

Substance & assessment	OAP Maryvale 2016	BoM LVA 2016	BoM LVA 2015	BoM LVA 2014	BoM LVA 2013	BoM LVA 2012
<b>Carbon monoxide:</b> SEPP(AQM) CO Design Criterion – 29,000 µg/m <sup>3</sup>						
Summary of CO results – all GLCs substantially less than the SEPP(AQM) design criterion						
CO, 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	2,527	2,559	2,036	6,343	ND	ND
CO, 99.9% 1h; grid maximum	1,607	1,616	1,490	3,432	ND	ND
CO, 90 <sup>th</sup> percentile grid result	1,489	1,490	1,264	3,432	ND	ND
CO, 99.9% 1h; discrete receptor maximum	1,488	1,497	1,268	3,432	ND	ND
<b>Nitrogen dioxide:</b> SEPP(AQM) NO <sub>2</sub> Design Criterion – 190 µg/m <sup>3</sup>						
Summary of NO <sub>2</sub> results – all GLCs substantially less than the SEPP(AQM) design criterion						
NO <sub>2</sub> , 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	95.6	79.3	93.4	84.1	84.3	69.1
NO <sub>2</sub> , 99.9% 1h; grid maximum	66.2	64.4	71.9	67.85	70.1	62.8
NO <sub>2</sub> , 90 <sup>th</sup> percentile grid result	50.8	50.8	55.6	50.76	54.5	49.0
NO <sub>2</sub> , 99.9% 1h; discrete receptor maximum	50.8	51.2	56.4	50.8	54.5	49.3
<b>Sulfur dioxide:</b> SEPP(AQM) SO <sub>2</sub> Design Criterion – 450 µg/m <sup>3</sup>						
Summary of SO <sub>2</sub> results – all GLCs substantially less than the SEPP(AQM) design criterion						
SO <sub>2</sub> , 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	167.0	169.7	155.7	122.4	192.5	230.5
SO <sub>2</sub> , 99.9% 1h; grid maximum	72.5	81.1	96.4	92.9	76.0	64.4
SO <sub>2</sub> , 90 <sup>th</sup> percentile grid result	70.6	70.9	85.2	89.1	70.6	60.9
SO <sub>2</sub> , 99.9% 1h; discrete receptor maximum	70.6	72.9	87.2	90.9	70.6	62.8
<b>Particulate matter 2.5 (PM<sub>2.5</sub>), at emission rate of 30 mg/m<sup>3</sup>(IED limit):</b> SEPP(AQM) PM <sub>2.5</sub> Design Criterion –50 µg/m <sup>3</sup>						
Summary of PM <sub>2.5</sub> results – 9 <sup>th</sup> highest GLCs above SEPP (AQM) design criterion, due to high background PM <sub>2.5</sub> levels						
PM <sub>2.5</sub> , 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	61.1	60.1	155.7	84.2	ND	ND
Background contribution	59.9	59.9	155.6	84.0	ND	ND
EfW contribution	1.2	0.2	0.3	1.6	ND	ND
PM <sub>2.5</sub> , 99.9% 1h; grid maximum	49.2	47.7	38.4	42.9	ND	ND
PM <sub>2.5</sub> , 90 <sup>th</sup> percentile grid result	47.1	47.1	37.6	40.3	ND	ND
PM <sub>2.5</sub> , 99.9% 1h; discrete receptor maximum	47.1	47.1	37.7	40.3	ND	ND

Substance & assessment	OAP Maryvale 2016	BoM LVA 2016	BoM LVA 2015	BoM LVA 2014	BoM LVA 2013	BoM LVA 2012
<b>Particulate matter 2.5 (PM<sub>2.5</sub>), at emission rate of 0.02 mg/m<sup>3</sup>, as per the average maximum in the Ricardo-AEA Report:</b> SEPP(AQM) PM <sub>2.5</sub> Design Criterion - 50 µg/m <sup>3</sup>						
Summary of PM <sub>2.5</sub> results - 9 <sup>th</sup> highest GLCs above SEPP (AQM) design criterion, due to high background PM <sub>2.5</sub> levels						
PM <sub>2.5</sub> , 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	61.1	60.1	155.7	84.1	ND	ND
PM <sub>2.5</sub> , 99.9% 1h; grid maximum	49.2	47.7	38.4	42.9	ND	ND
PM <sub>2.5</sub> , 90 <sup>th</sup> percentile grid result	47.1	47.1	37.6	40.3	ND	ND
PM <sub>2.5</sub> , 99.9% 1h; discrete receptor maximum	47.1	47.1	37.6	40.3	ND	ND
<b>Particulate matter 2.5 (PM<sub>2.5</sub>), for background PM2.5 (emission rate of zero mg/m<sup>3</sup>):</b> SEPP(AQM) PM <sub>2.5</sub> Design Criterion - 50 µg/m <sup>3</sup>						
Summary of PM <sub>2.5</sub> results - 9 <sup>th</sup> highest GLCs above SEPP (AQM) design criterion						
PM <sub>2.5</sub> , 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	59.9	59.9	155.6	84.0	ND	ND
PM <sub>2.5</sub> , 99.9% 1h; grid maximum	47.1	47.1	37.6	40.3	ND	ND
PM <sub>2.5</sub> , 99.9% 1h; discrete receptor maximum	47.1	47.1	37.6	40.3	ND	ND
<b>Ammonia:</b> SEPP(AQM) NH <sub>3</sub> Design Criterion - 600 µg/m <sup>3</sup>						
Summary of NH <sub>3</sub> results - all GLCs substantially less than the SEPP(AQM) design criterion						
NH <sub>3</sub> , 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	26.6	15.7	15.6	15.5	15.6	14.9
NH <sub>3</sub> , 99.9% 1h; grid maximum	10.0	14.4	13.8	13.7	14.0	13.2
NH <sub>3</sub> , 90 <sup>th</sup> percentile grid result	4.2	4.2	4.4	4.9	4.4	4.3
NH <sub>3</sub> , 99.9% 1h; discrete receptor maximum	4.6	5.1	5.1	5.6	5.2	4.8
<b>Dioxins and Furans:</b> SEPP(AQM) B(a)P Design Criterion - 3.7E-06 µg/m <sup>3</sup>						
Summary of DF results - all GLCs substantially less than the SEPP(AQM) design criterion						
DF, 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	8.9E-08	5.2E-08	5.2E-08	5.2E-08	5.2E-08	5.0E-08
DF, 99.9% 1h; grid maximum	3.3E-08	4.8E-08	4.6E-08	4.6E-08	4.7E-08	4.4E-08
DF, 90 <sup>th</sup> percentile grid result	1.4E-08	1.4E-08	1.5E-08	1.6E-08	1.5E-08	1.4E-08
DF, 99.9% 1h; discrete receptor maximum	1.5E-08	1.7E-08	1.7E-08	1.9E-08	1.7E-08	1.6E-08
<b>PAHs as B(a)P:</b> SEPP(AQM) B(a)P Design Criterion - 0.73 µg/m <sup>3</sup>						
Summary of B(a)P results - all GLCs substantially less than the SEPP(AQM) design criterion						
B(a)P, 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	0.012	0.007	0.007	0.007	0.007	0.007
B(a)P, 99.9% 1h; grid maximum	0.004	0.006	0.006	0.006	0.006	0.006
B(a)P, 90 <sup>th</sup> percentile grid result	0.002	0.002	0.002	0.002	0.002	0.002
B(a)P, 99.9% 1h; discrete receptor maximum	0.002	0.002	0.002	0.002	0.002	0.002
<b>Hexavalent chromium (highest risk metal):</b> SEPP(AQM) Cr(VI) Design Criterion - 0.17 µg/m <sup>3</sup>						
Summary of Cr(VI) results - all GLCs substantially less than the SEPP(AQM) design criterion						
Cr(VI), 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	0.136	0.080	0.080	0.079	0.080	0.076
Cr(VI), 99.9% 1h; grid maximum	0.051	0.073	0.070	0.070	0.071	0.067
Cr(VI), 90 <sup>th</sup> percentile grid result	0.021	0.022	0.023	0.025	0.023	0.022
Cr(VI), 99.9% 1h; discrete receptor maximum	0.024	0.026	0.026	0.029	0.026	0.025
<b>Cadmium (2nd-highest risk metal):</b> SEPP(AQM) Cd Design Criterion - 0.033 µg/m <sup>3</sup>						
Summary of Cd results - all GLCs less than the SEPP(AQM) design criterion						
Cd, 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	0.027	0.016	0.016	0.015	0.016	0.015
Cd, 99.9% 1h; grid maximum	0.010	0.014	0.014	0.014	0.014	0.013
Cd, 90 <sup>th</sup> percentile grid result	0.004	0.004	0.004	0.005	0.004	0.004
Cd, 99.9% 1h; discrete receptor maximum	0.005	0.005	0.005	0.006	0.005	0.005
<b>Mercury:</b> SEPP(AQM) Hg Design Criterion - 0.33 µg/m <sup>3</sup>						
Summary of Hg results - all GLCs substantially less than the SEPP(AQM) design criterion						
Hg, 99.9% 1h; 9 <sup>th</sup> -highest from 'Top 100 Table'	0.044	0.026	0.026	0.026	0.026	0.025
Hg, 99.9% 1h; grid maximum	0.017	0.024	0.023	0.023	0.023	0.022
Hg, 90 <sup>th</sup> percentile grid result	0.007	0.007	0.007	0.008	0.007	0.007
Hg, 99.9% 1h; discrete receptor maximum	0.008	0.009	0.008	0.009	0.009	0.008

- "SEPP (AQM): State Environment Protection Policy (Air Quality Management)"
- "ND: no data - no data available for this time period"
- "GLC: ground level concentration"
- "ug/m<sup>3</sup>: micrograms per cubic metre (1 microgram is one millionth of a gram)"