AIR QUALITY AND COCKBURN CEMENT LIMITED (CCL): FACT SHEET

About Cockburn Cement

Cockburn Cement Limited (CCL) manufactures cement and lime that is used in the construction, engineering, infrastructure and resource sectors. The manufacturing process includes controls to capture or treat emissions to air[1]. CCL's Munster plant activities are regulated by the Department of Water and Environment Regulation (DWER) via licence conditions that require:

- Air emissions monitoring
- Dispersion modelling, assessment and reporting
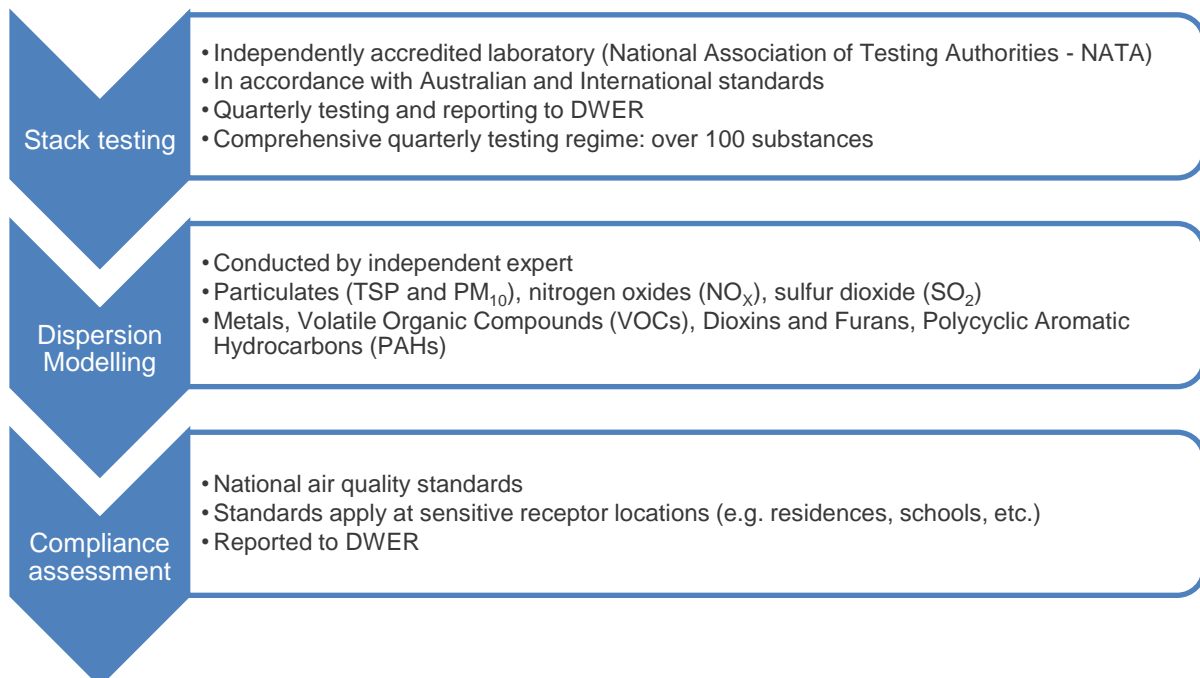- Compliance with strict limits
- Continuous improvement.

1. CCL AIR QUALITY MONITORING PROGRAM

As a part of CCL's emissions monitoring program, regular stack testing of all kilns at the Munster plant are undertaken. This is conducted to:

- Ensure the Munster plant's operations are within normal operating parameters;
- Assess compliance with licence emissions limits;
- Provide input to dispersion modelling.

The emissions monitoring program is regulated by DWER and gives confidence to all stakeholders: CCL, DWER and the community, that emissions from the plant meet all relevant air quality and health standards.

The emissions monitoring program encompasses three separate stages:

Stack testing
- Independently accredited laboratory (National Association of Testing Authorities - NATA)
- In accordance with Australian and International standards
- Quarterly testing and reporting to DWER
- Comprehensive quarterly testing regime: over 100 substances

Dispersion Modelling
- Conducted by independent expert
- Particulates (TSP and PM_{10}), nitrogen oxides (NO_X), sulfur dioxide (SO_2)
- Metals, Volatile Organic Compounds (VOCs), Dioxins and Furans, Polycyclic Aromatic Hydrocarbons (PAHs)

Compliance assessment
- National air quality standards
- Standards apply at sensitive receptor locations (e.g. residences, schools, etc.)
- Reported to DWER

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[1] Control technology includes baghouse filters on Kiln 5 and Kiln 6

2.   AIR QUALITY

Human activities and natural processes such as vehicle traffic and bushfires can produce emissions to air that, in elevated quantities, can affect human health. Air quality in the region around the Munster plant is very good by Australian and world standards. The levels of key air quality indicators are consistently better than the national standards.

Ambient air quality monitoring is conducted in Western Australia by DWER. The monitoring stations provide a *representative measure of the air quality likely to be experienced by the general population*[2]. A summary of monitoring results reported by DWER[3] is presented in the table below, comparing those results with the national ambient air quality standard (Air NEPM).

The DWER monitoring results show that all the measured levels comply with the national Air NEPM standards. Occasional exceedances of the PM_{10} standard are not due to urban activities, they are due to extreme events such as bushfires.

Emissions testing at the Munster plant is conducted on a quarterly basis by an independent, NATA accredited, stack sampling professional. CCL then engages an independent expert to conduct dispersion modelling, to predict the ground-level concentrations of those emissions. The dispersion modelling methodology was developed in consultation with WA EPA (now part of DWER) and complies with standard industry practice.

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[2] National Environment Protection (Ambient Air Quality) Measure
http://www.nepc.gov.au/nepms/ambient-air-quality
[3] 2016 Western Australia air monitoring report. Final version published July 2017. State of Western Australia. Available at: https://www.der.wa.gov.au/your-environment/air/203-air-quality-publications
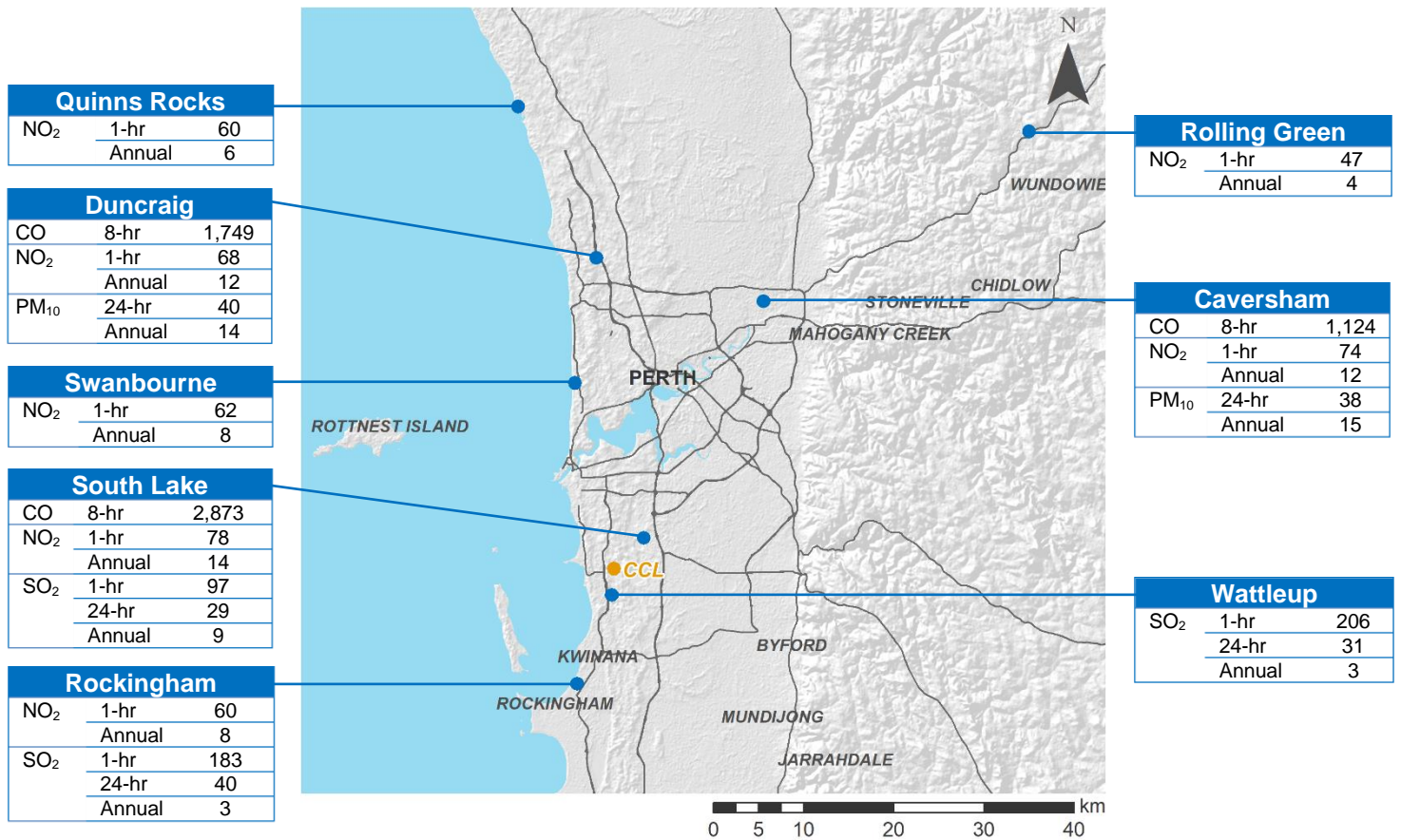
Figure 1   Maximum measured concentrations of substances in the Perth region (DWER)

Ambient concentrations that are reported in this fact sheet are in units of micrograms per cubic metre ($\mu g/m^3$), which is a measure of the mass of a substance within a given volume of air[4].

Results of the CCL Munster plant dispersion modelling since 2012 are summarised in the table below. The modelling has consistently shown that ground-level concentrations associated with emissions from the CCL Munster kilns comply with the national Air NEPM standards. Comparison with the DWER monitoring data in Figure 1 shows that the predicted ambient concentrations are lower than values measured in other areas in and around Perth.
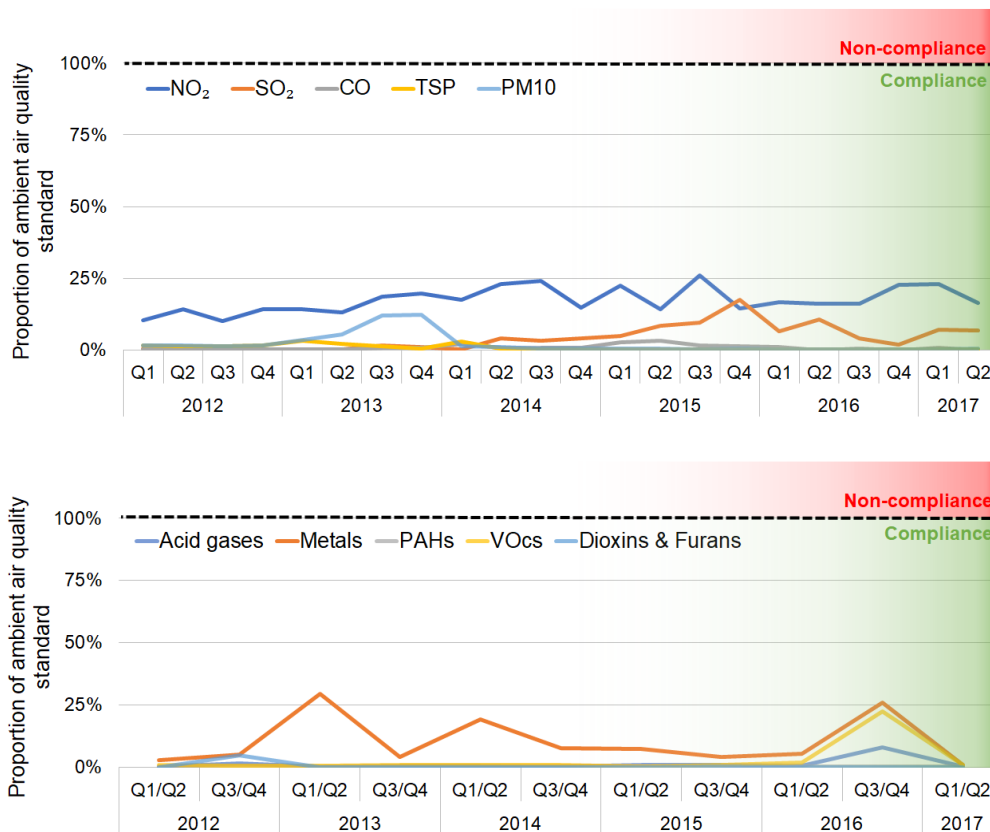
Table 1   Predicted concentrations due to operation of the CCL Munster kilns

Substance	Averaging period	NEPM standard	Maximum prediction
CO	8-hour	10,900	367
NO_2	1-hour	246	64
	Annual	62	2
SO_2	1-hour	570	100
	24-hour	228	22
	Annual	60	2
PM_{10}	24-hour Max	50	6
	Annual	25	0.5

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[4] 1,000 micrograms = 1 milligram

3. CCL'S MUNSTER PLANT TRACK RECORD OF COMPLIANCE

Predicted concentrations of substances associated with the Munster plant activities have, over many years, been found to be well below the national Air NEPM standards. The figures below present a summary of results since 2012.

4. AMBIENT AIR QUALITY STANDARDS

In accordance with CCL's environmental license, the CCL Munster plant emissions are assessed against the following national standards:

- National Environmental Protection (Ambient Air Quality) Measure (Air NEPM) (as amended 2016)
  - *The desired environmental outcome of this Measure is ambient air quality that allows for the adequate protection of human health and well-being.*
  - *Carbon monoxide, Nitrogen dioxide, Photochemical Oxidants (as Ozone), Sulfur Dioxide, Lead, Particles (as PM_{10} and $PM_{2.5}$)*
  - *Representative measure of the air quality likely to be experienced by the general population*
- National Environmental Protection (Air Toxics) Measure (2011)
  - *The national environment protection goal of this Measure is to improve the information base regarding ambient air toxics within the Australian environment in order to facilitate the development of standards*
  - *Benzene, Formaldehyde, Benzo(a)pyrene as a marker for Polycyclic Aromatic Hydrocarbons, Toluene and Xylenes (as total of ortho, meta and para isomers)*
- Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales (NSW EPA, 2016)
  - *Lists the statutory methods that are to be used to model and assess emissions from stationary sources in NSW*
  - *Comprehensive list of ambient air quality standards for substances*
  - *Commonly used in other jurisdictions that don't have specific criteria*

5. DISPERSION MODEL

In accordance with the requirements of DWER, an independent expert undertakes a dispersion modelling assessment of the Munster plant emissions on a quarterly basis. The results are reported to DWER on a quarterly basis each year.

The dispersion model has the following specifications:

- Ausplume v6.0 – developed by Environment Protection Authority Victoria, approved by DWER and widely used in Australia for regulatory purposes.
- The model is configured in accordance with the requirements of DWER.
- Concentrations are predicted across a 12 kilometre domain with one prediction made every 200 metres (Figure 2).
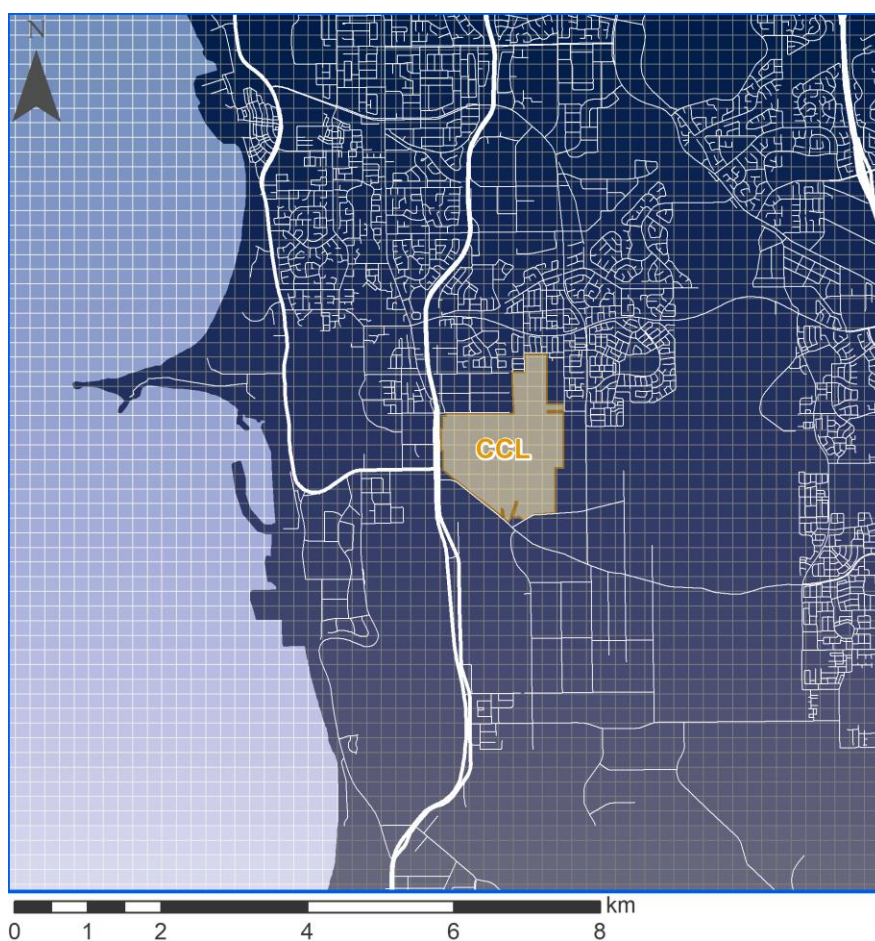

Figure 2   **Map of the modelling domain showing the CCL Munster plant and the 200 metre prediction grid**