Submission to the Australian Senate Inquiry: The Impacts on Health of Air Quality in Australia by Port Waratah Coal Services

1. Introduction

Port Waratah Coal Services (PWCS) is located in the Port of Newcastle and has been operating since 1976. PWCS provides coal receival, blending, stockpiling and ship loading services to the Hunter Valley Coal Chain. Port Waratah operates two terminals: Kooragang, which has the capacity to handle 108 million tonnes of coal per annum (mtpa) and Carrington, which has the capacity to handle 25mtpa. The nearest residential areas to PWCS operations include Fern Bay, Stockton, Carrington, Tighes Hill, Mayfield and Warabrook.

Due to increased demand from the Hunter Valley Coal Chain, PWCS currently has two expansion projects, both located on Kooragang Island. The Kooragang Expansion Project (KEP) has planning approval from the NSW Government and is expected to be completed later in 2013 and will increase the capacity of Kooragang Terminal by 12mpta. The second, known as Terminal 4 or the T4 Project, is located to the west of current operations on Kooragang Island and is designed to have the capacity to handle 70 mpta. The T4 Project is currently in Feasibility Stage, and is seeking planning approval from the NSW Government under Part 3A of the Environment Planning and Assessment Act (1979).

PWCS operates under several regulatory environmental approvals, licences and permits issued by the NSW Government which regulate the development's impact on air quality.

Due to the nature of the business – the handling of a dry bulk commodity – dust and air quality are key focus areas for employees, regulators and the community. PWCS welcomes the opportunity to make a submission to the Australian Senate Community Affairs Committee Inquiry into Impacts on Health of Air Quality in Australia.

2. Background to PWCS' Submission

PWCS notes that the terms of reference of the inquiry focus on the impacts on health of air quality in Australia including:

- Particulate matter, its sources and effects;
- Those populations most at risk and the causes that put those populations at risk;
- The standards, monitoring and regulation of air quality at all levels of government; and
- Any other related matters.

We would like to provide the following submission from the context of our operations. This submission has been prepared taking into account the following:

- This submission focuses on the offsite air quality impacts of PWCS' operations and not on issues associated with workplace health and safety.

- To support us in our decision-making, PWCS draws on a number of expert consultants to advise and report on matters pertaining to air quality and health. PWCS has drawn on some of this information in preparing this proposal, in particular the work of Dr Yvonne Scorgie, Senior Air Quality Scientist for Environ (15 years' experience), and Dr David McKenzie, a respiratory physician (30 years' experience).

- In terms of our operations, PWCS recognises particulate matter (TSP, PM_{10}, $PM_{2.5}$) is of most interest to community and regulators, and these particulates will form the focus of PWCS' submission.

- PWCS has developed this submission as a summary of all its operations and proposed projects (i.e. Kooragang Coal Terminal, Carrington Coal Terminal, KEP and the T4 Project). Most of the material referenced is from work undertaken for the T4 Project planning approval application as:

    - It is the most recent and comprehensive air quality assessment undertaken by PWCS;

    - It comprehensively reviewed the baseline environment , which includes current Kooragang and Carrington operations;

    - It considers other developments in the locality which have been proposed but not yet constructed in addition to the T4 project, to provide a complete view of cumulative ambient air quality;

    - Work undertaken has included both qualitative and quantitative assessments to consider impacts on amenity and health; and

    - The T4 Project is a topic of public debate and will possibly be raised as a part of the inquiry or by other submissions directly.

- It should be noted that the T4 Project is currently engaged in an approvals process through the NSW State Government. This includes a review and assessment of the project by two separate independent Planning Assessment Commission Panels. PWCS offers the information which has been collected as a part of that assessment to inform the Inquiry on general air quality issues, not to contribute to the determination on the acceptability of the T4 project.

3. Response to the Terms of Reference

3.1. Particulate matter, its sources and effects

PWCS believes that robust science must form the basis for both understanding and addressing the impacts on health due to air quality in Australia. Following a recent analysis

of air quality monitoring data from the Lower Hunter, the NSW Office of Environment and Heritage (OEH 2012:2) concluded that "overall air quality in the Lower Hunter is as good – or better than – air quality in Sydney and the Illawarra".

The National Pollutant Inventory (NPI) data for the 2009-2010 reporting period included 70 individual reporting sources within a 30km radius of the T4 Project area. Existing air quality was also influenced by natural sources, such as airborne sea salt and windblown dust. Regional events, such as dust storms and bushfires, contribute episodically to suspended particulate matter concentrations (EMM, 2012:225). A chemical analysis of $PM_{2.5}$ at Mayfield found its major components to be sea spray, soil, black carbon, ammonium sulphate and organics (ANSTO, 2008). Sources of black carbon are mainly generated from combustion processes (soot), but can also include carbon from coal dust (Nelson et al. 2007). ANSTO $PM_{2.5}$ chemical analysis between 1993 and 2010 at Mayfield show that over the monitoring period there was a decline in the elemental carbon (potentially including coal dust) and soil and an increase in the contribution of ammonium sulphate and sea salt. This composition analysis is expected to be indicative of the $PM_{2.5}$ composition across the broader region, with similar compositions measured at sites in Sydney and the Upper Hunter (ANSTO, 2008).

PWCS takes the maintenance of our social licence to operate seriously. We have developed targeted management strategies to minimise off-site dust emissions. These include, but are not limited to:

- Investment and implementation of an 'Intelligent Dust Management System' (IDMS) at Kooragang, Carrington and the proposed T4 Project. The IDMS consists of:
    - A Bureau of Meteorology 'dust risk' forecasting service
    - Characterisation of coal types by their inherent 'dustiness'
    - Dust risk rankings based on continuous onsite meteorological monitoring
    - Real time dust monitoring at site boundaries to monitor actual dust levels
    - Improved coal stockpile evaporation rate calculations
    - Improved coverage and faster cycle times for stockpile sprays
    - Real time internal notifications for high dust risk conditions and dust levels
    - Linking all the above into a continuous, automated, predictive and proactive dust management system.
- Enclosure of coal receival areas, coal transfer areas and conveyor systems where practical;
- Conveyor belt cleaning systems to remove fine material adhering to the conveyor belt;
- Sealing of main access roads, and progressive sealing of additional internal road networks;
- Sealing of wharf areas;
- Modification and review of dust generating activities under adverse conditions;
- Automated stockpile sprays linked to the IDMS;

- Operation of road sweepers and water-carts onsite;
- Extensive program of coal spillage clean up;
- Extensive wash down program of plant, equipment and infrastructure to prevent dust/coal build up;
- Variable height stacking of coal to minimise the 'drop-height' of coal to the stockpile;
- An extensive dust monitoring network;
- Landscaping of open areas where practical;
- Use of earthen bunds and tree screening; and
- Completion of a 'Community Dust Profile' Survey to further PWCS' understanding of community perceptions in relation to dust, its sources and impacts.

3.2. Populations most at risk and the causes that put those populations at risk

PWCS acknowledges that some members of the community have concerns around the potential impacts of air quality and particulate matter on human health. In response to this, PWCS commissioned Dr David McKenzie, a respiratory physician, to prepare a review of the T4 Air Quality assessment, based on available literature and his own professional experience. His key findings were:

- High levels of urban pollution are known to cause adverse health effects, especially in the frail and elderly with cardiac and respiratory disease. Urban pollution generally contains a large number of substances including solid particles of dust, pollens, fungal spores, vapours consisting of tiny droplets of unburnt hydrocarbons including benzene, toxic organic micropollutants, heavy metals and various gases including ozone, nitrogen oxides, carbon monoxide and sulphur dioxide. The toxic organic micro pollutants include polyaromatic hydrocarbons, polychlorinated biphenyls, dioxins and furans. The bulk of these come from burning fossil fuels including petroleum products and oil. Criteria levels (or standards) for pollutants have been set at levels which are believed to be thresholds below which there are acceptably low risks for adverse health effects. For example, the current levels for PM_{10} are 50µg /m^3 for any 24 hour period and 30 µg /m^3 for an annual average.

- The urban pollutants most strongly associated with adverse outcomes are "black smoke" or "elemental carbon" which are products of combustion and most strongly associated with diesel traffic.

- The types and proportions of suspended particulates (PM_{10} and $PM_{2.5}$) vary between urban, industrial, semi-rural, rural and coastal regions. Air quality criteria for PM_{10} (and $PM_{2.5}$) and other specific pollutants (e.g. oxides of sulphur dioxide and nitrogen and ozone) have been established largely from studies of densely populated urban areas and applied to other settings. Given the difference in source of PM_{10} in an urban setting (i.e. predominantly vehicle combustion) compared to a rural or coastal setting (predominantly mechanical disturbance of crustal material, organic and sea salt) using the urban criteria in other settings is regarded as conservative. The T4

Project site is coastal and located on a river with some relatively low density urban areas and industrial sites nearby.

- Based on the data available from the T4 Environmental Assessment [which includes Carrington and Kooragang emissions] Dr McKenzie concluded that the levels of airborne dust, coal dust, silica, particulate diesel exhaust emissions and other specific components of combustion and pollutants would be within the current standards for the residents of communities in the vicinity of the T4 Project.

- Using the dispersion modelling data for TSP, PM_{10} and $PM_{2.5}$, dust levels would be at acceptable levels in terms of health risk in the surrounding residential areas even if the PM_{10} values exceeded the criteria from time to time. The contribution from the T4 Project is predicted to be a small percentage of the total and will not be the cause of exceedances which are likely to be related to dust storms and bush fires. Fumes and gases from diesel exhausts and ships are likely to disperse further and more quickly in the atmosphere than particulate matter. These are not likely to exceed criteria levels or provide a health risk for residents.

3.3. Standards, monitoring and regulation of air quality at all levels of government

As an industrial operation, PWCS is regulated by two different criteria in regards to air quality:

- The NSW Work Health and Safety Act (2011) *(not the focus of this submission)*

- The NSW Protection of the Environment Operations Clean Air Regulation (2010)

The specific offsite goals are contained in Figure 1. These standards are applicable to the cumulative ambient air quality from all dust sources.

Pollutant	Averaging Period	Concentration (µg/m³)	Reference
TSP	Annual	90	OEH[1][2]
PM_{10}	24 hours	50	OEH[1]
	24 hours	50[4]	NEPM[3]
	Annual	30	OEH[1]
$PM_{2.5}$	24 hours	25	NEPM[5]
	Annual	8	NEPM[5]

Note 1: *Approved Methods for Modelling*
Note 2: OEH impact assessment criterion based on the subsequently rescinded National Health and Medical Research Council (NHMRC) recommended goal
Note 3: NEPC, 2003, *National Environment Protection (Ambient Air Quality) Measure*, as amended
Note 4: Provision made for up to five exceedances of the limit per year
Note 5: Advisory reporting goal issued by the NEPC (NEPC, 2003)

Figure 1 PWCS Air Quality Criteria and Goals
Source: Environ 2012:11

PWCS is required to monitor ambient dust levels in community locations around its operations for dust deposition (deposited dust gauges), TSP (high volume air samplers) and PM_{10} (high volume air samplers).

A recent assessment of emissions (Environ, 2012) assessed the cumulative impact of current PWCS operations at Kooragang and Carrington as well as the possible contributions of the T4 Project. The assessment found that:

- Cumulative annual average TSP concentrations and dust deposition rates, inclusive of the T4 Project contribution, are predicted to remain below applicable assessment criteria at all assessment locations.

- Cumulative annual average concentrations of PM_{10}, inclusive of the T4 Project contribution, are predicted to remain below the applicable assessment criteria at all assessment locations and for all assessed scenarios.

- Maximum baseline PM_{10} concentrations infrequently exceed the OEH maximum 24-hour average PM_{10} criterion without any increment associated with the T4 Project. By example, one exceedance day was recorded during 2010. In such cases the NSW EPA requires an assessment of whether or not a proposed project would cause any additional exceedances of the criterion. No additional exceedances of the OEH maximum 24-hour average PM_{10} criterion are predicted with the addition of the T4 Project.

3.4. Other related matters

PWCS acknowledges that notwithstanding the findings of these scientific reports, some members of the community remain concerned about dust. PWCS seeks to minimise dust emissions and engage with the community transparently and honestly. In doing this, PWCS undertakes the following activities which seek to build understanding and trust within the community;

- Holding quarterly Community Terminal Meetings;

- Individual investigations into community complaints, including, where appropriate, dust sampling;

- Making air quality monitoring data available on the PWCS website;

- Commissioning of a Community Dust Profile to better understand community perceptions and understandings of dust;

- Representation on the Newcastle Community Consultative Committee for the Environment;

- In principle support for a centralised, real-time Lower Hunter Air Quality Network;

- Undertaking a social impact assessment for the T4 Project which included comprehensive community consultation including one-on-one interviews, community telephone survey, themed dialogue workshops, community information sessions and community newsletters; and

- Biennial community telephone surveys to understand broad attitudes, perceptions and concerns of PWCS' operations and projects.

In Newcastle the community plays an active role in identifying air quality issues, and there is a growing expectation that members of the community be actively engaged in air quality monitoring and management efforts. PWCS is committed to on-going participation with regulatory authorities and to address air quality issues and support local air quality management.

4. Conclusion

PWCS is committed to minimising impacts on the environment and our community. We heavily invest in scientific studies, modern technology and monitoring equipment to ensure we meet NSW and National Guidelines for air quality. From the advice provided to us by government agencies and specialist consultants, these guidelines are set in order to protect human health. From the information we have from our monitoring sites and government reports, Newcastle air quality meets these standards. Notwithstanding this, we recognise there is a perceived concern about the impacts of air quality on health and we are committed to working with community and government to better communicate and educate in an effort to allay these concerns.

5. References and Further Reading

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Environ (2012) *Air Quality Assessment for the Terminal 4 Project* Available at: https://majorprojectsaffinitylivecom/public/b9942e7bf6f55739997eafb336e77b8d/51%20Vol%205%20App%20M%20Air%20Quality%20Assessment%20(Part%201)pdf

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