



Kooragang Coal Terminal Construction Environmental Management Plan

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Kooragang Coal Terminal Construction Environmental Management Plan

Prepared by

Umwelt (Australia) Pty Limited

on behalf of



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1.0 Background

Port Waratah Coal Services Limited (PWCS) owns and operates the Carrington and Kooragang Coal Terminals in the Port of Newcastle in New South Wales (NSW). These terminals receive, assemble and load Hunter Valley coal onto ships for export to customers around the world.

The Kooragang Coal Terminal (KCT) operations are located on Kooragang Island on the lower reaches of the Hunter River approximately 2 kilometres north of Newcastle (refer to **Figure 1.1**). As shown on **Figure 1.1**, the urban areas of Fern Bay, Stockton (North) and Mayfield are located approximately 1.7 kilometres to the east, 1.5 kilometres to the south-east; and 1.7 kilometres to the south-west of the site respectively. The former BHP steelworks and current OneSteel operations are located to the south and south-west, across the South Arm of the Hunter River.

PWCS has approval to construct and operate KCT at a throughput capacity of 120 million tonnes per annum (Mtpa). This capacity has resulted from a series of progressive approvals for Stages 1, 2 and 3 and the 120 Mtpa Project Approval (06_0189) and its modification known as the Stage 4 Project. Stage 1 infrastructure has operated since 1984 and Stage 2 infrastructure was commissioned in the mid 1990s.

The Stage 3 infrastructure (Development Consent (35/96)) is being constructed in phases and the upgrades associated with the 120 Mtpa approval are being undertaken progressively. Both the Stage 3 Development Consent and the 120 Mtpa Project Approval require the preparation and approval (Council and Director-General respectively) of a Construction Environmental Management Plan (CEMP) prior to the commencement of the associated construction activities.

This Construction Environmental Management Plan (CEMP) has been prepared to provide a consolidated management plan that meets the requirements of both the Stage 3 Development Consent and the 120 Mtpa Project Approval for KCT.

The 120 Mtpa CEMP was approved by the Director-General in March 2008. To streamline the environmental management and compliance requirements the approved 120 Mtpa CEMP has been updated to address the requirements of the Stage 3 and 4 Development Consents for the remaining approved component of the staged expansion. This CEMP will therefore supersede the CEMP approved in March 2008 and incorporates the construction of the remaining components of the Stage 3 and 4 Development Consents.

The CEMP provides a consolidated management document and more robust and rigorous management measures for the construction of the remaining Stage 3 components than that outlined in the Stage 3 Development Consent.



Legend

 Kooragang Coal Terminal

FIGURE 1.1

Location of Kooragang Coal Terminal

2.0 Construction Activities

2.1 Construction Activities and Indicative Program

Construction activities can be typically divided into a series of phases being:

- Site Establishment: the typical activities associated with this phase may include:
 - establishing construction compounds, work areas and lay down areas;
 - installation of erosion and sedimentation control devices to control and divert run-off from exposed areas; and
 - installation of relevant fencing as required and signage at the entrance to the site to comply with occupational health and safety requirements.
- Site Mobilisation: the typical activities associated with this phase are associated with preparing for the commencement of the main construction activities and may include:
 - erection of temporary site buildings and the connection of utilities e.g. phone, power, water, sewer;
 - provision of additional hardstand laydown areas within the compound for storage of various plant and building equipment, and materials;
 - delivery of construction plant and equipment, and materials and equipment; and
 - delivery of plant items.
- Construction: the typical activities associated with this phase may include:
 - earthworks;
 - delivery of materials and equipment;
 - on site fabrication of components;
 - assembly of prefabricated components; and
 - installation of fabricated components (new or replacement components) i.e. mechanical and electrical fitout.
- Demobilisation: the typical activities associated with this phase may include the removal of facilities and services established to support the construction activities and rehabilitating the site.

The above activities will be undertaken as part of the ongoing upgrade and expansion of KCT under the existing Stage 3 Development Consent (DA 35/96), the 120 Mtpa project approval (PA 06-0189) and its modification. This work is being undertaken on a staged basis, in conjunction with routine operational and maintenance activities. The construction activities are therefore being undertaken over an extended period of time by appropriately sized teams to suit equipment availability and operational needs. Construction of the remaining Stage 3 components of KCT approved infrastructure is expected to be completed by 2011. Construction of the Stage 4 components will be undertaken in response to coal demand as part of the ongoing expansion of the Hunter Valley Coal export industry.

All vehicles associated with the construction workforce will be parked on site or on land subject to an agreement between PWCS and the landowner for the purpose. The typical types of equipment used during the construction activities includes cranes, boom lifts, elevated work platforms, trucks, drilling and piling rigs, forklifts, dozers, rollers, graders, loaders, compactors, excavators, heavy vehicles (delivery of equipment), and miscellaneous vehicles.

The above phases, activities and associated plant and equipment are applicable to all construction activities undertaken at KCT. It is also anticipated that the CEMP would be applicable to construction activities required by subsequent licences and/or approvals as part of any future expansion works. The structure of the CEMP allows the inclusion of issue specific management sub plans as appendices, as required. In the event of subsequent project approvals for KCT, the issue specific management sub plans will be reviewed and if required amended as appropriate and submitted for approval.

2.2 Construction Hours

Construction activities which are inaudible at residential receivers could occur over 24 hours per day 7 days per week (refer to Condition 2.7 of the 120 Mtpa Project Approval).

Construction activities which are audible at any residential premises will be limited to the hours of 7.00 am to 6.00 pm seven days a week. This requirement does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons.

2.3 Environmental Management Plan Context

PWCS has designed and implemented a range of environmental management strategies and plans to effectively manage the impacts of KCT on the environment and local community. All management strategies and plans meet current regulatory and community standards. Central to the environmental management framework of KCT is an environmental management system (EMS) independently certified under the ISO14001 Standard. The PWCS EMS provides the framework for environmental management including KCT operations and construction activities.

The EMS incorporates a range of strategies and procedures that outline the specific processes implemented at KCT to manage, monitor and effectively minimise potential impacts of KCT on the surrounding environment in accordance with the conditions of the existing approvals.

The Construction Environmental Management Framework (refer to **Figure 2.1**), outlines how design and construction requirements from the Project Approvals and Conditions of Consent are addressed in the CEMP. **Figure 2.1** depicts the relationship between the various management plans developed for KCT and the EMS framework.

As outlined in **Section 1.0**, a number of specialised management plans have been developed. These specialised management plans have been prepared to provide specific guidance on the management of potential noise, surface water and traffic impacts associated with construction activities. These specialised management plans have been developed as sub plans under this CEMP and are included as appendices.

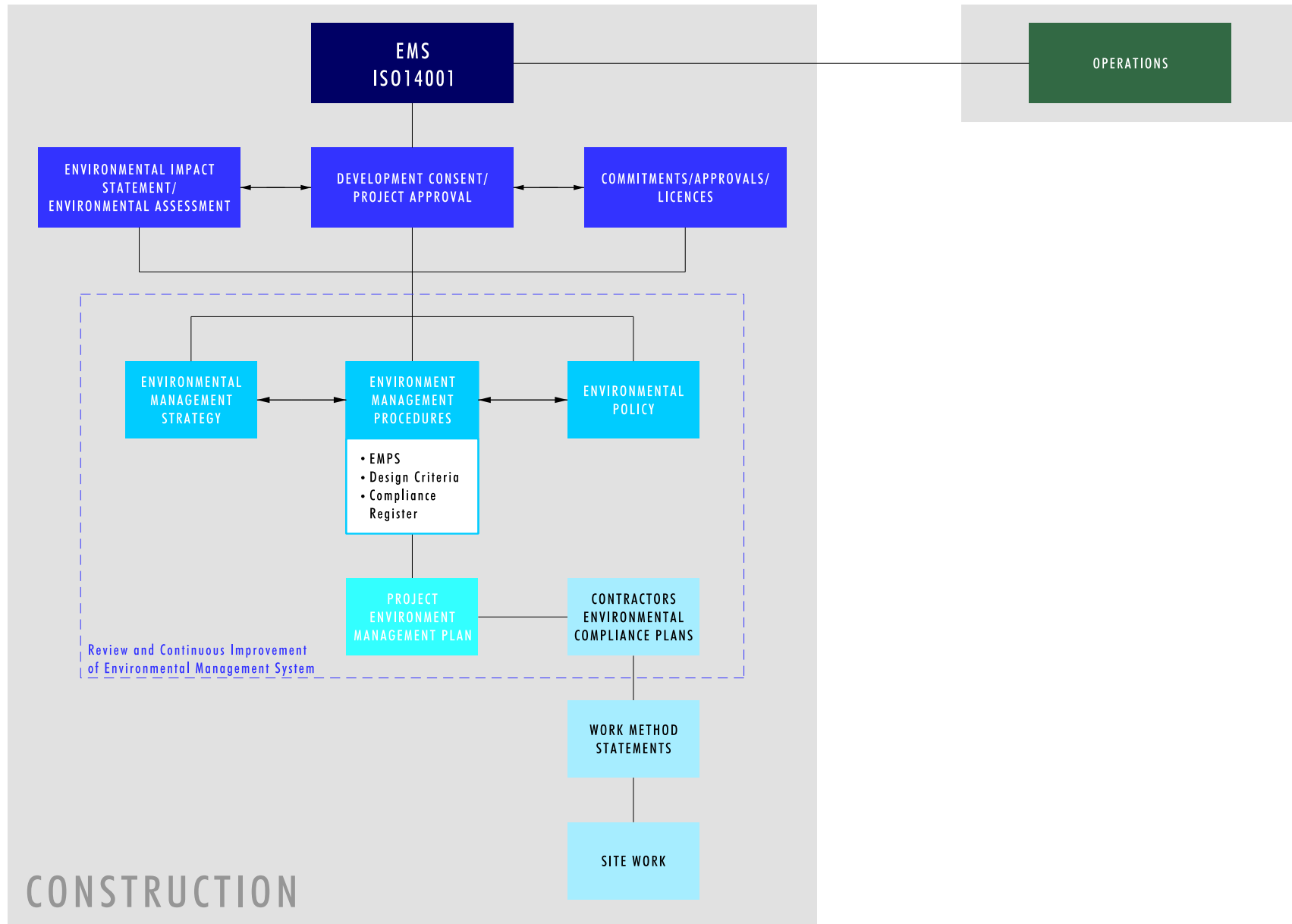


FIGURE 2.1

Environmental Management Framework
Port Waratah Coal Services

2.4 Purpose and Scope

This CEMP has been prepared in accordance with Condition 13 of the Stage 3 Development Consent and Condition 7.2 of the 120 Mtpa Project Approval to outline the environmental management practices and procedures to be followed during the construction activities at KCT. The CEMP has been prepared in accordance with the requirements of the Guideline for the Preparation of Environmental Management Plans (DIPNR 2004).

2.5 Objectives

The objectives of this CEMP are to:

- Minimise and control the impact of construction activities on the environment.
- Achieve compliance with regulatory and PWCS requirements.
- Define the roles and responsibilities and actions that are required to respond to environmental incidents.

These objectives will be achieved by:

- Incorporating environmental requirements in project design criteria and construction plans.
- Raising PWCS and Contractor awareness of, and compliance with, on site and off site environmental requirements.
- Providing regular overview and auditing of design and construction activities to achieve environmental performance and compliance.
- Preparation of issue specific Management Plans associated with construction activities in accordance with Condition 7.2 of the 120 Mtpa Project Approval.
- The use of specific tools and activities, such as:
 - Employee/Contractor Environmental Awareness Training during Inductions, Toolbox, Pre-Starts, Daily Information Sheets etc.
 - Site Environmental Inspections and Audits
 - Environmental Monitoring.
 - Emergency Response Action Plans.
 - Incident Reporting, including analysing of cause and corrective actions to rectify reoccurrence.
 - Non-conformance reporting with actions to rectify and close out.
 - Environmental requirements to be included in Contractor Work Method Statements.

2.6 Environmental Policy

PWCS will perform its activities in a manner which prevents pollution, promotes sustainability and minimises impacts on the environment and local community. PWCS expects everyone - employees and contract organisations, to act responsibly towards the environment in performing their work.

As part of the Environmental Policy, PWCS will:

- Provide environmental awareness training to all employees and contract organisations to ensure that they:
 - Understand the environmental risk of their tasks;
 - Understand their responsibilities and accountabilities;
 - Have the knowledge and skills to perform their work with respect to the environment;
 - Have the knowledge and skills to report and respond responsibly to environmental incidents and emergencies; and
 - Have the resources, training and documentation to perform their work in accordance with this policy and the Kooragang Expansion Project programs and procedures.
- Establishing and implementing effective communications regarding the environment with employees, contract organisations, regulatory authorities, stakeholders and the community.
- Identify and analyse environmental risks and implementing control measures to mitigate against these.
- Establishing and implementing Environmental Objectives and Targets and related Environmental Improvement Programs that drive improvement in environmental performance.
- Developing and implementing programs to continually improve environmental performance in relation to issues such as greenhouse gas emissions (in accordance with the *'PWCS Greenhouse Gas and Energy Policy'*), waste, noise, air and water.
- Manage its operations in compliance with all applicable laws, regulations and statutory requirements relating to the environment.

3.0 Statutory Requirements

3.1 Legislative Requirements

This section provides an overview of the key legislative and policy requirements for the environmental management of remaining Stage 3 and 120 Mtpa construction activities. **Table 3.1** provides a list of the key legislation and policies applicable to construction activities, the specific requirements for PWCS, and an indication of where the specific requirements are addressed in this CEMP.

Table 3.1 – Key Legislative and Policy Requirements Relevant to Construction Activities

Legislation/Policy	Requirements for Construction Activities	Approval/Licence Received
Environmental Protection and Biodiversity Conservation Act	Two areas of national environmental significance potentially relate to the activities of PWCS: a) migratory species and threatened species utilising PWCS lands; and b) the adjoining Kooragang Island Nature Reserve which is a RAMSAR Wetland The provisions of the EPBC Act are triggered if construction activities are considered a controlled activity under the Act. In 2007 the 120 Mtpa Project was referred to the then Commonwealth Department of Environment and Water Resources, who confirmed that the Project was not a controlled action.	NA
Environmental Planning and Assessment Act 1979	PWCS has been granted a project approval for the Stage 3 Expansion and the 120 Mtpa Project. The EP&A Act requires that all activities undertaken under the Stage 3 Development Consent and the 120 Mtpa Project Approval comply with the conditions of the relevant approvals. Construction activities will be undertaken in accordance with the relevant conditions of each approval.	Stage 3 infrastructure (Development Consent (35/96 granted 1997) 120 Mtpa Project Approval (06_0189 granted 13 April 2007)
Protection of the Environment Operations Act 1997	The Protection of the Environment Operations Act prohibits the pollution of air, water and land. PWCS currently holds an Environmental Protection Licence under the POEO Act for KCT operations. All construction activities will be undertaken so as not to pollute air, water or land and to comply with the relevant provisions of the EPL for KCT.	Environment Protection Licence No's 13022, 1552 and 5022. Modification to this licence is not required
Water Act 1912	A licence under Part 5 of the <i>Water Act 1912</i> will be required for groundwater interception and management as part of the Stage 4 construction activities associated with the dump station.	licence to be held prior to construction of the dump station.

Note NA = Not Applicable

3.2 Project Approval Requirements

The PWCS Development Approvals specify a number of conditions that specifically apply to environmental management during construction activities. These conditions are outlined in **Table 3.2**, along with an indication of where each of the specific requirements is addressed by this CEMP.

Table 3.2 – KCT Stage 3 and 120 Mtpa Construction Environmental Management Requirements

Condition Number	Condition Detail	Section of Plan
Stage 3 Development Consent		
13	The Applicant shall prepare Environmental Management Plans for the construction phase and the operation phase of the Stage 3 development and submit these to Council for approval prior to the commencement of each phase of the Stage 3 operations.	Whole of Plan
120 Mtpa Project Approval / Modification		
2.2	The Proponent shall design, construct, commission, operate and maintain the project in a manner that minimises or prevents the emission of dust from the Site including wind blown and traffic generated dust.	Section 5.3
2.3	The Proponent shall take all practicable measures to ensure that all vehicles entering or leaving the Site, carrying a load that may generate dust, are covered at all times, except during loading and unloading. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times, to the extent practicable.	Section 5.3
2.4	All activities on the Site shall be undertaken with the objective of preventing visible emissions of dust beyond the boundary of the Site. Should such visible dust emissions occur at any time, the Proponent shall identify and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate.	Section 5.3
2.5	The Proponent shall control dust emissions on all internal roads, trafficable areas and manoeuvring areas to minimise the potential for dust generation by sealing, or otherwise treating surfaces in a manner acceptable to the Director-General.	Section 5.3
2.6	The Proponent shall minimise noise emissions from plant and equipment operated on the Site in relation to the project according to the principles outlined in the NSW Government's <i>Industrial Noise Policy</i> .	Section 5.4
2.7	The Proponent shall only undertake construction activities associated with the project that would generate an audible noise at any residential premises between 7.00 am and 6.00 pm, seven days a week. Audible noise is defined as 'noise that can be heard at the receiver'. This condition does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons. Note: 'safety or emergency reasons' refers to emergency works which may need to be undertaken to avoid loss of life, property loss and/or to prevent environmental harm.	Section 2.2 and Appendix 2

Table 3.2 – KCT Stage 3 and 120 Mtpa Construction Environmental Management Requirements (cont)

Condition Number	Condition Detail	Section of Plan
120 Mtpa Project Approval / Modification (cont)		
2.13	The Proponent shall not permit the discharge of any water from the Site to the Hunter River unless expressly provided under the provisions of an Environment Protection Licence, or when a storm event exceeds a 1 in 100 year ARI event or after prolonged wet weather 'equivalent' to this event.	Section 5.1 and Appendix 1
2.13A	The construction of the rail loop augmentation, forming part of the Stage 4 Project, shall be integrated with existing surface water management measures to ensure compliance with condition 2.12, or the requirement of any applicable Environment Protection Licence.	Section 5.1 and Appendix 1
2.14	The Proponent shall take all reasonable measures to prevent soil erosion and the discharge of sediments and pollutants from the Site during the construction of the project.	Section 5.1 and Appendix 1
2.14A	The Proponent shall ensure that groundwater interactions that may occur from construction of the fourth dump station and associated conveyor infrastructure are minimised. Water quality monitoring shall be conducted during these works and where the monitoring indicates potential impact on the groundwater system, treatment options for dewatering shall be investigated and implemented in consultation with NOW and in accordance with any relevant approval from NOW.	Section 5.2
2.15	The proponent shall install stormwater drains, stormwater ponds, settlement ponds and/or storage ponds and other erosion, sediment and pollution controls as may be appropriate to manage stormwater on the Site. The Proponent shall maintain all erosion, sediment and pollution control infrastructure at or above design capacity for the duration of construction of the project and until such time as all ground disturbed by the works has been stabilised and rehabilitated so that it no longer acts as a source of sediment.	Section 5.1 and Appendix 1
2.20	The Proponent shall ensure that all new external lighting associated with the project is mounted, screened and directed in such a manner so as not to create a nuisance to surrounding land and water users. The lighting shall be the minimum level of illumination necessary and be in general accordance with the latest version of <i>AS 4282-1997 Control of the Obtrusive Effects of Outdoor Lighting</i> .	Section 5.7
2.22	Parking for all construction related vehicles associated with Stage 4 must be provided within the Kooragang Coal Terminal site or on land subject to an agreement between PWCS and the landholder for the purpose.	Section 5.11 and Appendix 3

Table 3.2 – KCT Stage 3 and 120 Mtpa Construction Environmental Management Requirements (cont)

Condition Number	Condition Detail	Section of Plan
120 Mtpa Project Approval / Modification (cont)		
2.23	The Proponent shall design and construct the project in a manner that mitigates to the extent that is reasonably practicable, direct physical impacts to adjoining property, property infrastructure and its operation, including conveyors, adjoining buildings and the like. The Proponent shall consult with directly affected property owner(s) on this matter and ensure that any damage or operational impacts caused by the project is rectified at the Proponent's expense to a standard comparable to that in existence prior to damage.	Section 5.12
7.2	Prior to the commencement of construction of the project, the Proponent shall prepare and implement a Construction Environmental Management Plan to outline environmental management practices and procedures to be followed during construction of the project. The Plan shall be prepared in accordance with <i>Guideline for the Preparation of Environmental Management Plans</i> (DIPNR 2004) and shall include, but not necessarily be limited to:	Whole of Plan
7.2 (a)	a description of all activities to be undertaken on the Site during construction including an indication of stages of construction, where relevant;	Section 2.1
7.2 (b)	statutory and other obligations that the Proponent is required to fulfil during construction including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies	Section 3.0
7.2 (c)	details of how the environmental performance of the construction works will be monitored, and what actions will be taken to address identified adverse environmental impacts. In particular, the following environmental performance issues shall be addressed in the Plan:	Section 6.0
7.2 (c) (i)	measures to monitor and manage dust emissions;	Sections 5.0 and 6.0
7.2 (c) (ii)	measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities;	Sections 5.0, 6.0 and Appendix 1
7.2 (c) (iii)	measures to monitor and control noise emissions during construction works;	Sections 5.0, 6.0 and Appendix 2
7.2 (d)	a description of the roles and responsibilities for all relevant employees involved in the construction of the project;	Section 4.0
7.2 (e)	the additional studies listed under condition 7.3 of this approval; and	Appendices 1, 2 and 3
7.2 (f)	complaints and enquiries handling procedures during construction.	Section 6.1.1

Table 3.2 – KCT Stage 3 and 120 Mtpa Construction Environmental Management Requirements (cont)

Condition Number	Condition Detail	Section of Plan
120 Mtpa Project Approval / Modification (cont)		
7.2	<p>Prior to the commencement of construction of the Stage 4 Project, the proponent shall revise the Construction Environment Management Plan and associated plans and protocols referred to in conditions 7.2 and 7.3 to incorporate this stage of the project.</p> <p>The Plan (and revisions to the Plan) shall be submitted for the approval of the Director-General no later than one month prior to the commencement of any construction works associated with the project (including the Stage 4 Project), or within such period otherwise agreed by the Director-General. Construction works shall not commence until written approval has been received from the Director-General.</p>	Whole of Plan
7.3	As part of the Construction Environmental Management Plan for the project required under condition 7.2 of this approval, the Proponent shall prepare and implement the following:	
7.3 (a)	a Construction Surface Water Management Plan to detail how surface water and stormwater will be managed on the site during construction. The plan shall include use of appropriately sized stormwater controls, in accordance with Managing Urban Stormwater: Soils and Construction (Landcom, 2004). The plan shall include specific measures to avoid sediment-laden stormwater from entering wetland areas or the Hunter River, and a monitoring program for stormwater leaving the site;	Section 5.1 and Appendix 1
7.3 (b)	a Construction Noise and Vibration Management Plan to detail how construction noise and vibration impacts would be minimised and managed, including, but not necessarily limited to:	Appendix 2
7.3 (b) (i)	details of construction activities and a schedule for construction works;	Section 2.1
7.3 (b) (ii)	identification of construction activities that have the potential to generate noise and/ or vibration impacts and adjacent industrial development (specifically the Kooragang Bulk Facilities); impacts on surrounding land uses, particularly residential areas;	Section 2.1, 5.12 and Appendix 2
7.3 (b) (iii)	a detailed description of what actions and measures would be implemented to ensure that these works would comply with the relevant noise and vibration criteria/ guidelines;	Sections 5.0, 6.0 Appendix 2 and 3.0
7.3 (b) (iv)	procedures for notifying residents of construction activities that are likely to effect their noise and vibration amenity, as well as procedures for dealing with and responding to noise complaints and enquiries; and	Sections 6.1.1 and Appendix 2
7.3 (b) (v)	a description of how the effectiveness of these actions and measures would be monitored during the proposed works, clearly indicating how often this monitoring would be conducted, how the results of this monitoring would be recorded; and, if any non-compliance is detected.	Appendix 2 and Section 3.0

Table 3.2 – KCT Stage 3 and 120 Mtpa Construction Environmental Management Requirements (cont)

Condition Number	Condition Detail	Section of Plan
120 Mtpa Project Approval / Modification (cont)		
7.3 (c)	<p>a Construction Traffic Management Protocol to detail how heavy vehicle movements associated with the project will be managed during construction, including site preparation and fill/ preloading activities. The Protocol shall specifically address the movement of oversize loads to and from the site, the management of construction traffic, restrictions to the hours of heavy vehicle movements to avoid road use conflicts, and the transport of construction waste materials. The Construction Traffic Management Protocol (and revisions to the Protocol) shall be submitted for the approval of the RTA and Council, prior to its submission to the Director-General for approval.</p> <p>For Stage 4 project works, a revised protocol shall take into account the completion of the Tourle Street Bridge and the improved regional connectivity provided by the new bridge to Industrial Drive and Pacific Highway</p>	Appendix 3

4.0 Roles and Responsibilities

Specific responsibilities under the CEMP are as follows:

PWCS General Manager

- Provide authority for environmental management in accordance with the PWCS Environmental Policy.
- Provide for the review of the PWCS Environmental Policy.

Kooragang Expansion Projects General Manager

- Ensure that adequate resources are available to implement the requirements of this CEMP.
- Ensure that the CEMP is relevant to construction activities.
- Ensure the CEMP is reviewed regularly to match construction activities.

Kooragang Expansion Projects Implementation Manager

- Co ordinate the Environmental Representative (ER).
- Ensure that the CEMP is relevant to current construction activities.
- Coordinate the development and maintenance of a protocol for evaluating compliance with applicable criteria relevant to construction activities.
- Coordinate the development and maintenance of a protocol for assessment and response to environmental monitoring data relevant to construction activities.
- Coordinate the notification of regulatory authorities and affected stakeholders of any exceptions to relevant environmental criteria and/or standards and undertake necessary reporting.
- Co-ordinate investigation of any environmental impacts or enquiries and implementation of any relevant mitigation and control.
- Liaise with regulatory authorities on matters relating to approvals and consent conditions.

PWCS Specialist Advisor Environment

- Co-ordinate the ongoing environmental monitoring program, community enquiry system and incident reporting program of KCT and notify the Kooragang Expansion Projects Implementation Manager of any monitoring, enquiry or incident associated with construction activities.
- Assist the ER in the investigation of any monitoring, enquiry and/or incident associated with construction activities, where required.

Environmental Representative (ER)

- Be the principal contact point in relation to environmental performance of the project and with DECCW
- Be responsible for all management plans and monitoring programs required under the approval.
- Be responsible for considering and advising on matters specified in the conditions of approval, and all other licences and approvals related to the environmental performance and impacts of the project.
- Be responsible for receiving and responding to complaints and enquiries.
- Has the authority and independence to require responsible steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.

Other Employees and Contractors

All employees and contractors are required to comply with the requirements of this CEMP.

5.0 Environmental Management Activities and Controls

This section outlines the environmental management activities and controls to be implemented during the construction activities at KCT.

5.1 Water Quality, Sediment and Erosion Control

All construction activities will be undertaken within the boundaries of the existing KCT water management system. PWCS has established a totally closed water management system to meet the design requirement of a 1 in 100 year design storm event or equivalent. All areas of KCT, including the wharf, capture water and channel it back to settling ponds for clarification prior to being held in storage ponds for re-use. In addition to these measures, localised erosion and sediment controls will be installed during the site establishment phase for each construction activity, as required. The KCT water management system is outlined further in the *Construction Surface Water Management Plan* (refer to **Appendix 1**).

5.2 Groundwater

Should groundwater be encountered during the excavation of the fourth dump station and associated conveyors works, PWCS will undertake water quality monitoring to identify any potential impact in accordance with condition 2.14A and any groundwater licence conditions issued by NSW Office of Water.

5.3 Air Quality

It is anticipated that total gaseous emissions released into the atmosphere during construction will be extremely small. Potential sources of emissions are refuelling of construction equipment and associated exhaust from internal combustion engines, evaporative losses associated with on site painting, and the application of synthetic linings, adhesives and waterproofing chemicals. The frequency and extent of these activities is limited and will have a minimal impact on air quality.

There is a potential for fugitive dust emissions from construction activities.

Fugitive dust is defined as dusts that become airborne due to the forces of wind or human activity. Fugitive dust emissions from construction activities may be generated due to vehicular activity and the action of wind on unsealed and/or uncontrolled areas.

The following techniques will be implemented to minimise fugitive dust generation and emission during construction activities associated with the Project:

- Unsealed roads will be kept sufficiently damp to minimise or prevent wind blown or traffic generated dust.
- Paved surfaces will be kept clean to minimise dust lift off due to traffic movements or wind action.
- Road trucks hauling bulk materials to or from the site will have their loads covered.
- Abrasive blasting operations will be controlled to contain all blast materials on site.

- Construction personnel will park in designated locations and not bring personal vehicles onto site.
- Disturbed areas will be stabilised as soon as practical.
- Road and traffic routes will be limited and clearly defined.
- On site vehicle speed will be limited.
- Dust control behaviours, expectations and controls will be an integral part of employee and contractor inductions and work method statements

5.4 Noise

PWCS has implemented a Continuous Noise Improvement Program throughout the operation of KCT. An integral aspect of ongoing noise management at KCT is an Acoustical Design, Procurement, Construction and Commissioning process. This program has aimed to meet approved noise limits and ensure that the noise management outcomes are consistent with current regulatory and community standards.

A range of specific noise management controls and activities will be implemented for all construction activities associated with the Project. These specific noise management activities and controls are outlined in the *Construction Noise Management Plan* (refer to **Appendix 2**).

5.5 Biodiversity

Construction activities are located within previously disturbed areas and are within the approved disturbance footprint for KCT and therefore will not have any biodiversity impacts.

5.6 Cultural Heritage

An Aboriginal Heritage assessment of the project was undertaken for the EA and concluded that there is negligible potential for discovering evidence of Aboriginal occupation within the project area.

Additionally, as part of the Stage 3 Approval a representative from the local aboriginal land council has inspected the site and identified it as not being a site of aboriginal heritage.

5.7 Visual

The scale, colour and nature of the new infrastructure will be consistent with the existing industrial visual character of PWCS operations and Kooragang Island generally.

Although the construction works will be undertaken within the footprint of the existing operation which are extensively lit, some localised lighting will be installed for operational and safety reasons. Night time visual impacts due to excessive light levels are not expected as lighting will be mounted, screened, and directed at the worksite. The lighting shall be the minimum level of illumination necessary, and be in accordance with *AS 4282 – 1997 Control of the Obtrusive Effects of Outdoor Lighting*. Thus no off-site lighting impacts are expected to occur.

5.8 Hazardous Substances Management

Contamination of soil by hazardous substances is a low risk, with hydrocarbon spills being the main risk. Avoidance of contamination of soil or groundwater is paramount. Spills of any type are unacceptable and the greatest care is to be taken in this regard. In the unlikely event of a spill, the contaminated material will be collected and disposed of or remediated appropriately.

Spill response is designed as a planned response to a chemical or hydrocarbon spill, in order to control the potential to cause harm to the environment.

In the unlikely event of a spill, the following steps shall be taken:

- Control the spill – attempt to stop or minimise the spill from the source.
- Contain the spill – Depending on the size of the spill this can be done by using any available material including coal, dirt or defined spill response material. Critical to this process is to prevent the spill from entering drains and waterways.
- Clean up the spill – spilt material should be cleaned up using an appropriate absorbent material and placed into bags for appropriate disposal off site by a registered waste transporting/disposal company.

All response and clean up materials that have been used shall be replaced as soon as practicable after use. Any activities identified as a high risk for environmental spills will cease where practical until an appropriate amount of spill containment and clean up equipment is immediately available in the work area.

Fuel, oils, chemicals, paints etc. will be labelled and stored in a bunded facility. The bund will be impervious and have a capacity equal to or greater than 110% of the volume held in the largest container. Transportable bunds will be used to contain potential spills in locations remote from bunded areas.

Such hazardous materials and wastes (e.g. chemical wastes, fuels, lubricants, etc) which remain after implementation of the waste minimisation process will be collected, handled and disposed of offsite.

Spill control and containment equipment e.g. absorbent materials/products such as socks, booms and pillows will be located on site in appropriately marked containers, regularly inspected and replenished as required, for use in the event of spills.

The first priority will be to have all vehicle, plant and equipment serviced off site, however, where this is not practical, a vehicle service bay, with an impervious liner, will be installed on site and will be used to carry out the servicing of plant, equipment and vehicles.

5.9 Waste Disposal

Construction activities are not expected to generate large quantities of waste as they typically will involve the installation of predominantly modular/prefabricated components, which are constructed off site and will therefore generate minimal on site waste. Similarly, earthworks are also expected to generate only minimal volumes of waste as excavated material will be re-used on site. Construction of concrete footings and pads are also not expected to generate significant volumes of waste as the amounts of steel and concrete required can be

easily quantified and ordered, with excess concrete being returned to the nearby construction material recycling plant.

KCT's overall waste management program focuses the following principles:

- waste avoidance;
- waste re-use;
- waste recycling with waste stream separation; and
- waste removal.

General wastes will be collected in labelled waste skips for disposal, by an approved and licensed contractor. This waste shall be disposed of at an approved off-site landfill location or recycling facility.

An approved and licensed Contractor, using a suitable vehicle, will collect sanitary wastes from the construction site toilet effluent collection tanks. Such sanitary waste will be processed off site, through a Hunter Water Corporation sewerage treatment plant.

Recycling is encouraged and facilitated where practical. Recycling will address such items as paper, plastics, metals, toner cartridges, concrete etc.

Concrete materials will be recycled through the Boral construction material recycling plant on Kooragang Island.

Waste material will not be disposed of on site. All waste must be removed from site.

5.10 Unauthorised Waste Disposal

Waste bins provided for the Project are to be used for Project waste purposes only. Should any unauthorised material which is not related to the Project be detected in the waste bins or dumped on site, an incident report will be raised and an investigation carried out to determine the source of the material and who brought it onto site. The materials will be disposed of appropriately and corrective action will be undertaken.

5.11 Traffic Management

Parking for all construction related vehicles will be within KCT or on land subject to an agreement between PWCS and the landowner. No changes are proposed to the existing site access roads. During construction activities heavy vehicles will periodically deliver construction material and equipment on an as needs basis. The specific management activities and controls for the movement of heavy vehicles, delivery of construction materials and equipment is outlined in the *Construction Traffic Management Protocol* (refer to **Appendix 3**).

5.12 Industrial Neighbours

The environmental assessment identified potential noise and vibration impacts on industrial neighbours (specifically Kooragang Bulk Facilities). PWCS will minimise construction impacts through the design process and consideration during the preparation of work method

statements for the associated construction activities and the construction noise and vibration management plan (refer to **Appendix 2**).

5.13 Incident Reporting

All environmental incidents, or potential incidents will be reported to the ER following the incident, or as soon as practical. The ER will then advise the Kooragang Expansion Projects Implementation Manager. Incident reporting will be undertaken in accordance with the Kooragang Expansion Projects procedures.

5.14 Environmental Training

Environmental awareness training and information will be provided for all team members as part of their construction inductions, toolbox, pre-start meetings, and through ongoing site communications.

5.15 Emergency Contacts and Response

PWCS is committed to establishing and maintaining a work place, which minimises hazards to human health and the environment including emergency situations (e.g. fires, explosions, unplanned material or liquid releases). All related emergency and corrective actions will be developed in conjunction with procedures and guidance set out in the Emergency Procedure, the Hazardous Substances Procedure and the Terms and Conditions of the EPCM (Environment, Procurement, and Construction & Management) Contract. These provisions shall be carried out promptly whenever emergencies occur which could threaten human health or the environment.

6.0 Monitor and Review

6.1 Environmental Monitoring

PWCS has designed and implemented a range of environmental management strategies and plans to effectively manage KCT construction impacts on the environment and local community, these include the development of specific surface water, noise and traffic management plans. These plans and strategies outline the specific processes implemented at KCT to manage, monitor and effectively control potential impacts of construction at KCT on the surrounding environment.

An integral aspect of the environmental management system in place at KCT is the air quality and noise monitoring program. The existing noise and air quality monitoring locations are positioned to measure noise and dust emissions of KCT facility in surrounding residential and industrial areas. The existing air quality and noise monitoring locations are shown on **Figure 6.1**. Environmental monitoring is undertaken on a regular basis in accordance with regulatory requirements, with monitoring results reported quarterly to the Department of Environment, Climate Change and Water (DECCW) and the Department of Planning.

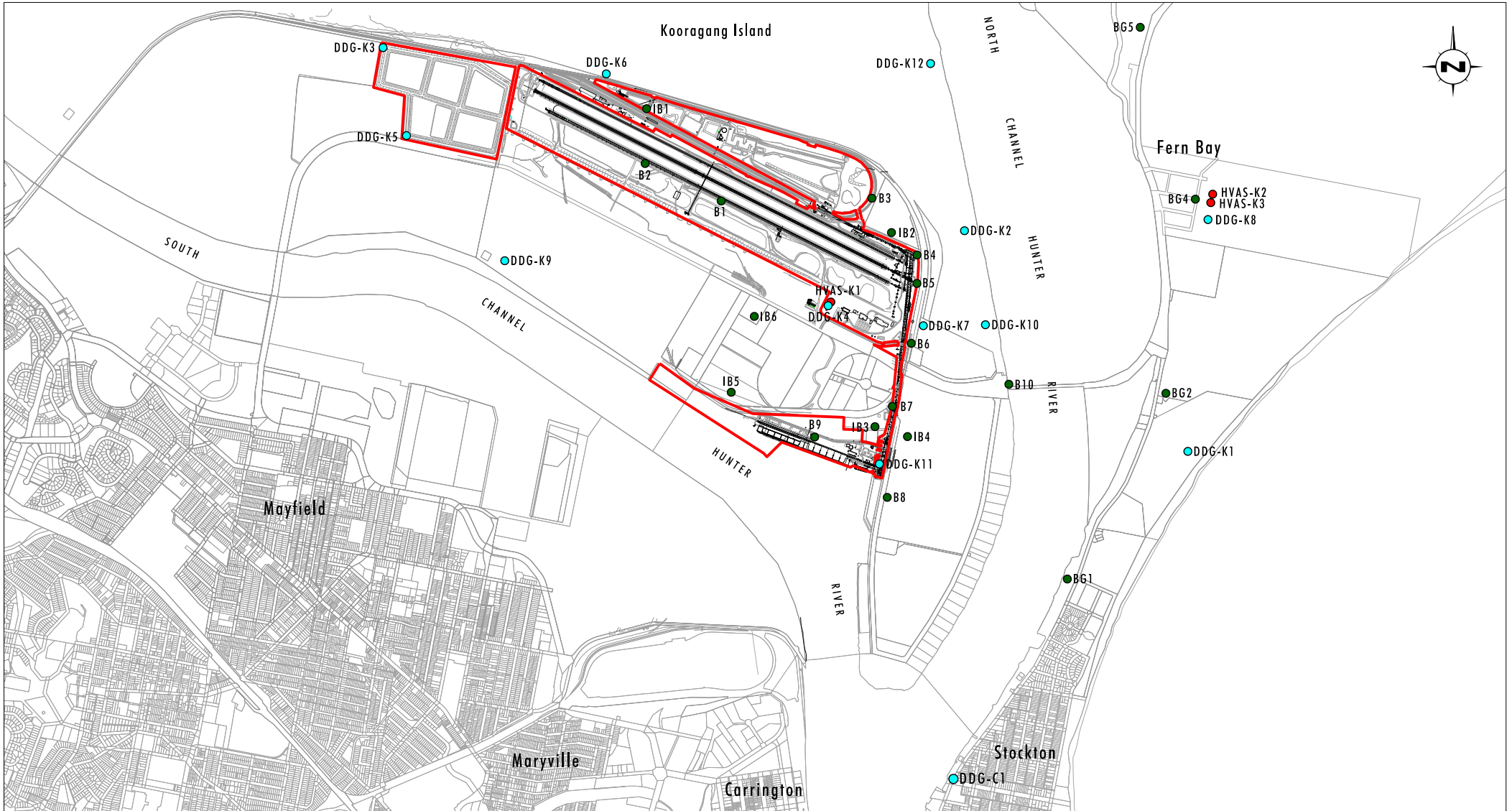
The environmental monitoring program will continue to be carried out in accordance with current practices at KCT. This monitoring will enable the review of the effectiveness of the environmental management controls and actions implemented during construction activities. Further details on specific environmental monitoring are outlined further in the specialised construction management plans attached to this CEMP in **Appendices 1, 2 and 3**.

6.1.1 Community Enquiries

PWCS maintains a 24 hour Community Enquiry line for KCT operations. The Community Enquiry line will also be available throughout the construction activities. The community enquiry processes in place at KCT are consistent with the requirements of the Stage 3 Development Consent and the 120 Mtpa Project Approval.

Enquiries will be documented and transmitted to the PWCS Specialist Advisor Environment immediately, in accordance with the compliance tracking program.

The PWCS community enquiry line phone number is (02) 4907 2280. If outside of normal work hours the caller is given the option to contact the shift supervisor of the operating plant or leave a message which will be responded to on the next working day.



Source: Port Waratah Coal Services Limited

0 0.5 1.0 1.5 km
1:35 000

- Legend**
- Kooragang Coal Terminal
 - Dust Monitoring Location
 - HVAS Monitoring Location
 - Noise Monitoring Location

FIGURE 6.1

Dust and Noise Monitoring Locations
Kooragang Coal Terminal

7.0 Corrective Action

Table 7.1 summarises the potential environmental issues that may arise during construction and the appropriate corrective action to be taken.

Table 7.1 - Corrective Actions

Problem	Corrective Action
Potential for an exception to environmental criteria based on observations and/or interpretation of monitoring data.	Investigation of exceptions, implement mitigation measures where applicable. Report potential exception to Senior Management. Provide feedback to construction personnel, where relevant.
Exception to relevant environmental quality criteria.	Investigation of exception, implement mitigation measures where applicable. Report exception to regulatory agencies, senior management and notify impacted residents as required. Provide feedback to construction personnel, where relevant.
Community enquiry.	Investigation of enquiry, implement mitigation measures where applicable and provide feedback to enquirer in accordance with enquiries protocol. Report enquiry to senior management as appropriate. Provide feedback to construction personnel, where relevant.

7.1 Review

The CEMP will be reviewed if changes to the project work scope occur.

Additionally in accordance with the requirements of the Project Approval for KCT PWCS will commission an annual Independent Environmental Audit, to the satisfaction of DoP, to assess the implementation of the conditions of consent. As required, the findings of the audit will be used in the review of the CEMP.

APPENDIX 1

Construction Surface Water Management Plan

PWCS Construction Surface Water Management Plan

1.0 Background

Condition 2.13 of the 120 Mtpa Project Approval details the performance criteria for the water management system, while condition 7.3(a) requires the preparation and implementation of a Construction Surface Water Management Plan (CSWMP).

This CSWMP has been prepared to address the requirements of these conditions and was approved by the Director-General from the Department of Planning (DoP) in April 2008. The CSWMP has been implemented on site since 2008. In mid 2010 the Construction Environmental Management Plan (CEMP) was revised to incorporate the construction activities and requirements associated with the Stage 3 Development Consent, 120 Mtpa / Stage 4 Project Approval and the issue specific management sub plans for surface water, noise and traffic. In the event of subsequent project approvals and licence associated with the Kooragang Coal Terminal (KCT), the CSWMP will be reviewed and amended as appropriate.

1.1 Management Plan Context

The CSWMP has been developed as a sub plan to the KCT CEMP. The context of this CSWMP in relation to KCT environmental management policy and systems is outlined in the CEMP.

1.2 Purpose and Scope

The CSWMP details how surface water, process water, washdown water and stormwater etc will be managed on site during construction activities.

1.3 Objectives

The objectives of this CSWMP are to:

- minimise and control surface water impacts to the environment resulting from construction activities;
- achieve compliance with regulatory and PWCS requirements;
- clearly define the actions that are required to respond to environmental incidents.

2.0 Construction Surface Water Management System

PWCS has established a closed water management system to meet the design requirement of a 1 in 100 year design storm event or equivalent and allows for the harvesting of storm water captured during rain events and satisfies the principles outlined in Managing Urban Stormwater: Soils and Construction. The water management system for the complete facility (some of which is yet to be constructed) is implemented and is operational. It is noted that

essentially all construction activities are located within the existing surface water management system. To complement the existing controls and further minimise any potential erosion and sedimentation impacts localised erosion and sediment controls will be installed during the site establishment phase for each construction activity. This includes the construction activities associated with the rail loop augmentation which will be designed to water and divert it back to the KCT water management system. The management of water during construction activities will be undertaken in accordance with the principles outlined in Managing Urban Stormwater: Soils and Construction and any applicable EPL.

The water management system operates to collect water from all operational activities and to harvest surface water for recycling. All areas of the plant, including the wharf, capture surface water and channel it back to settling ponds for clarification prior to being held in storage ponds for re-use (refer to **Figure 2.1**).

On site there are two 12 megalitre (ML) settling ponds and two 12 ML clarifying ponds. The ponds are located within the rail loop and are adjacent to large bunded areas (refer to **Figure 2.2**). There are also two stormwater detention basins with a combined capacity of 80 ML, which provide further detention capacity when needed during rainfall events. The 80 ML basins are utilised for the capture of surface water from the KCT site. The water from these additional storage areas can be recovered to the clarified water ponds for re-use.

Once the captured water passes into the clarifying ponds it is available for delivery to the pump house for reticulation across the site's process water system. This process water is used for wetting coal and stockpiles to control dust, wash down and clean up, fire fighting systems and landscape irrigation. The water quality is monitored regularly to ensure it is suitable for the purpose of recycling.

3.0 Water Monitoring

Water may overflow from the existing KCT water management system during extreme or prolonged wet weather. Overflows are controlled within an existing stormwater channel which provides a vegetated flow path to the North Arm of the Hunter River. The location of the rail loop embankment between the stormwater channel and the adjacent Kooragang Nature Reserve provides a barrier to protect the Kooragang Nature Reserve in the unlikely event that the capacity of the stormwater channel is exceeded. Any overflow of the water management system due to rainfall in excess of the design event or as a result of prolonged wet weather will be reported as part of the operational environmental monitoring program.

In addition to the existing KCT water management system, specific controls are in place in relation to spill response and hazardous substance management. These specific activities and controls are outlined in the CEMP (see Section 5.8 and 5.9).

3.1 Corrective Action

Section 7.0 of the CEMP outlines the corrective action process to be followed in the event of a potential environmental incident.

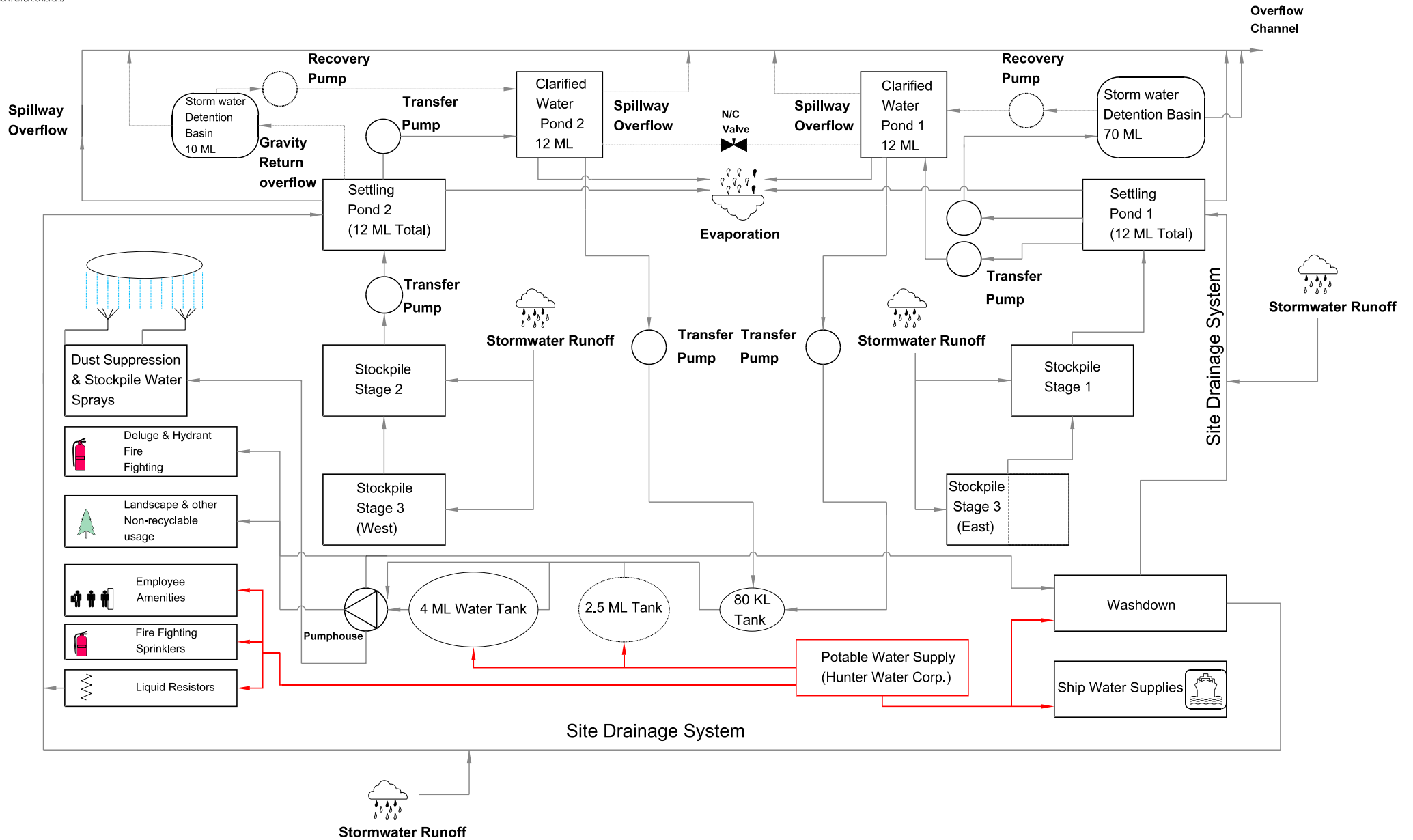
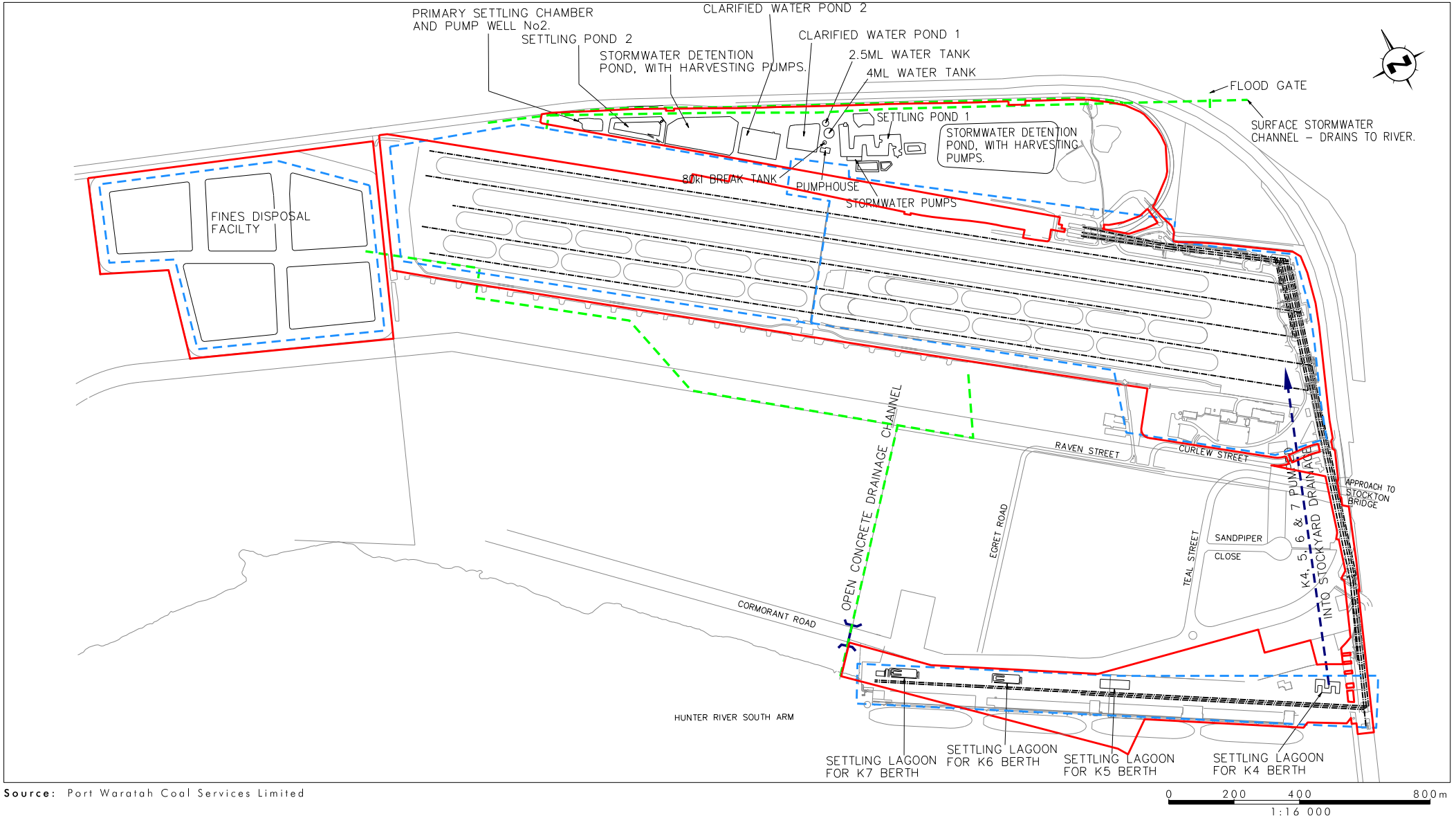
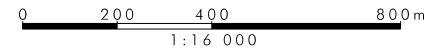


FIGURE 2.1

Schematic of Water Management System
Kooragang Coal Terminal



Source: Port Waratah Coal Services Limited



- Legend**
- Kooragang Coal Terminal
 - Pump Delivery Pipeline
 - - - Catchment Boundary
 - Culvert
 - - - Open Channel Drainage

FIGURE 2.2

**Plan of Water Management System
Kooragang Coal Terminal**

APPENDIX 2

Construction Noise and Vibration Management Plan

PWCS Construction Noise and Vibration Management Plan

1.0 Background

Condition 7.3(b) of the 120 Mtpa Project Approval requires the preparation and implementation of a Construction Noise and Vibration Management Plan (CNVMP).

The CNVMP has been prepared to address the requirements of this condition and was approved by the Director-General from the Department of Planning (DoP) in March 2008. The CNVMP has been implemented on site since 2008. In March 2010 the Construction Environmental Management Plan (CEMP) was revised to incorporate the construction requirements associated with the Stage 3 Development Consent and the issue specific management sub plans for surface water, noise and traffic.

In the event of further project approval and / or licence requirements associated with the Kooragang Coal Terminal (KCT), the CNVMP will be reviewed and amended as appropriate.

The CNVMP has been prepared for PWCS by Umwelt (Australia) Pty Limited (Umwelt), with input from Heggies Pty Ltd on the specific noise monitoring requirements for construction activities associated with KCT.

1.1 Management Sub Plan Context

The CNVMP has been developed as a supplementary management plan to the KCT CEMP. The context of this CNVMP in relation to KCT environmental management policy and systems is outlined in the CEMP.

1.2 Purpose and Scope

This CNVMP has been prepared in accordance with Condition 7.2(b) of the 120 Mtpa Project Approval and Condition 13 of the Stage 3 Development Consent to detail how construction noise and vibration would be minimised and managed during construction activities.

1.3 Objective

The primary objective of the CNVMP is to outline procedures to minimise and control the noise and vibration impacts of construction activities on the environment.

2.0 Construction Noise and Vibration Management

2.1 Potential Construction Noise and Vibration Impacts

The major sources of noise during construction are potentially from outdoor construction equipment as part of the installation of plant and equipment, earthworks and from truck deliveries during each phase of construction, as outlined in Section 2.1 of the CEMP. The construction activities may vary from relatively low intensity to medium intensity during times of peak activity.

The distance from construction activities to any residential areas is such that there would be a minimal noise impact on the receivers. The noise impact assessments undertaken as part of the Stage 3 EIS, 120 Mtpa EA and Stage 4 Modification demonstrate that the noise levels resulting from construction are likely to be indiscernible at nearest residential receivers.

Despite the low potential for construction noise being discernable in receiver areas, should construction activities be considered to have affected receiver areas, residents will be notified through the existing community consultation processes and invited to make contact through the community enquiry line if the effects were considered unacceptable.

PWCS has approval under its Stage 3 Development Consent to undertaken pile driving and blasting activities. Blasting activities will not be required to complete the scope of works. Pile driving will take place for the wharf construction and specific noise monitoring will be undertaken at the commencement of this activity. Appropriate actions will be implemented dependant on the outcomes of the monitoring.

The construction activities of pile driving and the use of vibration compactors will generate ground vibration. The Stage 4 Modification EA concluded that the damage and annoyance risk to all residential receivers is negligible - as the nearest dwellings are well beyond 180 m. Similarly, the damage risk to the nearest commercial and industrial receivers are considered minimal as the nearest buildings and mechanical plant (assumed operating) are beyond 12 metres.

The risk of annoyance to the occupants of offices and workshops is also considered minimal based on distance at all but the very nearest adjacent industrial neighbours (i.e. the KBF Administrative Building), where vibration monitoring and short term piling energy management may be required during piling activities to achieve compliance with the relevant criteria.

2.2 Construction Hours

Construction activities which are audible at any residential premises will be limited between 7.00 am and 6.00 pm seven days a week. This requirement does not apply in the event of a direction from police or other relevant authority for safety or emergency reasons.

Construction activities which are inaudible at residential receivers may be undertaken 24 hours per day 7 days per week (refer to Condition 2.7 of the 120 Mtpa Project Approval).

2.3 Receiver Areas

2.3.1 Residential Receivers

The potentially most affected residential receivers and key noise monitoring locations are listed in **Table 2.1**. Construction activities will be undertaken across the whole site, as such, the potential noise impacts, whilst assessed as minimal, may affect receiver areas differently dependent on the nature of the particular construction activity and location within KCT site.

Table 2.1 - Residential Receivers

Receiver Area	ID and Key Noise Monitoring Locations
Fern Bay North	FN1 Nelson Bay Road
Fern Bay West	FW1 1 Fullerton Lane
Stockton West	SW1 284 Fullerton Street
Mayfield West/Warrabrook	W1 47 Stevenson Avenue
	W2 4 Groongal Street
Mayfield	M2 45 Simpson Crescent
	M4 52 Arthur Street
Carrington/Maryville	C1 Cnr Hargrave and Young Streets

2.3.2 Industrial Receivers

The potentially most affected industrial receivers are listed in **Table 2.2**. Where a noise contribution can't be measured at an industrial receiver, measurements may be conducted at a representative location at a similar distance or at a closer proximity to the construction site so that the contributed noise level can be calculated.

Table 2.2 - Industrial Receivers

Receiver Area	ID and Key Noise Monitoring Locations
Kooragang Island	IB2 Mountain Industries
	IB3 Kooragang Bulk Facilities
	IB6 Cargill Australia Raven St
Mayfield North	MN1 OneSteel

2.4 Construction Noise Criteria

2.4.1 Residential Receivers

The relevant criteria for construction noise are based on the duration of the construction activities as outlined in the Interim Construction Noise Guideline (ICNG) (DECCW 2009). The interim guideline for major projects recommends a construction noise management level (CNML) equivalent to the RBL plus 10 dBA within standard hours (i.e. daytime) and RBL plus 5 dBA outside standard hours (i.e. evening and night-time). The approved construction noise condition and the ICNG construction noise management levels are presented in **Table 2.3**.

Table 2.3 - Residential DECCW Construction Noise Criteria, LAeq(15minute) dB(A)

Residential Receiver Area	Project Approval Construction Noise Condition 2.7 ¹	Daytime ¹ LAeq(15minute) CNML RBL plus 10 dBA	Evening LAeq(15minute) CNML RBL plus 5 dBA	Night-time LAeq(15minute) CNML RBL plus 5 dBA
Fern Bay North	The Proponent shall only undertake construction activities associated with the project that would generate an audible noise at any residential premises between 7:00 am and 6:00 pm, seven days a week. Audible noise is defined as "noise that can be heard at the receiver".	54	50	45
Fern Bay West		57	47	45
Fern Bay East		50	48	46
Stockton West		52	48	47
Stockton East		51	47	47
Mayfield West		55	51	46
Mayfield		56	52	48
Carrington		52	46	42

Note 1: 7 days per week - 0700 hours to 1800 hours.

A review of noise measurements during the previous Stage 3 and the current project construction phase confirms that noise emissions arising from construction activities are not discernible at the nearest residential receiver areas of Fern Bay and Stockton and any construction noise impacts are therefore minimal. It is reasonable to anticipate intrusive construction noise emissions will remain indiscernible at the nearest residential receiver areas and below the approved construction noise limits.

2.4.2 Industrial Receivers

The DECCW's ICNG also recommends a CNML for industrial and commercial receivers as presented in **Table 2.4**.

Table 2.4 - Industrial and Commercial DECCW Construction Noise Criteria, dB(A)

Receiver Type	Construction Noise Criteria External LAeq(15minute)
Industrial	75 dB(A)
Commercial	70 dB(A)

2.5 Construction Vibration Criteria

2.5.1 Residential, Industrial and Structural Assessment Criteria

German Standard DIN 4150-3 1999 "Structural Vibration Part 3: Effects of Vibration on Structures" provides guideline criteria for evaluating the short and long-term effects of vibration on structures. In addition, the DECCW has released an interim guideline "Assessing Vibration: A Technical Guideline" dated February 2006 which provides guideline building vibration levels associated with a low probability of annoyance from occupants. The range of applicable damage and annoyance risk vibration velocity criteria are discussed in the Stage 4 EA and summarised in **Table 2.5**.

Table 2.5 - Vibration Velocity Damage and Annoyance Risk Criteria, (mm/s)

Receiver Type	Damage Risk (mm/s)		Annoyance Risk (mm/s)	
	Horizontal	Vertical	Horizontal	Vertical
Residential/Dwellings	15	5	1.2	0.45
Commercial/Offices	40	20	1.6	0.6
Industrial/Workshops	40	20	3.2	1.2
Mechanical (On/Off) ¹	20/5	20/5	-	-
Electronic/Computers	5	5	-	-
Subsurface/Pipework	50-100	50-100	-	-

Note 1: Use of machinery on/use of machinery off.

2.6 Construction Noise and Vibration Management and Control

In addition to the ongoing implementation of the Continuous Noise Improvement Program, noise and vibration monitoring will be carried out in accordance with the Construction Noise and Vibration Management Sub Plan. Monitoring will be carried out on the construction area perimeter and in other locations, and will assess construction and background noise and vibration to confirm compliance with prescribed limits.

Due to the nature of the construction activities, monitoring will be carried out to focus on the specific task being undertaken, and will change according to the location of construction activities. Where there is a potential for prolonged or intermittent activity to be reasonably detected at residential areas (but still be within prescribed limits) the need to liaise with affected residents will be implemented by PWCS.

PWCS is committed to the management of potential noise impacts on receiver areas as a result of construction activities at KCT. As such, all construction activities will be undertaken to comply with the relevant construction noise criteria outlined in **Section 2.3**. The specific activities and controls that will be implemented to control construction activities to within the relevant criteria include:

- all equipment used on site is maintained to achieve optimum noise attenuation performance.
- Prevent modifications that could potentially increase the noise emitted from exhaust systems of equipment utilised on site.
- Awareness of climatic conditions such as temperature inversions or unfavourable wind directions, which may enhance off site noise propagation.
- Ensure that horns and other signalling devices (reversing beepers) fitted to construction vehicles to provide a danger warning, and are not able to audible off site.
- Adjust work hours to suit the activity and the prevailing background levels and weather conditions.

3.0 Monitoring and Review

3.1 Construction Noise Monitoring

3.1.1 General Requirements

The noise measurement procedures employed throughout the monitoring program shall be guided by the requirements of AS 1055.1-1997, 'Acoustics - Description and Measurement of Environmental Noise, Part 1 General Procedures' and the DECCW's Industrial Noise Policy (INP 2000).

3.1.2 Operator-Attended Noise Surveys

Operator-attended noise measurements will be conducted to quantify the contributed level of noise emissions from construction operations as well as the overall level of ambient noise. The time and location of these surveys will be determined by the particular construction activity and its location to the relevant receivers.

The operator shall quantify and characterise the $L_{Aeq(15\text{minute})}$ intrusive noise level from construction operations over a 15 minute measurement period. In addition, the operator shall quantify and characterise the overall levels of ambient noise (i.e. L_{Amax} , L_{A1} , L_{A10} , L_{A50} , L_{A90} , and L_{Aeq}) over the 15 minute measurement interval.

In some instances, it may be difficult to measure the intrusive construction noise over a full 15 minute period in the presence of other noise sources. In such instances, the $L_{Aeq(15\text{minute})}$ noise levels may be measured at a point between the source and receiver, and calculated back to the receiver.

3.1.3 Key Monitoring Locations and Intervals

3.1.3.1 Daytime Construction (7.00 am to 6.00 pm)

Operator attended noise measurements shall be conducted during daytime construction campaigns (for each type of construction activity) at selected KCT industrial boundary locations (or other noise-sensitive locations) relevant to the construction operations at the time of monitoring, to determine if construction noise is audible.

In the event that construction noise is not audible at the selected KCT industrial boundary monitoring locations, it will be determined that construction noise from that type of activity would also be inaudible at the residential receiver areas and therefore in compliance with the construction noise criteria. It is envisaged that once compliance has been determined for a particular type of activity and location, that no subsequent monitoring of that activity would be required.

In the event that construction noise is audible and can be quantified at the selected KCT industrial boundary monitoring locations, additional noise monitoring will be conducted at relevant key monitoring locations at the potentially most affected receiver locations. The selection of the key monitoring locations will be relevant to the construction operations at the time of monitoring, in order to quantify noise emissions and estimate the $L_{Aeq(15\text{minute})}$ intrusive noise level from the construction. The operator shall quantify and characterise the maximum (L_{Amax}), L_{A10} , and background (L_{A90}) noise levels from ambient noise sources and construction operations over a 15 minute measurement period.

3.1.3.2 Out of Hours Construction (6.00 pm to 7.00 am)

Evening and night time construction noise will be monitored at selected key monitoring locations in the potentially affected residential receiver locations (or other noise-sensitive locations) relevant to the construction operations at the time of monitoring, in order to quantify the audibility of construction activities.

3.1.4 Noise Monitoring Equipment

All acoustic instrumentation employed throughout the monitoring program will comply with the requirements of AS 1259.2-1990 'Sound Level Meters' and carry current NATA or manufacturer calibration certificates. The instrumentation will be operated and maintained by suitably qualified or trained personnel.

All instrumentation will be programmed to record continuously statistical noise level indices in 15 minute intervals including the L_{Amax} , L_{A1} , L_{A10} , L_{A50} , L_{A90} and L_{Aeq} .

Instrument calibration shall be conducted before and after each measurement survey, with the variation in calibrated levels not to exceed ± 0.5 dB.

All noise measurement results will be accompanied by both qualitative descriptions (including cloud cover) and quantitative measurements of the prevailing local weather conditions throughout the survey period.

3.1.5 Nearfield Noise Measurement Requirements

In addition to identifying the source(s) of excessive noise emission level, any potentially excessively noisy item(s) of plant and equipment will be measured, assessed and mitigated where appropriate.

3.2 Construction Vibration Monitoring

3.2.1 General Requirements

Continuous vibration monitoring procedures employed throughout the monitoring programme will be guided by the requirements of German Standard DIN 4150-3 1999 "Structural Vibration Part 3: Effects of Vibration on Structures" and the DECCW's interim guideline "Assessing Vibration: A Technical Guideline" dated February 2006.

3.2.2 Monitoring Locations and Intervals

At the commencement of pile driving continuous vibration monitoring measurements will be conducted at the nearest industrial/commercial building on Kooragang Island. In some instances, it may be difficult to measure continuous vibration levels in the presence of other ambient sources (i.e. traffic vibration). In such instances continuous vibration may be measured in radial alignment from source to receiver and calculated back to the receiver.

3.2.3 Continuous Vibration Monitoring Equipment

Vibration monitoring instrumentation will be employed to meet the following primary specifications presented in **Table 3.1**. The instrumentation will be installed, operated and maintained by suitably qualified or trained personnel. The instruments will carry current NATA or manufacturer calibration certificates.

Table 3.1 - Vibration Monitor Primary Specifications

Specification	Seismic
Sample Rate	Minimum 1024 samples per second per channel
Frequency Response	2 Hz to 250 Hz (3 dB points)
Resolution	0.016 mm/s
Range	0.1 mm/s to 254 mm/s
Accuracy	3% at 15 Hz
Recording Mode	Full Waveform and Histogram recording with archiving

3.3 Reporting and Corrective Action

3.3.1 Reporting Requirements

All routine monitoring results will be documented and forwarded to the Specialist Advisor Environment on a monthly basis during construction activity. In the event of an exceedance of the construction noise and vibration criteria it will be reported immediately including the location and the level of exceedance. The monitoring results shall be documented and forwarded to the Environment Representative within 7 days.

3.3.2 Corrective Action

Section 7.0 of the CEMP outlines the corrective action process to be followed in the event of a potential environmental incident.

APPENDIX 3

Construction Traffic Management Protocol

PWCS Construction Traffic Management Protocol

1.0 Background

Condition 7.3(c) of the 120 Mtpa Project Approval requires the preparation and implementation of a Construction Traffic Management Protocol (CTMP).

This CTMP has been prepared to address the requirements of this condition and was approved by the Director-General from the Department of Planning (DoP) in March 2008 and has been implemented on site since 2008. In March 2010 the Construction Environmental Management Plan (CEMP) was revised to incorporate the construction activities associated with the Stage 3 Development Consent and the issue specific management sub plans for surface water, noise and traffic. In the event of subsequent project approvals and licence associated with the Kooragang Coal Terminal (KCT), this CTMP will be reviewed and amended as appropriate.

1.1 Traffic Management Context

Heavy vehicles will be delivering plant, equipment and materials to KCT periodically during the construction period. Heavy vehicle movements, at times, have the potential to impact on normal traffic flow external and internal to the KCT site.

It is noted that the Tourle Street Bridge upgrade was completed in 2009. While the new bridge provides improved access to Industrial Drive and the Pacific Highway it does not require the revision of the CTMP.

1.2 Purpose and Scope

The purpose of the CTMP is to outline the appropriate processes to be followed for the management of heavy vehicle movements as part of construction activities.

The protocol:

- outlines construction traffic management actions for heavy vehicles accessing KCT during construction activities;
- encompasses transportation activities including:
 - transportation of construction plant, equipment and materials to KCT from local, interstate and overseas suppliers;
 - transportation of construction equipment and materials to KCT from the wharf to the stockyard area; and
 - transportation of construction waste materials from KCT.

1.3 Objectives

The objective of the Construction Traffic Management Protocol is to manage heavy vehicle movements during construction activities to ensure:

- road safety requirements are identified and managed as a priority; and
- impacts to external and internal road users are controlled and minimised.

2.0 Construction Traffic Management Protocol

The Construction Traffic Management Protocol will, where possible, adhere to the following principles for heavy vehicle and oversize loads:

- Use Egret Street/Raven Street for access to KCT.
- Use Egret Street/Raven Street for the transportation of waste concrete construction materials to Boral's construction material recycling plant on Kooragang Island.
- Heavy vehicle loads are only to use designated entry and exit points at KCT.
- Heavy vehicle loads which may potentially cause significant traffic disruption are to be delivered outside peak traffic hours, where possible.
- Oversize loads will be transported according to the requirements of the RTA and police, and have the appropriate approvals and escorts as required.
- Temporary road closures, if required, will be undertaken with the approval of the authorities, and in accordance with any specific requirements of such approval.
- Power line management, if required for oversized loads, will be in consultation with Energy Australia, and in accordance with any specific requirements.
- Work method statements are to be completed for all heavy vehicle and oversize loads being transported to KCT to identify all hazards and controls to manage the associated risks.
- Parking for all construction related vehicles will be within the KCT site or on land subject to an agreement between PWCS and the landowner.
- Should significant traffic disruption be anticipated then advice via local media will be implemented to communicate with the general public and road users.

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