Project N953
Construction Environmental Management Plan - Stage 3 Main Construction

Intermodal Logistics Centre at Enfield

Plan approved by:

Name	Title	Approved
Jason Pearson	Project Manager	19 May 2011

Details of revisions

Level	Details	Date	Initial
1.0	Final for Main Construction (Stage 3)	19 May 2011	George Kollias
2.0	Final for Main Construction (Stage 3)	19 May 2011	George Kollias

Notes:

1. The Leighton Way, which forms part of the Leighton Management System, holds the current electronic version of this plan.
2. The electronic version is controlled.
3. Key personnel will be notified of changes to the electronic version by way of the content change management system in The Leighton Way.

Details of Version Amendments:

Plan Control

The Project System Co-ordinator will maintain, review and update this plan.

Amendment

Each new version to the plan will be distributed and changes to the recent version will be highlighted. The version number is included at the bottom of each page at the end of the document number. When amendments occur, the entire document will be reissued with the revision number updated accordingly. All amendments to the plan will be approved by key personnel. Minor amendments can be made to the electronic copy of this document without reissuing.

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01 Project Description

The project comprises the development of a new Intermodal Logistics Centre (ILC), associated road and rail infrastructure works, services and environmental enhancement works.

The ILC at Enfield will be used for the transfer and storage of container freight to and from Botany Bay, packing and unpacking of containers within the proposed warehouses and storage of empty containers for later re-use or for return to the port.

The ILC at Enfield will comprise:

- an intermodal terminal (IMT) for the loading and unloading of containers between road and rail and short term storage of containers;
- the provision of warehousing for the packing and unpacking of containers and short-term storage of cargo;
- empty container storage (ECS) facilities, constructed by Sydney Ports, for the storage of empty containers for later packing or transfer by rail;
- the provision of a light industrial and commercial (LIC) area complementary to operations at the ILC which will act as an interface to adjacent uses along Cosgrove Road;
- an area for ecological enhancement and community opportunities. The area also serves as a buffer between operations of the ILC site and residences to the south of the ILC site;
- off-site works comprising construction of a road bridge over RailCorp existing New Marshalling Yards for access to Wentworth Street, local road works on Cosgrove Road and reconstruction of the Norfolk Road and Roberts Road intersection, to manage access/egress of vehicles to/from the ILC site, and rail connections to the freight rail network.

02 Introduction

This Main Construction Phase (Stage 3) Construction Environmental Management Plan (CEMP), which has been prepared by Leightons Contractors Pty Ltd (LCPL), sets out the environmental management system (EMS) to be used to manage and mitigate the environmental impacts from the Main Construction phase of the Project.

The CEMP has been prepared under Sydney Ports overarching CEMP Framework (CEMPF) (available at the ILC project website http://www.sydneyports.com.au/port_development/enfield).

It also sets out the processes and procedures by which LCPL will:

- Ensure compliance with the relevant Minister's Conditions of Approval (MCoA) dated 5 September 2007 including Modifications (MOD) MOD1 dated 7 October 2008, MOD2 dated 30 March 2009 and MOD4 dated 27 May 2010;
- Ensure compliance with all relevant Environmental Legislation including the Protection of the Environment Operations Act 1997;
- Ensure compliance with the Environmental Assessment (EA) and Preferred Project Report (PPR) Statement of Commitments;
- Ensure compliance with Community Consultation Plan for Main Construction;
- Conform to the requirements of International environmental standard AS/NZS ISO 14001:2004.

This CEMP has been prepared to be consistent with the Guideline for the Preparation of Environmental Management Plans (DIPNR 2004) and LCPL's project management system (called the "Leighton Way").

This CEMP applies to Stage 3 works (described in Section 4). The Stage 2 CEMP developed by LCPL for the Early Works was approved on 6th October 2010 by the Director-General's Representative of the Department of Planning.

This CEMP and its sub-plans will be implemented by all personnel during the Main Construction phase of the Project.

03 Environmental Management System

Leighton Contractors Pty Ltd are certified to AS/NZS ISO14001 and have distinct processes to manage environmental matters. These procedures exist within the LCPL nanagement system known as 'The Leighton Way'.

The Leighton Way

The Leighton Way provides specific processes on how to manage environmental matters. These processes form the basis for environmental management and are amended where necessary to become more project specific. These processes are then combined to form part of the CEMP. These processes provide the high level detail on how to manage environmental issues on site.

Construction Environment Management Plan

This Construction Environment Management Plan (CEMP) incorporates all of the requirements of the project approval documents and other requirements including the contract Leighton Contractors has with Sydney Ports to construct the Main Construction works.

The CEMP feeds down into the Sub Plans, with topics of this CEMP being further expanded upon in the Sub Plans as discussed below.

The CEMP includes LCPL's Compliance Tracking Program, which tracks compliance with Ministers Conditions of Approval.

Sub Plans

Sub Plans deal directly with certain environmental aspects and impacts of higher environmental risk. The Sub Plans for the Project include:

- Soil & Water Management Plan
- Noise & Vibration Management Plan (D-G)
- Traffic Management Plan (D-G)
- Air Quality & Dust Management Plan (D-G)
- Flora & Fauna Management Plan
- Waste, Reuse & Recycling Management Plan
- Energy & Water Management Plan

Sub Plans with the annotation 'D-G' require the Director-General's approval required under the MCoA for this phase of the project, in particular MCoA 6.3 (a), (b) & (e). Other items of MCoA 6.3 will be addressed by the Principal, Sydney Ports Corporation, and referenced in this CEMP and in Sydney Ports' CEMPF.

Stakeholder & Community Involvement Plan

Although not a Sub Plan to this CEMP, LCPL's Stakeholder & Community Involvement Plan (SCIP) is closely linked to various environmental aspects and impacts of construction. The SCIP has been established to detail processes and procedures for consultation and notification to community and stakeholders surrounding the Project site.

Constraints Map

A Constraints Map is provided as Appendix A to show the location of and set the context of the site.

04 Construction Activities

Construction activities at the Intermodal Logistics Centre are broken up into stages as defined in Sydney Ports' CEMPF.

The Main Construction phase (Stage 3) is the subject of this Construction Environmental Management Plan. The Main Construction phase will comprise:

- All infrastructure associated with warehouse areas A and B including earthworks, retaining walls, drainage infrastructure, noise walls and Utility Services
- All infrastructure associated with the Empty Container Storage (ECS) areas and warehouse areas C, D, E and F including earthworks, retaining walls, drainage infrastructure and Utility Services
- All infrastructure associated with the Intermodal Terminal (IMT) and the internal rail siding and through lines including earthworks, pavement, trackwork and signalling, level crossing at gravel access road, retaining walls, drainage infrastructure and Utility Services
- Internal roads
- RTA endorsed works mainly associated with the intersection of Roberts Road and Norfolk Road
- Off-site utility connections including sewer and water infrastructure works, electrical connections and telecommunication connections
- Construction of remaining noise walls
- Construction of frog movement corridor
- Earthworks for Light Industrial Commercial area
- Landscaping

05 Objectives and Targets

LCPL has developed core values to guide the culture and behaviours of all company employees. These core values include commitments to respect the environment and community by continually seeking opportunities for positive environmental outcomes. LCPL is committed to:

- Doing more, use less
- Thinking of future generations
- Going beyond mandatory compliance
- Positively shaping the environment

In addition to these core values, LCPL's corporate objectives are to:

- Eliminate regulatory non-compliance
- Reduce waste
- Avoid unnecessary environmental impacts

Environmental objectives and targets for the Project have been developed to align with these corporate values.

Project Environmental Objectives and Targets

Environmental Impact	Objective	Target
Environmental approvals	Project to be constructed in accordance with the MCoA, the EA and Preferred Project Report	No identified non-conformances with MCoA
Effect on the natural ecosystem due to project activities	Ensure there are no adverse effects on the natural ecosystem during the course of construction as a result of project activities beyond those predicted in the EA or subsequent environmental assessments for the works Provide secure habitat for the Green and Golden Bell Frog (GGBF) by constructing the FHCA in the southern part of the site and landscaping it in accordance with the Frog Management Plan (FMP) Minimise the likelihood of direct impacts to threatened species during the site works by complying with the Frog Protection Plan (FPP), including: carrying out frog clearances and inspections prior to commencing work, including removing any frogs found in the works area and construction of frog exclusion fencing Provide for the management and control of weeds in accordance with the Noxious Weeds Act	Ensure no release of toxic materials to the natural ecosystem No unnecessary damage to the natural ecosystem during construction. This includes any impacts on fauna and flora attributable to site works Provide finishing and landscaping in accordance with the FMP
Water pollution resulting from project activities	Ensure no unplanned water is discharged except in the event excessive rainfall (in excess of 95th %'ile 2-day event according to Landcom's Managing Urban Stormwater: Soils and Construction (Blue Book) and of a flood which endangers life or property	No legal breaches or regulatory action in relation to project discharges

	Ensure that the quality of natural waterways are not adversely affected during construction Develop and implement Erosion and Sediment Control plans (ESCP) in accordance with Landcom's Blue Book for activities with the risk to generate significant erosion and pollution of receiving waters Manage accumulated site run-off appropriately to ensure no turbidity, pH or fuels/oils affected water enters receiving waters, with the preference for on-site re-use instead of treated and tested discharges Construct and maintain sedimentation basins on the site to aid collection, treatment and re-use of site run-off Ensure all stockpiled materials are adequately located, stabilised and maintained to prevent erosion and dispersal of the materials	
Generation of waste	Adopt the avoid, reduce, re-use, recycle, dispose hierarchy Minimise impacts from waste generation Avoid contamination of recyclable waste streams Ensure all Project Personnel are aware of the importance of sound waste management practices and the actions they can take	Separate waste into streams to maximise recycling / reuse and to minimise (where practicable) waste sent to landfill All concrete re-used as clean fill on site, or recycled at an off-site facility
Energy & Water	Raise awareness of the issues of Sustainability amongst all Project Personnel working on the project during the Main Construction phase Implement measures to reduce energy and water use	Minimise energy and water usage

Spoil	Maximise the reuse of spoil	No removal of clean spoil or soils from the construction site, unless absolutely necessary
Air pollution resulting from project activities	Ensure that dust and exhaust emissions of plant and equipment produced by construction activities are controlled to an acceptable level and meet the criteria in the MCoA Minimise any adverse impacts on existing air quality Achieve particulate concentrations from construction activities that meet guideline values	No environmental complaints, fines or prosecutions relating to dust and air emissions generated by the project
Noise pollution resulting from project activities	Ensure appropriate environmental controls and procedures are implemented during construction to minimise noise and vibration impacts to all sensitive receivers Ensure appropriate measures are implemented to address the relevant MCoA, legislation and guidelines	To receive no complaints in relation to noise generated by project activities
Contaminated land	Identify any contaminated land and ensure there are no adverse impact on human health or the environment Manage construction activities so as to not contaminate the site and comply with the Project Approval and regulatory requirements in relation to contamination	Contaminated spoil to be managed in accordance with DECCW requirements and the project approval No soil contaminated due to construction activities
Deposition of mud on roadways	Avoid the deposition of mud on roadways as a result of project activities	Receive no complaints or regulatory action relating to mud being deposited on roadways as a result of project activities
Effect on Indigenous Heritage	Protect and respect any items of indigenous significance which may be discovered during the Main Construction phase	Cause no damage to any items of indigenous significance identified during the course of the project

Effect on Non-Indigenous Heritage	Protect any items of non-indigenous significance during the Main Construction phase	Cause no damage to items of non-indigenous significance during the course of the project

06 Policies

LCPL corporate division endorses environmental practices within the company by sanctioning a LCPL Environmental Policy. This Policy is included as Appendix B to this CEMP and will be fully applied on the ILC at Enfield project.

07 Director-General's Approvals

The MCoA for the project are provided in Sydney Ports' CEMPF, and the Department of Planning and Infrastructure (DoPI) and Sydney Ports' websites. The MCoA will be used as part of LCPL's Compliance Tracking Program. The following MCoA conditions relate directly to this CEMP:

MCoA No. and Description	Reference
4.1 The Proponent shall develop and implement a **Compliance Tracking Program** to track compliance with the requirements of this approval. The Program shall include, but not necessarily limited to:	This CEMP and LCPL's Compliance Tracking Program involving the tracking of compliance against the MCoA (as discussed above). Refer also to the Sydney Ports' CEMPF
a) provisions for periodic review of the compliance status of the project against the requirements of this approval;	Monthly internal tracking against MCoA as part of LCPL's Compliance Tracking Program
b) provisions for periodic reporting of compliance status to the Director-General;	Sydney Ports' CEMPF
c) a program for independent environmental auditing at least annually, or as otherwise agreed by the Director-General, in accordance with ISO 19011:2002- Guidelines for Quality and/ or Environmental Management Systems Auditing; and	Sydney Ports' CEMPF. See also Section 12.4.3 of this CEMP
d) mechanisms for rectifying any non-compliance identified during environmental auditing or review of compliance.	Non-compliance mechanisms implemented in accordance with CEMP Section 12.4.4

6.2 Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Director-General a **Construction Environmental Management Plan** to detail an environmental management framework, practices and procedures to be followed during site preparation and construction of the project. The Plan shall be prepared in accordance with *Guideline for the Preparation of Environmental Management Plans* (DIPNR 2004) and shall include, but not necessarily be limited to:	This CEMP
a) a framework consistent with that presented in Chapter 21 of the document referred to under condition 1.1b) of this approval;	This CEMP and Sub Plans
b) a description of all activities to be undertaken on site during site establishment and construction of the project including an indication of stages of construction, where relevant;	Section 4 of this CEMP and Sydney Ports' CEMPF
c) statutory and other obligations that the Proponent is required to fulfil during site establishment and construction, including all approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;	This CEMP Section 08, and Section 1.4 of respective Sub Plans
d) specific consideration of measures to address any requirements of the DECC during site establishment and construction;	DECCW consultation undertaken by Sydney Ports Corportation and provided in Appendix C of the CEMPF. LCPL addresses comments provided by DECCW through the implementation of this CEMP and Sub Plans. This CEMP has been prepared in accordance with DECCW recommendation for environmental management plans for each stage of development. This CEMP will be audited as part of the project Annual Independent Audit, as recommended by DECCW. In accordance with the DECCW Consultation Documents, potential environmental impacts associated with construction will be managed by the implementation of appropriate environmental management systems as detailed in this CEMP and Sub Plans.

	This CEMP, Sub Plans address the key issues identified in the DECCW Consultation Documents being: • Community consultation (Community Consultation Plan attached to CEMPF); • Construction hours (Noise & Vibration Management Plan); • Reasonable and feasible noise and vibration mitigations, and noise monitoring for 'out of hours' works (Noise & Vibration Management Plan); • Sediment and erosion controls (Soil & Water Management Plan); • Potential site contamination investigated and managed (Soil & Water Manangement Plan); • Air quality associated with construction works is managed (Air Quality & Dust Management Plan); • Waste management principles applied (Waste, Reuse & Recycling Management Plan); • Storage and reuse of stormwater be investigated (Soil & Water Management Plan and Energy & Water Management Plan).
e) a description of the roles and responsibilities for all relevant employees involved in the site establishment or construction of the project.	This CEMP Section 10 and processes within Section 12
f) details of how the environmental performance of the site preparation and 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:	This CEMP and/or Sub Plans
i) measures to monitor and manage dust emissions;	Air Quality & Dust Management Plan (Sub Plan)
ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities; and	Soil & Water Management Plan (Sub Plan)
iii) measures to monitor and control noise emissions during construction works;	Noise & Vibration Management Plan (Sub Plan)
g) a description of the roles and responsibilities for all relevant employees involved in site preparation and construction of the project and a program for how these employees will be trained in responsibilities identified in the plan;	This CEMP Section 10 and processes within Section 12

h) complaints handling procedures to be applied during operation of the project (conditions 5.2 and condition 5.3 of this approval);	Any telephone calls (including to the 1800no. Enquiry or Complaints Line) and verbal contacts will be recorded by the LCPL Stakeholder & Community Manager. Records of all the contact details and issues data will be entered into the Community Database. For contacts during standard working hours or non-construction hours - after the initial contact is received, respond within 24 hours or within 2 hours maximum for emergencies. For contacts during night works - calls will be answered immediately and followed up the following day. For all complaints - initiate investigation within 2 hours. A verbal response is to be given to the resident within 3 hours or as soon as practical (or as agreed to with the resident). Investigations should be done within 1 working day. Sydney Ports are to be advised within 24 hours. For further details refer to Sydney Ports CEMPF and Section 11.
i) the issue-specific management plans listed under condition 6.3 of this approval.	See MCoA 6.3 below
The Construction Environmental Plan shall be made available for inspection by the public upon request following its approval by the Director-General.	The Sydney Ports' CEMPF and this CEMP and Sub Plans will be made available on the Sydney Ports' website
6.3 As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following **Management Plans**:	Sub Plans to the CEMP have been prepared by LCPL where responsibility lies with the contractor
a) a Construction Noise Management Plan to outline construction noise mitigation, monitoring and management measures to be implemented to minimise noise impacts during construction of the project. The Plan shall include, but not necessarily be limited to:	Noise and Vibration Management Plan (Sub Plan)
i) details of construction activities and a schedule for construction works;	Noise and Vibration Management Plan (Sub Plan) Section 2.2
ii) identification of construction activities that have the potential to generate noise and/ or vibration impacts on surrounding land uses, particularly residential areas;	Noise and Vibration Management Plan (Sub Plan) Section 2.2

iii) where the relevant construction noise goals contained in the *Noise Management Guideline - Construction Noise* (formerly published as Chapter 171 of the *Environmental Noise Control Manual*) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable and reasonable noise mitigation measures to seek to achieve the relevant construction noise goals;	Noise and Vibration Management Plan (Sub Plan) Section 2.4
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	Noise and Vibration Management Plan (Sub Plan) Section 3.1 and Stakeholder and Community Involvement Plan
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.	Noise and Vibration Management Plan (Sub Plan) Section 5.1
b) a Construction Traffic Management Protocol to detail how heavy vehicle movements associated with the project will be managed during construction. 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;	Traffic Management Plan (Sub Plan)
c) a Heritage Interpretation Plan and Strategy to detail how heritage items to be retain on-site will be protected during site preparation and construction, and how relocated heritage items will be protected and maintained during those works. The Plan shall include a strategy for the on-going management and interpretation of heritage items and values on the site, and shall be prepared in accordance with NSW Heritage Office guidelines;	Sydney Ports have prepared a heritage Interpretation Plan and Strategy (HIPS), which is available on Sydney Ports' website. The Heritage Protection Plan provided in the HIPS details how the retained on-site heritage items will be protected during construction. LCPL addresses the management of retained or uncovered heritage items as relevant to the Main Construction phase in this CEMP Section 12.3.4 and 12.3.5. LCPL's management of retained heritage items is consistent with Sydney Ports' Heritage Protection Plan
d) a Landscape and Ecological Area Management Plan to detail how the site will be landscaped and maintained. The Plan shall be generally consistent with the Landscape Masterplan presented in the document referred to under condition 1.1b) of this approval and shall include, but not necessarily be limited to;	The Sydney Ports' CEMPF provides details with regards to this Plan. This Plan is to be approved before landscaping (other than frog pond vegetation and immediate surrounds as detailed in the approved Frog Management Plan) is undertaken.

	The Flora & Fauna Management Plan (Sub Plan) has referenced aspects of landscape and ecological area management
i) provision for the use of locally-endemic native species for landscaping the site; ii) consideration of landscaping locations and densities to maximise visual screening of the project from residential receptors and public open space;	The Sydney Ports' CEMPF provides details with regards to the Landscape and Ecological Area Management Plan which covers these items of the MCoA. This Plan is to be approved before landscaping (other than frog pond vegetation and immediate surrounds as detailed in the approved Frog Management Plan) is undertaken
iii) measures to maximise the retention of locally-endemic native species existing on the site, and removal of weeds and non-indigenous vegetation; and	The Flora & Fauna Management Plan (Sub Plan) includes measure to retain if possible locally-endemic native species, and manage weeds and other non-indigenous vegetation, particularly in the southern portion of of the site
iv) measures for the enhancement, revegetation and on-going management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria Aurea*;	Sydney Ports' Frog Management Plan and the Flora & Fauna Management Plan (Sub Plan)
e) a Construction Dust Management Protocol to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM10 concentration (24-hour) of greater than 50 ugm-3 at any offiste residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance amy relate to activities associated with the project.	Air Quality & Dust Management Plan (Sub Plan)

The requirements of Sydney Ports' Heritage Interpretation Plan and Strategy, and the Landscape and Ecological Area Management Plan have been incorporated into this CEMP as applicable to this phase of the works. The Frog Management Plan, attached in Sydney Ports' CEMPF addresses the requirements of Condition of Approval 6.3d)iv) in relation to the provision of a suitable habitat for the Green and Golden Bell Frog. Condition 6.3d)iii) is addressed in the Flora and Fauna Management Plan, a Sub Plan of this CEMP.

08 Relevant Legislation

A general list of the relevant legislation applicable or potentially applicable to the Main Construction phase of the project is contained in the following table:

Legislation	Summary
Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000	The project must comply with the Minister's Conditions of Approval
Protection of the Environment Operations Act 1997	The project must comply with section 120 of the POEO Act 1997 which prohibits the pollution of waters, an Environmental Protection Licence (EPL) is not required for the project
Protection of the Environment Operations (Waste) Regulation 2005 + Amendment Regulation 2008	These Regulations set out the types of waste to which waste tracking requirements apply, including special requirements relating to the management of asbestos waste. These Regulations also enable the use of exempt material as fill
Contaminated Land Management Act 1997	The management of established capping / containment cells and of any unexpected finds of contamination uncovered during construction will be in accordance with the CLM Act, guidelines prepared under the CLM Act and the conditions of approval
Heritage Act 1977	This Act aims to conserve items of heritage significance. Measures to protect the Tarpaulin Shed and Pillar Water Tank are provided in the Sydney Ports' Heritage Protection Plan and incorporated into this CEMP
Threatened Species Conservation Act 1995	This Act establishes a framework for the protection of threatened species, populations and ecological communities in NSW. The construction works will not directly impact on any known threatened species, populations, endangered ecological communities (EEC) or critical habitats
Noxious Weeds Act 1993	Under this Act, land owners and controllers are required to control and manage noxious weeds on land under their control.
National Parks and Wildlfie Act 1974	The proposed works would not affect any items or places of Aboriginal significance and therefore no approvals would be required under this Act
Waste Avoidance and Resource Recovery Act 2001	The Act aims to reduce the environmental harm associated with inappropriate waste management and promotes the efficient use of resources under the principles of ecologically sustainable development
Fisheries Management Act 1994	This Act provides protection for aquatic reserves under the Act. The project would have no impacts on protected areas or impede fish passage

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)	Under this Act, activities that have the potential to impact matters of national environmental significance or are on Commonwealth Lands are subject to additional assessment and referral requirements. The project will not impact matters of national significance or any Commonwealth land. In response to a referral to the Department of Environment an Heritage (DEH), DEH advised Sydney Ports that no approval is required under the EPBC Act (for details refer to the EA)
Roads Act 1993	Road opening permits are required to be obtained from the relevant Road Authority (Strathfield Council). Road opening permits will be obtained where required

09 Training and Awareness

Leighton Contractors has its own in-house Environmental Awareness Programme (EnviroEssentials), which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Erosion and Sediment Control, Noise and Vibration, Heritage and Ecology.

Relevant construction personnel will attend the EnviroEssentials programs for Legal and Regulatory Compliance. This will include those people in roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Approved Construction Hours
- Erosion and sediment control plans and procedures
- Approved traffic routes
- Noise restrictions and monitoring
- Site noise controls
- Sensitive receivers (including residential and special use areas)
- Site rules in relation to parking and general behaviour of staff
- Waste reduction, re-use and recycling
- Potential Green and Golden Bell Frog Habitat
- Heritage constraints

10 Organisation and Responsibilities

Environmental management on the Project will be under the control of the Project Manager. The day-to-day environmental management duties will be provided by the site Environmental Manager (EM). The site EM will liaise directly with the LCPL NSW Branch Environmental Manager and Sydney Ports Environmental Representative to ensure the Project is meeting all its corporate, contractual and legal environmental requirements.

The responsibilities for environmental management are as per the Sydney Ports' CEMPF. These and other roles are expanded upon further as follows:

Project Manager

Overall accountability for compliance with all applicable environmental legislation, conditions of approval and Contract obligations.

Environmental Manager (EM)

Implement the project environmental management system as detailed in the CEMP.

Ensure that all Project environmental obligations are met.

Facilitate environmental induction / training.

Coordinate response to all environmental incidents.

Manage sub-consultants where necessary.

Prepare documentation to demonstrate compliance and report on compliance.

Conduct site inspections and system environmental audits.

Ensure corrective actions are implemented.

Liaise with the Sydney Ports for environmental matters on site.

Stop work immediately if an unacceptable impact is likely to occur or to require other reasonable steps to be taken to avoid or minimise any adverse impacts. In the event of stopping works, notify Sydney Ports and LCPL NSW Branch Environmental Manager within 24 hours.

Construction Manager

Responsible for compliance with all applicable environmental legislation, conditions of approval and Contract obligations.

Area Manager / Project Engineer

Directs and implements on-site environmental management measures across all sites.

General Superintendent

Manages on-site construction in relation to environmental management for their site. Reports to the Project Manager or Construction Manager any non-compliance against set criteria.

Site Foreman

Manages on-site construction in relation to environmental management for their site. Reports to the Site Superintendent or Area Manager any non-compliance against set criteria.

Sydney Ports Environmental Representative (SPER)

Reviews the CEMP and amendments to the CEMP in conjunction with other Sydney Ports personnel.

Liaise with LCPL site Environmental Representative for all environmental matters and incidents.

Conduct inspections on site where necessary.

Carry out environmental audits of the project where necessary.

Organise Independent Environmental Audits in accordance with MCoA 4.1c).

LCPL NSW Branch Environmental Manager

Provides assistance where necessary in the management of environmental matters on the Project.

Provides information / direction on environmental matters that have arisen on other LCPL projects which are pertinent to the appropriate environmental management on the Project.

Gives guidance where necessary on environmental matters that directly influence the environmentally safe running of the Project.

11 Emergency Contacts and Response

A 1800 has been established for the project, and is available 24 hours a day, seven days a week. The contact details are as follows:

Project telephone no.: 1800 708 228

A LCPL delegated personnel will have the authority to stop or direct works in an emergency situation. Procedures as detailed in the project Safety Plan and Incident Management Plan will be followed in the event of an emergency.

Other contact details for the project include:

Email: ilcenfield.project@sydneyports.com.au

Mail: PO Box 117, Enfield NSW 2136

An Emergency Response Plan has also been prepared, and will be implemented as part of the Project OH&S and Rail Safety Management Plan.

012 Environment

12.1 Consult & Communicate

12.1.1 Communicate environmental requirements

Description

Communication with the work force and other Project Personnel on environmental issues is necessary to ensure compliance during work activities.

Roles

Environmental Manager, Engineer, Safety & Health Manager, Project Personnel, Foreman

Process

Shift pre-starts

Prior to each work shift a pre-start meeting will be held. These pre-starts are usually chaired by the Foreman with input provided by other Foreman, the Engineers, the Safety & Health Manager, the Environmental Manager and any other person on the project. The pre-start will provide relevant information to Project Personnel on the hazards / issues that may be expected during the course of the shifts work. If there is expected to be environmental hazards / issues whilst carrying out activities these will be discussed.

It is encouraged for Project Personnel to provide feedback on possible environmental issues that may arise during work activities.

Toolbox talks

Toolbox talks are held when issues of an important nature have occurred or changes to work conditions have been recommended / highligted and information is to be disseminated to the work force. The issue may be a project based matter or come from sources outside of the project.

The toolbox talk will be recorded on a Toolbox Talk Record sheet with all attendees printing and signing the sheet.

Tools

12.1.2 Establish Environmental Committee

Description

The advice provided to a project or workplace team on environmentally related matters and issues.

Roles

Environmental Manager, Project Personnel

Process

A Safety, Health and Environmental Committee will be set up for the Main Construction phase, so that all safety, health and environmental matters are dealt with at the same meeting.

Election of the Committee

Interested Project Personnel can put themselves forward as a member of the committee, with as many members taken from the different disciplines on the project as practicable.

The site Environmental Manager or his delegate will be part of the committee to ensure information on environmental matters applicable to the construction works are discussed.

The personnel on the committee will alter during the progress of the works to ensure members come from the new disciplines at that point in the construction works.

Functions of the Committee

The environmental component of the committee's functions is to assist the project team or workplace team in protecting the environment, minimising pollution and respecting the local community through facilitating sound environmental management practices, including the following:

- Assess and review risks to the environment arising from work
- Make recommendations about measures to eliminate or control risks
- Introduce or alter the procedures for monitoring risks to the environment
- Propose changes to work premises, systems, methods, plant or substances that may affect the environment
- Analyse incident investigations
- Make decisions about the procedures for consultation on environmental matters
- Assess and review permits and licences as applicable and conformance with requirements
- Recognise and reward individual and team efforts on environmental performances.
- Promote project achievements

Conducting meetings

At its first meeting, the Committee will appoint a chairperson, establish a constitution and agree the regularity of subsequent meetings, but will be at least every three months.

Documents will be made available to the committee where necessary, to allow feedback with the following items provided for information:

- Incident review
- Corrective actions
- Trend analysis
- Changes to legislation, standards or site rules

- Changes to the workplace or work methodologies
- Inspections and audits, including by regulatory agencies
- Nominations of awards / recognition
- Material developed for internal or external promotion of project achievements

Distribution of minutes

The nominated person will take minutes of the meeting and distribute them to:

- all members of the committee (both attendees and absentees)
- all noticeboards
- the Project Manager

Tools

Environmental Committee Meeting Minutes Template
Project Committee Members

12.2 Identify & Assess

12.2.1 Environmental Risks, Aspects and Impacts

Description

Environmental risk identification and assessment provides a way of mitigating a foreseeable risk from determining the consequence and likelihood of an outcome. Environmental risk assessments will be undertaken in LCPL's software package Active Risk Manager (ARM) and in other environmental documentation.

Roles

Environmental Manager

Process

The ongoing determination of environmental aspects and impacts will be achieved through a risk management process. The process results in the development of environmental risks and a corresponding mitigation strategy. The risk is based on the environmental aspect, the scale of the impact, the type of potential impact and the likelihood of the occurrence.

ARM will document the Main Construction phase risk assessment across all funtional areas, including Environmental. ARM determines risk ranking and documents the appropriate controls required to manage the risk, including the need for Sub Plans, procedures and other environmental controls.

The environmental component of the Main Construction phase risk assessment in ARM is provided in Appendix C of this CEMP.

The environmental risks will be reviewed by the site Environmental Manager as part of the overall review of the project. This will be carried out at least every six months or prior to a major change in work activities.

Environmental risk assessments also form part of the Safety, Health and Environment Work Method Statements (SHEWMS) procedure whereby activities are documented and controls are put in place to mitigate the proposed risk.

Tools

12.3 Implement Controls

12.3.1 Air quality

Description

Air quality can have major impacts on human and environmental wellbeing. Management principles are designed to reduce and control the effects of air pollution generated from site activities on adjacent receptors, travelling public, workers and flora and fauna.

Roles

Environmental Manager, Foreman, Project Personnel

Process

Air quality sensitive receptors for the project

The locations of sensitive receptors for the project have been detailed in the Project's EA. These are also graphically presented in the Constraints Map in Appendix A and further discussed in the Air Quality & Dust Management Plan.

Monitoring air quality

- In accordance with the Project Approval, Sydney Ports Corporation has installed two real-time dust monitoring stations for the project, one at the north west portion of the site and one in the south east portion of the site
- These stations monitor impacts at the residential sensitive receptors to the north-west and south-east of the site
- Monitoring has previously been undertaken for PM10 at these two stations and will form a baseline for the construction phase of the project. Real time monitoring will continue at these locations with data being made available to LCPL during the construction phase and any issues that arise being investigated by LCPL
- A meteorological station is co-located with the dust monitoring station in the south east of the site
- The Environmental Manager will be responsible for monitoring the real-time data and informing Project Personnel and Foreman of current levels

Further information on monitoring of air quality is contained in the Air Quality & Dust Management Plan.

Mitigation of air quality impacts

- Strategies for controlling dust that will be employed for the Main Construction works include the use of water carts, reduced speeds, signage to vehicle drivers and plant/equipment and barriers
- Watering of roads and stockpiles will be carried out and the retrieval of deposited dirt from sealed access points and affected roads will be carried out
- All dust-generating activities will be monitored and inspected daily
- Stockpiles will be situated away from sensitive receptors as far as practicable
- Burning of vegetation or materials onsite is prohibited without approval from the Office of Environment and Heritage
- Weather forecasts will be monitored for high temperatures and strong winds so work activities can be appropriately planned

- Cleared areas on site will be progressively rehabilitated and stabilised to reduce air pollution, as soon as is practical
- Any unreasonable release of odours, dust and smoke to the atmosphere will not be allowed
- All construction related plant and vehicles will go through a wheel-wash/rumble grid before exiting the site

Further guidance is provided in the Air Quality & Dust Management Plan.

Tools

12.3.2 Asbestos

Description

Asbestos is found in many forms - as sprayed insulating coating on steelwork and concrete, lagging on pipes and boilers, insulation board in walls and on doors and ceilings, asbestos cement for roof and wall coverings, pipes and tanks, decorative plasters, asbestiform mineralogy, and train brake shoes.

Roles

Environmental Manager, Supervisor, Safety & Health Manager, Project Personnel, Contractor

Process

Asbestos Management Plan

The Australian Government National Occupational Health and Safety Commission (NOHSC) Code of Practice for the Management and Control of Asbestos in Workplaces requires that an Asbestos Management Plan is to be developed for all workplaces where Asbestos Containing Materials (ACM) remain, or are likely to remain, in situ.

The Sydney Ports' Remediation Action Plan for Known Soil Contamination Intermodal Logistics Centre @ Enfield, subsequent validation documentation endorsed by the Site Auditor accredited under the Contaminated Land Management Act, and the Contamination Management Plan for Construction are used by LCPL as the site Asbestos Management Plan.

Managing known sources of asbestos

Asbestos identified on the site has been remediated by Sydney Ports in accordance with the project approval and the requirements of the Site Auditor. Asbestos contamination has been contained in a number of containment cells and capping areas as shown in Sydney Ports' Contamination Management Plan for Construction. Where intrusive works are required in containment cells and capping areas, specific health controls will be implemented and all works will be carried out in accordance with the Contamination Management Plan for Construction (attached to the CEMPF).

Managing unexpected finds of asbestos

Although the site has been remediated there is the possibility of unexpected asbestos being found on the site during construction. If asbestos is found, the Unexpected Finds Protocol of the Soil & Water Management Plan and the Contamination Management Plan for Construction will be followed. If asbestos is known to be in the vicinity of construction activities, the Supervisor and other Project Personnel including the workforce will be notified. The clean-up will be directed by the Environmental Manager and/or Safety & Health Manager to ensure correct techniques are applied. Works to remove small amounts of bonded asbestos by Bonded Asbestos Trained Project Personnel are directed by a specific Safety, Health and Environment Work Method Statement (SHEWMS) for the task. If significant amounts of asbestos contamination is identified in soils, remediation works will be undertaken in accordance with the Contamination Management Plan for Construction which is appended to Sydney Ports' CEMPF.

Waste testing and tracking

Any asbestos unearthed on site will be tested in accordance with the relevant legislation requirements. When required, asbestos remediation will be undertaken in accordance with the Remediation Action Plan for Known Soil Contamination Intermodal Logistics Centre @ Enfield and the Contamination Management Plan for Construction attached in Sydney Ports' CEMPF.

Any asbestos material which needs to be disposed of off site will be sent to a licensed landfill facility. The material will be tracked using waste tracking records.

Contractors who are handling and disposing of waste will be suitably licensed and will be aware of safety and environmental requirements for handling and disposal. All disposal dockets will be provided to the site Environmental Manager as a record of disposal.

All test records and waste disposal records for asbestos will be kept for at least seven years.

Tools

SafetyLaw & EnviroLaw

12.3.3 Contaminated land

Description

Describes the process for identifying and managing contaminated land on the project site.

Roles

Environmental Manager

Process

Identifying contaminated land

Due to the previous uses of the site, contamination was found in parts of the site. Remediation of the Sydney Ports' ILC site was undertaken during 2009 and early 2010 in accordance with the Remediation Action Plans and Site Audit Statements issued by an accredited Site Auditor under the Contaminated Land Management Act (refer to Sydney Ports' CEMPF for details). LCPL will carry out its works in accordance with the various documents provided by Sydney Ports and identified in Sydney Ports' CEMPF. If unexpected contamination is found during construction, the remediation of affected areas will follow the Unexpected Finds Procedure established in the Soil & Water Management Plan, developed as part of this CEMP and in accordance with the Sydney Ports' Contamination Management Plan for Construction.

Mitigation of contaminated land impacts

In addition to managing the constructed containment cells, LCPL will take measures to prevent further contamination as follows:

- Site inspections will be undertaken to determine the presence of unexpected contaminated land
- Areas of known contained / capped contamination will be identified in the Project Induction and signage will be placed out on site
- The volume of contaminated material, if any, will be defined during construction.
- Machinery and equipment will be inspected prior to its arrival on site and during the course of its use during the works, as part of the Plant Management System
- If excavation of material is required in containment cells / capped areas, this will be done in accordance with directions from the Site Auditor, Sydney Ports, the requirements of the Contamination Management Plan for Construction and as required by relevant legislation
- Identified contaminated soils will be excavated and stored separately to ‘clean’ soils and volumes will not be altered by ‘diluting’ the impacted soils with clean materials
- Details of contaminated land control methods will be detailed by the site Environmental Manager in monthly environmental reports and quarterly compliance reports
- Treatment of spills will be managed as per the process 'Manage incidents involving hazardous substances'

Further guidance regarding Contamination Management is provided in the Soil & Water Management Plan (SWMP). The SWMP also includes Sydney Ports' Contractors Obligations for Excavation for ILC at Enfield and the Unexpected Find Procedure.

Tools

SafetyLaw & EnviroLaw

12.3.4 Cultural heritage - Indigenous

Description

Management of Aboriginal and Torres Strait Islander cultural heritage is a statutory requirement. Cultural heritage is defined as areas, objects and places displaying archaeological or historic significance. This includes objects situated on or under the surface of the land. In addition, the EPBC Act 1999 lists Commonwealth interests as issues in Environmental and Cultural Heritage management.

Roles

Environmental Manager, Foreman, Project Personnel

Process

Existing Indigenous environment

It is not anticipated that indigenous heritage items will be found during the course of construction with the likelihood of disturbing indigenous artefacts, highly unlikely due to previous landuses and a history of disturbances on the site.

Mitigation of cultural heritage impacts

LCPL will take the following measures to mitigate impacts on indigenous cultural heritage:

- Should any potential indigenous heritage items be discovered during the course of the works, the works will cease immediately, barriers / para-webbing will be provided around the affected area and Sydney Ports and Office of Environment and Heritage will be notified. Consent for disturbing any indigenous objects or artefacts will be necessary from Office of Environment and Heritage (NPWS) before any works recommence in accordance with Section 90 of the NP&W Act 1974

Duty of Care

Project Personnel will take all reasonable care not to damage items of indigenous cultural heritage if found on site.

Discovery of heritage item/s

When any heritage item is discovered during construction, the following steps will be taken:

1. Work will cease and care taken to minimise further disturbance
2. The Foreman will be notified immediately, who will then report the find to the site Environmental Manager
3. The area will not be disturbed until an assessment is completed, an inspection undertaken and direction to proceed from Office of Environment and Heritage and Sydney Ports provided
4. The exact location of the discovery will be photographed
5. All relevant management measures to protect the site will be implemented, eg. restrict access to the area to prevent further disturbance, erect barriers and proceed with protective measures

Tools

12.3.5 Cultural heritage - Non-indigenous

Description

Management of cultural heritage is a statutory requirement. Cultural heritage is defined as areas, objects and places displaying archaeological or historic significance. This includes objects situated on or under the surface of the land. In addition, the EPBC Act 1999 lists Commonwealth interests as issues in Environmental and Cultural Heritage management.

Roles

Environmental Manager, Foreman, Project Personnel

Process

Existing heritage items

The Pillar Water Tank and the Pedestrian Footbridge were relocated by Sydney Ports in accordance with the project approval. In accordance with the Project Approval, the Pillar Water Tank will be re-established in the southern part of the site and the footbridge has been relocated off the site to a heritage organisation. The Tarpaulin Shed will remain in place unaffected by Main Construction phase works. No other known heritage items are located within the project footprint.

Mitigation of cultural heritage impacts

- The location of retained heritage items including Pillar Water Tank and Tarpaulin Shed will be provided to all Project Personnel at Project Inductions
- Fence off and provide signage around known heritage items
- Ensure protocols exist for communication of newly discovered artefacts / objects / areas and the process for the project to proceed to afford these areas adequate protection
- Management protocols for a cultural heritage area shall be in accordance with Sydney Ports' Heritage Protection Plan attached in the CEMPF

Duty of Care

Duty of care exists under the Heritage Act 1977 legislation for non-indigenous heritage and requires prevention of damage unless instructed otherwise to proceed.

Discovery of heritage item/s

When any heritage item is discovered during construction, the following steps will be undertaken:

1. Work will cease and care taken to minimise further disturbance
2. The Foreman will be notified immediately, who will then report the find to the site Environmental Manager who in turn will notify Sydney Ports and/or Office of Environment and Heritage
3. The area will not be disturbed until an assessment is completed, an inspection undertaken and direction to proceed provided by Sydney Ports and the Office of Environment and Heritage
4. The exact location of the discovery will be photographed and documented
5. The site will be protected by the erection of barriers / para-webbing and managed to restrict access to prevent disturbance of materials or the site and to proceed with other protective measures

Tools

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12.3.6 Erosion and Sediment control

Description

The effects of poor management of erosion and sediment control can lead to pollution of receiving waters and potential prosecution. This procedure describes the process to be used to guide the implementation and operation of erosion and sediment controls for the Main Construction phase works.

Roles

Environmental Manager, Construction Manager, LCPL NSW Branch Environmental Manager, Project Manager, Project Personnel

Process

This process covers the key principles of planning, design, construction and operation of erosion and sediment controls.

These key principles are expanded upon in the Soil & Water Management Plan, developed as part of this CEMP.

Approach to Erosion and Sediment Control

LCPL's policy is to eliminate and minimise erosion first and control sediment second.

Other factors that influence this approach include:

- The local environment, in particular the frequency, intensity and duration of rainfall events, the proximity to local waterways and their environmental protection status
- Local terrain and geographical constraints
- The construction staging of the project
- The scale of earthworks on the project, which have a higher risk with large cut, fill and earthworks operations

These factors have been considered in the project risk assessment ARM, provided in Appendix C of the CEMP. The project risk assessment is led by the Project Manager, with input from the Environmental Manager and other Project Personnel where required.

Planning

Key planning considerations are:

- Preventing erosion through limiting disturbance, staging access controls, location of materials storage areas and the use of ground cover
- Avoid the need for erosion control by diverting runoff around site
- Control water on site to minimise concentrated and high velocity flows
- Plan construction activities so that soil exposure and other potential risks can be eliminated and permanent controls can be installed during the early stages of construction
- Staging of controls to allow for the dynamic nature of some construction works such as earthworks across large areas of the site
- Rehabilitate areas as soon as practicable to minimise exposure of bare areas in conjunction with permanent landscaping works
- Ensure all erosion and sediment controls are kept in a properly functioning condition until all works are completed and the site is rehabilitated

Design of Controls

The site Environmental Manager will manage the design of the Erosion and Sediment Controls and seek expert opinion from a Soil Conservationist as required.

Key Design Considerations are:

- Ensuring there is no pollution of external waters
- Use of industry best practice guidelines - in general, the ‘'Blue Book" - Managing Urban Stormwater: Soils and Construction (Landcom, 2004) is recognised as the industry ‘'best practice" design manual
- Discharge only in accordance with water quality discharge criteria for the site (50ntu for turbidity and pH between 6.5 and 8.5 with no visible oil and grease)
- Industry best practice and lessons learned from previous projects
- Consultation will be undertaken with the Construction Team and where necessary Sydney Ports and relevant authorities to ensure any specific requirements are integrated into the design
- Where practical, temporary sediment basins will be located in the same location as the permanent detention basins and will be shown on Erosion and Sediment Control Plans (ESCPs)
- The design of basins will include the following detail: volumes of the basin, outlet structure detail, spillway detail, compaction rates, maximum wall slope and materials to be used in construction
- The use of physical controls (eg use of barrier fences) to restrict access to certain areas

Construction of Controls

The Construction Manager is responsible for ensuring Erosion and Sediment Controls are constructed in accordance with the ESCPs, basin design and relevant standards.

Key construction considerations are:

- Basins are to be constructed in accordance with Managing Urban Stormwater: Soils and Construction (Landcom, 2004) (the ‘Blue Book')
- The site Environmental Manager will check to ensure sediment basins are built according to the design and will report any deficiencies to the Construction Manager
- Sediment controls fences are installed correctly
- Ensure entry and exit points are adequately stabilised with crushed aggregate / hardstand / rumble grids
- All vehicles and equipment directly associated with the construction works must pass through a wheel wash/rumble grid prior to leaving the site

Operation of Controls

The Construction Manager will ensure corrective actions as identified by the site Environmental Manager during routine inspections are implemented and that approval to discharge by the site Environmental Manager is obtained prior to release of treated water to the environment.

The three key operational areas are:

- ***Ongoing Inspection and Maintenance of Sediment Controls*** - Formal Inspection to be undertaken weekly and the day after heavy storm events by the site Environmental Manager. This will guide and prioritise the maintenance programme so that key risks are mitigated
- ***Treatment of Sediment Laden Water to enable discharge*** - this is to be achieved by settlement (over time) or accelerated settlement using Gypsum (preferred), Alum, or other suitable flocculants

- ***Discharge to the environment*** - Water quality must be of a satisfactory standard and must comply with the discharge limits specified below and in the Soil & Water Management Plan. Prior to discharge the site Environmental Manager must be notified to arrange the necessary testing prior to discharge to ensure compliance with the water quality criteria

Water quality discharge criteria for the site will be 50ntu for turbidity and pH between 6.5 and 8.5 with no visible oil and grease.

DISCHARGING DIRTY WATER TO THE ENVIRONMENT IS A CRIMINAL OFFENCE - IF IN DOUBT SEEK ASSISTANCE FROM THE ENVIRONMENTAL MANAGER

Training and Awareness

The site Environmental Manager will be responsible for organising the delivery of training packages and will be assisted by the LCPL NSW Branch Environmental Manager.

To help improve the education and awareness of personnel that are involved on a day to day basis the following will be considered for implementation:

- *Toolbox Talks* - for site personnel to address site specific day to day issues, following incidents and to communicate opportunities for improvement
- *Formal Site Practical Training* - for site personnel involved in the planning, installation and maintenance of erosion and sediment control features
- *Formal Planning and Design Training* - for Project Personnel involved in the planning and design of erosion and sediment controls

Tools

Environmental Checklist

12.3.7 Fauna and flora

Description

Certain flora and fauna species are protected under the NSW legislation - National Parks & Wildlife Act 1974 and the Threatened Species Conservation Act 1995 and the Federal legislation - Environment Protection Biodiversity Act 1999 (EPBC Act). In NSW, the Threatened Species Conservation Act lists and allows for the protection of animals and plants that are considered vulnerable, endangered or critical. Under the EPBC Act, fauna, flora and fish species which are threatened nationally can be listed under different categories of protection.

Roles

Environmental Manager, Sydney Ports Consulting Herpetologist

Process

The EA for the project (October 2005) indicated that the ILC site is a highly disturbed area with very little original topography or original vegetation remaining.

It indicated that none of the plant communities in the site constituted threatened species or ecological communities, as no plant species that were listed on either TSC Act or the EPBC Act were recorded within the ILC site.

Similarly, due to the highly disturbed nature of the site there was no indication of any native fauna on the site. The only threatened species recorded was a Grey-headed Flying Fox flying overhead which was not roosting or feeding in the area.

Although Green and Golden Bell Frogs (GGBF) were not observed on the site during studies carried out for the EA and during surveys undertaken on the site during the enabling works and Stage 2 works, potential GGBF habitat is located on the site. GGBF is an endangered species under the Threatened Species Conservation Act and is listed as vulnerable under the EPBC Act. The potential habitat will be managed as set out in Sydney Ports 'Frog Management Plan and Frog Protection Plan' (provided in Sydney Ports' CEMPF). Potential GGBF habitat within the site has been protected with frog protection fencing. LCPL will inspect and maintain the existing frog protection fencing and newly constructed (Early Works) frog ponds in the Frog Habitat Creation Area. Information will be provided within the site inductions to ensure Project Personnel are aware of the location of the potential GGBF habitat and the management process for the GGBF.

Management of fauna and flora will be in accordance with the Flora and Fauna Management Plan (FFMP). The overall management of fauna and flora on the project site is the responsibility of the site Environmental Manager.

Identifying endangered species and sensitive areas

If there are sightings of rare or endangered flora or fauna species on site photographs will be taken, if possible, and the sighting recorded. The site Environmental Manager will be notified to ensure the sighting is notifiable.

If endangered species of fauna or flora are encountered the area will be cordoned off to protect them until removed and/or relocated if possible.

Areas of specific sensitivity, including the location of the potential GGBF habitat, will be identified and illustrated on the site constraints map. This information will be conveyed to the workforce during site inductions, toolbox talks and pre-start meetings.

Mitigation of impacts

- All clearing operations will be assessed and approved through the Pre-Vegetation Clearing Checklist in the FFMP
- Any locally-endemic native vegetation existing at the southern part of the site (at the heritage precinct and Frog Habitat Creation Area (except frog ponds area)) will be retained where possible, in accordance with the FFMP
- Project Personnel will be instructed to check for any trapped wildlife in excavations or under stockpiles of materials. This issue will be covered in the project induction so employees are aware of dangers to both themselves and the trapped wildlife
- Parking, lay-down of equipment and stockpiling of materials within the dripline of retained trees will be prevented through the use of demarcation fences and signage
- Frog inspection and clearances will be carried out before works are undertaken and in accordance with the Frog Protection Plan
- Weeds will be removed in accordance with the FFMP

Liaison with Wildlife groups

- Communication with outside groups (eg. WIRES and Sydney Ports Consulting Herpetologist) will be coordinated through the site Environmental Manager
- The contact details for WIRES is 1800 641 188

Weeds

A number of weed species within the site area were identified in the EA. The Flora and Fauna Management Plan will be complied with for the control of weeds.

Managing injuries to animals

- Any injuries or fatalities to wildlife caused by work activities, and their treatment, will be recorded
- Employees will be instructed not to handle wildlife unless appropriately trained
- A veterinarian or Wildlife Officer from a suitably qualified agency like WIRES will be contacted for advice on how to treat / remove badly injured animals
- In accordance with the FPP, Sydney Ports Representative / Sydney Ports Consulting Herpetologist will be contacted if live or dead GGBF are found

Feral animals

The conditions on site and any found feral animals will be managed to maintain a safe, clean and native fauna-friendly site and surrounds.

The issue, mitigations and monitoring of fauna and flora are further expanded upon in the Flora & Fauna Management Plan, developed as part of this CEMP.

Tools

Environmental Checklist

12.3.8 Groundwater quality

Description

Groundwater is the water located beneath the ground surface. The level of the water table on the project is anticipated to be below excavations except for piling operations.

Roles

Environmental Manager, Area Manager, Foreman

Process

The main Construction works are not likely to intercept the groundwater table. If groundwater is produced from any excavation, it will be re-used on site wherever possible as dust suppression.

To minimise the possibility of groundwater contamination the following mitigation measures will be used:

- Concrete washdown areas are to be constructed for concrete washout of agitators, pumps and other concrete equipment
- Concrete washdown pits are to be constructed and operated in accordance with DECCW guideline "Environmental Best Management Practice Guideline for Concreting Contractors" (DEC, 2004)
- During excavation works the excavated areas will be inspected by the Foreman and/or Area Manager to ensure groundwater table has not been reached
- SHEWMS will provide details on the procedures required if the groundwater is intercepted during excavation. Assistance will be provided by the site Environmental Manager where necessary

Groundwater contamination mitigation measures are discussed in the Soil & Water Management Plan, developed as part of this CEMP.

Tools

Water Release Approval

12.3.9 Noise and Vibration

Description

The project is bound by industrial land to the east and west and mixed industrial / residential to the north-west and south-east. Existing noise levels are dominated by traffic along the main arterial routes in addition to surrounding industrial activities, including the existing railway infrastructure of the New Enfield Marshalling Yards. This section describes the background to noise and vibration aspects. Furthermore the Noise & Vibration Management Plan expands on the measures to be taken to control noise and vibration during the Main Construction phase.

Roles

Environmental Manager, Area Manager

Process

The EA for the project assessed the noise and vibration impacts during the Main Construction phase.

Noise

The EA indicated that construction noise has the potential to exceed noise goal criteria during some activities. Where noise exceedances area likely, reasonable and feasible noise mitigation measures would be implemented to reduce impacts to as close as possible to predicted and goal levels.

Due to the nature of the project, some works may be required during the evening and night-time periods, and on weekends.

MCoA 2.15 establishes construction hours for construction activities that generate audible noise at residential premises. Out of Hours works that are audible at the nearest sensitive receivers must be approved by the Director-General of the Department of Planning and Infrastructure, following an assessment of noise impacts and appropriate notification of impacted members of the community.

Conversely, construction activities which are not audible at residential premises outside of standard approved hours could comply with MCoA 2.15.

Vibration

An assessment of vibration impacts was undertaken for the EA. The EA concluded that there would be no vibration impacts during the Main Construction phase as the majority of vibration from typical vibration activities (such as vibrating rollers) would not have an effect beyond 25m. Residential receivers area are at distances greater than 50m, so it was concluded that it would be unlikely that ground vibration would be an issue.

To attain the design compaction levels during the Main Construction phase of the project, compaction activities may be required within the main project site. The use of Impact Rollers to consolidate deep fills (up to max of 6m deep in parts) may be required. Compaction by this method which has a greater vibratory impact and compacts to greater depths, may be necessary instead of traditional techniques that require the removal and re-compaction of material and therefore a much greater amount of soil disturbance and effort.

LCPL will undertake compaction using Vibratory Rollers and Impact Rollers. Additional assessments may be undertaken to further determine safe-working distances for these activities. The responsible Area Manager and site Environmental Manager will coordinate this task.

Mitigation Measures

Refer to the Noise & Vibration Management Plan for details of the mitigation measures associated with the potential noise and vibration impacts for the Main Construction phase. The key mitigation measures are:

- Construction activities audible (at nearest residential receiver) are only to be undertaken between standard construction hours, unless approved by the Department of Planning and Infrastructure or undertaken for emergency or safety reasons
- Works may be undertaken outside of standard construction hours if they are assessed as inaudible through an Inaudible Works Self Assessment by the Environmental Manager
- Use of non-tonal reversing/movement alarms on all construction vehicles and mobile plant regularly used on site and for any out of hours work, unless a safety risk assessment requires a tonal beeper
- Implementing controls to minimise noise at surrounding residential receivers through using least noisy construction methods and equipment, treatment of noise at the source (plant and equipment), works planning, respite periods and more as fully detailed in Noise & Vibration Management Plan
- Notify residents of construction activities likely to affect amenity due to noise or vibration work in advance of the work being undertaken
- Undertake condition surveys for residences and commercial buildings potentially impacted by vibratory activities
- Undertake vibration monitoring for different compaction methodologies and determine Safe Working Distances

If noise monitoring results indicate non-compliance with site criteria and/or excessive comlaints are received, additional mitigation measures as identified in the Noise & Vibration Management Plan will be implemented where they have been assessed to be "reasonable and feasible" (in accordance with the Interim Construction Noise Guideline).

Tools

12.3.10 Waste management

Description

A general environmental duty of care exists to manage and control waste materials. Note: Asbestos waste management requirements are included in Section 12.3.2.

Roles

Environmental Manager, Contractor

Process

The DECCW Waste Management Hierarchy will be implemented for the Main Construction: avoidance of unnecessary resource consumption, resource recovery (including reuse, reprocessing, recycling and energy recovery), and disposal.

The following will be adhered to:

- Protection of the Environment Operations Act 1997
- Waste Avoidance and Resource Recovery Act 2001
- Protection of the Environment Operations (Waste) Regulation 2005
- Protection of the Environment Operations (General) Regulation 2009
- DECCW Waste Classification Guidelines
- NSW Government (DECCW) Waste Reduction and Purchasing Policy (WRAPP)

Mitigation of waste

Waste management principles and mitigation measures are further discussed in the Waste, Reuse and Recycling Management Plan, developed as part of this CEMP.

The Environmental Manager will implement the following controls to mitigate project waste:

- Identification of possible waste streams generated by the project and management opportunities (e.g. avoid / reuse / recycle)
- Provision of the appropriate number and types of bins onsite for each of the different types of waste. Bins will be clearly marked and monitored for cross-contamination of wastes
- Disposal of any hazardous wastes according to legislative requirements
- Tracking of disposal of hazardous wastes or goods through dockets and manifests
- Salvage and reuse of materials (electrical cables, fences) and recycling wherever possible
- Recycling of waste oils and disposal of waste tyres at approved locations only
- Details of waste disposed of and recycled will be recorded in the monthly Environmental report to Sydney Ports
- Treated timbers containing arsenic and pesticide treatments (such as copper logs), and/or contain chlorine residues, will be managed and disposed of appropriately

Waste management principles and mitigations are further discussed in the Waste, Reuse and Recycling Management Plan.

Waste management licenses, permits and approvals

The following will be observed in regards to licenses, permits and approvals:

- Asbestos Contractor will be appropriately licensed to undertake asbestos removal works

- The disposal of regulated waste materials require a licence
- Manage excavated spoil in accordance with Sydney Ports Contamination Management Plan for Construction (attached in Sydney Ports' CEMPF) as required, to ensure it is suitable for future land use of the site
- Asphalt and concrete are not regulated wastes
- Radioactive materials such as certain types of batteries or electronic equipment require a licence to remove
- Nuisance laws exist to limit littering around sites and are a general duty of care provision

Waste removal

At completion of the project:

- waste piles will be removed from site to the correct receiving facilities
- specialised bins will be emptied, waste tracking dockets received, and all bins and skips returned to owners
- all project lay-down areas will be cleared of items and waste
- the site office area will be cleaned and all items and waste removed

Tools

Environmental Checklist

12.4 Review & Monitor

12.4.1 Inspect site - environment

Description

Environmental site inspections are used to identify hazards and deficiencies and assess compliance against regulatory requirements and best practice processes and intiatives. Environmental site inspections will cover all aspects of the Main Construction works.

Roles

Environmental Manager, Project Manager, Project Personnel, Foreman

Process

Daily inspections

All Employees will conduct a daily visual site inspection of their area whilst on site and report any environmental hazards to their Supervisor by using the Passport Hazard Report (part of LCPL Hazard Reporting system, see OH&S and Rail Safety Plan for more details) facility or verbally informing their Supervisor of a deficiency.

Each Foreman will conduct a daily visual site inspection of work areas to ensure any potential environmental hazard or deficiency is identified, assessed and controlled as required.

The relevant points from the inspection will be recorded in the Foremans Daily Diary and/or by issuance of a Passport Hazard Report.

Weekly and monthly inspections

A site Environmental Checklist (refer CEMP Appendix C) will be completed as a record of an inspection by the Environmental Manager and/or other appropriate Project Personnel including Foremen and Engineers on a monthly basis. Additionally the Project Manager is to undertake a monthly inspection of the site using the Environmental Checklist. The checklist provides prompts to allow for the recording of implemented controls and/or deficiencies or lack of environmental controls.

The Environmental Manager has the authority to stop works until the appropriate controls are implemented.

Any environmental hazard or deficiency identified during the inspection will be managed through action notes on the Environmental Checklist or written into an Inspection Report. The Environmental Manager will review the close-out of items once the actions are complete.

The Safety, Health and Environmental Committee will have access to the inspection reports where required for follow up during meetings.

Leighton Contractors Branch inspections

The Leighton Contractors NSW/ACT/NZ Branch Representatives will perform four inspections per year on the project. The inspection will consist of a walk-around of the project site areas. Findings will be recorded on the Workplace Inspection checklist and relevant personnel advised of the findings.

Sydney Ports or regulatory body inspections

Sydney Ports representatives will inspect the project where necessary. Environmental findings from these inspections will be provided to relevant Project Personnel and the Environmental Manager to discuss and disseminate to appropriate persons.

Regulatory bodies may inspect the project where they believe it is deemed necessary, usually following a complaint or significant issue. Actions to rectify deficiencies will be undertaken where required.

Inspections of Sub-Contractors activities

In addition to the system audit / surveillance carried out on the Sub-Contractor's activities, the Foreman may carry out inspections of all works in progress to assess Sub-Contractors environmental performance. Sub-Contractors will be required to participate in environmental audits and inspections of their activities.

If Sub-Contractor work on site is being performed contrary to the applicable environmental processes in place and/or applicable legislative requirements, action to remedy the situation will be undertaken immediately. This may include a direction to stop if necessary.

Independent Site Auditor Inspections

An Independent Site Auditor will undertake an inspection and audit of the site as part of the annual audit against MCoAs and CEMPs as required by MCoA 4.1.

Tools

Environmental Checklist

12.4.2 Environmental baseline and condition monitoring

Description

Baseline readings of environmental aspects are undertaken prior to commencing works. 'Compliance monitoring' then compares those readings to the observed conditions while work is in progress. This continued monitoring establishes compliance levels in conjunction with criteria set in the MCoA or in relevant guidelines.

Roles

Environmental Manager

Process

Background environmental monitoring data for the project is provided in Chapter 11 of the EA for noise and Chapter 12 of the EA for dust.

Noise

Noise monitoring was undertaken in the EA at six residential locations around the periphery of the site. This monitoring will be taken as the baseline.

Noise monitoring during the Main Construction phase will include monthly attended noise measurements at representative locations for the most potentially affected residents. For details of compliance monitoring, refer to the Noise and Vibration Management Plan.

Dust

Since the commencement of Enabling works at the site, real-time dust monitoring PM10 has been ongoing at two locations in the north and south sections of the site. This monitoring will be taken as a baseline whilst Main Construction works are being carried out on the site.

For further details of ongoing PM10 monitoring, refer to the Air Quality and Dust Management Plan for more details. Notwithstanding the background monitoring results, the criteria in the MCoA 6.3e) must be complied with.

Vibration

Dilapidation or condition surveys will be performed on sensitive buildings and roads around the periphery of the site, prior to vibration intensive works occurring in an area that may affect this property. These surveys will be undertaken by Specialist Consultants.

These dilapidation surveys are discussed further in the Noise and Vibration Management Plan.

Water Quality

Water quality monitoring and background levels for dry and wet weather flows were detailed in the EA. Further details are provided in the Soil & Water Management Plan.

Additional background water quality monitoring may be undertaken by the Environmental Manager before significant site clearance activities.

Tools

12.4.3 Conduct internal audit - environment

Description

This procedure describes the process for internal audits which relate to the Environmental function. Internal audits are part of the continual improvement process and are used to identify opportunities and ascertain whether systems, processes and products comply with specified, agreed and/or statutory requirements. Audit procedures are further expanded upon in the LCPL Quality Plan.

Roles

Environmental Manager, Quality Manager, LCPL NSW Branch Environmental Manager

Process

Auditing scope

Internal audits for the Environmental function will be performed to verify that the Main Construction phase works are being undertaken in compliance with:

- Conditions of Approval
- Environmental legal obligations
- LCPL requirements
- Requirements of this CEMP

Internal Audits will help identify any non-compliances which require addressing and also identify any opportunities for improvement.

Audit frequency

LCPL will schedule and undertake Internal Environmental Audits at least every six months. Internal Environmental Audits will be undertaken by the LCPL NSW Branch Environmental Manager. The timing of these audits may correspond with similar Internal Audits for other functional areas including Safety and Quality.

The Audit Schedule will be coordinated and maintained by the LCPL Quality Manager, following consultation with the Environmental Manager and other functional area managers.

Undertake Audit

The Auditor will record the audit findings in the Audit Checklist and identify and classify deficiencies or improvements identified during audits as either Observations, Recommendations, or Corrective Action Requests:

- Corrective Action Request - where no process exists to manage a specific aspect of the project, or where a process exists but has not been implemented
- Observation - where a process exists and has been implemented but where there are minor issues, where no process exists but it cannot be demonstrated that it is required
- Recommendation - where there is an opportunity for improvement

Issue Audit Report

The Auditor will prepare and issue an audit report that includes an Audit Action List to the Project Team. The Auditor will raise Corrective Action Requests for the Project Tea to close-out.

Observations and Recommendations should be considered for action by the Project Team.

LCPL's Environmental Manager will issue Sydney Ports with a copy of the Audit Report for the Internal Environmental Audit.

Tools

12.4.4 Corrective Action

Description

During construction, where environmental issues and non-compliances with the MCoA and approved CEMP are identified, corrective actions will be implemented. Where hazards and potential deficiencies are identified, they will be managed using the appropriate environmental system.

Roles

Environmental Manager, Project Manager

Process

An environmental issue may be found through a verification process such as monitoring, inspecting and auditing, or through receipt of a complaint. The process for managing environmental issues is as follows:

- When an environmental issue is found through inspections, corrective actions will be identified and documented on the Environmental Checklist, Inspection Record or other documentation as necessary. These records will detail the issue, the corrective and preventative actions proposed and the responsibilities and timing for completion of the actions
- Where the environmental issue is associated with an audit or monitoring event, the actions will be linked to the record of that event
- Once an action is complete, the environmental checksheet will be updated to close the action including input of comments and completion date

In addition to the above, where the issue is of a more serious nature, has been identified repeatedly or constitutes an exceedence of regulatory obligations, the following will apply:

- Where required, the activity associated with the issue will be stopped and will not recommence until such time as remedial action is taken to eliminate the issue
- An incident report will be logged in Cintellate (LCPL Corporate reporting system). The incident will be forwarded to the person responsible for completion of the corrective action
- An Environmental Nonconformance Report (NCR) may be prepared depending on the severity of the incident
- Once the corrective action has been implemented the incident will be closed out
- The incident will be reported in monthly reports provided to LCPL NSW Branch and to Sydney Ports
- The tracking of environmental incidents will be undertaken by the site Environmental Manager or their delegate
- Appropriate notification of issues of a serious nature will be provided to Sydney Ports and/or the relevant authority by the site Environmental Manager or Project Manager

Tools

12.4.5 CEMP Review

Description

This describes the process for the ongoing review of the CEMP and its associated documents.

Roles

Environmental Manager, Project Manager

Process

The CEMP, its operation and implementation and the associated elements of the accompanying environmental management systems, will be reviewed every 6 months following approval of the CEMP by the Department of Planning and Infrastructure, to ensure that the environmental system is conforming with the MCoA, LCPL EMS, LCPL Policy, legal requirements and other associated environmental documents. In addition, if during the project, corrective or preventative actions are raised indicating deficiencies in the CEMP or EMS, this will trigger the review process.

The Project Manager will be responsible for initiating the management review process in accordance with the management review program for the project. The site Environmental Manager is responsible for managing the review and implementing any of the recommendations that arise through the review process and the subsequent amendments to the CEMP and associated documents.

Details of any significant changes made to the CEMP and Sub-Plans will be supplied to Sydney Ports and the Department of Planning and Infrastructure.

Tools

12.5 Manage Incident

12.5.1 Report environmental incidents

Description

Describes how environmental incidents are classified (as low to high severity) and reported.

Roles

Environmental Manager

Process

Classifying incidents

The reporting of environmental incidents relating to harmful effects is classified into three levels of incident:

- Level 3: Low severity occurrence defined as pollution or degradation with short-term (less than one month) and reversible detrimental effects on the environment and/or community. For example, minor oil spill completely remediated.
- Level 2: Medium severity defined as pollution or degradation with persistent (greater than three months) but not reversible detrimental effects on the environment and/or community.
- Level 1: High severity event defined as pollution or degradation that has or may have irreversible detrimental effects on the environment and/or community, for example, illegal clearing of endangered plants.

The LCPL Incident Management Reporting System - Cintellate, contains more detailed incident classifications.

Recording incidents

- Details of incidents will be entered by the site Environmental Manager or their delegate into the Cintellate Incident Management System as soon as possible following an incident.
- All Level 3 incidents will be reported at project-level only.
- Level 2 incidents will be reported to the Leighton Contractors' NSW Branch Office and to Sydney Ports.
- All Level 1 events will be reported to the Leighton Contractors' NSW Branch Office, Corporate Office and Sydney Ports. In liaison with Sydney Ports, environmental incidents with actual or potential significant off-site impacts on people or the biophysical environment will be notified to the Director-General as soon as practicable after the occurrence of the incident in accordance with the requirements of MCoA 7.1.

The Cintellate Incident Management System shall act as the register of environmental incidents in accordance with MCoA 7.2. LCPL will meet the requirements of the Director-General to address the cause or impact of any accident, as required by MCoA 7.3.

Tools

SH&E Incident Management System

12.5.2 Manage incidents involving hazardous substances

Description

Describes the management of incidents involving hazardous substances include fire, explosion, spillage, leakage or other escape into the environment.

Roles

Environmental Manager, Safety & Health Manager, Personnel

Process

The Project will maintain an emergency response capability with a suitable number of spill kits available in the event of an environmental spill.

In the event of an incident or near miss involving a dangerous goods spill or leak:

- Personnel will take immediate action to reduce any risk associated with the spill or leak
- the Safety & Health Manager will investigate the incident to determine the likely cause, record the outcome of the investigation and take appropriate remedial actions
- the site Environmental Manager will review the risk assessment as detailed in the project risk register and take appropriate actions to reduce risk.
- excavate or remove contaminated ground (spills up to five litres or less) in a sensitive area, or remedy through an approved process
- the site Environmental Manager will coordinate remediation works through the DECCW if the spill is a Level 2 Medium with a persistent impact over three months
- the site Environmental Manager will conduct soil sampling and monitoring of the cleanup area if required
- the site Environmental Manager will obtain inputs from Consultants if required.

Reporting of spills in non-sensitive areas will be conducted as follows:

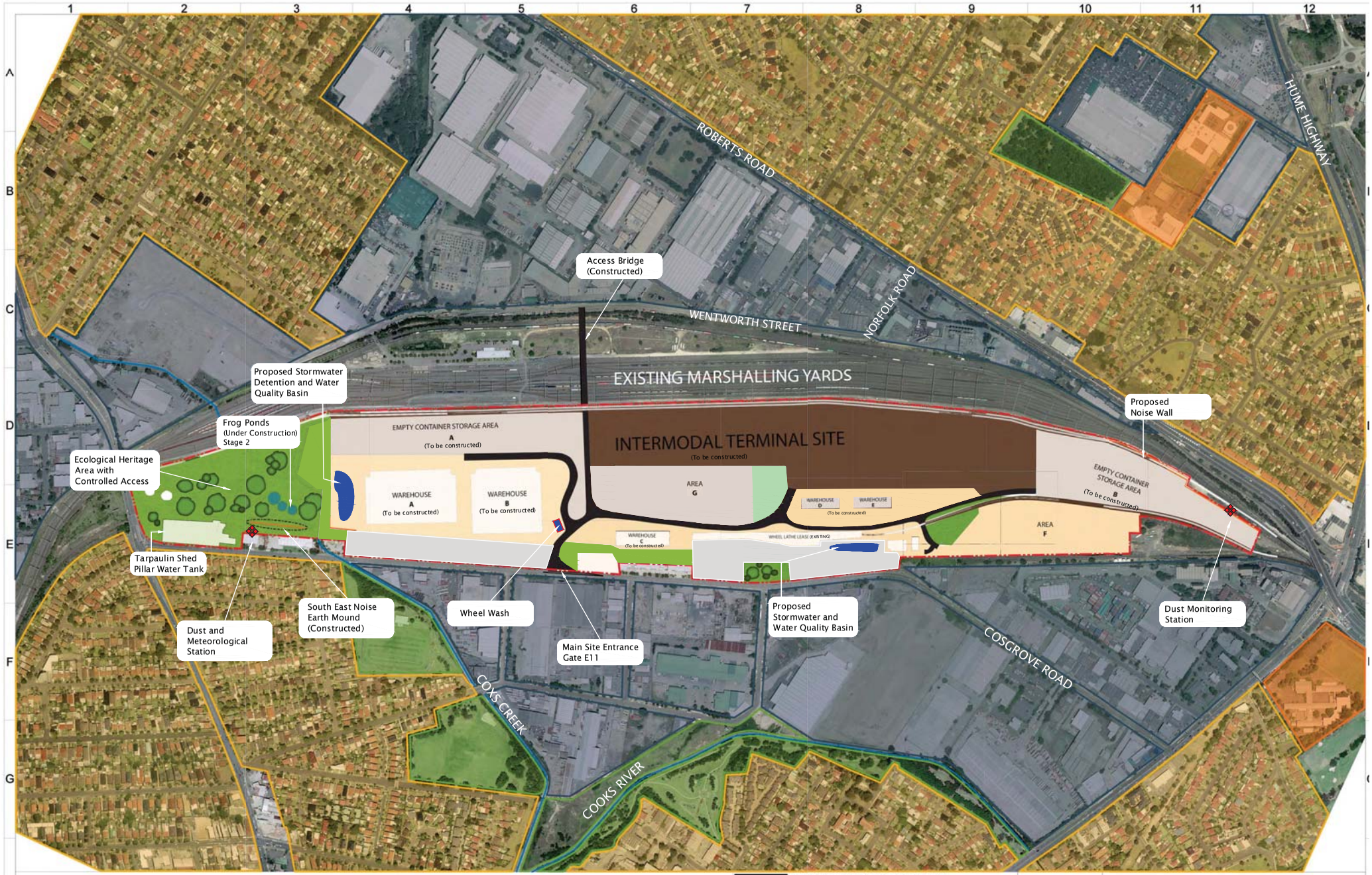
- LEVEL 3: Less than 20 litres will be reported through the internal Cintellate Incident Management System and Monthly Environmental Report.
- LEVEL 2: Over 20 litres will be reported to the Project Manager immediately and managed according to the project Emergency Response Plan / Incident Management Plan.
- LEVEL 1: Significant spills / incidents may require upward reporting.

The appropriate authorities will be notified in accordance with the Section 12.5.1 of the CEMP, and Emergency Response procedures as part of the OH&S and Rail Safety Management Plan.

Tools

SH&E Incident Management System

Appendix A: Constraints Map



Note

1. Potential Frog Habitat and Frog Fences are shown on Frog Management Plan (Sydney Ports CEMPF)
2. Containment Cells / Capping Areas shown in CMP for Construction (Sydney Ports CEMPF)

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ENFIELD INTERMODAL LOGISTICS CENTRE

Surrounding Landuses and Constraints Map
Main Construcion

Appendix B: LCPL Environmental Policy

Leighton Contractors Group Environmental Policy

'CREATING A SUSTAINABLE FUTURE'

Leighton Contractors is committed to environmental sustainability. We strive to balance our economic and operational requirements with social responsibilities whilst minimising the impact of our business activities on the environment and surrounding communities.

To assist us in achieving our environmental objectives we will undertake the following:

- Promote a culture of innovation, engagement and participation;
- Promote the efficient use of energy and water, reduction of waste, recycling of materials and prevention of pollution;
- Improve our energy efficiency and management of our greenhouse emissions;
- Maintain an Environmental Management Systems in accordance with AS/NZS ISO 14001;
- Meet or exceed relevant environmental legislation and other criteria to which we subscribe;
- Regularly review our environmental performance and identify and implement opportunities for improvement;
- Influence our suppliers and subcontractors with our approach towards responsible environmental practices;
- Promote practices, systems, values and behaviours that contribute to environmental sustainability;
- Demonstrate leadership in environmental management both internally and within the industries we operate.

This policy will provide the framework for setting environmental objectives and targets within our business.

P J McMorrow

Managing Director

Leighton Contractors Pty Ltd

Appendix C: ARM Environmental Risk Assessment

Hazard/Safety Risk	Current Assessment	Treatment Plan	Post Mgt Assessment	Plan Owner
Area: Environment				
122577 : **Interaction with Native Wildlife** Injury to native wildlife **Cause**: Construction activities adjacent to sensitive ecological areas **Effect**: Damage to Wildlife, green and golden bell frogs **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Unlikely Safety: Minor **Severity**: 7 Low Threat **Crisis Event**: N/A	Ensure correct environmental plan is adopted in sensitive areas, sign post sensitive areas, SHEWMS, prestart, induction, barriers and fences, frog and native animal inspection, environment education & training	Probability: Rare Safety: Minor **Severity**: 6 Low Threat	Bowers, Jeffrey
122592 : **Excessive noise at receivers** Excessive noise at receivers **Cause**: Lack of mitigation measeures, controls not working, equipment not in good working order, poor selection or orientation of equipmet, labour attitude labour culture **Effect**: Community complaints, fines, prosecution **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Possible Safety: Moderate **Severity**: 13 High Threat **Crisis Event**: N/A	Construction noise and vibration management plan, notification, Stakeholder and community involvement plan, selection of plant, orientation and location of plant, methodology, SHEWMS, out of hours approval and notification, temporary protection at source.	Probability: Rare Safety: Moderate **Severity**: 11 Moderate Threat	Undefined
122594 : **Water Pollution** Water Pollution affecting natural environment **Cause**: Discharging contaminated / sediment laden fluids into water courses **Effect**: Damage to environment, prosecution **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Possible Safety: Minor **Severity**: 16 V High Threat **Crisis Event**: N/A	Ensure approved environmental plan and sediment control plan is adopted & implemented, SHEWMS, prestart, induction, adequate supervision by EM, water discharge approval, man pump at all times, follow requirements from Construction Safety Essentils 1 - Permit to Work	Probability: Rare Safety: Minor **Severity**: 14 High Threat	Bowers, Jeffrey
122596 : **Spills of Hazardous Substances** Injury from Hazardous Substances, Property Damage **Cause**: Exposure, Improper Handling and Procedures **Effect**: Personel injury, Property Damage **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Unlikely Safety: Minor **Severity**: 7 Low Threat **Crisis Event**: N/A	MSDS, SHEWMS, correct procedure, safe storage, alternative options, spill kits, bunded pallets, education and training, store minimum quantities	Probability: Rare Safety: Minor **Severity**: 6 Low Threat	Bowers, Jeffrey

Hazard/Safety Risk	Current Assessment	Treatment Plan	Post Mgt Assessment	Plan Owner
122599 : **Damage to Public, Private, Community structures (e.g. cracks in houses) due to construction** Construction equipment causing vibration at receivers or at distance **Cause**: Heavy dynamic compaction and excessive impact rolling activities **Effect**: Property damage, complaints, human health affects **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Unlikely Safety: Moderate **Severity**: 12 High Threat **Crisis Event**: N/A	Dilapidation surveys, follow the notification procedure, vibration monitoring, complete trial procedure, complete desk top study of vibration affects, cut off trenches, monitoring set up of cut off trenches, noise and vibration management plan, SHEWMS, prestart, adequate supervision, regular communication with community, safe working distances, selection of plant, induction.	Probability: Rare Safety: Moderate **Severity**: 11 Moderate Threat	Bowers, Jeffrey
122601 : **Flooding** Flooding of site or external areas **Cause**: Failure to comply to procedures, Erosion & Sedimentation Control, Poor planning, Review of Controls **Effect**: Property damage, traffic delays, personel safety, public safety **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Unlikely Safety: Minor **Severity**: 7 Low Threat **Crisis Event**: N/A	Soil & water management plan, erosion and sedimentation plan, inspections, audits, checks, adequate supervision, effective communication, permanent drainage, detention basin, weather watch, PTE in place to weekly service & specifications, spare materials available onsite	Probability: Rare Safety: Minor **Severity**: 6 Low Threat	Bowers, Jeffrey
160377 : **Discovery of bones (human and or animal)** Possibility of finding bones (if Human bones then NSW Police to be notofied) if animal bones, dispose of these bones approiately **Cause**: Discovery of bones (human and or animal) **Effect**: Project work area closed down by NSW Police (if Human bones are discovered) **Owner**: Bowers, Jeffrey **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Possible Safety: Minor **Severity**: 8 Moderate Threat **Crisis Event**: N/A	Project work area closed down by NSW Police (if Human bones are discovered), inform workforce to keep an eye out for possible bones and not to bury them and keep quiet - Project will NOT loose time if these events occur.	Probability: Possible Safety: Minor **Severity**: 8 Moderate Threat	Bowers, Jeffrey
160381 : **Unexpected contamination found in work area** **Cause**: Existing contamination in Lot 42 and old Telstra pits **Effect**: **Owner**: Bojko, Greg **Area:** Environment **Origin:** Undefined **Status:** Active	Probability: Almost Certain Safety: Moderate **Severity**: 18 V High Threat **Crisis Event**: N/A	Unexpected finds protocol, Remediial action plan in place, use certified contractors / personnel,	Probability: Rare Safety: Moderate **Severity**: 11 Moderate Threat	Bojko, Greg

Hazard/Safety Risk	Current Assessment		Treatment Plan	Post Mgt Assessment		Plan Owner
160385 : **Dust impacts** **Cause**: Excessive dust generated during works, lack of controls **Effect**: **Owner**: Pearson, Jason **Area**: Environment **Origin**: Undefined **Status**: Active	Probability	Almost Certain	Air quality and dust management plan, site inspections, water cart on site, maintaing haul roads, planning works around forecast weather events	Probability	Unlikely	Pearson, Jason
	Severity	20 Extreme Threat		**Severity**	15 High Threat	
	Crisis Event	N/A				
160388 : **Vibration imoacts to sensitive receivers** **Cause**: Compaction equipment, rock breaking of concrete / aspalt, not following safe working distances **Effect**: **Owner**: Pearson, Jason **Area**: Environment **Origin**: Undefined **Status**: Active	Probability	Almost Certain	Follow noise and vibration plan, monitoring, verify safe working distances, selection of plant	Probability	Rare	Pearson, Jason
	Severity	18 V High Threat		**Severity**	11 Moderate Threat	
	Crisis Event	N/A				
160389 : **Uncontrolled disturbance of capped / containment cells** **Cause**: Excavation in containment cells, tracking of heavy plant and equipment over areas, unauthorised works **Effect**: **Owner**: Bojko, Greg **Area**: Environment **Origin**: Undefined **Status**: Active	Probability	Possible	PTE, soil and water management plan, signage, prestarts, planning works, barriers, inductions	Probability	Rare	Bojko, Greg
	Safety	Moderate		Safety	Minor	
	Severity	13 High Threat		**Severity**	5 Low Threat	
	Crisis Event	N/A				

Appendix D: Environmental Checklist

Environmental Checklist

Project: Intermodal Logistic Centre @ Enfield **Project No:** N953

Date: **Time:** ☐ AM ☐ PM

Weather: **Rain:**

Site Activity:
e.g. bridge piling

1. Soil, Contamination and Water Quality	
☐ Yes ☐ No ☐ N/A	Erosion and Sediment Control Plans developed & implemented for high-risk areas or activities
☐ Yes ☐ No ☐ N/A	Minimise disturbance, progressively rehabilitate, and maximise cover
☐ Yes ☐ No ☐ N/A	Are sediment controls being maintained and have capacity to filter run-off
☐ Yes ☐ No ☐ N/A	Are sandbags or other sediment controls installed around stormwater pits
☐ Yes ☐ No ☐ N/A	Are spoil stockpiles appropriately located and managed to prevent sediment loss
☐ Yes ☐ No ☐ N/A	Are all vehicles associated with construction using wheel wash/rumble grids before leaving the site
☐ Yes ☐ No ☐ N/A	Are all vehicle loads covered to prevent release of material
☐ Yes ☐ No ☐ N/A	Is stormwater runoff controlled through sedimentation controls including sediment fence, sandbags etc
☐ Yes ☐ No ☐ N/A	Is water being captured in sedimentation basins where used
☐ Yes ☐ No ☐ N/A	Is captured water being reuse as far as practicable
☐ Yes ☐ No ☐ N/A	Does discharged water meet the criteria stated in the CEMP & SWMP (<50ntu, pH6.5-8.5, no visible oil/sheen)
☐ Yes ☐ No ☐ N/A	Are BoM & site meteorological stations being monitored so planning takes into account weather forecasts
☐ Yes ☐ No ☐ N/A	Is plant and equipment checked daily to ensure there are no leakages of oil, fuel or other liquids
☐ Yes ☐ No ☐ N/A	Is known contamination being managed in line with Soil & Water Management Plan
☐ Yes ☐ No ☐ N/A	Is there any encroachment on or damage to capping layers of existing containment cells
☐ Yes ☐ No ☐ N/A	Spoil being managed appropriately from the Main Construction works
☐ Yes ☐ No ☐ N/A	Unexpected finds (including asbestos) reported, managed in accordance with Unexpected Finds Procedure
☐ Yes ☐ No ☐ N/A	Are concrete washouts being used and have sufficient capacity
☐ Yes ☐ No ☐ N/A	Are chemicals stored and used in accordance with MSDS
☐ Yes ☐ No ☐ N/A	Is chemical storage sufficient (120%) of the volume stored
☐ Yes ☐ No ☐ N/A	Are spill kits and other spill control material available at the active work areas
☐ Yes ☐ No ☐ N/A	Are any accidental spillages reported, controlled immediately and actions taken to prevent reoccurrence
☐ Yes ☐ No ☐ N/A	Mobile generators or pumps in an appropriately bunded location while deployed onsite
☐ Yes ☐ No ☐ N/A	Maintenance and cleaning of plant on hardstand areas with appropriate controls

☐ Yes ☐ No ☐ N/A	Are all quarantine and machinery wash down water and amenities wastewater directed to sewer or to an appropriately licensed liquid waste disposal facility
☐ Yes ☐ No ☐ N/A	If Acid Sulphate Soils suspected, it is investigated and controls implemented

Comments:

2. Air Quality and Dust	
☐ Yes ☐ No ☐ N/A	Is regular watering of active work areas undertaken, including stockpiles and haul roads
☐ Yes ☐ No ☐ N/A	Is a 20km/hr speed limit applied and enforced on the site
☐ Yes ☐ No ☐ N/A	Is real-time dust monitoring being monitored & activities modified where currently or likely to exceed 50$\mu g/m^3$
☐ Yes ☐ No ☐ N/A	Is the area of disturbed or exposed land at any one time minimised
☐ Yes ☐ No ☐ N/A	Are staff educated on correct material handling procedures and dust management
☐ Yes ☐ No ☐ N/A	Is any site dirt tracked onto public roads by construction vehicles
☐ Yes ☐ No ☐ N/A	Are stockpiles stabilised and managed as to avoid dust generation
☐ Yes ☐ No ☐ N/A	Constant visual observation for excessive dust production
☐ Yes ☐ No ☐ N/A	Slow or stop dust generating activities which cannot be adequately controlled by water or other means
☐ Yes ☐ No ☐ N/A	Rumble grids/rock rumbles/wheel washes being used to minimise dirt tracked onto roads
☐ Yes ☐ No ☐ N/A	Are streets near exit to site clean / swept?
☐ Yes ☐ No ☐ N/A	Dust generating loads are covered coming to and leaving the site
☐ Yes ☐ No ☐ N/A	Concrete / rock breaking activities have water available for dust suppression
☐ Yes ☐ No ☐ N/A	All plant and equipment in good working order to minimise emissions
☐ Yes ☐ No ☐ N/A	Offensive odours from excavations reported and investigated

Comments:

3. Noise and Vibration	
☐ Yes ☐ No ☐ N/A	Are the works being carried out within the prescribed hours unless approved by Dept. Planning & Infrastructure
☐ Yes ☐ No ☐ N/A	Noise controls implemented as per NVMP, SHEWMS and/or Out of Hours Approval
☐ Yes ☐ No ☐ N/A	Non-tonal reversing beepers or smart alarms used on vehicle & plant regularly used onsite
☐ Yes ☐ No ☐ N/A	Checking noise levels of individual items of plant aren't excessive
☐ Yes ☐ No ☐ N/A	Respite periods for noise intensive works near residential receivers
☐ Yes ☐ No ☐ N/A	Orientate plant and equipment so that noise generated is directed away from residential receivers
☐ Yes ☐ No ☐ N/A	Position items of noisy plant and equipment away from each other as far as practicable
☐ Yes ☐ No ☐ N/A	Switch off plant and equipment that is idling unnecessarily
☐ Yes ☐ No ☐ N/A	Use silenced compressors and generators
☐ Yes ☐ No ☐ N/A	Determine Safe Working Distances and monitor vibratory activities
☐ Yes ☐ No ☐ N/A	Undertake vibration monitoring to verify Safe Working Distances where residences are potentially impacted
☐ Yes ☐ No ☐ N/A	Undertake condition surveys of residences and commercial buildings potentially impacted by vibration
☐ Yes ☐ No ☐ N/A	If noise or vibration monitoring shows values approaching criteria or exceeding, implement reasonable and feasible measures to attempt to reduce levels
Comments:	

4. Flora and Fauna	
☐ Yes ☐ No ☐ N/A	Frog Habitat exclusion zones adhered to
☐ Yes ☐ No ☐ N/A	Exclusion fence in good order, inspected and maintained before nightfall
☐ Yes ☐ No ☐ N/A	Frog Clearances undertaken in areas of known or suspected frog habitat prior to commencing work in those areas
☐ Yes ☐ No ☐ N/A	Any found frogs being managed in accordance with Frog Protection Plan
☐ Yes ☐ No ☐ N/A	Any proposed use of pesticides around frog habitat areas assessed by the Environmental Manager, and where required endorsed by Sydney Ports following consultation with Herpetologist
☐ Yes ☐ No ☐ N/A	Indirect impacts of construction (e.g. spills and air quality) being managed
☐ Yes ☐ No ☐ N/A	Only site run-off and potable water can drain through frog habitat areas, other sources must be investigated
☐ Yes ☐ No ☐ N/A	Take measures to protect all native fauna from the impacts of construction activities
☐ Yes ☐ No ☐ N/A	Manage tree removal in the southern portion of the site to maximise retained vegetation through Pre-Vegetation Removal Checklist
☐ Yes ☐ No ☐ N/A	No stockpiling or lay-down of materials within drip-line or over root ball of trees to be retained

☐ Yes ☐ No ☐ N/A	Manage weeds onsite through Pre-Vegetation Removal Checklist
☐ Yes ☐ No ☐ N/A	Pesticides used in accordance with legislation and regulations, training requirements and notification requirements
☐ Yes ☐ No ☐ N/A	Pesticide application records must be completed and submitted to Sydney Ports within 24hours
☐ Yes ☐ No ☐ N/A	Pesticides must not be applied within existing potential frog habitat and frog habitat creation area
☐ Yes ☐ No ☐ N/A	Controls for pesticide application being followed (not while hot, windy, raining)
☐ Yes ☐ No ☐ N/A	Noxious weeds managed in accordance with the Weed Management Strategy provided in the FFMP
☐ Yes ☐ No ☐ N/A	Manage feral animals to maintain safe, clean and native fauna-friendly site
Comments:	

5. Waste Management	
☐ Yes ☐ No ☐ N/A	LCPL staff and sub-contractors using reduce, reuse, recycle and dispose hierarchy
☐ Yes ☐ No ☐ N/A	Is all liquid and/or non-liquid waste generated, stored on site or disposed of being assessed and classified in accordance with the DECCW's Waste Classification Guideline
☐ Yes ☐ No ☐ N/A	Are all asbestos or asbestos-contaminated materials uncovered during construction being managed in accordance with the requirements Soil & Water management Plan (which incorporates the requirements of the POEO Waste Reg. and any DECC guidelines relating to asbestos)
☐ Yes ☐ No ☐ N/A	Waste materials being tracked
☐ Yes ☐ No ☐ N/A	Segregate waste streams to prevent contamination of reusable and recyclable materials
☐ Yes ☐ No ☐ N/A	All waste concrete being reused on-site or recycled off-site
☐ Yes ☐ No ☐ N/A	No disposal of clean soils to off-site
☐ Yes ☐ No ☐ N/A	Collect and store waste oil, other liquids and spillages in suitable containers and store in bunded areas before disposal
☐ Yes ☐ No ☐ N/A	All permanent bunded storage areas covered
☐ Yes ☐ No ☐ N/A	Site free of litter and good housekeeping maintained
☐ Yes ☐ No ☐ N/A	Are recycling bins provided for and being used by LCPL staff and sub-contractors
☐ Yes ☐ No ☐ N/A	Are all waste materials removed from site directed to a waste management facility lawfully permitted to accept the materials
Comments:	

6. Traffic	
☐ Yes ☐ No ☐ N/A	Are the works being carried out in accordance with the Construction Traffic Management Protocol
☐ Yes ☐ No ☐ N/A	Are all vehicles parking within the site to minimise impact on Cosgrove Road
☐ Yes ☐ No ☐ N/A	Are all heavy construction traffic using the designated arterial roads
☐ Yes ☐ No ☐ N/A	There are no truck movements outside construction work hours
Comments:	

7. Community	
☐ Yes ☐ No ☐ N/A	Are the works being carried out in accordance with the Stakeholder and Community Liaison Plan
☐ Yes ☐ No ☐ N/A	Have activities with potential community impact been assessed by the Community Manager
☐ Yes ☐ No ☐ N/A	Are any contacts made to project personnel directed to the 1800 numbers
☐ Yes ☐ No ☐ N/A	Are all complaints being recorded on the Complaints Register
☐ Yes ☐ No ☐ N/A	Are controls being implemented in accordance with method statements and approvals to minimise community impact
☐ Yes ☐ No ☐ N/A	Are work areas outside the site left in a safe and clean condition
Comments:	

8. Heritage	
☐ Yes ☐ No ☐ N/A	Items of European Heritage significance stored, protected and signed in the southern portion of the site in accordance with the Sydney Ports' Heritage Protection Plan
☐ Yes ☐ No ☐ N/A	If any suspected indigenous or non-indigenous heritage items are discovered, stop works and investigate
Comments:	

INSPECTION DETAILS

Inspected By **Signature:**

Other Comments:

ILC at Enfield

Soil and Water Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	21/09/10	GK
1.1 & 1.2	Minor changes addressing Sydney Ports' additional comments.	27 & 28/09/10	GK
1.03	Draft as updated for Main Construction	22/03/11	GK
2.0	Final for Main Construction	5/04/11	GK
3.0	Final for Main Construction	17/05/11	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Soil and Water Management Subplan (SWMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Main Construction phase. The purpose of the SWMP is to describe how Leighton Contractors (LCPL) will manage and control the erosion and sedimentation, potential soil contamination (including asbestos) and potential chemical contaminant risks associated with the Main Construction phase.

The plan has been prepared to address the requirements of: a number of the Ministers Conditions of Approval; the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005) and Sydney Ports Corporation (Sydney Ports) Construction Environmental Management Plan Framework (CEMPF) (2010); and all applicable legislation.

1.2 Background

The EA for the Project assessed the geology, topography, soils, groundwater, water quality, hydrology and hydraulic impacts during the construction and subsequent operation of the Project. A detailed description of the methodology for construction and assessment of these aspects is provided in Chapters 9 and 10 of the EA.

The EA determined that construction activities have the potential to disturb soils during the remediation works, installation of infrastructure and site forming activities (earthworks and grading). A Soil and Water Management Plan, written in accordance with 'Managing Urban Stormwater, Soils & Construction, Volume 1, 4th Edition' (Landcom 2004) (from here on referred to as 'Bluebook') was called for to determine the methods of managing erosion and sediment control issues.

The EA discusses the implementation of various erosion and sediment controls including sedimentation basins to manage the issue of potential turbid water runoff generated during the course of construction.

Groundwater was identified to be as two aquifers on-site; a perched aquifer within the base of the deeper fills and a deeper aquifer associated with the underlying natural clays. Previous studies have found that any potential groundwater contamination is likely to reflect the regional (degraded) background conditions.

The EA found that areas of the site were contaminated in parts, but with the appropriate remediation strategy being prepared and implemented, contaminant exposure or mobilisation risks would be addressed. Sydney Ports has undertaken remediation works on the Sydney Port's ILC site and has obtained the required Site Auditor's Statements and documentation for this phase of the project in accordance with the Project Approval (refer to Sydney Ports' CEMPF). Contamination contained on site as part of the remediation works and the appropriate controls are detailed in the Contamination Management Plan for Construction

(Coffey, November 2009). This Soil and Water Management Plan is written in accordance with the requirements of this reference document and the Project Approval.

The Environmental Assessment concluded, provided that the proposed mitigation measures discussed in the EA are implemented during the construction phase, no negative impacts with respect to geology, soils, contaminated lands, or hydrology are anticipated as a result of the project.

1.3 Objectives

The key objectives of the SWMP are to ensure the potential soil and water impacts from the Project are minimised and managed in accordance with the requirements of the Project Approval and applicable legislative requirements. To achieve this objective, the LCPL project team will undertake the following:

- Develop and implement Erosion and Sediment Control Plans (ESCP) in accordance with 'Bluebook' for activities with the risk to generate significant erosion and pollution of receiving waters
- Manage accumulated site run-off appropriately to ensure no turbidity, pH or fuels/oils affected water enters receiving waters, with the preference for on-site reuse instead of treated and tested discharges
- Construct and maintain sedimentation basins on the site to aid the collection, treatment and reuse of site run-off
- Ensure all stockpiled materials are adequately located, stabilised and maintained to prevent erosion and dispersal of the materials
- Manage construction activities so as to not contaminate the site and comply with the Project Approval and regulatory requirements in relation to contamination
- Review and update as necessary this Soil and Water Management Plan and the control measures required by it.

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to soil and water management includes:

- **The Environment Planning and Assessment Act (1979)** - The project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the POEO Act, which covers a range of environmental offences including pollution offences. Specifically, Section 120 of the Act which prohibits the pollution of waters. An Environment Protection Licence (EPL) is not required for the project under the POEO Act as the project is not listed as a "scheduled activity". No voluntary licence for water discharges is considered necessary at this point, as the preference for any captured site run-off would be for re-use onsite for dust suppression. Where discharge is necessary for safety or other

reasons, treatment and testing will be undertaken to ensure the water is compliant with the criteria established in this plan.

- **Contaminated Land Management Act (1997) –** The management of any unexpected contamination during construction will be undertaken in accordance with the CLM Act, guidelines prepared under the CLM Act and the applicable requirements of the project approval.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to SWMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Water Quality and Hydrological Impacts		
2.28	Except as may be expressively provided under an Environment Protection Licence applicable to the project, the Proponent shall comply with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.	This Soil and Water Management Plan (SWMP)
2.29	Soil and water management controls shall be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during site preparation and construction activities, in accordance with Landcom's Managing Urban Stormwater: Soils and Construction (Bluebook)	This SWMP
2.30	All stockpiled construction materials shall be adequately located, stabilised and maintained to prevent erosion or dispersal of the materials.	This SWMP Sect 4.1
2.31	The Proponent shall construct and maintain stormwater detention basins on the site, generally consistent with the basin sizes/ locations presented in the document referred to under condition 1.1h) of this approval. Opportunities to reuse stormwater from detention basins for ecological areas or for site operations shall be investigated during detailed design of the project, and where practicable, the Proponent shall utilise collected water preferentially to external potable water supplies for operational activities on the site, subject to testing to confirm the suitability of collected water quality.	Required for Operation. However, construction phase sedimentation basins may be constructed during Main Construction phase, in the location of proposed Stormwater Detention Basins or elsewhere. This SWMP Sect 4.1, sedimentation

MCoA	Description	Reference
		basins will be sized according to Bluebook.
2.32	All quarantine and machinery wash down waters and amenities wastewater shall be directed to sewer (subject to Sydney Water Corporation approval), or to an appropriately licensed liquid waste disposal facility.	Required for Operation. This SWMP Sect 4.1. Maintenance of plant and equipment during construction
2.33	The Proponent shall design, install, maintain and operate rainwater tanks for the collection of water for domestic uses on the site. Collected rainwater shall be used preferentially to external potable water supplies.	Required for operation. This SWMP Sect 4.1
Waste Management		
2.42	The Proponent shall ensure that contaminated areas of the site that are disturbed by construction works associated with the project are remediated prior to the commencement of project operations at these areas. All remediation works shall be undertaken in accordance with the requirements of the Contaminated Land Management Act 1997 and Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 1997).	This SWMP Sect 4.1 and Appendix A
2.43	Prior to the commencement of construction works associated with the project that may disturb contaminated areas of the site, the Proponent shall submit to the Director-General a Site Audit Statement(s), prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the area of the site on which construction is to be undertaken has been or can be remediated to a standard consistent with the intended land use. A final Site Audit Statement(s), prepared by an accredited Site Auditor, certifying that the contaminated areas have been remediated to a standard consistent with the intended land use is to be submitted to the Director-General prior to operation of the remediated site(s).	This SWMP Sect 4.1 and Appendix A
2.44	The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during the construction, commissioning and operation of the project strictly in accordance with the requirements under *Protection of the*	This SWMP Sect 4.1

MCoA	Description	Reference
	Environment Operations (Waste) Regulation 2005 and any guidelines or requirements issued by the DECC in relation to those materials.	
6.2	Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Director-General a CEMP...The Plan...shall include: f) details of how the environmental performance of the site preparation and 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: ii) measures to monitor and minimise soil erosion and the discharge of sediment and other pollutants to lands and/ or waters during construction activities;	This SWMP Sect 4.1, 5.1

Guidelines

The development of Erosion & Sediment Control plans, design and implementation of sedimentation/detention basins, use of other erosion and sediment controls, and management of water will be undertaken in accordance with Landcom's 'Bluebook'.

The management of any unexpected contamination and/or works in containment cells/capping areas will be in accordance with the *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 1997), the Contamination Management Plan for Construction (attached in Sydney Ports' CEMPF) and the Conditions of Approval. The Summary Flowchart for Excavation (Appendix A) will also guide much of the works on the site.

Control of fuels, oils and other chemicals will be undertaken in accordance with DECCW's *Bunding and Spill Management Guidelines* and any relevant legislation or Australian Standard.

2 Identify and Assess

2.1 Existing Environment

Overview

The project site comprises three geological formations including Bringelly Shale, Minchinbury Sandstone and Ashfield Shale, all part of the Wianamatta Group. Weathering processes occurring on the site are likely to produce residual silty and clayey natural soils. The site also has the potential to contain swampy soils and alluvial deposits as a result of the low-lying nature of the southern section of the site.

Soils at or near the ILC site are classified disturbed soils under the Soil Landscapes of the Sydney 1:100,000 Sheet (Soil Conservation Service of NSW, Chapman et al, 1989). The erodibility of these soils is highly variable.

The site gradually slopes from the west to the east, with surface water draining to four drainage lines. These concrete and masonry drainage lines are tributaries of both Coxs Creek and the Cooks River, before their confluence 300m to the east of the site.

The majority of the site has no known occurrence of acid sulphate soil (ASS) material. There is a small section in the south east of the site adjacent to Coxs Creek where there is a low probability of ASS occurring at depths greater than 3 m below ground surface.

Previous studies have identified two aquifers on-site, a perched aquifer within the fill and a deeper aquifer associated with the underlying clays and shales. Perched aquifers drain to the underlying aquifer, and the general subsurface flow is towards the base of the culverts which lie along buried watercourses. Previous studies have found that the groundwater contamination is not significantly widespread and any potential contamination is likely to reflect the regional (degraded) background conditions.

The potential for flooding exists in the southern part of the site at Coxs Creek and to the west of the project site, where the upper reaches of the two northern drainage lines flood local streets and businesses.

The site has a history of previous industrial use and as a result there is potential for ground contamination. As part of the project's Stage 1B, remediation works were undertaken during 2009 and 2010 at the Sydney Ports' ILC site in accordance with the project approval and Site Audit Statements (SAS) issued by an accredited Site Auditor under the CLM Act. The SASs are available in Sydney Ports' project website. Unexpected contamination and any works required in containment cells/capping areas will be managed in accordance with the project approval and the Contamination Management Plan for Construction (attached in Sydney Ports' CEMPF).

Any contamination issues for off-site works must also be addressed as these areas have not been assessed in past studies. This includes areas required for the slip lane at the corner of Roberts Road and Norfolk Road.

Background Water Quality

Existing water quality data is available from previous monitoring as presented in the EA. The data provided is for mean results for wet weather flows in Coxs Creek (**Table 2**) and dry weather flows in the two northern drains (Central and DELEC Drains respectively) (**Table 3**).

Table 2: Mean Water Quality in Cox Creek (Wet Weather Flows)*

Parameters	**Guideline Concentration (ANZECC 2000)**	**Wet Weather Concentrations**	
		Upstream of site	**Downstream of site**
Faecal Coliforms (cfu/100mL)	1000	57000	54000
Total phosphorus (μg/L)	25	198	211
Total nitrogen (mg/L)	0.35	4.10	3.28
Suspended Solids (mg/L)	-	14.0	50.0
Turbidity (NTU)	6-50	46	144
Dissolved oxygen (mg/L)	>6	10.6	8.9
BOD (mg/L)	-	4.0	5.0
pH	6.5-8.5	8.1	8.0
Grease (mg/L)	-	10.0	2.0
Copper (μg/L)	1.4	20	34
Lead (μg/L)	3.4	20	36
Zinc (μg/L)	8.0	130	240

***Taken from Scientific Sciences monitoring 1992.**

Table 3: Mean Water Quality in Central and DELEC Drains (Dry Weather Flows)*

Parameters	**Upstream of site**	**Downstream of site**
DELEC Drain		
Suspended Solids (mg/L)	6	8.3
BOD (mg/L)	7.6	8.3
pH	7.8	7.6
Grease (mg/L)	2	2.3

Parameters	Upstream of site	Downstream of site
Central Drain		
Suspended Solids (mg/L)	11.3	11.3
BOD (mg/L)	9	9.3
pH	7.5	7.5
Grease (mg/L)	3.6	4

***Taken from Freight Corp monitoring average results 1999 - 2001.**

2.2 Construction Activities

Construction activities that have the potential to cause impacts include the following:

Site General Works

- Prepare haul roads
- Clearing & grubbing
- Removal of Unsuitable material
- Construction of sedimentation ponds

Earthworks and Drainage

- Earthworks and compaction works
- Stormwater drainage works
- Relocation of services
- Retaining walls/embankments

Road and Rail Infrastructure

- Vehicle movements
- Off Site Access Works
- Reinforced earth wall for road embankment
- Install services, drainage and capping material for new rail line
- Earthworks
- Cleared areas for pavement works

External Utility Service Installation

- Non-destructive excavation
- Trenching

2.3 Potential Impacts

Soil Erosion

The soils on-site are considered to have moderate to high erodibility. Potential for erosion will be reduced by the low gradients of the site. This Soil and Water Management Plan has been

prepared prior to commencement of Main Construction works onsite and as part of the Construction Environmental Management Plan (CEMP). This SWMP has been prepared in accordance with the principles and practices provided in the Bluebook.

Erosion and sediment control measures identified in this plan will be implemented prior to construction commencement, and maintained in an appropriate manner until all ground surfaces are stabilised, sealed or revegetated. As such, no erosion and sedimentation impacts are predicted.

Acid Sulphate Soils

Works in the southern portion of the site would not lead to a lowering of ground water levels or works more than 2m below the natural ground surface. Therefore, no ASS management measures need to be considered as part of the detailed design.

Water Quality

During the Main Construction phase, the main potential water quality impacts from the ILC site would be the export of sediments and other potential pollutants to the local waterways due to the exposure of soils to erosion. Erosion and sediment control structures and good site practices will be implemented to minimise the potential for adverse impacts on local surface water quality during the construction phase.

With controls in place, the quality of water leaving the site will meet the established guidelines, that is ANZECC and water quality criteria for those water quality parameters the construction site can potentially impact (turbidity, pH and oil/grease).

Contamination Mobilisation

Any unexpected residual contamination and the constructed containment cells/capping areas will be managed in accordance with the Contamination Management Plan for Construction to ensure contamination mobilisation does not occur. Contamination risks for both on-site and off-site works will be assessed in an ongoing manner during construction and an unexpected finds procedure will be in place.

An appropriately qualified consultant will provide advice on mitigation measures required for works that involve disturbance of containment cells/capping areas and for the management of any unexpected contaminants found during construction in accordance with the above document and DECCW's guideline Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.

Groundwater

During the site validation, Coffey carried out groundwater sampling and assessment at the site (Coffey, April 2010; "Validation Report for Separable Portion 2, 3, 4 and 5 ILC @ Enfield"). Coffey concluded in its assessment that the groundwater within the site was not significantly impacted and that the levels of chemicals in the groundwater were representative of background concentrations. The Main Construction phase works are not anticipated to cause any impacts on groundwater.

3 Consult and Communicate

3.1 Training and Awareness

Leighton Contractors has an environmental training program called EnviroEssentials (see CEMP for more details) which addresses LCPL key construction risk areas including erosion and sediment control.

Additional training and awareness will be provided during the course of the project. Training of key staff on Erosion and Sediment Control Plan (ESCP) development, managing erosion, and correct choice and installation of sediment control structures will be provided by accredited Soil Conservation trainers.

Awareness will be provided through the provision of erosion and sediment control handbooks to Supervisory Staff, alerts and posters and through discussion of erosion and sediment control aspects at pre-start and mass toolbox talks.

Similarly, training and awareness regarding topics of contamination management, acid sulphate soils and spill control will also be undertaken.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- ESCP required for works that have high erosion and sedimentation risks
- Implementation of the controls as per the ESCP, as far as practicable before the work starts
- Management of turbid water and sedimentation basins
- Minimise wastage and reuse of as much water as possible on-site
- Water treatment and testing before any discharge, HOLDPOINT requiring Environmental Manager sign-off before discharge
- Inspections and monitoring of site

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise erosion and sedimentation impacts:

- Erosion and Sediment Control Plan (ESCP) will be developed and implemented in accordance with the 'Bluebook' for works with the potential to cause erosion and sedimentation. See example for Sedimentation Basin Construction (Appendix B)
- ESCP to be implemented as far as practicable before the work starts (progressive implementation of erosion and sediment controls may be required)
- Only disturb areas necessary for the works to be done
- Re-establish ground cover or stabilise areas that have been disturbed, progressively and once the work is complete
- Monitor weather forecasts, current weather from on-site meteorological station, and plan works accordingly
- Reduce the velocity (and erosivity) of run-off by reducing flow lengths through the installation of sandbags, check banks, speed humps and other devices in exposed areas
- Install a range of appropriate sedimentation control devices to establish a series of controls before water is directed to sedimentation basins
- Establish and maintain appropriately sized sedimentation basins to capture sediment laden site run-off
- Sizing of sedimentation basins for the catchments, soil type and typical rainfall characteristics of the area will be in accordance with the 'Bluebook'
- Sedimentation basins will be in the approximate locations of the operational detention basins, unless scheduling of construction doesn't allow for sedimentation basins to be built there
- Manage and treat captured water in sedimentation basins for reuse on-site (preferred) and for controlled discharge where necessary for safety or other operational reasons
- Treatment of the captured water will be in accordance with the LCPL procedure for Sediment Basin Flocculation (Appendix C)
- Gypsum or Aluminium Sulphate will be used to flocculate suspended sediments and pH buffering with an acid may also be required

- Water to be discharged from site is to be treated and tested to meet ANZECC water quality criteria for protection of aquatic ecosystems, that is, no visible oil/grease, NTU <50 and pH 6.5 - 8.5
- HOLDPOINT Following treatment and testing, discharges from site must be approved by the Environmental Manager or delegated representative who has the appropriate training before discharge
- All discharges from basins are to be recorded on the Sedimentation Basin Checklist (Appendix D)
- All other discharges from site that can't be reused onsite and not placed in sedimentation basins, whether water accumulated in tanks, pits or excavations, are to be recorded on the Discharge Water Quality Checklist (Appendix E)
- Where there is a need for additional water for dust suppression and other activities, over and above water captured and reused, a potable water supply will be used
- Potable water use for dust suppression and other construction activities will be monitored to prevent wastage though Environmental Checklist inspections
- Other sources of water may be investigated. Relevant licenses and permits would be obtained prior to water extraction
- Rainwater tank(s) to be installed at the Main Site office (Building 31) and where possible elsewhere. Captured rainwater to be re-used onsite
- Appropriately locate and manage stockpiles so as to not to create a potential sediment source that could contaminate nearby watercourses, by diverting run-on water, providing sediment controls to filter run-off, and stabilising where necessary
- All vehicle associated with construction works will pass through the rumble grids or wheel wash prior to leaving the site
- Vehicle loads will be covered to prevent the release of material

The following mitigation measures will be implemented to minimise contamination mobilisation impacts:

- Works in containment cells/capping areas or for any unexpected contamination found during site works are to be managed in accordance with the Contamination Management Plan for Construction (Coffey 2009) (attached in Sydney Ports' CEMPF)
- Follow the procedure attached in Appendix A for all intrusive works
- Notification to Sydney Ports is required prior to intrusive works in containment cells and capping areas in accordance with Contamination Management Plan for Construction
- The Site Auditor accredited under the Contaminated Land Management Act 1997 is to be involved for any construction works that involve disturbance of contaminated soils (unexpected contamination or works in containment cells and capped areas) in accordance with the MCoA, Plans and Procedures detailed above in Sections 1.4, 2.1 and 2.3.
- LCPL and its sub-contractors will comply with any requirements and conditions of any Site Audit Statements or interim advice provided by Site Auditor on remediated sites within the ILC project

- Any identified asbestos or asbestos-contaminated materials that may be uncovered during the construction will be managed strictly in accordance with the requirements of Protection of the Environment Operations (Waste) Regulation, Occupational Health & Safety Act (see Safety & Health Plan and Rail Safety Plan) and any relevant guidelines or other established requirements
- Unexpected Finds Procedure (Appendix F) will be followed if unknown contamination or asbestos is found during the course of site activities
- Any new containment cell proposed will be planned and approved in consultation with Sydney Ports and the Site Auditor
- All concreting works must be undertaken in accordance with the DECCW's Environmental Best Management Practice Guideline for Concreting Contractors, including installing concrete washout facilities where necessary
- Machinery will be checked before being used onsite through plant risk assessment, and daily during plant pre-starts checks

The following mitigation measures will be implemented to manage spillage prevention, containment and clean-up:

- Storage and handling of chemicals must be in accordance with the Material Safety Data Sheets
- Temporary bunding is required, particularly in any location with direct drainage to a waterway or environmentally sensitive areas, to manage any spillage of a chemical, fuel or lubricant
- Refuelling operations should be undertaken away from drains and watercourses and must not be left unattended
- Adequate quantities of spill control materials (spill kits and others) must be kept readily available
- In the event of an accidental spillage, spilled materials will be controlled, contained and cleaned up as soon as practicable
- Spill materials will be disposed of appropriately
- Impervious bunds for storage must be of sufficient capacity to contain at least 120% of the stored chemicals
- Bunds will be monitored during the weekly checklist inspection and any required maintenance and decanting will be directed by the Environmental Manager
- Controls around transportation of smaller receptacles of chemicals to site and appropriate application of materials will be detailed in Safety Health Environmental Work Method Statement (SHEWMS) or similar
- Mobile generators or pumps will be placed in an appropriately bunded location while deployed onsite
- Maintenance and cleaning of plant and equipment will be carried out on hardstand areas with appropriate controls
- Plant and equipment will be routinely checked for leaks and any required clean-up and repair promptly actioned

- Amenities wastewater will be directed to sewer or collected by an appropriately licensed contractor

The following mitigation measures will be implemented to minimise potential for acid generation if Acid Sulphate Soils (ASS) are discovered:

- If suspected ASS is excavated implement the Unexpected Finds Procedure (Appendix F)
- Additional control plan for ASS will be developed if/when risk increases due to activity or methodology to be undertaken changes. This will include procedures for sampling and measures for management of actual or potential ASS
- Awareness training regarding what ASS looks and smells like, the potential effects of acid generation and pollution downstream will be provided to staff and subcontractors

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections that include checks on aspects of soil and water will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Main Construction phase. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on soil, water contamination and potential ASS impact.

Water quality testing will be undertaken where controlled discharge of captured, treated and tested site water is necessary for safety or other operational reasons, as detailed in Section 4.1 Mitigation Measures.

All discharges from basins will be recorded on the Sedimentation Basin Checklist (Appendix D).

All other discharges from site that can't be reused and not placed in sedimentation basins, whether water accumulated in tanks, pits or excavations, will be recorded on the Discharge Water Quality Checklist (Appendix E).

No specific water quality monitoring of receiving waters is required by the MCoA or contract.

5.2 Auditing

Six monthly internal audits for compliance against the relevant MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess soil and water aspects including monitoring, reporting, effectiveness of controls, community and complaints management. The site EM is responsible for managing and implementing audit actions and the Project Manager has overall accountability for ensuring compliance.

Annual external independent environmental audits are undertaken by an Independent Auditor in accordance with the requirements of MCoA 4.1 (for details refer to Sydney Ports' CEMPF). The annual Audit Reports are available on Sydney Port's website.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents during the Main Construction phase will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

7 Appendices

Appendix A

Flowchart for Excavation - ILC at Enfield

Received 24/6/10

Contractors' Obligation for Excavation for ILC at Enfield: Sheet 1 of 2

For excavation within the site in:

- Lot 2, DP 1006861
- Lot 14, DP 1007302
- Lot 101, DP 1001498

Is excavation within an area of known contamination as shown in Drawing SEDP140B?

No

Commence excavation

Unexpected contamination found?

Yes

Implement and comply with the Contamination Management Plan for Construction (Coffey, 2009) as summarised below:

- Immediately notify SPC of the identified or suspected contamination;
- Engage an appropriately qualified environmental consultant to carry out an assessment of the nature and extent of the unexpected contamination
- Liaise with an accredited site auditor under the CLM Act;
- Carry out any required remediation work in accordance with the remediation acceptance criteria specified in the RAP (Coffey, 2009a) and site auditor requirements to remove or contain the identified contamination;
- Carry out any required validation work to demonstrate that the identified contamination has been adequately remediated or managed; and
- Report the works conducted to a standard suitable for review by an accredited site auditor.

No

Continue Excavation

Yes

Works impact Containment Cell A (including buffer zones)

Implement and comply with the requirements of Appendix A of the Contamination Mgmt Plan for Construction: Site Management Plan Asbestos Soil Containment Cell – Separable Portion 1 Intermodal Logistics Centre @ Enfield (Coffey, 2009) as summarised below:

Any intrusive works or maintenance activities which fully or partially penetrate the containment cell cap must be authorised by SPC;

- Comply with the SMP, applicable legislation and regulations during the works. If actions are undertaken that substantially modify SP1 (e.g. re-development), such that the capping layer in the containment cell in SP1 is likely to be disturbed, a new SMP must be prepared by a suitably qualified environmental consultant;
- Assess property and activity specific environmental and health and safety risks associated with the work;
- Prepare a Site Specific Health and Safety Plan (SSHSP), Site Specific Contamination Management Plan (SSCMP), SWMS and a Contingency Plan, prior to commencement of works;
- Induct all personnel undertaking the works to the requirements of this SMP, the SSHSP and the SSCMP;
- Comply with and implement control measures in accordance with the SMP, SSHSP and SSCMP during the works;
- Respond to and manage environment, health and safety incidents;
- Following the completion of works submit a report to SPC, describing the works undertaken, disposal procedures, mitigation measures implemented, any environmental incidents that occurred including response, clearance results, and steps taken to making good the cap; and
- Ensure the works area is restored to a safe condition with cap fully reinstated following completion of works.

Works impact Containment Cells 1, 2, 3 and 4 (including buffer zones)

Implement and comply with the Contamination Management Plan for Construction (Coffey, 2009) as summarised below:

Inform SPC in writing, at least 10 working days prior to the commencement of any such works, and submit with the notification a work plan for review and agreement, addressing, as a minimum, the following:

- Monitoring of the works by an appropriately qualified environmental consultant;
- Supervision by an AS1 licensed contractor during any required removal and off-site transportation of any asbestos impacted soil. This may not be required for works only in the buffer zones, depending on discussions with SPC;
- Dust minimisation during excavation, transport and placement works;
- Tracking and recording the excavation locations and the management of excavated contaminated soils;
- Contingency Plan for unforseen environmental issues;
- Reinstatement of the cap and the geo-fabric marker layer of the containment cell to its former condition;
- Inspection by an appropriately qualified environmental consultant to validate the rectification works;
- SPC approved placement or off-site disposal (following waste classification) of excavated contaminated soil to meet site remediation objectives; and
- Reporting of the works conducted to a standard suitable for review by an accredited site auditor under the Contaminated Land Management Act

Works impact Capping Areas D/E and F (including buffer zones)

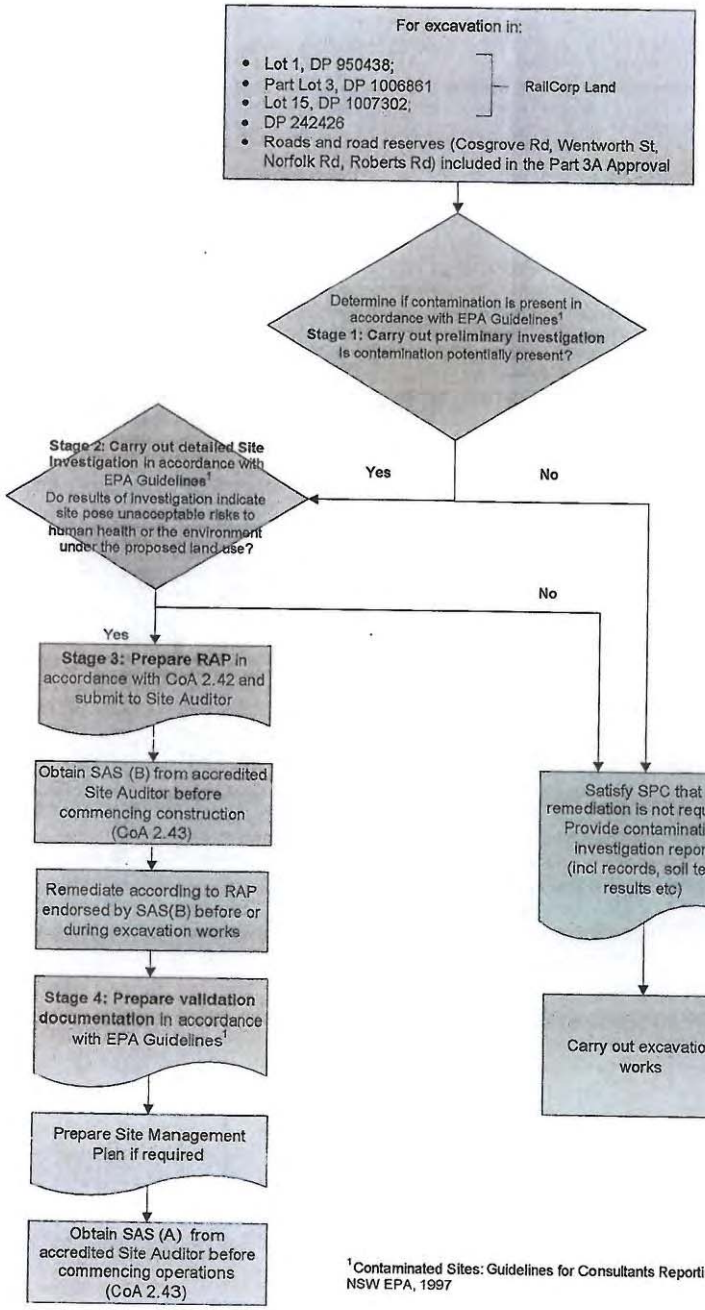
Implement and comply with the Contamination Management Plan for Construction (Coffey, 2009) as summarised below:

Inform SPC in writing, at least 10 working days prior to the commencement of any such works, and submit with the notification a work plan for review and agreement, addressing, as a minimum, the following:

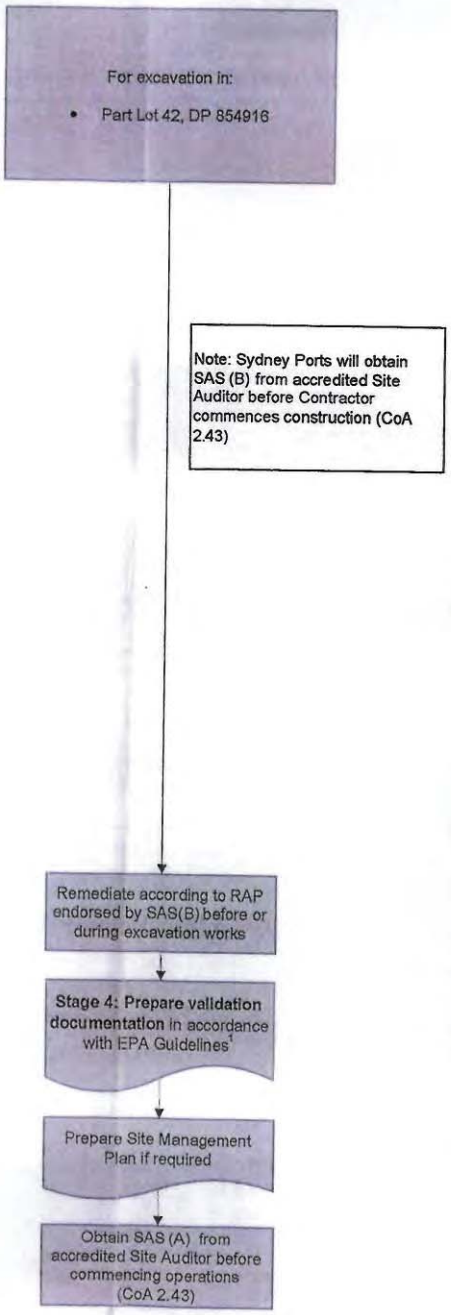
- Monitoring of the works by an appropriately qualified environmental consultant;
- Dust minimisation during excavation, transport and placement works;
- Tracking and recording the excavation locations and the management of excavated contaminated soils;
- Contingency Plan for unforseen environmental issues;
- Reinstatement of the cap and the geo-fabric marker layer of the containment cell to its former condition;
- Inspection by an appropriately qualified environmental consultant to validate the rectification works;
- SPC approved placement or off-site disposal (following waste classification) of excavated contaminated soil to meet site remediation objectives; and
- Reporting of the works conducted to a standard suitable for review by an accredited site auditor under the Contaminated Land Management Act

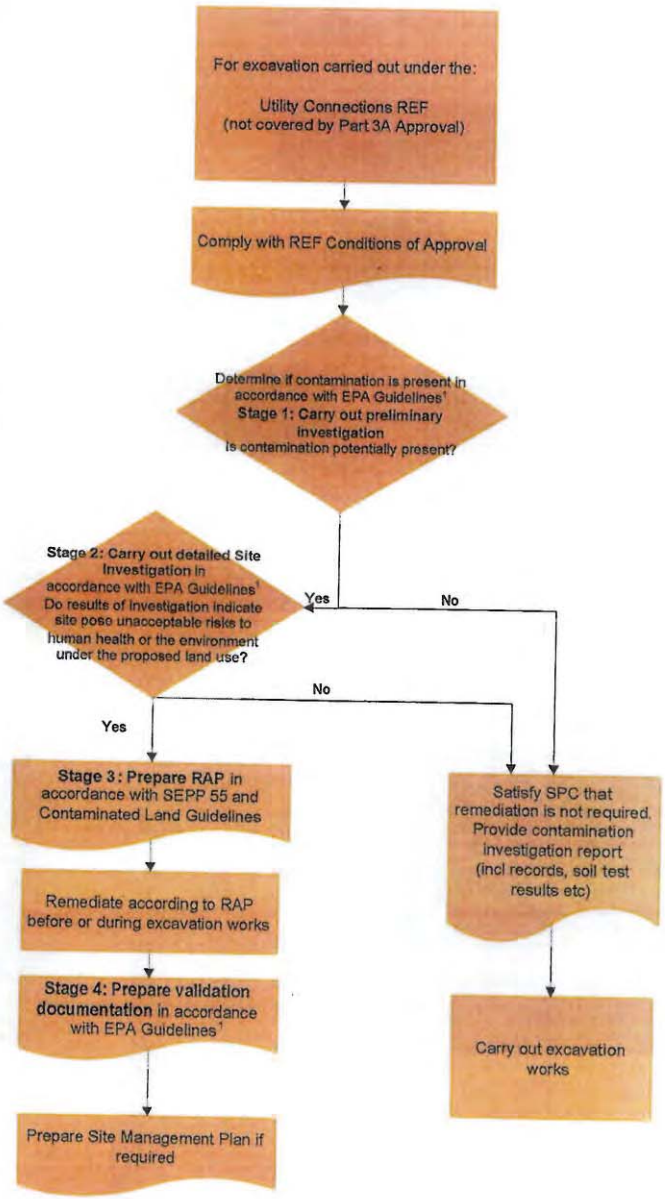
Contractor to provide SPC with documentation in accordance with the contract (e.g. as constructed drawings etc.) to enable SPC to obtain the final Site Auditor's Statement SAS(A).

Contractors' Obligations for Excavation for ILC at Enfield: Sheet 2 of 2



[1]Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites. NSW EPA, 1997





Appendix B

Example ESCPs for Sedimentation Basin Construction

Erosion and Sediment Control Plan

Project No.: **N953**

ESCP No.012 Rev B

ERSED Principles

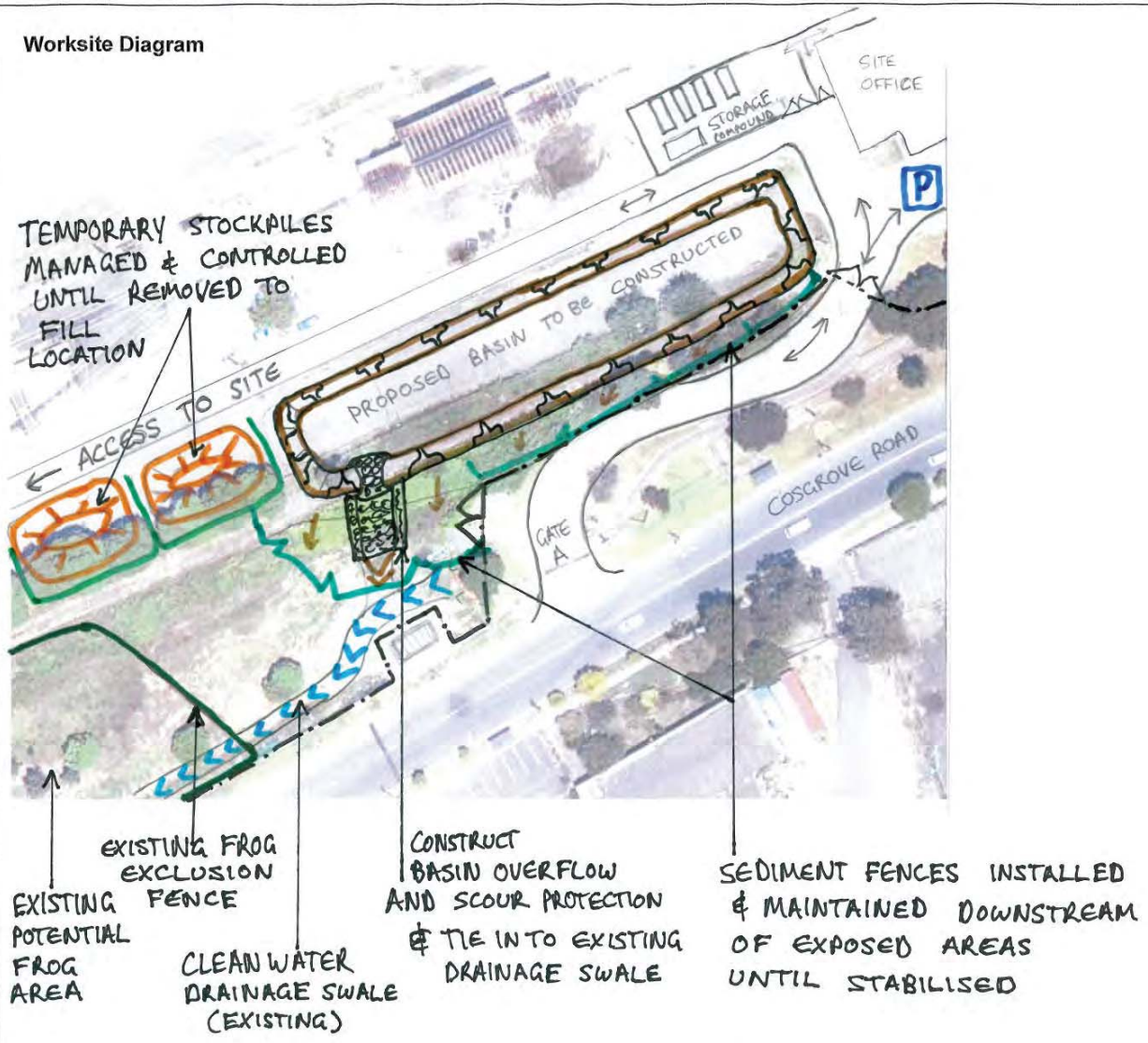
- The implementation of temporary erosion and sediment controls will be progressive and continual.
- Minimal disturbance at all times and "No Disturbance Zones" are to be enforced where practical.
- Erosion control measures will be designed so that they are as close as possible to the potential source of sediment.
- All stormwater pits that lie within disturbed areas shall be protected to prevent dirty run-off from disturbed areas entering the drainage system.
- Any temporary controls will be reinstated at the end of each day.
- Sediment fences will be inspected for undercutting, sagging and overtopping, and repaired immediately.
- Sand bags will be replaced when punctured or are not working effectively.
- Each day and after rainfall events, sediment and erosion controls will be inspected to ensure performance is as designed.

Legend

- Clean Water Diversion
- Dirty Water
- Sand Bags / Sed Fence
- Stormwater Protection
- 'No Disturbance Zone'
- Check Dams
- Berm
- Boundary Fence

Note - Refer to Bluebook Handbook for setup, control types, diversion types and maintenance requirements.

Worksite Diagram



Erosion and Sediment Control Plans

Erosion and Sediment Control Plans (ESCP) will be developed for each high risk work area prior to the start of construction. These will be signed off by the Environmental Manager.

Hold Point for Dewatering Onsite

Prior to any dewatering and/or discharge contact Environmental Manager or delegate and train representative who will signoff the hold point once water is "clean". Testing and, where necessary, treatment of any dewatered construction water must be undertaken prior to discharge. This may occur within excavation or in a sealed container(s).

Description of Works: Sedimentation Basin Construction	
Location (Chainage):	**Date: 17 May 2011**
Site Foreman:	**Signature:**
Environment Manager:	**Signature:**

Appendix C

Sediment Basin Flocculation Procedure

Sediment Basin Flocculation

Description

This procedure details the requirements to be followed for sediment basin flocculation and water discharge to minimise environmental impact and to comply with water quality criteria. Deep excavations can also act as a sediment basin and accumulate large volumes of water. Any water accumulated in deep excavations must be treated and disposed of in accordance with this procedure. Further detail is provided in the "Blue Book - Managing Urban Stormwater - Soils and Construction" or other relevant local guideline. Manufacturer specifications, best practice and past experience should also guide the flocculation of sediment basins.

Roles

DECCW, Environmental Manager, Foreman, Leading Hand, Site Employee

Process

Training

All personnel who are involved with the flocculation of sediment basins are to be inducted into this (and site specific) procedure (s) via a toolbox talk prior to any flocculation and discharge activities occurring.This will include the Leading Hand, Foreman and any Site Employee directly involved in flocculation and release of water.The Environmental Manager will be responsible for organising and delivering the toolbox talks.

Responsibility

It is the responsibility of the Leading Hand, Foreman and relevant Site Employees to ensure that any flocculation and discharge is undertaken in accordance with this procedure and approval is obtained from the Environmental Manager to discharge treated water to the environment.

Determine Discharge Point

The discharge point is detailed in the relevant Erosion and Sediment Control Plans. The Environmental Manager will be consulted with during the design and construction phase to ensure that the discharge point does not cause scouring or damage to natural vegetation.

Re-use of Sediment Basin Water

Where practicable, water from sediment basins is to be reused **on site** for dust suppression without any treatment. Approximate volumes of water re-used should be recorded on the ‘Water Release Approval' Tool or other mechanism in agreement with the Environmental Manager.

If the water cannot be utilised on the site, it is to be discharged off site, following the process below.

Water Treatment

No Treatment Required

If the water is clear, the Environmental Manager is to be consulted with and the water tested prior to discharge**,** providing minimum water quality standards are met (refer to details below). All discharges must be approved by the Environmental Manager.

Flocculation

If the water is visibly dirty, it will need flocculation prior to testing and subsequent discharge.

Gypsum is the preferred flocculant as it has a relatively low potential to harm the environment. The ''Blue Book'' provides guidance to application rates and methods for flocculating with Gypsum, however site conditions (eg soil type) will also influence the type and application of flocculants.

Other flocculants can also be used that in certain circumstances will accelerate flocculation. These include Powdered and Liquid Alum, Coagulants and Polyelectrolytes. Use of any flocculant should be discussed and agreed with the Environmental Manager.

Care is to be taken with the choice of flocculant, its dosage rate and any special requirements to ensure that toxic situations are not created with consequent damage to ecology or to the health of the operator.

A site specific procedure for the flocculation of sediment basins should be developed prior to construction activities occurring at site taking account of local and site conditions, type of flocculant and the need to provide pH buffering. The site procedure should consider manufacturers specifications for dosing rates, Material Safety Data Sheets (MSDS) and industry best practice guidelines. This procedure shall be prepared by the site Environmental Manager.

pH Buffering

In some instances, particularly when gypsum is used, pH buffering may be required to ensure the pH of the discharge is within acceptable limits. The Environmental Manager will provide guidance with regard to appropriate buffering solutions and their application.

Oil and Grease

If an oily sheen is present on the surface of the water, a hydrophobic oil boom (or other suitable device) will be used to skim off the sheen.

Alternatively, the oily water can be removed by a liquid waste contractor and disposed of at a facility approved by the Environmental Manager.

Safety

SAFETY FIRST

ENSURE THE MSDS FOR STORAGE AND HANDLING OF THE FLOCCULANT AND OTHER CHEMICALS IS FOLLOWED

ALL WORKING NEAR WATER PROCEDURES MUST BE FOLLOWED

Test Water

Once the water has been flocculated and appears clean, the Environmental Manager must be contacted to test the water.

The following criteria must be met prior to any discharge, unless specified in the Environment Protection Licence or prescribed by the local DECCW.

- pH - 6.5 - 8.5
- Total Suspended Solids (TSS) - <50mg/L*
- Oil and Grease - None Visible

A sample will be collected by the Environmental Manager to be sent to the laboratory for testing of the above parameters. Samples should be collected from 30cm below the surface of the water in accordance with AS/NZS 5667.1: 1988.

If agreed with the DECCW a relationship between TSS and Turbidity can be established to facilitate immediate prompt discharge of sediment basins. This could be achieved with the assistance of the laboratory.

Obtain Approval to Discharge - HOLD POINT

If the above criteria are not met, the Environmental Manager will advise the Foreman or his delegate that further treatment and testing is necessary.

If the above criteria are met, the Environmental Manager will approve the discharge of the water by completing and signing the Water Release Approval Tool.

HOLD POINT - NO WATER IS TO BE DISCHARGED UNTIL THIS APPROVAL HAS BEEN GRANTED

Discharge Water

Once approval has been given, water may be discharged. The method for discharge will depend upon the design of the sediment basin. Generally discharge will either involve pumping, decanting or syphoning.

Any discharging activities whether offsite or onsite must be under constant supervision by the Foreman or his delegate to prevent the discharge of dirty water. If pumping is used, the suction inlet must be lifted off the floor of the basin (either propper or floated) to prevent the pump from discharging dirty water or sludge from the bottom of the basin. A concrete plinth or similar physical barrier may also be installed within the basin to prevent highly concentrated sediment from being drawn from the bottom of the sediment basin as the clear water becomes drawn down. Any observations made should be recorded on the 'Water Release Approval Tool' and kept on file.

DISCHARGES MUST BE SUPERVISED AT ALL TIMES.

IF PERSONNEL SUPERVISING MUST LEAVE PUMP OUT AREA, THEN THE DISCHARGE MUST BE STOPPED.

Appendix D

Sedimentation Basin Checklist

SEDIMENTATION BASIN CHECKLIST

Sedimentation Basins Inspection Checklist (Must Complete All Sections)

Basin ID: _____	**Date of Rain Event: _____** **Amount of Rain: _____**mm	**Date Inspected: _____**

What is the approximate volume of water in the basin (as a % of the total capacity)? _____%

	CONTROL MEASURE	YES	NO	COMMENTS
1	Is maintenance to the basin required? (eg spillway, wall etc)			
2	Does the basin need de-silting? (ie >30% capacity reduced by silt)			
3	Is any oil and/or grease visible on the surface of the water? If visible, remove using a suitable absorbent material.			
4	Any additional water pumped/drained in? Additional flocculants added?			Date & time _____ Amount _____ Date & time _____ Amount _____
5	**Flocculate Basin** How much flocculent was added? (Guide: 32kg/100 cubic metres Gypsum) (Guide: 4kg/100 cubic metres Alum) How much Lime / Alum was added to meet the required pH range? (if required)	Flocculent used: (Alum/Gypsum) Amount _____kg Date & time added _____ Amount _____kg Date & time added _____		
6	**Allow 24hrs then Sample Basin** If NTU>45 re-flocculate or sample and send grab sample to Lab <u>Discharge Permitted only if all of the following are met:</u> ➢ NTU<45 ➢ No oil or grease visible ➢ pH is between 6.5 - 8.5	Date & time of test_____ Turbidity = _____NTU pH = _____ Oil or grease visible - (Yes/No)		
7	**If Laboratory Results Required** **Discharge Criteria** TSS < 50mg/L Oil and Grease < 10mg/L PH 6.5 – 8.5	TSS = _____mg/L Oil and Grease = _____mg/L PH = _____		
8	**Date Of Discharge:** **Date Valve Closed on Discharge:**	_____ _____		

Additional Comments:

Approved by (MUST BE AN AUTHORISED PERSON):	**Discharged by:**

Appendix E

Discharge Water Quality Checklist

DISCHARGE WATER QUALITY CHECKLIST

Discharge Water Quality Checklist (Must Complete All Sections)

Location: _____	**Date of Rain Event: _____** **Amount of Rain: _____**mm	**Date Inspected: _____**

What is the approximate volume of water to be discharges? _____ L / kL

	CONTROL MEASURE	YES	NO	COMMENTS
1	Can the water be re-used for dust suppression or other?			
2	Is it necessary to discharge water? (note reason)			
3	Is any oil and/or grease visible on the surface of the water? If visible, remove using a suitable absorbent material.			
4	Any other potential contaminants other than turbidity, pH or oil/grease of concern			
5	**Flocculate pit, tank or excavation** How much flocculent was added? (Guide: 32kg/100 cubic metres Gypsum) (Guide: 4kg/100 cubic metres Alum) How much Lime / Alum was added to meet the required pH range? (if required)	Flocculent used: (Alum/Gypsum) Amount _____kg Date & time added _____ Amount _____kg Date & time added _____		
6	**Allow 24hrs then sample water** If NTU>45 re-flocculate or sample and send grab sample to Lab <u>Discharge Permitted only if all of the following are met:</u> ➢ NTU<45 ➢ No oil or grease visible ➢ pH is between 6.5 - 8.5	Date & time of test_____ Turbidity = _____NTU pH = _____ Oil or grease visible - (Yes/No)		
7	**If Laboratory Results Required** **Discharge Criteria** TSS < 50mg/L Oil and Grease < 10mg/L PH 6.5 – 8.5	TSS = _____mg/L Oil and Grease = _____mg/L PH = _____		
8	**Date Of Discharge:** **Location of Discharge:** **(Must not affect frog habitat)**	_____ _____		

Additional Comments:

Approved by (MUST BE AN AUTHORISED PERSON):	**Discharged by:**

Appendix F

Unexpected Finds Procedure

Unexpected Find Procedure
Contamination, Asbestos & Acid Sulphate Soil

Purpose

This Procedure details the methodology to be followed to identify and manage unexpected contaminated material during the construction of the Project. The objective of this Procedure is to minimise human health and environmental risks from the disturbance of contaminated land during the Project, and to ensure that contaminated material is managed, handled and/or transported in accordance with the following requirements:

- Ministers Conditions of Approval (MCoA), particularly MCoA 2.42, 2.43 & 2.44
- Contaminated Land Management Act 1997
- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 1997)
- Contamination Management Plan for Construction (Coffey, November 2009)
- Validation Report for Separable Portion 2, 3, 4 and 5 ILC at Enfield (Coffey, April 2010)
- Interim Advice Letter Implementation of Remedial Action Plan for Separable Portions 2, 3, 4 and 5 ILC @ Enfield (Environ, July 2010)
- Remediation Action Plan for Known Soil Contamination Intermodal Logistics Centre at Enfield (RAP) (Coffey 2009)
- Waste Classification Guidelines (DECC 2008)
- Occupational Health and Safety Act 2000 and asbestos guidelines

Scope

This Procedure is applicable to all personnel and subcontractors if suspected contaminated material (including, but not limited to, total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAH), metals, volatile organic compounds (VOC) or asbestos containing materials) or acid sulphate soils are encountered at any location of the ILC Enfield Project.

Induction / Training

The Environmental Manager (EM) will ensure all personnel responsible for managing potential contaminated land/spoil and fill issues understand the requirements of this Procedure. All Project personnel will also be inducted on the identification of potentially contaminated land.

Identifying potentially contaminated land

The Project personnel will be informed to be aware of the following visual and olfactory signs of contamination while working:

- Unexpected oil/diesel/tar, sheens, saturated with PSH (phase separated hydrocarbon)
- Hydrocarbon odours or any unusual chemical odour
- Discoloured soil
- Asbestos troughing, pieces, fibre cement sheets, fibres; and/or
- Acid Sulphate Soils (ASS) or potential ASS as grey, gluggy soils with rotten egg gas smell

Potential contamination may be encountered in various potential situations during construction including (but not limited to):

- Unexpected storage tanks and associated underground fuel infrastructure, including fill lines and breather lines;
- Buried drums and waste containers
- Free product of phase separated hydrocarbon (PSH); and

• Buried asbestos or other material at concentrations above the remediation criteria (Coffey 2009a)

Procedure for Contaminated Land (No Suspected Asbestos Risk)

1. Managing potential contamination

If signs of contamination are identified during the works or as part of any investigations (i.e. phase 1 assessment) in any material during construction and there is no suspected asbestos risk, the following process will be followed:

a) Cease work in the area of concern immediately;

b) Isolate the area with barrier tape or any other physical barrier to prevent workers from entering the potentially contaminated location;

c) If possible relocate workers to another work location away from area of potential contamination;

d) Report the area of concern to the Superintendent and EM immediately;

e) Superintendent or EM will contact the Safety Manager and Area Manager;

f) EM will determine if it is defined as contaminated as per Contamination Management Plan for Construction. At this point EM may determine that it is not in fact considered contamination and works can proceed;

NB: Odorous and stained soils could be encountered during construction. However, the site specific remediation criteria specified in the RAP indicate that these soils, if not saturated with PHS, are suitable for the proposed land use and require no further remediation to render the site suitable for the proposed use.

g) EM will notify Sydney Ports of the identified or suspected contamination;

h) Area Manager will delegate an Engineer responsible for the management of this unexpected find;

i) Engineer responsible will follow the procedure Flowchart for Excavation - ILC at Enfield (Soil & Water Management Plan Appendix A). Advice and support will be given by the EM during the process;

j) EM will engage a suitably qualified contaminated land management consultant

k) Engineer coordinate with contaminated land management consultant to inspect the site and carry out an initial assessment of the nature and extent of the contamination

l) EM or consultant will liaise with accredited Site Auditor under the Contaminated Land Management Act

m) EM or consultant will advise Engineer what remediation is required

2. Undertake the required remediation

Occupational Health & Safety requirements must be satisfied before commencing remediation works.

Carry out any required remediation works in accordance with the RAP (Coffey 2009a) and Site Auditor requirements to remove or contain the identified contamination.

Engineer in charge will liaise with consultant, plan and undertake the works to remediate. The Environmental Manager and Area Manager will be responsible for overseeing the process.

3. Carry out the validation work

Carry out any required validation work to demonstrate that the identified contamination has been adequately remediated or managed in line with RAP.

Engineer in charge will liaise with consultant, plan and undertake any validation work required. The Environmental Manager and Area Manager will be responsible for overseeing the process.

Environmental Manager will report that works have been undertaken to a standard suitable for review by an accredited Site Auditor.

4. Recommence work

Environmental Manager will report progress to Sydney Ports during the above processes. Environmental Manager will be responsible for providing Sydney Ports with documentation in accordance with the contract (e.g. as constructed drawing etc.) to enable Sydney Ports to obtain the final Site Auditor's Statement SAS(A).

Work will not recommence onsite without the prior written approval of the EM.

Procedure for Suspected or Known Asbestos Risk

1. Managing potential asbestos

If signs of asbestos contamination are identified in any material during construction the following process will be followed:

a) Cease work in the area of concern immediately;

b) Isolate the area with barrier tape or any other physical barrier to prevent workers from entering the potentially contaminated location;

c) Keep area wet, but without causing potential asbestos dust particle to become air-bourne

d) Foreman to notify workers through direct communication or revised pre-start of the potential risks and controls being implemented to mitigate these risks. If possible relocate workers to another work location away from area of potential contamination;

e) Report the area of concern to the Superintendent and EM immediately;

f) Superintendent or EM will contact the Safety Manager and Area Manager;

g) EM and/or Safety Manager will determine if asbestos is defined as Bonded or Friable, and advise the Superintendent and Engineer of the process this find will be managed;

h) EM will notify Sydney Ports of the identified or suspected asbestos contamination;

i) Area Manager will delegate an Engineer responsible for the management of this asbestos find;

j) Engineer responsible will follow procedures of Soil & Water Management Plan and Safety Plan to organise collection and disposal of asbestos. Advice and support will be given by the Safety Manager and EM during the process;

Occupational Health & Safety requirements must be satisfied before commencing collection.

k) For Bonded Asbestos pieces, trained and ticketed site staff may collect and bag these pieces in accordance with procedures in the Safety Plan. Bags will be placed in a secured bin for later disposal by a licensed Asbestos Contractor;

l) Friable Asbestos will be managed by an AS1 licensed contractor, with the appropriate air monitoring, disposal techniques and clearance certification being undertaken; and

m) The Environmental Manager or consultant will liaise with the Site Auditor.

2. Recommence work

Following the collection and disposal of friable asbestos, and clearance certification (for friable asbestos), the Safety Manager or Environmental Manager will give the approval for works to recommence.

Procedure for Suspected or Known Acid Sulphate Soil

1. Managing potential ASS

If signs of acid sulphate soils are identified in any materials being excavates during construction, especially where near a creek line, the following process will be followed:

a) Pause work in the area of concern to allow investigation;

b) Report the area of concern to the Superintendent and EM immediately;

c) EM will undertake visual inspection and pH tests to identify if acid sulphate soils or not;

e) If confirmed as ASS, that soil will be taken to a designated area on the main project site and treated with lime to neutralise generated or potential acid, in line with management procedure

f) Appropriate reuse or treated soil will be determined by the EM, in consultation with the accredited Site Auditor

2. Recommence work

Work may recommence when actual or potential ASS material has been moved to the treatment area.

Noise and Vibration Management Plan

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	21/09/10	GK
1.01	Minor changes addressing additional Sydney Ports comments	27/09/10	GK
1.02	Minor changes addressing additional Sydney Ports comments	28/09/10	GK
1.03	Draft as updated for Main Construction	23/03/11	GK
2.0	Final for Main Construction	5/04/11	GK
3.0	Final for Main Construction	17/05/11	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Construction Noise and Vibration Management Plan (CNVMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Main Construction phase. The purpose of the CNVMP is to describe how Leighton Contractors (LCPL) will manage and control noise and vibration risks associated with the Main Construction phase.

The plan has been prepared to address the requirements of Condition 6.3 a) of the Ministers Conditions of Approval, the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005) and all applicable legislation.

1.2 Background

The EA for the Project assessed the noise and vibration impacts during the construction and subsequent operation of the Project. A detailed description of the methodology for construction noise and vibration assessment is provided in Chapter 11 and Appendix E of the EA.

The EA found that construction noise has the potential to exceed noise goal criteria, particularly during earthworks activities. Where noise exceedances are likely, reasonable and feasible noise mitigation measures would be implemented to reduce impacts to as close as possible to predicted and goal levels.

An assessment of vibration impacts was undertaken for the EA. The EA determined there would be no vibration impacts during the construction phase as the majority of vibration typical vibratory activities (such as vibrating rollers) would not have an effect beyond 50m. Residential receivers are at distances greater than 50m, so the affected area was expected to be negligible.

To attain the design compaction levels during the Main Construction phase of the project, compaction activities may be required within the main project site. The use of Impact Rollers to consolidate deep fills (up to max of 6m deep in parts) may be required. Compaction by these methods which have a greater vibratory impact and compact to greater depths may be necessary instead of traditional techniques that require the removal and re-compaction of material and therefore a much greater amount of soil disturbance and effort.

Additionally, noise and vibration generating activities will be required at the intersection of Roberts Road and Norfolk Road. These are likely to include night-time works as dictated by RTA Road Occupancy Licence (ROL) conditions because of the high volume of traffic Roberts Road handles during day-time hours, being a major regional arterial road of Sydney.

Further assessments of these noise and vibration generating activities will be undertaken as necessary and controls implemented to ensure minimal noise and vibration impacts at the

nearest residential receivers prior to commencement of such activities. Department of Planning and Infrastructure (DoPI) approval for Out of Hours Works will be sought in the case of Roberts Road Intersection works and any other audible works that may need to be undertaken outside standard working hours.

1.3 Objectives

The key objectives of the CNVMP are to ensure the potential noise and vibration impacts from the Main Construction works are minimised and managed in accordance with the Project Approval. To achieve this objective, the LCPL project team will undertake the following:

- Ensure appropriate environmental controls and procedures are implemented during construction to minimise noise and vibration impacts to all sensitive receivers
- To ensure appropriate measures are implemented to address the relevant MCoA, legislation and guidelines

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to noise and vibration management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including noise generation. Specifically, Part 5.5 of the Act details noise pollution offences and requirements for the proper and efficient operation, maintenance and handling of plant, equipment and materials. An Environment Protection Licence (EPL) is not required for the project under the PoEO Act as the project is not listed as a ‘’scheduled activity’’.

Guidelines

Guidelines relevant to noise and vibration management include:

- **DECCW Interim Construction Noise Guideline (ICNG) 2009 –** the ICNG sets out ways to deal with noise impacts on residents and other sensitive receivers by presenting assessment approaches that are tailored to the scale of construction projects and indicate how work practices can be modified to minimise impacts. The ICNG sets out guideline management levels for noise impacts. These are provided in Table 2 of this plan.
- **Environmental Criteria for Road Traffic Noise (ECRTN), 1999 –** The ECRTN provides criteria that can be used to assess noise impacts for new and developed roads and methodologies that recognise the benefits of all noise mitigation measures. It is noted that DECCW are in the process of preparing an interim Guideline for Traffic Noise which is currently being reviewed. If necessary, this CNVMP will be reviewed when DECCW’s interim plan is released.

- **Australian Standard (AS 2436-2010) –** Guide to noise and vibration control on construction, demolition and maintenance sites. It provides guidance on noise and vibration control and investigation and identification of sources, measurements of sound and vibration.
- **Assessing Vibration: A Technical Guideline –** This Guideline is based on the British Standard BS6472-1992, Evaluation of human exposure to vibration in buildings. Presents preferred and maximum vibration values for assessing human responses to vibration.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to CNVMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
2.13	The proponent shall minimise noise emissions from plant and equipment operated on the site by installing and maintaining, wherever practicable efficient silencers, low noise mufflers (residential standard) and by replacing reversing alarms with alternative silent measures, such as flashing lights (subject to occupational health and safety requirements)	This CNVMP Sect 4.1
2.14	The proponent, shall as soon as practicable during site preparation, and prior to the commencement of construction of rail trackwork and hardstand for the intermodal terminal, empty container and warehousing components for the project, install earth mound noise barriers in the south east of the site, as generally described in the documents referred to under condition 1.1 of this approval	This CNVMP Sect 4.1 and Figure 1
2.15	The proponent shall only undertake site preparation and construction activities associated with the project that would generate an audible noise at any residential premises during the following hours: • 7am-6pm Mon - Fri inclusive • 8am to 1pm on Saturdays and • At no time on Sundays or Public Holidays This condition does not apply in the event of a direction from police or other relevant authority for safety reasons	This CNVMP Sect 2.3 This condition does not apply to inaudible (at nearest residential receiver) works or audible works approved by the Director-General under MCoA 2.16
2.16	The hours of site preparation and construction activities specified under condition 2.15 of this approval may be varied with the prior written approval of the Director-General. Any request to alter the hours of construction specified under condition 2.15 shall be	This CNVMP Sect 2.3

MCoA	Description	Reference
	• Considered on a case by case basis • Accompanied by details of the nature and need for activities to be constructed during the varied construction hours; and • Accompanied by sufficient information for the Director General to reasonably determine that activities undertaken during the varied construction hours will not adversely impact on the acoustic amenity of receptors in the vicinity of the site	
6.3	As part of the Construction Environmental Management Plan for this project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following management plans	-
6.3 a)	A Construction Noise Management Plan to outline construction noise mitigation, monitoring and management measures to be implemented to minimise noise impacts during construction of the project. The plan shall include but not necessarily be limited to:	This CNVMP
i)	Details of construction activities and a schedule of construction works	CEMP & This CNVMP Sect 2.2
ii)	Identification of construction activities that have the potential to generate noise and/or vibration impacts on surrounding land uses, particularly residential areas	This CNVMP Sect 2.2
iii)	Where the relevant construction noise goals contained in the Noise Management Guideline (formerly published as Chapter 171 of the Environmental Noise Control Manual) are predicted to be exceeded at sensitive receivers, provision for the application of all practicable reasonable and feasible noise mitigation measures to achieve the relevant construction noise and vibration goals	This CNVMP Sect 4.1
iv)	Procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity as well as procedures for dealing with and responding to noise complaints: and	CEMP and this CNVMP Sect 3.1
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	This CNVMP Sect 5.1

2.1 Existing Environment

Overview

The project is bound by industrial land to the east and west and mixed industrial/residential to the north-west and south-east. Existing noise levels are dominated by traffic along the main arterial routes in addition to industrial uses, including the existing railway infrastructure of the New Enfield Marshalling Yards.

Sensitive Receivers

The nearest potential sensitive receivers include residences in the vicinity of:

- Cosgrove Road, south-east of the site and south of Cox's Creek Channel;
- Punchbowl Road, south of the site adjacent to the rail line;
- Wentworth Street (south) adjacent to the rail line south-west of the site and the New Enfield Marshalling Yards;
- The intersection of Norfolk Road and Roberts Road, located west of the site and the New Enfield Marshalling Yards;
- The intersection of Rebecca Road and Roberts Road, located to the north-west of site and the New Enfield Marshalling Yards;
- Margaret Street, backing onto Roberts Road, located to the north-west of site and the New Enfield Marshalling Yards; and
- Gregory Street, Therry Street and McEnroe Street, Strathfield South adjacent to Cooks River Reserve, located east of the industrial land which is east of the ILC site.

Other sensitive land uses identified in the study area include Strathfield High School, Begnell and Matthews Parks and the Greenacre Bowling Club. The locations of these sensitive receivers are shown in Figure 1.

Background Noise Levels

Background noise levels were measured as part of the Environmental Assessment (SKM, 2005). Assessment and monitoring locations are shown on the Locality Map, Figure 1. The daytime levels are reported in Table 2 along with the ICNG noise criteria.

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Figure 1 : Locality Map Showing Site and Surrounding Land Use

Date : 22/06/05 | **Scale:** NTS

Ref : TB867-01P04 (rev 3)

Table 2: Background Noise Levels and Noise Criteria

Location	EA Measured L_{90} Background Levels (7am – 6pm)	EA Measured L_{eq} Ambient Noise Levels (7am – 6pm)	Old Criteria LA_{10} criteria (L_{90} +5dBA)	New Criteria ICNG Criteria (RBL (EA Measured L_{90}) + 10dBA)	New Criteria ICNG Daytime Indoor Criteria ($LA_{eq\ (15min)}$)
A1: 6 Jean Street	49	59	54	55	-
A2:42 Norfolk Road	48	61	53	58	-
A3: 14 Wentworth Street (South)	44	61	49	54	-
A4: 124B Dean Street	44	60	49	54	-
A5: 43 Blanche Street	41	55	46	51	-
A6: 40 Bazentin Street	41	56	46	51	-
A14: Strathfield High School	-	-	-	-	45dBA

Notes:

1. RBL not assessed as part of EA. LA_{90} has been adopted as RBL
2. The management levels prescribed by the Interim Construction Noise Guideline (ICNG) were released in 2009 (following project approval) and are considered relevant to the project

2.2 Construction Activities

Construction activities that have the potential to cause acoustic and vibration impacts include the following:

Site General Works

- Vehicle movement on haul roads
- Site and vegetation clearance
- Establish sedimentation basins
- Transporting of and management of site material

Earthworks and Drainage

- Earthworks and compaction works
- Stormwater drainage works

- Relocation of services
- Retaining walls/embankments

Road and Rail Infrastructure

- Vehicle movements
- Off-site access works
- Bulk earthworks using heavy earthmoving equipment
- Drainage works
- Install services
- Pavement works

External Utility Service Installation

- Non-destructive excavation
- Trenching

2.3 Hours of Construction

Standard Hours of Construction

The approved hours for construction are 7am to 6pm (Monday to Fridays) and 8am to 1pm on Saturdays.

Construction activities associated with the main construction will be undertaken within these hours, unless an Out of Hours Approval has been provided by the DoP in accordance with the requirement of MCoA 2.16 or the works are not audible at any residential premises.

Out Of Hours Works

Due to the nature of the project, some works may be required outside standard approved hours. Such works may include (but not be limited to):

- Works on neighbouring roads that can only be undertaken during low traffic flows (night)
- Service works or diversions that can only be undertaken during periods of low demand
- Delivery of oversize plant and equipment that cannot be delivered safely during normal work hours due to RTA traffic restrictions

If works that may be audible at the nearest residential receivers are required to be undertaken outside the standard hours, they will only commence with the approval of the Director General, following an assessment of noise impacts and appropriate notification of impacted members of the community.

Works that do not require approval from the Director General include:

- Emergency works directed by the Police or other Emergency Service (eg Fire Brigade)
- Works that have been assessed to be inaudible at the nearest residential premises

2.4 Potential Impacts

Construction Noise

The impacts of the construction phase were predicted in the EA. Table 11-16 of the EA provides a summary of predicted noise impacts for sites A1- A6 for the various stages of construction. These locations represent the nearest residences. The assessment concluded that the noisiest periods would be during earthworks. In addition to compliance in residential areas, the noise impacts at Strathfield High School need to be managed, to minimise impact on school operations.

A summary of worst case predicted impacts can be seen in Table 3.

Table 3: Worst Case Predicted Noise Impacts without Mitigation Measures (SKM, 2005)

Location	New Criteria ICNG Criteria (RBL (EA Measured L_{90}) + 10dBA)	LA_{10} predicted
A1: 6 Jean Street	55	76
A2:42 Norfolk Road	58	62
A3: 14 Wentworth Street (South)	54	68
A4: 124B Dean Street	54	62
A5: 43 Blanche Street	51	81
A6: 40 Bazentin Street	51	75

Notes to Table:

1. The predicted impacts assumed worst case scenario when all plant and equipment was operating simultaneously, equipment has no acoustic treatments and no shielding is afforded by building facades or intervening structures
2. RBL not assessed as part of EA. LA_{90} has been adopted as RBL
3. The management levels prescribed by the Interim Construction Noise Guideline (ICNG) were released in 2009 (following project approval) and are considered relevant to the project
4. Predicted impacts against the ICNG criteria of RBL (LAeq) + 10dBA have not been assessed, so compare with LA_{10} in the absence of LA_{eq} data

Out of Hours and Possession Approvals

Some Out of Hours or Rail Possession activities are likely to be required throughout the construction period. These activities may be required to be undertaken out of hours to:

- Ensure safety and protection of workers and members of the public
- Carry out works during scheduled possessions determined by Rail Authorities or Rail Operators
- Reduce disruption to traffic and the community
- Satisfy operational requirements of government agencies or authorities

- Respond to unforeseen circumstances

Examples include:

- RailCorp or Pacific National allow access to the New Enfield Marshalling Yards or Main Freight Lines
- Temporary utility shutdowns during off peak periods for service installation works and cut-overs
- Delivery to, and removal from site, of over-sized plant and equipment to conform to RTA requirements e.g. wide load delivery of 825 Compactors
- RTA issued Road Occupancy Licences (ROL) dictate strict times for closure of lanes on major arterial roads e.g. Roberts Road
- Large concrete pours that require extended hours to complete

MCoA 2.15 establishes construction hours for construction activities that generate audible noise at residential premises. Conversely, construction activities which are not audible at residential premises outside of standard approved hours could comply with this Condition.

An Out of Hours Self-Assessment of construction activities will be undertaken by the Environmental Manager, where works can be shown to be inaudible at the nearest sensitive receiver through simple noise calculations and comparisons to past work, or through a more sophisticated noise assessment undertaken by the Leighton Contractors' Noise Consultant if simple calculations are not appropriate.

For works considered to be audible at a sensitive receiver out of standard construction hours, an application with a noise assessment (Construction Noise Impact Statement (CNIS)) and justification of why the work needs to be undertaken at such hours, will be submitted to the Director-General for approval on a case-by-case basis in line with MCoA 2.16.

Roberts Road Intersection Works

Noise and vibration generating activities will be required at the intersection of Roberts Road and Norfolk Road for reconfiguration of this intersection as part of the Main Construction phase works. These works will most likely include a large proportion of night-time works as dictated by RTA Road Occupancy Licence (ROL) conditions because of the high volume of traffic Roberts Road handles during day-time hours, being a major regional arterial road of Sydney.

Further assessments of these noise and vibration generating activities will be undertaken and controls implemented to ensure minimal noise and vibration impacts at the nearest residential receivers prior to commencement of such activities. The Director-General for Department of Planning and Infrastructure's (DoPI) approval for Out of Hours Works will be sought in the case of the Roberts Road and Norfolk Road intersection works.

Traffic Noise

The EA included an assessment of the noise impacts associated with the operation of the ILC facility. The assessment indicated that the operational noise impacts from truck movements would comply with the DECCW Environmental Criteria for Road Traffic Noise. As the number of truck movements and construction associated light vehicle traffic during the construction phase is significantly less than the predicted vehicle movements for the operational phase, it is expected that traffic noise impacts during the construction phase would also comply with the ECRTN criteria.

Vibration

Vibration impacts from traditional Vibratory Rollers are expected to be negligible as these types of rollers typically have a Safe Working Distance of 25m for cosmetic damage to a residential property, and the nearest sensitive receivers are approximately 50m or more from the source. Many of the site areas to be compacted are greater than 100m away from residences.

The use of Impact Rollers to consolidate deep fills (up to a maximum of 6m in depth) was investigated by LCPL during the Early Works phase. The use of Impact Rollers allows compaction to much greater depths, but may also causes greater vibration impacts and a minor increase to Safe Working Distances. Preliminary results from near-field vibration monitoring have established a Safe Working Distance at or near that of the Vibratory Roller (25t) used in the vibration trials. Additional near-field vibration monitoring of this activity will be undertaken to further develop a Safe Working Distance.

3 Consult and Communicate

3.1 Stakeholder Consultation

A process for notifying the community prior to and during construction works (for particularly noisy or potentially vibration intensive activities) is included in the Construction Environment Management Plan (CEMP) and LCPL's Stakeholder and Community Involvement Plan. In summary this process involves:

- Updating the community prior to and during the construction phases
- Notifying residents and other sensitive receivers of particularly noisy activities
- Notifying residents and other sensitive receivers of potentially vibration intensive activities
- A clear procedure for making, recording and responding to community complaints and impacts
- Consulting with residents and other sensitive land uses such as schools to understand any specific requirements they may have that may restrict site operations

3.2 Training and Awareness

Leighton Contractors has an environmental training program EnviroEssentials which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Construction Noise and Vibration and other key risk areas such as Erosion and Sediment Control.

All relevant construction personnel will attend the EnviroEssentials program for Legal and Regulatory Compliance and Noise and Vibration. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Approved Construction Hours (including arrival and departure times)
- Approved traffic routes
- Noise restrictions and monitoring
- Site noise controls
- Sensitive receivers (including residential and special use areas)
- Site rules in relation to parking and general behaviour of staff

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise noise and vibration impacts:

- Ensure that audible construction activities are only undertaken between 7am and 6pm Mondays to Fridays, and Saturday 8am to 1pm, unless approved by the Department of Planning, assessed as inaudible in an Inaudible Works Self Assessment or for emergency or safety reasons
- The earth noise mound at the south-eastern corner of the site within the vicinity of Cosgrove Road has been constructed prior to the commencement of construction of rail trackwork and hardstand for the intermodal terminal empty container and warehousing components for the project, in accordance with Condition of Approval 2.14
- Non-tonal reversing beepers or smart alarms must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work, unless a safety risk assessment requires a tonal beeper
- An ongoing programme of inspection and/or testing, undertaken on a risk-based approach, will assess plant and equipment against Australian Standard AS 2436-2010. Where machinery does not comply, investigation into whether it would need to be removed from site, replaced or upgraded with acoustic apertures, mufflers or other mechanical treatment to reduce noise impacts to acceptable levels will be initiated
- When within 200m of a residential receiver, limit any construction activities that result in noise intensive, impulsive or tonal noise such as rock hammering, impact piling and saw-cutting to 3 hour shifts, ensuring 1 hour of respite is provided before re-starting with the activity, and between the hours of 8am and 6pm unless approved by the Director-General of Department of Planning and Infrastructure (DoPI)
- Where practicable, locating site facilities, offices and storage containers in areas where they provide additional shielding to residents and other sensitive receivers
- Orient plant and equipment away from residential or other receivers
- Position items of noisy plant and equipment as far apart as is practicable from each other
- Ensure that where options exist, use least noisy construction methods, vehicles, plant and equipment

- Design the work site to minimise the need for truck reversing movements
- Switch off plant and equipment that is idling unnecessarily, especially during out of hours works
- Use vibration or rotary piling techniques for all piles where applicable. Where impact piling is required, limit the impact of noise emissions using measures such as limiting hours of operation, lowering the height of use of hammers, shielding the pile driving by the positioning of construction equipment or use of acoustic shrouding and resilient dollies
- Use silenced generators and compressors
- Prevent vehicles and plant queuing and idling outside the site prior to the morning start time
- If parking of trucks with deliveries or over-sized plant is required out of hours on Cosgrove Road, park away from residents and switch off engines immediately once stopped
- Blasting is not permitted
- Notify residents of construction activities likely to affect amenity due to noise or vibration in advance of the work
- Undertake condition surveys for residences and commercial buildings potentially impacted by vibratory activities
- Follow Head Earthworks Specification establishing vibration levels by type of receiver (residential, commercial/industrial, infrastructure etc.)
- Undertake vibration monitoring for different compaction methodologies (if not already assessed during Early Works) and determine Safe Working Distances

If noise monitoring results indicate non-compliance with site criteria and/or excessive complaints are received, the following measures will be implemented where necessary and where they have been assessed to be ‘’reasonable and feasible’’ (in accordance with the ICNG)

- Acoustic treatments of individual machines such as lining of engines and upgraded mufflers
- Providing “at source” acoustic plant enclosures and local noise hoardings
- Alter the hours of work to minimise intrusive noise to residential receivers
- Where there are no other reasonable and feasible alternatives, and intrusive noisy work is required to complete the work for a short duration (e.g. one shift), Leighton Contractors will consider other arrangements such as temporary acoustic barrier or if this is not practical then consider alternative accommodation to the impacted resident for the short period.

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections of activities with the potential to cause noise and vibration impacts will be undertaken by the Environment Manager (EM) and forwarded to the Project Manager (PM). These inspections will be undertaken for the duration of the Main Construction phase. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on noise and vibration impact inspections.

Noise monitoring during the Main Construction phase will include monthly attended noise measurements at the Locations A1- A6 identified in Table 3, being the representative locations for the most potentially affected residents. Noise monitoring may be undertaken during normal day-time hours or when works are occurring during approved out-of-hours times. Noise monitoring data will be recorded on the Noise Monitoring Record Sheet (Appendix A).

In addition to the above routine monitoring:

- Testing may be undertaken to assess plant and equipment against Australian Standard AS 2436-2010, where Environmental Checklist inspections identify plant and equipment as being noisy. Equipment that does not comply with this standard will be upgraded with acoustic treatments or removed from site
- Supplementary monitoring may be undertaken when there is a complaint or when a new phase of work commences
- Noise monitoring may be carried out in response to exceedences of the construction noise levels identified in this plan, or for the purposes of refining construction methods or techniques to minimise noise
- Noise monitoring may be undertaken at Strathfield High School (Location A14) on a risk based approach, and also following any enquiry or complaint from the school

Where noise levels are found to exceed the predicted worst case levels, the source of excessive noise generation will be identified, and any additional reasonable and feasible measures available will be implemented to either reduce noise emissions or reduce the impacts on receivers.

Details of site activity and equipment usage will be noted during construction noise monitoring. Reports prepared following completion of the monitoring include the following:

- The locations and results of the construction noise monitoring

- Tabulation of noise monitoring results together with notes identifying the principle noise sources and operations
- Summary of any measurements exceeding the goals, and descriptions of the plant or operations causing these exceedences
- Details of corrective action applicable to goal exceedences and confirmation of its successful implementation

Vibration

Vibration monitoring will be undertaken for different compaction methodologies (if not already assessed during Early Works) to determine Safe Working Distances to ensure levels of vibration experienced at residential and other receivers are compliant with the Australian Standard AS2436-2010 and DECCW's *Assessing Vibration: A Technical Guideline*. Some monitoring may be carried out during construction works to verify compliance.

5.2 Auditing

Six monthly internal audits for compliance against the MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess noise and vibration monitoring, reporting, effectiveness of controls, community and complaints management. The EM will be responsible for managing and implementing audit actions and the PM will have overall accountability for ensuring compliance.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

7 Appendices

Appendix A

Noise Monitoring Record Sheet

	Noise Monitoring Record Sheet	ILC Enfield N953

CHAINAGE OF CONSTRUCTION ACTIVITY (Up/Down):		**MONITORING LOCATION:**	
DATE OF TEST:		**TEST CONDUCTED BY:**	
ACTIVITY/ SERVICE:		**OPERATOR:**	
DISTANCE FROM NOISE SOURCE: **WIND SPEED/DIRECTION:**		**INTERVENING GROUND (e.g. hard/soft, flat / fenced):**	
METEROLOGICAL CONDITIONS (i.e. cloud cover):			
LABORATORY CALIBRATION: Acoustic Research Laboratories 05 / 11 / 10			
FIELD CALIBRATION:			
TEST PROCEDURE: AS 2659, INP & ICNG			
EXISTING BACKGROUND (RBL) **Reference Relevant Noise Catchment Area (NCA)**		**RBL:**	**NCA:**
L_{10} or L_{eq} Noise Goal: (RBL +10 stan +5 OOH)	**L_{A1} Noise Goal:** (Refer to CNIS)	**PREDICTED NOISE LEVELS** **Reference (EA or other):**	
		L_{eq}	**$L_{A1\ 60\ second}$**
RESULTS			
Start time: (24hr clock)		End time: (24hr clock)	
Time weighting:	(Fast) / Slow	Frequency weightings:	(A) / C / Flat
L_{eq}		$L_{A1\ 60\ second}$ (NIGHT WORKS ONLY)	
Exceedance of Noise Goal:		L_{eq}	L_{A1}
Difference to Predicted (CNIS):		L_{eq}	L_{A1}
Site Activities / Type of Plant in Operation		**Monitoring Comments**	
Site Diagram (show monitoring location, buildings, construction zone other noise sources, distances, north up/down track)			

Intermodal Logistics Centre at Enfield

Construction Traffic Management Protocol

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	BH
1.1	Minor amendments – added sections in MCoA conditions	28/09/10	BH
1.2	Minor amendments – additional Sydney Ports comments	28/09/10	GK
2.0	Final for Main Construction	13/05/11	GK
3.0	Final for Main Construction	18/05/11	GK
4.0	Final for Main Construction	19/05/11	GK

Contents

1 Introduction

Purpose of this Plan

The Construction Traffic Management Protocol (CTMP) describes how Leighton Contractors Pty Ltd (LCPL) proposes to safely manage vehicular, cyclists and pedestrian traffic during the construction of the ILC project, including the Main Construction phase of base infrastructure construction and remaining off-site works (as described in Sydney Ports' CEMPF).

LCPL acknowledges the safety of road users and the effective management of traffic is paramount to the successful day-to-day activities during the construction phase of this Project. This CTMP seeks to ensure the certainty of the delivery of the prescribed road user requirements including: provision of a safe environment for workers and the travelling public, and minimising impacts on the road network.

Scope

The CTMP details the road safety and traffic management principles, strategies and measures that will be applied to enable LCPL to comply with project approval and the requirements of relevant authorities / stakeholders.

The strategies identified in this plan / strategy document will specifically address the following:

- Traffic management objectives & targets
- Constraints & risks
- Potential road network impacts
- Organisation and responsibilities
- Management process tools
- Describe the controls & measures to be applied
- Outline the specific community / stakeholder consultation process and community relations strategies for managing changed traffic conditions
- Auditing, inspections and monitoring
- Reporting

When developing this protocol, LCPL has considered all inputs including:

- Project approvals and associated environmental documents
- Statutory obligations
- Stakeholder requirements and concerns
- Project constraints – managerial and physical
- LCPL policies and procedures

Traffic Management Overview

LCPL recognises the effective management of construction impacts on the road network is critical to the success of our projects. We seek to build and maintain a reputation of giving the utmost consideration to the needs of road users, not only by providing safe environments but minimising impacts on the road network.

This protocol provides direction on the controls to be applied and demonstrates how LCPL will conform to the Project Approval and relevant stakeholder requirements.

The traffic management principles to be applied by LCPL during Main Construction will ensure:

- The provision of a safe environment for road users and workers
- Any impact on road users is kept to a minimum
- Access is maintained for the local community, transport operators, (including over-dimension load movements) & commercial developments
- Road users and local communities are regularly informed in relation to changed traffic conditions
- Provide safe working areas for LCPL staff and subcontractors

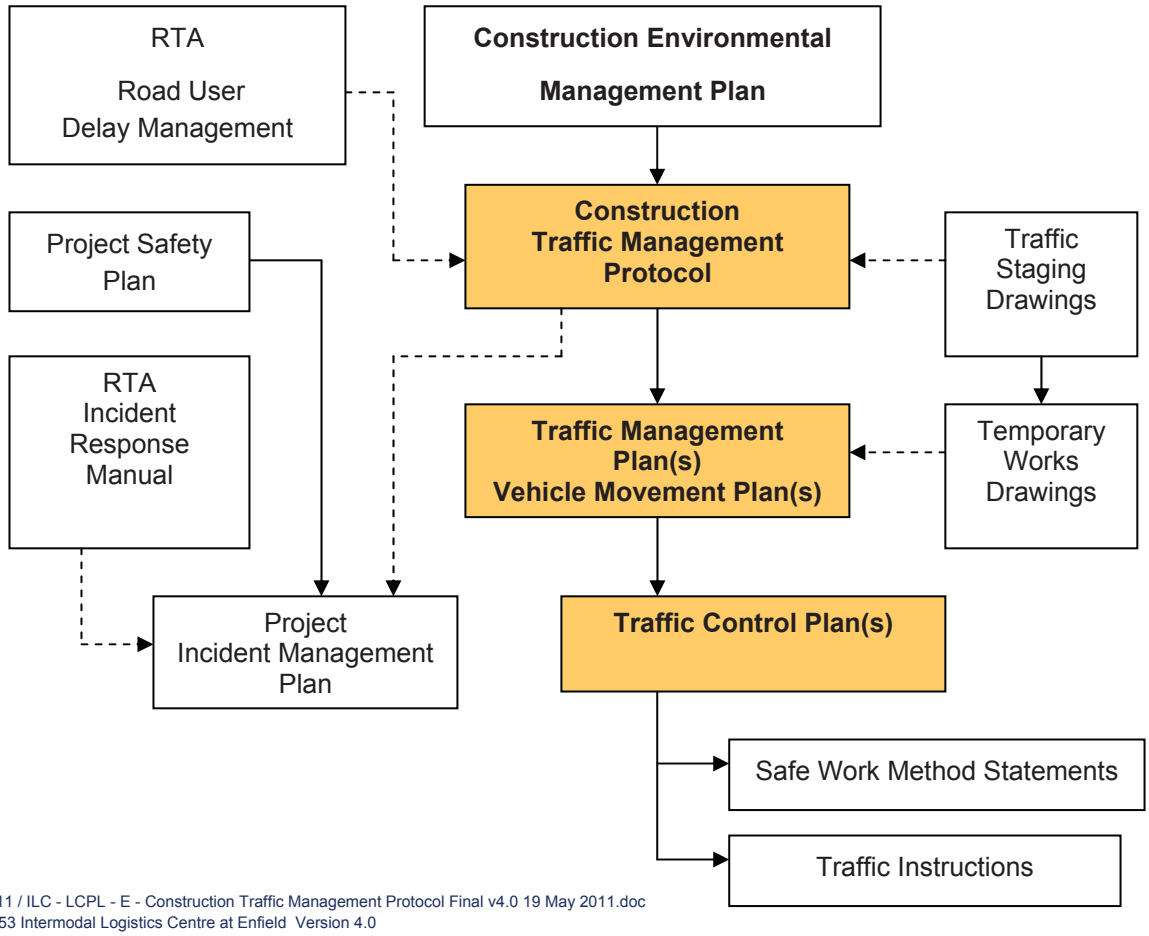
Plan Relationship

This CTMP provides the framework for the preparation of all plans, drawings and topic instructions dealing with the safe and effective management of traffic during the Main Construction phase of the project. The plan / strategy interfaces with other Project Plans as part of the overall Project Management System.

The following documents and associated operational procedures are integrated with and are referenced from the CTMP:

- Vehicle Movement Plan(s)
- Traffic Management Plan(s)
- Traffic Staging Drawing(s) (TSDs)
- Traffic Control Plans (TCPs)
- Process instructions
- Traffic instructions
- Safe Work Method Statements (SWMS)

Figure: Describes the relationship between the various traffic management documents.



Traffic Management Plans

Traffic Management Plans (TMPs) or Vehicle Movement Plans (VMPs) detail the specific road safety and traffic management measures that will be applied whilst undertaking the Main Construction works. The TMPs are based on the principles and strategies of the Construction Traffic Management Protocol, and the obligations under the Project Approval and the requirements of relevant road authorities and other stakeholders. TMPs will include the associated traffic staging drawings, and where required, temporary works drawings.

Traffic Staging Drawings

Traffic Staging Drawings illustrate the proposed traffic staging to be implemented during the Main Construction phase. These drawings: outline the sequencing, basic construction methodology, identify the need for temporary works, specify any particular traffic management measures / controls, define work areas, and illustrate the available travel lanes. The staging drawings are based on the design drawings, and are prepared in association with the over arching construction program.

Within the Traffic Management Plan, LCPL will prepare drawings for each traffic stage of the Project.

Traffic Control Plans (TCPs)

Traffic Control Plans are diagrams that illustrate the signs, road markings and devices that will be installed to warn traffic, and guide it around or past, or if necessary through the work site. These plans will address the specific measures stipulated within the TMPs and will comply with the requirements of Australian Standard AS 1742.3 – Traffic control devices for works on roads.

Processes

Processes are instruction documents that detail how particular activities are to be carried out during Main Construction. Specific Processes will be developed for traffic management activities as the need arises during Main Construction, including, but not limit to:

- Preparation of Traffic Control Plans
- Lane closure / road occupancy & roadwork speed limit submissions
- Temporary safety barriers, linemarking & signage
- Inspecting traffic controls
- Conducting road safety audits
- Wheel wash and exit controls

When approved, these Processes are forwarded to relevant Construction Team members, and specific training sessions will be conducted.

Traffic Instructions

Traffic Instructions are issued for specific road safety and traffic management matters that are applicable project wide. The types of issues may relate to: unsafe practices, reinforcement of road rules, new or amended instructions, non-conformance to standards etc. The instructions will concisely detail the problem identified, the corrective action that needs to

be applied and method of communicating the instruction to the relevant personnel. Each traffic instruction will have a unique reference number.

Safety Health and Environment Work Method Statements (SHEWMS)

Where it is considered that a work process must be carried-out in a strictly controlled manner to ensure the specified safety & quality requirements will be met, a specific SHEWMS will be prepared and implemented.

An LCPL Engineer will prepare SHEWMSs in consultation with workers, relevant functional managers and implement before the related work starts, to ensure the issues relating to safety and quality are appropriately addressed.

The provisions for working, on or adjacent to roadways, and the traffic control measures to be applied will be incorporated where necessary within the SHEWMS.

Program

The construction of the Early Works (Stage 2) commenced in October 2010. The Main Construction works (Stage 3) are expected to commence mid 2011. The Main Construction period will take approximately 2 years. Traffic management works will occur during all phases of construction.

Environmental Management System

The overarching Environmental Management System for the Main Construction works is described in the **Construction Environmental Management Plan** - **Stage 3 Main Construction** (CEMP). The CEMP has been developed to comply with the requirements of the Minister for Planning's Conditions of Approval (MCoA), and ISO14001:2004 - Environmental Management Systems.

This Traffic Management Strategy includes the Construction Traffic Management Protocol required by the MCoA 6.3(b). There are a number of MCoA relating to Traffic Management, with the intent to prevent impacts on surrounding areas. Responsibility for certain MCoA during the Main Construction phases will be with LCPL to comply with. Other conditions including those relating to Operational Phases will be the responsibility of Sydney Ports.

Construction Hours of Operation

In accordance with Conditions of Approval 2.15, LCPL will only undertake construction works associated with the project, during the following hours:

a) 7:00am to 6:00pm, Mondays to Fridays inclusive

b) 8:00am to 1:00pm on Saturdays

c) At no time on Sundays or public holidays

The condition MCoA 2.15 does not apply in the event of a direction from Police or other relevant authority for safety reasons.

However, under MCoA 2.16, construction works associated with the project may be varied with the prior written approval of the Director-General allowing audible (at residential premises) works to be undertaken outside of the standard construction hours. Such out of hours work may be required to undertake traffic management and services road crossings on the busy roads that surround the site, particularly at the intersection of Norfolk Road and Roberts Road and on Cosgrove Road.

Constraints

Constraints are those issues (e.g. regulatory, physical or social) that define the environment and conditions under which the works must be undertaken. The road safety and traffic management constraints are defined by: the project approvals; requirements of road authorities and other stakeholders; traffic / transport legislation and technical standards.

A list of the various technical specifications, guidelines and standards identified as being applicable to the Main Construction works are included in Appendix A of this plan / protocol.

Relevant conditions of the Minister's Conditions of Project Approval, with a cross reference to where the condition is addressed in this Plan or other Project management documents are provided in the table below.

Table: Ministers Conditions of Approval

MCoA No.	Condition /Commitment Requirements	Plan Reference
MCoA – 2.1	The proponent shall provide a shuttle bus service between Strathfield train station and the site during peak construction works, and shall encourage construction employees to utilise public transport rather than private transport to the site.	**CTMP Section 2**
MCoA – 2.2	The proponent shall provide a manual and/or technological solution to control the frequency of articulated and B-double vehicles utilising the Cosgrove Road entrance to the site during morning and afternoon peak periods.	**CTMP Section 7**
MCoA – 6.3(b)	The Proponent shall prepare and implement a **Construction Traffic Management Protocol** to detail how heavy vehicle movements associated with the project will be managed during construction. 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.	**CTMP Sections 2, 4 & 7**

Risks

Risk management, in accordance with the requirements of Australian / New Zealand / International Standard AS/NZS ISO 31000:2009 is an integral component of the Leighton Contractors' Management System.

Risk management for this project involves a systematic method of identifying, analysing and controlling the risks associated with the project's activities or processes, to minimise loss and maximise opportunities.

Assessments will be conducted to identify the potential road safety and traffic management risks associated with the Main Construction works. The risks identified will form part of the inputs during development of the traffic control plans.

Organisation and Responsibilities

Project Management Overview

The Project Manager is responsible for the implementation of this CTMP. The Construction Manager and wider project team will comply with and deliver the requirements of this CTMP.

Traffic management roles and responsibilities

A Traffic Manager / Coordinator (LCPL NSW Branch or Subcontractor) may be used to provide road safety and traffic management assistance during the Main Construction phase. The roles of the traffic manager are outlined below.

Traffic Manager / Coordinator

- Support construction staff in the planning and coordination of traffic management activities in timely and efficient manner
- Manage the planning, development, implementation, revisions, and approvals of the CTMP/S, TMPs and Traffic Control Plans (TCPs)
- Ensure all traffic management measures are planned, implemented and maintained in accordance with best practice, including all relevant safety regulations and standards
- Obtain and negotiate lane closure / road occupancy approvals and speed limit consents from the RTA and Council.
- Liaise and maintain a productive relationship with the RTA, Local Councils, Police, emergencies service agencies, and other stakeholders on all traffic and incident related issues
- Assist the Design Team to facilitate the preparation of Traffic Staging Drawings, Temporary Works Drawings and TCPs, in accordance with the relevant standards.
- Monitor and evaluate the ongoing effectiveness of traffic management activities of the project, including road user delays and where necessary implement corrective actions to rectify any deficiencies
- Investigate traffic related incidents / hazards, identify preventative measures and manage the implementation of actions to mitigate, future occurrences
- Support the RTA's unplanned incident management strategy, and when requested coordinate the response of incident management teams and resources accordingly
- Manage the Project's road safety audit and inspection process, implement corrective actions and maintain detailed records.
- Assist the Stakeholder and Community Relations Manager with the dissemination of changed traffic condition information to potentially affected parties, including road users, local communities and transport operators

Other Construction Personnel and Responsibilities

- The Construction Team are responsible for all construction activities, including the implementation and maintenance of the various temporary traffic management arrangements. The other key construction personnel and their traffic management related responsibilities are described below

Project Manager

- Reviews and approves the CTMP
- Ensures the Project's road safety and traffic management objectives are achieved.

Construction Manager

- Co-ordinates traffic management activities within the construction team
- Supports the delivery of the road safety and traffic management objectives in accordance with the CTMP
- Review, Approve and Implement the TMP
- Provides direction and support to the Area Managers to enable effective planning of temporary traffic management arrangements
- Ensures all construction team members receive the appropriate training

Area Managers/Engineer(s) responsible for the work activity

- Assists in the delivery of the road safety and traffic management objectives outlined in the CTMP and TMPs
- Plans and carries out all work activities and identifies the required traffic management arrangements to facilitate the works in accordance with the CTMP & TMPS
- Liaises with the Traffic Manager in the planning and implementation of the required traffic management arrangements
- Prepares TCPs to facilitate the works in consultation with the Traffic Manager and obtains approval from the Site Traffic Manager
- Conducts regular inspections (including pre-starts) of traffic controls and VMPs and where necessary instructs the rectification of deficiencies
- Allocates plant, equipment and resources for the works including the provision of the temporary traffic control arrangements
- Conducts and keeps records of daily and weekly (day & night) inspections of the traffic control arrangements, assist audits and where necessary rectifies deficiencies

Functional Personnel and Responsibilities

- Functional personnel provide support for all construction activities and their traffic management related responsibilities are described below

Stakeholder & Community Relations Manager

- Represents the Project for community and stakeholders issues in consultation with Sydney Ports
- Conducts consultation with stakeholders for traffic planning, and provides an ongoing liaison role in accordance with the requirements of Sydney Ports
- Prepares and distributes changed traffic condition information to road users, transport operators and local communities

2 Identifying Potential Construction Impacts

Description

This process identifies the construction activities and their potential impacts, which will enable the development of effective mitigation solutions.

The process includes details of the: construction activities; construction site office(s); concept traffic staging; major traffic diversions; existing road network; traffic data and analysis and specific construction impacts.

Roles

Traffic Manager, Safety Manager, Construction Manager

Process

The Traffic Manager in conjunction with the Safety Manager and Construction Manager will sequence construction works with the objective to; maximise safety for workers and road users by isolating work areas from traffic flow, maintain existing capacity where possible, minimise road user delays, avoid major activities during peak periods, and avoid restrictions on transport operators.

The effective planning of all construction activities is the key to achieving these objectives.

Construction activities

The construction activities to be undertaken during Main Construction works include:

- All infrastructure associated with warehouse areas A and B including earthworks, retaining walls, drainage infrastructure, noise walls and Utility Services
- All infrastructure associated with the Empty Container Storage (ECS) areas and warehouse areas C, D, E and F including earthworks, retaining walls, drainage infrastructure and Utility Services
- All infrastructure associated with the Intermodal Terminal (IMT) and the internal rail siding and through lines including earthworks, pavement, trackwork and signalling, level crossing at gravel access road, retaining walls, drainage infrastructure and Utility Services
- Internal roads
- RTA endorsed works mainly associated with the intersection of Roberts Road and Norfolk Road
- Off-site utility connections including sewer and water infrastructure works, electrical connections and telecommunication connections
- Construction of remaining noise walls
- Construction of frog movement corridor
- Earthworks for Light Industrial Commercial area
- Landscaping

Location of construction site compound(s)

The areas chosen for the site compounds have been considered by LCPL to offer the best proximity to the worksites to minimise travel time on site. There were numerous physical and logistical constraints to locating the compounds and the best possible sites have been chosen.

Subsequently, LCPL will be establishing one main site compound and three smaller work compounds. These compounds are described below.

Site Compound

The Main Project Office – is located north of an existing tenancy and south of Sydney Ports Office on the ILC site as shown on the Vehicle Movement Plan N953-VMP 001 in Appendix B. Access to the Main Project Office is from the existing driveway (Gate A) which connects to Cosgrove Road, north of Cleveland Street.

Three other smaller compounds and permanent construction access points will be established for the project, at the following locations:

- Gate B Located opposite Hope Street and provides access to the Haul Road in the middle of the site. This gate will also provide access to other tenants using the site
- Gate C: Located in Wentworth Street to provide access to the new road bridge over the rail line
- Gate D: Located at Pacific National's existing driveway in Wentworth Street. This provides access to a laydown area and site shed on the alignment of the proposed bridge site

Some temporary access points may be required at Cosgrove Road during the construction of works adjacent to Cosgrove Road. The locations of Gates A-D are shown in Appendix B.

Traffic Generation

Estimated traffic generation of the main site office (Gate A) and other construction access points (Gates B, C and D) during peak construction are provided in the tables below. It is based on the experience of previous road projects with similar staff numbers. The adopted vehicle occupancy rates for: office staff, design staff, managers, supervisors, and technical staff, are 1 per vehicle, and 3 per vehicle for construction workers. The movements are typically 80% light vehicles/utes, 20% trucks/heavy vehicles.

Due to the nature of their work, managers, supervisors, surveyors, soil lab technicians, functional managers and plant mechanics will conduct regular trips throughout the day. It has been estimated that these staff on average will undertake two in and out movements per day. All other staff will undertake one in and out movement per day. The typical site traffic flows will occur between 0630 and 1830 Monday to Friday, and between 700 and 1330 Saturdays. The estimated evening peak hour is based on most staff / workers departing between 1630 and 1830, (approximately 50% of total vehicles departing per hour).

Table: Estimated Traffic Generation of Main Project Office (Gate A)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Office / Design / Technical Staff	20	20	20	20	40	10
Managers / Supervisors / Surveyors / Lab Staff	30	30	60	60	120	30
Workers	60	20	20	20	40	10
Office Delivery and Service Vehicles	-	10	10	10	20	3
Plant Yard	5	5	10	10	20	5
Deliveries	-	25	25	25	50	6
Totals	**115**	**110**	-	-	**290**	**64**

Table: Estimated Traffic Generation of Construction Access (Gate B)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Office / Design / Technical Staff	10	10	10	10	20	5
Managers / Supervisors / Surveyors / Lab Staff	20	20	40	40	80	20
Workers	60	20	20	20	40	10
Office Delivery and Service Vehicles	-	2	2	2	4	1
Deliveries	-	50	50	50	100	12
Totals	**90**	**102**	-	-	**244**	**48**

Table: Estimated Traffic Generation of Construction Access (Gate C)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Workers	10	4	4	4	8	4
Deliveries	-	5	5	5	10	1
Totals	**10**	**9**	-	-	**18**	**5**

Table: Estimated Traffic Generation of Construction Access (Gate D)

Type	Number of Staff	Number of Vehicles	Trip Movements		Maximum Trips per day	Evening Peak Hour Trips
			In	Out		
Office / Technical Staff	4	4	4	4	8	2
Managers / Supervisors / Surveyors / Lab Staff	4	4	8	8	16	4
Workers	20	8	8	8	16	4
Office Delivery and Service Vehicles	-	10	10	10	20	4
Deliveries plant and precast bridge components	-	20	20	20	40	6
Totals	**28**	**46**	-	-	**100**	**20**

The above tables are an indication of the average movement per day during Main Construction works. These numbers will vary and increase during certain work activities requiring repeat bulk deliveries and haulage.

All site office access points will be: located at points that, as a minimum, provide safe intersection sight distance (SISD), or desirable entering sight distance (ESD); designed to accommodate the turning movements of the largest vehicle servicing the site, and appropriately signposted.

Further, security fencing, flood lighting and an appropriate security system to restrict public access to the compound areas will be provided.

The locations of the site compounds and access gates are illustrated in the Vehicle Movement Plan provided in Appendix B.

Employees Journey to Work

To encourage construction employees to utilise public transport rather than private transport to the site, a 12-seater bus will be provided during peak construction to provide transport between Strathfield train station and the site. This will satisfy condition 2.1 of the Minister's Condition of Approval.

Specific Traffic Management Plans (TMPs)

The Main Construction phase of the project includes the construction of the Intermodal Logistics Centre, rail work, upgrading of off-site roads, landscaped areas, utilities and all associated activities. It will require off-site road upgrades and service diversions.

Specific TMP will be developed for the Main Construction phase. Traffic Control Plans (TCPs) will be developed for the specific off-site activities that affect the road networks in the vicinity of the site.

Traffic Staging

The effective management of traffic during the Main Construction works of the Project is critical. The development of the traffic staging is the first step, and the basis for all traffic management planning. The traffic staging will be developed as an integral part of the planning process, in association with the constructability assessment, and construction program.

A brief summary of the proposed traffic staging for the works in Roberts Road and Cosgrove Road is described below.

Roberts Road Traffic Staging

There are five stages planned for the upgrading of the intersection of Roberts Road and Norfolk Road.

Stage 1
The existing traffic arrangements are maintained. A traffic signal controller currently located at the vacant land will be relocated and the left-turn slip lane constructed behind concrete barriers. Also part of the traffic signal and refuge island, traffic signal posts and kerb and gutter works will be completed.

Stage 2
The kerbside lane in the southbound direction on Roberts Road will be closed for two weeks, reducing traffic lanes in the southbound direction to two lanes. This would allow construction of the concrete works (including kerb and pavement) at the left turn slip lane. Also the remainder of the concrete works at the island and installation of signal posts will be completed.

Stage 3
The median lanes on northbound and southbound sides of Roberts Road south of Norfolk Road will be closed at night on weekdays for around one month. This would allow construction of the extension to the right turn bay on Roberts Road.

Some works will also be carried out during the day. The traffic management plan will be developed with the staging drawings for the sequence of works. The works during the day will be carried out either with the lane closure or after the installation of concrete jersey barriers in the median to separate the workforce from the live traffic.

Stage 4
Final asphalt paving at the intersection of Roberts Road/ Norfolk Road and also in the upgraded section of Norfolk Road will be carried out at night for 1 week. This would require progressive temporary closure of relevant traffic lanes.

Stage 5
Linemarking of the new pavement surfaces in Roberts Road and Norfolk Road will be carried out at night under traffic control.

Cosgrove Road Traffic Staging

There are two main stages planned for the construction of the permanent access to site from Cosgrove Road.

Stage 1
Existing traffic arrangement in Cosgrove Road is maintained with safety barriers installed to close the parking lane. This would allow the construction of the left turn slip lane.

Stage 2
The linemarking works for the right-turn bay into the site will be installed under one lane alternate traffic control. In addition a reduced 40km/h speed limit will be installed in Cosgrove Road during the works.

Traffic staging drawings will be prepared to illustrate the traffic management arrangements described above, including proposed main access points and major construction vehicle movements (refer to Section 7 “Manage Construction Traffic”).

Conceptual Traffic Staging Drawings for works in Roberts Road are shown in Appendix C.

Material Haulage Operations

LCPL recognises the effective management of haulage operations is necessary to minimise the impact on the road network.

LCPL will implement various controls and procedures for the haulage operations, to mitigate any road network impacts.

Identified Impacts

Road network
Main Construction works can potentially impact on the existing traffic flows along Roberts Road, Norfolk Road (west), Wentworth Street, Cosgrove Road. However, as detailed in this plan LCPL will aim to isolate work areas, keep road user delays to an absolute minimum and maintain access for transport operators.

During the construction phase, the potential restrictions on the existing road network may include: reduced roadwork speed limits, temporary sidetracks and deviations, short-term one lane alternate operations, haulage operations, and over-dimension vehicle movements. However only Roberts Road, Wentworth Street, Norfolk Road and Cosgrove Road will be affected by short-term lane closures. With the exception of short-term traffic control for oversize vehicle access, LCPL will maintain access for all vehicles along the affected roads.

In regards to the road network in the immediate vicinity of the site, LCPL will prepare a road dilapidation report for all non-arterial roads likely to be used by construction traffic prior to commencement of construction and after construction is completed. A copy of this report will be provided to the relevant road authority (Strathfield Municipal Council or Bankstown City Council) on request. With the exception of damage resulting from normal usage of the road, LCPL will repair any damage that has resulted from Main Construction works.

Consequently the main potential impact of the construction works on the road network will consist of the road users experiencing increased travel times. To keep the road user delays along Roberts Road to a minimum, LCPL will plan and stage all works to avoid road occupancies during peak periods. To assist this process, the Traffic Manager has analysed the RTA’s historical traffic volume data along the road, and developed several traffic volume profiles. These traffic volume profiles are provided in the section below.

Traffic Flow Demand Profiles

Hourly, daily and weekly traffic patterns for Roberts Road and Cosgrove Road have been extracted from the RTA Traffic Volume Data for Sydney Region 2005. The traffic volumes have been factored up by 3% per annum to 2010 forecast flows based on general growth rates of traffic in Sydney. It should be noted that the recently published household survey of Sydney residents by the NSW Transport Data Centre in the 12 months to 2008/2009 indicated that weekday trip growth slowed to just 0.2% for the 12 month period.

These traffic patterns will form the basis for planning the construction staging works and road occupancies and diversions for Main Construction.

Hourly Flows

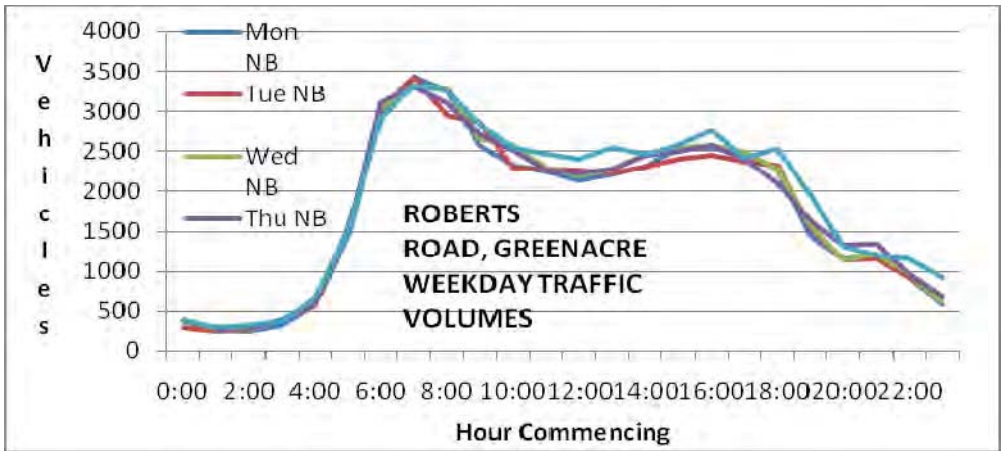
The northbound and southbound average hourly flows (vehicles per hour) over an average weekday (Mon to Fri) and an average weekend (Sat to Sun) for both Roberts Road and Cosgrove Road are presented in the figures below. A review of the hourly profiles reveals the following patterns:

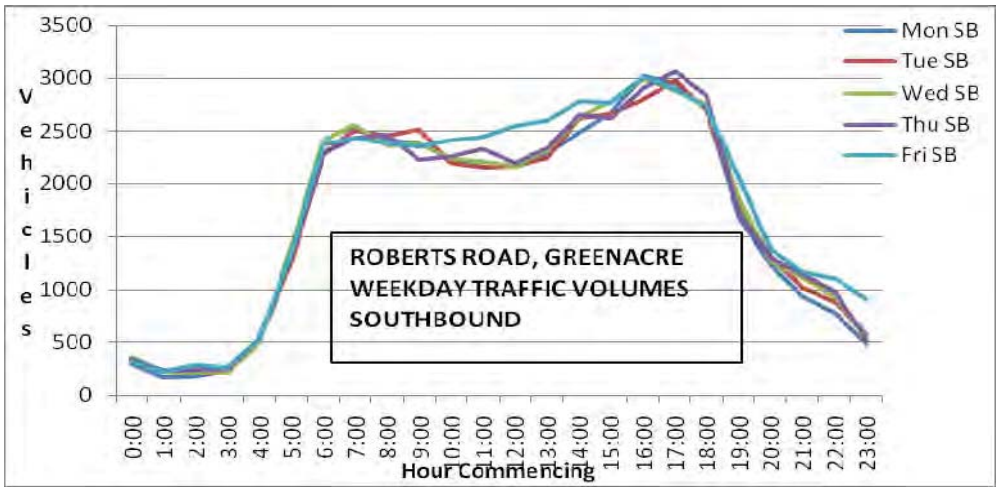
Roberts Road

- The average weekday hourly flows peak between 6:00am and 9:00am in the northbound direction
- For the southbound direction, the average weekday hourly flows peak between 4:00pm and 6:00pm
- Traffic volumes are lower in the night between 9:00pm and 5:00am in both directions.
- The average weekend hourly flows peak between 11:00am and 5:00pm

Cosgrove Road

- The average weekday hourly flows peak between 6:00am and 8:00am and 4:00pm-6:00pm in the both directions
- After 6:00pm, traffic volumes drop below 400 vehicles per hour in each direction
- In the weekend, hourly flows peak at around 400 vehicles per hour during the midday
- After 6:00pm, traffic volume drops to below 200 vehicles per hour in each direction in the weekend




Vehicles
3500
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2000
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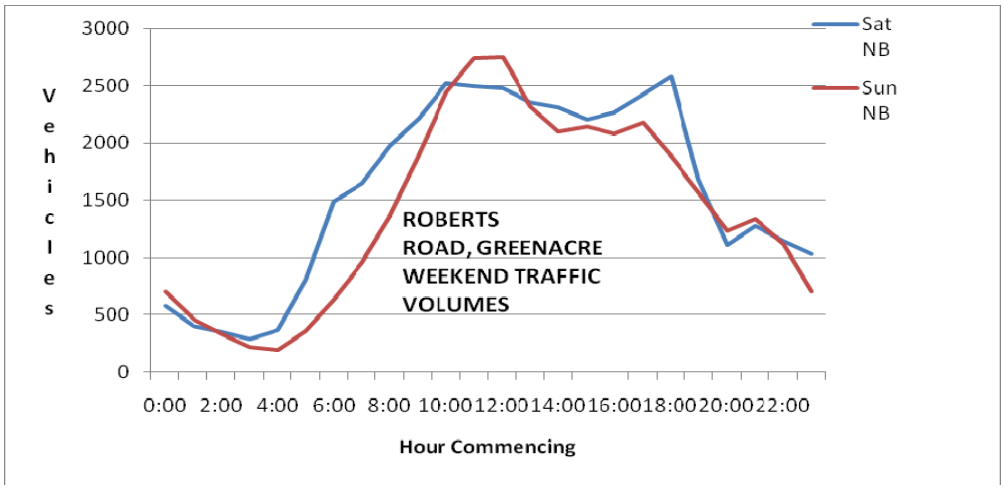
0
Mon SB
Tue SB
Wed SB
Thu SB
Fri SB
ROBERTS ROAD, GREENACRE
WEEKDAY TRAFFIC VOLUMES
SOUTHBOUND
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 0:00 1:00 2:00 3:00 4:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00
Hour Commencing


Vehicles
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Sat NB
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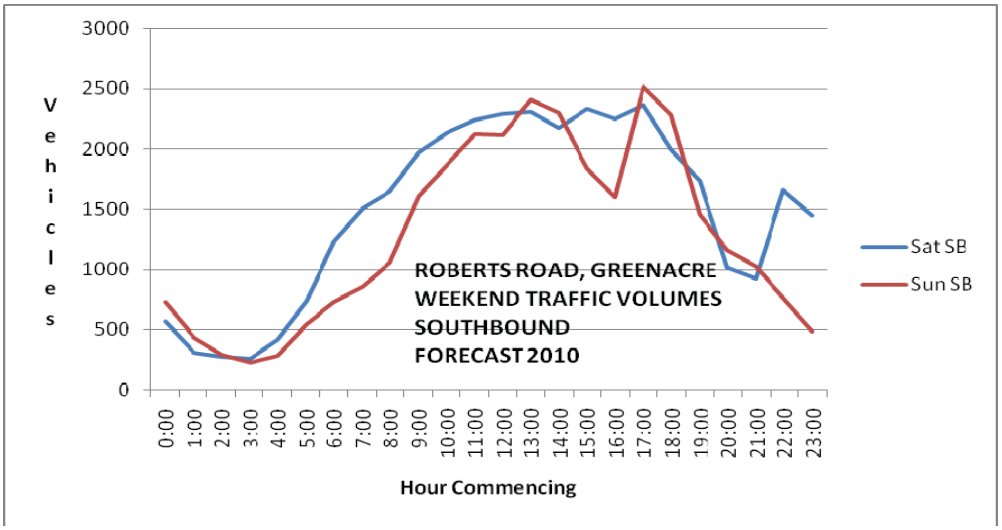
ROBERTS
ROAD, GREENACRE
WEEKEND TRAFFIC
VOLUMES
0:00 2:00 4:00 6:00 8:00 10:00 12:00 14:00 16:00 18:00 20:00 22:00
Hour Commencing


Vehicles
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Sat SB
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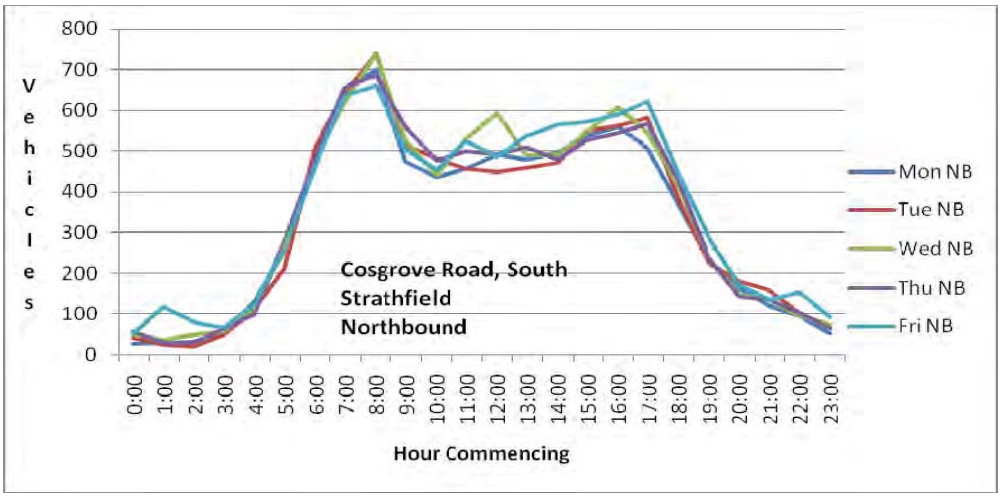
ROBERTS ROAD, GREENACRE
WEEKEND TRAFFIC VOLUMES
SOUTHBOUND
FORECAST 2010
0:00 1:00 2:00 3:00 4:00 5:00 6:00 7:00 8:00 9:00 10:00 11:00 12:00 13:00 14:00 15:00 16:00 17:00 18:00 19:00 20:00 21:00 22:00 23:00
Hour Commencing


800
700
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Vehicles
Cosgrove Road, South
Strathfield
Northbound
Mon NB
Tue NB
Wed NB
Thu NB
Fri NB
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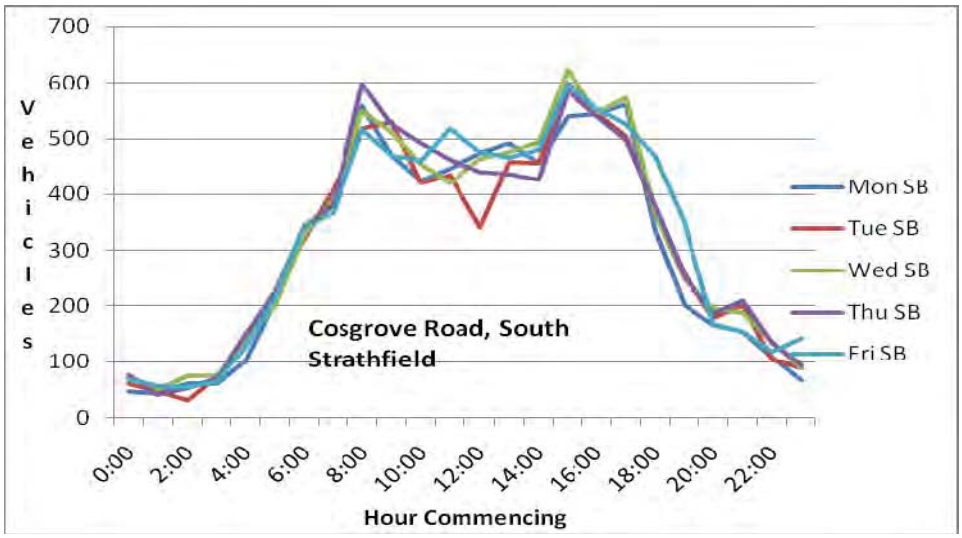
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Vehicles
Cosgrove Road, South
Strathfield
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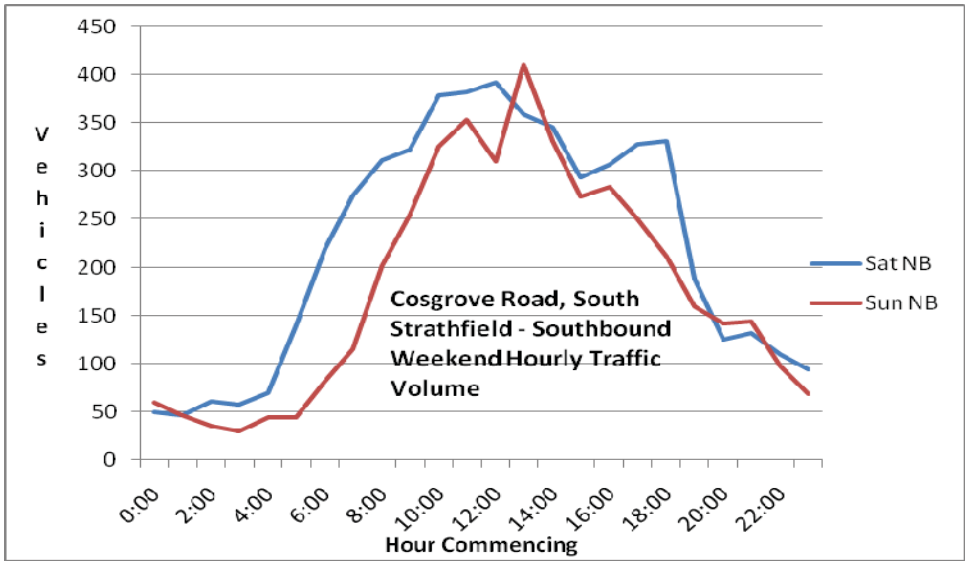
450
400
350
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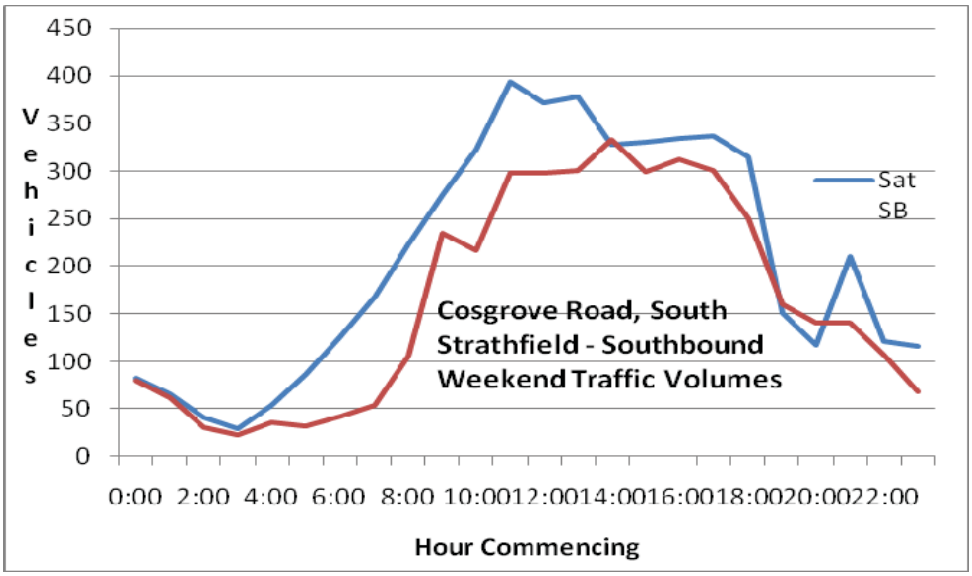
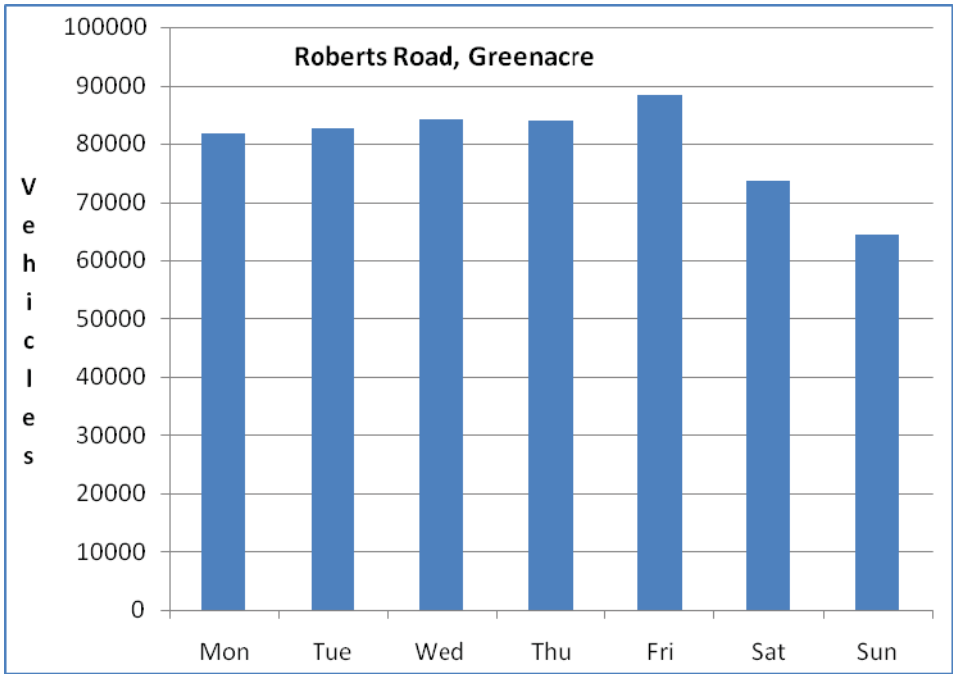
250
200
150
100
50
0
Vehicles
Cosgrove Road, South
Strathfield - Southbound
Weekend Hourly Traffic
Volume
Sat NB
Sun NB
0:00
2:00
4:00
6:00
8:00
10:00
12:00
14:00
16:00
18:00
20:00
22:00
Hour Commencing

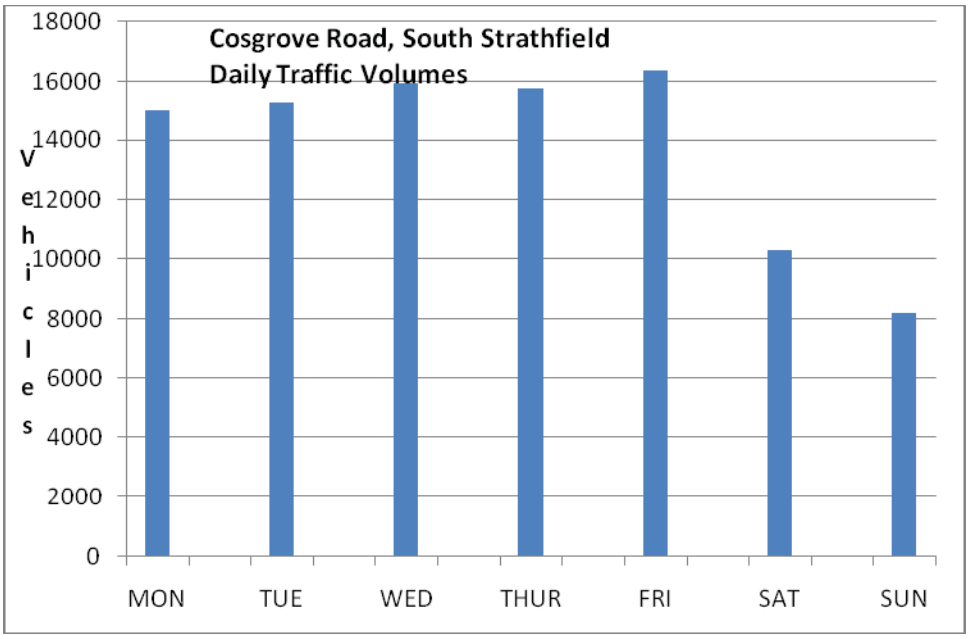


Daily Profiles

The figures below illustrate the estimated daily traffic demand profiles on Roberts Road, Greenacre and Cosgrove Road, South Strathfield. A review of the profiles indicates the following for the two roads:

- Daily traffic volumes increase gradually from Monday to Friday
- Traffic flows in the weekends are lower than in the weekdays
- The highest traffic flows occur on Fridays and lowest traffic flows occur on Sundays





Specific Impacts

Pedestrians and Cyclists

LCPL will give consideration to the potential of pedestrian and cyclist movements when preparing temporary works drawings and the Traffic Control Plan, and where warranted, implement temporary facilities in accordance with the RTA and AUSTROADS requirements.

During the construction works for upgrading of Roberts Road/Norfolk Road intersection, the pedestrian crossing at the northern leg of the intersection will be closed. However, pedestrians will be able to cross Roberts Road at the southern leg. Pedestrian warning signs will be installed to guide pedestrians.

On-street Parking

Parking of construction vehicles on Cosgrove Road and Wentworth St will be kept to a minimum and wherever possible will be within site compound areas. However by necessity some itinerant parking of construction vehicles on these roads will be required during certain works such as the following:

- Delivery of construction materials to work areas adjacent to these road ways
- Out of hours delivery of large precast elements subject to out of hours notifications and RTA permits
- Delivery of large cranes and construction equipment subject to out of hours notifications and RTA permits
- Road pavement works for intersections, tie ins to local roads
- Temporary closure of road shoulders to maintain a safe work place for works adjacent to the roadways
- Site investigation of services

Public Transport

The public transport provisions, in the vicinity of the site includes railway stations Strathfield, Bankstown, Punchbowl, Wiley Park and Lakemba generally around 2 to 4 kilometres from the site.

Two bus companies, Veolia Transport and Punchbowl Bus Company service the area. The services in the vicinity of the site include:

Bus Route Numbers	Route Description	Operator
913	Bankstown to Strathfield via Greenacre	Veolia Transport
914	Greenacre to Strathfield	Veolia Transport
939	Hurstville to Bankstown via Greenacre	Punchbowl Bus Company
946	Hurstville to Bankstown via Lakemba	Punchbowl Bus Company

LCPL will consider the potential impacts on these bus routes and stop facilities when preparing temporary works drawings and Traffic Control Plans. Where possible, LCPL will maintain the existing facilities, however where this cannot be achieved, any existing bus stop will be relocated and equivalent temporary facilities will be provided. All temporary facilities will be developed and constructed in accordance with the RTA and Department of Transport requirements. All proposed changes to existing routes and bus stops facilities will be discussed with the relevant Operator, prior to the commencement of works, and notifications will be provided to passengers.

Access to Properties

LCPL considers minimising the impact and maintaining the amenity of local residents and businesses in the vicinity of the construction works to be very important. In this regard, various environmental and traffic management measures will be applied, in particular those measures that maintain access to the road network.

LCPL will aim to maintain existing property access points and access to community facilities and businesses. Where this cannot be achieved, LCPL will provide temporary alternative access tracks which will be constructed at no cost to the resident or business. All temporary access points and associated tracks will be: designed in accordance with RTA guidelines; accommodate the largest vehicles servicing the property; positioned at a location that has safe intersection sight distance; constructed of an all weather surface with appropriate drainage; and provide the minimum inconvenience to the resident. Where necessary, entrance gates and boundary fences will be adjusted to suit the temporary access tracks.

All proposed changes to existing access arrangements will be discussed with residents and businesses prior to the commencement of works. Upon completion of the construction works, the original property access for residents or businesses will be re-instated.

3 Minimise Road User Delay

Description

This process focuses on minimising delays experienced by road users during the Main Construction phase of the project. It covers delay minimisation strategies, specific measures that can be applied and where guidance can be obtained.

Roles

Traffic Manager

Process

Overview

The reliable and efficient operation of the state road network is vital to NSW and Australia. Australian Standard 1742.3 Section 2.3.2 (b), states that work schedules shall be arranged to minimise:

- Disruption of established traffic movements and patterns
- Interference with traffic at peak movement periods and at night, weekends, holiday periods and special events
- Interference with public transport services

LCPL acknowledges that maintaining the Level of Service of the road network and minimising the delays experienced by road users during the construction of any project is important. This process outlines the various strategies and measures that can be applied to minimise road user delays.

Despite the importance of minimising road user delays, LCPL will not pursue the minimisation of delays to the extent that it will compromise safety of workers or road users.

Delay Minimisation Strategies

The delay minimisation strategies to be applied by LCPL may include:

- Minimising the impacts of each work area
- Maximising the operating performance of the individual routes
- Aim to maintain access
- Coordinating works at each work area to ensure road users do not encounter several delays in quick succession

Implement Measures

There are various measures that can be applied to minimise road user delays, which are generally divided in four categories:

- Design of temporary works/staging
- Isolation of work areas
- Work methods
- Planning of lane closure / road occupancies

Where practical, LCPL will apply the following measures:

- Ensure road user delays are given consideration during the planning phase (i.e. develop alignments to avoid conflicts and potential impacts with the existing road network)

- During the planning phase develop traffic staging and temporary works that: avoid conflicts with the existing road network; maximises separation between work areas and travel lanes or isolates work areas, and maintains as far as reasonably practicable the existing Level of Service of the road network
- Isolate work areas from traffic flows (e.g. using alternative routes, temporary sidetracks, lane deviations / widening and temporary safety barriers)
- Develop alternative work methods to minimise impacts (e.g. utilise more efficient plant / equipment, apply different design solution, enclosed work platforms, time of day applications)
- Plan all lane closures / road occupancies with the aim to: minimise the actual work area, limit obstructions and restrictions, maximise the roads capacity, and avoid peak traffic flow periods
- Analyse traffic volume data to: establish the capacity of the road; assess the potential impact on traffic flows, and identify the best time to apply temporary traffic arrangements, so as to minimise the inconvenience to road users
- Provide road users with changed traffic condition information to enable them to plan their journey and avoid the road works

4 Maintain Access for Heavy Vehicles

Description

LCPL acknowledges the importance of maintaining access along major freight routes. This process provides details on: the heavy vehicle volumes; detail of over dimension loads.

Roles

Traffic Manager

Process

Transport Network

Trucks will use the surrounding arterial roads, Roberts Road, Hume Highway and Punchbowl Road to access the site (via Wentworth Street and Cosgrove Road) during construction works. Traffic Analysis for the environmental assessment of the project indicated that the percentage of heavy vehicles on these roads are relatively low, ranging from 2.0 percent for Punchbowl Road to 4.7 percent for Roberts Road. Cosgrove Road does experience a higher percentage of trucks that the roads discussed above, as it services the surrounding light industrial and commercial area and is not a major route for passenger vehicles.

It is still necessary to cater for the movement of heavy vehicles and especially over-dimension loads during the construction works.

Over Dimension Loads

The loads carried by the heavy vehicles vary, and over-dimension loads are transported regularly. These loads vary in width, height, length and mass.

The RTA's Special Permits Unit at Glen Innes controls the issuing of permits to enable operators to travel on the NSW route network. Subject to the size of the load, co-ordination with the NSW Police is also required.

In NSW rural areas, the transportation of over-dimension loads is only permitted during daylight hours.

The RTA's Operating Conditions: "Special permits for oversize and overmass vehicles and loads", (2007) document outlines the various operating restrictions and conditions.

The role of LCPL

To facilitate the movement of heavy vehicles the Traffic Manager will:

- Give consideration to the movement of heavy vehicles and over-dimension loads when preparing temporary works drawings and Traffic Control Plans (adopting designs that provide a minimum lane width of 3.5m, and can accommodate the turning movements of a 26m long B-Double heavy vehicle)
- Minimise traffic control operations at night that may disrupt freight movement;
- Limit obstructions and restrictions on the carriageways, and when required provide alternatives to maintain access for transport operators including over-dimension load movements
- Liaise with the police, permit authority and operators, and provide up-to-date information to of any obstructions (specify minimum dimensions) that may impact on movement of over-dimension vehicles
- Keep a register of proposed over dimension vehicle movements for the Main Construction works, determine the best opportunity to proceed through the work site, and advise the transport operator accordingly;
- When traffic control operations are in place, Traffic Controllers will effectively co-ordinate the movement of over-dimension vehicles through the work site
- Assist the RTA Special Permits Unit and over-dimension operators by notifying the RTA of any obstructions that may impact on over-dimension vehicle movements;
- Where possible, arrange the removal and re-instatement of roadside furniture and traffic control devices that impede over-dimension vehicle movements
- Regularly monitor heavy vehicle movements through the work site and when required implement the appropriate controls to mitigate potential hazards and or congestion

5 Managing Pedestrians

Description

This process describes how LCPL will safely manage pedestrians during Main Construction. LCPL recognises the importance of giving consideration to all road users, including vulnerable users and not just vehicle traffic. This process covers pedestrian needs; defining the work area; provision of temporary footpaths and provision of pedestrian crossings.

Roles

Traffic Manager, liaison with Roads and Traffic Authority, Strathfield Council, Bankstown City Council

Process

Identify Pedestrian Needs

When planning construction activities, LCPL will give consideration to the:

- Number of pedestrians
- Type of pedestrian activity: whether office, retail, residential or recreational;
- Origin and destination points of the pedestrians, and their desired travel path
- Needs of vulnerable pedestrians, such as young children, the elderly, vision impaired, disabled people, people with prams and trolleys

- Proximity of pedestrian generation developments, such as schools, shopping centres, railway stations, bus terminals etc

The AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13, Section 1 provides guidance on the needs of pedestrians.

Define the Work Area

Unlike motor vehicles, pedestrian movements within and outside of the road reserve are generally unrestricted, with free access available to most areas.

To provide a safe environment for pedestrians, LCPL will clearly define the boundaries of all work areas, and where required provided defined walking paths.

Fencing will be installed to restrict physical access to hazardous areas and for site security, which will be appropriately sign posted. Various types of temporary and semi-permanent fencing may be installed, including plastic mesh; water filled plastic delineators; weldmesh pool fencing and chain wire mesh and so on. All physical barriers will be maintained during the project and appropriately secured to prevent injury to the public.

Provide Temporary Footpaths

Where the work areas restrict access to existing footpaths, LCPL will implement alternative routes and facilities. Alternatives may include using the opposite footpath, detours via other streets, or the provision of temporary footpaths through the work area.

All temporary footpaths will be:

- Clearly defined
- Signposted appropriately to indicate the direction of the footpath
- Constructed of an all weather surface, free of trip hazards
- Designed to accommodate the type of pedestrians to be encountered within the area
- Where required, provided with pram ramps, hand rails and lighting
- The minimum width specified by the RTA
- Kept well maintained whilst in operation.

When pedestrians are diverted onto the existing roadways adjacent to traffic flows, additional treatments will be implemented by LCPL to ensure adequate separation is provided and it is clearly delineated. Section 9.3 of the RTA's Traffic Control at Worksites (TC@WS) manual provides guidance on the design parameters of footpaths.

The AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13, Sections 2 and 6 provides guidance on the design parameters of footpaths. RTA's requirements and specifications will be considered when designing alternative pedestrian footpaths and associated facilities.

A Traffic Control Plan will be developed by the Traffic Manager for all alterations to existing pedestrian footpaths.

Provide Pedestrian Crossings

Where feasible, the Traffic Manager will aim to maintain all existing pedestrian crossing facilities. Where this cannot be achieved alternative facilities that are a similar standard to the present facility will be provided.

Types of temporary crossing facilities may include pedestrian refuges; marked foot crossings; pedestrian actuated traffic signals; temporary grade separated pedestrian bridges and so on.

The AUSTROADS Guide to Traffic Engineering Practice – Pedestrians Part 13, Section 3 provides guidance on the design parameters of pedestrian crossing facilities.

A Traffic Control Plan will be developed by LCPL for all alterations to existing pedestrian crossing facilities.

LCPL will obtain any required approval from the relevant road authority (Strathfield Council, Bankstown City Council or the RTA), prior to adjusting any existing pedestrian crossing facility or the implementation of any new temporary facility.

6 Managing Cyclists

Description

This process describes how LCPL will safely manage cyclists during the construction of this project. LCPL recognises the importance of giving consideration to all road users, including vulnerable users and not just vehicle traffic. This process details cyclists' needs; defining the work area and hazards; provision of temporary cycle paths and provision of crossing facilities.

Roles

Project Manager, Traffic Manager

Process

Consider Cyclist

When planning construction activities, LCPL will give consideration to the:

- Number of cyclists
- Type of cycling activity: school children, recreational, commuter, utility, touring or sport training
- Origin and destination points of the cyclists, and the connectivity of their routes
- Needs of vulnerable cyclists, such as young children under 14 years
- Proximity of cyclist generating developments, such as schools, universities, public transport terminals, shopping precincts and CBDs etc
- The travel speed of cyclists

The AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14, Sections 2, 3 & Appendix B provides guidance on the needs of cyclists.

Define Work Areas and Hazards

Unlike motor vehicles, bicycle movements can be either on or off road. Cyclists generally travel along footpaths, cycleways, shared paths, road shoulders, or within travel lanes.

To provide a safe environment for cyclists, the Traffic Manager will clearly define the boundaries of all work areas, and implement measures to mitigate any hazards.

Fencing will be installed to restrict physical access to hazardous areas and for site security, which will be appropriately sign posted. Various types of temporary and semi-permanent fencing may be installed, including: plastic mesh; water filled plastic delineators; weldmesh pool fencing; chain wire mesh and so on. All physical barriers will be maintained during the project and appropriately secured to prevent injury to the public.

Provide Temporary Cycle Paths

Where work areas restrict access to formal designated cycle paths (as opposed to footpaths), the Traffic Manager will implement alternative routes and facilities. Alternatives may include using the opposite side of the road, detours via other streets/cycle routes, or the provision of temporary cycle paths through the work area.

All temporary cycle paths will be:

- Clearly defined
- Signposted appropriately to indicate the direction of the cycle path
- Constructed of an asphalt or concrete smooth surface equivalent to the section of path on each approach to the temporary path, free of loose materials and obstacles
- Designed to accommodate the type of cyclists to be encountered along the route
- Where required, provided with ramps, holding rails and lighting
- Kept well maintained whilst in operation

The design parameters for off-road cycle paths are specified in AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14, Section 6 and RTA's Traffic Control at Worksite Manual, Section 9. Section 9.4.3 of the RTA's manual specifies that the width of off-road cycle paths should be a minimum of:

- 2.0 metres for a separate two-way path
- 3.0 metres for a two-way path shared with pedestrians.

Where this cannot be provided, the path will match existing widths

The Strathfield Municipal Council or Bankstown City Council's requirements and specifications will be considered if designing alternative cycle routes and associated facilities on local roads is required.

The provision of on-road cycle facilities requires careful assessment, and the following factors will be considered by LCPL:

- On-street parking conditions
- Travel speed of traffic
- Traffic volumes
- Bicycle volumes
- Experience of the cyclists
- Percentage of heavy vehicles
- Carriageway, lane, and parking lane widths available
- The alignment of the road

The AUSTROADS Guide to Traffic Engineering Practice – Bicycles Part 14, Section 4 and 5 provides guidance on the design parameters of on-road facilities.

A Traffic Control Plan will be developed for all alterations to existing cycle paths.

Provide Cycle Crossings

Where feasible, LCPL will aim to maintain all existing cycle crossing facilities. Where this cannot be achieved, alternative facilities that are a similar standard to the present facility will be provided.

Types of temporary crossing facilities may include general crossing treatments (Figure 6-29 AUSTROADS Guide); refuge islands; controlled traffic signals and so on.

The AUSTROADS Guide to Traffic Engineering Practice – Bicycles sections 4, 5 & 6 provide guidance on the design parameters of cycle crossing facilities.

A Traffic Control Plan will be developed by the Traffic Manager for all alterations to existing cycle crossing facilities.

LCPL will consult with any local bicycle user groups and obtain approval from the relevant road authority prior to adjusting any existing cycle facilities, or the implementation of any new temporary facilities.

7 Manage Construction Traffic

Description

This process covers the management of construction vehicle movements on site and throughout the road network. It details driver responsibilities, types of vehicles, hazardous movements, planning vehicle movements, haulage route on site, haulage route on-road network, access points, traffic control, monitoring, and safety and environmental controls.

LCPL will monitor the use of local roads by construction heavy vehicle traffic. Haulage routes will be covered in the Project Induction and will be given to the delivery companies. Measures will be developed to minimise and/or restrict use of local roads by heavy vehicle traffic as far as reasonable and practicable. Similarly, hours of major haulage movements with larger articulated trucks will be planned and communicated to haulage companies (through purchase orders, delivery inductions etc), so as to minimise impact on morning and afternoon peak times on public roads.

Roles

Traffic Manager, Drivers, Project Manager

Process

The effective management of construction vehicle movements on site and throughout the road network is critical to the success of all projects. LCPL will plan all construction vehicle movements with the aim to minimise the risk to other road users and keep the traffic generated by the project to minimum.

The types of construction vehicle movements may include:

- Deliveries of materials, supplies, plant or equipment to site
- Transportation of over dimension loads
- Deliveries of concrete from batching plants to site
- Regular trips by construction personnel in work trucks and utes

Driver Responsibilities

All drivers employed on the ILC at Enfield, whether direct employees or contractors, have a responsibility to drive safely, and comply with State road regulations, the Australian Road Rules and any other directives issued on the project.

Drivers must exercise care at all times. Special care must be taken when exiting and entering traffic flows, and whilst travelling within the construction site.

Where issued, drivers must comply with requirements of the project's "Safe Driving Policy" and any Vehicle Movement Plans (VMPs) to be developed for specific work areas and routes.

Types of Vehicles

The types of vehicles used on projects will vary depending on the type of infrastructure being constructed.

- **Off-road plant items / vehicles** may include: scrapers, dump trucks and all wheel drivers tippers
- **On-road registered vehicles** may include: 4wd utilities; single unit trucks with or without dog trailers; semi-trailers; B-doubles; and over dimension floats / platforms cranes and other heavy vehicles

Hazardous Movements

When planning construction vehicle movements, a SHEWMS will be prepared for each specific location. The following hazardous movements will require particular consideration:

- Entering and exiting work sites to and from adjacent travel lanes
- U-Turns movements across travel lanes and at median crossover points between dual carriageways is not allowed
- Reversing manoeuvres within the work area and in the adjacent travel lanes is minimised
- Travelling through the work area intermingling with construction personnel and in the vicinity of unprotected hazards is minimised
- The stopping of construction vehicles within the adjacent travel lanes

LCPL will apply controls and measures to mitigate the risk of these hazardous movements including, but not limited to: restrict the practice of specific movements (e.g. turning bans); the provision of permanent major traffic controls and devices, installation of temporary traffic controls; the installation of deceleration, acceleration and turning lanes outside of the through lanes; educating drivers; installation of warning devices on vehicles and the application of VMPs.

Plan Vehicle Movements

LCPL acknowledges that attention must be given to the safe movement of construction vehicles when planning construction activities.

When planning construction vehicle movements for each stage of work, the Traffic Manager will:

- Comply with all relevant environmental approvals
- Minimise the number of vehicle movements by balancing earthworks and recycling excavated materials
- Conduct a risk assessment to identify specific hazards and facilitate the application of mitigation measures
- Promote safe driving principles
- Develop on-road haulage routes that not only provides an efficient operation and uses major roads where possible, but minimises the impact on the local road network and local community
- Analyse, assess and mitigate the impacts of the traffic generated by the construction works
- Set-up depots and stockpiles at locations that minimise travel distances and impacts;
- Prepare Vehicle Movement Plan (VMP) for all construction vehicle movements, whether on-site or on-road, and ensure the routes are communicated to all construction personnel;

- Where feasible, restrict haulage operations to the construction corridor
- Minimise the number of access points and haul road crossings
- Evaluate the need for temporary traffic control and / or major traffic controls to separate conflicts
- Implement appropriate environmental controls
- Design and implement safe access points
- Provide an efficient and well maintained vehicle fleet
- Determine the most appropriate hours of operation that will minimise the impact on the road networks (especially morning and afternoon peak times) and local communities
- Communicate requirements to haulage companies in contract documentation (purchase orders) or induction material (Project induction, delivery inductions)

A Vehicle Movement Plan (VMP) is defined as a diagram that shows the preferred travel paths for vehicles associated with a work site entering, leaving or crossing the through traffic stream. A VMP should also show travel paths for trucks at key points on routes remote form the work site such as places to turn around, accesses, ramps and side roads.

A VMP may be combined with or superimposed on a TCP and a written document or drawing.

The hours of operation for the movement of construction vehicles will be in accordance with the approved operating hours in accordance with the environmental approval.

A Vehicle Movement Plan for this project is provided in Appendix B.

Manage Haulage Routes On-site

Whilst driving on construction sites there are a number of hazards a driver may experience, including: rough surfaces; deep excavations; low clearance; other larger plant; steep embankments, existing infrastructure etc.

Of equal importance is the safety of unprotected construction personnel working within the work site. For each stage of work LCPL will ensure that:

- A risk assessment is conducted for all work activities and vehicle movements
- VMPs are developed for all regular vehicle movements
- Regular toolbox meetings are held to discuss on-site vehicle movements and the changes to work areas
- All plant are fitted with the appropriate flashing yellow lights, reversing alarms, horns and two-way radios
- Access tracks are clearly defined and sign posted
- Pedestrian tracks and crossing points are defined and clearly sign posted
- Where possible, large items of plant, such as scrapers are separated from smaller plant items
- Where possible, workers do not operate within 3 metres of moving plant, and plant operators are tool boxed when moved into a new work area
- Spotters and / or Traffic Controllers are positioned when workers are operating in close proximity to access tracks and plant
- Appropriate warning signs are installed on the approach to hazards or conflict points;
- Where necessary appropriate traffic controls are installed
- Consideration is given to the installation and enforcement of reduced on-site speed limits (i.e. maximum of 10km/h whilst passing workers on foot)
- As necessary, delivery vehicles are to be managed on-site

Manage Haulage Routes on the Road Network

LCPL will plan all vehicle movements to minimise the impact on the road network. Where possible, movements will be limited to the construction site, by fine tuning the design to achieve an earthworks balance and reusing materials generated by excavations to reduce the need for off- site transportation.

When on-road haulage operations are required LCPL will for each stage of work:

- Conduct a traffic analysis to determine the number of vehicle movements and assess the potential impact on the road network
- Develop a route that maximises the use of the arterial roads and minimises the use of local roads
- Assess the route and determine the potential impacts on existing developments / traffic generating facilities (such as school, shopping centres, intersections, LATM etc)
- Prohibit the use of local roads in residential areas by heavy vehicles
- Select a route that has a minimal impact, and or where the potential impacts can be effectively managed
- As required, consult with Local Councils, road authorities and key stakeholders
- Select haulage vehicles that can safely negotiate the route
- Where possible, avoid movements during peak periods
- Develop a detailed VMP and toolbox all drivers
- Ensure the fleet are regularly maintained
- Prepare a plan to manage vehicle breakdowns and to clean up spills
- Develop contact lists for heavy tow operators

Heavy Vehicle Routes

Trucks will be required to deliver construction materials to site. It is also necessary to transport the construction waste to an appropriately licensed disposal facility

The proposed haulage routes for construction trucks on public roads are presented below.

Wentworth Street Access Points

Entry

From North: Trucks would approach from Warringah Freeway, Lane Cove Tunnel, M2 Freeway, M7 Freeway, left onto M4, right onto Centenary Drive, then Roberts Road, left onto Norfolk Road, right onto Wentworth Street and left onto site.

From South: Trucks would approach from M5, turn into M7, right onto M4, right onto Centenary Drive, then Roberts Road, right onto Norfolk Road, right onto Wentworth Street and left onto site.

From West: Trucks would approach from M4, right onto Centenary Drive, then Roberts Road, right onto Norfolk Road, right onto Wentworth Street and left onto site.

From East: Trucks would approach from Eastern Distributor, General Holmes Drive, M5 Motorway, right onto King Georges Road, then Wiley Avenue, then Roberts Road, right into Norfolk Road, right onto Wentworth Street and left onto site.

Exit

To North: From site, right into Wentworth Street, left into Norfolk Road, right into Roberts Road, then Centenary Drive, Homebush Bay Drive, Lane Cove Road, Ryde Road and left onto Pacific Highway.

To South: From site, right into Wentworth Street, left into Norfolk Road, right into Roberts Road, Centenary Drive, left into M4 Motorway, left into M7 Motorway and to the south via M5 Motorway.

To West: From site, right into Wentworth Street, left into Norfolk Road, right into Roberts Road, Centenary Drive, left into M4 Motorway.

To East: From site, right into Wentworth Street, left into Norfolk Road, left onto Roberts Road, then Wiley Avenue, King Georges Road and the east via M5 Motorway or Princes Highway.

Cosgrove Road Access Points

Entry

From North: Trucks would approach from Warringah Freeway, Lane Cove Tunnel, M2 Freeway, M7 Freeway, left onto M4, right onto Centenary Drive, left onto Hume Highway, right into Cosgrove Road and right into site.

From South: Trucks would approach from M5, turn into M7, right onto M4, right onto Centenary Drive, left onto Hume Highway, right onto Cosgrove Road and right into site.

Alternatively, trucks would approach from Princes Highway, left into King Georges Road, right into Punchbowl Road, left into Cosgrove Road and left into site.

From West: Trucks would approach from M4, right onto Centenary Drive, left onto Hume Highway, right onto Cosgrove Road and right into site.

From East: Trucks would approach from Eastern Distributor, General Holmes Drive, M5 Motorway, right onto King Georges Road, right into Punchbowl Road, left into Cosgrove Road and left into site.

Exit

To North: From site, left into Cosgrove Road, left into Hume Highway, right into Centenary Drive, Homebush Bay Drive, Lane Cove Road, Ryde Road and left onto Pacific Highway.

To South: From site, right into Cosgrove Road, right into Punchbowl Road, left into King Georges Road and to south via right turn onto M5 Motorway or right turn onto the Princes Highway.

To West: : From site, left into Cosgrove Road, left into Hume Highway, right into Centenary Drive, left into M4 Motorway.

To East: From site, right into Cosgrove Road, right into Punchbowl Road, left into King Georges Road and to east via left turn onto M5 Motorway or via left turn onto the Princes Highway.

Oversize and Overmass Vehicles

The movement of oversize loads to and from the site will need to be effectively managed. Over-dimension vehicles will be required for delivery of machinery or large items.

The RTA's Operating Conditions, "Specific Permits for Oversize and Overmass Vehicles and Loads Guidelines 2007" will apply. All operators are required to apply to the RTA for a permit oversize and overmass vehicles that exceed the statutory dimension limits (eg semi-trailer

over 4.3m height, 2.5m wide, 19m long), or exceeding the maximum axle loadings for the vehicle configuration. In Sydney Metropolitan Zone during daytime an oversize vehicle must not travel after 6:00am. Additional restrictions also apply along the Freeways approaching Sydney.

Plan Construction Access Points

The most hazardous movement for construction vehicles occur when the vehicle is entering or exiting the construction site to and from the adjacent travel lane. The risk is increased on high speed / high volume roads where existing access points are limited, as drivers do not expect vehicles to be turning from or entering the traffic flows.

When planning construction access points for each stage of work the Project Manager will:

- Where feasible, utilise existing local road junctions to access construction work areas
- Keep the number of access points to a minimum
- Ensure the new construction access points do not adversely impact on any existing intersections, traffic facilities or traffic generating developments
- Only install access points that are clearly visible, and have adequate sight distance (minimum Safe Intersection Site Distance (i.e. 130m @ 70km/h)
- Design all junctions and access points in accordance with AUSTROADS Guide to Road Design, Part 4A – Unsignalised and Signalised Intersections and the RTA Road Design Guide
- Ensure the junction configuration has sufficient capacity to accommodate the traffic generated by the construction site
- The access is designed to accommodate the turning movements of the largest vehicles that will be accessing the site
- The treatment maximises rear end protection for vehicles turning right into the access
- On high speed roads appropriate acceleration and deceleration lanes are provided
- Where installed, security fences and gates are indented to maintain clear sight lines and enable vehicles to park clear of the adjacent travel lanes
- Access junction must be constructed of a suitable all weather surface that prevents debris from being tracked onto the adjacent travel lanes and the potential road safety issues caused by damage to existing shoulder material
- Ensure all access points are clearly visible to approaching traffic and signposted accordingly

The AUSTROADS Guide to Road Design, Part 4A – Unsignalised and Signalised Intersections and section 4 of the RTA Road Design Guide provide guidance on the design of junctions and access points.

No matter the type of junction configuration implemented, temporary traffic controls may be required from time to time to facilitate short-term major haulage operations and the movement of over-dimension vehicles.

Implement Traffic Controls

Risk assessments are conducted as part of the project risk strategy. Active Risk Manager (ARM) is used to manage these risks and specific controls put in place to mitigate particular hazardous traffic movements.

The type of temporary traffic controls to be installed by LCPL may include:

- Truck warning signs in advance of access points
- Reduced speed zones on the approaches to work areas close to the road

- Traffic controllers at access points to facilitate entry and exit movements when required
- Road shoulder closures to provide safe work area behind safety barriers
- Closure of slow and fast lanes to provide safe work area

In addition, all access points will be appropriately signposted on the approaches and at the access. Consideration will be given to the use of unique identification numbers for all access points.

A SHEWMS in consultation with construction team will be developed. A Traffic Control Plan (TCP) will also be developed for all sign posting schemes, which may be a separate plan or incorporated within the VMP.

Implement Environmental Controls

LCPL will implement various environmental controls and measures for the haulage operations to mitigate the impacts on surrounding environment and road network.

Measures to be applied by LCPL include:

- The compulsory covering of all loads prior to leaving the site
- Provision of suitable wheel cleaning facilities at all major access points;
- Dust suppression measures conducted regularly at loading / unloading areas and along the routes
- Haulage vehicle noise and pollution emission will be monitored to ensure they are compliant with the vehicles manufacturer's specifications
- Clean-up crews, including street sweepers, will be available to manage material spills
- Internal speed limits of 20 km/hour
- All materials will be managed in strict accordance of the Project Approval and any subsequent approvals

Environmental controls are further described in the LCPL's Construction Environmental Management Plan and related Sub Plans.

Monitor Haulage Operations

During haulage operations LCPL will conduct regular monitoring of the various haulage routes to ensure that:

- Operations are complying with the Project Approval and the requirements of the Construction Traffic Management Plan / Strategy
- Haulage vehicles are travelling only on designated routes
- Haulage operations are not causing traffic congestion throughout the road network
- The VMPs are being applied and complied with
- Damage to pavements and traffic facilities are reported and rectified
- Haulage vehicles are fitted with appropriate warning devices
- All necessary Traffic Control Plans are installed
- The required vehicle and access point environmental controls are applied

8 Obtain Lane Closure and Road Occupancy Approvals

Description

This process describes how LCPL will apply for the necessary approvals to occupy the road network and install temporary traffic control signs or devices. It covers: identifying the road

authorities; road occupancy requirements on local roads; lane closure & road occupancy requirements; lane closure & road occupancy submission procedure; lane closure & road occupancy extension procedure; typical lane closure & road occupancy approval conditions, and lane closure & road occupancy authorisation limitations.

Roles

Traffic Manager, Project Manager, RTA, Councils

Process

Obtain approvals

LCPL will obtain the necessary approvals from the appropriate road authorities prior to conducting any works within the road reserve.

The three specific areas of approval will include:

- All development works within the road reserve and/or any changes to existing infrastructure
- The temporary or permanent installation and/or changes of any regulatory traffic control device
- Lane & road closures, occupation of the road network to conduct works, and the associated installation of temporary traffic control devices

Identify the Road Authorities

The road authorities responsible for roads affected by the Main Construction are outlined in the table below.

Table: Roads and responsible Road Authority

Road	Classification	Road Authority
Hume Highway	**State**	**RTA**
Roberts Road	**State**	**RTA**
Punchbowl Road	**State**	**RTA**
Cosgrove Road	**Regional**	**Strathfield Council**
Norfolk Road East	**Local**	**Strathfield Council**
Norfolk Road West	**Local**	**Bankstown City Council**
Wentworth Street	**Local**	**Strathfield Council**

LCPL will liaise with key stakeholders and the relevant road authorities during the construction phases.

Lane Closure & Road Occupancy Local and Regional Roads

In accordance with the requirements of the Roads Act 1993, the approval of the relevant authority is required prior to undertaking works within the road reserve.

LCPL will obtain the approval of the relevant road authority prior to the installation of temporary traffic controls or devices and occupying the road network.

The submission to the road authority will include:

- Brief details of the works to be conducted

- Any relevant design drawings of the works
- Program of the works
- Copies of Traffic Control Plans
- If applicable, details of speed limit authorisation submission
- Contact details of a construction site representative

Lane Closure & Road Occupancy State Roads

The RTA is responsible for the operational efficiency of the NSW Road Network, including the coordination of planned and unplanned incidents. The overall coordination of incidents is managed by the RTA's Transport Management Centre (TMC) at Eveleigh in Sydney.

The responsible contact for this section will be documented by LCPL, including details of the relevant contact for the RTA's approvals.

LCPL acknowledges that it is responsible for obtaining all necessary approvals for the implementation of lane closures & road occupancies, and understands the benefits of minimising unavoidable delays at separate work sites.

The Project Manager acknowledges all road occupancies will be subject to the specific period of operation stated on the approval, and conditions on obtaining other necessary approvals.

LCPL acknowledges that a Road Occupancy Licence (ROL) scheme applies along the Hume Highway, and understands the benefits of co-ordinating the occurrence of delays at separate work sites. Consequently, except in the case of an emergency, or when directed by Police or Emergency Services, LCPL will obtain an ROL prior to the commencement of any works which:

- Slows, stops or otherwise delays Roberts Road and Hume Highway
- Diverts Roberts Road or Hume Highway traffic from its normal course along the road carriageway, including lane closures, turning restrictions, side-tracks, detours and diversions
- Occupies any portion of Roberts Road or the Hume Highway that is normally available for traffic, including road shoulders

An emergency is defined as an unforseen event, which requires urgent attention to protect life or property or an occasion when emergency services (Police, Fire Brigade, Ambulance or State Emergency Services) take control of a portion of the road network.

LCPL acknowledges all road occupancies will be subject to the specific period of operation stated on the approved ROL, and conditions on obtaining other necessary approvals.

Despite the hours of operation stated in Section 1, all road occupancies will be subject to the specific period of operation stated on any approved Licence and conditions on obtaining the other necessary approvals.

Lane Closure & Road Occupancy Submission Procedure

Any required ROL Application will be forwarded to the RTA Transport Management Centre, who have the responsibility for processing and approving ROL. The RTA generally requires at least 10 working days to process the application and will either grant or reject application within this period.

It should be noted the road occupancy requests must comply with the various road safety and traffic management principles, objectives and targets outlined in the Construction Traffic Management Plan.

Extensions of Lane Closure & Road Occupancy Approvals

The RTA has limited the maximum period of a ROL to one month to 6 months. To obtain extensions, LCPL will be required to re-submit a completed ROL Application Form with a copy of original TCP, quoting the previous ROL number.

If the original lane closure & road occupancy submission is to be altered or changed, (e.g. change to times, TCP or proposed occupancy, work type etc), a new ROL submission will need to be prepared.

It is the responsibility of LCPL to ensure the validity of each approved lane closure or road occupancy, thus regular monitoring of approval expiry dates is essential. The Traffic Manager will maintain a database, which will contain details of road occupancy approvals to assist with this process.

Road Occupancy Conditions

Generally, the RTA will apply conditions to the approvals, which may include:

- Maximum traffic stoppage times
- Maximum queue lengths
- Maximum travel time delays
- The provision of adequate roadway capacity to maintain an acceptable Level of Service
- Measures to provide information to road users
- Provision of a weekly schedule outlining the proposed road occupancies for the preceding week
- Records detailing the date and time of the road occupancy, and the location of all signs, and any other relevant information associated with the traffic control, must be kept

The RTA has the power to revoke the approvals at anytime for breaches of the associated conditions.

Authorisation Limitations

Generally, in accordance with any RTA requirement, the responsibility for implementation, coordination, and compliance with the lane closure & road occupancy approvals remains with LCPL and specifically, the Traffic Manager. The RTA's granting of the approval does not:

- Constitute approval by the RTA of any actions that relate to traffic safety, occupational health and safety, or environmental issues and management
- Relieve LCPL or any person of their responsibility for compliance with legislation, regulations, or established operational procedures
- Change any management accountability or responsibility

9 Apply Roadwork Speed Limits

Description

Temporary roadwork speed limits are one of many traffic controls that can be implemented to manage the speed of traffic approaching, and passing through a work site.

This process outlines the methodology for applying roadwork speed limits, including: determining the need for a roadwork speed zone; submission procedure; process for obtaining extensions to the period of operation; speed zone conditions and limitations of speed zone authorisations.

Roles

Traffic Manager, RTA, Project Manager

Process

Leighton Contractors Pty Ltd (LCPL) acknowledges that roadwork speed zones must be logical and credible, as well as enforceable. When considering the use of a roadwork speed zone, LCPL will adopt the principles outlined in AS 1742.3, which state that roadwork speed zones must;

- Only be used where they are self-enforcing or will be enforced
- Not be used alone but with other traffic control signs and devices
- Not be used in place of more effective traffic controls
- Only be used while road works are in progress or the lower standard road conditions exist

Determine the Need for a Roadwork Speed Zone

Roadwork speed zone are only effective in controlling driver behaviour, if they appear reasonable to drivers. A reduced roadwork speed zone must only be implemented where it is warranted.

Roadwork speed zones should not be applied as the only option to control traffic, but as one measure along with other temporary traffic control signs and devices.

Roadwork speed zones may be installed to assist in controlling vehicle speeds when: traffic travels through the work site; workers are endangered by high speed traffic; dust or smoke reduces visibility; loose material is present on the road surface; the road geometry is of a lower standard; deep excavations exist adjacent to the travel lanes; the safety of a bridge structure is temporarily reduced and traffic is temporarily diverted onto opposing travel lanes or carriageways.

Section 4.9 of Australian Standards 1742.3 provides guidance to assist with the selection and installation of roadwork speed zones. Specifically Table 4.7 of AS 1742.3 outlines the general selection criteria for selecting the speed limits (40, 60 or 80 km/h).

To reinforce the reduced speed zones, LCPL will conduct regular reviews of the speed limit signage and consult with the NSW Police representatives to obtain enhanced enforcement of the roadwork speed zones, particularly during working hours.

If required, LCPL will prepare a speed zone application and submit it to the RTA's Transport Management Office located at Eveleigh, at least 10 working days prior to the commencement of work. Once approved, a copy of the Speed Zoning Authorisation will be forwarded to the local NSW Police Highway Patrol Office, and if necessary to the Local Council. LCPL accepts that it will be responsible for the management of records associated with the speed zone, in accordance with Section 8.2.6 of the RTA's TC@WS Manual.

Submission Procedure

Guidance for applicants applying for Speed Zone Authorisation (SZA) is provided in the RTA's Road Occupancy Manual issued by the Transport Management Centre (TMC). The manual contains a number of explanatory notes, checklists, and application forms. The

documents applicable to this project include: DTR (SZA) Application Explanatory Notes Form R and DTR (SZA) Application Form R which is attached as a knowledge resource to this Topic.

Upon the receipt of a request from the Project Engineer, the Traffic Manager will process the submission to the RTA in accordance with the ROL (SZA) process flow chart.

The SZA Application must be forwarded to the local RTA's Regional office that has the responsibility for processing an approving SZA. The RTA generally requires at least 10 working days to process the application and will either grant or reject application within this period.

Once approved, LCPL will forward a copy of the SZA to the local NSW Police Highway Patrol Office, and if necessary to the Local Council. LCPL accepts it will be responsible for the management of records associated with the speed zone in accordance with Section 8.2.6 of the RTA's TC@WS Manual.

Extensions to Period of Operation

The RTA limits the period of operation of a SZA from one month to six months. To obtain extensions, the Traffic Manager will be required to re-submit a SZA submission. If there are no amendments, other than dates, to the original submission, the Traffic Manager will only be required to submit a completed SZA Application Form R with a copy of original TCP, quoting the previous SZA number.

If the original SZA submission has been amended, (eg change time, TCP, location or speed reduction etc), a new SZA submission will need to be prepared and submitted.

It is the responsibility of the Project Manager to ensure the validity of each approved speed limit, thus regular monitoring of the expiry dates is essential. The Traffic Manager will maintain a database which will contain details of speed limit consent to assist with this process.

Speed Zone Conditions

Generally, the RTA will apply conditions to speed limit authorisations, and has the power to revoke an approval at anytime for breaches of the conditions.

The typical conditions include, but not limited to:

- A copy of the SZA must be made available to the local NSW Police Highway Patrol representative, and RTA accordingly
- The temporary roadwork speed zone must be installed in compliance with conditions, notes, applicable dates and locations stipulated in SZA
- Specific measures required to manage adjacent speed zones, or potential conflicts with other temporary speed zones at construction sites in the immediate area
- All temporary roadwork speed limits must be installed as per the Traffic Control Plan and operated in accordance with the RTA requirements
- Similar to all regulatory signs, the speed limit signs are to be properly erected, and any contradictory signs or road markings are to be removed or covered
- Records detailing the date and time the speed limit is in operation, the speed limit displayed, and the location of all signs, and any other relevant information associated with the speed limit, must be kept

Authorisation Limitations

Generally, in accordance with the RTA's requirements, the responsibility for implementation, coordination, and compliance of the speed zone remains with the Project, specifically the Traffic Manager. The RTA's granting of the approval does not:

- Constitute approval by the RTA of any actions that relate to traffic safety, occupational health and safety, or environmental issues and management
- Relieve the Project or any person of their responsibility for compliance with legislation, regulations, or established operational procedures
- Change any management accountability or responsibility

10 Use Traffic Control Devices

Description

This process focuses on using traffic control devices to regulate, warn and guide road users. It provides guidance in the use of sign posting and road markings, variable message signs, flashing arrow signs, and portable traffic signals.

Roles

Project Manager, Traffic Manager, Traffic Control Team

Process

Overview

Traffic control devices are all signs, traffic signals, road markings, pavement markers, traffic islands, and/or other devices placed or erected to regulate, warn and/or guide road users. The function of a traffic control device is to promote orderly traffic flow, regulate traffic (assign right of way, and indicate regulations in force), warn road users of hazards or regulatory controls ahead, (in particular they also warn of temporary hazards that could endanger road users or workers at roadwork sites), and guide traffic (e.g. guide signs to inform road users of directions to destinations, identify routes, and pavement markings to guide the travel path of vehicles).

Australian Standard 1742.2 Section 1.71 states traffic control devices should conform to the following principles:

- Be capable of fulfilling an important need
- Command attention
- Convey a clear, simple meaning with the minimum number of messages required to obtain the desired response from the driver
- Command respect
- Be located to give adequate time for response
- Not obscure any other traffic control devices

LCPL acknowledges the importance of traffic control devices and how they influence traffic flow and the safety for road users, in particular where temporary traffic controls are implemented at work sites. During the construction of the project, LCPL will assess the appropriateness for traffic control devices in accordance with the relevant guides / standards, and where required, install the device correctly, and conduct regular maintenance.

Sign Posting and Road Markings

Signs and road markings are an important aspect of road safety and traffic management. Regulatory signs control specific traffic movements, warning signs give advance notice of

traffic hazards, road markings (& pavement markers) provide delineation and reinforce signage, and guide signs give advance guidance and advice of routes and destinations which assist all drivers to make clear, early decisions.

The aim of sign posting is to:

- Warn and inform road users of conditions ahead
- Guide and control road users to safely negotiate the road ahead
- Ensure the signs and their structures are not a hazard in themselves
- Provide drivers with sufficient information to ensure there are no surprises along their path of travel
- To provide data in a controlled and consistent way to avoid information overload

Ensure Devices are Installed Correctly

LCPL recognises the value of providing road users with timely, clear and consistent messages and LCPL will ensure all signs, road markings and devices installed during the construction of the project are:

- Assessed for use in accordance with the appropriate guidelines
- Manufactured in accordance with the requirements of the Australian Standards
- Installed in accordance with the relevant guides and standards
- Not contradictory to existing signs or markings
- When no longer required, covered or removed
- Regularly maintained and repaired / replaced when damaged or lose reflectivity.

All sign posting installed throughout the Main Construction will comply with the requirements outlined in the RTA's Traffic Control at Worksites Manual, the RTA's Interim Guide to Signs and Markings, AUSTROADS Guide to Traffic Engineering Practice, Part 8 – Traffic Control Devices and the relevant Parts of Australian Standard 1742.

In addition, to the sign posting requirements stipulated in the RTA's TC@WS manual and the Australian Standards, LCPL will be applying the following sign posting parameters:

- Where possible, duplicate signs will be implemented for all short-term TCPs
- The signs located in the enhanced advanced warning schemes approaching the Zones will be a minimum of Type C size
- The minimum size of signs used on the project will be Type B
- Consideration will be given to the installation of short-term signs on permanent posts with secure covers, where works occur in the same location on a regular basis

Further, LCPL will conduct detailed reviews of all short and long term signage every 2 months to ensure a clear and concise message is given to approaching road users, without creating sign clutter.

Develop Traffic Control Plans

Traffic Control Plans (TCPs) will be developed to illustrate all temporary traffic arrangements, including the various traffic control signs, road markings and devices to be installed.

The installation of home-made or non-standard signs will not be permitted during Main Construction.

Utilise Variable Message Signs

LCPL considers Variable Message Sign(s) (VMS) are a very effective traffic control tool. During construction, LCPL may utilise portable VMS to enhance advanced warning sign posting and provide changed traffic condition information to road users.

When not required for construction activities, the VMS can also be utilised to support the RTA's incident management operations, and for the display of road safety messages.

The use of VMS and the appropriate message will be incorporated within the site specific TCPs.

The positioning and setting of VMS messages will be coordinated by the Traffic Manager.

LCPL will deploy the VMS and set standard messages in accordance with the RTA's requirements. Where applicable, VMS devices utilised on the project will comply with RTA's specifications.

Utilise Flashing Arrows Signs

Flashing Arrow Signs (FAS) are key components of most TCPs, in particular for use when closing traffic lanes, and conducting mobile traffic control operations.

The requirements of when to utilise a FAS are stipulated in various sections of AS1742.3 and RTA's TC@WS manual. When stipulated by the TCP, LCPL will implement FAS in accordance with Section 3.12 of the AS 1742.3 and Appendix D of the RTA's TC@WS manual.

Where applicable, FAS used on LCPL will comply with the RTA equipment requirements FAS/4 and be controlled by a trained traffic control team member.

11 Prepare Traffic Control Plans

Description

The provision of a safe environment for road users and works staff is a key objective. This process provides a comprehensive guide to the preparation of Traffic Control Plans (TCPs). It covers the design process; types of TCPs; a comprehensive TCP preparation checklist; outlines the need to conduct a site inspection, and TCP developer qualification requirements.

Roles

Traffic Manager, Project Engineer, Site Engineer, Project Employees, Contractors

Process

A TCP is a diagram showing signs and devices arranged to warn traffic and guide it around, past, or if necessary through a work site or temporary hazard.

All TCPs will be developed by LCPL, with the aim of:

- **Warning** drivers of changes to the usual road conditions
- **Informing** drivers about changed conditions
- **Guiding** drivers through the work site
- **Safety** for workers, motorists, pedestrians and cyclists

The TCPs are based on the principles and measures outlined in the Construction Traffic Management Plan / Strategy.

Design TCPs

The TCPs are designed by LCPL in accordance with the requirements stipulated with Australian Standard 1742.3. Standard TCPs may be adopted directly from: the RTA's TC@WS Manual and AS1742.3. However, the standard TCPs must be modified to suit site conditions. Where modifications to the standard TCPs are necessary, these modifications must be shown clearly and recorded on a copy of the TCP.

To ensure compliance with these specifications LCPL has developed a Process for the preparation of TCPs that contains a detailed preparation checklist.

Where possible, LCPL will prepare all TCPs using computer aided software, which will provide a clear, concise, and consistent format and if possible, scaled dimensions. The aim is to avoid the use of deficient TCPs, remove the inconsistency of overlapping or adjoining TCPs, and give due consideration to the road design principles.

In addition to the specifications above, all unique TCP design parameters determined during the project will be tabled in a Traffic Guide, which will ensure these parameters are consistently applied project wide. For example, on this project a shadow vehicle with a flashing yellow light must be positioned on the approach to all Traffic Controllers.

Develop Site-Specific TCPs

Site specific TCPs will be developed by LCPL for both long and short-term works.

- Long-term relates to temporary arrangements that will be in place for a period longer than 1 shift. TCPs for long-term works will be prepared for the following:
    1. closure of the kerbside lane or parking lane in Roberts Road, Norfolk Road and Cosgrove Road for construction of left-turn slip lane
    2. installation of safety barriers in Wentworth Street to create an access at the newly constructed (Stage 2) bridge
    3. provision of temporary safety barriers and construction access points.
- Short-term relates to a temporary arrangement that will be applied for 1 shift or less, and where normal operating conditions are reinstated after all temporary traffic management devices are removed from the roadway. Short-term TCPs will be installed as required to facilitate day-to-day construction activities such as installation of safety barriers, one-lane alternate operations, surveying & geotechnical activities, site deliveries, service investigations, maintenance activities, plant movements and haulage operations

Provide Safe Clearances to Work Areas

Maintaining a safe environment for workers is critical, particularly when operating, on or near high speed roads. LCPL will be applying requirements that exceed those specified in Section 3.6 of the RTA's TC@WS Manual, and Section 4.2 of AS1742.3. The requirements adopted by LCPL are shown in the table below.

Table: Work Area Clearance Requirements

Speed Limit	Minimum Clearance
No Work Permitted	Within 1.2 metres
40km/h	Greater than 1.2 but less than 3.0 metres
60km/h	Greater than 3.0 but less than 4.5 metres

80km/h	Greater than 4.5 but less than 6.0 metres

The work area clearances stated in the above table are the absolute minimum requirements. Despite a reduced speed limit being in operation, the separation between workers and traffic will be maximised by applying lane closures, lane deviations, and or, by narrowing lane width.

The selection and installation of all temporary safety barriers for this Project will be in accordance with Section 6 of the RTA's Road Design Guide, and the applicable manufacturer's specifications.

Apply Checklist

LCPL has developed a comprehensive checklist for the preparation of a Traffic Control Plan, which is based on the key considerations and factors that are stated within the Australian Standard 1742.3. This checklist can also be used as an auditing tool to check compliance of TCPs.

The Project Manager must ensure this checklist is applied when preparing TCPs.

Conduct Site Inspection

LCPL acknowledges that it is imperative that, prior to preparing a TCP, the Project Engineer, or Site Engineer responsible must conduct a detailed site inspection with the aim of identifying the existing lane configurations, junction treatments, traffic operations, traffic control signage, speed zone locations, side roads, alignment restrictions horizontal and vertical, private access points, bus stops, cycle / pedestrian facilities, bridge structures, roadside furniture, and any feature that may affect the installation of the desired TCP.

It should be noted that RTA will generally not approve a lane closure / road occupancy application if the TCP is deficient and measures are not included to address specific site issues.

Check Qualifications

Although the checklist is for the use of all LCPL Employees and Contractors, a TCP can only be selected or modified by a suitably qualified person who has successfully completed the relevant RTA TC@/WS select/modify Traffic Control Plans course (red card). In addition, a TCP can only be designed or audited by a person who has successfully completed the RTA TC@WS design/ inspect Traffic Control Plans course (orange card).

12 Conduct Traffic Control Inspections

Description

This process focuses on the continuous monitoring of temporary traffic controls at work sites during the construction phase. The aim of this process is to provide a safe environment for workers and road users, monitor compliance against the Traffic Control Plan and identify safety hazards in order to implement corrective solutions. This process details the type, frequency, responsibility and checklists for inspections.

Roles

Traffic Manager, Traffic Control Leading Hand, Site Engineer, Project Engineer, Project Manager

Process

Inspections of the temporary traffic controls will be conducted during the construction phase, focusing on monitoring compliance against the TCP and identifying safety hazards, to enable implementation of corrective solutions.

LCPL will conduct four main types of inspections on projects:

- Pre-start and pre-close down inspections of short-term traffic control
- Weekly inspections of long-term traffic control
- Night inspections of long-term traffic control
- Pre-opening inspections of minor temporary traffic switches

These inspections will be carried out in accordance with Appendix A of Australian Standard 1742.3.

Frequency

The Traffic Manager will ensure regular inspections of temporary traffic controls are conducted during the construction of this project.

The frequency of the traffic control at work sites inspections will be subject to the construction program and the types of activities in progress. The responsibility and frequency of inspections are summarised in the table below.

Table: Inspection Frequency

Inspection	Responsibility	Frequency
Pre-start & pre-close down	Traffic Control Leading Hand and Site / Project Engineer	Before works start and prior to closing down. The Leading Hand must also conduct regular inspections throughout the shift.
Weekly inspections	Foreman and Site / Project Engineer	On the day before the work begins, and at least once per week.
Night inspections	Foreman and Site / Project Engineer	At least once during the first week and at least every two months.
Pre-opening inspections of minor temporary traffic switches	Project Manager & Traffic Manager	Prior to opening any minor temporary traffic switches, lane deviations or sidetracks.

Note: The reference to the Site / Project Engineer in the above table refers to the engineer that is responsible for the work activity and the development / implementation of the TCP.

Inspection Checklists

LCPL will apply comprehensive checklists to assist the inspection process.

The short-term, long-term, or night inspections checklist is based on the Appendix E of the RTA's TC@WS Manual. The pre-opening inspection of minor temporary traffic switches is based on Checklist 4 of the AUSTROADS Guide to Road Safety, Part 6: Road Safety Audit (2009).

13 Conduct Traffic Control Road Safety Audits

Description

This process focuses on road safety audits conducted during the construction phase, aiming to identify any deficiencies and or safety hazards, regardless of current practice, standards or operations, to enable LCPL to implement corrective solutions. It covers types of road safety audits, methodology for conducting road safety audits, frequency of audits, responsibility for conducting the various audits, and comprehensive audit checklists.

Roles

Road Safety Auditor, Project Manager, Traffic Manager, Quality Manager, Performance Manager

Process

Overview

AUSTROADS defines a road safety audit as a formal examination of a future road or traffic project or an existing road, in which an independent, qualified auditor(s) reports on the roads crash potential and safety performance. There are various types of audits conducted on new road projects from feasibility audits through to pre-opening audits. Audits are also conducted to assess the safety of existing roads and temporary traffic arrangements implemented for roadwork.

These audits will be conducted in accordance with the AUSTROADS Guide to Road Safety, Part 6: Road Safety Audit (2009).

For the ILC Main Construction works, LCPL will conduct both internal and external road safety audits. The type and frequency of the audits will be determined by the scale of the project, outcomes from risk assessments, and the contract requirements.

The internal audits will be conducted every month by the Traffic Manager and the project manager.

The external audits will be conducted every 6 months by a suitably qualified road safety and traffic engineering auditor. Pre-opening audits will be conducted prior to opening all new roads and for all major temporary traffic switches. LCPL will engage suitably qualified road safety auditor(s) who have undergone road safety audit training and received certification under the Institute of Public Works Engineering Australia (IPWEA) Accreditation Scheme to conduct the external audits. An experienced auditor who has achieved Road Safety Auditor Level 3 certification will lead the audit team.

Apply Audit Methodology

The following methodology will be applied on this project when conducting the road safety audits:

- A commencement meeting will be held between auditor(s) and construction representatives
- Reviewing relevant documents (including design plans, crash histories, previous audits etc)
- Conduct site inspections during the day and night, noting deficiencies and hazards
- Assessing the inspection findings in accordance with relevant practices, guides and current standards

- Forwarding a draft list of deficiencies to the Project Manager for review, and if necessary immediate action
- Prepare a concise audit report, which includes a table detailing the deficiencies identified
- Conduct a completion meeting with the Project Manager
- The Project Manager provides a response to the audit findings
- Where necessary, the Project Manager is to program necessary actions to rectify deficiencies

LCPL will also apply this methodology and provide feedback to any road safety audits that are conducted by the RTA, or other stakeholders.

Audit Frequency & Responsibility

The Traffic Manager will be responsible for managing the Project's road safety audit program in coordination with the Quality Manager and or Performance Manager.

The responsibility and frequency of audits is summarised in table below.

Table: Audit Responsibility and Frequency

Audit Type	Responsibility	Frequency
Internal audit of temporary traffic arrangements.	To be conducted by the Traffic Manager and project manager.	A sample of sites at least once per month.
External audit of temporary traffic arrangements.	Traffic Manager to engage a pre-qualified auditor who is external to the project.	A sample of sites at least every 6 months.
Pre-opening audit of new roads and or major temporary traffic switches.	Traffic Manager to engage a pre-qualified auditor who is external to the project.	Prior to the opening of all new roads and major temporary traffic switches.

Apply Audit Checklists

LCPL will apply comprehensive checklists to assist the auditing process.

The internal audit checklist is based on the AS 1742.3 and the Appendix E of the NSW RTA's Traffic Control at Work Sites Manual.

The external audit checklist is based on Checklist 5 of the AUSTROADS Guide to Road Safety, Part 6: Road Safety Audit (2009).

The pre-opening audit checklist is based on Checklist 4 of the AUSTROADS Road Safety Audit guide (2nd Edition).

14 Manage Unplanned Incidents

Description

This process describes how LCPL will support emergency service agencies and RTA in the management of emergencies / unplanned incidents on roadways approaching and within the construction area, and assist in restoration of normal traffic conditions. It covers the emergency management responsibilities, RTA incident management responsibilities,

unplanned incidents on the road network and construction site emergencies / unplanned incidents.

Roles

Project Manager, Traffic Manager, Safety Manager

Process

Types of Incidents

The types of emergencies / unplanned incidents that may occur include, but are not limited to:

- Motor vehicle crashes
- Environmental spills
- Terrorist attacks
- Bomb threats
- Construction type incidents
- Structural catastrophic failures
- Inclement weather conditions
- Flooding
- Anti-social behaviour

All incidents are entered into the safety database SHE Manager, by the Traffic Manager or project Safety Team member.

Manage Emergencies

The Government of NSW acknowledges the inevitable nature of emergencies and their potentially significant social, economic and environmental consequences. Accordingly, the Government has enacted the State Emergency and Rescue Management Act, 1989 (as amended). Emergencies may be controlled by combat agencies or emergency operations controllers as specified in the State Emergency and Rescue Management Act, 1989 (as amended), which recognises the need for a coordinated response by all agencies having roles or responsibilities for such emergencies.

The State Emergency and Rescue Management Act identified agencies primarily responsible for controlling particular hazards/emergencies. Combat agencies particularly relating to NSW are detailed in the table below.

Table: Agency Responsibilities

Event	Agency
Law Enforcement / Emergencies	NSW Police
Fire:	NSW Fire Brigades
Hazardous Materials:	NSW Fire Brigades
Flood:	NSW State Emergency Service
Storm and Tempest:	NSW State Emergency Service

NSW RTA responsibilities

In accordance with its statutory obligations, RTA has the ultimate responsibility for road safety and traffic management of the State Road Network. It is the lead agency for traffic management in New South Wales, including the management of unplanned incidents in co-

ordination with NSW Police. For further information refer to the “RTA and Police - Memorandum of Understanding Traffic Management of Incidents” (1999).

The RTA’s Transport Management Centre (TMC) at Eveleigh is responsible for the management of unplanned incidents throughout the NSW road network. Under the RTA and Police MOU, the incident scene and responsibility is divided into three cordons:

- Inner Cordon – Police lead with RTA support
- Outside the Inner Cordon – RTA lead with Police support
- Outside of Outer Cordon – RTA leads and manages

LCPL may be requested by emergency service agencies or the RTA to provide support when emergencies/unplanned incidents occur within, or adjacent to the construction site.

Manage Unplanned Incidents on the Road Network

The occurrence of unplanned incidents within the construction site will potentially have negative impacts on the operation of the road network. Similarly incidents that occur on the surrounding road network can temporarily restrict construction activities.

LCPL will:

- Apply and maintain communication protocols, particularly between construction site and RTA representatives
- Inform the RTA of any incident and provide assistance, if appropriate, for the duration of the incident
- If resources are available, provide initial response to unplanned incidents with the aim to make incident scene safe, and prevent further harm to persons or property
- Provide support to emergency services, including traffic control in the vicinity of the incident
- During major incidents provide a senior construction representative on-site to liaise with the RTA and emergency service agencies
- Reschedule planned works that will interfere with the incident, or create additional delays to those road users already affected by the incident
- Disseminate road condition information to the RTA for their distribution to road users

Manage Construction Site Emergencies / Unplanned Incidents

LCPL will develop an Incident Management Plan and a Crisis Management Plan as part of the Project Safety Plan, which will incorporate standard operating procedures for managing construction site emergencies / incidents. These plans will:

- Define LCPL’s roles and responsibilities in the event of incident and emergencies
- Establish and define LCPL’s emergency response procedures dealing with different category of emergency arising from construction, traffic, environmental incidents
- Identify and define the roles and responsibilities of key LCPL’s project personnel during emergencies and incidents
- List available LCPL’s resources
- Define the RTA and emergency services roles and responsibilities in the event of an incident or emergency
- Outline the communication protocols and system
- Outline incident administration procedures including training, record keeping etc
- Establish formal arrangements for the review and maintenance of the plan

15 Manage Special and Major Events

Description

This process focuses on managing traffic for special / major events and includes key definitions, guidelines, responsibilities for managing special / major events, LCPL's role, examples of what constitutes an event and the four classifications of events.

Roles

Traffic Manager

Process

Definition

The NSW RTA defines a special / major event (in traffic management terms) as any planned activity that is wholly or partially conducted on a road, requires multiple agency involvement, requires special traffic management arrangements and may involve large numbers of participants and / or spectators. Major events would generally attract crowds in excess of 30,000 people.

LCPL acknowledges that special events contribute to society and reinforce the values of Australians.

Key Guideline

In 2003, the NSW Government published "The Guide to Traffic and Transport Management for Special Events", which provides a comprehensive guide for organising, managing and controlling special events. This guide was developed in consultation with representative from: the NSW Premier's Department; RTA; Local Government Association; numerous NSW Local Councils; Police and members of the events industry.

Responsibility for Special / Major Events

RTA has the ultimate responsibility for road safety and traffic management of the road network. RTA is responsible for the assessment and coordination of special events, which is conducted in consultation with event organisers, NSW Police and Local Councils.

Role of LCPL

LCPL acknowledges considerable planning is required to successfully move large volumes of people in an efficient manner to minimise disruption to normal transport patterns.

Planning will be undertaken by LCPL, to ensure special / major events of any category that may impact on the road network through or in the vicinity of a construction site are managed. LCPL will actively participate in regular forums, communicate, and cooperate in the management process with the RTA, event organisers and relevant project members and clients.

16 Consultation and Communication Strategy

Description

A detailed Stakeholder and Community Involvement Plan (SCIP) has been prepared by LCPL. The SCIP outlines initiatives which will be undertaken to keep the community informed and provide opportunities for community involvement during Main Construction Works

The broad objectives for community relations and stakeholder relations are to:

- Provide accurate information as the project proceeds
- Listen to the community and key stakeholders' feedback about the construction of the project and integrate into the project where appropriate

Specific objectives are:

- Identify affected landowners
- Regularly disseminate up-to-date information to stakeholders, the wider community, including the road users, and affected landowners
- Provide for two-way communication between LCPL and all community and stakeholders, particularly adjoining landowners
- Prompt handling and resolution of issues affecting stakeholders and the wider community
- Meet the consultation related conditions contained in the Project Approval
- Fulfil the consultation related commitments made by Sydney Ports about the project in the environmental assessment

The (SCIP) also contains a subsection that outlines the specific consultation and community strategies to be applied for managing traffic.

LCPL, in conjunction with the Sydney Ports, will set up proactive measures to communicate with the community, road authorities, Local Councils, emergency service agencies and key stakeholders, including the Road Transport Coordination Group during the Main Construction phase.

The main objectives of the traffic communications strategies are to:

- Provide timely, accurate and comprehensive traffic information to all potential and existing road users affected by the works
- Allow and accommodate community and key stakeholder feedback regarding road safety and traffic management issues
- Minimise and manage traffic impacts and construction activities to protect locally affected residential and business amenity
- Ensure media are well informed

This Process details the various components of the strategy including:

- Identifying key stakeholders
- Consultation process
- Notification of emergency services
- Static roadwork information signs
- Use of variable message signs
- Changed traffic condition advertising
- Community letterbox notifications

Roles

Project Manager, Community Relations and Communications Manager, Traffic Manager

Process

General

LCPL in conjunction with Sydney Ports will disseminate changed traffic condition information using the following methods as required:

- Consultation with key stakeholders
- Variable message and temporary roadwork information signage
- Changed traffic condition advertising (including website)
- Community letterbox notifications

Consultation

LCPL in liaison with Sydney Ports will regularly consult with key stakeholders. The Traffic Manager will update the Road Transport Coordination Group, and provide information to key stakeholders as required by Sydney Ports.

Issues to be discussed at these forums may include: but are not limited to: potential risks associated with proposed changed traffic conditions; public safety; construction activities; community concerns; public transport issues; pedestrian and bicycle movements; and communication strategies etc.

The communication tools that LCPL will use for information dissemination with regard to traffic and transport during Main Construction include:

- Notification to emergency services
- Static roadwork information signs
- Variable Message Signs (VMS)
- Changed traffic condition advertising
- Community letterbox notifications

17 Conduct Reporting

Description

This process focuses on reporting to Sydney Ports, community, and other relevant stakeholders on all road safety and traffic management issues that may impact on the road network. This includes information to be reported, frequency and methods of reporting.

Roles

Traffic Manager, Project Manager, Sydney Ports

Process

LCPL acknowledges the importance of keeping Sydney Ports and stakeholders regularly informed.

Report Traffic Information

Traffic management information will be provided by the Traffic Manager to the Project manager, other relevant functional managers, Sydney Ports and Road Transport Coordination Group as required. Report information may include;

- Reports on recent traffic, pedestrian and cyclist incidents
- Community and media feedback as they relate to road safety and traffic management issues

- Current and upcoming critical issues, (including those identified by Sydney Ports, and other stakeholders and the proposed measures to address these issues as required);
- Construction activities and scheduling
- Recent and proposed changed traffic conditions and the impacts on the operation of the road network
- The current status of Traffic Management Plan, planned lane closure / road occupancy and roadwork speed limit, approvals and implementation
- Media and community information released and proposed to be released
- Results and feedback from recent inspections and road safety audits
- Performance results and trends traffic management targets

Australian Standard 1742.3 (Appendix A) provides guidance on the specific information that should be recorded and reported for incidents that occur at roadwork sites.

Frequency of Reporting

The frequency of reports provided by LCPL will be in the following four categories:

- Immediate - reporting of major incidents and critical issues
- Within 1 working day - formal reports of major incidents
- Weekly reports - on planned lane closures / road occupancies and the performance results of recently implemented changed traffic conditions / operations
- Monthly reports - summarising: construction activities; proposed major traffic changes; upcoming media releases; incidents & issues; road network performance etc

Methods of Reporting

The methods of reporting to be applied by LCPL may include:

- Verbal reports on issues of an urgent nature, (e.g. initial reporting of major unplanned incidents, adverse community / political feedback)
- Safety incidents will be recorded in the safety database SHE, as per Safety reporting process
- Formal written reports in a format subject to client and stakeholder needs
- Presentations to consultative and stakeholder forums

Appendix A

Applicable Specifications, Standards and Guides

Traffic Specifications, Standards and Guides

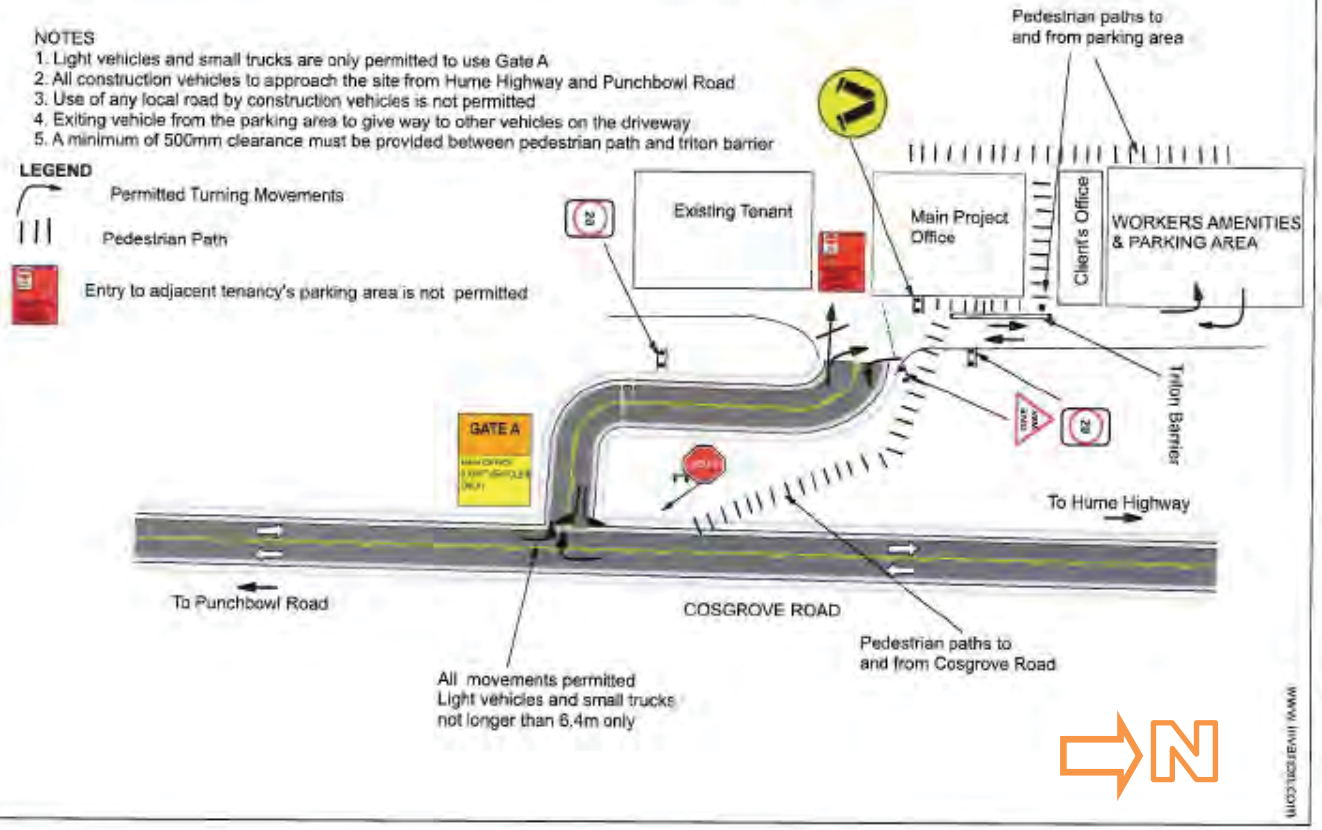
- NSW RTA Traffic Control at Worksites manual Version 4 (This is the guiding document/standard/requirement which outline how to conduct Traffic Control in NSW)
- Australian Road Rules.
- Australian Standard 1742.3, Traffic control devices for works on roads.
- Australian Standard 1742 Parts 1 to 14, Manual of uniform traffic control devices (as required).
- Australian / New Zealand Standard – AS/NZS3845 Road Safety Barrier Systems.
- AUSTROADS Road Safety Audit Guide (2nd Edition) 2002.
- AUSTROADS Guide to Traffic Management – Part 1 Introduction to Traffic Management
- AUSTROADS Guide to Traffic Management – Part 5 Road Management
- AUSTROADS Guide to Traffic Management – Part 6 Intersections, Interchanges and Crossings
- AUSTROADS Guide to Traffic Management – Part 8 Local Area Traffic Management
- AUSTROADS Guide to Traffic Management – Part 11 Parking

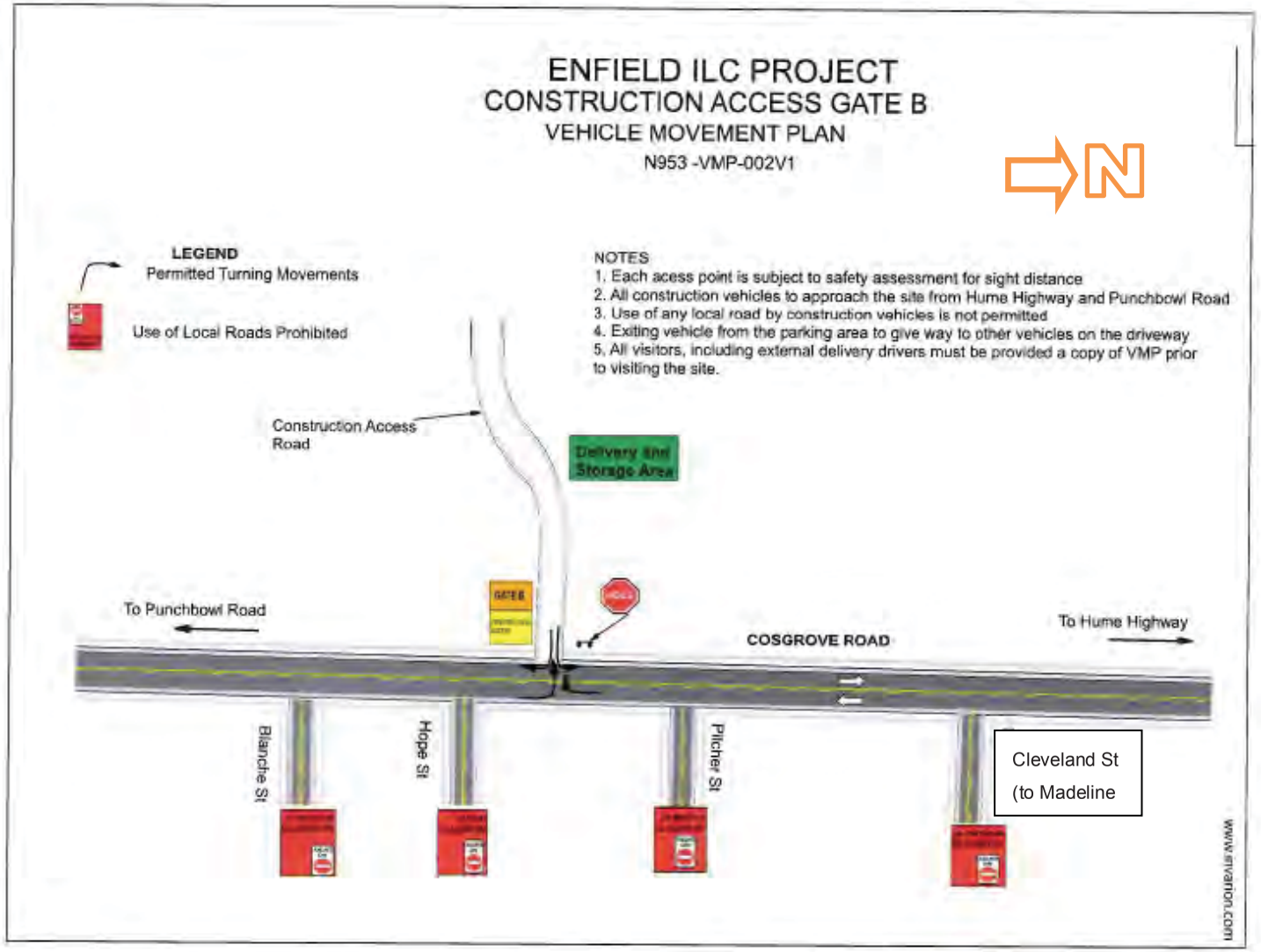
Appendix B

Vehicle Movement Plans


N
Cosgrove Road
Cleveland Street
Hope Street
Wentworth Street
GATE A
GATE B
GATE C
GATE D
GATE LAYOUT PLAN
Project: ILC at Enfield
Belfield

ENFIELD ILC PROJECT
MAIN SITE OFFICE
GATE A VEHICLE MOVEMENT PLAN
N953-VMP 001 V1



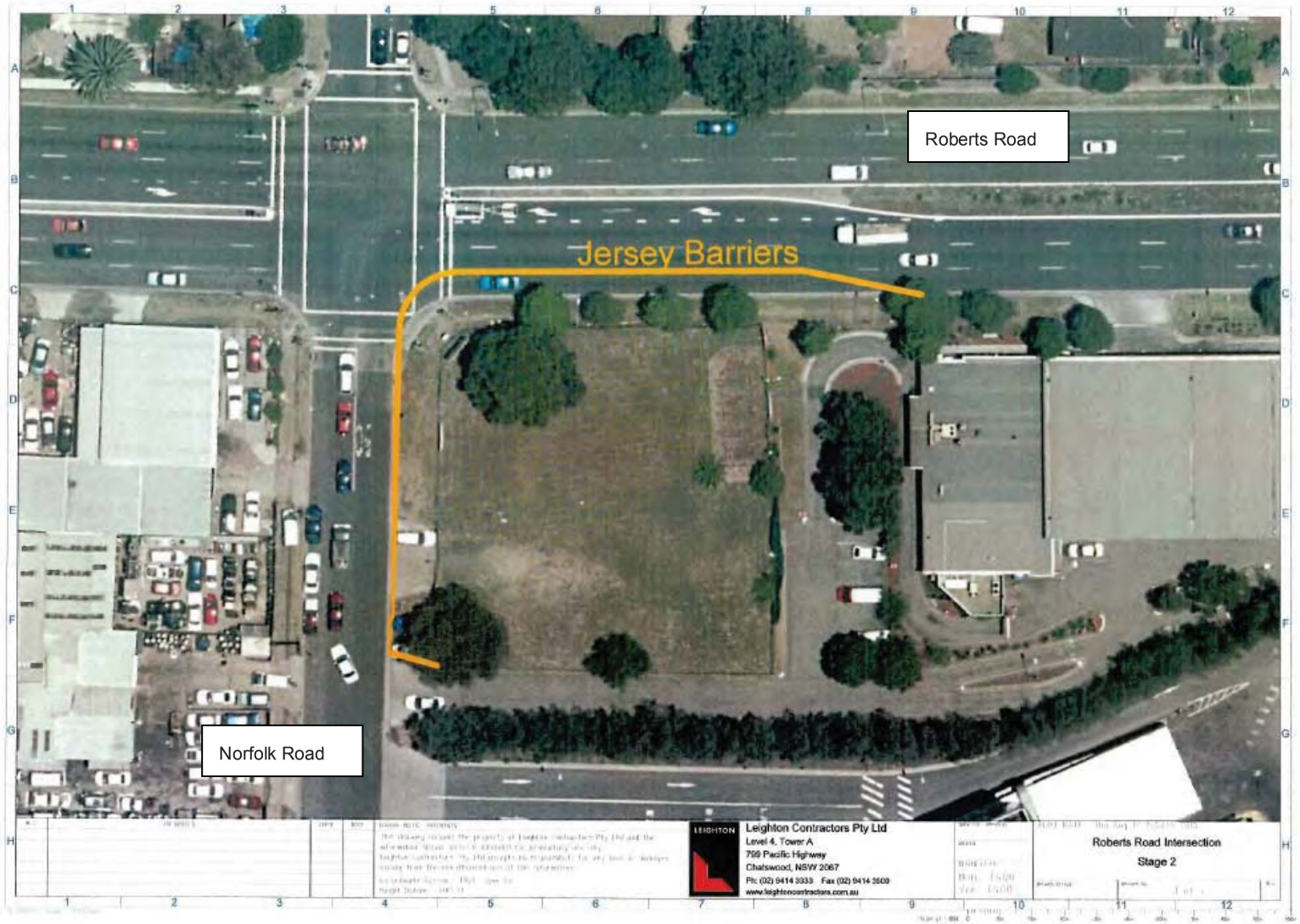

ENFIELD ILC PROJECT
CONSTRUCTION ACCESS GATE B
VEHICLE MOVEMENT PLAN
N953 -VMP-002V1
N
LEGEND
Permitted Turning Movements
Use of Local Roads Prohibited
NOTES
1. Each acess point is subject to safety assessment for sight distance
2. All construction vehicles to approach the site from Hume Highway and Punchbowl Road
3. Use of any local road by construction vehicles is not permitted
4. Exiting vehicle from the parking area to give way to other vehicles on the driveway
5. All visitors, including external delivery drivers must be provided a copy of VMP prior to visiting the site.
Construction Access Road
Delivery and Storage Area
GATE B
To Punchbowl Road
COSGROVE ROAD
To Hume Highway
Blanche St
Hope St
Pitcher St
Cleveland St
(to Madeline
www.srivanion.com


ENFIELD ILC PROJECT
CONSTRUCTION ACCESS (GATES C & D)
VEHICLE MOVEMENT PLAN
N953 - VMP 003 V1
NOTES
1. Each acess point is subject to safety assessment for sight distance
2. All construction vehicles to approach the site from Roberts Road/ Norfolk Road intersection
3. Roads indicated "No Entry" are not to be used by any construction vehicle
4. Exiting vehicle from the access points are to obey the "Stop" signs at all times.
5. Only the movements shown must be undertaken. Other movements can be permitted only under traffic control.
6. The VMP must also be provided to all external delivery drivers
Roberts Road
Norfolk Road
Roberts Road
Mayvic Street
Kingsbury Street
Ford Street
Norfolk Road
Wentworth Street
GATE D
GATE C
GATE W2
GATE W1
TO BRIDGE SITE COMPOUND
N
www.invarion.com

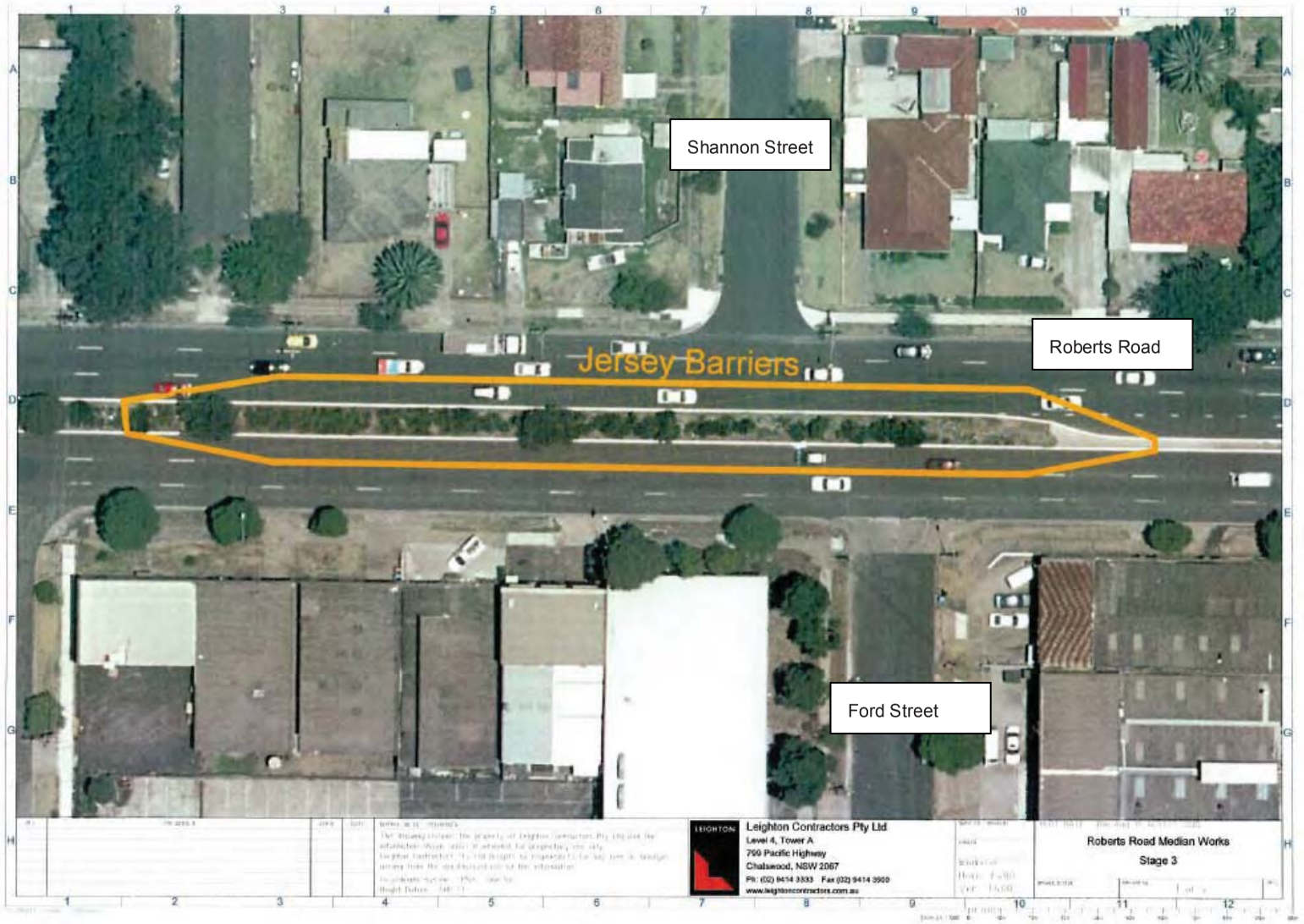
Appendix C

Indicative Traffic Staging Drawings

Roberts Road / Norfolk Road Intersection Works


Roberts Road
Jersey Barriers
Norfolk Road
Leighton Contractors Pty Ltd
Level 4, Tower A
799 Pacific Highway
Chatswood, NSW 2067
Ph: (02) 9414 3333 Fax (02) 9414 3509
www.leightoncontractors.com.au
Roberts Road Intersection
Stage 2


Roberts Road
Jersey Barriers
Norfolk Road
Leighton Contractors Pty Ltd
Level 4, Tower A
799 Pacific Highway
Chatswood, NSW 2067
Ph: (02) 9414 3333 Fax (02) 9414 3000
www.leightoncontractors.com.au
Roberts Road Intersection
Stage 1


Shannon Street
Roberts Road
Jersey Barriers
Ford Street
Leighton Contractors Pty Ltd
Level 4, Tower A
799 Pacific Highway
Chatswood, NSW 2067
Ph: (02) 9414 3333 Fax (02) 9414 3500
www.leightoncontractors.com.au
Roberts Road Median Works
Stage 3

ILC at Enfield

Air Quality & Dust Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK
1.01	Draft as updated for Main Construction	25/02/11	GK
2.0	Final for Main Construction	24/03/11	GK
3.0	Final for Main Construction	17/05/11	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Air Quality & Dust Management Plan (AQDMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Main Construction phase. The purpose of the AQDMP is to describe how Leighton Contractors (LCPL) will manage and control the air quality and dust aspects and risks associated with the Main Construction phase.

The plan has been prepared to address the requirements of Condition 6.3 e) of the Ministers Conditions of Approval, the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005) and all applicable legislation.

1.2 Background

The EA for the ILC Project assessed the air quality and dust impacts during the construction and subsequent operation of the Project. A detailed description of the methodology for construction air quality assessment is provided in Chapter 12 and Appendix F of the EA.

The EA found that air quality (mainly dust generation) is not likely to exceed adopted criteria provided that the proposed mitigation measures are implemented during the construction phase.

1.3 Objectives

The key objectives of the AQDMP are to ensure the potential air quality / dust impacts from the Main Construction phase are minimised and managed in accordance with the project approval. To achieve this objective, the LCPL project team will undertake the following:

- Ensure that dust and exhaust emissions of plant and equipment produced by construction activities are controlled to an acceptable level and meet the criteria in the MCoA
- Minimise any adverse impacts on existing air quality
- Achieve particulate concentrations from construction activities that meet guideline values
- No environmental complaints, fines or prosecutions relating to dust and air emissions

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to air quality / dust management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including air pollution and offensive odours. Part 5.4 of the Act which requires the occupier who operates any plant on the premises, to have suitably maintained plant and equipment, which is operated in a proper and efficient manner so as not to cause air pollution. With regard to odours at an unlicensed facility, odours must not be emitted so as to unreasonably interfere with the amenity of neighbours or the general public.

Ministers Conditions of Approval

The Ministers Conditions of Approval (MCoA) relevant to AQDMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Air Quality Impacts		
2.20	The Proponent shall install, operate and maintain a meteorological monitoring station to monitor weather conditions representative of those on the site, in accordance with: a) AM-1 Guide to Siting of Sampling Units (AS 2922-1987); b) AM-2 Guide for Horizontal Measurement of Wind for Air Quality Applications (AS 2923-1987); and c) AM-4 On-Site Meteorological Monitoring Program Guidance for Regulatory Modelling Applications. The Proponent shall install the meteorological monitoring station prior to the commencement of site preparation or construction works and shall use the station to undertake the monitoring required under condition 3.1 of this approval. This condition does not preclude the Proponent from reaching agreement with any other relevant party for the installation, operation and maintenance of a shared monitoring station, provided the outcomes of this condition are achieved.	Sydney Ports have installed, operate and maintain a meteorological station on the ILC Site in accordance with this requirement. Leighton Contractors monitor real-time data from the station and compare to construction activities in accordance with MCoA 3.2
Odour		
2.21	The Proponent shall not permit any offensive odour, as defined under section 129 of the *Protection of the Environment Operations Act 1997*, to be emitted	AQDMP (this Plan) Section 4.1

MCoA	Description	Reference
	beyond the boundary of land owned by the Proponent (the site the subject of this approval).	
Dust Emissions		
2.22	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.	AQDMP (this Plan) Section 4.1
2.23	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.	AQDMP (this Plan) Section 4.1
2.24	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, such that emissions of visible dust cease.	AQDMP (this Plan) Section 4.1
2.25	The Proponent shall manage, maintain and use internal haulage roads in order to prevent dust emissions. The measures to be implemented for the management of potential dust emissions from internal roads during construction shall be incorporated in the Construction Environmental Management Plan required under condition 6.3.	AQDMP (this Plan) Section 4.1
2.26	The Proponent shall apply and enforce a 25 km/ h speed limit on the site during site preparation and construction works to minimise the potential for dust generation.	AQDMP (this Plan) Section 4.1
2.27	The Proponent shall ensure that all vehicles and equipment directly associated with site preparation and construction works (as distinct from passenger vehicles) pass through a wheel wash prior to leaving the site.	AQDMP (this Plan) Section 4.1
Meteorological Monitoring		
3.1	From the commencement of site preparation and construction works associated with the project, the Proponent shall continuously monitor, utilising the meteorological monitoring station referred to under condition 2.20 of this approval, each of the	AQDMP (this Plan) Section 5.1

<table>
<tr><th>MCoA</th><th>Description</th><th>Reference</th></tr>
<tr><td></td><td>parameters listed in Table 4, utilising the sampling method indicated and applying a 15-minute average period to all results, and recording data in units specified in the Table.
Table 4 – Meteorological Monitoring
<table>
<tr><th>Parameter</th><th>Units of Measure</th><th>Sampling Method*</th><th>Method</th></tr>
<tr><td>Temperature at two metres</td><td>°C</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr>
<tr><td>Temperature at ten metres</td><td>°C</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr>
<tr><td>Wind speed at ten metres</td><td>ms^{-1}</td><td>AM-2 and AM-4</td><td>AS 2923-1987; USEPA (2000) EPA 454/R-99-005</td></tr>
<tr><td>Wind direction at ten metres</td><td>°</td><td>AM-2 and AM-4</td><td>AS 2923-1987; USEPA (2000) EPA 454/R-99-005</td></tr>
<tr><td>Solar radiation</td><td>Wm^{-2}</td><td>AM-4</td><td>USEPA (2000) EPA 454/ R-99-005</td></tr>
</table>
*refer Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA, 2005)</td><td></td></tr>
<tr><td colspan="3">Construction Dust Monitoring</td></tr>
<tr><td>3.2</td><td>The Proponent shall, from the commencement of soil disturbing works on the site until all large exposed areas have either been landscaped or sealed, continuously monitor ambient dust concentrations (PM10) at two of the most-affected residential receptor(s) to the site (with monitoring undertaken either on the boundary of the site or within the affected residential areas) employing the sampling and analysis methods specified under AM-18 or AS3580.9.8 or as otherwise agreed by the Director-General. Results of dust monitoring shall be recorded in µgm-3 and shall be utilised for the purpose of site preparation and construction dust management under condition 6.3(e) of this approval.</td><td>AQDMP (this Plan) Section 5.1</td></tr>
<tr><td colspan="3">CEMP Sub Plans</td></tr>
<tr><td>6.2</td><td>Prior to the commencement of site preparation works or construction of the project, the Proponent shall prepare and submit for the approval of the Director-General a Construction Environmental Management Plan to detail an environmental management framework, practices and procedures to be followed during site preparation and construction of the project. The Plan shall be prepared in accordance with Guideline for the Preparation of Environmental Management Plans (DIPNR 2004) and shall include, but not necessarily be limited to:
f) details of how the environmental performance of the site preparation and 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:
i) measures to monitor and manage dust</td><td>CEMP and AQDMP (this Plan)</td></tr>
</table>

MCoA	Description	Reference
	emissions;	
6.3	As part of the Construction Environmental Management Plan for the project, required under condition 6.2 of this approval, the Proponent shall prepare and implement the following Management Plans: e) a Construction Dust Management Protocol to detail how dust impacts will be mitigated, monitored and managed during construction of the project. The Plan shall include procedures for the identification of situations in which site preparation or construction works may contribute to an ambient PM10 concentration (24-hour) of greater then 50µgm-3 at any off-site residential receptor, with details of measures to be implemented (including alteration or cessation of works, as may be relevant) to prevent or minimise exceedance of this criterion, in so far as the exceedance may relate to activities associated with the project.	AQDMP (this Plan)

2 Identify and Assess

2.1 Existing Environment

Overview

The ILC site is bound by industrial land to the east and west and mixed industrial/residential to the north and south. DECCW has an air quality monitoring network that informs the public about air quality. The nearest DECCW air monitoring stations to the project are located at Chullora (Approximately one and a half kilometres to the north west), Lidcombe (approximately four kilometres north-west) and Earlwood (approximately six kilometres south east).

In accordance with MCoA 3.3, Sydney Ports have procured and installed dust monitoring stations at the north-western and south-eastern portions of the site as detailed in the Sydney Ports' Construction Environmental Management Plan Framework document. In accordance with the requirements of MCoA 2.20, a meteorological station is co-located with the dust monitoring station in the south-east of the site. These monitoring stations provide continuous real-time PM10 dust and meteorological monitoring. Sydney Ports make the monitoring data available to LCPL for ongoing dust management during construction.

Sensitive Receptors

Discrete receptors were nominated in the EA to allow ease of impact description. These receptors represent other similar sensitive receivers around them. These receptors are as follows:

- R1 Cosgrove Road, eastern side of Cosgrove Road, south of Cox's Creek Channel
- R2 Cosgrove Road / Punchbowl Road, north eastern side of Cosgrove Road
- R3 Juno Parade, north side of road near intersection with Punchbowl Road
- R4 Wentworth Street, eastern side of road, north of Juno Parade
- R5 Roberts Road, western side of road, north of Jean St

The nearest residential areas are located to the south-east (R1, R2) and the north-west (R5) of the site.

Background Air Quality Levels

Background air quality levels were provided in the Environmental Assessment. The annual average of monthly maximums and annual average of monthly average levels at Earlwood are reported in Table 2 along with relevant NSW EPA PM_{10} (24-hour) criteria (MCoA 6.3e also requires compliance with this criteria).

Table 2: PM_{10} (24-hour) concentrations at Earlwood (1996-2003)

Year	Average of Monthly Maximum (μg/m3)	Average of Monthly Average (μg/m3)	NSW EPA PM_{10} (24-hour) Criteria
1996	37.4	28.5	50 μg/m3
1997	37.8	24.3	
1998	36.0	23.2	
1999	25.2	18.5	
2000	32.3	21.1	
2001	27.1	18.5	
2002	34.9	23.3	
2003	31.2	21.5	
Average	32.7	22.3	

More recent data is available from the DECCW Chullora air monitoring station showed high monthly maximums, including significant exceedances. The data for 2003 to 2010 is as below Table 3, along with relevant NSW EPA PM_{10} (24-hour) criteria.

Table 3: PM_{10} (24-hour) concentrations at Chullora (2003-2010)

Year	Average of Monthly Maximum (μg/m3)	Average of Monthly Average (μg/m3)	NSW EPA PM_{10} (24-hour) Criteria
2003	63.4	23.5	50 μg/m3
2004	43.4	22.6	
2005	40.8	22.1	
2006	40.3	22.0	
2007	35.2	19.4	
2008	36.1	19.5	
2009	176.6	26.2	
2010	33.1	17.7	
Average	58.6	21.6	

2.2 Construction Activities

Construction activities that are likely to cause air quality impacts include the following:

Site Earthworks

- Vehicle movement on haul roads
- Site and vegetation clearance
- Establish sedimentation basins

- Transporting of and management of site material

Road and Rail Infrastructure

- Vehicle movements
- Off-site access works
- Bulk earthworks using heavy earthmoving equipment
- Drainage works
- Install services
- Pavement works
- Railway line and connections
- Excavation of abutments at Punchbowl Road

External Utility Service Installation (11kV and Water)

2.3 Potential Impacts

Dust Deposition and PM10

The impacts of the construction phase were predicted in the EA. Table 12-5 of the EA provides a summary of predicted impacts for discrete receptor sites R1- R5 for the various stages of construction. The assessment concluded that the deposition rates for all receptor sites with dust mitigation measures in place were expected not to exceed the criterion in DECCW Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales and AS 3580.10.1–2003.

A summary of worst case predicted impacts can be seen in Table 4.

Table 4: Worst Case Predicted Dust Impacts

Discrete Receptor	Site Criterion (g/m^2/month)	Refined Monthly Average Dust deposition (g/m^2/month)
R1	4.0	3.2
R2	4.0	2.5
R3	4.0	2.0
R4	4.0	2.1
R5	4.0	4.0

Notes to Table:

1. The dust deposition results are provided as a single result determined from an annual statistic.

SKM (2005) carried out AUSPLUME modelling of particulate matter (PM10) for the construction phase. The results showed that the long-term (annual average) air quality criteria for PM10 of 30μg/m3 would not be exceeded even by worst case construction activities. It also concluded that the 24hr criteria (50μg/m3) would not be exceeded if mitigation measures were implemented.

The EA concluded potential for off site dust emissions created during construction of the Project would be minimised through the development and implementation of a Dust Management Plan as part of the CEMP. This Plan satisfies that requirement.

3 Consult and Communicate

3.1 Stakeholder Consultation

A process for notifying the community prior to and during construction works (particularly for potentially dusty activities) is included in the Construction Environmental Management Plan (CEMP) and the Stakeholder and Community Involvement Plan. In summary this process involves:

- updating the community prior to and during the construction phases
- notifying residents and other sensitive receivers of potentially dusty activities
- a clear procedure for making, recording and responding to community complaints.

3.2 Training and Awareness

Leighton Contractors has an environmental training program which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Air Quality issues and other key risk areas such as Noise and Erosion and Sediment Control.

All relevant construction personnel will attend the program for Legal and Regulatory Compliance and Air Quality. This will focus on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Sensitive Receptors (what are they?)
- Measures to alleviate dust issues
- Inspections and monitoring of site.

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise air quality/dust or odour impacts.

- Continue the dust and meteorological monitoring program which commenced prior to earlier phases of the Project.
- Check weather forecasts before Daily Pre-start and brief work crews of potential hot, windy days and additional controls required
- Undertake regular watering of active work area, including stockpiles and loads of soil being transported, to reduce wind blown dust emissions and monitor throughout the day
- Haulage trucks to use sealed or stabilised haul roads where possible when transporting materials on and off site
- Water cart to be used on haul roads to prevent dust generation
- Other suitable liquids/additives may be used for dust suppression on haul roads following Sydney Ports approval for use
- Minimise area of disturbed or exposed land at any one time through staging of construction works
- Assess construction work activity and modify as appropriate if real-time dust and meteorological monitoring data indicates ambient air quality criteria (PM10 of 50μg/m3 (24h) is likely to be exceeded due to Main Construction phase activities
- Cover, stabilise or revegetate stockpiles if they are to be left for extended periods, and progressively landscape exposed areas and where material is to remain in situ for a long period of time
- Concrete breaking activities to be minimised where possible; when concrete breaking is required, it will be sprayed with water to minimise dust
- Rock breaking activities are to have water available for dust suppression
- Plant and equipment in good order with appropriate maintenance log records will only be used on site
- Ensure all construction facilities are designed and operated to minimise the emission of dust, odour, smoke, cement dust, pesticide and other substances into the atmosphere
- All construction vehicles and equipment are to pass through a wheel wash / rumble grid control before entering public roads or onto other completed pavements

- Planning of works to minimise bare areas
- Slow or stop dust generating activities which cannot be adequately controlled by water or other means
- Limiting potentially dust generating works during high wind occurrences (e.g. >30kts winds/45kts gusts)
- Enforce a maximum speed limit of 20km/h on-site
- Maintain dust control equipment so that it is available when required, including during periods of dust generating activities or high wind speed
- Maintain exhaust systems of construction plant, vehicles and machinery in accordance with manufacturer's specifications and undertake periodic visual checks of exhaust systems' emissions
- Ensure that all vehicles entering and leaving the site carrying a load that may generate dust are covered at all times, except during loading and unloading
- During excavation works if there is an offensive odour emanating from the excavation, work will cease and the site Environmental Manager consulted on the management of the odour
- Maintain access to and security around the dust and meteorological stations
- Toolbox site crew on status of real-time dust and meteorological monitoring when significant events are occurring
- When real-time monitoring approaches or exceeds the criteria (PM10 concentration (24h) of 50μg/m3) and it can potentially be attributed to LCPL construction, dust generating works will be slowed or ceased, and appropriate controls including water cart implemented until dust levels are reduced
- Environmental Manager to provide required reports to Sydney Ports where exceedances in real-time monitoring due to Main Construction are observed, within required timeframes (2 hours verbally and within 24 hours in writing). The report will include measures implemented to address the exceedances, where the likely cause of the exceedance is LCPL construction. If the exceedance is not attributable to LCPL, the possible cause of the exceedance will be attempted to be identified/explained.

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Inspections

Documented weekly environmental inspections that will include air quality / dust / odour checks will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Main Construction phase. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on air quality / dust impact inspections.

Additional inspections undertaken onsite include Daily Site Supervisors Diary entries for actions taken onsite for that shift, and Monthly Site Inspections are undertaken by the Project Manager.

Monitoring

Diary visual monitoring of dust levels and work activities which have the potential to generate dust will be undertaken by the Site Supervisors and/or the Environmental Manager (EM).

LCPL's EM will also monitor the real-time continuous data from the Sydney Ports' owned monitoring stations located at the north-west of the site (PM_{10} monitoring station) and the south-east of the site (PM_{10} and meteorological monitoring station).

Results of the real-time continuous data will be utilised for the purposes of construction dust management in accordance with MCoA 6.3(e). This data will be viewed on the Sydney Ports' air quality consultant's website.

If the site's dust monitoring results indicate non-compliance with site criteria (i.e. PM10 concentration (24h) of 50μg/m3) and/or excessive complaints are received, the following actions will be undertaken to determine the source:

- Checks on the type of weather (e.g. wind direction, wet/dry weather) during the time in question and the regional background PM10 data
- Checks on the activities being carried out during the non-compliance
- Checks on other types of activities (outside influences) in the vicinity of the non-compliance
- Check on the ambient regional air quality conditions, available from the DECCW website (http://www.environment.nsw.gov.au/AQMS/hourlydata.htm)
- Changing the way work activities are being carried out if the activities are the cause of the exceedance

Reporting

Where dust monitoring results indicate an exceedance of the MCoA established criteria of 50 μg/m3 (NSW EPA PM_{10} (24-hour) criteria) and the investigation as above indicates impacts are as a result of construction activities, the Environmental Manager will notify the Sydney Ports Superintendent within 2 hours verbally and within 24 hours in writing. The written report to the Superintendent should detail the incident, the actions taken to remedy the problem and the timing of such actions. A final report with proposed measures to prevent the occurrence of a similar incident must be submitted to the Superintendent within five business days.

5.2 Auditing

Six monthly internal environmental audits for compliance against the relevant MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess air quality / dust monitoring, reporting, effectiveness of controls, community and complaints management. The site EM is responsible for managing and implementing audit actions and the Project Manager will have overall accountability for ensuring compliance.

Independent environmental auditing will be carried out annually as described in Sydney Ports' CEMPF.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

ILC at Enfield

Flora and Fauna Management Plan

Details of revisions			
Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK
1.01	Minor changes addressing Sydney Ports' additional comments	28/09/10	GK
1.02	Draft as updated for Main Construction	25/02/11	GK
1.03	Draft for Main Construction addressing Sydney Ports' comments and incorporating Weed Mgmt Strategy	31/03/11	GK
2.0	Final for Main Construction	17/05/11	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Flora and Fauna Management Plan (FFMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Main Construction phase. The purpose of the FFMP is to describe how Leighton Contractors (LCPL) will manage and control the flora and fauna aspects and risks associated with the Main Construction phase. These aspects and risks include:

- Habitat conservation measures to protect the potential Green and Golden Bell Frog (GGBF) habitat in accordance with Sydney Ports' Frog Protection Plan (FPP) and Frog Management Plan (FMP), and any other threatened species discovered on the site
- Management of weeds during site clearing
- Appropriate pesticide and herbicide use, with specific controls to prevent impacts on potential and existing frog habitat areas, water ways, and other non-target areas
- Maximise the retention, where feasible, of locally-endemic native species at the southern part of the site, except the Frog Habitat Creation Area (FHCA) which will require excavation and planting in accordance with the design prepared by Sydney Port's Consulting Herpetologist.

The FFMP has been prepared to address:

- the relevant requirements of the relevant Ministers Conditions of Approval (MCoA), including MCoA 6.3 d) iii) and 6.3 d) iv) where applicable to this phase of the works
- the mitigation measures detailed in the Environmental Assessment (EA) (SKM 2005
- the mitigation measures detailed in the Preferred Project Report (SKM, 2006)
- all applicable legislation

Site landscaping as part of the Main Construction phase will be guided by the Landscape and Ecological Area Management Plan (LEAMP) required under MCoA 6.3 d), once approved by the Director-General.

Condition 6.3 d) iv) is addressed in Sydney Ports' Frog Management Plan (FMP), which is attached in Sydney Ports' Construction Environmental Management Plan Framework (CEMPF) and is a Sub-Plan of the LEAMP. This FFMP addresses the landscaping required in the FHCA, which will be carried out in accordance with the requirements of the FMP.

1.2 Background

The EA (SKM, 2005) for the ILC Project assessed the Flora and Fauna aspects and impacts during the construction and subsequent operation of the Project. A detailed description of the flora and fauna issues and mitigations is provided in Chapter 13 of the EA.

The EA found that the ILC site represents a highly disturbed and modified environment that provides habitat to a number of common, disturbance tolerant flora and fauna species. Within the areas of likely disturbance, the habitats and vegetation communities present are considered to be of low ecological value. The ILC proposal was not considered to affect, threaten or have an adverse impact on any of those plants or animals listed under schedules of the Threatened Species Conservation (TSC) Act or the Environmental Protection and Biodiversity Conservation (EPBC) Act.

The ILC site does, however, provide some existing potential habitat for GGBF. The GGBF is an endangered species listed under Schedule 1 of the TSC Act. The creation of the FHCA in the southern part of the site will minimise the impact of any further disturbance that may result from the development of the ILC site and provide an opportunity to ameliorate adverse impacts on potential GGBF habitat that may be occurring in the area, as well as assisting with the conservation of the species. The development of secure, high quality habitat areas and the linking of the habitat areas to other GGBF sites nearby is consistent with the aims of the *Green and Golden Bell Frog Draft Recovery Plan* prepared by the NSW Department of Environment and Conservation (DEC, 2005).

An eight part test of significance under Section 5A of the EP&A Act was carried out as part of the EA to assess the potential impacts of the development of the ILC site on GGBF. The test included the proposed mitigation measures outlined in the EA and concluded that risks encountered for dispersing frogs would be more than offset by the creation of the FHCA. It concluded that the proposed ILC development is not likely to have a significant effect on the GGBF.

1.3 Objectives

The key objectives of the FFMP are to ensure the potential flora and fauna impacts from the Main Construction phase are minimised. To achieve this objective, the LCPL project team will undertake the following:

- Provide secure habitat for the GGBF by constructing the FHCA in the southern part of the site and landscaping it in accordance with the FMP
- Minimise the likelihood of direct impacts to threatened species during the site works through carrying out frog clearances and inspections prior to commencing work, including removing any frogs found in the works area and construction of frog exclusion fencing
- Provide for the removal of weeds in accordance with the *Noxious Weeds Act* and the retention, where possible, of locally-endemic native species at the southern part of the site (excluding at the location of the frog ponds)
- Provide finishing and landscaping in accordance with LEAMP

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to flora and fauna management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with. Section 75U of the EPA Act lists various approval requirements that do not apply to an approved Part 3A project.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including pollution to waters and land.
- **Threatened Species Conservation Act (1995)** – The proposal would not directly impact on any known threatened species, populations, endangered ecological communities or critical habitats. An assessment under Section 5A of the EP&A Act for the GGBF undertaken for the EA concluded that it was unlikely that a significant impact to the species would occur as a result of the project.
- **Noxious Weeds Act** – There are no approvals or permit requirements applicable to the project under the Act. However, Sydney Ports and LCPL are required under the Act to control and manage noxious weeds on the land under their control.

Ministers Conditions of Approval

The MCoA relevant to this FFMP, with details of the condition and how it is addressed, are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Ecology Impacts		
2.48	The Proponent shall implement all of the relevant actions for the site recommended in the Management Plan for the Green and Golden Bell Frog Key Population at Greenacre (DECC, May 2007), being: a) creation of overwintering habitat as part of the two-hectare improved foraging habitat at the southern end of the site; b) provision of linkages to the former Railcorp ponds; and	LCPL will construct the Frog Habitat Creation Area (FHCA) in accordance with Sydney Ports' CEMPF The FHCA will have linkages to RailCorp ponds through an appropriate corridor as per Sydney Ports' FMP

MCoA	Description	Reference
	c) restrictions on the use of herbicides in known frog habitat and attainment of water quality standards for water discharged from the site.	The requirements of the FMP have been incorporated into the CEMP.
	These actions shall be incorporated within both the Construction Environmental Management Plan (refer to condition 6.2) and the Operation Environmental Management Plan (refer condition 6.4) as relevant, including provisions for monitoring the outcomes of these actions and periodically reporting outcomes to the DECC at a frequency agreed with the DECC.	This FFMP and the CEMP, and Sydney Ports' CEMP Framework.
Construction Environmental Management Plan		
6.3 d)	iii) measures to maximise the retention of locally-endemic native species existing on the site, and removal of weeds and non-indigenous vegetation; and iv) measures for the enhancement, revegetation and on-going management of the Ecological Area on the site, including measures to provide suitable habitat for *Litoria Aurea*;	This FFMP and the FMP (attached in Sydney Ports' CEMPF).

2.1 Existing Environment

Overview

The ILC site represents a highly disturbed and modified environment that provides habitat to a number of common, disturbance tolerant flora and fauna species. Within the areas of likely disturbance, the habitats and vegetation communities present are considered to be of low ecological value. The ILC proposal is not considered to affect, threaten or have an adverse impact on any of those plants or animals listed under schedules of the TSC Act or the EPBC Act.

The ILC site does, however, provide some potential habitat for the GGBF. The creation of the FHCA would minimise the impact of any further disturbance that may result from the development of the ILC site.

Weed Management

Weeds abound on the ILC site and appropriate management under the Noxious Weeds Act is required. The weed biomass above and below ground will be substantially removed to allow for the reuse of the existing fill and stockpiles to backfill and level the site.

Weeds were identified on site and documented in the EA (SKM, 2005). Noxious weeds at the site are listed in Table 2 below (for further details refer to the EA).

Table 2: Noxious Weeds on the ILC Site

Botanical Name	Common Name	Class	Class Meaning & Weed Control Guidelines
Cestrum parqui	Green Cestrum	3	**Regionally Controlled Weeds** The plant must be fully and continuously suppressed and destroyed.
Chrysanthemoides monilifera	Bitou Bush	3	
Cortaderia selloana	Pampas Grass	3	
Hypericum performatum	St Johns Wort	4	**Locally Controlled Weeds** The growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local control authority (Strathfield Council).
Lantana camara	Lantana	4	
Ligustrum lucidium	Broad-leaved Privet	4	
Parietaria judaica	Pellitory	4	
Ricinus communis	Caster Oil Plant	4	
Rubus fructicosus	Blackberry	4	
Oxalis articulata	Wood Sorrel	5	**Restricted Plants.**

Botanical Name	Common Name	Class	Class Meaning & Weed Control Guidelines
Salix babylonica	Weeping Willow	5	There are no requirements to control existing plants of class 5 weeds. However, the weeds are 'notifiable' and a range of restrictions on their sale and movement exist.
Salix nigra	Black Willow	5	

Source: draft LEAMP (AECOM, 2011)

An updated inspection and assessment of the site was undertaken by LCPL's Ecologist on 6 January 2011. The inspection and recommendations on how weeds should be controlled, managed and disposed of have been provided as guidance for weed management actions in a *Weed Management Strategy (May 2011)* for the ILC at Enfield Site (Appendix A).

2.2 Construction Activities

Construction activities associated with the Main Construction phase that are likely to cause potential impacts to existing site flora and fauna include the following:

Site General Works

- Prepare haul roads
- Weed control and herbicide use
- Clearing & grubbing
- Removal of Unsuitable material
- Construction of sedimentation ponds
- Construction of FHCA corridor and landscaping of FHCA

Earthworks and Drainage

- Earthworks and compaction works
- Stormwater and drainage connections to existing drainage lines
- Relocation of services on and off-site

Road and Rail Infrastructure

- Vehicle movements onsite
- Herbicide use
- Off site rail connections works
- Cleared areas for pavement works
- Landscape planting once internal roads complete

External Utility Service Installation

- Non-destructive excavation
- Trenching
- Trimming or removal of trees only where necessary

2.3 Potential Impacts

As the site is highly disturbed with a large density of weeds, the Main Construction phase is anticipated to have beneficial impact on the site flora and fauna through activities of weed management, endemic tree retention where feasible, and ultimately site landscaping with locally-endemic native species.

The implementation of Sydney Ports' FPP, FMP, CEMP and this FFMP will ensure impacts to flora and fauna, especially the GGBF, will be mitigated. This FFMP is consistent with the EA and DECC's *Management Plan for the Green and Golden Bell Frog Population at Greenacre* (DECC, 2007).

3 Consult and Communicate

3.1 Stakeholder Consultation

Frog Management

Sydney Ports has ongoing consultation with DECCW regarding the GGBF, including quarterly reporting on the project progress. Consultation with DECCW is attached in the Sydney Ports' CEMPF. This has guided the development of the Sydney Ports' FPP and FMP.

LCPL will continue to involve a Consulting Herpetologist in the management decisions regarding the GGBF and GGBF habitat.

Emergency Advice for Injured Birds & Animals

Improper rescue can hurt and distress the animal and also the rescuer. Caution is required when handling many species of wildlife. For Specialist Emergency Advice during a rescue of injured native birds and animals, the Environmental Manager or other project representative may call the WIRES service:

13 000 WIRES or 13 00 094 737

3.2 Training and Awareness

LCPL has an environmental training program which addresses Leighton Contractors' key construction risk areas including Flora and Fauna Management. All relevant construction personnel attend the program. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory induction is held for all construction personnel to ensure they understand the specific site requirements. The induction will include as a minimum:

- Location of potential GGBF habitat
- Requirements for Frog Clearance Surveys and No-Go Areas
- Careful construction of the FHCA
- Prevention of animal entrapment
- Appropriate pesticide notification, use and reporting
- Management of weeds
- Clean work areas to prevent the attraction of feral animals

4 Implement Controls

4.1 Mitigation Measures

4.1.1 General

The following mitigation measures will be implemented to minimise Flora and Fauna risks and impacts

- Implement frog protection fences and other No-Go Areas Frog protection measures are detailed in Section 4.1.2
- Manage indirect impacts on flora and fauna including construction spills and air quality impacts
- Sitings of native fauna will be reported to the Environmental Manager, any actions required to protect or relocate observed native fauna from the impacts of the Main Construction phase works will then be determined. The WIRES Service can provide advice by calling 13 000 WIRES or 13 00 094 737
- Management of any trimming, clearing and grubbing of existing vegetation on the site through a Pre-Vegetation Removal Checklist (Appendix B)
- Pre-Vegetation Removal Checklist process will also identify and implement controls for retention where possible of locally endemic native species in areas adjacent to the works
- Isolated native flora species remaining at the southern part of the site (excluding areas to be developed such as the Frog Habitat Creation Area) will be retained by restricting heavy machinery in the area to the minimum necessary and by increasing workers' awareness through inductions and pre-start toolboxes.
- Water captured on-site in detention basins and potable water can be used for dust suppression and other activities where possible
- Firearms are not permitted on the construction site except for security purposes permitted by law
- Keep work areas clean to prevent the attraction of feral animals
- Manage feral animals as required to maintain a safe, clean and native fauna-friendly site and surrounds

4.1.2 Frog Protection Measures

Site Inspections and Frog Searches

Identification of Potential Frog Habitat Areas

- Environmental Manager will determine the requirements for frog searches and mitigation measures, depending on the location in which work is to be carried out, in accordance with the FMP and FPP
- If there is uncertainty regarding the requirements for the proposed work area, then Sydney Ports' Consulting Herpetologist must be consulted (Dr Arthur White ph: (02) 9599-1161)

Potential Frog Habitat Areas

- Frog protection fences must be erected around areas of potential frog habitat prior to works commencing in the vicinity of these areas to contain frogs within the habitat areas
- Prior to any works being carried out within the potential frog habitat areas, frog clearances must be carried out by Sydney Ports' Consulting Herpetologist and a clearance letter issued by the Consulting Herpetologist
- Works must not commence until the clearance letter has been issued by the Consulting Herpetologist to Sydney Ports and LCPL

Frog Protection Fences

Installation and Use

- Temporary frog protection fences must be erected around areas of potential GGBF habitat prior to any works being carried out either in or adjacent to these areas
- The fences provide a barrier to minimise the likelihood of GGBF being injured or killed as a result of construction works
- Fences may need to include frog proof gates to allow access to the work sites
- The gates must be shut at the end of each day

Inspection and Maintenance

- All frog fences must be visually inspected by LCPL Site Supervisors during works to ensure that they are functional and not torn or holed
- The Site Supervisors must ensure that any required repairs to the fence are made before nightfall so that the frog clearance remains valid for the enclosed area
- If gaps in the fence or the access gate are left open overnight, the frog clearance will become invalid and work must cease until a new frog clearance is carried out and the enclosed area is again certified as cleared of frogs by the Consulting Herpetologist

Frog Clearances

- Frog clearances will be carried out within the works areas enclosed by the frog protection fences after the frog protection fences have been erected and before construction commences in these areas
- Frog clearances comprise night-time searches for GGBF under favourable weather conditions. Frogs will be located using headlamps and be processed before being released
- All frog handling procedures will comply with the NSW National Parks and Wildlife Service's frog hygiene protocol

- Once the frog clearance has been completed and the area is free of GGBFs (as best can be determined), Sydney Ports' Consulting Herpetologist will issue a clearance letter to Sydney Ports and LCPL
- Works must not commence until the clearance letter has been issued by the Consulting Herpetologist to Sydney Ports and LCPL

Found Frogs

- Should any live frogs be discovered while construction works are being undertaken LCPL must place the frogs into a holding container with some water and immediately advise Sydney Ports and Sydney Ports' Consulting Herpetologist. Pet pack containers will be supplied by Sydney Ports' Consulting Herpetologist for this purpose
- LCPL must retain the carcass of any dead GGBFs found during construction works and immediately advise Sydney Ports and Sydney Ports' Consulting Herpetologist. If the cause of death is not obvious, Sydney Ports' Consulting Herpetologist will preserve the frog in buffered alcohol and forward it to Taronga Zoo for pathological testing.

Measures to Address Indirect Impacts

Construction Spills and Air Quality Impacts

- Construction spills and air quality impacts which may impact on GGBF are addressed in LCPL's CEMP and Sub Plans including Air Quality and Dust Management Plan and Soil and Water Management Plan
- Fuel and chemical storage sites will be established away from potential frog habitat areas
- Wind-blown cement dust or construction fines will be contained through the use of silt screens, where possible, around the work site
- Water carts will be used to suppress dust in exposed construction areas

Importation of Soil or Mulch to the Site

- Soil, mulch and other landscaping materials may harbour spores of *Batrachochytrium*, a virulent and highly contagious frog disease that has been recognised as a Key Threatening Process for GGBF (*Threatened Species Conservation Act 1995*). Site landscaping materials must comply with the relevant Australian Standards (e.g.AS4419)

Importation of Water to the Site

- Water required for filling of the frog ponds could be sourced from stormwater runoff from the site catchment, either from the site bio-retention basin or direct runoff from the area to the south of the FHCA
- Mains water could also be used as it is chlorine-treated and cannot transmit chytrid spores
- No water from outside sources that has not been chlorine-treated will be accepted on site as imported water from other water bodies could potentially contain juvenile Plague Minnows, a noted predator of the tadpoles of GGBF and a recognised Key Threatening Process (*Threatened Species Conservation Act 1995*)

- Water will not be accepted on site unless it has been demonstrated to be fish free. For water sourced from open water bodies, this means that the water must have been screened through 600 micron mesh before it will be accepted

4.1.3 Weed Management

Controls for weed management for the Main Construction phase are detailed in Appendix A, and will generally include:

- Management of weed management activities through the Pre-Vegetation Removal Checklist (Appendix B)
- Noxious weeds will be removed in accordance with the *Noxious Weeds Act* weeds and in accordance with DPI and Strathfield Council requirements.
- Pesticides use must be used in accordance with the legislation and regulations, and training requirements must be complied with
- Notification of pesticide use is to be undertaken in accordance with the Sydney Ports' *Pesticide Use Notification Plan* especially where pesticides are to be used in public areas
- Pesticide application records must be completed when applying pesticides in accordance with the *Pesticides Regulations 2009* and a copy of the record submitted to the Sydney Ports Superintendent within 24hours of applying the pesticide
- Pesticides must not be applied within existing potential frog habitat, the FHCA and frog movement corridor (once constructed)
- Pesticides must not be applied when winds may cause drift of pesticides into non-target areas including the frog zones above, and onto surface waters which drain into the frog zones above.
- Pesticides must not be applied on hot days where plants are stressed or after seed has set
- Pesticides must not be applied within 24 hours of rain or when rain is imminent
- The Sydney Ports Superintendent may give approval to cut and paint weeds with herbicides in or near the existing potential frog habitat areas
- Herbicides may be used on other parts of the site provided spray drift cannot reach the FHCA and surface sprays cannot enter the FHCA in solution via surface water runoff.
- Any disposal of noxious weeds off-site must be to a DECCW licensed landfill
- Once constructed, signs will be erected around the FHCA indicating that herbicides, particularly glyphosate products, should not to be used around the ponds without approval of Sydney Ports in consultation with the Consulting Herpetologist.

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Inspections

Documented weekly environmental inspections that will include checks on aspects of Flora and Fauna will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Main Construction phase. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on Flora and Fauna aspects including GGBF management, threatened species protection, weed management and feral animal control.

Frog Inspections and Clearances

Frog protection fences are required to be erected in accordance with Section 4.1 Mitigation Measures and the FMP. Additionally to this, prior to any work occurring in the potential frog habitat areas, frog clearances must be carried out by a Consulting Herpetologist and a clearance letter issued. Works must not commence until the clearance letter has been issued by the Consulting Herpetologist.

Found Frogs

Any frogs found during frog clearances or monitoring surveys must be dealt with in accordance with the Frog Protection Plan. Whether alive, diseased, injured or dead, the Frog Protection Plan stipulates how the frogs are to be handled.

Pesticide Use

Pesticide application records must be completed when applying pesticides in accordance with the *Pesticides Regulations 2009* and a copy of the record submitted to the Superintendent within 24hours of applying the pesticide.

Records detailing application of pesticide should be consistent with Sydney Ports' Sample Pesticide Application Record Sheet.

5.2 Auditing

Six monthly internal environmental audits for compliance against the MCoA and LCPL's CEMP and Sub Plans will be undertaken by LCPL. The audit will include a detailed site inspection and assessment of compliance with this plan. The site EM will be responsible for managing and implementing audit actions and the Project Manager will have overall accountability for ensuring compliance. Annual independent environmental auditing in accordance with Condition 4.1c) is discussed in Sydney Ports' CEMPF.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by Leighton Contractors in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

7 Appendices

Appendix A

Weed Management Strategy (May 2011)

LEIGHTON CONTRACTORS

Intermodal Logistics Centre

Stage 3 Main Construction Works

Weed Management Strategy

May 2011

Alison Hunt and Associates Pty Ltd

TERRESTRIAL | MARINE | AQUATIC

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1 INTRODUCTION

1.1 Purpose

Alison Hunt & Associates Pty Ltd was commissioned by Leighton Contractors (Leighton) to prepare a strategy to assist with weed removal and control across the Intermodal Logistics Centre (ILC) project site as part of the Stage 3 Main Construction Environmental Management Plan (CEMP). Project Approval for the ILC Project, was provided by the Minister for Planning on 5 September 2007, under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Aims

This Weed Management Strategy aims to:

- Identify the existing weeds across the site;
- Map major infestations of weeds declared as noxious under the NW Act in the Strathfield LGA;
- Provide strategies and actions to assist Leighton Contractors (Leighton) remove current weeds throughout the approximately 60 acre site;
- Provide practical strategies to assist with the on-site management of the biomass of removed weeds;
- Provide actions to assist with the ongoing control of weeds across the site for the duration of the main construction works; and
- Assist Leighton to meet their responsibilities under the *Noxious Weeds Act 1993* (NW Act).

1.3 The Site

The ILC site is located on the site of the former Enfield Marshalling Yards at Strathfield South within Strathfield local government area (LGA) and is approximately 13 km from the Sydney central business district and 18 km from Botany Bay (Figure 1 and Figure 2). It is comprised of approximately 60 ha of land which is approximately 2 km long and 0.5 km in width, and is located between Cosgrove Road to the east, and RailCorp land to the west which is bordered by Wentworth Road.

The site of the former Enfield Marshalling Yards was initially developed in 1916, as a steam locomotive depot to support the Clyde Yard in Auburn which had reached its capacity. The Enfield yard's operation as a depot ended in 1993 and much of the site has remained vacant since that time. The western edge of the site was developed in 1996 as a new marshalling yard which is owned by RailCorp and operated by Pacific National. The Proponent considered the former marshalling yard site as a suitable location for the construction of an intermodal terminal and progressively purchased the remainder of the site between 2001 and 2003.

The site is located within the Cooks River Catchment, which covers approximately 10,000 ha of mainly residential and industrial land. Existing stormwater infrastructure on the site comprises underground pipes which transport stormwater from Wentworth Street to Cosgrove Road, under the site. Coxs Creek, a tributary of the Cooks River, runs under the site for a distance and then emerges as an open,

concrete lined, channel part of the way across the site. The other pipes discharge into unnamed creeks that are open for a short distance and then become culverts under Cosgrove Road.

The ILC site is currently a severely degraded landscape which has very few remaining natural features. It is dominated by abandoned buildings, bare earth, paved areas and five stockpiles which are located in the southern half of the site.

1.4 Project Description

The project comprises the development of the ILC and associated rail infrastructure, services and environmental enhancement works. The new ILC will be used for the transfer and storage of container freight going to and from Botany Bay, packing and unpacking of containers within the proposed warehouses and storage of empty containers.

The development of the Enfield site will comprise:

- An intermodal terminal for the loading and unloading of containers;
- Warehousing;
- Empty container storage facilities;
- A light industrial and commercial area;
- Construction of a road bridge over the existing new marshalling yards for access to Wentworth Street; and
- A community area which will include ecological enhancement primarily associated with the proposed Green and Golden Bell Frog (*Litoria aurea*) habitat and Coxs Creek.

At completion, the majority of site will consist of hard surfaces and would be covered by buildings, rail infrastructure and paved areas for storage of containers and roads. Areas that would remain unpaved include the proposed Green and Golden Bell Frog and associated landscaping area largely based around Stockpile 4 at the southern part of the ILC site.

2 CONTROL FRAMEWORK

2.1 Weeds of National Significance (WONS)

In 1998, Australian governments endorsed a framework to identify which weed species could be considered WONS within an agricultural, forestry and environmental context. Twenty weed species were identified as WONS and these determinations were based on:

- The invasiveness of a weed species;
- A weed's potential impacts;
- The potential for spread of a weed; and
- Socio-economic and environmental values.

The issues concerning WONS are of such a magnitude that they require coordination among all levels of government, organisations and individuals and whilst individual landowners and managers are ultimately responsible for managing WONS, State and Territory governments are responsible for overall legislation and administration. Each WONS has a strategic plan that outlines strategies and actions required to control the weed and identifies responsibilities for each action.

2.2 NSW *Noxious Weeds Act 1993*

In NSW the identification, classification and control of noxious weeds is governed by the *Noxious Weeds Act 1993* as amended 2005 (NW Act). Plants that have been declared as noxious weeds are classified into specific control classes in each Local Control Area, or LGA. These classes and the control requirements are listed in Table 1.

Table 1 Weed classes under the *Noxious Weeds Act 1993*

Weed Class	Control Requirements
Class 1 State Prohibited Weeds	Plants that pose a potentially serious threat to primary production or the environment and are not present in the State or are present only to a limited extent. Legal requirements are that the plant must be eradicated from the land and the land must be kept free of the plant.
Class 2 Regionally Prohibited Weeds	Plants that pose a potentially serious threat to primary production or the environment of a region to which the order applies and are not present in the region or are present only to a limited extent. Legal requirements are that the plant must be eradicated from the land and the land must be kept free of the plant.
Class 3 Regionally Controlled Weeds	Plants that pose a serious threat to primary production or the environment of an area to which the order applies, and are likely to spread in the area or to another area. Legal requirements are that the plant must be fully and continuously suppressed and destroyed.

Weed Class	Control Requirements
Class 4 Locally Controlled Weeds	Plants that pose a threat to primary production, the environment or human health, are widely distributed in an area to which the order applies and are likely to spread in the area or to another area. Legal requirements are that the growth and spread of the plant must be controlled according to the measures specified in a management plan published by the local authority.
Class 5 Restricted Plants	Plants that are likely, by their sale or the sale of their seeds or movement within the State or an area of the State, to spread in the State or outside the State. Legal requirements are that the requirements in the NW Act for a notifiable weed must be complied with.

Advice received from Department of Trade and Investment, Regional Infrastructure and Services (M. Michelmore, Invasive Species Unit) regarding disposal of noxious weeds states:

> *Noxious weeds can be buried on or near the site they were harvested. Typical depths of cover by earth are 1 m prickly pear, 2 m alligator weed, 0.5 m all other weeds. The site will need to have some monitoring to control weeds in case of slumping, erosion, or other. If weeds are moved from lot to adjacent lot, or across a public road, that is part of the same development, then there is no need for approval to move. If weed control class 1, class 2, or class 5 weeds are moved along public roads, then we can issue a permit.*
>
> *It is important that you know that councils are responsible for enforcement of noxious weeds control on private and council lands. The Minister for Primary Industries is responsible for enforcement of noxious weed control on land of public authorities, such as railways.*

2.3 Environmental Weeds

Environmental weeds are not legally controlled but include any plant that can cause serious harm to the environment by invading and overtaking natural systems and are sometimes referred to as Regionally Significant weeds. Environmental weeds tend to be species that are plastic and adaptable making them capable of easily colonising a range of environments.

These can also be native species which are known to opportunistically expand as a consequence of anthropogenic effects and this can threaten natural ecosystems, through invasion of plant communities, by out-competing other locally indigenous species, by reducing diversity and resulting in a loss of more diverse habitat for native animals.

3 ILC SITE

3.1 Site Assessment

An assessment of the ILC site was undertaken on 6 January 2011. On the day of assessment the weather was dry and humid with temperatures around 26 °C, although Sydney has been experiencing higher than normal rainfall during the latter half of 2010.

During the assessment a list of plant species occurring across the site was compiled. Notes were made on their density of occurrence and the major infestations of noxious weeds were mapped.

Occurrences of the most commonly recorded weeds were ranked as:

R = rare
L = localised
O = occasional
C = common
VC = very dominant
D = dominant

3.2 Weed Distribution

The site supports an extensive suite of weed species, seven of which are declared as Noxious within the Strathfield LGA and these were:

- Blackberry;
- Pampas Grass;
- Lantana;
- Boneseed;
- Green Cestrum;
- Castor Oil Plant; and
- Large Leaved Privet.

Blackberry, Boneseed and Lantana are also listed as WONS. The list of species, legal status and the density of the most commonly occurring species is provided in Table 2 and the distribution of those noxious weeds with large clumping infestations across the site (i.e. Blackberry, Lantana and Pampas Grass) is shown in Figure 1 and Figure 2.

Whilst Blackberry, Lantana and Pampas Grass occur largely as well defined infestations, many smaller occurrences of each of these are also scattered across the site. The majority of the other weed species are scattered throughout, although Castor Oil Plant appears to be germinating in areas of bare soil which have been overturned in the past month.

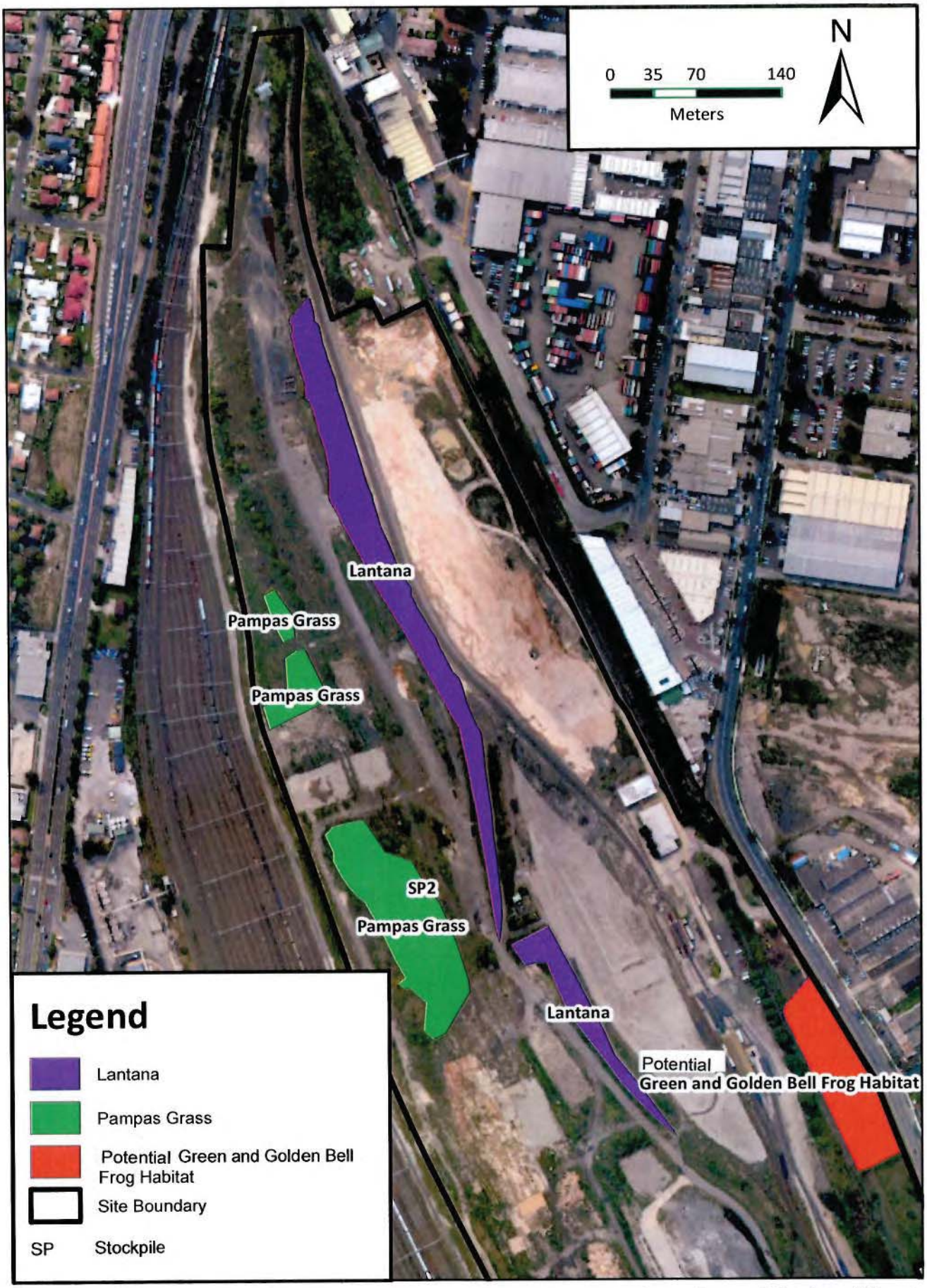
Table 2 Significant Weed Species Recorded in the Study Area

SCIENTIFIC NAME	COMMON NAME	NOXIOUS CLASS*	WoNS	ENVIRONMENTAL WEEDS	OCCURRENCE *
Woody Weeds					
Acacia baileyana	Cootamundra Wattle			√	R
Acacia podyrifolia	Mt Morgan Wattle			√	R
Acacia saligna	Sickle-leaf Wattle			√	C
Albizia lophantha	Albizia			√	R
***Cestrum parqui** *	**Green Cestrum**	3			O
Chrysanthemoides monilifera* subsp *monilifera	**Boneseed**	3	**WoNS**		L
Cinnamomum camphora *	Camphor laurel			√	O
Cotoneaster sp.	Cotoneaster				O
Erythrina skyesii	Indian Coral Tree			√	R
Genista monspessulana *	Cape Broom			√	O
***Lantana camara** *	**Lantana**	4	**WoNS**		VC
***Ligustrum lucidum** *	**Large Leaved Privet**	4			O
Melia azedarach	White Cedar			√	R
Olea europaea subsp *cuspidata*	African Olive			√	O
Psoralea pinnata	Purple Pea Flower			√	O/L
Pyracantha sp.				√	R
***Rubus fruticosus* (aggregate) ***	**Blackberry**	4	**WoNS**		C

SCIENTIFIC NAME	COMMON NAME	NOXIOUS CLASS*	WoNS	ENVIRONMENTAL WEEDS	OCCURRENCE *
Herbaceous Weeds					
Grasses					
Arundo donax	Giant Reed				L
***Cortaderia selloana** *	**Pampas Grass**	3		√	VC
Eragrostis curvula	African Love Grass			√	C
Pennisetum clandestinum	Kikuyu Grass			√	C
Phylostachys ? auera	Golden Cane / Bamboo			√	L
Other introduced grasses					VC
Flowering Forbs					
Ageratina adenophora	Crofton Weed			√	O
Asclepias fruticosus = Gompholobium	Cotton Bush			√	O
Ambrosia sp.	Perennial Ragweed			√	O
Coreopsis lanceolata	Coreopsis			√	L
Cyperus eragrostis, C spp.	Umbrella Sedge			√	C/L
Foeniculum vulgare	Fennel			√	VC
***Ricinus communis** *	**Castor Oils Plant**	4			VC
Xanthium spinosum	Noogoora Burr			√	O

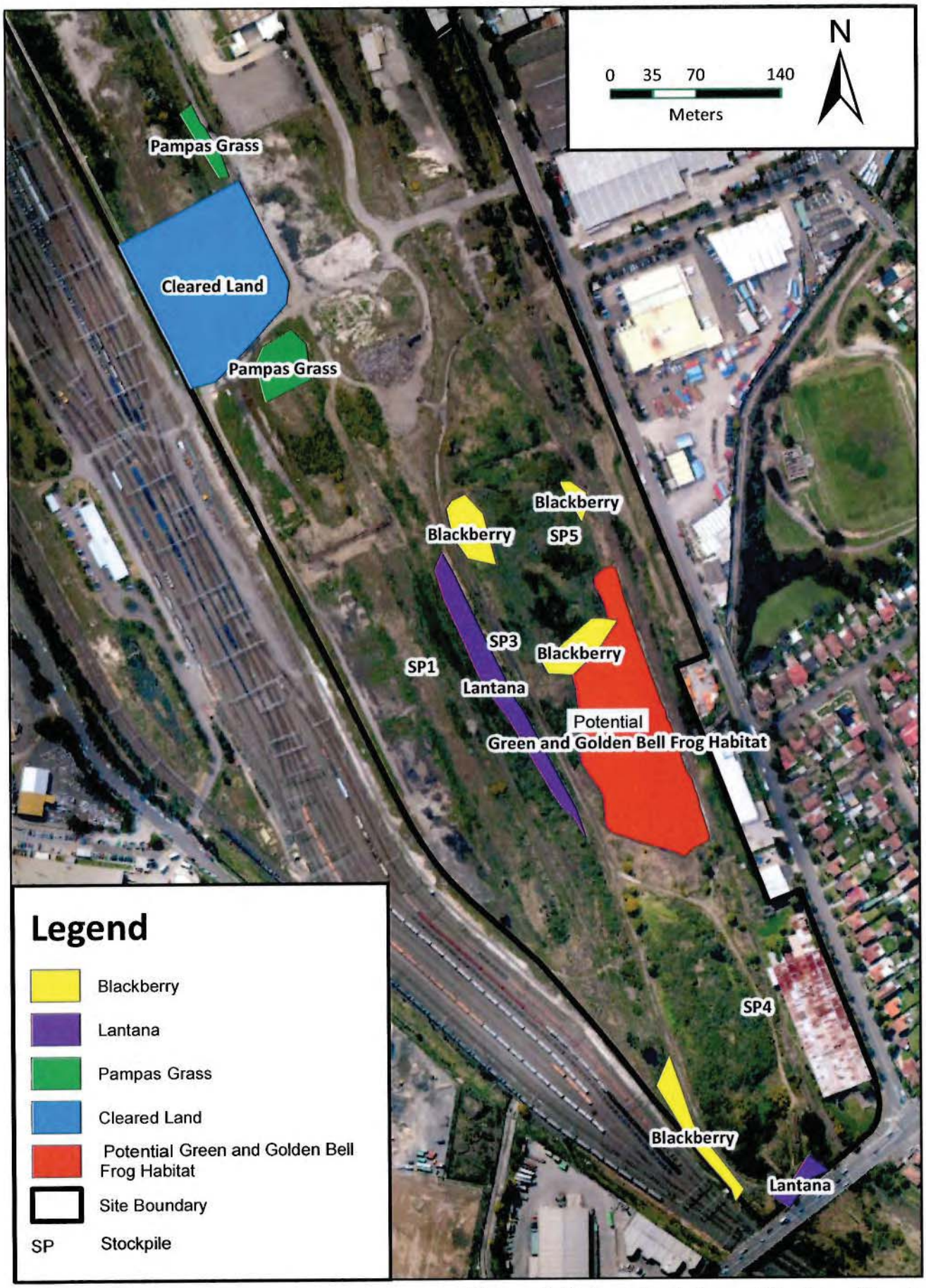
SCIENTIFIC NAME	COMMON NAME	NOXIOUS CLASS*	WoNS	ENVIRONMENTAL WEEDS	OCCURRENCE *
Vines, Climbers & Scramblers					
Acetosa sagittata	Turkey Rhubarb			√	O
Anredera cordifolia	Madeira Vine			√	L
Araujia sericifera	White Moth Vine			√	L
Ipomoea indica *	Morning Glory Vine			√	C
Lonicera japonica	Japanese Honeysuckle			√	L
Tradescantia fluminensis *	Wandering Jew			√	O

Note: some of the environmental weeds listed above are declared as noxious weeds in other LGAs in the Sydney Region (*Noxious Weeds Act 1993*, Amended 2005), Key: R=rare; L= localised; O=occasional, C=common, VC=very common; D=dominant. WONS = Weeds of national significance.



Intermodal Logistics Centre at Enfield

Figure 1: Major infestations of Noxious Weeds across the ILC site North - January 2011



Intermodal Logistics Centre at Enfield

Figure 1: Major infestations of Noxious Weeds across the ILC site South - January 2011

4 APPROACH

4.1 Challenges

The size of and the intensity of weed infestations site across the site provides a number of challenges in formulating a strategy for removal, disposal and control during construction. Hence, a number of control strategies are being considered within the potential framework to meet the needs of the site. Although it is possible that a single strategy could be developed to provide control it is more likely that an integrated strategy would be the most effective from a cost and resource perspective, including herbicide and non-herbicide control methods.

4.2 Potential Approaches

A number of approaches have been trialled and in some cases used successfully in Australia and these are included in Table 3.

Table 3 Weed control methods

Control Method	Description	Applicability to ILC
Biological control	Weed biological control involves the use of the plant's natural enemies such as insects, mites and diseases to control weed populations . It is an economical, effective and environmentally sound method of weed control. Biological control is practical and effective for inaccessible areas such as timbered, rocky and steep locations; areas of low-priority for control, situations where biocontrol is the only option (for example sensitive aquatic areas); situations where chemical control may be too expensive or not effective. Biocontrol is a long-term technique with extensive development and establishment phases. Biocontrol does not eradicate a weed, but if successful, reduces it to an acceptable level where it can be controlled by other means.	Technique too species focussed and too long term for the immediate needs of the site.

Control Method	Description	Applicability to ILC
Flame weeding	Used in Sweden for general weed control on hard surfaces in urban areas. The efficacy of flame weeding is attributed to a direct effect of the flame on the plant's cell membrane and an indirect effect during subsequent desiccation. The weed flaming process does not require the weed to be burnt. Rather it raises moisture temperatures to above 100°C, at which time the moisture turns to steam and ruptures the plants' cells.	Not suitable given the large areas and expanse of weeds. If technique further developed in Australia could be a suitable technique for weed control after construction.
Hot water application	Steaming is a relatively new weed control method. Applying hot water to a weed results in the loss of the plant's waxy coating, a reduction in moisture, and dehydration. The system operates by plumbing water under pressure through a heated chamber onto the weeds. The combination of heat, pressure, and water volume breaks down the cellular structure, causing discolouration and death within hours or over a few days. One treatment can kill most annuals and some young perennials.	This form of weed control is still in the developmental stage and hence is not suitable for immediate use. If technique further developed in Australia could be a suitable technique for weed control after construction.
Goats	The ability of goats to control weeds in Australia has been well documented. Goats have been used for sustainable pasture management and weed control in a range of weed situations. They can be integrated with sheep, cattle and cropping enterprises to provide weed control and pasture improvement. In most situations, goats should be seen as only one aspect of an integrated weed control program, which can also include burning, mechanical removal, spraying and pasture improvement.	The use of goats for weed control is a medium to long-term proposition. Whilst they have the potential to reduce the biomass over the long term, the husbandry and management of these animals would be onerous given the site type and location.
Herbicide control	Herbicides are widely used for control of weeds in both agricultural and non-agricultural situations. With the increasing array of products and the continuing refinement of application equipment, herbicides are a particularly attractive option because of their effectiveness and practicality in a wide variety of weed control situations. In many situations, herbicides used alone, or integrated with other control methods can prove to be the most economical means of control, requiring less labour, fuel and equipment than other methods.	This method along with mechanical control would meet best practice guidelines for control across the site.

Control Method	Description	Applicability to ILC
Burial	Noxious weeds can be buried on or near the site they are harvested. Typical depths of cover by earth are 1 m prickly pear, 2 m alligator weed, 0.5 m all other weeds.	This control method will be implemented across the site. The site will need to have some monitoring to control weeds in case of slumping, erosion, or other.
Cultivation	Cultivation is a proven way of controlling weeds. Implements range from large tractors and ploughs to hand tools such as chipping hoes . This method results in direct control of weeds.	This method is appropriate for small infestations of non-woody weeds. The size of the site and the degree of infestation and ultimate landuse of the site makes this method unacceptable.
Slashing	Slashing can be used to prevent tall growing weeds from flowering and setting seed. This method can be undertaken with a tractor and slashing implement or by using a hand-held brush-cutting machine. Slashing is not effective for eradicating a weed, but is useful for temporarily controlling weeds until they re-shoot. Slashing is cheaper than cultivation and preserves the ground cover, thus reducing soil erosion and improving access in wet weather.	Slashing would reduce the height of the plants and would reduce some of the biomass. Although this method would not control weeds.
Mulching	Mulching involves the use of physical barriers such as black plastic sheeting, woven paper products or woven cloth to exclude sunlight and prevent weed establishment. Mulching has been used in various situations, and is useful along roadsides, steep banks and cuttings where areas need to be revegetated. This option is viable for small areas and can assist in weed control, bank stabilisation and erosion.	As the majority of the area will be reformed, this method of weed control would not be appropriate.
Fire	Fire has been used for many years as a form of vegetation and weed control. It can be a useful option for the control of lantana and blackberry in certain situations. Controlled burning for managing woody weeds can help restore land to an open condition providing access for further weed control. The direct costs of managed burning are far lower than those of alternative techniques such as chemical treatment and mechanical clearing. Large, dense woody weed infestations are most suitable for fire control, as larger areas burn more effectively.	This method of weed control across the site would be a cost effective if the appropriate permits could be obtained.

Control Method	Description	Applicability to ILC
Reafforestation	Reafforestation is a long-term method of weed control. The aim of reafforestation is to form a dense tree canopy that restricts sunlight penetration to weeds on the forest floor. Reafforestation can be in the form of revegetation with mixed native vegetation species or through establishment of a single species in a plantation.	This method is to be implemented in the southern area of the site.
Land management	Management of the land can play a major role in reducing the incidence and impact of weeds on a property.	Not applicable to the ILC site.
Source: DII 2009		

4.3 Specific Weed Control Measures

4.3.1 Woody Weeds

The successful treatment of woody weeds depends on the size of individual plants, their reproductive strategies (seed and / or vegetative regeneration), and the extent of the infestation. Target weeding using a selective herbicide prior to scalping the soil or excavating with a backhoe (or similar) is the key to successful control.

Woody weeds will almost always re-shoot from cut stems or roots left in the soil and many will regenerate from weed debris left lying on moist soil. Grubbing out woody weeds, lopping or felling without treating the stumps with herbicide is generally ineffective, and results in high follow up and maintenance costs to treat weeds regenerating from broken rootstock.

The control and eradication methods recommended for the noxious weeds and some other weeds recorded across the ILC are detailed in Table 4 and Table 5.

Table 4 Woody weeds - Specific species control methods

Species	Control Method
Privet (*Ligustrum* species)	Foliar spraying of Privet seedlings with Glyphosate (marketed as Roundup or Glyphosate 340) is successful for plants up to 30 cm in height. The recommended application rate is 1:30 Glyphosate: water with a surfactant such as Pulse, Codacide Oil or Synertrol Oil added to the mix. Mature plants (> 1 m in height) must be poisoned using the cut-stump or drill and poison techniques. Privet is notorious for regenerating from broken rootstock and attempts to control this species without poisoning the rootstock are usually unsuccessful. Target herbicide treatment of Privet and other mature woody weeds, followed by grubbing or excavation and then disposal of the weed debris by stockpiling and/or burial is strongly recommended. **Note** that stockpiles must also be monitored and treated as necessary to ensure that plants regenerating from rootstock or seeds in the soil seed bank do not re-establish.
Lantana (*Lantana camara*)	Large clumps of Lantana may be sprayed using herbicides marketed for that purpose. However, Glyphosate works well at a rate of 1:100 when sprayed in summer and maximum leaf coverage is obtained. The dead clumps may be left on the spot to rot or compacted prior to burning. Lantana is difficult to burn as the wiry stems retain moisture for a long period of time. Resprouting will invariably occur if Lantana is grubbed out or burnt without first treating stumps/rootstock with herbicide. Other herbicides which achieve good results include Triclopyr and Picloram (Access), Glyphosate and Metsulphron (Trounce), Dichlorprop (Lantana 600) and Metsulfron methyl (Brushoff).

Species	Control Method
	The common practice of removing Lantana on agricultural land mechanically is not recommended unless regrowth is treated with herbicide first. Broken roots left in the soil rapidly regenerate, and the inevitable soil disturbance encourages establishment of other weeds and results in erosion on sloping ground. Alternatively, Lantana plants may be grubbed out and 2-3 herbicide treatments applied over a period of 12-18 months to control any regrowth.
Blackberry (*Rubus fruticosus* agg.)	Information regarding Blackberry control is available from Department of Industry & Investment regarding the various herbicides available, application rates, techniques and best season for control. Two commonly used foliar herbicides are Garlon and Roundup (Glyphosate) applied during the fruiting season. Of the two chemicals, Garlon is the preferred options at 1:300, not only because it has a more effective kill because it is specific to woody weeds. Metsulfron methyl (Brushoff) is commonly used to control Blackberry in rural and pasture areas but the cost, the chemical residual left in the soil and its toxicity near water does not make it a feasible option where drains or waterways are located nearby. Like any woody weed, and particularly with Blackberry, the need for follow-up treatment is crucial. The effects of the herbicide treatment may be enhanced if treated areas are burnt several months after treatment and the regrowth is sprayed the following season.
Camphor laurel (*Cinnamomum camphora*)	This species is notorious for resprouting after herbicide treatment. Generally resistant to Glyphosate herbicide, except for seedlings <0.5 m high). Physical removal, followed by chemical treatment of cut stump *and* any broken roots is the only effective control method. Recommended chemicals include Triclopyr and Picloram (various rates) and Picloram (undiluted). Other herbicides are also registered, including metsulfron methyl (Brushoff) and MCPA Dicamba (various trade names).
Green Cestrum (*Cestrum parqui*)	The use of selective herbicides on Green Cestrum has been more successful than mechanical treatment (e.g. grubbing) so a combination of both methods is recommended. However, the plant is resistant to some chemicals, including Glyphosate (Roundup) and treated plants regenerate rapidly from rootstock. Physical removal on its own has proved to be ineffective because of rapid regrowth fro rootstock. Two herbicides, Amitrole T and Picloram (*Tordon or Vigilant*), are effective in killing Green Cestrum. Used as a spray when the plant is actively growing and before flowering commences, good control is achieved. Picloram can also be applied as a granular formulation. Amitrol T will not affect seed in the soil seed bank and the flush of spring seedlings must be sprayed or removed mechanically. In contrast, Picloram persists in the soil and kills seedlings as they emerge in the following year. The persistence of Picloram is a distinct disadvantage in an urban situation where regrowth of native or other vegetation is desired.

4.3.2 Herbaceous Weeds

The successful treatment of herbaceous weeds (flowering forbs, grasses and vine weeds) depends upon available equipment, labour and time. Most grasses and small herbaceous weeds (>1 m in height) can be controlled by scaping the soil to a depth of at least 15 cm, while individuals or large plants can be grubbed out. Large infestations are best treated with a foliar spray prior to scalping as much of the root mass will be deeper than 15 cm and these will rapidly reshoot. Follow-up herbicide treatment is essential to achieve complete control.

Unwanted grasses may be successfully controlled using a grass-specific herbicide such as Fusilade. However, this chemical is expensive and may only be applicable to sites where the existing landform is to be retained and excavation or earthworks are not being considered.

Any site treated for herbaceous weed control should be followed-up regularly. Most herbaceous weeds either produce vast quantities of seed that remain in the soil for easy distribution by birds and animals or reproduce new plants from the tiniest stem or rhizome fragment left on the ground.

Table 5 Herbaceous weeds - Specific species control methods

Species	Control Method
Castor Oil Plant (*Ricinus communis*)	This species is intolerant of some herbicides, but an overall spray with Glyphosate (Roundup) or a Picloran (Tordon or Vigilant) + 2, 4-D mixture gives good results. Apply spray when plants are actively growing (e.g. spring/summer) and thoroughly wet all leaves and stems. Large plants may also be treated with the cut-stump method using Glyphosate and Triclopyr (*Garlon 480*), or by stem injection using undiluted Glyphosate or Hexazinone (*Velpar*). The large Castor Oil seeds are long-lived (>10 years) and if buried will regenerate from several metres down, particularly if the overlying soil is disturbed. Note that the herbicides listed above will not affect the seed already in the soil, so some regrowth can be expected, especially if the infestation is long-standing. **Note: Seeds are highly poisonous.**
Crofton Weed (*Ageratina adenophora*)	Large infestations of Crofton Weed are best sprayed with Glyphosate at 1:100 as a foliar spray. Crofton Weed does not regenerate from rootstock and the plant will compose readily, but seeds are very long lived and follow up will be necessary.
Pampas Grass (*Cortaderia selloana*)	In NSW a pesticide circular permits overall spraying of the foliage with Glyphosate. Autumn and spring are the optimal times for treating with Glyphosate at the rate of 1:100 or 1:75. Plants with a basal diameter of >1m may require high dosages. It is important to get unto the base of the plant and treat thoroughly. Larger plants may be removed using a chainsaw or whipper snipper and the open leaf cuts sprayed with Glyphosate. Debris is best disposed of by burning. Burning large clumps without the prior application of herbicide is ineffective as (as with most grasses) fire stimulates the species' growth.

Species	Control Method
	Follow-up treatment will required to target re-shooting stems or regrowth of new plants, even if plants have been grubbed out and stockpiled. Under strict supervision plants can be buried and any regrowth must be sprayed. Similarly, stockpiles must be sprayed regularly or covered with black plastic and allowed to compost.
Giant Reed (*Arundo donax*)	Physical removal of small plants (as per Pampas Grass) is possible. These may be upended on a hard surface or stockpiled and treated *in situ* if they regenerate. For large stands, Glyphosate at 200 m l/ 10L water is recommended as a foliar spray to be used prior to grubbing out. Alternatively, the culms can be cut down with a chain saw and the exposed stumps sprayed with undiluted Glyphosate. **Note:** as with all weeds with an extensive root mass, it is important to leave the plants *in situ* and the soil undisturbed for the time recommended on the product label. Failure to do so will result in partial failure of the control method.
Wandering Jew (*Tradescantia fluminensis*)	For large areas, spraying followed by scalping of the soil to a depth of at least 15 cm is the only really effective method of control. The best time for treatment is late winter to early spring, the time of maximum new growth. Two applications about 6-8 weeks apart are necessary depending on the rate of regrowth. On warm days the herbicide is slow to react and its use is best delayed. Optimal spraying times are early morning/late afternoon or anytime on overcast days. Rates vary greatly between different sites and soil conditions; however a 1:50 solution sprayed to wet the whole plant to the point of runoff is recommended. The addition of Pulse Penetrant will improve the absorption rate. Glyphosate takes up to 3 months after spraying to achieve a total kill, especially in very hot, cold, or dry weather conditions. Stockpiled plants will almost always regenerate, whether treated with herbicide beforehand or not, so a covering of black plastic (or similar) will be required.
Vines, e.g. Morning Glory (*Ipomoea indicia*) Honeysuckle (*Lonicera japonica*)	Vines which root at the nodes may be controlled by grubbing, but this is tedious and requires careful, thorough work. Frequent follow up is vital as small pieces of stem severed from the main plant during weeding will rapidly produce roots to form new plants. Vines can be treated with herbicide where infestations are dense and there is no danger of contaminating nearby waterways or damaging desirable plants. Glyphosate is recommended, used as a foliar spray. Alternatively, a chemical such as Fluroxypyr (Starane) may be used. This herbicide is more expensive, but achieves a much better root kill on vines, whereas Glyphosate often just burns the top growth off.
Madeira Vine (*Anredera cordifolia*)	For control of plants with thickened underground tubers such as Madeira Vine or *Acetosa* (see below), spraying is less successful as too little herbicide enters the plant to penetrate through to all the aerial and underground tubers. Repeated applications will necessary. Herbicide treatment prior to excavation of soil and / or scalping must be followed by spraying to control fallen and regenerating tubers. Small plants respond well to spot -spraying at 1:100 Glyphosate. Metsulfron methyl (Brushoff), Picloram (Vigilant) and Fluroxypyr (Starane) are also registered for use on Madeira Vine. Treated

Species	Control Method
	areas should be checked every 4 to 6 weeks for several years. Mulching or covering with soil will not affect this species' regenerative potential. Regrowth can exceed 4 metres in 3-4 weeks in peak growing conditions.
Weeds with underground tubers or bulbs	For the control of weeds with underground tubers or bulbs such as Acetosa and Fennel, spraying is similarly unsuccessful as too little herbicide enters the plant to penetrate through to all the tubers/bulbs. For successful control of mature plants with thickened underground tubers, bulbs or rhizomes repeated applications will be necessary. Small plants regenerating from fragmented or fallen tubers / bulbs respond well to spot-spraying. Most weeds will respond well to Glyphosate at 1:100 with an added surfactant. Note that *Fennel* may be treated like *Arundo donax* or Pampas Grass – by slashing the top growth and spraying the cut stems with an herbicide such as Glyphosate. Older plants with thickened stems can be drilled and poisoned but this is only cost effective if infestations are localised. Using a surfactant such as Pulse will help the Glyphosate penetrate better. Ratios for spraying can be as strong as 1:20 for tuber-bearing plants, but 1:30 to 1:75 is more adequate, especially for seedlings.
Turkey Rhubarb (*Acetosa sagittata*)	If the site is being excavated, all of the underground tubers must be removed. This is often difficult and time consuming unless the soil is removed to some depth because tubers are connected by a thin piece of tissue, and in many cases tubers are buried under fill, rubble, rocks, and/or buried under layers of silt and sediment. Seed set is profuse, and a flush of new seedlings will almost always establish around treated plants. These are best treated with the above mentioned dosage of herbicide at around 3-5 cm high. Tubers located close to the soil surface in open soils are the easiest to remove. However, it is important to remove all of the tubers at depth (both small and large). Smaller tubers are often found deep in the soil profile attached to finer, weaker roots (up to several metres in depth).
African Love Grass (*Eragrostis curvula*)	This species requires herbicide treatment and intensive follow up as seed set is prolific and seeds are long-lived. Several chemicals are registered in NSW: Glyphosate (Roundup); sulfometuron-methyl (various trade names), and Hexazinone (Velpar and various trade names). The latter is soil residual and may be most useful in a situation where no other vegetation is going to be allowed to re-establish.

5 PREFERRED STRATEGIES

The following protocols are recommended for use across the ILC site but it is understood that these may be integrated with other strategies after review and discussion.

5.1 Preferred Weed Control & Disposal of Debris Options

5.1.1 Woody Weeds and Perennial Vines

- Target weeding of all noxious and keystone environmental weeds using appropriate herbicides at the recommended label rates;
- Treated weeds to be left *in situ*, with no soil disturbance, for the recommended label time to achieve a total root kill;
- Dead weed biomass is to be grubbed or excavated to a depth of at least 15 cm (more if possible);
- Stockpiles to be sprayed with herbicide every 30 days in the summer period or every 60 – 90 days in cooler weather. Alternatively, cover stockpile with black plastic and secure edges. Note that stockpiles should be kept small enough to treat and/or cover effectively;
- Noxious weeds can be buried on or near the site they are harvested. Typical depths of cover by earth are 1 m prickly pear, 2 m alligator weed, 0.5 m all other weeds. The site must have some monitoring to control weeds in case of slumping, erosion, or other (M. Michelmore, Invasive Species Unit, Department of Trade and Investment); and
- Sites where weeds have been grubbed out or excavated and the landform reshaped must be monitored for weed regrowth and treated with herbicide (boom spray) as required.

5.1.2 Herbaceous Weeds and Grasses

- Slash tall herbaceous weeds to reduce biomass and remove debris to compost stockpile;
- Scalp soil, excavate to a depth of at least 15 cm, more if possible;
- Remove weed debris to stockpile site and cover or treat with herbicide (as above);
- Monitor for regrowth in treated sites and treat with Glyphosate as required;
- Alternatively, herbicide application to herbaceous weeds and grasses via boom spray prior to scalping soil to achieve a good root kill and reduce maintenance costs;
- It is possible to use a *soil residual herbicide* to ensure that no regrowth occurs, but this will have to be applied prior to any excavation or soil disturbance. Dead grass thatch can then simply be turned into the soil and buried; and
- Many of the systemic herbicides (e.g. Roundup, Garlon, Brushoff) are foliar herbicides, i.e. the chemical is taken up by the leaves and green stems. If the weeds are slashed and the top growth removed before herbicide application, then the uptake of chemical will be minimal.

5.2 Additional Notes

The following points are also noted:

- It is preferable that control should be undertaken by suitably qualified bush regeneration contractor;
- All weed control activities should be undertaken wearing appropriate personal protective equipment including an effective dust mask during the digging and removal of plant matter;
- Herbicides must be registered and used strictly in accordance to the instructions on the label and in accordance with relevant safety and environmental legislation and procedures;
- Use of herbicides on steep slopes and near any type of watercourse has a serious risk of contamination and damage to aquatic environments and therefore extreme caution should be practiced. Spraying of herbicide must not be undertaken in or adjacent to any riparian area; and
- Spraying of herbicides within or near the proposed Green and Golden Bell Frog habitat (Figures 1 and 2) should not be undertaken. Instead the following techniques should be adopted (DECC 2008):
    - Hand-pulling small soft plants such as many herbaceous weeds and grasses and the seedlings of Privet, Camphor Laurel and Lantana;
    - For plants with rhizomes or long tap roots (e.g. Asparagus Fern and some grasses) inserting a knife into the ground near the plant and cutting around the root;
    - The stem of vines and scramblers and plants with extensive root systems can be scraped with a knife and herbicide carefully applied along the length of the scrape;
    - Cutting small woody weeds as near to ground level as possible and applying herbicide within 20 seconds to the cut, for plants with stems less than 5 cm in diameter;
    - 'Frilling' large woody weeds with stems greater than 5 cm in diameter, by making a cut with a chisel at the base of the plant and applying herbicide into the gap immediately. Continuing in a circle round the trunk, repeat the 'cut and poison' technique at five centimetre intervals.

6 REFERENCES

DECC 2008 **Best Practice Guidelines. Green and Golden Bell Frog Habitat.** Department of Environment and Climate Change NSW, Goulburn Street, Sydney.

Department of Industry and Investment (Industry & Investment NSW) 2009 **Noxious and Environmental Weed Control Handbook. A guide to weed control in non-crop, aquatic and bushland situations.** 4th Edition State of New South Wales.

SKM 2005 **Environmental Assessment Intermodal Logistics Centre at Enfield.** Prepared for Sydney Ports.

Other Useful Websites for Weed Management

Sydney Weeds Committees Website

http://www.sydneyweeds.org.au/weeds.php

The Weed Society of NSW

http://nswweedsoc.org.au/

Department of Industry & Investment – Agriculture

http://www.dpi.nsw.gov.au/agriculture

Office of Environment and Heritage

http://www.nationalparks.nsw.gov.au/npws.nsf/content/nsw_weeds

Weeds of National Significance

http://www.weeds.org.au/natsig.htm

Weeds Australia

http://www.weeds.org.au/

CRC Weed Management

http://www.weeds.crc.org.au/index_noflash.html

NPWS Weed Removal Fact Sheets

http://www.nationalparks.nsw.gov.au/npws.nsf/content/weed_removal_factsheets

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Appendix B

Pre-Vegetation Removal Checklist

	PRE-VEGETATION REMOVAL CHECKLIST	Location: Date:

Discuss any weed spraying or tree removal activity with the Environmental Manager.
No vegetation removal is allowed to occur without Environmental Manager's Approval.

Request Date:		**Area:**			
#	**Control Measure**	**Yes**	**No**	**N/A**	**Comments**
1.	Vegetation removal required? Provide works required and justification /comment				
2.	Has Environmental Manager been onsite to walk through?				
3.	Boundary of clearing zone determined or individual trees marked?				
4.	Are other approvals (Council or Railcorp) required because of location of trees?				
5.	Is retention of trees in areas not requiring removal being maximised? e.g. southern portion of the site				
6.	Protective fencing installed around sensitive area, including frog ponds?				
7.	Vegetation waste or mulch stockpile location identified?				
8.	Tannin runoff risk assessed and managed?				
9.	Sediment controls identified following vegetation removal / disturbance?				
10.	Determine spray area for herbicides? Demarcated?				
11.	Trained persons spraying weeds?				
12.	Appropriate weather conditions for spraying: not hot & dry, windy or rain within 24hrs before or after?				
13.	Use of herbicides away from existing potential frog habitats or Frog habitat construction Area?				
14.	Prior notification for pesticide use in public areas complete?				
15.	Special permission required to cut and paint weeds within frog areas?				
16.	Any other issues to add or delete from the checklist?				

Completed by Engineer: Date:	Environmental Manager Approval: Date:

ILC at Enfield

Waste, Reuse & Recycling Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK
1.01	Draft as updated for Main Construction	23/02/11	GK
2.0	Final for Main Construction	23/03/11	GK
3.0	Final for Main Construction	17/05/11	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Waste, Reuse & Recycling Management Plan (WRRMP) forms part of the Construction Environmental Management Plan (CEMP) for the Intermodal Logistics Centre at Enfield (ILC)'s Main Construction phase. The purpose of the WRRMP is to describe how Leighton Contractors will assess and where possible reduce waste produced during construction, maximise resource recovery opportunities, and indicate how waste will be managed, tracked and reported.

1.2 Objectives

The key objectives of the WRRMP are to ensure that resources are used efficiently and waste from the Project is minimised. To achieve this objective, the LCPL project team will undertake the following:

- Adopt the avoid, reduce, reuse, recycle, dispose hierarchy
- Minimise impacts from waste generation
- Minimise contamination of recyclable waste streams
- All concrete re-used as clean fill on site, or recycled at an offsite facility
- No removal of clean spoil or soils from the construction site, unless absolutely necessary
- Ensure that all project personnel are aware of the importance of sound waste management practices and the actions they can take

1.3 Legislation and Guidelines

Legislation

The main legislation relevant to waste, reuse and recycling management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences for issues including waste management. Section 143 requires waste to only be deposited at an appropriate DECCW-licenced waste disposal facility or other premises where waste can be legally disposed. Licensed

transporters must be used to transport waste classified as industrial or hazardous. The Act also regulates crushing and grinding activities which relate to the recycling of concrete and asphalt on site.

- **Protection of the Environment Operations (Waste) Regulation (2005) + POEO Amendment Regulation 2008** – Schedule 1 sets out the types of waste to which waste tracking requirements apply. Clause 42 provides special requirements relating to the transportation, collection, storage, or disposal of asbestos wastes. Clause 51A provides general provisions relating to waste exemptions.
- **Waste Avoidance and Resource Recovery Act (2001)** – Encourages the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development. This legislation's objective is to ensure that resource management options are considered against the avoidance, resource recovery and disposal hierarchy, and to provide for the continual reduction in waste generation.

Ministers Conditions of Approval

The Ministers Conditions of Approval relevant to WRRMP with details of the condition and how it is addressed are described in Table 1.

Table 1: Relevant Ministers Conditions of Approval

MCoA	Description	Reference
Waste Management		
2.39	All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials.	WRRMP (this Plan) Sect 4.1
2.40	The Proponent shall ensure that all liquid and/ or non-liquid waste generated, stored on the site or disposed of, is assessed and classified in accordance with the Waste Classification Guidelines (DECC, 2008).	WRRMP (this Plan) Sect 4.1
2.41	The Proponent shall ensure that the transport of any hazardous and/ or industrial and/ or Group A waste from the site is conducted strictly in accordance with any requirements that may be specified by the DECC in relation to the transport of those wastes.	WRRMP (this Plan) Sect 4.1
2.42	The Proponent shall ensure that contaminated areas of the site that are disturbed by construction works associated with the project are remediated prior to the commencement of project operations at these areas. All remediation works shall be undertaken in accordance with the requirements of the Contaminated Land Management Act 1997 and Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (EPA, 1997).	Soil & Water Management Plan Contamination Management Plan for Construction (attached in Sydney Ports' CEMP Framework)
2.43	Prior to the commencement of construction works associated with the project that may disturb	Soil & Water

MCoA	Description	Reference
	contaminated areas of the site, the Proponent shall submit to the Director-General a Site Audit Statement(s), prepared by an accredited Site Auditor under the Contaminated Land Management Act 1997, verifying that the area of the site on which construction is to be undertaken has been or can be remediated to a standard consistent with the intended land use. A final Site Audit Statement(s), prepared by an accredited Site Auditor, certifying that the contaminated areas have been remediated to a standard consistent with the intended land use is to be submitted to the Director-General prior to operation of the remediated site(s).	Management Plan Site Audit Statements uploaded in the Sydney Port's project website
2.44	The Proponent shall manage any asbestos or asbestos-contaminated materials that may be uncovered during the construction, commissioning and operation of the project strictly in accordance with the requirements under *Protection of the Environment Operations (Waste) Regulation 2005* and any guidelines or requirements issued by the DECC in relation to those materials.	WRRMP (this Plan) Sect 4.1 & Safety Management Plan

Other Guidelines

Development of this WRRMP referenced other guidelines relevant to waste, reuse and recycling aspects. These include the following:

- Green Waste Action Plans and Construction and Demolition Waste Action Plan
- Environmental Guidelines: Assessment, Classification and Purchasing Policy
- NSW Government's Waste Reduction and Purchasing Policy (WRAPP)
- Waste Classification Guidelines (DECC 2008)
- DECCW Resource Recovery Guidelines
- Sydney Ports' Green Ports Guidelines

2 Identify and Assess

2.1 Construction Activities

Potential waste streams and the construction activities that generated them include:

- Green waste (vegetation) and weed waste during site clearing
- Sewage and domestic waste as applicable to all stages of construction at site amenities
- Materials unsuitable for reuse generated by sorting of materials during stockpiling and earthworks activities
- Unexpected contaminated soils and asbestos found during excavation
- Excess concrete, asphalt and masonry, steel, ballast, sleepers and hazardous materials during the removal of pavements, built structures and rail
- Excess concrete, asphalt and masonry during construction of the Overbridge, abutments, retaining walls, drainage and paving
- Steel from the construction of new rail

A significant opportunity with regards to waste management during the Main Construction is to reprocess waste concrete and asphalt to provide a recycled aggregate for further beneficial use on the site (e.g. backfill material and on internal haul roads). Any potential operations of crushing and grinding of concrete and asphalt to recycle aggregates is likely to be small in scale in relation to the rest of the activities undertaken during Main Construction.

2.2 Potential Impacts

With the appropriate controls implemented in accordance with this plan, there will be reduced risks to human health and degradation of the environment by the use of mechanisms that promote pollution prevention, the elimination of harmful wastes, the reduction in the use of materials, and the reuse, recovery and recycling of materials.

Any unexpected contaminated soils that may be found on the site will be carefully remediated and managed in accordance with the processes established in the Soil & Water Plan and the Contamination Management Plan for Construction attached in Sydney Ports' CEMP Framework.

Any potential operations of crushing and grinding of concrete and asphalt to recycle aggregates will be assessed and managed in accordance with this and other Sub Plans of the CEMP, particularly for potential noise and dust impacts. Consultation with DECCW with regards to a potential licence will be undertaken should the intended production rate of the activity reach the scheduled trigger values.

3 Consult and Communicate

3.1 Training and Awareness

Leighton Contractors has an environmental training program which addresses LCPL key construction risk areas including Legal and Regulatory Compliance, Air Quality, Noise and Erosion and Sediment Control and includes Waste Management.

All relevant construction personnel will attend the program. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include the topic of Waste, Reuse and Recycling, and discuss:

- Implementation of the reduce, reuse, recycle, dispose hierarchy
- Segregating wastes to aid reuse and recycling
- Minimise contamination of recyclable waste streams
- Actions to be implemented onsite to reduce waste
- Requirements of waste tracking
- Made aware of the importance of sound waste management practices and the actions they can take
- Segregating stockpiles of spoil and avoiding the mixing spoil of different qualities, to maximise the reuse of suitable spoil during construction

Ongoing awareness will be provided through posters and alerts posted on noticeboards and in lunch rooms.

3.2 Discussion and Feedback

Discussion and feedback regarding ongoing success of waste management and resource recovery controls can be had through discussions with operators of plant and site personnel onsite, and at forums such as toolbox talks or at Safety & Environment Committee Meetings.

4 Implement Controls

4.1 Mitigation Measures

The following mitigation measures will be implemented to minimise waste, and maximise reuse and recycling:

- Adopt and promote the avoid, reduce, reuse, recycle dispose hierarchy
- Prior to any off site disposal, classify all wastes generated and stored on the site during construction in accordance with the DECCW's Waste Classification Guidelines (April 2008)
- Establish a Waste Register to track waste sent off-site, and reuse and recycling on and off-site
- Use tracking dockets, obtain and retain receipts for waste and recyclable material removed from site
- All waste materials removed from the site shall only be directed to a waste management facility lawfully permitted to accept the materials
- The transport of any hazardous, industrial or Group A waste from the site will be conducted strictly in accordance with any requirements that may be specified by the DECCW in relation to the transport of those wastes
- Any asbestos waste found is to be management in accordance with the specific requirements of the Waste Regulation, other DECCW requirements and safety requirements of the Safety Plan and relevant legislation
- Establish contracts with key waste management organisations to maximise re-use, recycling and appropriate disposal opportunities over the life of the project
- Include in waste contractor sub-contract agreements requirements to comply with statutory requirements, report quantities, types, dates and destination of material removed from site
- Calculate precise estimates and ordering prior to placing orders
- If possible, implement agreements with suppliers to return excess construction materials or packaging for future reuse
- Segregate waste streams to prevent contamination of reusable and recyclable materials
- All concrete re-used as clean fill on site, or recycled at an offsite facility
- No removal of clean spoil or soils from the construction site, unless absolutely necessary

- Collect and store waste oil, other liquid wastes and spillages in suitable containers and store in a bunded area until collected for recycling or disposal. All permanent bunded storage areas must be covered
- Keep site free of litter and maintain good housekeeping at all times
- Provide paper recycling bins/boxes in all site offices. All paper waste to be sent to recycling facility.
- Encourage all project personnel to recycle paper and co-mingled recyclables in offices and compounds
- Provide education to staff and subcontractors regarding the importance of appropriately managing waste.
- Stockpile management – keep different material separate to maximise reuse of suitable material during construction
- Any potential operation of crushing and grinding of concrete and asphalt to recycle aggregates will be assessed and managed in accordance with the CEMP and other Sub Plans, and consultation with DECCW with regards to a potential licence will be undertaken if the intended production rates are above trigger values for a scheduled activity

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections that will include waste, reuse and recycling checks will be undertaken by the site Environment Manager (EM) and forwarded to the Construction Manager (CM). These inspections will be undertaken for the duration of the Project. Issues that cannot be closed out immediately will be entered into an action list and reported as described in the CEMP.

The weekly environmental checklist is included as an Appendix to the CEMP and includes a section on waste management.

Waste information reportable under the NSW Government 'Waste Reduction and Purchasing Policy' must be provided to Sydney Ports Superintendent monthly and annually by 14 July for each financial year and at project completion.

Reporting on reuse and recycling efforts and on waste management will be undertaken by the Environmental Manager to Leighton Contractors NSW/ACT/NZ Branch as part of internal monthly reporting requirements.

5.2 Auditing

Six monthly internal environmental compliance audits for compliance against the MCoA will be undertaken. The audit will include a detailed site inspection and assessment of compliance with this plan. The audit will assess reuse and recycling efforts, waste tracking, reporting, and effectiveness of controls. The site EM will be responsible for managing and implementing audit actions and the Project Manager will have overall accountability for ensuring compliance.

Independent environmental auditing will be carried out annually as described in Sydney Ports' CEMPF.

6 Manage Incident

6.1 Incident Management Framework

All environmental incidents on the project will be managed by LCPL in accordance with the incident management protocol as described in the CEMP and OH&S and Rail Safety Management Plan. This includes internal and potentially external notification and recording, reporting and response processes.

ILC at Enfield

Energy & Water Management Plan

Details of revisions

Level	Details	Date	Initial
1.0	For submission as part of Sydney Ports' CEMPF and LCPL's CEMP to Director-General	27/09/10	GK
1.01	Minor changes addressing Sydney Ports' additional comments	28/09/10	GK
1.02	Draft as updated for Main Construction	23/02/11	GK
2.0	Final for Main Construction	23/03/11	GK

Contents

1 Introduction

1.1 Purpose and Scope

This Energy and Water Management Plan (EWMP) forms part of the CEMP for the Enfield Intermodal Logistics Centre (ILC)'s Main Construction phase. The purpose of the EWMP is to detail the strategy Leighton Contractors (LCPL) will take to reduce the amount or improve the efficiency of energy and water use during the Main Construction phase, in an effort to achieve greater sustainability during construction.

The EWMP has been prepared to address the Commitment made in the EA that Energy and Water Management Strategies would be developed as part of the CEMP. The Commitment states:

> *Suitable measures would be identified and implemented during the construction phase. Energy management measures could include:*
>
> - *management and maintenance of equipment;*
> - *programming of works;*
> - *fuel usage control.*
>
> *Water management measures could include:*
>
> - *reduce consumption;*
> - *reuse of water where practicable.*

This EWMP addresses Environmentally Sustainable Development (ESD) aspects that are central to the intentions of all past and future project assessments and approvals.

1.2 Background

Sustainability refers to development that meets the needs of the present generation without compromising the ability for future generations to meet their needs (World Business Council for Sustainable Development). To achieve this, greater emphasis must be placed on decreasing our reliance on natural resources by minimising what resources we need to expend and utilising those resources efficiently. This in turn will lead to considerable reductions in the amount of waste and emissions that are generated.

Energy and water are two vital resources that are an obvious focus when attempting to improve the sustainability of a project.

1.3 Objectives

The key objective of the EWMP is to minimise the potential impact of the Main Construction phase on the resources of energy which include fuels (diesel/petrol) and electricity, and water from potable and other sources.

To achieve this objective, the LCPL project team will undertake the following:

- Raise awareness of the issues of Sustainability amongst all project personnel working on the project during the Main Construction phase
- Implement measures to reduce energy and water use

1.4 Legislation and Guidelines

Legislation

The main legislation relevant to energy and water management includes:

- **The Environment Planning and Assessment Act (1979)** - the project has been assessed and approved under Part 3A of the EP&A Act. The Project has been approved in accordance with Section 75J of the Act with a number of Conditions of Approval that must be complied with.
- **Protection of the Environment Operations Act (1997)** – Construction of the project will be undertaken in accordance with the PoEO Act, which covers a range of environmental offences including pollution to waters and land.
- **National Greenhouse and Energy Reporting Act (2007)** – Introduces a national framework for the reporting and dissemination of information about the greenhouse gas emissions, greenhouse gas projects, and energy use and production of corporations. Refer to Section 5.1.

Green Ports Guideline

Sydney Ports Corporation created the Green Port Guidelines with the aim of encouraging port developers and operators to adopt sustainable business approaches and to encourage innovation in design and operation.

The Guidelines and accompanying Checklist (attached in Appendix A) provide some simple strategies and practices to demonstrate how developments can be both environmentally friendly and commercially viable.

As the Green Ports Guideline intended, LCPL is using this as a guide and taking steps to implement simple environmental solutions to reduce energy consumption and water use amongst other things, and contribute to making port developments ‘greener’ places.

A completed Green Ports Guideline Checklist is provided as an Appendix to this Plan.

2 Identify and Assess

2.1 Existing Environment

The ILC Main Construction phase represents an opportunity to improve energy and water use beyond the 'norm', and lead by example to conserve these precious resources.

2.2 Resource Use

Construction activities that are likely to directly consume energy include any activity that requires plant and equipment which burns fuel, the majority of which are either diesel or petrol. Offices and compounds, plus some construction activities, require electricity to operate.

Other indirect uses of fuel and electricity includes staff travel to and from work, off-site transport and deliveries, and energy used to make the materials required for the Main Construction phase.

Water is used on-site for various activities including: dust suppression of exposed areas, haul roads and stockpiles; during saw-cutting; for concrete curing; and for other activities. Within the Main Site Office and at satellite compounds water is used for drinking and food preparation, and at bathroom amenities.

2.3 Potential Impacts

With such a large project site and considering the number of plant items that will be required to undertake the Main Construction phase, the greatest use of fuel will be for the running of diesel powered construction plant.

Again, the size of the ILC site and the significant amount of disturbance construction activities including earthworks entail, it is probable that the largest use of water will be for dust suppression activities.

3 Consult and Communicate

3.1 Training and Awareness

Leighton Contractors has an environmental training program which addresses LCPL key construction risk areas such as Legal and Regulatory Compliance, Air Quality, Noise and Erosion and Sediment Control and includes Energy Efficiency and Resource Use.

All relevant construction personnel will attend the program. This will be focussed on roles in a position of leadership and influence including site engineers, supervisors and construction managers.

In addition to specific training, a mandatory site specific site induction will be held for all construction personnel to ensure they understand the specific site requirements. The induction will include the topic of Energy & Water, and will discuss:

- What is sustainability?
- Likely resource uses
- Actions to be implemented onsite to reduce energy and water use
- Ways to conserve energy and water around the office

Ongoing awareness will be provided through posters and alerts posted on noticeboards and in lunch rooms.

3.2 Discussion and Feedback

Discussion and feedback regarding energy and water management controls can be had through discussions with operators of plant onsite, and at forums such as toolbox talks or at Safety & Environment Committee Meetings.

4 Implement Controls

4.1 Action Items

The following Action items will be implemented to conserve energy and water resources. Energy Action Items include:

- Plant Management System to provide efficiencies through appropriate selection, maintenance and operation of plant and equipment
- Plant Management System to drive efficient use, reductions in amount of fuels (particularly diesel) used and minimising greenhouse gas emissions, e.g. maintenance and servicing to ensure operating as efficiently as possible
- Programming of work to prevent unnecessary waiting and idling
- Vehicle Movement Plans (part of safety and traffic procedures) establishing haulage patterns which provide efficient use of large earthworks plant
- Coordinate plant to avoid unnecessary truck movements and idling
- Switching off plant and equipment when not in use for extended periods
- Monitoring fuel usage
- Car-pooling and alternative modes of transport will be encouraged throughout the Main Construction phase
- A 12 seater van will be provided to ferry people from the nearest railway station to the site during Main Construction

Water Action Items include:

- Treatment and re-use of captured site run-off
- Use water from sedimentation basins in preference to mains water for dust suppression
- Monitor use of water for dust suppression and other activities, and investigate ways to reduce potable water demand
- Investigate other treatment options (tackifiers, suppressants, polymers etc.) for exposed areas, stockpiles and haul roads
- Rainwater tank(s) will be installed at Building 31 for reuse onsite
- Dual flush toilets in most compounds
- Purchase/used water efficient appliances in compounds

- Investigate use of ‘Desert Cubes’ or similar to allow waterless urinals

Other actions are provided in the attached Green Ports Guideline Checklist.

5 Review and Monitor

5.1 Monitoring, Inspections and Reporting

Documented weekly environmental inspections that will include checks on efficient use of energy and water will be undertaken by the site Environment Manager and others including the Project Manager.

Data collection and reporting to Leighton Contractors NSW/ACT/NZ Branch includes data on energy and water usage. This data is required as part of Leighton Contractor's reporting obligations under National Greenhouse and Energy Reporting Act. Leighton Contractors will supply this data to Sydney Ports Corporation where required, to satisfy their reporting requirements.

5.2 Auditing

Six monthly internal environmental audits for compliance against the MCoA and for environmental management will be undertaken. The audit may assess energy and water aspects.

The requirements for Annual Independent Environmental Auditing in accordance with Condition 4.1c) of the Project Approval is documented in Sydney Ports' Construction Environmental Management Framework and is organised by Sydney Ports. The Independent Environmental Audit includes compliance with the CEMP and will therefore assess the implementation of this Energy and Water Management Plan..

5.3 Action Items Review

New Action Items may be added at any time to this Plan and implemented on-site as soon as possible. Improvement of existing items and innovation leading to new items will be encouraged throughout the project.

Furthermore, Action Items may be altered or deleted from time-to-time to where they are considered unviable, there is an unforseen issue with implementing what has been identified, or where further assessment has shown implementation will provide little value.

The site Environmental Manager will be responsible implementing the action items as per Section 4.1 and the Green Ports Checklist, with the support and financial backing of the Project Manager. The site Environmental Manager will be responsible for the regular review of Action Items.

6 Appendix A – Green Ports Guideline Checklist

Appendix A

Green Ports Guideline Checklist

Checklist

Applicant details

Name	Jason Pearson (Project Manager) George Kollias (Environmental Manager)	**Company**	Leighton Contractors
Address	71-73 Cosgrove Road		
City/Town	South Strathfield	**State**	New South Wales
Postcode	2136		
Telephone	1800 708 228	**Mobile**	
Email			

Project details

Location of proposed development
Intermodal Logistics Centre (ILC) at Enfield, 71-73 Cosgrove Road, South Strathfield NSW 2136
Description of proposed development
Main Construction phase of the ILC (Stage 3 in Sydney Ports' CEMP Framework)
The details on this form are the provisions and intentions for maximising the environmental sustainability of this development.

Name	Jason Pearson		
Signature		**Date**	March 2011

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Materials selection	R1	Reduce the quantity of new materials being used by reusing materials or by utilising recycled materials.	Yes	Continue to use the refurbished Building 31 as the main site office for all engineering, supervisory and support staff. Reuse of materials from excavated pavements and internal roads will be investigated Crushing of waste concrete on the site is envisaged, to supply recycled aggregates for use on the site. Recycled aggregates conforming to relevant engineering specs may also be brought onto site Reuse of excess sleepers in the Frog Habitat Creation Area and movement corridor	Occupation of the building after refurbishment during Early Works Onsite reuse of materials will be recorded Recycled aggregates purchased and brought to site will be recorded
	R2	Encourage environmentally friendly production of materials.	N/A	Not applicable as the development of the ILC Main Construction does not involve the production of materials	
	R3	Specify materials that have minimal embodied energy and environmental impact.	Yes	Investigate the procurement of concrete from nearby concrete plants of either Boral or Hanson to minimise emissions through transportation of one of the main products used in construction	Contract and use once awarded
	R4	Consider the end of life of materials and the whole building, design for deconstruction.	N/A	Design and selection of materials for pavement and structures completed by others	

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Waste management	W1	Minimise the generation of wastes.	Yes	Implement a Waste, Reuse and Recycling Management Plan to identify opportunities to prevent over-ordering, maximise use of material onsite, reuse materials as far as practical, recycle material onsite or off-site and dispose to landfill only what absolutely has to	Waste, Reuse and Recycling Management Plan Project Induction
	W2	Facilitate recycling to reduce the amount of waste going to landfill.	Yes	Establish stockpiling and materials handling areas to segregate different waste streams and facilitate reuse and recycling on-site or off-site	Segregation of material onsite for appropriate reuse, recycling and disposal
	W3	Ensure the safe storage and handling of hazardous wastes.	Yes	Any Hazardous Substances will be handled and stored safely and in an environmentally responsible manner, with covered and bunded storage areas and controls for use when in the field Hazardous wastes transported from site will be removed and disposed of by appropriately licensed contractors	Safety Management Plan CEMP Soil & Water Management Plan MSDS register Waste, Reuse & Recycling Management Plan

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Water consumption	H1	Reduce consumption of potable water internally.	Yes	Rainwater tanks will be installed at Building 31 amenities and water to be reused Dual flush toilets in portable sheds. To be installed in existing bathrooms of Building 31	
	H2	Manage and monitor water usage and any leaks.	Yes	Monitor water used on-site for dust suppression and other activities, and investigate ways to reduce potable water demand	
	H3	Reduce the quantity of potable water used for landscape irrigation.	Yes	Landscaping irrigation will be required during the Main Construction phase to help establish newly planted areas. Landscape irrigation will be placed on timer that will water plants during the establishment period, at appropriate times of the day (dawn and dusk) to avoid evaporation. The effectiveness of the irrigation activity will be monitored.	
	H4	Treat water on-site and reuse the treated water to reduce demand on the local potable water supply and the demand on the local infrastructure.	Yes	Sedimentation basins will be constructed to capture site run-off. Water will be treated for turbidity and/or pH if required. Water will be reused where possible for site activities including dust suppression	Soil & Water Management Plan

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Energy use	E1	Reduce energy consumption and hence greenhouse gas emissions.	Yes	Plant and equipment selected, maintained and operated to provide efficient use and minimise greenhouse gas emissions Use energy efficient appliances (such as fridges & printers). Ensure equipment turns off when not required, including computers	Plant Management System which includes pre-delivery inspection and daily pre-start checks Establish Vehicle Management Plans to allow smooth, efficient operation of large construction plant
	E2	Manage the use of energy to minimise consumption.	Yes	Ensure Main Office lighting and other lighting is switched off when not required as far as practicable, allowing for lighting at night for security purposes Turn off computers at the end of the day Use of energy efficient fluorescent light bulbs through the Project Office, Building 31	Ongoing awareness to ensure culture of minimising energy use with office lighting and computers
	E3	Source energy from renewable sources.	No	Sourcing energy (electricity) from renewable sources doesn't address the issue or aid continuous improvement for the construction industry, where diesel is the biggest energy use. The northern dust monitor is powered by small solar panels	
	E4	Source energy from alternate energy sources and use less greenhouse intensive fuels (in particular limit diesel use).	Yes	Improving efficiency of plant and equipment through appropriate selection, maintenance and operation, thus minimising diesel (and other fuels) use	Plant Management System which includes pre-delivery inspection and daily pre-start checks Establish Vehicle Management Plans to allow smooth, efficient operation of large construction plant

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Transportation	T1	Encourage the use of alternative modes of transport by employees, in order to reduce the amount of inefficient/individual car travel and therefore greenhouse gas emissions.	Yes	Alternative modes of transport will be encouraged throughout the project, including car-pooling, cycling and public transport A 12 seater van will be provided to ferry people from the nearest railway station to the site during Main Construction	
	T2	Reduce greenhouse gas emissions from operational vehicles and equipment.	Yes	Plant and equipment selected, maintained and operated to provide efficient use and minimise greenhouse gas emissions Coordinate plant to avoid unnecessary truck movement and idling Switching off plant and equipment when not in use for extended periods	Plant Management System which includes pre-delivery inspection and daily pre-start checks Establish Vehicle Management Plans to allow smooth, efficient operation of large construction plant

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Indoor environment	IE1	Improve the quality of indoor air to protect the health of employees and enhance productivity.	Yes	Improve the overall health of Building 31 Main Site Office through the removal of asbestos items and managing lead paint, improving the indoor health of the building and adding life to its use	Continue to use the refurbished Building 31 as the main site office for use by all engineering, supervisory and support staff.
	IE2	Optimise daylighting and make best use of artificial lighting to assist eye health and productivity.	Yes	Use of existing windows in Building 31	
	IE3	Provide optimum acoustical environment for productivity and to prevent ear damage.	Yes	Appropriate placement of printers within the Main Site Office and locating the server in a separate utility room	

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Emissions	EM1	Protect the ozone layer and reduce the potential for global warming.	Yes	Ensure existing Air Conditioning System is working efficiently and without leaks	Air Conditioning Service Report(s)
	EM2	Limit the generation of air pollutants and ensure that they are emitted away from sensitive receptors.	Yes	Ensure existing Air Conditioning System is working efficiently and without leaks	Air Conditioning Service Report(s)
	EM3	Minimise odours.	Yes	No odours expected, but any report of odour will be investigated	Air Quality & Dust Management Plan
	EM4	Minimise noise nuisance.	Yes	Many measures for the various activities of construction Monitoring will be conducted	Noise & Vibration Management Plan Monitoring record
	EM5	Avoid light spill into night sky or neighbouring properties/areas.	Yes	Light towers used for out of hours works will be orientated away from neighbours and potential frog habitats	Observations during Out of Hours works
	EM6	Avoid accidental contact with hazardous or poisonous goods.	Yes	Appropriate storage, handling and use of all chemicals	Safety Management Plan MSDS

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Water quality	HQ1	Manage stormwater to reduce peak stormwater flows and protect water quality.	Yes	Install sedimentation pond(s) which will become the ultimate stormwater detention basis for the development	Soil & Water Management Plan
	HQ2	Manage water quality to protect the harbour and other water bodies.	Yes	Erosion and sediment controls including sedimentation basins and discharge procedures to prevent pollution of drains and watercourse with sediments, nutrients and other contaminants	Soil & Water Management Plan Erosion & Sediment Control Plans
	HQ3	Prevent damage from potential flood events and water table changes.	Yes	Acknowledge historical flooding upstream of the project site along Coxs Creek and drains which cross site. No restriction of flows within these drains	Soil & Water Management Plan

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Land use	L1	Encourage the redevelopment of sites that have previously been developed and remediate contaminated land.	Yes	Redevelopment of the site includes the management of previously remediated areas and potentially the remediation of unexpected contamination Low probability of Acid Sulphate Soils in the southern section of the site	
	L2	Use landscaping to enhance biodiversity and conserve and create habitat for flora and fauna.	Yes	Landscaping in accordance with Landscaping Specifications	
	L3	Enhance visual amenity.	Yes	Improve visual amenity through clearing, levelling and improving the site	Remove unsightly weed covered stockpiles to improve amenity of area
	L4	Avoid impact on identified heritage items.	Yes	Identified heritage items that remain on the site will be protected	CEMP Induction

	Item No	Purpose/criteria	Has this been addressed? (Yes, No, N/A)	How has it been addressed? Or, why has it not been addressed?	Provide details of supporting documentation/ reference material
Environmental management	M1	Maintain good relationships with stakeholders and respond to any complaints.	Yes	Consultation with surrounding Stakeholders and Community will be undertaken in accordance with the Stakeholder & Community Management Plan	Stakeholder & Community Management Plan Induction
	M2	Provide a framework for identifying, managing and minimising environmental impacts, and maximising environmental benefits.	Yes	The CEMP established the Environmental System (EMS) to be used during the construction of the project Sub Plans have been developed for specific high risk aspects Works will be compliant to all relevant planning and environmental legislation Continuous Improvement and Innovation in relation to environmental aspects will be encourage as part of the ongoing use of the EMS	CEMP Sub Plans Inductions, Training & Awareness Inspections & Auditing Monitoring
	M3	Educate developers, tenants and employees about ESD and how to improve sustainability.	Yes	Improve worker knowledge about environmental issues and Sustainability through ongoing communications and awareness	Inductions, Training & Awareness