

IFL Cockle Creek Stage 2

Construction Environmental Management Plan
March 2010

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Glossary

Table 1 Glossary of terms

Abbreviation	Description
ANZECC	Australian and New Zealand Environmental and Conservation Council
BOD	Biological Oxygen Demand
CCA	Critical Construction Activities
CEMP	Construction Environmental Management Plan
Client	Incitec Fertilizers Limited
DECCW	Department of Environment, Climate Change and Water
DEW	Department of Environment and Water Resources
DEWHA	Department of Environment, Water, Heritage and the Arts
EA	Environmental Assessment (as under Part 3A of the EP&A Act)
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EMS	Environmental Management System
EPA	NSW Environment Protection Authority (part of DECCW)
EP&A Act	New South Wales Environmental Planning and Assessment Act 1979
EPL	Environment Protection Licence
ERA	Environmental Risk Assessment
ERSED	Erosion and Sediment
ESD	Ecologically Sustainable Development
hr	hour
IFL	Incitec Fertilizers Limited
IPL	Incitec Pivot Limited
kL	kilolitre
km	kilometre
LEP	Local Environmental Plan
L	litre
L 10	Sound pressure level exceeded 10% of the time during the monitoring period
L 90	Sound pressure level exceeded 90% of the time during the monitoring period

Abbreviation	Description
m	metre
mg	milligram
ML	mega litre (1,000,000 litres)
MSDS	Material Safety Data Sheet
NEPM	National Environment Protection Measure
NPWS	National Parks and Wildlife Service (part of DECCW)
NTU	Nephelometric Turbidity Units
OHS and R	Occupational Health and Safety and Rehabilitation
RTA	Roads and Traffic Authority
SEPP	State Environmental Planning Policy
s	second
SWMP	Surface water management plan
SWMS	Safe work method statement
TSS	total suspended solids
µg	microgram
µm	micron
VOC	volatile organic compound
WQMP	Water quality management plan

1 Introduction

1.1 Overview

In 2005, the Incitec Fertilizers Limited (IFL) Cockle Creek Site (herein referred to as 'the Site') located in the township of Boolaroo, New South Wales (NSW), was declared a remediation site under Part 3, Division 3 of the *Contaminated Land Management Act 1997* (CLM Act) by the NSW Environment Protection Authority (EPA), a part of the NSW Department of Environment, Climate Change and Water (DECCW). This action is referred to as the Declaration of a Remediation Site, also granting the Site remediation status.

Prior to 1969, the Site was part of the adjoining Pasminco zinc and lead smelter facility, but was subsequently excised and sold to a predecessor of IFL. IFL manufactured and distributed fertilisers from the Site until January 2009, when manufacturing activities ceased. Distribution is ongoing. A combination of the recent Site use and the surrounding historical operations has resulted in heavy metal contamination of the soil and groundwater on and under the Site.

In response to the Site's remediation status, a commitment was made by Incitec Pivot Limited (IPL), the parent company of IFL, to remediate the Site. This prompted IFL to offer a voluntary remediation proposal (VRP) to DECCW in July 2008, which resulted in a voluntary remediation agreement (VRA) being executed on 7 August 2008. The VRA outlines the approach to be taken to remediate the Site and commits IPL to remediating the vacant area of the land outside the containment cell and buffer zones to a standard suitable for residential purposes.

Under the *Contaminated Land Management Act 1997*, a VRA is now referred to as a Voluntary Management Proposal (VMP). On 9 February 2010 a VMP for the IFL Cockle Creek Site was created under section 17 of the *Contaminated Land Management Act (NSW) 1997* and amends the previous VRA dated 24 July 2008.

The project has been conducted in two stages. The first stage was the installation and operation of a groundwater treatment plant. This approval was granted under Part 3A of the *Environmental Planning and Assessment Act 1979* on the 17 August 2009. Stage 2 is the remainder of the remediation works and is the subject of this Construction Environmental Management Plan.

1.2 Project description and objectives

Objective

The primary objective of the project is to address the Declaration of Remediation Site issued by the EPA in July 2005. The declaration was made as a result of the EPA identifying that the Site fill and groundwater is contaminated with metals, in particular zinc, lead, and nickel, with the contaminated groundwater migration determined to be a significant risk of harm for the nearby Cockle Creek.

The Site will be remediated from its current industrial use. An engineered containment cell landform will hold the contamination removed from the Site. The Site will be subdivided with the containment cell retained and managed by IFL while the balance of the Site will be sold as suitable for low-density

residential development with associated commercial activities. It is proposed that the resulting containment cell landform will be open space with low-maintenance vegetation to ensure that erosion and sediment control measures will not be required after remediation is complete.

This remediation program is necessary to address the 'significant risk of harm' and to minimise human health and environmental impacts currently affecting the Site and its surrounding areas, and to progress planning for future use.

Furthermore, the project will assist in the coordination of the remediation of the Site and remediation on the neighbouring Pasminco lands, which has already commenced.

Construction activities

Phase 2

The objectives of Phase 2 include establishment of a containment cell and associated environmental controls in the northern portion of the Site, and the remediation of accessible contaminated fill and soil material to the north of the operational areas of the facility. The contaminated material beneath the containment cell footprint will be removed before the cell is constructed so that all contaminated material is contained within the cell. The containment cell would be designed to create a low-maintenance repository structure for on-site contaminated fill, soil and building materials with limited potential for impacts to the surrounding environment in the future.

Phase 3

The objectives of Phase 3 are the decommissioning of the majority of site infrastructure, once site operations are completed (including demolition of most structures), and placement of underlying contaminated fill material located across the central portion of the Site within the northern containment cell.

Phase 4

The objective of Phase 4 is the remediation of the in-filled gully and remaining areas in the southern portion of the Site, including any final landform rehabilitation required to ensure the Site is suitable for its proposed future residential land use. This will involve the removal of all contaminated material across the southern portion of the Site and placement within the northern containment cell.

Relationship between various phases

The northern portion of the Site will be the focus of both the Stage 1 (Phase 1) and Stage 2 – Phase 2 remediation activities as it is relatively unaffected by current commercial operations.

It is anticipated that the Phase 3 and 4 remedial activities under Stage 2 will progress in that order, but the implementation of Phase 4 will require careful coordination with Pasminco in regard to slope stability along the southwestern Site boundary. The current freshwater dam will need to be removed during remediation, the majority of which is located within the PCCS site.

The containment cell will be constructed and filled progressively during Phases 2 to 4 of the Stage 2 works.

Construction timetable

The proposed timeframes for the remediation phases are:

- Phase 2 – July 2010 to October 2014.
- Phase 3 – October 2010 to August 2014.
- Phase 4 – July 2010 to April 2014.

More detail can be found in Appendix E, Voluntary Management Proposal.

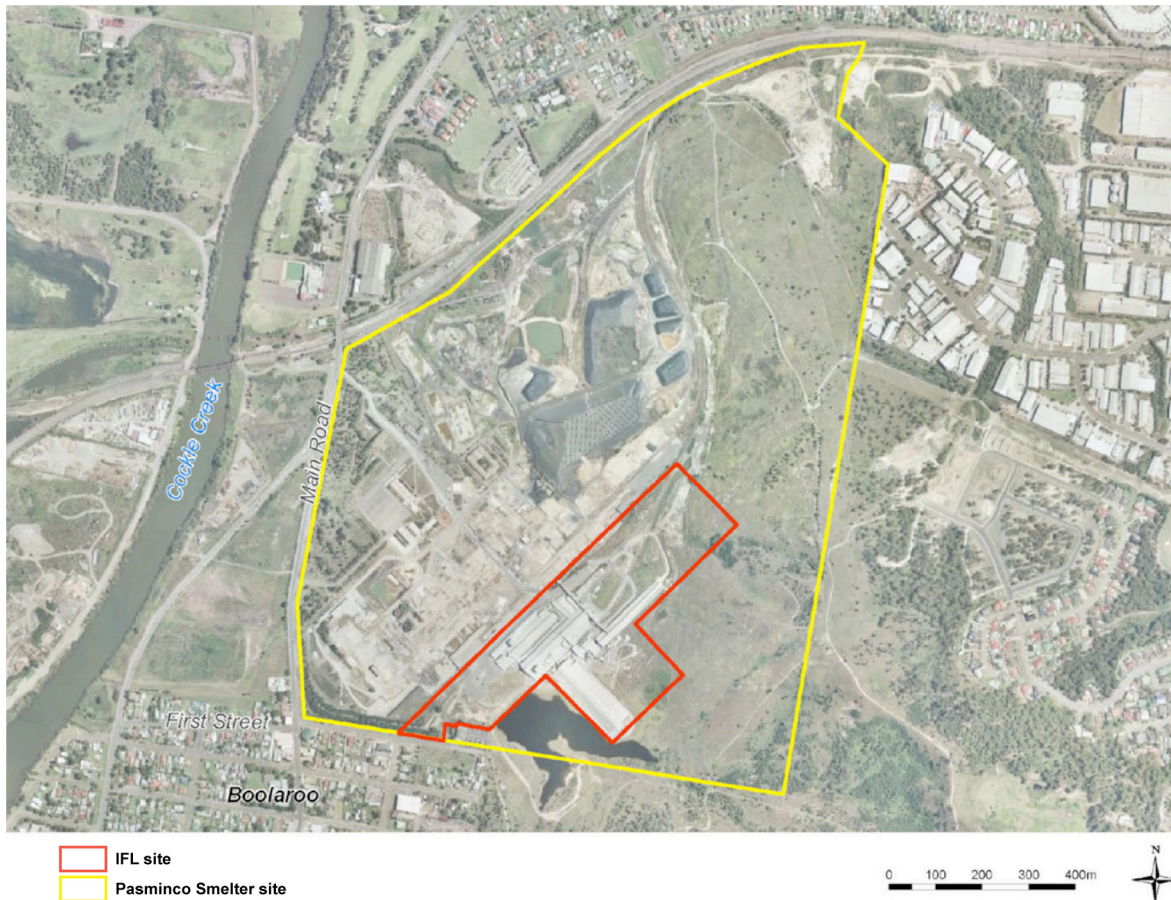
Site description

The Site is located at 13 Main Road, Boolaroo, NSW. It is Lot 1 on Deposited Plan (DP) 225720 within the Lake Macquarie local government area (LGA). The Site forms part of the Cardiff/Glendale area. It is two hours driving time north of Sydney, half an hour west of the regional centre of Newcastle (approximately 12km) and in the geographic heart of the Hunter area. Cockle Creek itself is located approximately one kilometre to the west of the Site and Lake Macquarie approximately two kilometres to the south.

Figure 1 Site location



Figure 2 Site in context



Existing land use

The main entrance to the Site occurs at the western boundary, where an access road passes through Pasmenco land and connects to Main Road, Boolaroo. The Site contains numerous buildings for administration, maintenance, dispatch, manufacture and storage of fertiliser product. Internal roadways are either concrete or bitumen, and are in good condition.

The central part of the Site includes the now decommissioned superphosphate manufacturing area, with a large number of adjacent storage sheds currently being used for the dispatch of fertiliser. Other buildings on the Site house crushers and other infrastructure. The sheds and buildings are largely constructed from corrugated steel and cement sheeting containing asbestos fibre with concrete floors.

Surrounding environment

The Site is located on a sloping section of Munibung Hill, overlooking the Cockle Creek valley. The peak of Munibung Hill occurs to the east of the Site, with the topography sloping steeply to the west.

The naturally westerly sloping topography of the Site has been altered to allow the construction of the existing Site facilities and infrastructure. A freshwater dam is located immediately outside the south-eastern area of the Site. The dam wall falls predominantly within the IFL Site, however the water it contains falls predominantly within Pasmenco land. The dam wall is located within IFL's property and is owned by IFL. The spillway occurs within the Site.

The nearest surface water body is Cockle Creek, which is located approximately one kilometre to the west of the Site, while Lake Macquarie is approximately two kilometres to the south. Groundwater flow is typically in a westerly direction, towards Cockle Creek. However, there are local variations to flow due to ongoing dewatering activities at the Teralba Colliery, to the west of the creek. Under the prevailing conditions groundwater emanating from the Site is not expected to discharge directly to Cockle Creek with groundwater levels depressed below that of the creek level. When the colliery is closed or dewatering activities cease, the regional groundwater environment would be expected to return to its natural flow pattern, with discharge to Cockle Creek or Lake Macquarie.

Boolaroo's residential area adjoins the Site and the Boolaroo village centre is approximately 0.5km away. The nearby Cardiff/Glendale area is undergoing strategic redevelopment, including the construction of a new railway station, and is identified in state and local plans as an emerging major regional centre. The centre will include new medium to high-density housing, retail and employment facilities. It already includes the largest industrial estate in the Lower Hunter.

1.3 Objectives of CEMP

This Construction Environmental Management Plan (CEMP) has been prepared to specify and document the environmental management requirements associated with the remediation program.

The environmental assessment document for this project details the environmental protection measures required, and this document details the requirements that are applicable to the construction phase of the project. This document applies for the duration of the remediation project.

This document has been prepared in accordance with ISO 14001 guidelines and covers issues raised in the environmental assessment and as a result of the public exhibition process, liaison with the site auditor, relevant government authorities and results of risk assessment.

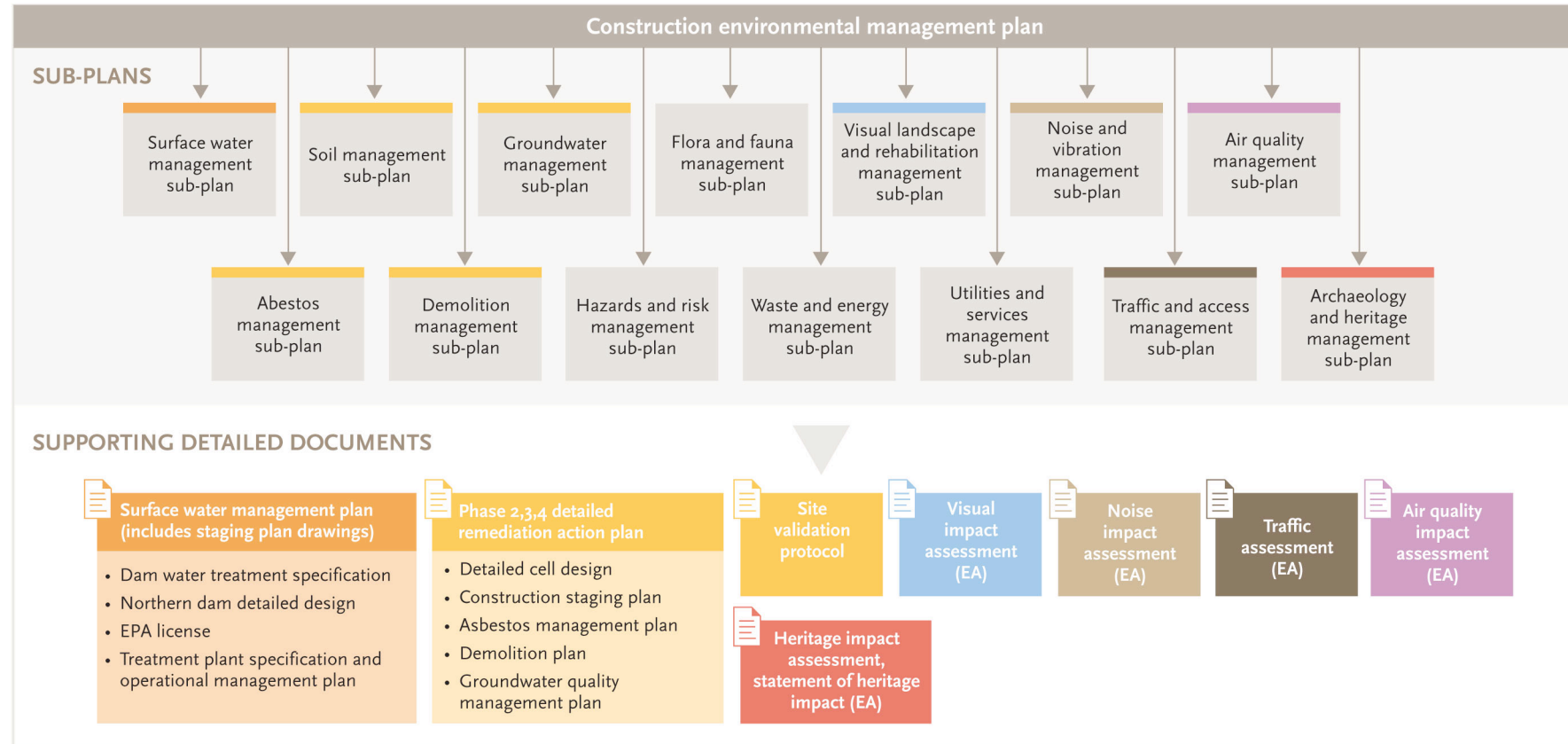
1.4 About this document

This CEMP relates to the remediation of the Cockle Creek site. It has been divided into four broad sections, as described below.

- Section 1 is an introduction to the project including proposed works, site description and objectives of the CEMP.
- Section 2 outlines the planning requirements for the proposed works and highlights potential environmental issues.
- Section 3 illustrates how the CEMP will be implemented and monitored and who is responsible for overseeing this.
- Section 4 describes the performance evaluation and review framework.

Figure 3 illustrates how this document has utilised other documents and plans, prepared for the IFL Cockle Creek project, to inform the mitigation measures proposed.

Figure 3 Documentation plan



2 Planning requirements

2.1 Development and approval process

Statutory approvals

Declaration of remediation site

The CLM Act aims to establish a process for investigating and remediating land where contamination presents a significant risk of harm to human health and other aspects of the environment. On 22 July 2005 the Site was declared to be a remediation site under Part 3, Division 3 of the CLM Act.

Under Section 21 of the CLM Act:

‘The EPA may declare land to be a remediation site if the land has... been found to be contaminated in such a way as to present a significant risk of harm.’

Following the EPA’s declaration of the Site as a remediation site, IFL prepared a VRP to remediate the Site to a standard suitable for residential use. This was endorsed by the EPA on 7 August 2008.

Amendments have since been made to the CLM Act, whereby a voluntary remediation proposal is taken to be a voluntary management proposal approved by the EPA, and the declaration of remediation site is taken to be a declaration of significantly contaminated land.

Approval requirements under Part 3A

The *Environmental Planning and Assessment Act* (EP&A Act) provides a framework for environmental planning and assessment in NSW. Part 3A of the EP&A Act provides an assessment and approval process for major infrastructure projects. As outlined under Section 75B of the Act, Part 3A applies to developments that are either declared:

- ‘(a) by a State Environmental Planning Policy, or*
- (b) by order of the Minister published in the Gazette.’*

As outlined in Clause 28 of the *State Environmental Planning Policy (Major Projects) 2005* (SEPP Major Projects), developments for which the policy applies to include:

- ‘(a) premises subject to a notice requiring prescribed remedial action to be taken under section 35 or section 36 of the Environmentally Hazardous Chemicals Act 1985 (as continued in force by the Contaminated Land Management Act 1997), or*
- (b) land declared as a remediation site under Division 3 of Part 3 of the Contaminated Land Management Act 1997.’*

In light of the Site being declared a remediation site in 2005 under Division 3, Part 3 of the CLM Act, it was subsequently included under SEPP Major Projects. This legislation has since been amended and now does not include all declared remediation sites. However, based on transitional provisions provided under the gazettal of the legislative amendment stating that ‘The amendments made to this Policy... do not extend to project applications under Part 3A of the Act, and development applications under Part 4 of the Act, made but not finally determined before the commencement of those amendments’, approval for the project remains subject to assessment under Part 3A of the EP&A Act.

2.2 Statutory obligations and requirements

Table 2 Regulatory requirements

Activity requiring approval	Legislation, licences, permits, consents or CoA	Authority	Date required/ construction stage	Date obtained/ person responsible	Where addressed in CEMP
Remediation works	Part 3A approval/EPL 208	DoP/DECCW	Prior to construction/post approval prior to construction	Manidis Roberts	Section 3 – Planning requirements
Demolition works	Part 3A approval/EPL 208	DoP/DECCW	Prior to construction/post approval prior to construction	Manidis Roberts	Section 3 – Planning requirements
Surface validation	Site Auditor sign-off of site suitability statement.	DECCW/Site Auditor	Completion of remediation works	IPL	Appendix A – Environmental Management sub-plans
Agricultural fertiliser (phosphate) production.	Environmental Protection Licence (EPL) 208 – scheduled activity to be amended	DECCW	Post approval. Prior to construction.	IPL	Appendix A – Environmental Management sub-plans
Aboriginal Heritage – Permit to alter or destroy.	National Parks and Wildlife Act, 1974 – Section 87 (to alter), 90 (to destroy)	DECCW	Not required at this stage. May be required if Indigenous relics/sites are discovered during excavation.	N/A	Appendix A – Environmental Management sub-plans
Flora and Fauna – Species Impact Statement	Threatened Species Conservation Act, 1995	DECCW	Not required at this stage. Required only if works are likely to have a significant impact on flora or fauna species listed under the Act.	N/A	Appendix A – Environmental Management sub-plans
Approval for significant environmental impacts of national	Environment Protection and Biodiversity Conservation Act,	DEWHA	Not required at this stage. Required only if the works impact	N/A	Appendix A – Environmental

Activity requiring approval	Legislation, licences, permits, consents or CoA	Authority	Date required/ construction stage	Date obtained/ person responsible	Where addressed in CEMP
significance.	1999		on matters of national significance.		Management subplans
Non-aboriginal Heritage – Excavation permit	NSW Heritage Act, 1977 – Section 139 (4).	DoP	Not required at this stage. May be required if skeletal remains or a previously undescribed item of potential heritage significance is uncovered during excavation. Approval requirement would be determined at the detailed design stage of the proposal or during construction.	N/A	Appendix A – Environmental Management subplans
Flora and Fauna – Consent to clear vegetation on State Protected Land that is not zoned as residential.	Native Vegetation Conservation Act, 2003 – Sections 19, 20, 21 and 22.	DECCW	Not required at this stage. Required if native vegetation is to be cleared within 'State Protected Land' as defined under the Act.	N/A	Appendix A – Environmental Management subplans

2.3 Environmental issues

The following aspects were identified as the key potential environmental risks relating to the Program:

- Soil.
- Non-indigenous heritage.
- Waste and resource management.
- Groundwater.
- Surface water and stormwater.
- Noise and vibration.
- Visual amenity.
- Land use.
- Air quality (including odour).

Each of these is addressed in a specific environmental management sub-plan, located in Appendix A.

The following aspects were identified as the low-risk potential environmental impacts relating to the Program:

- Indigenous heritage.
- Mine subsidence.
- Flora and fauna.
- Hazards and risks.
- Socio-economic impacts.
- Traffic and access.

2.4 Environmental risk

This section is to identify key activities that will be conducted on-site, their likely impacts and consequences and overall priority. The consequence is ranked from one to five, one being the lowest (virtually no consequence) and five being the highest (catastrophic consequence). The likelihood is also ranked from one to five, one being the lowest (extremely unlikely to happen) and five being the highest (almost certainly will happen). The priority is then calculated by multiplying the consequence by the likelihood. It then identifies where mitigation measures for these activities have been addressed.

Table 3 Environmental risk assessment

ID	Activity description	Description of issue	Description of Consequence	Environmental aspect (Y/N)										Priority			Management measures required to mitigate consequence	Residual rating
				Soil and water quality	Flora and fauna	Visual and landscape	Noise and vibration	Air quality	Traffic and access	Heritage	Safety and hazard	Waste and energy	Utilities and services	Consequence (1-5)	Likelihood (1-5)	Priority (C x L)		
1	Asbestos Removal	Uncontrolled release of asbestos	Inadvertent inhalation of asbestos fibres					Y			Y			5	2	10	Refer to: - Asbestos management sub-plan. - Demolition management sub-plan.	2
2	Vegetation clearing	Mobilise underlying soils	Sedimentation, dust and erosion	Y	Y	Y		Y						3	3	9	Refer to: Flora and fauna management sub-plan.	2
		Disposal of potentially contaminated vegetation	Inappropriate disposal of waste		Y						Y	Y		4	2	8	Refer to: Waste and energy management sub-plan.	2
3	Site management	Invasion of weeds	Weed infestation		Y									2	2	4	Refer to: Flora and fauna management sub-plan.	1
		Inappropriate waste management	Untidy site			Y					Y	Y		1	3	3	Refer to: Waste and energy management sub-plan.	1

ID	Activity description	Description of issue	Description of Consequence	Environmental aspect (Y/N)										Priority			Management measures required to mitigate consequence	Residual rating
				Soil and water quality	Flora and fauna	Visual and landscape	Noise and vibration	Air quality	Traffic and access	Heritage	Safety and hazard	Waste and energy	Utilities and services	Consequence (1-5)	Likelihood (1-5)	Priority (C x L)		
4	Removal of redundant infrastructure	Inappropriate waste management	Inappropriate disposal of waste.									Y		2	1	2	Refer to: - Asbestos management sub-plan. - Demolition management sub-plan.	1
5	Relocation/ removal of services	Disruption of services	Impact to property, environment or person								Y	Y	Y	5	2	10	Refer to: Utilities and services management sub-plan.	2
6	Dam construction	Incomplete structure before heavy rain	Mobilisation of contaminated surface water	Y										4	1	4	Refer to: Dam detailed design documents, including sediment and erosion control plan.	2

ID	Activity description	Description of issue	Description of Consequence	Environmental aspect (Y/N)										Priority			Management measures required to mitigate consequence	Residual rating
				Soil and water quality	Flora and fauna	Visual and landscape	Noise and vibration	Air quality	Traffic and access	Heritage	Safety and hazard	Waste and energy	Utilities and services	Consequence (1-5)	Likelihood (1-5)	Priority (C x L)		
7	Operation of water treatment system, including dams and treatment plants	System capacity breached	Mobilisation of contaminated surface water	Y										4	2	8	Refer to: • Surface water management plan. • Section 7 license conditions.	1
8	Establishment of southern gully	Incomplete structure before heavy rain	Mobilisation of contaminated surface water	Y										4	1	4	Refer to: • Sediment and erosion control plan and remediation staging plan.	2
		Operating machinery near residences	Disturbing nearby stakeholders				Y	Y						4	2	8	Refer to: • Noise and vibration management sub-plan. • Air quality management sub-plan.	1

ID	Activity description	Description of issue	Description of Consequence	Environmental aspect (Y/N)											Priority			Management measures required to mitigate consequence	Residual rating
				Soil and water quality	Flora and fauna	Visual and landscape	Noise and vibration	Air quality	Traffic and access	Heritage	Safety and hazard	Waste and energy	Utilities and services	Consequence (1-5)	Likelihood (1-5)	Priority (C x L)			
9	Excavation of contaminated soil	Uncontrolled release of contaminated material	Contamination of clean areas	Y				Y						3	2	6	Refer to: • Soil management sub-plan.	2	
		Disposal of inert oversize screenings.	Inappropriate disposal of waste.								Y		3	2	6	Refer to: • Soil management sub-plan. • Waste and energy management sub-plan.	1		
10	Storage of contaminated soil	Uncontrolled release of contaminated material	Contamination of clean areas	Y				Y						3	3	9	Refer to: • Soil management sub-plan.	1	
11	Storage of clean fill	Uncontrolled release of material	Sedimentation and dust	Y				Y						2	1	2	Refer to: • Soil management sub-plan.	1	
12	Excavation of clean material	Uncontrolled release of material	Sedimentation and dust	Y				Y						2	1	2	Refer to: • Soil management sub-plan.	1	
13	Installation of cell lining	Damage to lining	Uncontrolled release of contaminants	Y										4	3	12	Refer to: • Remediation staging plan.	2	

ID	Activity description	Description of issue	Description of Consequence	Environmental aspect (Y/N)									Priority			Management measures required to mitigate consequence	Residual rating	
				Soil and water quality	Flora and fauna	Visual and landscape	Noise and vibration	Air quality	Traffic and access	Heritage	Safety and hazard	Waste and energy	Utilities and services	Consequence (1-5)	Likelihood (1-5)			Priority (C x L)
14	Installation of capping material	Loss of capping material	Sedimentation and dust	Y				Y						2	3	6	Refer to: • Soil management sub-plan.	1
15	Site rehabilitation	Uncontrolled release of material during rehabilitation works	Sedimentation and dust	Y				Y						3	3	9	Refer to: • Visual, landscape and rehabilitation management sub-plan.	1

Critical construction activities and hold points

The project consists of separate activities, which are distinct in their location and function. Several of these activities could impact upon the environment during construction and, as such, would be considered a hold point in the project schedule. The Project Manager and Environmental Advisor will identify these, prior to construction commencing.

Before commencement of the identified critical activities the Environmental Advisor, Site Supervisor and Site Manager shall meet to review CEMP and high-risk activity requirements and agree upon any additional mitigation measures, for example increase surface water mitigation measures when removing the proposed dam.

Site validation

This is considered in the Site validation protocol contained in Appendix F.

3 Implementation and operation

3.1 Environmental Management Program

This chapter describes the Environmental Management Program that is necessary to meet the requirements stipulated by the Project Approval. The Program comprises a series of management plans that have been developed to address each of the Project's environmental aspects stipulated in Section 2.3 of this document.

Each management plan contains the following key information:

- What is to be achieved (objectives and targets)?
- What actions are to be undertaken to achieve these objectives and targets (safeguards and management actions).
- Who undertakes the actions, and when actions are to be undertaken (responsibility and timing).
- What documented evidence, records or sign-offs are to be maintained throughout the Program (audit trail)?

3.2 Sub-plan documentation

Outlined below is a complete list of the management sub-plans that have been included in this CEMP.

- Soil.
- Surface water (including stormwater).
- Groundwater.
- Flora and fauna.
- Visual, Landscape and Rehabilitation Plan.
- Noise and vibration.
- Air quality (including odour).
- Traffic and access.
- Archaeology and heritage.
- Hazards and risks.
- Waste and energy management.
- Utilities and services.
- Asbestos.
- Demolition.

3.3 Structure and responsibilities

A copy of the organisational chart is provided at Appendix C. The organisational chart included in this CEMP will not be maintained as current. The following provides a brief description of personnel key to the implementation of this CEMP.

Table 4 Roles and responsibilities

Position	Role and responsibility	Authority
Site Manager	• Be familiar with the relevant regulatory and project requirements and their effect on all work in progress. • Ensure compliance of all activities with the CEMP. • Ensure compliance of all activities with the EMS. • Aim to achieve and outstanding outcome of CEMP implementation. • Obtain and comply with all environmental approvals, licences and permits. • Liaise with statutory authorities. • Implement, maintain, monitor, report and advise the Environmental Advisor on all environmental issues. • Provide direction and guidance to the Site Supervisors, project engineers and supervisors to implement the CEMP. • Ensure all environmental incidents are reported and investigated in accordance with the Emergency Response Plan. • Ensure all subcontractors are informed of environmental management requirements prior to being engaged. • Monitor and take action to ensure these are implemented throughout the life of the workplace.	• 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, at no cost to the Principal. • Report any serious incidents, as soon as practicable, or no later than 24 hours after occurrence.
Site Supervisors/ Project Engineers	• Comply with the relevant environmental regulatory and project requirements as identified in the CEMP. • Exercise an appropriate level of diligence in enforcing work practices that minimize adverse environmental impacts.	• 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, at no cost to the Principal.

Position	Role and responsibility	Authority
	• Supervise all employees (including contractors) in the environmental standards required in their works. • Ensure the development of environmental controls for the work activity. • Ensure all employees in the workplace comply with environmental requirements. • Ensure all employees report any environmental risks or hazards. • Liaise with employees and sub contractors to ensure prompt response when environmental issues are raised. • Participate in regular environmental site inspections.	• Report any such occurrences to the Site Manager and Environmental Advisor, as soon as practicable, or no later than 24 hours after occurrence.
Environmental Advisor	• Monitor the implementation of all environmental management requirements both legislative and as identified in the CEMP. • Ensure the system of environmental management is planned, documented, implemented and maintained in accordance with the requirements • Assist the Site Manager in the implementation of the CEMP. • Ensure the details of the Contractor's CEMP accurately reflect the Contractor's construction activities. • Assist the Site Manager in obtaining and complying with all necessary environmental approvals/licenses. • Report on the sub-contractors' environmental performance, including non-conformances, and compliance with all regulatory requirements and maintain necessary environmental management records. • Assist the Site Manager in monitoring environmental performance and reporting. • Ensure that workplace environmental records are maintained, reviewed &, where applicable, corrective action taken. • Assist the Site Manager in ensuring that all environmental incidents are reported, investigated and corrective action taken to prevent recurrence. • Assist the project team in the implementation and maintenance of environmental controls. • Facilitate environmental induction and training of all site personnel, to ensure that all relevant employees and contractors receive environmental inductions and ongoing training as appropriate.	• 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, at no cost to the Principal. • Report any such occurrences to the Project Engineer, as soon as practicable, or no later than 24 hours after occurrence.

Position	Role and responsibility	Authority
	• Participate in regular workplace inspections to ensure compliance with the CEMP. • Assist with environmental hazard and risk identification and elimination. • Provide assistance to the Site Manager in the establishment and training in this plan; • Ensure all environmental incident response equipment is maintained on the program; • Ensure environmental incident response requirements are included and maintained up to date in the project induction; • Respond to the requirements of Regulatory Authorities as required; • Provide guidance and coordinate response to environmental incidents as required by the Site Manager, such as: • Meet Regulatory Authorities representatives at the designated location; • Direct Regulatory Authorities to the exact location of the emergency incident; • Provide up-to-date information on the status of the incident to the Regulatory Authorities; • Coordinate required responses and reporting. • Undertaking routine and random site inspections and audits. Site inspections shall be undertaken a minimum of once a week.	
All employees	• Comply with statutory and program requirements, as identified at the time of induction, as they apply to the type of work the employee is involved in. • Report any incident that may result in environmental harm that arises in the course of, or in connection with, their work. • Implement practical ways to control environmental risks.	• 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, at no cost to the Principal • Report any such occurrences to the Environmental Advisor, as soon as practicable, or no later than 24 hours after occurrence.

3.4 Training and environmental awareness

Qualifications

All personnel directly involved in environmental management shall be appropriately qualified to undertake the tasks of the position to which they are appointed.

All personnel involved in the construction works (including contractors and sub-contractors) must complete the project induction program that will advise them of the requirements of the CEMP and specific site requirements.

The Site Supervisor will be responsible for the implementation of the induction program, which shall be reviewed and approved by the Site Auditor prior to commencement of the program. The Environmental Advisor will also hold records of attendance on site.

Training programs

Site induction training program

All personnel employed on the Project, including sub-contractors, shall be required to participate prior to commencing work at the site in an environmental induction program, the purpose of which will be to:

- Introduce the CEMP and the Environmental Management Policy; and
- Review all relevant issues and controls.

A copy of the CEMP will be made available to each employee prior to commencement of training and during the life of the project.

Induction and training will address the following issues, as relevant to staff roles:

- Environmental awareness.
- Ecologically Sustainable Development (ESD) principles.
- Environmental policies.
- Relevant legislation/licences/approvals.
- Concept of due diligence.
- Site-specific environmental issues:
 - Construction Environmental Management Plan – including the content and intent of the CEMP and the importance of conformance, roles and responsibilities.
 - Operational issues.
 - Environmental management issues.
 - Emergency preparedness and response.
 - Incident reporting.
 - Community consultation and complaint handling procedures.
 - Identified environmental sensitivities.
 - Site environmental procedures.

3.5 Communication

Community and stakeholder engagement

IPL has developed a Communications Plan for the project. The Communications Plan defines the approach, objectives, key messages, tools and methods of communication to be used with key project stakeholders. The overall objective of the plan is to ensure that the community and key stakeholders are accurately informed in relation to the scope and timing of the design and construction phase of the IFL Cockle Creek project.

External stakeholders

Table 5 Environmental stakeholder contact details

Agency/company	Contact
Department of Environment, Climate Change and Water	9995 5555
Local Aboriginal Land Council	9689 4444
Lake Macquarie City Council	9976 1500

A full list of stakeholders appears in Table 2 of the Communications Plan.

Complaints register

Complaints will be recorded through the IPL company incident register. All complaints will be responded to and investigated. The NSW DECCW will be advised of the complaint, the investigation and the intended controls.

Methods of communication

Over the life of the project, IPL will continue to communicate and consult with stakeholders and the community via the following methods:

- Local media will continue to be engaged via press releases and advertising, as appropriate, to keep the community informed of developments.
- Meetings will be held with key stakeholders and community groups as appropriate.
- Periodic issue of IPL's community newsletter will be prepared and distributed to publicise actions and progress at the site.
- Website information will be updated on an ongoing basis.
- Contact details will provide in various forums to allow project feedback from the community and other stakeholders.

3.6 Strategy for emergency response

This is considered under a site based safety management plan. This will be prepared prior to construction beginning.

4 Performance evaluation and review

Compliance/verification reporting

Environmental monitoring for this project will be conducted in accordance with the monitoring requirements for each management plan. This plan will be utilised by the Site Manager and the Environmental Advisor to monitor the implementation of the CEMP and includes:

- Identification of environmental impacts, both positive and negative.
- Responsibilities.
- Methodology.
- Equipment to be used.
- Frequency of monitoring and testing.
- Identification of locations.
- Performance standards.
- Details of hold points.
- Details of records.

Environmental monitoring will be undertaken to validate estimates of the impacts of the project, it would also validate the implementation of the CEMP, and the effectiveness of the environmental controls. Monitoring requirements are detailed in Table 6 below.

Table 6 Monitoring to be undertaken during construction

Issue	Location	Monitoring Parameter	Responsibility	Frequency
During construction				
Soil contamination	Soil stockpiles.	DECCW Waste classification guidelines.	Environmental Advisor	As needed.
Surface water quality	License discharge points.	Environmental Protection Licence (EPL) 208.	Environmental Advisor	Weekly and as required by the EPL.
Groundwater quality	Groundwater treatment plant.	EPL 208.	Environmental Advisor	As required by the EPL and groundwater quality management plan.
Flora and Fauna	Whole of site.	Consistent with CEMP.	Environmental Advisor	Weekly.
Landscaping and rehabilitation (where applicable)	Whole of site.	Consistent with conditions of approval and cell specifications.	Environmental Advisor, rehabilitation contractor.	Weekly.
Noise and vibration	Whole of site.	NSW DECCW guidelines for construction noise.	Environmental Advisor	Weekly and after any complaint.
Air quality and odour	Monitoring points.	NSW DECCW guidelines for air quality.	Environmental Advisor, Site Supervisor	Weekly and after any complaint.
Traffic/access	Whole of site and access and egress points.	Consistent with CEMP.	Site Supervisor	Daily.
Archaeology and Heritage	Whole of site.	Consistent with CEMP.	Environmental Advisor	Daily.
Hazard/risk	Whole of site.	Inductions, toolbox talks, visual inspection.	All site personnel.	Daily.
Erosion and sedimentation	Whole of site.	EPL 208.	Environmental Advisor	Daily.
Waste and energy	Whole of site.	Consistent with CEMP.	All site personnel.	Daily.
Utilities and services	Whole of site.	Consistent with CEMP.	Site Supervisor.	Daily.

Issue	Location	Monitoring Parameter	Responsibility	Frequency
Training	Employees.	Consistent with CEMP.	Site Manager.	As needed.
General site environment	Whole of site	Consistent with CEMP.	All site personnel.	Daily.
Asbestos management (where applicable)	Demolition of building and if any is uncovered during excavation.	Consistent with national standards and licensed contractor systems.	Site Supervisor	As needed.

The Environmental Advisor will enter into the environmental monitoring register a record of all monitoring undertaken during construction activities. Records of actions identified and their close out will be maintained by the Environmental Advisor. Inspection records, actions, close out details and verification will be documented. Actions will be managed through these processes with elevation to non-conformances or improvement opportunities as required.

Incident management and corrective and preventative action

Corrective and preventative action involves the management of environmental incidents or complaints that may occur.

Environmental incidents are situations or events that do not comply with the safeguards and procedures stipulated by the CEMP. These are outlined in tables 7 and 8. Any such finding will be documented in the form of an incident register and a corrective action plan shall be prepared and implemented.

Definitions of incidents

Table 7 Definitions

Term	Definitions
Emergency response services	May, as appropriate, mean police, ambulance, fire brigades, state emergency services, hospitals or other specialist groups.
Incident	An incident is an undesired event that has resulted in harm to people, damage to property, loss to process, or harm to the environment or community.
Near hit	Is any occurrence, or situation, which potentially could have caused adverse consequences to people, the environment, property, reputation, or a combination of these, but which did not occur.
Incident Types	
Distribution incident	An incident arising from the transport or storage of raw materials, products, intermediates or wastes owned by the company and prior to delivery to the customer. A distribution incident may occur on a company site when transport vehicles are involved.
Electrical incident	Any incident involving an electrical current. One incident may be classified as both an electrical incident and an injury.
Environmental licence non-compliances	An excursion outside statutory discharge or emission limits (either a site's specific environmental licence, or a State Environmental Planning Policies (SEPPs). A failure to conduct a monitoring test as required in the site's environmental licence.
Environment complaint	Adverse comments and notifications from any external stakeholder including government authorities, relating to the operations or products of the company communicated to the company via any means (phone call, web site, prosecution). Note: complaints regarding truck driver behaviour should be recorded as a Distribution Incident.
Fire/explosion incident	An incident on a company site or involving off site company assets and involving an unplanned explosion or fire, including precursors to fire such as smouldering, overheating or other sources of ignition.
Near hits (near misses/unusual incidents)	An event with no adverse outcomes, or relatively minor outcomes (eg minor injuries, small spills, plant upsets), that could have had much more serious consequences and therefore warrants management's attention and the sharing of learnings with others.
Occupational injury	Is an injury, which results from a work accident or a single instantaneous exposure in the work environment.
Occupational illness	An 'occupational illness' is a diagnosed abnormal condition or disorder, other than one resulting from an 'Occupational Injury', which is caused by exposure to environmental factors associated with employment. An Occupational Illness does not arise from a single incident or instantaneous event.

Term	Definitions
Operation incident	Significant major deviation or repeated minor deviations from normal operating mode which has caused, or could potentially cause operation outside of design operating limits or practices, or a deviation from production plan or schedule.
Product (consumer) incident	A consumer or post consumer incident with Health Safety and Environment (HSE) implications that involves a company product after delivery to a customer. Product incidents include: • Injuries or illnesses or health effects attributed to a company product. • Transport or storage incidents (other than distribution incidents) involving loss of containment of a company product. • Customer site incidents involving loss of containment of a company product. • Failure of company product packaging. • Incorrect labelling of a company product. • Failure to provide Material Safety Data Sheets (MSDS) or incorrect information supplied. • Issues (injuries, illnesses, Loss Of Containments (LOCs), etc) at contract manufacturers or packers. • Delivery of wrong product. • Product quality issues with potential downstream HSE impact. • Customer incidents where a company product has been implicated. • Inappropriate disposal of a company product. • Contamination or pollution arising from use or disposal of a company product.
Security incident	An incident which results in the loss of company assets or which puts company assets or people (company workers &/or members of the public) at risk from threat, criminal, hostile or malicious activity. Assistance with classification and categorisation of security incidents can be obtained by contacting the responsible HSE Advisor.
Site loss of containment incident	An unplanned release on a company operated site of a material from a vessel, tank, pipe, pump, container or package in which it was designed to be contained. Fires and explosions can be the consequence of a loss of containment and in such instances should be reported as both a loss of containment and a fire/explosion.
Vehicle and mobile equipment	An incident which: • Occurs when travelling in or involves a company owned, leased or rented motor vehicle, whether work related or otherwise. • Involves an employee travelling in a non company vehicle on company business. • Involves on site mobile equipment either company or contractor owned or leased.

Table 8 Incident types

Incident type	Direction on what constitutes 1 incident	Near hit	Category 1 insignificant/minor (least severe)	Category 2 moderate	Category 3 major	Category 4 catastrophic (most severe)
Environmental licence non-compliance	A continuous or semi continuous event.	Licence monitoring result which is within licence requirements, but outside the company's internal benchmark measurement.	Minor impact on environment. Unlikely to cause community concern and not reportable to authorities eg exceeds internal site measure, but within licence limits.	Moderate impact on the environment. Regulatory authorities require notification. Likely to cause community concern.	Major impact on the environment. Regulatory authorities require immediate notification. Possible prosecution. Likely to cause community concern.	A catastrophic incident which: • Impacts widely on the environment. • Is prosecuted or receives other regulatory action. • Has community impact Receives national/ international media coverage.
Environmental complaint	Multiple community complaints arising from one incident should all be logged against that 1 incident.	Complaint from any external stakeholder which after investigation is believed to be unfounded, eg odour did not originate from IPL site.	An incident which did or could have arisen as a result of company operations, but caused only minor and non permanent impact on a few external stakeholders. Eg a minor odour complaint	An incident which: • Has a moderate impact wider than immediate neighbours. • Permanent impact on neighbours. • Has a longer lasting impact on multiple immediate neighbours or wider. • Receives citation or formal warning from an authority or statutory body. • Local media coverage.	• Has a major impact wider than immediate neighbours. • Significant prosecution usually involving a court appearance. • Receives State media coverage.	• Has a catastrophic impact wider than immediate neighbour. • Receives national/ international media coverage.

Incident type	Direction on what constitutes 1 incident	Near hit	Category 1 insignificant/minor (least severe)	Category 2 moderate	Category 3 major	Category 4 catastrophic (most severe)
Site loss of containment	A continuous or semi continuous event.	An undesirable event that under different circumstances could have resulted in a loss of containment.	A minor site loss of containment that: • Did not cause a recordable injury. • Had minor impact on flora/fauna in the immediate surrounding area. • Was contained within company premises. • Had no effect outside the immediate area. • Was quickly brought under control.	A moderately serious site loss of containment which caused: • A medical treatment, restricted work, or lost workday injury. • Evident pollution. • Local concern. • Evident temporary off site destruction of flora/fauna. • Minor but permanent impact on heritage values of significance to the local community. • Attracted local or state media attention. • Reportable to Authorities.	A major site loss of containment which caused: • Permanent disability or multiple lost workday injuries. • Significant local pollution. • Significant impact on local flora/fauna (either on site or off site). • Major and permanent adverse impact on heritage values of significance to the local community. • National media attention. • Reportable to Authorities.	A catastrophic site loss of containment which caused: • Multiple permanent disabilities or fatality. • Species loss from the district. • Destruction of heritage values of significance to wider community. • Widespread pollution. • Reportable to Authorities.

Any person who detects an incident, including a HSE incident, a security related incident, and/or a 'near hit', shall immediately notify the person responsible for the area/activity.

That person shall also initiate appropriate actions to minimise the potential impact of the incident. The Site Manager and Environmental Advisor shall be immediately notified to assist with the management of the incident.

Where an incident has the potential to escalate, the person detecting the situation shall initiate the site specific *Emergency Incident Response* as outlined Appendix C.

The Environmental Advisor and Site Manager will determine whether there is a duty to notify incidents to regulatory authorities.

The findings, conclusions and recommendations reached as a result of monitoring audits and other environmental management reviews will be documented. Any corrective and preventative action plans will be identified and implemented. Records of all non-conformances and corrective action plans shall be held on site by the Site Manager for inspection by relevant authorities.

During the personnel training and induction program, the Site Supervisor will emphasise to all personnel working on the site that all incidents must be documented and investigated accordingly.

The incident investigation will include the following basic elements:

- Definition of the problem – gather information and establish facts.
- Review of the quick fixes.
- Identification of root causes – isolate the essential contributory factors.
- Determine corrective and preventative actions.
- Carry out corrective actions – review of the actions for effectiveness.

Records

Environmental records, which will be collated and held on site by the Site Manager and Environmental Advisor during the construction phase of the Project, will include the following:

- Training and induction records.
- Environmental incident reports.
- CEMP distribution records.
- Environmental complaint records.
- Non-conformances and corrective and preventative action reports.
- Environmental monitoring data and reports.
- Environmental site inspection audit checklists.

CEMP review

The CEMP is a 'live' document, with the ability to change as the program situation changes. These changes can be in the form of recommendations from the Environmental Advisor, Site Manager or site employees. An Environmental Management Review can be called by IPL at any time to assess the performance of the CEMP and to suggest changes. Any changes must be consistent with the conditions of the approval.

Program review audits

Program review audits will be conducted regularly at a frequency determined by IPL and as required by the Environmental Management System. These audits will assess compliance with the requirements of this CEMP, the conditions of the approval and of Incitec Pivot's corporate EMS.

In addition external audits can be undertaken, either routinely every 6 months or at strategic intervals throughout the project. These audits could examine the performance of the project against the criteria specified by IPL.

Appendix A

Environmental management sub plans

A.1 Soil Management Sub Plan

Table 9 Soil objectives, targets, legislative requirements and references

Environmental objectives	Minimal/no impact on local waterways (including soil erosion or chemical spillage) disturbance arising from the construction/commissioning/operation.
Key legislation	- Contaminated Land Management Act 1997. - Protection of the Environment Operations Act 1997. - Soil Conservation Act 1938.
Target/performance measures	- No spills or runoff of contaminants entering waterways (stormwater, surface runoff or groundwater) or contaminating 'clean' land. - Site validation tests meet appropriate DECCW requirements.
Key guidelines, standards and other references	- EPL 208 - NSW DECC Environment Protection Manual (DEC, 1994). - NSW Department of Housing ('Managing Urban Stormwater, Soils and Construction', 3rd Edition, August 1998). - Stage 2 Environmental Assessment and Submissions Report.

Table 10 Soil Management Plan

Action		Responsibility	Timing	Supporting documents
1.1	Soil erosion and sediment controls to be installed, operated and maintained to minimise any sediment entering waters. All erosion and sediment control measures to be established before works commence and remain in place until surfaces have been fully restored and stabilised. These will be regularly inspected and appropriate removal of sediment undertaken.	Site Manager	Prior to construction. Inspection to occur weekly or after storm events	Environmental Assessment.
1.2	Preparation of a soil erosion and sediment control site plan indicating where controls to be installed, frequency of checking, what to occur after storm events etc, recording keeping.	Environmental Advisor	Prior to construction.	

Action		Responsibility	Timing	Supporting documents
1.3	Soil stockpiles are to be stored in site sheds whenever possible. If stored external to sheds, soil stockpiles will be managed to prevent environmental impacts.	Site Manager	During construction.	Environmental Assessment.
1.4	All 'clean' spoil will be tested and classified prior to reuse or disposal.	Environmental Advisor	During construction.	
1.5	Any imported 'clean' fill will be segregated and stored separately to contaminated fill.	Site Manager	During construction.	
1.6	Construction will be staged to minimise the amount of exposed soil at any one time.	Site Manager	During construction.	Environmental Assessment.
1.7	Remediated surfaces will undergo validation tests.	Site Manager	Post construction.	• Voluntary Management Proposal. • Surface validation protocols.

A.2 Surface Water Management Sub Plan

Table 11 Surface water objectives, targets, legislative requirements and references

Environmental objectives	- Minimal/no impact on local waterways disturbance arising from the construction/commissioning/operation. - Comply with the DECCW requirements for stormwater runoff water quality. - Minimise potential for flooding via effective surface water management.
Key legislation	- Contaminated Land Management Act 1997. - Protection of the Environment Operations Act 1997. - Soil Conservation Act 1938
Target/ performance measures	- No spills or runoff of contaminants entering waterways. - Compliance with site Environmental Protection Licence
Key guidelines, standards and other references	- EPL 208 - NSW DECC Environment Protection Manual (DEC, 1994). - NSW Department of Housing ('Managing Urban Stormwater, Soils and Construction', 3rd Edition, August 1998). - Stage 2 Environmental Assessment and Submissions Report. - Incitec Cockle Creek Surface water management plan (SWMP) (provided in volume 2 of this report) - Incitec Cockle Creek Surface Water Monitoring Plan (SWMP) (provided in volume 2 of this report)

Table 12 Surface Water Management Plan

Action		Responsibility	Timing	Supporting documents
2.1	Surface water issues included in site staff inductions. This is to include: - General housekeeping – trucks will cross a 'cattle grid' before leaving site, covering loads. - Covering stockpiles at the end of the day, compacting stockpiles throughout construction. - Identify locations of dam structures and which areas drain into them. - Procedures to prepare for heavy rainfall events. - Awareness of licensed monitoring points.	Site Manager	Prior to and throughout construction	

Action		Responsibility	Timing	Supporting documents
2.2	Site SWMP implemented prior to earthworks commencing. Soil erosion and sediment controls to be installed, operated and maintained to minimise any sediment entering waters. All erosion and sediment control measures to be established before works commence and remain in place until surfaces have been fully restored and stabilised. These will be regularly inspected and appropriate removal of sediment undertaken.	Site Manager	Prior to construction. Inspection to occur weekly or after storm events	Environmental Assessment
2.3	Northern and southern dams constructed prior to major remediation works commencing. Ensure all levels of edges and base are accurate with survey. Ensure soils are compacted and stabilised, any inlet channels and edges armoured for erosion protection.	Site Manager	Prior to construction. Inspection to occur weekly or after storm events	SWMP
2.4	Surface water diversions installed to direct relevant catchments to storages and treatment according to the SWMP.	Site Manager	Prior to construction.	SWMP
2.5	Surface Water treatment plant installed and commissioned prior to earthworks commencing.	Site Manager	Prior to construction.	SWMP
2.6	Establish procedure for heavy rainfall events: prepare deluge pumps, ensure electrics are functional, monitor dam levels, monitor central easement discharge.	Site Manager	Prior to construction	
2.7	Maintain stability of slopes during remediation works to ensure no major slippages of soil during rain or during work period. This applies to areas undergoing remediation, stockpile areas and cell construction areas.	Site Manager	Throughout construction period	Remediation Action Plan
2.8	Monitor water quality discharged from central and southern easements in accordance with Surface Water Monitoring Plan.	Site Manager	As specified in the monitoring plan and EPL 208	Surface Water Monitoring Plan EPL 208

A.3 Groundwater Management Sub Plan

Table 13 Groundwater objectives, targets, legislative requirements and references

Environmental objectives	- Minimise impact on adjacent groundwater and soils. - Minimal/no impact on local waterways (including soil erosion or chemical spillage) disturbance arising from the construction/commissioning/operation. - Comply with the DECCW requirements for groundwater quality.
Key legislation	- Contaminated Land Management Act 1997. - Protection of the Environment Operations Act 1997. - Soil Conservation Act 1938.
Target/ performance measures	- Continued draw down of groundwaters at the site boundary to limit off site contaminated groundwater migration. - Remediation of groundwater hot spots in accordance with Site Auditor/DECCW requirements. - No spills or runoff of contaminants entering waterways (stormwater, surface runoff or groundwater) or contaminating land. - Site validation and TCLP test results meet appropriate Site Auditor/DECCW requirements.
Key guidelines, standards and other references	- Guidelines for the NSW Site Auditor Scheme (second edition), April 2006 - Stage 2 Environmental Assessment and Submissions Report. - NSW DEC 2007 – Guidelines for the Assessment and Management of Groundwater Contamination, March 2007

Table 14 Groundwater Management Plan

Action		Responsibility	Timing	Supporting documents
3.1	Develop plan for maintenance of the ground water treatment plant (GWTP). The maintenance plan would outline the monitoring regime and would set the performance indicators Develop performance indicators for groundwater treatment plant in accordance with Site Auditor/DECCW.	Site Manager	Prior to and during construction.	Environmental Assessment/Groundwater quality management plan
3.2	Progressive removal of northern groundwater treatment system as cell is constructed.	Site Manager	During construction.	Environmental Assessment/Groundwater quality management plan
3.3	Installation of 'underdrain' beneath cell to ensure cell lining is not impacted by groundwater system.	Site Manager	During construction.	Environmental Assessment/Groundwater quality management plan

Action		Responsibility	Timing	Supporting documents
3.4	If groundwater is encountered during soil excavation, it is to be managed through the surface water management system.	Site Manager	During construction.	Environmental Assessment/Groundwater quality management plan
3.5	Institute the groundwater quality management plan (GQMP) to collect groundwater data from monitoring wells to assess the change in groundwater impacts in response to remediation.	Site Manager	During and after construction.	Environmental Assessment/Groundwater quality management plan

A.4 Flora and Fauna Management Sub Plan

Table 15 Flora and fauna objectives, targets, legislative requirements and references

Environmental objectives	- To minimise the disturbance to the local flora and fauna communities. - Carry out appropriate rehabilitation and revegetation.
Key legislation	- Protection of the Environment Operations Act 1997. - Fisheries Management Act 1994. - Environment Protection and Biodiversity Conservation Act 1999. - Coastal Protection Act 1997. - Native Vegetation Conservation Act 1997.
Target/ performance measures	- Visual observation of no introduction of weeds with construction equipment. - No change to water volume of flows.
Key guidelines, standards and other references	- NSW Fisheries Aquatic Habitat Management and Fish Conservation Policy and Guidelines. - Stage 2 Environmental Assessment and Submissions Report.

Table 16 Flora and Fauna Management Plan

Action		Responsibility	Timing	Supporting documents
4.1	If, during the course of construction, the Project team becomes aware of the presence of any threatened flora and fauna, all work likely to affect the site(s) shall cease immediately, be reported to the Site Manager. Any required permit/consent(s) shall be obtained and shall be accompanied by appropriate supporting documentation.	Site Manager	During Construction	Environmental Assessment
4.2	Vehicles are to cross a 'cattle grid' before leaving site, covering loads. This will minimise the spread of prohibited weeds or plants.	Site Manager	During Construction	Environmental Assessment
4.3	The site is to be rehabilitated using only native species.	Environmental Advisor	Post Construction	

A.5 Visual, Landscape and Rehabilitation Sub Plan

Table 17 Visual, landscape and rehabilitation objectives, targets and legislative requirements

Environmental objectives	- Minimise visual disturbance arising from project construction and completion. - Restore and landscape areas disturbed by construction works with native (endemic) species (if applicable).
Key legislation	- Protection of the Environment Operations Act 1997. - Soil Conservation Act 1938. - Native Vegetation Conservation Act 1997.
Target/ performance measures	All disturbed surfaces revegetated appropriately.

Table 18 Visual, Landscape and Rehabilitation Management Plan

Action		Responsibility	Timing	Supporting documents
5.1	Minimise external lighting to avoid visual spill and use down lighting with shades, if necessary.	Site Manager	During construction	Environmental Assessment
5.2	Design refinements to the cell should, where possible address the final landform in a manner that reduces the more artificial appearance of this feature when compared with the adjoining topography.	Design Manager	During detailed design	Environmental Assessment
5.3	Planting on the cell should where possible be varied in nature and grouped to assist in breaking down the visual prominence of the landform. The use of low shrubs (where these can be shown not to disturb capping layers) may also assist in this regard. Groups of trees in other parts of the site close to the base of the containment cell may also break down the monolithic nature of the cell.	Site Manager	During construction	Environmental Assessment
5.4	Any restoration of the former creek leading to the location of the existing dam should adopt riparian style planting.	Design Manager	During construction	Environmental Assessment
5.5	All temporary fencing for securing the works and other temporary structures should be recessive in colour where possible.	Site Manager	During construction	Environmental Assessment

A.6 Noise and Vibration Management Plan

Table 19 Noise and vibration objectives, targets, legislative requirements and references

Environmental objectives	- Keep construction noise levels within community accepted levels. - Comply with the requirements of the DECCW for construction and traffic noise and vibration. - Ensure construction equipment has adequate noise prevention safeguards and is maintained in good working order. - No effect on adjoining properties as a result of vibration from construction activities.
Key legislation	Protection of the Environment Operations Act 1997.
Target/ performance measures	- No breach of limits as required by DECCW and statutory OH&S requirements. - No complaints relating to noise or vibration arising from construction activities.
Key guidelines, standards and other references	- NSW EPA Environment Protection Manual (EPA, 1994). - AS2436 – 1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites.

Table 20 Noise and Vibration Management Plan

Action		Responsibility	Timing	Supporting documents
6.1	Develop and implement a noise monitoring audit program to ensure equipment remains within specified limits.	Environmental Advisor	Prior to Commencement of Construction	Environmental Assessment
6.2	A community information program should be developed before construction and/or high risk activities are commenced. This should usually include a leaflet distribution and direct discussions and negotiations with affected residents, explaining the type, time and duration of expected noise emissions.	Community Manager	Prior to Commencement of Construction	Environmental Assessment
6.3	Nominate a community liaison officer with a contact telephone number.	Community Manager	Prior to Commencement of Construction	Environmental Assessment
6.4	Establish a complaints and feedback hotline.	Community Manager	Prior to Commencement of Construction	Environmental Assessment
6.5	Establish stringent noise emission limits for specific equipment.	Environmental Advisor	Prior to Commencement of Construction	Environmental Assessment
6.6	Schedule activities between Monday through Friday from 7 am to 6 pm and Saturday 8 am to 1 pm. No work is to occur on Sundays or public holidays.	Site Manager	During Construction	Environmental Assessment

Action		Responsibility	Timing	Supporting documents
6.7	Perform noisy work during less sensitive time periods (eg 10 a.m.-2 p.m.).	Site Manager	During Construction	Environmental Assessment
6.8	Post types of work, a schedule and equipment details for times when noise levels will potentially exceed the guideline level. These can be retained as site records or provided to stakeholders	Site Manager	During Construction	Environmental Assessment
6.9	Train workers and contractors to use equipment in ways to minimise noise (eg avoid dropping materials from height). This will be included in the site induction.	Site Supervisor	During Construction	Environmental Assessment
6.10	Where available, use quieter plant or alternative work approaches to complete high noise-level tasks.	Site Supervisor	During Construction	Environmental Assessment
6.11	If deemed necessary, stagger activities and equipment to reduce noise so only one activity at a time is taking place.	Site Manager	During Construction	Environmental Assessment
6.12	Where possible, concentrate noisy activities at one location and move to another as quickly as possible.	Site Supervisor	During Construction	Environmental Assessment
6.13	Ensure equipment is well maintained and fitted with adequately maintained silencers that meet the design specifications.	Site Supervisor	During Construction	Environmental Assessment
6.14	Use only necessary size and power on machinery.	Site Supervisor	During Construction	Environmental Assessment
6.15	Involve affected residents in the development of acceptable noise management strategies, for example, noise barriers, modified work hours etc.	Site Manager/ Community Manager	During Construction	Environmental Assessment
6.16	Ensure Timely responses to complaints, providing information on planned actions and progress towards the resolution of concerns.	Community Manager	During Construction	Environmental Assessment

A.7 Air Quality (including Odour) Management Sub Plan

Table 21 Air quality objectives, targets, legislative requirements and references

Environmental objectives	- Minimise dust creation during construction. - Avoid using ozone depleting substances. - Minimise impacts of exhaust emissions. - No odour impacts as a result of construction activities.
Key legislation	Protection of the Environment Operations Act 1997.
Target/ performance measures	- Minimal dust and particulate matter at the site boundary. - Meet air quality requirements. - No odour complaints associated with construction works.
Key guidelines, standards and other references	NSW EPA Environment Protection Manual (EPA, 1994).

Table 22 Air Quality Management Plan

Action		Responsibility	Timing	Supporting documents
7.1	Ensure trafficable areas are clearly defined to prevent unnecessary vehicle movement.	Site Manager	Prior to Commencement of Construction	Environmental Assessment
7.2	Develop and Implement an air quality monitoring plan to manage PM ₁₀ peaks to inform dust management planning and minimise the potential for cumulative impacts.	Environmental Advisor	Prior to Commencement of Construction	Environmental Assessment
7.3	Replace or modify the high volume sampler at First Street to allow for PM ₁₀ monitoring at this location.	Environmental Advisor	Prior to Commencement of Construction	Environmental Assessment
7.4	PM ₁₀ samples should be sent to an accredited laboratory for metals analysis.	Environmental Advisor	During construction	Environmental Assessment
7.5	In the event that regular exceedances of this parameter (PM ₁₀) are witnessed, consider the introduction of a real-time, continuous PM ₁₀ monitor be placed within the vicinity of the sensitive receptors predicted to experience the highest impacts of this parameter (eg between 5 First Street and 20 First Street).	Environmental Advisor	During construction	Environmental Assessment
7.6	Conduct dust deposition monitoring at sites DG1 to DG6 throughout the remediation project.	Environmental Advisor	During construction	Environmental Assessment

Action		Responsibility	Timing	Supporting documents
7.7	All compliance monitoring to be conducted in accordance with Australian Standards as referenced in the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> (DECC, 2005b). Of specific relevance are: AS 3580.10.1-2003 Methods for Sampling and Analysis of Ambient Air – Determination of Particulates – Deposited Matter – Gravimetric Method (DEC Method AM-19). AS 3580.9.6-2003 Particulate Matter – PM10 – high volume sampler with size selective inlet (DEC Method AM-18).	Environmental Advisor	During construction	Environmental Assessment
7.8	Use a water tanker and water sprays onto exposed areas to suppress dust on-site during construction activities (use recycled water where possible). Apply water sprays to roads in excess of 2litres/m2/hour.	Site Supervisor	During Construction	Environmental Assessment
7.9	Stockpiles are to be compressed and partially sealed by tracking over with machinery.	Site Supervisor	During Construction	Environmental Assessment
7.10	If a crusher is used it should be sited in the area of the Stage 2 cell, at a significant separation distance from the closest residential receptors.	Site Manager	During Construction	Environmental Assessment
7.11	Crushing activities are conducted only when low dust generating activities are being conducted and are not conducted during early morning or late afternoon periods when inversion conditions may arise.	Site Manager	During Construction	Environmental Assessment
7.12	The specification for the crusher is also to include dust controls to a standard equivalent to water spraying during crushing.	Site Manager	During Construction	Environmental Assessment
7.13	Fill material in situ is kept at a minimum of 20% moisture content.	Site Supervisor	During Construction	Environmental Assessment
7.14	Use freeboards or covers for trucks, where necessary.	Site Manager	During Construction	Environmental Assessment
7.15	In the event that fill material is deposited on roadways, it needs to be cleaned up in a timely manner.	Environmental Advisor	During construction	Environmental Assessment
7.16	Effectively seed/cover Natural material stockpiles before the material dries out.	Site Supervisor	During Construction	Environmental Assessment
7.17	Minimise truck traffic and unpaved road lengths.	Site Manager	During Construction	Environmental Assessment

Action		Responsibility	Timing	Supporting documents
7.18	Allow as much material as possible to be excavated, screened and placed directly in the cell without the need for temporary stockpiling and double handling.	Site Manager	During Construction	Environmental Assessment
7.19	Cover stockpiles with plastic sheeting.	Site Supervisor	During Construction	Environmental Assessment
7.20	Apply stockpile wind screens	Site Supervisor	During Construction	Environmental Assessment
7.21	Minimise exposed and disturbed surface areas.	Site Manager	During Construction	Environmental Assessment
7.22	Use of wind screening at material transfer points.	Site Supervisor	During Construction	Environmental Assessment
7.23	Ensure all stockpiles are stabilized.	Site Supervisor	During construction	Environmental Assessment

A.8 Traffic/Access Management Sub Plan

Table 23 Traffic/access objectives, targets, legislative requirements and references

Environmental objectives	• Maintain existing road conditions. • Minimise traffic disruptions. • Ensure construction activities provide safe and convenient access to local roads. • Adjacent roads kept clean or free of spoil from site vehicles.
Key legislation	• Road Safety Traffic Regulations 1988.
Target/performance measures	• No traffic complaints associated with upgrade works.
Key guidelines, standards and other references	• RTA Traffic Control at Work Sites Manual.

Table 24 Traffic/Access Management Plan

Action		Responsibility	Timing	Supporting documents
8.1	Prepare internal traffic management plans for each phase of the project.	Environmental Advisor	Prior to Construction commencing for each phase	Environmental Assessment
8.2	Install signs along Lake Road prior to the main site access to warn traffic of possible heavy vehicle movements entering and exiting the site. Including, warning signs 'Trucks Turning' (W5-205) with supplementary sign '120 metre on left/right' (W8-207(L/R)) located 120 metres on both approaches; and truck symbol sign (W5-22) located 60 metres on both approaches to the site access.	Site Manager	Prior to Construction commencing	Environmental Assessment
8.3	Restrict all parking and temporary storage of equipment at the site to designated areas within the site. Control parking and vehicle movements within the site to minimise disruption.	Site Manager	During Construction	Environmental Assessment
8.4	Ensure vehicles adhere to site speed limit of 15 km/hr	Site Supervisor	During Construction	Environmental Assessment
8.5	Ensure all contractors and sub-contractors are fully licensed.	Safety Manager	During Construction	Environmental Assessment
8.6	Ensure vehicles remain on designated haul roads and driveways.	Site Supervisor	During Construction	Environmental Assessment

A.9 Archaeology and Heritage Management Sub Plan

Table 25 Archaeology and heritage objectives, targets and legislative requirements

Environmental objectives	Protect any indigenous artefacts or materials should they be found during construction.
Key legislation	- Heritage Act 1977. - National Parks and Wildlife Act 1974.
Target/ performance measures	Indigenous and European artefacts or materials protected if found.

Table 26 Archaeology and Heritage Management Plan

Action		Responsibility	Timing	Supporting documents
9.1	Cease work immediately in affected areas and provide protective fencing around location, if any potential Indigenous artefacts or materials are found and inform Site Manager and Environmental Advisor. Obtain necessary approvals before recommencing work.	Site Supervisor	During construction	Environmental Assessment
9.2	Cease work immediately in affected areas and provide protective fencing around location, if any potential European artefacts or materials are found and inform Site Manager and Environmental Advisor. Obtain necessary approvals before recommencing work.	Site Supervisor	During construction	Environmental Assessment

A.10 Hazards and Risk Management Plan

Table 27 Hazard and risk objectives, targets and legislative requirements

Environmental objectives	• Avoid/minimise potential human health and environmental effects from exposure to fuels and hazardous chemicals. • Establish control measures to prevent and manage accidents, spills and other discharges of hazardous chemicals and dangerous goods to the environment. • Minimise potential for workplace accidents related to amplification works.
Key legislation	• Protection of the Environment Operations Act 1997. • Occupational Health and Safety Act 2000. • Dangerous Goods Act 1975.
Target/performance measures	• Zero accidents or incidents recorded. • Storage and spillage control measures installed appropriately.

Table 28 Hazard and Risk Management Plan

Action		Responsibility	Timing	Supporting documents
10.1	Induct all construction personnel to the requirements to comply with site requirements and all applicable occupational health and safety requirements, and the location of existing chemical facilities (include locations on the site layout plans).	Safety Manager	Ongoing	Environmental Assessment
10.2	Ensure all necessary Personal Protective Equipment (PPE) is provided.	Safety Manager	Ongoing	Environmental Assessment
10.3	Ensure all personnel and subcontractors are qualified to undertake the work they have been commissioned to undertake.	Safety Manager	Ongoing	Environmental Assessment
10.4	Ensure work is carried out in accordance with the site safety management plan.	Safety Manager	Ongoing	Environmental Assessment

A.11 Waste and Energy Management Sub Plan

Table 29 Waste and energy objectives, targets, legislative requirements and references

Environmental objectives	- Avoid/minimise generation of waste material; appropriate reuse/recycling where this is not practicable. - Wastes not kept on-site to be disposed of in a lawful manner that does not harm the environment.
Key legislation	- Waste Avoidance and Resource Recovery Act, 2001. - Protection of the Environment Operations Act, 1997.
Target/ performance measures	- Only wastes not able to be recycled or stored on-site should be disposed of at landfill. - Records of all waste transported and received at licensed landfill. - Use materials produced with a recycled content where possible.
Key guidelines, standards and other references	Nil

Table 30 Waste and Energy Management Plan

Action		Responsibility	Timing	Supporting documents
11.1	Provide separate waste bins for: - General waste and timber - Paper - Concrete - Steel - Recyclables - Vegetation potentially contaminated by soil.	Site Manager	During construction	Environmental Assessment
11.2	All vehicles and site machinery will be switched off when not in use.	All personnel	During construction	
11.3	Any material to be disposed of off-site will be classified and sent to an appropriately licensed facility.	Environmental Advisor	During construction	
11.4	Records will be kept of all material sent off-site, including: - Material type. - Amount of material. - Facility it was sent to and copies of the facility's license.	Environmental Advisor	During construction	

A.12 Utilities and Services Management Sub Plan

Table 31 Utility and services objectives, targets and legislative requirements

Environmental objectives	Complete construction works with minimal disruption to services and utilities.
Key legislation	- Protection of the Environment Operations Act 1997. - EPL 208. - Environment Protection and Biodiversity Conservation Act 1999. - Telecommunications Act, 1987.
Target/ performance measures	Minimal interruptions to the utilities and services.

Table 32 Utility and Services Management Plan

Action		Responsibility	Timing	Supporting documents
12.1	Where the construction activities will impact on the existing services, the Project team will follow the Project Management Plan developed in conjunction with relevant stakeholders.	Site Manager and representatives	Prior to the commencement of construction	Environmental Assessment
12.2	Coordinate disconnection of power with EnergyAustralia.	Site Manager.	During construction	
12.3	Coordinate disconnection of communications with Telstra/Optus.	Site Manager.	During construction	
12.4	Coordinate disconnection of water with water authority.	Site Manager.	During construction	

A.13 Asbestos Management Sub Plan

Table 33 Asbestos objectives, targets and legislative requirements

Environmental objectives	Nil harm site personnel from removal, collection, transport and disposal of asbestos products.
Key legislation	- Occupational Health and Safety Act 2000. - Occupational Health and Safety Regulation 2001. - Dangerous Goods Act 1975.
Target/ performance measures	IPL and National Exposure Standard for asbestos of 0.1 fibres/mL
Key guidelines, standards and other references	Australian Standards - AS4681:2000 The Storage and handling of Class 9 (miscellaneous) dangerous goods and articles, including all amendments. - AS2601:2001 Demolition of structures. National Occupational Health and Safety Commission (NOHSC) - Code of Practice for the Safe Removal of Asbestos 2nd Edition [NOHSC: 2002 (2005)]. - Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC:2018 (2005)]. - Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC: 3003(2005)]. - Adopted National Exposure Standards for Atmospheric Contaminants in the Occupational Environment [NOHSC: 1003(1995)]. Other - Workcover requirements. - Waste Classification Guidelines part 1: Classifying Waste.

Table 34 Asbestos Management Plan

Action		Responsibility	Timing	Supporting documents
13.1	Select licensed asbestos removal contractor.	Demolition manager	Before commencing removal	Environmental Assessment
13.2	Provide asbestos register to removal contractor.	Demolition manager	During tender process	Asbestos register
13.3	Gain appropriate permits to work.	Site Manager	Before commencing removal	National Standard
13.4	Undertake exposure monitoring in accordance with national standards.	Demolition manager	During asbestos removal	National Standard

Action		Responsibility	Timing	Supporting documents
13.5	Ensure appropriate disposal and containment and record keeping in accordance with national standard.	Site Manager	During asbestos removal	National Standard
13.6	Undertake auditing of work practices of asbestos removal contractor in accordance with national standard.	Various	During asbestos removal	National Standard

A.14 Demolition Management Sub Plan

Table 35 Demolition objectives, targets and legislative requirements

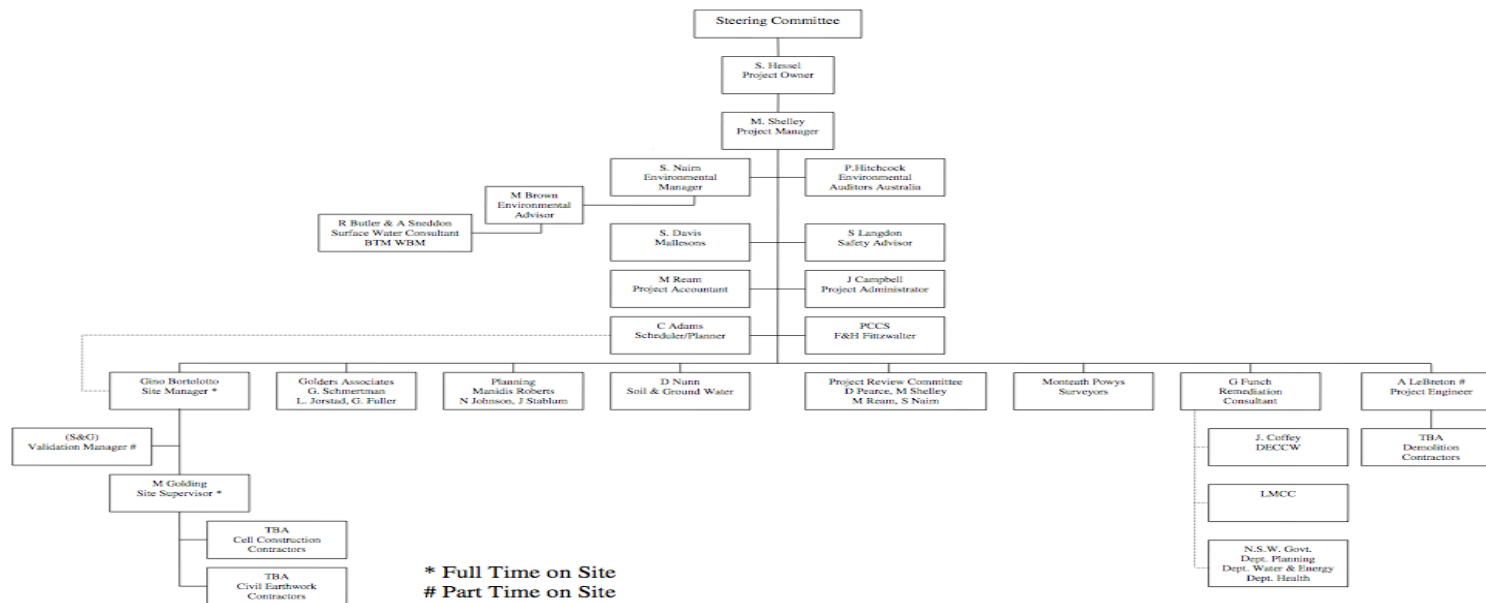
Environmental objectives	• Provision of a clean uncontaminated land area. • Nil harm site personnel from removal, collection, transport and disposal of demolition products.
Key legislation	• Occupational Health and Safety Act 2000. • Occupational Health and Safety Regulation 2001. • Dangerous Goods Act 1975. • Waste Avoidance and Resource Recovery Act, 2001.
Target/ performance measures	• Zero accidents or incidents recorded.
Key guidelines, standards and other references	Australian Standards • AS4681:2000 The Storage and handling of Class 9 (miscellaneous) dangerous goods and articles, including all amendments. • AS2601:2001 Demolition of structures. Other • Workcover requirements. • Waste Classification Guidelines part 1: Classifying Waste.

Table 36 Demolition Management Plan

Action		Responsibility	Timing	Supporting documents
14.1	Select licensed demolition contractor.	Demolition manager	Before commencing removal	Environmental Assessment
14.2	Provide work scope, drawings and other information to demolition contractor.	Demolition manager	During tender process	Work scope
14.3	Gain appropriate permits to work.	Site Manager	Before commencing removal	National Standard
14.4	Ensure appropriate disposal and containment in accordance with national standards.	Site Manager	During construction	National Standard
14.5	Audit of work practices of selected licensed demolition contractor in accordance with national standard.	Various	During demolition	National Standard

Appendix B Organisation chart

IPL –Cockle Creek Remediation Project, Org Chart March 2010



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Appendix C Environmental incident response plan

If there is an incident that causes concern for the health and safety of workers, the public and/or the environment.

Table 37 Environmental Incident Response (EIR) Plan

Immediate action	• Stop work. • Assess the situation: • Identify the severity. • (If necessary) evacuate. Secure/isolate the area as appropriate
Notification	Depending upon the severity, initially contact the: • Supervisor. • Environmental Advisor • Site Manager. Act on their instructions.
Treatment	Spills/escape of polluted water: • Contain the spill – ensure that no further escape occurs, especially off-site. • Determine whether clean up is likely to be required – recover spilt material. • The Environmental Advisor, in consultation with the Site Manager, determines the most suitable process for clean up and disposal of contaminated materials. Odours and dust: • Apply odour/dust suppression agents (including water mists, soil, chemicals). • Consider carefully which option to select in light of the scale and type of problem. • The Environmental Advisor, in consultation with the Site Manager, determines the most suitable corrective actions. Landslip: • Isolate (turn off) water mains that could discharge into the area. • Obtain specialist advice BEFORE attempting to rescue people or equipment – landslip area is likely to be unstable. • Once the source is contained or the discharge has stopped, determine whether clean up is likely to be required. • The Environmental Advisor, in consultation with the Site Manager, determines the most suitable process for clean up and disposal of materials.

	Flora/fauna kills, injury or disturbance • Cease activity causing flora/fauna injury or disturbance. • The method selected must be carefully considered in light of the scale and nature of the problem. • The Environmental Advisor, in consultation with the Site Manager, determines the most suitable corrective actions. • Notify NPWS (now DECCW) if an endangered/threatened flora species is affected or killed. Release of waste • Cease activity causing the release of wastes off-site. • The method selected must be carefully considered in light of the scale and type of problem. • The Environmental Advisor, in consultation with the Site Manager, determines the most suitable process for clean up.
Follow up	• Debrief – identify the reason for the occurrence of the event and identify ways of preventing repeat incidents. Consider the use of a toolbox talk to follow up as soon as practicable. • Record – document all details on, Incident Investigation form or Significant Investigation form.

Appendix D Incident notification heirarchy

See Site Safety Management Plan.

Appendix E Voluntary Management Proposal

The Voluntary Management Proposal can be found in Appendix I of the Cockle Creek Environmental Assessment, Stage 2 Submissions Report, prepared for Incitec Fertilizers Limited.

Appendix F **Site validation protocol**

Appendix G

Groundwater quality management plan

Appendix H

Surface water management plan