



Advisian

WorleyParsons Group



**Queensland
Government**



Abbot Point Growth Gateway Project

Outline Environmental Management Plan

23 July 2015



Disclaimer

This report has been prepared on behalf of and for the exclusive use of the Department of State Development, and is subject to and issued in accordance with the agreement between the Department of State Development and Advisian. Advisian accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this report by any third party.

Copying this report without the permission of the Department of State Development, or Advisian is not permitted.

PROJECT NO 301001-01956 – ABBOT POINT GROWTH GATEWAY PROJECT: OUTLINE ENVIRONMENTAL MANAGEMENT PLAN

Rev	Description	Author	Review	Advisian Approval	Date
Rev A	Draft for client review	R Asnicar	T Graham	A Hanly	13-Jul-15
Rev B	Draft for client review	R Asnicar	T Graham	A Hanly	14-Jul-15
Rev C	Draft for client review	R Asnicar	T Graham	A Hanly	23-Jul-15



Table of Contents

1	Introduction	7
1.1	Management plans	7
1.2	Purpose of Outline EMP	8
1.3	Approach	9
2	Structure and Responsibility	11
2.1	Format and content	11
2.2	Responsibility	12
2.3	Legislation	13
2.4	Environmental training and inductions	14
3	Environmental Management Measures	16
3.1	Ecology (fauna and flora)	18
3.2	Water quality (surface water and groundwater)	25
3.3	Land	29
3.4	Noise and vibration	38
3.5	Air quality	40
3.6	Waste	44
3.7	Cultural heritage (Indigenous and non-Indigenous)	48
3.8	Community engagement	51
3.9	Emergency response	53
3.10	Acid sulfate soils	57
3.11	Erosion and sediment control plan	60
3.12	Containment risks management	64
3.13	Operation and decommissioning	67
4	EMP Monitoring and Review	68
4.1	Monitoring and inspection	68
4.2	Compliance audits	72
4.3	Review	76
4.4	Incident reporting and complaints	77



4.5	Non-compliance and corrective action	80
4.6	Records	81

List of Figures

Figure 1-1	Environmental management framework and responsibilities	10
------------	---	----

List of Tables

Table 2-1	Major elements of the EMP	11
Table 2-2	Project approvals – offshore components	13
Table 2-3	Project approvals – onshore components	14
Table 4-1	Items for management review	76



Acronyms and Abbreviations

Acronym / Abbreviation	Description
AASS	Actual acid sulfate soil
APSDA	Abbot Point State Development Area
ASS	Acid sulfate soil
ASSMP	Acid sulfate soil management plan
CC	Construction Contractor
CCS	Construction Contractor Supervisor
CEMP	Construction Environmental Management Plan
CL	Checklist
DMCP	Dredged Material Containment Pond
DEHP	Department of Environment and Heritage Protection
DMP	Dredged Management Plan
DNRM	Department of Natural Resources and Mines
DoE	Department of the Environment
DP	Design Phase
DSD	Department of State Development
DSI	Detailed Site Investigation
EA	Environmental Authority
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
Eng	Design Engineer
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
ERA	Environmentally Relevant Activity
GBR	Great Barrier Reef



GBRMP	Great Barrier Reef Marine Park
GBRWHA	Great Barrier Reef World Heritage Area
HSE	Health Safety and Environment
JSEA	Job Safety and Environmental Analysis
LED	Light emitting diode
MCU	Material Change of Use
MER	Monthly Environmental Report
Mm ³	Million m ³
MNES	Matters of National Environmental Significance
MSDS	Material Safety Data Sheets
NQBP	North Queensland Bulk Ports Corporation Limited
OEMP	Operation Environmental Management Plan
Op	Operations Phase
OpPM	Operations Project Manager
OUV	Outstanding Universal Value
PASS	Potential acid sulfate soils
PPDA	Priority Port Development Area
PreC	Pre Constructions Phase
PD	Project Director
PSI	Preliminary Site Investigation
Qld	Queensland
RPEQ	Registered Professional Engineer Queensland
SEVT	Semi-Evergreen Vine Thicket
SP Act	<i>Sustainable Planning Act 2009</i>



Advisian

WorleyParsons Group



**Queensland
Government**

SQP

Suitably Qualified Person

VI

Visual Inspection



1 Introduction

The Abbot Point Growth Gateway Project (the Project) is proposed by the Queensland Government Department of State Development (DSD) to support the development of the already approved T0 project at the Port of Abbot Point through undertaking capital dredging to provide sea access for this terminal. The Project includes:

- Construction of onshore dredged material containment ponds (DMCPs) within the area previously allocated for the development of Terminal 2 (T2) and adjoining industrial land
- Capital dredging of approximately 1.1 million m³ *in situ* (Mm³) of previously undisturbed seabed for new berth pockets and ship apron areas required to support the development of T0
- Relocation of the dredged material to the DMCPs and offshore discharge of return water
- Ongoing management of the dredged material including its removal, treatment and beneficial reuse within the port area and the Abbot Point State Development Area (APSDA), where appropriate.

The Project is currently undergoing assessment for approval under Queensland and Australian Government legislation (described in Section 2.3). This document provides the outline for the Project's Environmental Management Plan (EMP). As an Outline EMP, the document should be read in conjunction with the relevant impact assessment documentation for the Project. This Outline EMP refers to that impact assessment documentation where relevant and also highlights where further work will be undertaken in developing the Project's final EMP. The following section provides a description of the Outline EMP and other management plans to be further developed for the Project, and the framework for how these relate to each other.

1.1 Management plans

To ensure the planning and delivery of the Project is responsibly and effectively managed with respect to the protection of environmental values (including MNES), a number of management plans will be prepared, each in general accordance with the ISO14001 specification for an environmental management system. At this stage, the following plans are envisaged, and will be subject to further consultation with relevant regulators:

1. Outline Environmental Management Plan (Outline EMP)
2. Outline Dredging Management Plan (Outline DMP)
3. Construction Environmental Management Plan (CEMP)
4. Operational Environmental Management Plan (OEMP)
5. Final DMP.

The first two plans are included with the Project's EIS, and will be used to inform the public and regulators of the proponent's intentions, and to assist with the further planning and engineering design for the Project. The Outline EMP and Outline DMP are related and should be read as companion documents.

This Outline EMP provides for the management and monitoring of the:



- The design and construction of the DMCPs
- The management of the DMCPs before and after completion of placement of dredged material
- The reuse (including any treatment that may be required) of dredged material, post-placement in the DMCPs.

The Outline DMP (refer Appendix X) provides for the management and monitoring of:

- Dredging
- Placement of dredged material in the DMCPs
- Return of water from the placement operation to sea.

It is anticipated that a CEMP and OEMP will ultimately be prepared in place of this Outline EMP, and be required as conditions of approval (should the Project be approved under the *Environmental Protection and Biodiversity Conservation Act 1999* - EPBC Act). The CEMP and OEMP would be required to be submitted and accepted by the Department of Environment (DoE) (along with relevant State regulators) prior to commencement of construction and operation, respectively. It is also anticipated that a final DMP will be required as a condition of approval, if approved, and would need to be submitted and accepted by DoE (along with relevant State regulators) prior to commencement of dredging.

Figure 1-1 illustrates this overall environmental management framework. This figure also depicts the main stages of the Project and which organisations will be responsible for environmental management. DSD is responsible for implementation of the Outline EMP and the Outline DMP to manage potential environmental impacts during the Project's planning and design phase. Responsibilities are further discussed in Section 2.2, including the party responsible for implementation of the CEMP and OEMP.

1.2 Purpose of Outline EMP

This Outline EMP describes the management arrangements for the construction of the DMCPs, the management of the DMCPs before and after completion of placement of dredged material, and the reuse (including any treatment that may be required) of dredged material, post-placement in the DMCPs.

The main purposes for this Outline EMP are to:

- Assist to achieve and demonstrate compliance with environmental legislation
- Provide a framework to ensure the environmental risks associated with the Project are properly managed during design, construction and operation
- Establish management plans for all relevant environmental aspects, control strategies, objectives and targets, responsibilities, monitoring, corrective actions and reporting to minimise environmental harm and demonstrate planned approach to achieve environmental compliance
- Ensure that environmental management detail is captured, documented and implemented at all stages of the Project
- The EMP responds to the DoE Guidelines requirements for management approaches of the following elements:
 - Identification of level of risk associated with potential impacts



- Consolidated list of mitigation measures to prevent, minimise or treat relevant potential impacts on protected matters
 - Description of mitigation measures and an assessment of the expected or predicted effectiveness of the mitigation measures
 - Statutory or policy basis for the mitigation measures
 - The name of the agency responsible for endorsing or approving each mitigation measure or monitoring program
- Identify and develop environmental management strategies and, where appropriate, mitigation measures as supporting information to accompany State Government approval applications including the Material Change of Use (MCU) application under the APSDA Development Scheme
 - Provide construction contractors with environmental requirements and to guide the development and implementation of work method statements/Job Safety and Environmental Analysis (JSEA) and measures to ensure environmental compliance
 - Developed in such a way to remain flexible enabling the addition or adoption of EMPs or measures as the Project scope, design, construction methodology and approval conditions evolve
 - Be compatible with future Construction and Operation EMPs as well the Outline DMP
 - Ensure the implementation of the Project's conditions of approval, if and when they are granted.

The management of impacts in this Outline EMP focusses on the following elements:

- Determining factors in the planning phase of the Project to avoid damage to the environment
- Developing measures to minimise and manage the potential risk of storage failure and/or overflow of the containment areas
- Measures to avoid or minimise damage to the Great Barrier Reef World Heritage Area (GBRWHA)
- Measures to avoid or minimise damage to the National Heritage Values of the Great Barrier Reef (GBR)
- Measures to avoid or minimise damage to the environment in the Commonwealth marine areas
- Measures to avoid or minimise damage to the environment in the Great Barrier Reef Marine Park (GBRMP)
- Measure to avoid or minimise disturbance to fauna and flora around and within the proposal area (particularly listed threatened species and ecological communities and listed migratory species)
- Staff training, including training in relation to environmental issues.

1.3 Approach

This EMP is developed based on the requirements of the international standard *AS/NZS ISO14001:2004 Environmental Management Systems*.

A risk-based approach has been applied to assess potential environmental impacts associated with the Project. The development of this EMP is closely linked with the risk assessment that was undertaken for the Project.



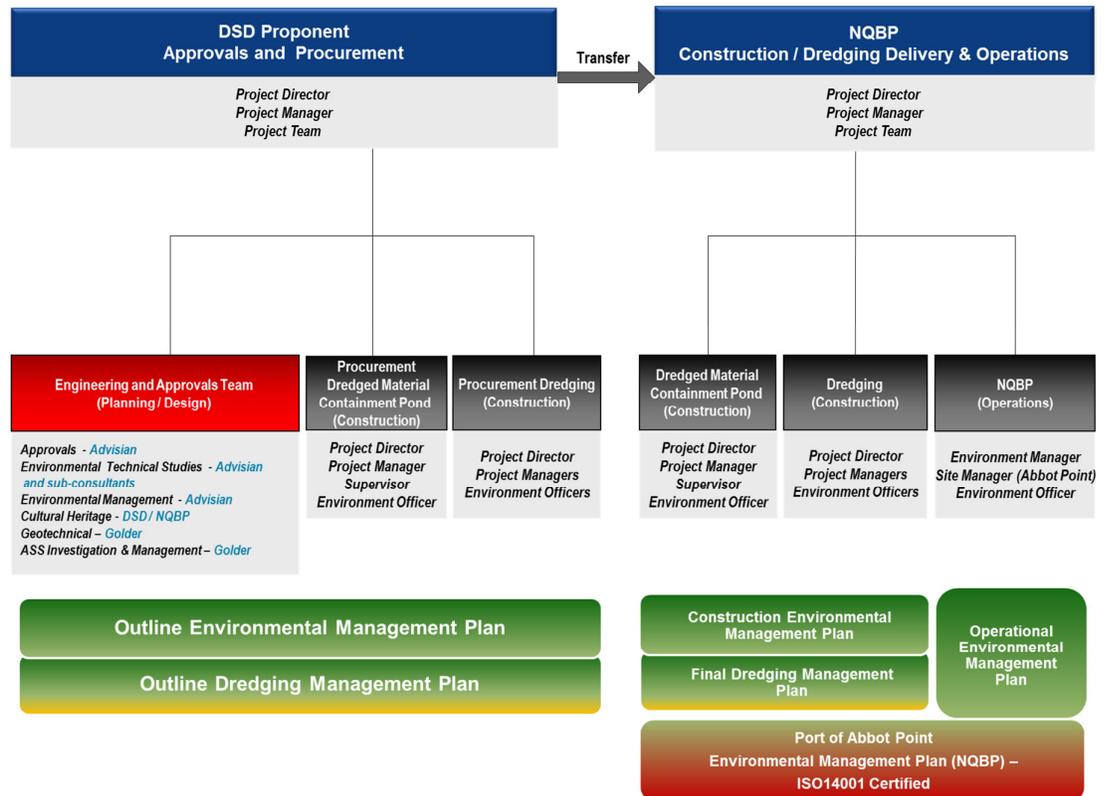
Section 1 Introduction

As part of the overall risk process (based on *ISO 31000:2009: Risk Management – Principles and Guidelines*), management and ongoing monitoring of the potential impacts and effectiveness of the proposed mitigation measures shall be undertaken throughout all phases of the Project. Potential environmental impacts were systematically identified and classified by linking them to project phases, project activities, technical assessment areas and controlling provisions (Matters of National Environmental Significance - MNES) and collated in a risk register.

Mitigation measures were identified to reduce the potential for consequences to occur and/or to reduce their severity if they do occur. These mitigation measures align with those presented in this EMP.

In the planning of this Project and preparation of its management plans, there has been regard for the principles of Ecologically Sustainable Development as well as the guiding principles contained in the *Protocol to the 1972 Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter*.

Figure 1-1 Environmental management framework and responsibilities





Section 2 Structure and Responsibility

2 Structure and Responsibility

2.1 Format and content

This Outline EMP collates the proposed environmental management measures into a single document, and presents issue specific management tables for the key environmental aspects and management responses. The elements covered are outlined in Table 2-1.

Table 2-1 Major elements of the EMP

Reference No.	Title
01	Ecology (flora and fauna)
02	Water quality management
03	Land management
04	Noise and vibration management
05	Air quality management
06	Waste management
07	Cultural heritage management
08	Community engagement
09	Emergency response
10	Acid sulfate soils
11	Erosion and sediment control
12	Containment risks management
13	Monitoring and inspection plan
14	Compliance audits
15	Incident reporting and complaints
16	Records management

Each of the environmental management tables details the Project’s environmental requirements for implementation during each project phase (planning and design, construction or operation), under the following headings:



Section 2

Structure and Responsibility

1. Environmental management control
2. Person responsible
3. Timing/frequency
4. Monitoring
5. Reference/notes.

The plans are presented in table format for ease of use and every individual management control measure has a unique identification number for ease of reference. The items' identification numbers will also assist the development of checklist for compliance audits.

This Outline EMP refers to specific management plans to meet the environmental objectives, targets and/or performance criteria that may be developed. They provide direction and background information on how a specific issue/aspect can be managed and monitored to achieve the objectives. These plans, as subplans to the CEMP and OEMP, include:

- Acid sulfate soils management plan (ASSMP)
- Stormwater management plan
- Dust management plan
- Water quality management plan
- Weed and pest management plan
- Construction fire management plan
- Vegetation clearing and rehabilitation plan
- Groundwater management plan.

Section 4 of this Outline EMP also establishes audit protocols as well as reporting and monitoring requirements.

Specific management plans have already been prepared in support of this EIS and to guide engineering design for the management of potential acid sulfate soils and stormwater management. These are provided in the following appendices:

- Appendix M – Preliminary Acid Sulfate Soils Management Plan
- Appendix N – Preliminary Stormwater Management Plan.

2.2 Responsibility

Responsibility for the implementation of this EMP is set out in Section 3. The primary responsibility for environmental performance in the planning and design phase will be borne by DSD. As part of the planning and design phase the EMP will be updated to incorporate approval conditions as required by regulatory authorities.

DSD (the Proponent) was established as an administrative unit of the State of Queensland on 16 February 2015 and represents the State of Queensland in relation to the proposed action. The Proponent has a sound record of responsible environmental management and there are no proceedings against the State of Queensland, represented by DSD, relating to



Section 2 Structure and Responsibility

<i>Sustainable Planning (SP) Act 2009</i>	Land owner's consent	Department of Natural Resources and Mines (DNRM)
<i>SP Act 2009</i>	Operational work - Tidal works	Department of Environment and Heritage Protection (DEHP)
<i>SP Act 2009</i>	Operational work – Removal, damage or destruction of marine plants	DEHP
<i>SP Act 2009</i>	MCU for Environmentally Relevant Activity (ERA) and Environmental Authority (EA) for ERA 16(1)(d) – dredging	DEHP
<i>Environmental Protection Act 1994</i>	Registered suitable operator certificate	DEHP

Table 2-3 Project approvals – onshore components

Legislation	Approval Required	Referral Agency
Australian Government		
<i>EPBC Act 1999</i>	EPBC Act approval via Environmental Impact Statement process	DoE
Queensland Government		
<i>APSDA Development Scheme 2014</i>	Land owner's consent	NQBP
<i>APSDA Development Scheme 2014</i>	MCU for assessable development within the APSDA precinct	Coordinator-General
<i>APSDA Development Scheme 2014</i>	Self-assessable development within the APSDA precinct - Operational Work	Coordinator-General
<i>Nature Conservation Act 1992</i> <i>Nature Conservation (Wildlife Management) Regulation 2006</i>	Permit to tamper with animal breeding places	DEHP

2.4 Environmental training and inductions

Prior to the commencement of construction, the Construction Contractor will need to demonstrate a clear understanding of the environmental management requirements and provide staff with appropriate environmental competencies to address the requirements of this EMP. The Construction Contractor will be responsible for the development of a Project-



specific training matrix. This training matrix will include, as a minimum, training needed for individual work functions and tasks.

To ensure all site staff are aware of, and trained in, the environmental requirements of the Project, personnel will be required to undergo a project specific Health Safety and Environment (HSE) induction. The induction will incorporate details of the primary environmental risks, relevant mitigation and control measures, incident response and required reporting measures.

The induction will include the following components:

- Adherence to HSE legislative requirements and environmental policies
- Site access requirements
- Conduct of personnel
- Erosion and sediment control
- Protection of water quality
- Noise reduction
- Spill management and response, including spill kit types and locations
- Amenity (including noise and light management)
- Vegetation, flora and fauna management (including interaction with fauna)
- Equipment hygiene requirements
- Cultural heritage management
- Waste management (including hazardous materials)
- Organisational structure, roles and responsibilities and communication protocols
- Definition of a reportable incident
- Incident management
- Crisis and emergency management.

Appointed contractors, sub-contractors, consultants and operators are required to ensure all personnel have attended the project specific HSE induction before the commencement of works. The personnel will also be familiar with, and sufficiently trained in the environmental controls required by this EMP relevant to their scope of work.

Regular induction refresher training will be delivered in toolbox talk sessions on environmental related information. Environmental awareness topics will be included in toolbox sessions and various other Project meetings. Visitors will also be required to attend a visitor induction prior to entry into the project area. Records of inductions and other environmental awareness training provided will be held by the Project Manager.



3 Environmental Management Measures

The intent of this EMP is to provide the necessary management tools to prevent or minimise the potential for environmental harm and/or nuisance.

The environmental management measures tables specify all the environmental management activities, mitigation and control measures proposed to prevent or minimise environmental harm. Responsibility is assigned for the control measures to specific personnel and timeframes for implementation as well as specifying the monitoring and measure associated with the control measures.

As discussed in Section 1.2, a risk assessment was undertaken for the Project and a risk register developed that identifies environmental risks and impacts. Six potential impacts were identified as having a high initial (unmitigated) risk, for which special regard has been paid to the certainty in the effectiveness of the proposed mitigation measures (listed in the environmental management tables). After assigning the mitigation measures these impacts were determined as having a low risk (i.e. the mitigated risk rating).

The seven potential environmental impacts having a high initial (unmitigated) risk relevant to MNES and general environmental values are as follows:

Water quality – groundwater

1. Oxidation of Potential Acid Sulfate Soils (PASS) dredged material leading to generation of acidic seepage from pond operation post placement. .

Ecology and air

2. Increased dust depositing on plants and dust concentrations affecting fauna, from footprint clearing and topsoil stripping during the construction of the containment pond
3. Increased dust depositing on plants and dust concentrations affecting fauna, from earthworks including embankment preparation, during the construction of the containment pond
4. Increased dust depositing on plants and dust concentrations affecting fauna, from earthworks including embankment preparation during the establishment of the final landform

Ecology and noise

5. Increased noise disturbing fauna including migratory shorebirds in the wetland, from earthworks including embankment preparation during the construction of the containment pond

Ecology

6. Vehicle strike on fauna including shorebirds and traffic-related disturbance of habitat, from traffic movements during the construction of the containment pond
7. Removal of threatened plants, threatened ecological communities and habitat for threatened flora from footprint clearing and topsoil stripping during the construction of the containment ponds.



Section 3

Environmental Management Measures

A high level of confidence in the effectiveness of mitigation measures to control each of these six potential impacts has been determined, for the following reasons:

- The management of potential acid sulfate soils in the dredged material will be under a ASSMP
- The assigned mitigation measures for dust impacts comprehensively covers all dust control measures relevant for the Project
- The preparation of a Dust Management Plan which will encompass detailed mitigation measures for the construction phase of the Project is the key measures of managing dust impacts
- Noise modelling and the subsequent impact assessment has indicated that with the proposed mitigation measures, particularly the proposed wetland buffer, the predicted noise levels in the wetland will not significantly impact on MNES values
- Mitigation measures are assigned to map MNES and design the Project footprint to avoid and/or minimise impacts
- The training and induction packages are proposed for construction personnel on safe driving procedures will be comprehensive and staff will be held accountable
- The implementation of the mitigation measures is underpinned by robust monitoring, auditing, non-compliance and corrective action management procedures.



3.1 Ecology (fauna and flora)

Objective:

To minimise impacts on flora and fauna from the Project with a particular focus on:

- EPBC Act listed migratory shorebirds
- EPBC Act listed migratory birds
- EPBC Act listed threatened species (Australian Painted Snipe and Squatter Pigeon)
- Waterbirds contributing to Outstanding Universal Value (OUV) of the GBRWHA.

Performance criteria:

- Implementation of all flora and fauna management measures
- No increase in the diversity or abundance of weeds present within the Project footprint and adjacent areas, including wetland habitats as a result of Project activities
- No deliberate or inadvertent introduction of pest animals to the Project area and adjacent areas, including wetland habitats.

Environmental Management Plan 1 - Ecology (flora and fauna) management

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design				
1.1 Include a minimum 50m buffer from the edge of the mapped wetland regional ecosystems (Vegetation management regional ecosystems and remnant map - version 8.0 coastal) and the Project's footprint.	DSD PD	DP	Design Report	
1.2 Pipeline corridor to be aligned in existing cleared areas or degraded or less sensitive environmental areas where	DSD PD	DP	Design Report	



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
possible.				
1.3 Plan to clear only vegetation that is directly in the path of the pipeline where there is no practicable alternative.	DSD PD	DP	Design Report	
1.4 Pre-clearance survey will be undertaken if it is determined that protected vegetation requires removal. Areas to be cleared will be surveyed in advance, marked-out and authorised by an appropriate person prior to clearing, to ensure no significant areas are inadvertently disturbed and no excessive clearing occurs.	DSD PD	DP	Design Report	
1.5 Prepare construction and operation water quality management plans to mitigate the potential water quality impacts of the Project on the surrounding environment.	CC	PreC	MER	Water quality management plan
1.6 Prepare construction and operation erosion and sedimentation control plans for the protection of the surrounding environment.	CC	PreC	MER	Erosion and sediment control plan
1.7 Prepare a construction and operation ASSMP to protect wetland water quality.	Eng	PreC	MER	ASSMP (Appendix M of the EIS)
1.8 Prepare construction and operational flora and fauna management plans.	CC	PreC	MER	
1.9 Prepare vegetation disturbance protocols.	CC	PreC	MER	



Section 3 Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
1.10 Prepare a vegetation clearing and rehabilitation plan that sets out vegetation rehabilitation actions that (i) ensure stabilisation of exposed soil and constructed embankments and, (ii) re-instate fauna movement opportunities where practicable using plant species native to the local area.	CC	PreC	MER	Vegetation clearing and rehabilitation plan
1.11 Prepare construction and operation dust management plan to avoid, targeting protection of semi-evergreen vine thicket (SEVT) and habitat of threatened and migratory species to manage and monitor construction and operational impacts and dust impacts on adjacent ecosystems.	CC	PreC	MER	Dust management plan
1.12 Prepare construction and operation fire management plan, targeting protection of SEVT and habitat of threatened and migratory species to manage the potential increased fire hazard from construction activities on the site.	CC	PreC	MER	Construction fire management plan
1.13 Prepare construction and operation weed and pest management plan targeting protection of SEVT and habitat of threatened and migratory species.	CC	PreC	MER	Weed and pest management plan
1.14 All personnel operating vehicles in and adjacent to the Project area will be made aware of the potential for Squatter Pigeon (and their behaviour) and other threatened and migratory species to occur on-site and be encountered on vehicle tracks.	CC	PreC	MER / Audit	Site induction
1.15 To minimise and manage the impacts to wildlife breeding	DSD PD	Design	MER	Species Management Program



Section 3 Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
places, where possible, avoid potential breeding grounds and construction in breeding seasons as listed in the <i>Species Management Program</i> (ELA, 2015).				(ELA, 2015)
Construction				
1.16 Trim terrestrial vegetation where possible rather than removing them.	CC	CP	MER / Audit	
1.17 Overarching management strategies for weed and fire management will be incorporated to the dredging management plan as relevant.	CC	CP	MER	Outline Dredging Management Plan
1.18 Deep pits and trenches, have infrastructure components installed in a timely fashion, be filled/rehabilitated and/or be monitored throughout each day to locate and remove any trapped fauna.	CC	CP	MER / Audit	
1.19 Monitor pits or trenches deeper than 0.5m, to locate trapped animals, and engage fauna handlers to remove trapped animals if required, .	CC	CP	MER / Audit	
1.20 Implement vegetation clearing and rehabilitation plan. Ensure the wetlands are a 'no-go' area for any construction machinery, equipment or materials.	CC	CP	MER / Audit	Vegetation clearing and rehabilitation plan
1.21 Implement construction erosion and sedimentation control plan.	CC	CP	MER / Audit	Erosion and sedimentation control



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
				plan
1.22 Threatened communities and species prescriptions will be implemented to manage impacts on potentially important habitats identified, including allowing perturbed fauna to relocate naturally.	CC	CP	MER / Audit	Species prescriptions to be developed
1.23 Implement construction vegetation rehabilitation actions including the re-establishing connectivity to the greatest realistic extent following construction and / or consolidating existing fragmented areas through restoration in accordance with the vegetation clearing and rehabilitation plan.	CC	CP	MER / Audit	Vegetation clearing and rehabilitation plan
1.24 Implement construction water quality management plan.	CC	CP	MER / Audit	Water quality management plan
1.25 Implement ASSMP to protect wetland water quality.	CC	CP	MER / Audit	ASSMP (Appendix M of the EIS)
1.26 Implement construction fire management actions.	CC	CP	MER / Audit	Fire management plan
1.27 Implement construction weed and pest species management actions.	CC	CP	MER / Audit	Weed and pest species management plan
1.28 Implement construction dust management plan.	CC	CP	MER / Audit	Dust management plan
1.29 Implementation of appropriate measures to minimise light spill into the wetland (e.g. scheduling of work, placement and orientation of flood lighting or mobile light towers which can be	CC	CP	MER / Audit	



Section 3 Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
moved and adjusted).				
1.30 Fence off habitat areas in selected locations, and ensure that earthworks do not encroach into the 50m buffer zone between the works site and Caley Valley Wetlands (i.e. from the edge of the mapped wetland regional ecosystems, Vegetation management regional ecosystems and remnant map - version 8.0 coastal), to prevent unplanned impacts outside the project area.	CC	CP	MER / Audit	Vegetation Management and Rehabilitation Plan
Operation				
1.31 Implement operation weed and pest species management (addressing feral pig, wild dog, red fox, feral cat and declared and environmental weed species).	OpPM	Op	MER / Audit	Weed and pest management plan
1.32 Implement operation dust management plan.	OpPM	Op	MER / Audit	Dust management plan
1.33 Implement operation fire management actions as specified in the Fire Management Plan.	OpPM	Op	MER / Audit	Fire Management Plan
1.34 Implement ASSMP to protect wetland water quality.	OpPM	Op	MER / Audit	ASSMP (Appendix M of the EIS)



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures

DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



Section 3 Environmental Management Measures

3.2 Water quality (surface water and groundwater)

- Objective:**
- To ensure that the quality of surface water leaving the site is acceptable
 - To construct the DMCP in a manner that has minimal impact to the surface water hydrology, water quality and aquatic ecology
 - To minimise potential impacts to the groundwater quality and groundwater levels.

- Performance criteria:**
- Implementation of all water quality management measures
 - Minimal impacts to the natural flow patterns, water quality and aquatic ecology as a result of the Project
 - No unauthorised release of contaminants directly or indirectly into watercourses or wetlands
 - Minimal impacts to the groundwater quality from Project activities
 - Minimal impact to groundwater dependent ecosystems from Project activities.

Environmental Management Plan 2 - Water quality management

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
SURFACE WATER				
Planning and Design				
2.1	In preparation for the design, vegetation clearing and disturbance will be minimised where possible.	DSD	DP	Design report
2.2	Prepare a Preliminary Stormwater Management Plan for the construction and operation of the DMCP.	Eng	DP	Design report
				Preliminary Stormwater Management Plan for the Dredge Material Containment Pond (Appendix N of the



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes	
EIS)					
Construction					
2.3	Appropriate sediment and erosion control measures will be further developed and implemented for the construction site including diverting drainage around the DMCP.	CC	PreC / DP	MER	Preliminary Stormwater Management Plan for the Dredge Material Containment Pond (Appendix N of the EIS)
2.4	The approved disturbance boundaries will be delineated clearly so they are identifiable by field staff, especially operators of heavy machinery.	CC	PreC	VI / MER	Induction package
2.5	Removal of vegetation will be limited to within the approved development precinct boundaries.	CC	CP	VI / MER / Audit	Flora and fauna management plan
2.6	Implement actions in the weed and pest management plan to monitor and control of weeds in areas where vegetation has been removed.	CC	CP	VI / MER	Weed and pest management plan
2.7	Implement a Stormwater Management Plan	CC	CP / Op	VI / MER	Preliminary Stormwater Management Plan for the Dredge Material Containment Pond (Appendix N of the EIS)
Operation					



Section 3 Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
2.8 Implement a Stormwater Management Plan	OpPM	Op	MER / Audit	Preliminary Stormwater Management Plan for the Dredge Material Containment Pond (Appendix N of the EIS)
GROUNDWATER				
Planning and Design				
2.9 Develop a groundwater monitoring plan.	PD	PreC	MER	
Construction				
2.10 Implement the proposed Groundwater Monitoring Plan.	PD	CP	Monitoring program / MER	Proposed groundwater monitoring plan
2.11 Store and handle chemicals and fuels (including wastes) in accordance with relevant Australian standards (e.g. AS1940:2004, AS3833:2007, AS3780:1994 etc.).	CC	CP	MER	Australian Standards
2.12 Strategically locate spill clean-up kits throughout the construction area.	CC	CP	Audit / MER	
Operation				
2.13 Implement the proposed Groundwater Monitoring Plan.	OpPM	Op	Monitoring program / MER /	Proposed groundwater monitoring plan



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
				Audit	
2.14	Review of Groundwater Monitoring Program.	OpPM	Annual	Audit	Water quality management plan
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



3.3 Land

- Objective:**
- To ensure the environmental values of the land, including topsoil, are protected through all phases of development
 - To manage contaminated soils appropriately and minimise the potential for contamination of the site.

- Performance criteria:**
- Implementation of all land management measures
 - No contamination of land from Project activities
 - All pre-existing contaminated sites are identified prior to construction
 - No significant failures of erosion and sediment control measures.

Environmental Management Plan 3 - Land management

Environmental Management Control		Responsible Person	Timing	Monitoring	Reference Notes
Planning and design					
3.1	All licences, permits and approvals obtained prior to construction.	PD	PreC	MER	
3.2	Prepare construction and operation of water quality management plans to mitigate the potential water quality impacts of the project on the surrounding environment.	CC	PreC	MER	Water quality management plan
3.3	Complete a Detailed Site Investigation (DSI) to investigate potential existing sources of contaminated land identified in the Preliminary Site Investigation (PSI).	PD	PreC	Audit	PSI



Section 3

Environmental Management Measures

Construction

3.4	Implement construction water quality management plans to mitigate the potential water quality impacts of the Project on the surrounding environment.	CC	PreC	MER	Water quality management plan
3.5	Topsoil and subsoil will be stripped in separate operations to prevent mixing and contamination of topsoil.	CC	CP	VI / MER	
3.6	Topsoil will be stripped to at least the minimum specified depth but will extend down to the maximum possible (as specified by the CC) with every effort made to preserve as much topsoil as is practical following vegetation clearing.	CC	CP	VI / MER	
3.7	Subsoil that is required to be excavated and stored will be removed and stockpiled separately from topsoil to prevent mixing with topsoil and, ideally, stockpiles will be located close to where they are sourced.	CC	CP	VI / MER	
3.8	Implement the dust management plan to dust from stockpiles.	CC	CP	VI / MER	
3.9	Implement the sediment and erosion control plan.	CC	CP	VI / MER	Sediment and erosion control plan
3.10	Windrows of cleared vegetation will be oriented to avoid diversion or concentration of overland flows.	CC	CP	VI / MER	



Section 3

Environmental Management Measures

3.11	Cleared vegetation will be stockpiled separately with a distinct break between the undisturbed vegetation and soil stockpiles, and in a manner that facilitates re-spreading or salvaging and fire management.	CC	CP	VI / MER
3.12	Vegetation that is cleared and chipped will be used to provide a thin surface mulch to improve the topsoil productivity and mitigate erosion hazards.	CC	CP	VI / MER
3.13	Care will be taken during stripping, stockpiling and/or re-spreading to ensure that structural degradation of the soil is minimal and to minimise soil compaction.	CC	CP	VI / MER
3.14	Topsoil will be stockpiled to minimise degradation of topsoil, maintain biological capital and maintain fertility.	CC	CP	VI / MER
3.15	Stockpiles will be placed away from discharge zones where they are not disturbed by other activities; topsoil will not be stockpiled against fences or vegetation and will be retained separately from mulch (apart from a surface layer).	CC	CP	VI / MER
3.16	Stockpiles exposed for extended periods (longer than three months) will be inspected and managed to maintain biological activity and prevent weed invasion; a competitive vegetative cover such as grasses could be used to discourage invasion by weed species.	CC	CP	VI / MER
3.17	Topsoil stockpile location will be recorded.	CC	CP	Audit / MER



Section 3

Environmental Management Measures

3.18	Control of weeds on the stockpiles is managed in accordance with the weed and pest management plan.	CC	CP	VI/MER	Weed and pest management plan
3.19	Prior to re-spreading, topsoil in stockpiles will be turned and loosened.	CC	CP	VI/MER	
3.20	Topsoil will be re-spread to depths adequate for revegetation	CC	CP	VI/MER	
3.21	Subsoil will be removed and stockpiled separately from topsoil to prevent mixing with topsoil and, ideally, stockpiles will be located close to where they are sourced.	CC	CP	VI / MER	
3.22	Progressive reinstatement of disturbed areas will commence as soon as practicable following the completion of construction activities.	CC	CP	VI / MER	
3.23	Topsoil application will only take place following initial reinstatement of the subsoil	CC	CP	VI / MER	
3.24	The duration of topsoil stockpiling will be as minimal as practicable. However, topsoils stockpiled for periods longer than three months will be monitored and managed to maintain biological activity and prevent weed invasion.	CC	CP	VI / MER	
3.25	Topsoils will be re-spread in even layers at an appropriate thickness.	CC	CP	VI / MER	
3.26	Hydro-seeding and hydro-mulching to encourage a more rapid revegetation and therefore stabilisation of the rehabilitated area, especially on batter slopes.	CC	CP	VI / MER	



Section 3

Environmental Management Measures

3.27	Vehicle movement will be restricted to encourage rapid re-establishment of vegetation.	CC	CP	VI/MER
3.28	The quantities of rehabilitation topsoil will be balanced against stored stockpile inventories.	CC	CP	VI/MER
3.29	Topsoils will be seeded with pasture grasses, or native species where native vegetation is the required final land use.	CC	CP	VI/MER
3.30	Any waste hazardous or liquid waste such as fuels, oils or other chemicals will be stored in an appropriately bunded area and collected in separate approved containers and transported to an approved facility for disposal.	CC	CP	VI/MER
3.31	Refuelling arrangements for equipment, vehicles or vessels will be conducted in accordance with Australian Standards and site Operating Procedures.	CC	CP	VI/MER
3.32	Permanent fuel and chemical stores and maintenance and refuelling areas are provided with appropriately sized secondary containment.	CC	CP	VI/MER
3.33	Completing land assessments of decommissioned chemical and fuel store areas and after fires, in accordance with DEHP guidelines	CC	CP	VI/MER
3.34	Keeping maintenance records and implementing an inspection program, of all plant and stores.	CC	CP	Audit/MER



Section 3

Environmental Management Measures

3.35	Installing and maintaining readily accessible spill kits and training staff in their use.	CC	CP	VI/MER	
3.36	If excavation works uncover unexpected significant contamination (i.e. waste from landfilling), all work in proximity of the contamination will cease, and an inspection and assessment of contamination levels will be carried out by a Suitably Qualified Person (SQP). Remediation measures will then be recommended and implemented before construction continues.	CC	CP	VI/MER	
3.37	Photographic records will be kept of construction activities.	CC	CP	MER	
3.38	Inspections of the construction sites and at locations downstream will be undertaken to identify any evidence of accelerated erosion due to increased runoff from construction activities or from concentrated/diverted runoff.	CC	CP	VI/MER	
3.39	A summary report of all test results and inspections will be compiled each week.	CC	CP	Audit/MER	
3.40	Records will be kept, of all test results, verifying the contamination status of any imported fill material . Specific records of volumes, origin, material type and placement, including photos, will be maintained.	CC	CP	MER	
3.41	Implement the Acid Sulfate Soils Management Plan.	CC	CP	Audit/MER	Preliminary Acid Sulfate Soils Management Plan(Appendix M of the EIS)



Section 3

Environmental Management Measures

3.42	Visual monitoring of waters will be conducted and surface waters and stormwater drainage in the vicinity of the construction site will be inspected for evidence of impacts.	CC	PreC, CP, Op	VI / MER	Preliminary Acid Sulfate Soils Management Plan (Appendix M of the EIS)
3.43	Any uncontrolled chemical releases to land or water will be reported to the environmental manager and records of location, release volume, chemical type, clean up actions and photos will be kept.	CC	PreC, CP, Op	VI / MER	Any uncontrolled chemical releases to land or water will be reported to the environmental manager and records of location, release volume, chemical type, clean up actions and photos will be kept.
Operation					
3.44	Prepare operation water quality management plans to help mitigate any potential water quality impacts of the Project on the surrounding environment.	OpPM	PreC	MER	Water quality management plan
3.45	Carry out quarterly inspections for soil degradation (e.g. subsidence or erosion), for a period of 12 months following rehabilitation; using a checklist and photographic records.	OpPM	Op, one year	MER	
3.46	Keeping maintenance records and implementing an inspection program, of all plant and stores.	OpPM	CP	Audit/MER	



Section 3

Environmental Management Measures

3.47	Any waste hazardous or liquid waste such as fuels, oils or other chemicals will be stored in an appropriately bunded area and collected in separate drums and transported to an approved facility for disposal.	OpPM	Op	VI/MER	
3.48	Refuelling arrangements for equipment, vehicles or vessels will be conducted in accordance with Australian Standards and site Operating Procedures.	OpPM	Op	VI/MER	
3.49	Permanent fuel and chemical stores and maintenance and refuelling areas are provided with appropriately sized secondary containment.	OpPM	Op	VI/MER	
3.50	Any uncontrolled chemical releases to land or water will be reported to the environmental manager and records of location, release volume, chemical type, clean up actions and photos will be kept.	CC	PreC, CP, Op	VI / MER	
3.51	Groundwater quality monitoring surrounding the ponds will be performed in accordance with the groundwater management plan.	PD	Op	MER	Proposed groundwater monitoring plan
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures



3.4 Noise and vibration

Objective: ▪ To construct and operate the Project activities in such a manner that has minimal noise and vibration impacts on sensitive receptors.

Performance criteria: ▪ Implementation of the noise management measures.

Environmental Management Plan 4 - Noise and vibration management

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
4.1	Off-site fabrication and construction will be planned and used where practicable to minimise construction noise.	CC	PreC	Design report	
Pre-Construction					
4.2	Construction site buildings, access roads and plant will be located so minimum disturbance to the community will occur.	CCM	PreC	Design report	
4.3	Noise reduction devices such as mufflers will be fitted to vehicles, plant and equipment.	CC	PreC	Design report	
4.4	Selection (where feasible and practicable) of less noisy equipment (i.e. electric instead of internal combustion and newer quieter equipment).	CC	PreC	Design report	
4.5	Noise emissions of hired equipment, e.g. light generators will be taken	CC	PreC	Design report	



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
into account in the equipment selection process.					
4.6	Briefing of the Construction Contractor's work team in order to create awareness of and to emphasise the importance of minimising noise emissions.	CC	PreC	MER	Induction package
Construction					
4.7	Adjust reversing alarms, where practicable, by limiting the acoustic range to the immediate danger area.	CC	CP	VI	
4.8	An internal roads maintenance program will be developed and implemented.	CC	CP	VI / MER	
4.9	Site inspections will be carried out to verify noise mitigation measures are in place. If required, identified necessary corrective actions will be actioned by the Construction Contractor.	CC	CP	VI / MER Monthly	
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



3.5 Air quality

Objective: ▪ To minimise dust and greenhouse gas emissions as a result of dredged material placement and DMCP management.

Performance criteria: ▪ Implementation of air quality management measures

Environmental Management Plan 5 - Air quality management

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
5.1	Prior to construction a dust management plan will be developed by the Construction Contractor in line with this EMP to minimise nuisance from dust.	CC	PreC	MER	Dust management plan
5.2	A pre-start audit will be undertaken by the Construction Contractor prior to commencement of the works to confirm the JSEA is considered appropriate to mitigate environmental impacts relating to air quality.	CC	PreC	Audit	
5.3	Undertake an assessment of proposed construction techniques and look for opportunities for fuel efficiency.	CC	PreC	Audit	
5.4	Consider the potential to switch to LED lighting from metal halide lamps in the lighting towers.	CC	PreC	Audit	
Construction					



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
5.5 Source construction materials locally where feasible to reduce the generation of GHG emissions.	CC	CP	Audit	
5.6 Ensure significant dust generation from earthworks are minimised, where practicable, during unfavourable meteorological conditions (e.g. watering haul routes during high winds).	CC	CP	VI / MER	
5.7 Watering of roads (incl. haul roads), exposed stockpiles and other exposed areas.	CC	CP	VI	
5.8 Designation of appropriate maximum speed limits during construction.	CC	CP	Audit	
5.9 Vehicular speeds and loads will be monitored to ensure compliance.	CC	CP	VI	
5.10 Loads will be covered (e.g. dump truck retractable canopies) when moving along public road networks or when there are unfavourable weather conditions.	CC	CP	VI	
5.11 Spillages of potential dust generating materials from any component of construction will be cleaned up as soon as practicable.	CC	CP	VI / MER	
5.12 Consider erection of physical barriers such as bunds or wind breaks around stockpiles and areas where earth moving is required, if other management methods are ineffective.	CC	CP	VI	
5.13 Equipment will be maintained and operated to ensure unnecessary air emissions will be minimised.	CC	CP	Audit	
5.14 Ensure all vehicles are suitably fitted with exhaust systems that minimise gaseous and	CC	CP	VI / Audit	



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
particulate emissions to meet vehicle design standards.				
5.15 Limiting extent of vegetation and soil clearing so as to minimise the area of exposed soil that may generate dust.	CC	CP	VI / MER/ Audit	
5.16 Compaction of construction site and stabilisation of vegetation to minimise dust lift-off due to wind erosion.	CC	CP	Audit	
5.17 Following construction of the embankments, top sides and external batters will be either topsoiled and seeded, or hydro-mulched.	CC	CP	VI / Audit	
5.18 Watering embankments, where practical, to minimum dust lift-off.	CC	CP	VI	
5.19 Burning or incineration of cleared vegetation or other materials will not be carried out on-site at any time. Potential use of cleared vegetation may include mulching to be placed on bare earth to reduce dust generation.	CC	CP	Audit / MER	
5.20 Undertake observations during construction to identify any impacts to flora and fauna.	CC	CP	VI	
5.21 Dust emissions and potential dust generating activities and areas will be monitored visually during construction.	CC	CP	VI, Audit/MER	
5.22 Implementation of additional mitigation measures when wind conditions become adverse and there is the potential for greater impacts. Control measures could include watering, reducing activity rates or covering equipment.	CC	CP	VI / MER	Dust management plan
Operation				



Section 3

Environmental Management Measures

Environmental Management Control				Person Responsible	Timing	Monitoring	Reference / Notes
5.23	Dust emissions and potential dust generating activities and areas will be monitored visually during operation.			OpPM	Op	VI	
5.24	Ensure all vehicles are suitably fitted with exhaust systems that minimise gaseous and particulate emissions to meet vehicle design standards.			OpPM	CP	VI / MER	
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection		
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report		
Eng	Design Engineer	CP	Construction Phase	CL	Checklist		
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis		
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit		



3.6 Waste

- Objective:**
- To implement the waste management hierarchy of avoid, re-use, recycle and disposal
 - To undertake Project activities in a manner that minimises adverse environmental impacts from waste.

- Performance criteria:**
- Implementation of the waste management measures
 - No land and water contamination as a result of inappropriate waste management
 - Waste minimisation strategy established.

Environmental Management Plan 6 - Waste management

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design				
6.1 Estimate the types and quantities of wastes likely to be generated during construction and operation.	Eng	PreC		Waste management plan
6.2 Develop a waste management plan specific to the types and quantity of waste expected to be generated.	CC	PreC / CP		Waste management plan
6.3 Limit the generation of waste through the design and tendering process wherever possible, and identify recycling measures which can be put in place.	Eng	PreC	MER	Waste management plan
Construction				



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
6.4 Training of all construction personnel on waste management procedures and onsite disposal processes.	CC	PreC and CP	MER	Induction package
6.5 All worksites will be kept clean and tidy with appropriate housekeeping procedures implemented.		CP	VI / MER Daily	Waste management plan
6.6 Areas will be nominated and marked within worksites for solid and liquid waste storage. Waste will not be stored outside these areas. Collection areas will be monitored weekly.	CC	CP	VI Weekly	Waste management plan
6.7 Any hazardous waste or liquid waste such as fuels, oils or other chemicals will be stored in an appropriately banded area and collected in separate drums and transported to an approved facility for disposal.	CC	CP	VI Daily	Storage and handling of materials
6.8 If wastes are listed as trackable wastes, they will be handled or transferred and documented in accordance with the <i>Environmental Protection Regulation 2008</i> .	CC	CP	Audit	Environmental Protection Regulation 2008
6.9 Waste will be removed from worksites and recycled or disposed at a licensed facility.	CC	CP	VI / MER Daily	
6.10 All waste awaiting recycling or disposal will be stored appropriately and transported to approved facilities outside the Project area	CC	CP	VI Daily	Waste management plan
6.11 Under no circumstances will waste be discharged directly to the marine environment.	CC	CP	VI	Waste



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
				Daily	management plan
6.12	No waste will be burnt on site.	CC	CP	VI / Audit	Waste management plan
6.13	A waste tracking system will be developed to maintain a record to track the management of general and regulated waste through to its final destination. This shall record the type of waste, and location and date of its final treatment.	CC	CP	MER	
6.14	The contractor will report any incident of waste spillage into the marine environment to Project Director as soon as possible and implement an appropriate spill clean-up procedure.	CC	CP	Audit	
Operation					
6.15	Domestic waste will be segregated , where practicable, and disposed to a licensed facility for disposal.	NQBP	Op	VI / MER	Waste management plan
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures



3.7 Cultural heritage (Indigenous and non-Indigenous)

Objective: ▪ To undertake Project activities in a manner that has minimal impacts to cultural heritage values.

Performance criteria: ▪ Implementation of cultural heritage management measures
 ▪ No unauthorised impacts to cultural heritage artefacts or non-Indigenous cultural heritage sites.

Environmental Management Plan 7 - Cultural heritage management

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
7.1	Consultation with all relevant Indigenous and non-Indigenous stakeholders during design development.	DSD	PreC	MER	
7.2	Continue negotiations with traditional owners Juru People regarding access to the site. An agreement must be reached prior to the commencement of any field work or construction activities at the site.	DSD	PreC	MER	DSD intends to develop a cultural heritage management agreement with the Juru People to manage cultural heritage values. This process has been initiated and is ongoing.
7.3	All relevant information regarding construction of the Project will be provided to the traditional land owners, including maps, the nature of works and ground disturbance activities.	CC	PreC		



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
7.4 Determine whether additional cultural heritage investigations are required prior to the commencement of construction.	DSD	PreC	VI	
7.5 If additional cultural heritage investigation are required, undertake pre-clearance surveys with the traditional owners prior to any ground disturbance. Identify and record any objects in the vicinity of construction activities.	DSD	PreC	MER / Audit Daily	Pre-clearance survey checklists
Construction				
7.6 All construction personnel will be inducted and will be informed of traditional owner's identified places and sites and the approach managing cultural heritage during construction of the Project.	CC	CP	Audit	Induction package
7.7 Maintain a register of key stakeholders relevant to cultural heritage.	CC	CP	Audit	
7.8 Continue to consult with registered stakeholders throughout the construction period and notify of any changes to the Project.	CC	CP	Audit	
7.9 Any ground disturbance in areas where cultural heritage was identified during pre-clearance surveys, or where the traditional owners identify there is a reasonable likelihood of sub-surface cultural heritage, will be subject to monitoring by the traditional owners.	CC	CP	VI / MER Daily	Monitoring checklists
7.10 If a suspected cultural heritage place or item is uncovered or identified during construction, all construction activities in the immediate area will cease and the traditional owner group and DEHP will be contacted	CC	CP	MER	



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
as soon as possible.					
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



3.8 Community engagement

Objective: ▪ To undertake Project activities in a manner that has minimal impacts to community values.

Performance criteria: ▪ Implementation of community engagement mitigation measures.

Environmental Management Plan 8 - Community engagement

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design				
8.1 Consult with the community throughout the design development to assist in further refinement of the Project.	DSD	PreC	MER	Communications and engagement strategy, dedicated project team email and community hotline, website feedback established
8.2 Disseminate information to the community regarding the commencement of construction, expected construction timeframe and activities.	CC	PreC	MER	
Construction				
8.3 Continue to consult with the community during the construction of the Project and ensure they are aware of any change timeframes..	CC	CP	MER	



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
8.4	Establish and maintain a community hotline to enable feedback and complaints.	CC	CP	MER	
8.7	The effectiveness of community consultation activities will be reviewed regularly.	CC	CP	Monthly	
Operation					
8.8	Consult with the community as required to keep them informed of any future development at the site or any changed activities.	OpPM	Op	MER	
8.9	Ensure there is an avenue for the community to provide feedback to those operating the site.	OpPM	Op	MER	
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



3.9 Emergency response

Objective: ▪ Hazards and risks associated with the Project will not adversely affect people or the environment.

Performance criteria: ▪ Compliance with emergency and spill response procedures.

Environmental Management Plan 9 - Emergency response

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
9.1	Any specific risks potentially associated with the Project will be identified.	CC	PreC	Audit	Risk register
9.2	Emergency and spill response procedures and plans will be developed. These will be tailored to the identified risks but also cover general procedures for unexpected events.	CC	PreC	Audit	Emergency Response Plan
9.3	Appropriate emergency contacts and locations will be determined.	CC	PreC	Audit	
Construction					
9.4	All construction personnel will be trained to implement the emergency response procedure and be aware of the location and correct use of spill response kits and equipment.	CC	PreC / CP	MER	Induction package
9.5	Refuelling arrangements for equipment, vehicles or vessels will be conducted in	CC	CP	VI	



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
accordance with Australian Standards and site Operating Procedures.				
9.6 An Emergency Contact List will be maintained with up to date copies displayed on site.	CC	CP	VI Monthly	
9.7 Storage of fuel, lubricants and oil on site will be in accordance with environmental licence conditions. When required they will be stored in a secure, bunded area, containers will be checked regularly and any spills cleaned up immediately.	CC	CP	VI / MER Daily	
9.8 Equipment and vehicles will be regularly checked for evidence of leaks and fitness of hydraulic hoses and seals. Maintenance or repairs will be conducted as necessary to prevent drips, leaks or likely equipment failures.	CC	CP	VI / MER Daily	Equipment or vehicle inspection checklist
9.9 Spill kits containing appropriate spill control materials, including booms and absorbent materials, will be maintained on site for use in the event a substance is spilled either on land or in the water.	CC	CP	VI	Regular inspection of spill kits to ensure all they contain all required equipment in working order
9.10 A register of Material Safety Data Sheets (MSDS) relating to all hazardous substances on site will be maintained.	CC	CP	Audit	



Section 3

Environmental Management Measures

Environmental Management Control	Person Responsible	Timing	Monitoring	Reference / Notes
9.11 In the event of a minor spill (a spill not able to be handled without the assistance of emergency services) to land, the contractor is to undertake to following: <ul style="list-style-type: none"> ▪ Stop the source of the spill ▪ Prevent the oil/chemical from entering the water and mop up the spill with appropriate absorbent material from an on board spill kit. The absorbent material is to be stored in an appropriate receptacle or bunded area until it can be disposed at an appropriately licensed facility ▪ Notify the Construction Contractor's Project Manager immediately. 	CC	CP		Emergency Response Plan
9.12 In the event of a fire or emergency, immediately call 000 and inform the relevant authority (such as Maritime Safety Queensland or DEHP).	CC	CP		Emergency Response Plan
9.13 All incidents will be reported and investigated and any corrective actions fed back into the relevant EMP(s).	CC	CP	Audit	Emergency Response Plan
9.14 A register will be kept to record all incidents that occur on site.	CC	CP	MER	
Operation				
9.15 Operational emergency and spill response procedures will be prepared and include an up-to-date contact list and response process to be followed in case of an emergency.	OpPM	Op		Emergency Response Plan
9.16 All staff will be trained to implement the emergency response procedure and be aware of the location and correct use of spill response kits and equipment.	OpPM	Op		Induction package



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures

Environmental Management Control				Person Responsible	Timing	Monitoring	Reference / Notes
9.17 A register will be kept to record all incidents that occur on site.				OpPM	Op	VI / MER	
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection		
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report		
Eng	Design Engineer	CP	Construction Phase	CL	Checklist		
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis		
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit		



3.10 Acid sulfate soils

Objective:

- To manage acid sulfate soils (ASS) appropriately to ensure the environmental values of the receiving environment are protected through all phases of the Project.

Performance criteria:

- No generation of acidic soil conditions during the construction of the DMCPs or placement of the dredged material
- No impacts from ASS to environmental receptors
- Implementation of all ASS management measures.

Environmental Management Plan 10 - Acid sulfate soils

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
10.1	Results of acid sulfate soil (ASS) sampling did not identify the presence of PASS or actual ASS (AASS) within the DMCPs area to a depth of 5 m below ground level (mbgl). If the DMCPs area is changed, extends further than 5 mbgl or dewatering of the excavation during construction is undertaken additional ASS assessment will be required.	Eng	DP, PreC	Design report	Preliminary ASSMP– Procedure CP-A , ASS Interpretive Report
10.2	Laboratory testing of historical vibrocore samples from the Multi Cargo Facility offshore investigations (GHD 2011).	PD	PreC	MER	Preliminary ASSMP Table 1 (Appendix M of the Environmental Impact Statement (EIS))
Construction					



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
10.3	Training and induction resources developed for site personnel to ensure basic recognition and identification of ASS, safe handling and treatment practices for the handling of ASS and an outline of the requirements of the ASSMP.	CC	PreC	Training records to be kept on file	Induction package, Preliminary ASSMP (Appendix M of the EIS)
10.4	Complete an ASS investigation of any soils visually identified as potentially being ASS.	CC	CP		Preliminary ASSMP – Procedure CP-A (Appendix M of the EIS)
10.5	Lime guard layer to be placed over the base of the secondary pond to address potential acid leaching and to precipitate metals from solution, if acid conditions occur.	PD	CP	CL	Preliminary ASSMP – Table 1 (Appendix M of the EIS)
10.6	If ASS is identified, review and update procedures as required.	CC	PreC	MER	Preliminary ASSMP – Procedure CP-B (Appendix M of the EIS)
Operation					
10.7	Phased characterisation/verification testing of placed dredged materials, by visual identification, field screening and subsequent laboratory testing, if warranted. Initial focus on fine materials segregated during placement. Strategies to be reviewed and updated if a higher level of risk is indicated. Phases include during placement, post placement and prior to dredged material re-use. [Characterisation during placement would be carried out under the Dredge Management Plan].	CC	Op	MER	Preliminary ASSMP – Procedure DS-A (Appendix M of the EIS)
10.8	Contingency measures to manage confirmed ASS, if identified during	CC	PreC	CL	Preliminary ASSMP –



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
placement, post placement or prior to re-use.. These may include lime dosing during placement or lime treatment post placement. Lime treatment post placement may include excavation and treatment within or outside the DMCP then redistribution and mixing; and Limed trench at relevant sections of embankments Treatment of runoff (if present) from the DMCP will also be required via lime dosing..					Procedure DS-B (Appendix M of the EIS)
10.9	Placement of crushed limestone at surface water discharge points and monitoring of water quality at these locations.	CC	PreC	CL	Preliminary ASSMP (Appendix M of the EIS)
10.10	Groundwater quality monitoring around the ponds to confirm the absence of ASS.	PD	PreC	MER	Preliminary ASSMP– Procedure DS-C, Dredging Management Plan (Appendix M of the EIS)
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



3.11 Erosion and sediment control plan

Objective: ▪ Minimise the potential for soil erosion and displacement of sediment on and off site.

Performance criteria: ▪ Implementation of erosion and sediment control measures
▪

Environmental Management Plan 11 - Erosion and sediment control

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
11.1	An erosion and sediment control plan will be developed prior to construction to indicate the location, design specifications, installation and maintenance of controls.	Eng	PreC	Design report	Preliminary Stormwater Management Plan for the Dredge Material Containment Pond (Appendix N of the EIS)
11.2	Erosion and sediment controls will be planned and designed using guidelines recognised as being current best practice (e.g. <i>IECA 2008, Best Practice Erosion and Sediment Control, International Erosion Control Association (Australasia)</i>).	Eng	PreC	Design report	Erosion and sediment control plan



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
11.3	Rationalisation of intermediate materials storage, as stored material may generate leachate or particulate bearing runoff to surface water and drainage systems.	CC	PreC	Design report	Material storage considerations
Construction					
11.4	Prior to the commencement of works, identify drainage lines and install appropriate sediment control measures to capture predicted stormwater and sediment loads (e.g. check dams, turf, filter socks, sediment fences, gravel, diversion drains or banks, bunds, catch drains, sedimentation traps or ponds, etc.). Revise plan as required.	CC	PreC	VI / MER	Erosion and sediment control plan
11.5	The DMCP will be constructed with a setback from the edge of the wetland.	CC	CP	VI / MER / Audit	Species Management Plan/Vegetation Management Plan
11.6	Sediment fences and runoff control devices. Construction will be conducted so as to minimise disturbed areas as well as minimising sediment and erosion movement.	CC	CP	Audit	Erosion and sediment control plan
11.7	Erosion and sediment control devices will be inspected promptly following heavy rain events to ensure they remain in good working order and maintenance will be performed where required.	CC	CP	VI / MER	Erosion and sediment control plan
11.8	Construction activities will not occur outside designated work areas.	CC	CP	VI / Audit	



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
11.9	Drainage control and sediment fencing will be maintained in place throughout the construction phase and monitored at regular intervals and repaired/replaced as required where damaged or operating ineffectively.	CC	CP	VI / MER	Erosion and sediment control plan
11.10	All stockpile areas will be located within the general area of disturbance.	CC	CP	VI	
11.11	Excavated material will be stored in a manner that prevents runoff (sediment and erosion) to ground surface.	CC	CP	VI / MER	
11.12	Limiting impact to DMCP embankment from erosive flow velocities by installing appropriate erosion and sedimentation control devices will be installed around the perimeter of embankments or stockpiles especially down gradient to wetlands.	CC	CP	VI	Erosion and sediment control plan
11.13	Stockpiles are to be protected once established to prevent them becoming a source of dust or sediment.	CC	CP		
11.14	Following construction of the embankments, top sides and external batters will be either topsoiled and seeded, or hydro-mulched. The seed stock will be comprised of native species, with a mix of fast and slow establishing grass species.	CC / Op	CP / Op	VI / MER	Erosion and sediment control plan
11.15	Monitoring will be undertaken for the growth and establishment of vegetation, excessive erosion on site and the build-up of sediment.	CC	CP	VI / MER	
11.16	Weekly inspections and audits of the Construction Contractor's daily reports and control measures will be conducted, as well as auditing of the soil tracking register and storage of excavated soil.	PD	CP	VI / MER	



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
11.17	Areas of identified dispersive soils will be monitored to assess the efficacy of erosion control measures.	CC	CP	VI / MER	
11.18	Regular auditing will be undertaken for erosion and sediment control measures, and surface water diversion methods to determine effectiveness of the adopted mitigation measures.	CC	CP	Audit	
Operation					
11.19	Monitoring will continue to be undertaken for the growth and establishment of vegetation, excessive erosion on site and the build-up of sediment.	OpPM	Op	Audit	
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



3.12 Containment risks management

Objective: ▪ Minimise environmental impact arising from failure of the DMCP structure.

Performance criteria: ▪ Implementation of containment risk management measures.

Environmental Management Plan 12 - Containment risk management

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
Planning and Design					
12.1	Design of containment structure/s and associated works will be undertaken and certified by a RPEQ in accordance with the provisions of <i>Professional Engineers Act (2002) (Qld)</i> and relevant engineering design standards and guidelines.	Eng	DP	Design certification	RPEQ certification
12.2	A formal risk assessment of the engineering containment risks for the DMCP embankments (including hydrology, hydraulics, failure consequence, seepage, geotechnical, engineering materials, construction method and operations and decommissioning) will be undertaken as part of design process. Refer Golder (2015) <i>Technical Memorandum - Risk Analysis of Dredge Material Containment</i> .	Eng	DP	Report	
12.3	Detailed design drawings and specifications to include outcomes of risk assessment.	Eng	DP	Report	Design Report
12.4	Third party independent review of the risk assessment and design of containment structure/s and associated works will be undertaken by a RPEQ.	Third party Eng	DP	Report	Third party independent review of risk assessment



Section 3

Environmental Management Measures

Environmental Management Control		Person Responsible	Timing	Monitoring	Reference / Notes
					and design
12.5	A containment structure and associated works post- construction structural integrity survey, inspection, testing and monitoring program will be developed.	PD	CP	Report	Structural integrity monitoring, monthly during construction and quarterly post construction
Construction					
12.6	Deliver the containment structure/s and associated works in accordance with design document with completion sign off.	CC	CP	Weekly	Construction contractor sign off at hand over following final inspection
12.7	Construction supervision of containment structure/s will be planned, undertaken and certified by RPEQ to ensure the works are built in accordance with the design intent, including drawings and specifications.	PD	CP	As per inspection program	Independent construction supervision (by others then the construction contractor)
12.8	Containment structures' structural integrity will be monitored.	CC	Op	Monthly	
Operation					



Advisian

WorleyParsons Group



**Queensland
Government**

Section 3

Environmental Management Measures

Environmental Management Control				Person Responsible	Timing	Monitoring	Reference / Notes
12.9	Containment structures defect liability period 24 months including condition inspections post completion.			OpPM	Op	Quarterly	
12.10	Containment structures structural integrity will be inspected and monitored.			OpPM	Op	Quarterly	
DSD	Department of State Development	DP	Design Phase	VI		Visual Inspection	
PD	Project Director	PreC	Pre Construction Phase	MER		Monthly Environmental Report	
Eng	Design Engineer	CP	Construction Phase	CL		Checklist	
CC	Construction Contractor	Op	Operations Phase	JSEA		Job Safety Environmental Analysis	
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit		Environmental Compliance Audit	



3.13 Operation and decommissioning

The operational life of the DMCPs will be defined during the design phase, however it is envisaged the site will be returned to a final landform within 10 years post dredging.

There is potential that the DMCPs could be made available for future dredging campaigns, e.g. T3 and maintenance dredging if this is able to be accommodated within the operational life of the DMCPs. However, it is not part of the current project.

Subject to appropriate regulatory approvals being in place, the dredged material may be mixed or improved within the DMCPs prior to its beneficial reuse. In targeted areas, such as those areas associated with approved but not yet constructed infrastructure, this may be undertaken immediately post dredging.

The dredged material may potentially be beneficially reused as general fill in the construction of future port developments (e.g. T0 or T3) or remain on T2 and adjoining industrial land. Alternatively, the dredged material may be moved elsewhere including the SDA to facilitate the development of the T2 site and adjacent industrial land, subject to appropriate approvals being in place.

If the DMCPs were to remain, and if no longer needed for management of dredged material, they will be returned to a suitable final landform, designed to shed surface water to natural drainage lines and mimic natural drainage patterns.

Final use of the DMCP and the site will be determined in the decommissioning plan to be approved prior to the end of the DMCP design life.

A monitoring program that will assess the effectiveness of rehabilitation efforts will be developed as part of the decommissioning plan. Monitoring of the rehabilitated area and benchmark reference site/s will be undertaken on a periodic basis while still under the responsibility of NQBP.



4 EMP Monitoring and Review

A monitoring program will be implemented during the Project. Records of all monitoring will be generated and held for the duration of the Project. Responsibility for these inspections will be determined by the Project Director and will include contractors.

The monitoring program for site establishment, construction and operations will be designed to comply with regulatory requirements and guidelines, and provide for the ongoing environmental performance of the Project. Monitoring applicable to this EMP that will be undertaken for the Project includes:

- Total number of environmental incidents (minor spills, etc.) and reportable environmental incidents will be recorded in a project reporting database according to the reporting requirements detailed in this EMP
- The death or injury to listed species during Project activities
- Unplanned impact caused to a matter of national environmental significance under the EPBC Act during an activity
- A monthly report of waste transfers
- A daily consultation log
- A record of equipment loss and retrieval
- Monitoring and/or auditing checklists and reports completed for each sub-plan
- A monthly report of outcomes of environmental inspections.

Detailed monitoring requirements, the impacts to be mitigated, performance objectives and standards, indicators, incident reporting and monitoring thresholds will be presented within the individual sub-plans.

4.1 Monitoring and inspection

Monitoring of compliance with controls and Project environmental performance will be achieved through a program of inspecting and testing, as detailed in the following management table. All monitoring records shall be kept in accordance with Section 4.6 and will be reviewed by the Project Director to check compliance with management controls and limits as set by the management plans in Section 3 of this EMP.

A data review shall be completed on a monthly basis to identify trends in environmental performance and to assess and identify opportunities for improvement. Authorised personnel, specifically trained, will perform monitoring and inspections during the site establishment, construction and operational phases.

The results of the monitoring programs identified below, will be used as management indicators of the effectiveness of environmental controls. An adaptive management approach will be implemented by the Project, and controls detailed within this EMP are subject to change pending development of the detailed sub-plans, and the results of identified monitoring programs, audits and inspections.



Environmental Management Plan 13 - Monitoring and inspection plan

Environmental Management Control		Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
Pre-Construction					
13.1	Site- and issue-specific baseline monitoring programs are specified in each sub-plan as presented in Section 3.				
13.2	Pre-start audit requirements are outlined in Section 4.2.				
Construction					
13.3	<p>Site inspections will be carried out by the Construction Contractor. Inspections of site activities will vary in their scope and intensity in accordance with the levels of risk posed by site activities, past incidents/non-conformances, weather conditions, etc.</p> <p>Site inspections will include, but not be limited to, the following:</p> <ul style="list-style-type: none"> ▪ Hazardous materials and dangerous goods storage controls and labelling ▪ Weed and pest presence and management controls ▪ Dust control measures ▪ Water (surface, ground, marine) quality protection measures ▪ Noise mitigation measures ▪ Implementation of corrective actions ▪ Waste management practices ▪ Intrusive works that may impact groundwater ▪ Construction works against JSEAs and relevant plans and 	CC	Daily	Daily site inspections	



Section 4

EMP Monitoring and Review

Environmental Management Control		Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
procedures.					
13.4	Weekly inspections and audits of the contractor's daily reports and control measures will be conducted.	CC	Weekly		
13.5	Fortnightly inspection of hazardous waste storages and spill kits to ensure adequacy to treat spill types, and they are in required locations.	CC	Fortnightly		
13.6	Monthly inspection of the Project area to identify evidence of vehicle activity off designated roads, wastes blown from the Project area, general housekeeping, condition of fencing and gates.	CC	Monthly		
13.7	Specific environmental monitoring.	CC	As identified in the sub-plan monitoring plan.		
Operation					
13.8	Ongoing monitoring of rehabilitated areas.	OpPM	Ongoing		



Advisian

WorleyParsons Group



**Queensland
Government**

Section 4

EMP Monitoring and Review

DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



4.2 Compliance audits

Environmental audits will be undertaken in order to measure the environment performance and compliance of the Project against legal obligations, conditions of approvals, and actions outlined in the final EMP(s). All audits will be scheduled and conducted in accordance with the Project's HSE Audit Plan that will be developed prior to commencement of site establishment and construction works. The audit plan will provide for internal and external audits.

An external audit will be conducted on an annual basis, or as required by the conditions of approval, by a suitably qualified and independent environmental auditor. In addition to the scheduled audits below, compliance audits against the commitments made in the final EMP(s), and development approval conditions, will be conducted:

- On commencement of each development activity
- Following a major environmental incident.



Section 4 EMP Monitoring and Review

Environmental Management Plan 14 - Compliance audits

Environmental Management Control	Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
Planning and Design				
14.1 Verification audit to ensure that environmental conditions/discharge limits have been incorporated into engineering design.	PD	PreC		
Pre-Construction				
14.2 A pre-start audit will be undertaken by the Project Manager prior to commencement of works to confirm that all required JSEAs for the planned construction activities are considered appropriate to mitigate environmental risks identified.	PD	PreC		
Construction				
14.3 Internal environmental audits of site activities related to construction will be undertaken on a monthly basis by the Construction Contractor.	CC	Monthly		
14.4 Third party environmental audits will be undertaken quarterly by a certified lead environmental auditor to monitor compliance of contractor's activities with the EMP. The audit scope may include verification of compliance with any EMP provision, for instance:	PD to arrange third party audit	Quarterly		
<ul style="list-style-type: none"> ▪ Compliance with statutory obligations ▪ Adequacy of monitoring and operational reports ▪ Implementation of mitigation measures 				



Section 4 EMP Monitoring and Review

Environmental Management Control	Person Responsible	Timing / Frequency	Monitoring / Reference / Notes
<ul style="list-style-type: none"> ▪ Adequacy of environmental training records ▪ Adequacy of environmental records ▪ Environmental reports ▪ Recording and completion of corrective actions following environmental incidents and complaints ▪ Achievement of environmental performance criteria ▪ Implementation of actions from previous audits ▪ Frequency of non-conformances and investigations ▪ Site environmental controls. 			
<p>14.5 Each Construction Contractor will be required to prepare and submit to the Project Manager an environmental compliance 'sign off' report for their respective work package(s) one month prior to completion of the construction package. The report must summarise how the Construction Contractor's environmental obligations have been addressed and any remaining actions to be taken to meet all obligations prior to leaving the site.</p>	CC	One month prior to completion of activity	
Operation			
<p>14.6 Audits of monitoring programs at intervals specified by the individual program. Refer Section 3.</p>	OpPM	Operations	



Advisian

WorleyParsons Group



**Queensland
Government**

Section 4

EMP Monitoring and Review

DSD Department of State Development
PD Project Director
Eng Design Engineer
CC Construction Contractor
CCS Construction Contractor Supervisor

DP Design Phase
PreC Pre Construction Phase
CP Construction Phase
Op Operations Phase
OpPM Operation Project Manager

VI Visual Inspection
MER Monthly Environmental Report
CL Checklist
JSEA Job Safety Environmental Analysis
Audit Environmental Compliance Audit



Section 4 EMP Monitoring and Review

4.3 Review

To ensure the continuing suitability, adequacy and effectiveness of this EMP, a program for periodical review has been adopted. The review will assess opportunities for improvement and any need for changes to the final EMP(s), including its environmental management controls and procedures.

The EMP review team will be led by the NQBP Project Director. The EMP review team may invite any individual to participate in the review. EMP management reviews will be conducted on a quarterly basis.

Procedures for the review are as follows:

1. Minutes of the review meeting will be taken and approved by the NQBP Project Director, who will indicate approval by signing the summary page. The minutes will be kept in the electronic document management system.
2. At a minimum, the items listed in Table 4-1 will be reviewed/discussed and recorded in the minutes.

Table 4-1 Items for management review

Monthly	Quarterly
Status of corrective actions from previous management reviews.	A reference to environmental performance as reported in the environmental annual return report relative to previous years.
Any change in circumstances relevant to environmental performance (including changes/developments in management structures, environmental responsibilities and legal and other requirements related to environmental aspects).	All proposed changes to the EMP or investigations/feasibility studies to be undertaken to resolve major environmental incidents and continued non-conformance issues.
Issues to be resolved and the completion date.	Person(s) responsible for establishing and implementing any changes to the EMP.
Any communication from external interested parties, including complaints.	Results of audits.
Recommendations for environmental practices/issues identified as requiring improvement.	The extent to which objectives and targets have been met.
Planned operational changes and any changes currently being utilised and their effectiveness.	Timetable for establishment and implementation of changes to the EMP.
Review environmental performance against set	



environmental key performance indicators once established.

3. Instructions will be issued to the individual(s) responsible for document control to incorporate the agreed-to changes to procedures into the relevant document(s)
4. Instructions will be issued to individual(s) responsible for implementing any changes
5. Environmental commitments will be reviewed and updated if required
6. Any inconsistencies will be resolved during the management review meeting or presented at the earliest practical date for resolution
7. The outcome of the review of the inconsistencies will be acted upon within one month of receiving the resolution.

4.4 Incident reporting and complaints

In the event of an environmental incident, exceedance or non-compliance with the EMP, an incident report will be prepared that includes details of the incident, response, corrective actions, responsibility and timing. Reports will be made available during audits where required.

Any environmental incident on the Project will be reported to and assessed by the Construction Project Manager and Operations Project Manager or his/her delegate, in conjunction with the relevant responsible supervisor.

A complaints management procedure will be developed to respond to community and stakeholder complaints. This will include the following:

- Date and time of the complaint
- Contact details of the complainant
- Identity of the person who received the complaint
- The manner in which the complaint was received
- The issue, nature and urgency of the complaint
- Any investigations undertaken
- Recommended responses
- Conclusions formed as part of investigations into the complaint
- Date action completed
- Notation as to the satisfaction or dissatisfaction of the complainant with the outcome
- Outcomes and responses to the complainant, including notation as to the satisfaction or dissatisfaction of the complainant with the outcome.



Section 4

EMP Monitoring and Review

Environmental Management Plan 15 - Incident reporting and complaints

Environmental Management Control		Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
Pre- Construction					
15.1	All construction personnel will be trained in the use of the Project’s incident reporting processes and procedures that apply to their role.	CC	PreCon		
Construction					
15.2	All incidents will be reported and investigated in accordance with Section 4.4.	CC	Ongoing		
15.3	All environmental incidents are to be reported to the Project Manager as soon as practicable after corrective actions are taken or by the end of the shift at the latest.	CC	Ongoing		
15.4	Project Manager will review incidents on a weekly basis to account for any compounding effects.	CC	Weekly		
15.5	Complaints relating to environmental aspects will be reported, investigated and managed in accordance with Section 4.4.	CC	Ongoing		
Operation					
15.6	Complaints relating to environmental aspects will be reported, investigated and managed in accordance with Section 4.4.	OpPM	Ongoing		



Section 4

EMP Monitoring and Review

Environmental Management Control		Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
15.7	All incidents will be reported and investigated in accordance with Section 4.4.	OpPM	Ongoing		
15.8	All environmental incidents are to be reported to the Operations Project Manager as soon as practicable after corrective actions are taken or by the end of the shift at the latest.	OpPM	Ongoing		
15.9	The Project Manager will review incidents on a weekly basis to account for any compounding effects.	OpPM	Weekly		
15.10	Complaints relating to environmental aspects will be reported, investigated and managed in accordance with the Project's incident reporting procedure in Section 4.4.	OpPM	Ongoing		
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit



4.5 Non-compliance and corrective action

An audit report will be prepared that will document the extent of environmental compliance findings, recommendations and actions resulting from site inspections and audits. This report will be distributed to the NQBP Project Director, Project Manager, Operations Project Manager and delegated personnel for review and action. The audit report will identify and provide recommendations for any non-conformances and opportunities for improvement, where relevant. Any breach of the EMP will be treated as a non-compliance requiring action (e.g. action may include review and amendment of the EMP's environmental management controls), regardless of whether there is a legislative basis to the commitment.

Negative findings arising from complaints, incidents, routine inspection, monitoring and auditing shall require corrective/preventive action. This shall include the preparation of documented action plans consistent with the level of risk associated with the matter of concern.

In the event of a non-conformance:

- The nature of the event will be investigated
- Advice will be sought from a specialist where the matter is outside the expertise of Project management
- Monitoring will be undertaken where required to properly investigate an incident, compliant or non-conformance
- An appropriate preventative and corrective action will be implemented
- The effectiveness or need for new/additional controls will be reviewed
- Strategies will be identified to prevent reoccurrence
- Environmental documentation will be reviewed and revised
- In certain situations work will be ceased until appropriate remedial actions are taken.

The status of corrective/preventive actions shall be periodically reviewed by the Project Manager and Operations Project Manager or his/her delegate, to ensure that all actions arising from inspections and audits are implemented in a timely manner, and verified and recorded as being satisfactorily completed.

Corrective action requests and observations of concern arising from external audits shall be addressed immediately following the site audit closing meeting using draft audit findings and resolved within two weeks of receiving the final audit report.



4.6 Records

All environmental management documentation generated on the Project, whether hard copy or electronically generated, will be controlled in accordance with the project document control procedure in Section 4.6. Records shall be kept to demonstrate compliance with the EMP, environmental approval conditions and other identified legal obligations.

Environmental Management Plan 16 - Records management

Environmental Management Control		Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
Planning and Design					
16.1	Current and superseded versions of this EMP with attached regulatory licences and permits.	PD	As required		
Pre-construction reports					
16.2	Correspondence with regulatory authorities.	PD	As required		
16.3	Employee training records and personnel competencies.	PD	Pre-Con		
Construction					
16.4	Regulatory authority inspection reports.	CC	As required		
16.5	Daily site inspection – completed checklist.	CC	Daily		
16.6	Weekly environmental inspection checklists. These reports shall include items such as environmental activities	CC	Weekly		



Section 4

EMP Monitoring and Review

Environmental Management Control	Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
undertaken, copies of completed inspection checklists, work areas and status, completed reinstatement, monitoring undertaken, consultation undertaken and tasks to be completed.				
16.7 Monthly reports. Update the Project Manager on the activities of the previous month, typically a summary of the weekly reports.	CC	Monthly		
16.8 Compliance reports: The approval holder will prepare environmental compliance reports, as required, for submission to the regulator(s), which will provide information on the ongoing status and performance of the construction works.	PD	As required		
16.9 Environmental monitoring records.	CC	As identified in the sub-plan monitoring plan.		
16.10 Environmental accidents/incidents/emergency reports.	PD	As required		
16.11 Non-conformance reports.	PD	As required		
16.12 Complaint reports/registers.	CC	As required		
16.13 A record/manifest will be maintained to track the management of general and regulated waste through to its final destination. The manifest shall record the type of	CC	Weekly		



Section 4

EMP Monitoring and Review

Environmental Management Control		Person Responsible	Timing / Frequency	Monitoring	Reference / Notes
waste, and the location and date of its final treatment.					
16.14	Audit reports.	CC		As required	
16.15	Management review minutes and actions taken.	CC		As required	
16.16	Progressive erosion and sediment control plans.	CC		As required	
Operation					
16.17	Environmental monitoring records.	OpPM		As detailed in sub-plans.	
DSD	Department of State Development	DP	Design Phase	VI	Visual Inspection
PD	Project Director	PreC	Pre Construction Phase	MER	Monthly Environmental Report
Eng	Design Engineer	CP	Construction Phase	CL	Checklist
CC	Construction Contractor	Op	Operations Phase	JSEA	Job Safety Environmental Analysis
CCS	Construction Contractor Supervisor	OpPM	Operation Project Manager	Audit	Environmental Compliance Audit