

Belmont Desalination Plant

Construction Soil and Water Management Sub-Plan

Document Number: CS1135-WT-BEL-EN-PLN-0021

Revision Number: 2 Issue Date: 31/10/2024



Revisions and Distribution

Revisions

...

Draft issues of this document are identified as Revision A, B, C, etc. Upon initial issue (generally Contract Award) this will be changed to a sequential number commencing at Revision 0. Revision numbers will continue at Revision 1, 2, etc.

Rev	Date	Prepared By [Name]	[Signature]	Reviewed By [Name]	[Signature]	Approved By [Name]	[Signature]	Remarks
A	06/05/2024	B Rice	BR	A Grant	AG	J Nisbet	JN	Submission for HW / ER review
В	09/08/2024	A Grant	AG	S Vincent G Fletcher E Coleman B Wackett	SV GF EC BW	S MacNish	SM	Update post modification
0	23/09/2024	A Grant	AG	S Vincent	SV	S MacNish	SM	Update post ER / HWC comments
1	08/10/2024	A Grant	AG	S Vincent G Fletcher E Coleman B Wackett	SV GF EC BW	S MacNish	SM	Update following LMCC consultation period
2	31/10/2024	A Grant	AG	S Vincent G Fletcher E Coleman B Wackett	SV GF EC BW	S MacNish	SM	Update following LMCC consultation period

Distribution List

Client's Representative	S Farrar
Project Director	S MacNish
Construction Manager	J Nisbet
Environment Manager	A Grant
Environmental Representative	D Bone
Soil Conservationist	G Fletcher

The controlled master version of this document is available for distribution as appropriate and maintained on the document management system being used on the Project, available to all Project workers. All circulated hard copies of this document are deemed to be uncontrolled.



Table of Contents

...

0

Revisions and Distribution	2
Terms and Abbreviations	5
Plan Profile	7
1. Introduction	8
1.1. Context	8
1.2. Background	8
1.2.1. The Project	8
1.2.2. Statutory Context	8
1.3. Environmental Management Systems Overview	9
1.3.1. Relationship between this Plan and other Project documents	9
1.4. Consultation for Preparation	9
2. Purpose and Objectives	10
2.1. Purpose	10
2.2. Objectives	10
3. Environment Requirements	11
3.1. Relevant Legislation and Guidelines	11
3.2. Conditions of Approval – SSI-8896	12
3.3. Revised Environmental Management Measures	14
3.4. Environment Protection License (EPL)	
3.5. Other Permits and Licences	17
4. Existing Environment	
4.1. Kev Reference Documents	
4.2. Topography and Soil Characteristics	
4.2.1. Topography	
4.2.2. Geology	
4.2.3. Soil Landscape and Characteristics	
4.2.4. Contamination	
4.2.5. Acid Sulfate Soils	22
4.2.6. Mining	24
4.2.7. Unexploded Ordinance	24
4.3. Surface Water	24
4.3.1. Hydrology and Flooding	24
4.3.2. Belmont WWTW Wet Weather Management	
4.4. Climate	25
4 4 1 Rainfall Frosivity Factor	25
5. Environmental Aspects and Impacts	26
5.1. Construction Activities	26
5.2 Impacts	26
6. Environmental Control Measures	
6.1. Soil and Surface Water Management During Construction	
6.1.1 Environmental Control Maps	
6.1.2. Progressive Erosion and Sediment Control Plans	
6.1.3. Stockpile Management Protocol	
6.1.4. Contaminated Land Management Plan	
CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN CS1135-WT-BEL-EN-PLN-0021 REV: 2 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION COMMERCIAL-IN-CONFIDENCE	3

6.1.6. Swale Drains and Site Sequencing. 38 6.2. Soil and Water Management in Design 38 7. Compliance Management 39 7.1. Roles and Responsibilities 39 7.2. Training. 39 7.3. Complaints Management 40 7.4. Monitoring and Inspection 40 7.5. Auditing. 41 7.6. Reporting 41 7.7. Non-compliance and Non-conformance 43 8. Review and Improvement 44 8.1. Continuous Improvement 44 8.2. ESCP Review 44 8.3. CSWMSP Version Control 44 Appendix A – Consultation Records 45 Appendix B – Site Auditor Review and Interim Site Audit Advice 47 Appendix C – Erosion and Sediment Control Strategy. 48 Appendix D – Acid Sulfate Soil Management Plan. 49 Appendix E – Unexpected Contamination Procedure 50	6.1.5. Acid Sulfate Soils Management Plan	37
6.2. Soil and Water Management in Design 38 7. Compliance Management 39 7.1. Roles and Responsibilities 39 7.2. Training 39 7.3. Complaints Management 40 7.4. Monitoring and Inspection 40 7.5. Auditing 41 7.6. Reporting 41 7.7. Non-compliance and Non-conformance 43 8. Review and Improvement 44 8.1. Continuous Improvement 44 8.2. ESCP Review 44 8.3. CSWMSP Version Control 44 Appendix A – Consultation Records 45 Appendix B – Site Auditor Review and Interim Site Audit Advice 47 Appendix D – Acid Sulfate Soil Management Plan 49 Appendix D – Acid Sulfate Soil Management Plan 49 Appendix E – Unexpected Contamination Procedure 50	6.1.6. Swale Drains and Site Sequencing	
7. Compliance Management 39 7.1. Roles and Responsibilities 39 7.2. Training 39 7.3. Complaints Management 40 7.4. Monitoring and Inspection 40 7.5. Auditing 41 7.6. Reporting 41 7.7. Non-compliance and Non-conformance 43 8. Review and Improvement 44 8.1. Continuous Improvement 44 8.2. ESCP Review 44 8.3. CSWMSP Version Control 44 Appendix A – Consultation Records 45 Appendix B – Site Auditor Review and Interim Site Audit Advice 47 Appendix C – Erosion and Sediment Control Strategy 48 Appendix D – Acid Sulfate Soil Management Plan 49 Appendix E – Unexpected Contamination Procedure 50	6.2. Soil and Water Management in Design	
7.1. Roles and Responsibilities 39 7.2. Training 39 7.3. Complaints Management 40 7.4. Monitoring and Inspection 40 7.5. Auditing 41 7.6. Reporting 41 7.7. Non-compliance and Non-conformance 43 8. Review and Improvement 44 8.1. Continuous Improvement 44 8.2. ESCP Review 44 8.3. CSWMSP Version Control 44 Appendix A – Consultation Records 45 Appendix B – Site Auditor Review and Interim Site Audit Advice 47 Appendix C – Erosion and Sediment Control Strategy 48 Appendix D – Acid Sulfate Soil Management Plan 49 Appendix E – Unexpected Contamination Procedure 50	7. Compliance Management	
7.2. Training397.3. Complaints Management407.4. Monitoring and Inspection407.5. Auditing417.6. Reporting417.7. Non-compliance and Non-conformance438. Review and Improvement448.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan.49Appendix E – Unexpected Contamination Procedure50	7.1. Roles and Responsibilities	
7.3. Complaints Management407.4. Monitoring and Inspection407.5. Auditing.417.6. Reporting417.7. Non-compliance and Non-conformance438. Review and Improvement448.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	7.2. Training	
7.4. Monitoring and Inspection407.5. Auditing417.6. Reporting417.7. Non-compliance and Non-conformance438. Review and Improvement448.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	7.3. Complaints Management	40
7.5. Auditing.417.6. Reporting417.7. Non-compliance and Non-conformance438. Review and Improvement448.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy.48Appendix D – Acid Sulfate Soil Management Plan.49Appendix E – Unexpected Contamination Procedure50	7.4. Monitoring and Inspection	40
7.6. Reporting417.7. Non-compliance and Non-conformance438. Review and Improvement448.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	7.5. Auditing	41
7.7. Non-compliance and Non-conformance438. Review and Improvement448.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	7.6. Reporting	41
 8. Review and Improvement	7.7. Non-compliance and Non-conformance	43
8.1. Continuous Improvement448.2. ESCP Review448.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	8. Review and Improvement	44
8.2. ESCP Review 44 8.3. CSWMSP Version Control 44 Appendix A – Consultation Records 45 Appendix B – Site Auditor Review and Interim Site Audit Advice 47 Appendix C – Erosion and Sediment Control Strategy 48 Appendix D – Acid Sulfate Soil Management Plan 49 Appendix E – Unexpected Contamination Procedure 50	8.1. Continuous Improvement	44
8.3. CSWMSP Version Control44Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	8.2. ESCP Review	44
Appendix A – Consultation Records45Appendix B – Site Auditor Review and Interim Site Audit Advice47Appendix C – Erosion and Sediment Control Strategy48Appendix D – Acid Sulfate Soil Management Plan49Appendix E – Unexpected Contamination Procedure50	8.3. CSWMSP Version Control	44
Appendix B – Site Auditor Review and Interim Site Audit Advice 47 Appendix C – Erosion and Sediment Control Strategy 48 Appendix D – Acid Sulfate Soil Management Plan 49 Appendix E – Unexpected Contamination Procedure 50	Appendix A – Consultation Records	45
Appendix C – Erosion and Sediment Control Strategy	Appendix B – Site Auditor Review and Interim Site Audit Advice	47
Appendix D – Acid Sulfate Soil Management Plan	Appendix C – Erosion and Sediment Control Strategy	
Appendix E – Unexpected Contamination Procedure50	Appendix D – Acid Sulfate Soil Management Plan	
	Appendix E – Unexpected Contamination Procedure	50

Figures

Figure 4-1 Soil Landscapes and Geotechnical Investigations	21
Figure 4-2 Acid Sulfate Soil mapping within proximity to the site	23

Tables

Table 3-1: Legislation and Regulatory Requirements	11
Table 3-2: Conditions of Approval relevant to the CSWMSP	12
Table 3-3: Environmental Management Measures relevant to this CSWMSP	14
Table 4-1: Summary of soil landscapes within the construction footprint	20
Table 4-2: Monthly % and annual rainfall erosivity (R-factor) values for Newcastle	25
Table 6-1: Soil and Surface Water Management and Mitigation Measures	27
Table 6-2: Stockpile Mitigation Measures	35
Table 7-1: Roles and responsibilities specific to this Plan	39
Table 7-2: Training responsibilities relevant to this Plan	39
Table 7-3: Monitoring, Inspection and Reporting Requirements	40
Table 7-4 Reporting requirements specific to soil and surface water management	41



Terms and Abbreviations

•...

6

Term/Abbreviation	Definition/Expanded text
AHD	Australian Height Datum
AMS	Activity Method Statements
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASS	Acid Sulfate Soil
ASSMAC	Acid Sulfate Soil Management Advisory Committee
ASSMP	Acid Sulfate Soils Management Plan
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Land Management Act 1997
CLMP	Contaminated Land Management Plan
CoA	Conditions of Approval
CoPC	Contaminants of Potential Concern
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CSMP	Contaminated Soil Management Plan
CSWMP	Construction Soils and Water Management Plan
DPI	Department of Primary Industries
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Former Department of Planning, Industry and Environment
DSI	Detailed Site Investigation
ECM	Environmental Control Maps
EIS	Environmental Impact Statement
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
EPL	Environment Protection Licence
ESCP	Erosion and Sediment Control Plan
ESCS	Erosion and Sediment Control Strategy
FERSP	Flood Emergency Response Sub-Plan
HWC	Hunter Water Corporation
NSWF	NSW Fisheries
PASS	Potential Acid Sulfate Soil
PESCP	Progressive Erosion and Sediment Control Plan
PFAS	Per- and polyfluoroalkyl substances
POEO Act	Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
REMM	Revised Environment Management Measures
RUSLE	Revised Universal Soil Loss Equation

	J <u>o</u> hn Hollvnd
Term/Abbreviation	Definition/Expanded text
SEARs	Secretary's Environmental Assessment Requirements
SMART	Specific, Measurable, Achievable, Relevant and Time-Bound
SSI	State Significant Infrastructure
TARP	Trigger Action Response Plan
TSS	Total suspended solids
UCP	Unexpected Contamination Procedure
WMP	Waste Management Sub-Plan
VENM	Virgin Excavated Natural Material



Construction Soil and Water Management Sub-Plan

Plan Profile

•••

0

Management System	The Project will use John Holland's Environmental Management System (EMS) and core Project plans to support Project delivery. Additional functional plans have been developed for the Project.		
Name	Construction Soil and Water Management Sub-Plan (CSWMSP)		
Authorisation	All personnel employed on the Project will perform their duties in accordance with the requirements of this Plan and in compliance with Project system procedures and any specific Project instructions. This Plan is authorised by the Project Director.		
Review and update	 This Plan will be regularly reviewed, developed, and updated: For changes in design or construction sequence, staging, methodology or resourcing To consider progress of the Project Company's Work For changes in access to the Project Site and Temporary Areas To consider changes directed by Hunter Waters representative. 		



1. Introduction

1.1. Context

•••

This Construction Soil and Water Management Sub-Plan (CSWMSP or Plan) forms part of the Construction Environmental Management Plan (CEMP) for the Belmont Desalination Plant ('the Project').

This CSWMSP has been prepared to address the requirements of the Conditions of Approval (CoA), the measures listed in the Belmont Desalination Plant Environmental Impact Statement (EIS) as amended by the Modification Report and Submissions Report (known as the Revised Environmental Management Measures (REMMs)), and all applicable guidelines and legislation.

1.2. Background

1.2.1. The Project

The Belmont Drought Response Desalination Plant ('the Project') was approved as SSI-8896 by the then New South Wales (NSW) Minister for Planning on the 23 July 2021. The approved Project involves the construction and operation of a drought response desalination plant producing up to 30 megalitres per day (ML/d) including seawater intake infrastructure; desalination units; brine discharge via existing ocean outfall; electricity/water supply; and ancillary works.

The approved Project is being developed on land (Part Lot 1 DP 433549) at 12a Ocean Park Road, Belmont South ('the Project area') that comprises a portion of the existing Belmont Wastewater Treatment Works (WWTW) which is located to the southeast of the town of Belmont, NSW within the Lake Macquarie City Council (LMCC) local government area (LGA). Belmont Lagoon, Cold Tea Creek and the residential area of Belmont is located to the west, with the Pacific Ocean bordering the site to the east and south.

The Modification EIS was exhibited by the Department of Planning and Environment (DPE) from 24 January 2024 to 20 February 2024. During the exhibition of the Modification EIS, 22 submissions were received from government agencies, stakeholders, and the community. A Submissions Report was prepared in May 2024 and made available via the Planning website.

Hunter Water completed a major review of the 2014 Lower Hunter Water Plan (LHWP) in 2022, now referred to as the Lower Hunter Water Security Plan (LHWSP) in accordance with the state-wide NSW Water Strategy and in consultation with DPE – Water, Lake Macquarie City Council, and the Lower Hunter community. Since the Project was approved the LHWP has been superseded by LHWSP (Hunter Water, 2022). The LHWSP outlines measures to ensure adequate water for the Lower Hunter region during drought including the change from a drought response Desalination Plant to a permanently available Desalination Plant at Belmont. A detailed Project description is provided in the CEMP.

1.2.2. Statutory Context

The Project was approved as State Significant Infrastructure (SSI-8896) by the then New South Wales (NSW) Minister for Planning and Public Spaces under Division 5.2 of Part 5 of the EP&A Act on the 23 July 2021 following submission of an EIS and Amendment Report to Department of Planning, Housing and Industry (DPHI) (formerly the Department of Planning, Infrastructure and Environment (DPIE)) in November 2019 and August 2020 respectively. The Project is identified as SSI as it satisfies Clause 4(1) of the then State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD).

Under Section 5.25 of the EP&A Act, a proponent may request the Minister to modify the approval for State Significant Infrastructure. Such approval is required if the infrastructure as modified is not consistent with the existing approval issued under section 5.13 of the Act. After consultation with the DPHI, a Modification Report was prepared in 2023 to support a request by Hunter Water for the Minister to modify the approval to allow further changes to the approved project.



The Modification report was exhibited by the DPHI from 24 January 2024 to 20 February 2024. During the exhibition of the Modification EIS, 22 submissions were received from government agencies, stakeholders, and the community. A Submissions Report was prepared and made available in May 2024 via the Project website.

1.3. Environmental Management Systems Overview

The Environmental Management System (EMS) overview is described in the CEMP. The EMS also incorporates the Project-specific CEMP and sub-plans, strategies and procedures. The EMS provides for overarching environmental management actions for implementation by Project personnel and contractors and will apply for the duration of construction.

1.3.1. Relationship between this Plan and other Project documents

Other Project documents that interface with this Plan include:

- CEMP and associated Sub-Plans
- Construction Management Plan
- Safety Management Plan

·••

Sustainability Management Plan

The key CEMP Sub-Plan interfaces that ensure the Project CoA and REMMs are implemented are as follows:

- The Construction Flood Emergency Response Management Sub-Plan (FERSP), which addressed controls regarding the management of site in response to forecast and actual flood events.
- Construction Groundwater Management Sub-Plan (CGMP), which address controls regarding the management of groundwater quality, discharge, and availability.
- The Waste Management Sub-Plan addresses the removal of waste from the site.

The CEMP provides a full list of plans, procedures and other documents that form the EMS.

1.4. Consultation for Preparation

In accordance with CoA C15, this CSWMSP has been prepared as part of the CEMP in consultation with Lake Macquarie City Council (LMCC).

This CSWMSP was provided to the Lake Macquarie City Council (LMCC) on 11 September 2024. All comments received were considered and the CSWMSP updated accordingly. Consultation records are provided in Appendix A.

Community feedback and complaints relating to soil and surface water impacts will be dealt with in accordance with the Communication Strategy and the Complaints Management System detailed in the CEMP.

In accordance with CoA C15, the following suitably qualified specialists have been involved in the development and preparation of this plan and associated appendices:

- Grant Fletcher of SOS Environmental (an accredited Certified Practising Erosion and Sediment Control (CPESC #7556) expert)0020
- Emma Coleman of Qualtest (a Certified Environmental Practitioner Site Contamination Specialist (CEnvP-SC)).
- Ben Wackett, specialist contamination consultant at Cavvanba appointed Site Auditor for the Belmont Desalination Plant.

In accordance with CoA A43, this Plan was endorsed by the Environmental Representative (ER) on XX XX 2024 prior to submission to the Planning Secretary for approval no later than one month before the commencement of construction.



2. Purpose and Objectives

2.1. Purpose

•••

The purpose of this Plan is to describe how the Project will manage and protect soil and surface water during construction of the Project.

2.2. Objectives

The key objective of the CSWMSP is to ensure all approval and contractual requirements relevant to soil and surface water including water quality are described, scheduled, and assigned responsibility as outlined in the Project environmental assessment documentation:

- EIS Chapters 7.1, 7.2 and 7.3
- EIS Appendix H Contamination Assessment
- EIS Appendix M Coastal Processes Assessment
- Modification Report Section 6.8 (surface water) and 6.10 (coastal hazards).
- Douglas Partners Additional Acid Sulphate Soils Investigations (May 2023)
- GHD Detailed Site Investigation (October 2020)
- GHD Additional Contamination Investigation Report (July 2023)
- Jacobs Response to Submissions Report (May 2024)

To achieve compliance with the conditions and objectives of the Project documents above, the Project will implement control measures (Section 6 of this Plan) to address the relevant CoA outlined in Section 3.2 and the safeguards detailed in the REMMs in Section 3.3.



3. Environment Requirements

•...

3.1. Relevant Legislation and Guidelines

Table 3-1 details the principal legislation, regulation, guidelines, specifications, and Australian Standards that are relevant to soil and surface water management.

Table 3-1: Legislation and Regulatory Requirements

Legislation	Environment Protection and Biodiversity Conservation Act 1999		
	Environmental Planning and Assessment Act 1979		
	Protection of the Environment Operations Act 1997		
	Water Management Act 2000 and Water Act 1912		
	Fisheries Management Act 1994		
	Hunter Water Act 1991		
	Hunter Water Regulation 2015		
	Contaminated Land Management Act 1997		
Plans and Policies	State Environmental Planning Policy (Resilience and Hazards) 2021		
	NSW Aquiter Interference Policy (DPI 2012)		
	NSW Wetlands Policy		
	NSW State Rivers and Estuaries Policy		
	Crossings (Ref: NSWF – 1181).		
	PFAS National Environmental Management Plan		
Guidelines and	Acid Sulfate Soil Manual (ASSMAC 1998)		
Specifications –	Acid Sulfate Soils Assessment Guidelines (Department of Planning 2008)		
Soils	National Acid Sulfate Soils Guidance (Sullivan et al, 2018)		
	Guidelines for the Management of Acid Sulphate materials: Acid Sulphate Soils, Acid Sulphate Rock and Monosulphidic Black Ooze (RTA 2005)		
NSW EPA (2014) Waste Classification Guidelines – Acid Sulfate Soils			
	Acid Sulfate Soils Assessment Guidelines (Acid Sulfate Soil Management Advisory Committee, 1998)		
	Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines Version 5 (Department of Resources and Department of Environment and Science, Queensland, 2023)		
	National Acid Sulfate Soils Guidance - National Acid Sulfate Soils Sampling and Identification Methods Manual (Department of Agriculture Water and the Environment 2022)		
	National Acid Sulfate Soils Guidance - National Acid Sulfate Soils Identification and Laboratory Methods Manual (Department of Agriculture Water and the Environment 2022).		
Guidelines and Specifications –	National Environmental Protection Measure (Assessment of Site Contamination) 1999 (as amended 2013) (National Environment Protection Council 2013)		
Contamination	Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000)		
	ANZG (2018) Water Quality Guidelines		
	Australian Drinking Water Guidelines (NHMRC 2011)		
	Guidelines for Consultants Reporting on Contaminated Land (NSW EPA, 2020)		
	Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (NSW Environment Protection Authority 2015)		
	Guidelines for the NSW Site Auditor Scheme, 3rd Edition (NSW Environment Protection Authority 2017)		
	Guideline for the Management of Contamination (Roads and Maritime Services 2013c)		
	Environment Protection Authority: Sampling design part 1 - application, Contaminated Land Guidelines (NSW EPA, 2022)		
	Environment Protection Authority: Sampling design part 2 - interpretation, Contaminated Land Guidelines (NSW EPA, 2022)		
	Preparing Environmental Management Plans for Contaminated Land (NSW EPA, 2022)		
	NSW EPA (2014) Waste Classification Guidelines		

		J <u>o</u> hn Holland
		WA Department of Health (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia
		Resource Recovery Orders/Exemptions under Part 9, Clause 91 to 93 of the Protection of the Environment Operations (Waste) Regulation 2014
G S E S C	Guidelines and Specifications – Frosion & Frodiment Control	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (2022) Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ 2000) ANZG (2018) Water Quality Guidelines Australian Drinking Water Guidelines (NHMRC 2011) Department of Environment and Conservation (DEC): Bunding & Spill Management. Insert to the Environment Protection Manual for Authorised Officers - Technical section "Bu" November 1997 Environmental Best Management Practice Guideline for Concreting Contractors, DEC (2004) Fairfull, S. and Witheridge, G. (2003) Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings, NSW Fisheries Guidelines for Controlled Activities on Waterfront Land NSW Department of Primary Industries (2014) Salinity Training Handbook National Water Quality Management Strategy (Australian Government 2018) NSW Water Quality and River Flow Objectives (DECCW 2006) Managing Urban Stormwater (Volume 1 and 2) (Landcom 2004) (DECC 2008) Managing Urban Stormwater: Soils and Construction. Landcom, (4th Edition) March 2004 (reprinted 2006) (the "Blue Book"). Volume 1 and Volume 2 Guidelines for Construction Water Quality Monitoring (RTA 2003b)
		Volume 2C Unsealed Roads (DECCW 2008)

3.2. Conditions of Approval – SSI-8896

The CoA relevant to this Plan are listed in Table 3-2. A cross reference is also included to indicate where the condition is addressed in this Plan or other Project management documents.

Table 3-2: Conditions of	of Approval	relevant to	the	CSWMSP
--------------------------	-------------	-------------	-----	--------

CoA No.	Comn	nitment	Document reference		
A2	The de	This Plan			
	a) in compliance with the conditions of this approval;				
	b) in	accordance with all written directions of the Planning Secretary;	_		
	c) in ac pe	accordance with the EIS, Amendment Report, Response to Submissions and Iditional information provided in support of the application during the assessment priod;			
	d) in	accordance with the management and mitigation measures in Appendix 2.			
	e) in inf pe	accordance with the Modification Report, Submissions Report and additional formation provided in support of the application during the modification assessment erriod.	_		
A8	Where Propo	Section 1.4 Appendix A Communications Strategy			
	(a) co S				
	(b) pi				
	i.	the outcome of that consultation, matters resolved and unresolved; and			
	ii.	details of any disagreement remaining between the party consulted and the Proponent and how the Proponent has addressed the matters not resolved.			
CONSTRUCTI WHEN PRINTI	ON SOIL A ED THIS D	ND WATER MANAGEMENT SUB-PLAN CS1135-WT-BEL-EN-PLN-0021 REV: 2 31/10/2024 OCUMENT IS AN UNCONTROLLED VERSION COMMERCIAL-IN-CONFIDENCE			

CoA No.	Commitment	Document reference
B4	A Complaints Management System must be prepared and implemented before the commencement of any Work and maintained for the duration of construction and for a minimum of 12 months following completion of construction of the SSI.	Section 7.3
C15	The Proponent must prepare a Construction Soil and Water Management Sub-Plan (CSWMSP) and the plan must address, but not be limited to the following:	Section 1.4
	(a) be prepared by a suitably qualified expert, in consultation with Council;	
	(b) a detailed plan for the containment of all runoff from the site on the site and detail of the management of any overflows;	Appendix C
	(c) measures to ensure that sediment and other materials are not tracked onto the roadway by vehicles leaving the site;	Table 6-1
	(d) describe all erosion and sediment controls to be implemented prior to the commencement of construction, including as a minimum, measures in accordance with the publication Managing Urban Stormwater: Soils & Construction (4th edition, Landcom 2004) commonly referred to as the 'Blue Book';	Appendix C
	(e) include an Acid Sulfate Soils Management Plan, if required, including measures for the management, handling, treatment and disposal of acid sulfate soils, including monitoring of water quality at acid sulfate soils treatment areas;	Appendix D
	(f) prevent cross-contamination of clean and sediment laden water.	Appendix C
	(g) provide a plan of how all construction works will be managed in a wet-weather events (i.e. storage of equipment, stabilisation of the Site);	Table 6-1
	(h) detail all off-Site flows from the Site; and	Appendix C
	(i) describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5-year ARI and 1 in 100-year ARI.	Appendix C
C23	Prior to the commencement of earthworks, the Proponent must prepare an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed. Where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site.	Appendix E
C28	Prior to the commencement of construction, the Proponent must engage a NSW EPA- accredited Site Auditor to provide advice throughout the duration of works in relation to disturbance of A-horizon soils (as shown at Appendix 3) in the south of the site that have not been subject to disturbance to ensure that any work required in relation to soil or groundwater contamination is appropriately managed.	A NSW accredited site auditor has been engaged in accordance with this condition
D21	 The Proponent must: (a) ensure that only VENM, ENM, or other material approved in writing by EPA is brought onto the site; (b) keep accurate records of the volume and type of fill to be used; and 	Section 6.1.4
	(c) make these records available to the Planning Secretary upon request.	
D22	Adequate provisions must be made to collect and discharge stormwater drainage during construction. The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter.	Section 6.1.2
D33	The Proponent must conduct site investigations to confirm the full nature and extent of the contamination in relation to disturbance of A-horizon soils (as shown at Appendix 3 of the Project Approval) in the south of the site that have not been subject to disturbance, and comply with the following requirements:	Section 6.1.4
	 (a) the site investigations must be undertaken, and the subsequent report(s), must be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997; (b) the reports must be prepared, or reviewed and approved by consultants certified 	
	under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil	

CoA No.	Commitment	Document reference
	Science Australia Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM) scheme; and	
	(c) the recommendations of any Remedial Action Plan and the unexpected finds procedure must be updated following results of further site investigations and implemented throughout duration of project work.	
D34	The Proponent must ensure the proposed development does not result in a change of risk in relation to any pre-existing contamination on the site that would result in significant contamination.	Section 6.1.4

3.3. Revised Environmental Management Measures

••••

Relevant REMMs are listed in Table 3-3 below. This includes reference to required outcomes, the timing of when the commitment applies and cross reference to indicate where the requirement is addressed in this Plan or other Project management documents.

Table 3-3: Environmental Management Measures relevant to this CSWMSP

Ref #	Commitment	Timing	Document Reference
SGC02	Hunter Water commits to undertaking a DSI prior to Project determination. The scope of the DSI will include analysis for heavy metals, TRH, BTEXN, PAHs, OCPs, PCBs and asbestos and has been based on existing contamination data and the low potential for significant contamination to be present on Project area. Hunter Water will also undertake a focused investigation within the area of TP204 to further assess potential asbestos impacts prior to construction. This assessment, and the outcomes of the DSI will inform the management measures in the Contaminated Soil Management Plan (CSMP) and if remediation is required.	Prior to construction	Additional assessments completed during design phase as required (GHD, 2023). Section 6.1.4
SGC03	 Include contamination mitigation measures in an overall Contaminated Soil Management Plan (CSMP) for the construction to describe excavation, validation and disposal requirements for potentially contaminated soils. The CSMP must be prepared by appropriately qualified specialists and form a sub plan to the CEMP and will include the following as a minimum: Method of identification, separation, management and tracking of contaminated soils Stockpile any contaminated soil as far away from waterways / drainage lines as possible Keep contaminated and non-contaminated soils separate at all times Testing of soils to assess suitability if they are to be placed poor constitue recentor. 	Prior to construction	Section 6.1.4
SGC04	 Include an asbestos finds procedure in the overall CSMP. The asbestos finds procedure will be prepared by suitably qualified person or a competent person as determined under the Work Health and Safety Regulation (2017), and include: Guidance on the identification of asbestos containing materials (ACM) Steps to be undertaken if ACM is identified during works Management and remediation/removal procedures Required health and safety controls Waste disposal requirements Ongoing site management. 	Prior to construction	Appendix E



Ref # Commitment Timin	ng Document
	Reference
SGC06Conduct ASS testing within the Project area to confirm presence of ASS. If the ASSMAC Assessment Guidelines action criteria are triggered an Acid Sulphate Soil Management Plan (ASSMP) will be prepared as part of the CEMP in accordance with the Acid Sulphate Soil Laboratory Methods and Manual (ASSMAC, 1998). Include the following as a minimum:Prior to constitution	o Section 4.2.5 ruction Appendix D
 Method for spoil material testing to confirm presence of ASS during construction and prior to excavation in an area Conduct laboratory testing to calculate and verify treatment of ASS spoil material if it is to be treated on-site Locate ASS treatment area within the Project area, which is already disturbed and is outside of flood liable land Measures to manage any stockpiles of ASS materials, including bunding and cover to minimise leachate Supervision and certification of treatment prior to removal from treatment areas for re-use. 	
SGC07 Prepare an Erosion and Sediment Control Plan (ESCP) as part of a SWMP in accordance with Blue Book - Managing Urban Stormwater: Soils and Construction (4th ed, Landcom, March 2004), which must include the following: Prior 1 • Establish all erosion and sediment control measures before ground disturbance work commences and these are to remain in place until all surfaces have been fully restored and/or stabilised • • Outline the process for stabilisation and progressive revegetation of all disturbed area which will include species consistent with the dune restoration project to be undertaken within the greater Belmont WWTW site. • • Maintenance and inspection program and checklist including: • Conditions that would trigger watering of exposed and revegetated areas • Requirements for maintenance of revegetated areas • Requirements for maintenance of revegetated areas • Maintenance of erosion and sediment controls including clean out before 30% capacity remaining • • Limiting traffic movements on disturbed areas • • Exposed areas that is susceptible to wind generated dust particles, shall be progressively vegetated or watered. Where vegetation is not yet possible, dust suppression by watering shall be provided • Install a 40% porous, open weave barrier fence as a wind-break on the eastern side of the Project area (including the new area identified for the Proposed Modification where the 11 kV powerline connection will be loccated) in accordance wit	o Section 6.1.2 Appendix C



Ref #	Commitment	Timing	Document Reference
	Professional in Erosion and Sediment Control (CPESC)) as a coordinated sub plan to the SWMP.		
SGC08	 Include the management of material movements in the Soil and Water Management Plan, as follows: Identification of materials during excavations including contaminated, ASS, ENM/VENM Stockpiling and tracking of all materials throughout construction Validation and certification of material stockpiles prior to reuse Tracking of materials incoming and outgoing from site (e.g. as waste, quality of imported material) Method of soil testing including number of samples and how samples will be taken to confirm any soil amelioration requirements. Topsoil testing to include as a minimum fertility, sodicity and aluminium toxicity Waste classification of soils that require offsite disposal 	Prior to construction	Section 6.1 See also the Waste Management Sub Plan
SGC11	using the six-step process and criteria detailed in Waste Classification Guidelines – Part 1: Classification of Waste (NSW EPA 2014). Should unexpected, contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA. Include contingency plans for unexpected finds protocols for contaminated soils in the CSMP	Prior to construction	Appendix E
WR01	Vehicle wash down and/or cement truck washout will occur in a designated bunded area or offsite.	Construction	Included in Construction Groundwater Management Plan
WR02	Include provision in the ESCP for visual inspections of nearby waterways and drainage lines following rainfall events and corrective actions in the event of impacts.	Prior to construction	Table 7-3
WR03	Revegetation will be undertaken in all areas subject to ground disturbance, in accordance with the requirements listed in Table 7-2 of the EIS. Sediment and erosion controls (including dust) will be maintained until vegetation cover is established.	Prior to construction	Section 6.1.2 Erosion and Sediment Control Strategy
TFB07	Erosion and sediment controls will be installed and maintained in accordance with the measures outlined for soils, geology and contamination in this table.	During Construction	See reference to SGC REMMs in this table above Section 6.1.2
TFB09	Additional Acid Sulphate Soil sampling would be completed during the detailed design phase to confirm the risk of exposure of acid sulphate soils due to drawdown. If this sampling identifies that there is a risk associated with an acid sulphate soil a management plan	Detailed Design	This testing has been completed preconstruction.

Ref #	Commitment	Timing	Document Reference
	will be prepared in accordance with the measures outlined for soils, geology and contamination in this table.		
TFB15	Erosion and sediment controls will be implemented in accordance with Table 7-2 of the EIS before commencement of ground disturbance work and will be retained until all surfaces have been fully restored and stabilised.	Construction	Section 6.1.2 and Appendix C
CP01	 Implement a coordinated erosion monitoring and mitigation program in conjunction with the existing strategies and dune restoration project implemented for the adjacent WWTW, including: Site profiling and revegetation following completion of civil works in accordance with the final design which is to comply with the Lake Macquarie Coastal Zone Management Plan (CZMP) (2015) and DLWC (2001). Monitoring of recession and implementation of mitigation measures below as needed: Beach management works such as beach scraping to reshape dunes and increase dune volume/recovery after storms if necessary. Stabilisation of the frontal dune system by removing invasive species and replacing with locally indigenous dune vegetation. Installation of sediment fences to minimise the movement of sands during construction. Control offroad vehicle access and surface runoff. Potential positive cumulative impact to align these works with Hunter Water's proposed dune protection and restoration project between the Belmont Golf Course and WWTW. Ensure the public are prevented from entering works areas and potential areas of impact. 	Construction	This REMM no longer is considered to apply to the Project as the change in design between the EIS phase and Modification has resulted in the proposed construction of a vertical shaft for the Intake pipeline and therefore highly unlikely to be exposed by dune / coastal erosion.
HH01	 Should unexpected, contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA Include contingency plans for unexpected finds protocols for contaminated soils in the CSMP. 	Construction	Appendix E

3.4. Environment Protection License (EPL)

The existing EPL for the Belmont WWTW may be amended to include the Belmont Desalination Plant for Project construction and commissioning water discharge into the existing WWTW

3.5. Other Permits and Licences

...

Other permits and licences which will be held by the Project during construction will likely include:

- Groundwater Licence including Water Access Licences
- Environmental Protection Licence (existing WWTW)

HWC will be responsible for obtaining such licences and permits for the duration of the project. JH will implement and maintain compliance with these permits and licences as required throughout all construction phases. Permits



and licenses relating to groundwater will be undertaken in accordance with the Construction Groundwater Management Plan (CGWMP).

•...



4. Existing Environment

•••

The following sections summarise what is known about factors influencing soils and surface water within the Project footprint.

4.1. Key Reference Documents

The key reference documents are detailed below:

- EIS Chapters 7.1, 7.2 and 7.3
- EIS Appendix H Contamination Assessment
- EIS Appendix M Coastal Processes Assessment
- Modification Report Section 6.8 (surface water) and 6.10 (coastal hazards).
- Douglas Partners Additional Acid Sulphate Soils Investigations (May 2023)
- GHD Detailed Site Investigation (October 2020)
- GHD Additional Contamination Investigation Report (July 2023)
- Jacobs Response to Submissions Report (May 2024)

4.2. Topography and Soil Characteristics

4.2.1. Topography

Topographically the Project area is in a relatively low-lying flat area, with elevation ranging from 2 m to 5 m Australian Height Datum (AHD). The surface has been modified to form evaporation ponds which are now decommissioned, including excavation below surrounding ground level within the ponds and build-up of the pond embankments, which vary in height between approximately 1.5 m - 3.0 m above surrounding ground level. To the north, the Belmont WWTW lies on top of a low rise, ranging from 4 m to 8 m AHD, and to the east are undulating sand dunes.

4.2.2. Geology

Reference is made to the Newcastle 1:100,000 scale Coalfields Regional Geology sheets (Department of Mineral Resources, 1995), the regional geological and coastal Quaternary geology maps ((Geological Survey of NSW, 2015) and (Geological Survey of NSW, 2016)).

These maps indicate the Project area is underlain by medium to fine grained dune and marine sand that has been disturbed by fill and excavation works related to the construction of the Belmont WWTW and previous Defence activities.

4.2.3. Soil Landscape and Characteristics

The Reference to the Gosford – Lake Macquarie soil landscape map (Department of Conservation and Land Management, 1993), identified that the project is underlain by the soil landscapes described in Table 7-1 and shown on Figure 7-1. The potential erosion hazard of each soil landscape was assessed in accordance with Figure 4.6 of the Blue Book - Managing Urban Stormwater: Soils and Construction (the Blue Book) (Landcom, 2004), reference Table 4-1.

Based on geotechnical investigations completed, the subsurface profile within the Project area generally consisted of fill or topsoil comprising silty sand, sandy gravel and clay to depths of up to 1.3 m, overlying alluvial sand and silty sands.



Table 4-1: Summary of soil landscapes within the construction footprint

•...

Soil Landscape	Location	Description	Limitations
Tuggerah	Western extent of the desalination plant site	• Gently undulating to rolling coastal dune fields. Local relief is up to 20 m and slope gradients are in the range of 1% to 10%. Soils include loose sands and are covered with heathland vegetation. Potential erosion hazard is low.	 Wind erosion hazard, high permeability soils, localized flooding, high water table, strongly acid soil in places and the landscape coincides with a mine subsidence district.
Narrabeen	Eastern extent of the desalination plant site	 Beaches and foredunes along the coast on mainland and barrier beaches exposed to ocean swell and saltladen winds. Local relief is <10 m (beach plains) and <20 m (foredunes) and slope gradients are <3% for beach dunes and up to 45% for foredunes. Soils are Sands. Potential erosion hazard is high. 	 Severe wave erosion hazard, severe wind erosion hazard, extreme foundation hazard, non-cohesive highly permeable strongly alkaline saline soils of very low fertility.





Figure 4-1 Soil Landscapes and Geotechnical Investigations

...



4.2.4. Contamination

Condition C20 of the Conditions of Approval require that the Construction Waste Management Sub Plan (CWMSP) reference the confirmation of the contamination status of the development areas of the site based on validation results. The CWMSP sub references here and Section 6.1.4.

A Site Auditor and Contamination specialists are employed on the project to validate as required, noting the site is suitable for industrial use and the intent is that soil will be retained on site unless it's identified as contaminated via the contamination processes set out in this Plan and as specified by the consultants on site. Where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site as per C23 of the CoA as referenced in the CWMSP. Reporting completed by the site auditor will be undertaken in accordance with Consultants reporting on contaminated land (*NSW EPA, 2020*).

Contamination assessments were undertaken by GHD in 2019, 2020 and 2023.

The assessments did not identify soil contamination above the adopted health assessment criteria for both recreational/open space and commercial/industrial land use for all samples analysed within the desalination plant site. PFAS was not detected at concentrations in soils that would pose a health or ecological risk under commercial/industrial use.

The assessments identified:

- One potential asbestos containing material (ACM) fragment was noted on the surface in the area of TP204 during the 2019 assessment. Further assessment in 2020 did not detect asbestos in shallow hand excavations adjacent and around TP204, indicating the impact was isolated;
- Non-friable Asbestos Containing Material (ACM) fragments were identified on the site surface in several locations. The majority of the site surface was unable to be assessed due to thick vegetation, and therefore asbestos impacts on the ground surface were not delineated; and,
- Non-friable Asbestos Containing Material (ACM) fragments were identified below ground level within TP410 and TP404.

The assessments indicated that there is a potential for isolated fragments of bonded ACM to be present on the surface, and within subsurface soils, at the Site.

Soils at the study area would generally be classified as General Solid Waste, with some minor exception areas of soils classified as Restricted Solid Waste. It is noted that the current Restricted Solid Waste classifications are based on results with no TCLP (Toxicity Characteristic Leaching Procedure) testing, and with further testing including TCLP testing would likely classify as General Solid Waste. In addition, soils where either asbestos fragments or acid sulfate soils are identified would also be classified as either asbestos waste or acid sulfate soil waste. It is noted that these classifications are preliminary only and further sampling and analysis would be required prior to disposal off site.

The previous assessments recommended preparation of a Contaminated Site Management Plan (CSMP) which would include an Unexpected Contamination Procedure (UCP) to manage the asbestos impacts. The contaminated site management will be undertaken in accordance with Section 6.1.4. This plan also includes an UCP in Appendix E.

4.2.5. Acid Sulfate Soils

The EIS provided reference to the Acid Sulphate Soil (ASS) Risk Map for Swansea (Department of Land and Water Conservation, 1997) and desktop review indicated that the southwestern portion of the Project area is located in an area with a high probability of occurrence of ASS. The northeastern portion of the Project area is mapped as having a low probability of occurrence of ASS.





Figure 4-2 Acid Sulfate Soil mapping within proximity to the site

Shown in the figure above, the following colours are defined as:

- Red HWs1 a high probability of occurrence of acid sulfate soils within 1 m of the ground surface;
- Red HWs2 a high probability of occurrence of acid sulfate soils between 1 and 3 m below the ground surface;
- Orange LWa4 a low probability of occurrence of acid sulfate soils greater than 3 m below the ground surface; and
- Yellow B beach deposits, no known occurrence of acid sulfate soils.

Two additional ASS assessments were completed during 2023:

- Douglas Partners ASS Assessment.
 - The purpose of this assessment was to determine the potential for ASS risk for the project, specifically
 considering the construction of the shaft and revised pipeline alignment as utilised for the Modification
 Report. The results of the report indicate that ASS is not likely to be encountered for the shaft and pipeline
 alignment to the depth of construction proposed.
 - PASS was detected in samples collected at depths between 1.25 2.0 mbgl that were tested for CRS within areas mapped as low and high probability risk of ASS occurrence. Field pH test results show PASS may extend above and below these depths. DP (2023) also detected PASS at 26.5 -28.28 mbgl in the onshore bore BH601, with PASS likely extending beyond this depth interval. If these soils were to be disturbed either through excavation or dewatering works development of an ASS Management Plan (ASSMP) would be required (refer to Appendix D).
- GHD ASS Assessment
 - This additional assessment was undertaken to provide data of potential ASS across the project site to gain additional data prior to construction to meet CoA D33.
 - The assessment found that PASS was detected in samples collected at depths between 1.25 and 2.0 mbgl in areas mapped as low and high probability of ASS risk occurrence. If these soils were to be disturbed either through excavation or dewatering works development of an ASSMP would be required (refer to Appendix D).

4.2.6. Mining

0

The Lake Macquarie Mine Subsidence District is located north of Belmont Swamp and west of the Fernleigh Track, including the residential areas of Jewells, more than 900 m north-west of the Project area. However, an initial review of publicly available data as part of the geotechnical assessment identified mine workings underlying the site (GHD, 2019b).

The review found that while the Project area is not within a mine subsidence district, underground mine workings of John Darling Colliery do underlay the Project area. Underground workings are within the Victoria Tunnel Seam (understood to be approximately 200 m below the existing surface of the Project area) and the deeper Borehole Seam. Mining of these seams was completed in the late 1980s and there are no current exploration or mining leases within the Project area.

4.2.7. Unexploded Ordinance

During World War Two the coastal area immediately east of Belmont was used as a field firing range and training area by Newcastle garrison units. The desktop review identified that the land directly to the north of the Belmont WWTW was a former Defence military area which is classified as having a slight potential for residual unexploded ordinance (UXO). This area, however, is outside the Project area and would not be impacted by the Project.

4.3. Surface Water

4.3.1. Hydrology and Flooding

The Project is located within a coastal dune environment which due to elevation and soil (sand) transmissivity lacks significant surface water features. Surface waterbodies and watercourses in close proximity to the Project area consist of:

- Belmont Lagoon located 30 m to the north-west. This is a shallow coastal saltwater lagoon which connects to Lake Macquarie in Belmont Bay via Cold Tea Creek. The lagoon is adjacent to protected (Coastal SEPP) wetlands.
- The South Pacific Ocean located 80 m to the east. This area of coastline between Redhead Headland to the north and Swansea Channel to the south contains three beaches. From north to south these beaches are known as Redhead Beach, Nine Mile Beach (adjacent to the site) and Blacksmiths Beach. With the exception of the Belmont WWTW and the Belmont Golf Course to the south, Nine Mile Beach and its dune system are relatively undeveloped and therefore have minimal surface impact from human activities. Due to the transmissivity of the sandy soils there is no significant standing water in the beach or dune environments close to the Project area.
- Belmont Bay located 1.2 km to the west. Belmont Bay forms part of Lake Macquarie which is a large (approx. 110 km 2), relatively shallow (average depth approx. 8 m) coastal saltwater lake which drains to the Pacific Ocean through the Swansea Channel approximately 5 km to the south of the Project area.
- Sludge/effluent lagoons within the Belmont WWTW. A lined lagoon within the boundaries of the Belmont WWTW for the storage of sludge materials following wastewater processing. The WWTW also includes a number of aboveground concrete storage tanks such as clarifier tanks and aerobic digester tanks.

Runoff from the west of the Belmont WWTW access road generally drains to Belmont Lagoon, while runoff from the east of the Belmont WWTW access road is directed to the lowest point at the Belmont WWTW at the base of the existing sand dunes along Nine Mile Beach where it infiltrates into the sandy soils.

The Lake Macquarie Waterway Flood Study (WMAwater, 2012) indicates probable flood levels for Lake Macquarie of 1.23 m AHD for a 1 in 20 year flood, and 1.5 m AHD for a 1 in 100 year flood. The Project is located outside of Council's mapped 1 in 100 year flood extent; however, portions of the site are within the Lake Macquarie LEP flood planning area (defined as 1 in 100 year flood level plus 0.5 m).

4.3.2. Belmont WWTW Wet Weather Management

Effluent discharged via the Belmont WWTW ocean outfall includes transfers from three inland WWTWs (Edgeworth, Dora Creek and Toronto). At each of these WWTWs effluent overflows can occur in extreme wet weather events when pump capacity is exceeded. Additionally, flows to Belmont WWTW cease when high water level triggers are reached at the Belmont WWTW hydraulic control structure, which can also contribute to overflows at the inland WWTWs.

4.4. Climate

0

Climate data was obtained from the Bureau of Meteorology (BoM) Newcastle Nobbys Signal Station weather station (site number 061055), located approximately 17 km north of the Project area. The annual average maximum and minimum temperatures experienced at Newcastle are 21.8 degrees and 14.3 degrees respectively. On average, January is the hottest month with an average maximum temperature of 25.6 degrees. July is the coldest month, with an average minimum temperature of 8.5 degrees. Most of the annual 1,121 mm of rainfall occurs between January and June.

4.4.1. Rainfall Erosivity Factor

The rainfall erosivity factor is a measure of the ability of rainfall to cause erosion (referred as "R" in the Revised Universal Soil Loss Equation RUSLE). The rainfall erosivity factor is used to determine the soil loss in tonnes per hectare over one year and is used in calculations when sizing construction sediment basins.

The Project has a Rainfall Erosivity Factor of 2500 (EI) based on mapping contained in Appendix B of Managing Urban Stormwater: Soils and Construction Volume 1 Fourth Edition (The Blue Book). R-factor data is detailed in Table 4-5 below showing that more than half (53%) the annual rainfall is expected in February to June.

Monthly % and annual rainfall erosivity (R-factor) values													
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Year
Mean monthly rainfall (mm)	71.6	81.3	135.5	125.2	118.1	87.5	131.9	64.1	57.1	66.2	68.2	102.3	1130.5
%	6.3	7.2	12	11.1	10.4	7.7	11.7	5.7	5.1	5.9	6.0	9.0	100.0
R-value	14	16	27	24	23	17	26	13	11	13	13	20	221



5. Environmental Aspects and Impacts

5.1. Construction Activities

The Project will involve a range of construction activities incorporating heavy machinery, plant and equipment. Construction activities with potential to result in adverse impacts to soils and surface water include:

- Vegetation clearing and topsoil stripping
- Soil compaction and road pavements, leading to reduced infiltration
- Temporary dewatering of water from the construction site, including dewatering of groundwater ingress to construction excavations
- · Attenuated or delayed discharge of stormwater captured in temporary sediment basins
- Reuse of stormwater captured in temporary sediment basins
- Bulk earthworks, cutting and filling
- Site access

·••

- Culvert and drainage works
- · Material stockpiles including the treatment of acid sulfate soil (if encountered)
- Paving activities
- Water use / extraction
- Compounds operation including fuel and chemical storage, refuelling and chemical handling
- Noxious weed treatment including herbicide spraying
- Movement of heavy vehicles.

5.2. Impacts

The potential for impacts on soil and surface water will depend on several factors. Primarily impacts will be dependent on the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction might include:

- Erosion and sedimentation
- Acid sulfate soils
- Spreading of contaminated soils to other areas of the site
- Pollution of nearby aquatic habitats, soils, watercourses, and groundwater systems
- Changes to the timing, rate, and volume of stormwater discharge
- Changes to existing flow regimes to receiving waterways and systems
- Scouring of watercourses.

Refer also to the Construction Groundwater Management Plan for management of potential impacts to groundwater including spill minimisation, containment and capture processes.



6. Environmental Control Measures

6.1. Soil and Surface Water Management During Construction

Specific measures and requirements to meet the objectives of this CSWMSP and to address impacts on soil and surface water are outlined in Table 6-1. Further explanatory detail on particular measures / requirements where noted in the evidence column is provided in the following sections.

Table 6-1: Soil and Surface Water Management and Mitigation Measures

ID	Measure/Requirement	ent When to Implement Responsibility			
Erosion and s	sediment control				
CSWMSP01	A Soil Conservation Specialist will be engaged for the duration of construction of the Project to provide advice on the planning and implementation of erosion and sediment control design, installation and maintenance, and review ESCPs.	Pre-construction/ During construction	Environment Manager	Best Practice	Section 6.1.1, 7.1 and PESCPs
CSWMSP02	Progressive ESCPs will be prepared prior to commencing each stage of work and will be updated following any major change to construction activity that impacts site conditions such as flow path changes, basin changes or other relevant management plan changes. Progressive ESCPs will detail controls required to avoid erosion and sedimentation of the site, surrounding areas, watercourses, drainage systems, water bodies and wetlands.	Pre-construction/ During construction	Environment Manager Foreperson	REMM SGC07 REMM WR02	Section 6.1.1, 7.1 and Appendix C PESCPs
CSWMSP03	Erosion and sediment controls will be installed and maintained at all worksites and adjacent areas as per site specific ESCPs and in accordance with TfNSW Specifications and the "Blue Book" guidelines.	Pre-construction/ During construction	Environment Manager Foreperson	REMM TFB07 REMM TFB15	Section 6.1.1 and Appendix C PESCPs
CSWMSP04	Works will be designed and programmed to minimise the extent of disturbance to vegetation, ground disturbance and exposed soil where practical to minimise the potential for erosion	Pre-construction/ During construction	Environment Manager Foreperson	Best practice	Section 6.1.1 and Appendix C PESCPs
CSWMSP05	 Measures will be implemented to minimise dust, soil, or mud from being deposited by vehicles onto public roads. This includes: Site access and egress points to be fitted with rumble grids and/or wheel wash facilities (or similar) to prevent tracking of sediment off site Residual tracking of material onto public roads will be managed with streetsweepers or equivalent as required Cleaning of hardstand areas as soon as practicably possible 	During construction	Environment Manager Foreperson	NSW CoA C15c	Section 6.1.1 and Appendix C PESCPs

ID	Measure/Requirement	When to Implement	Responsibility	Reference	Evidence
CSWMSP07	 Prior to rainfall events of greater than 20 mm, the site will be inspected for the potential implementation of additional wet-weather event controls. These may include: Removal / storage of equipment, Additional stabilisation of the site such as covering of stockpiles and exposed areas with geofabric 	Pre-construction / Construction	All Personnel	NSW CoA C15g	Section 6.1.1 and Appendix C PESCPs
CSWMSP08	Catch drains, contour and diversion drains across exposed areas will be installed immediately following clearing, and re-established and maintained during topsoil removal and earthwork operations. Drains will be appropriately stabilised with scour protection provided at outlets in accordance with Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004) and Volume 2D (DECC 2008). Scour protection will be provided at all locations necessary to prevent scour in waterways, including ephemeral waterways. Unless otherwise required Scour protection will be designed for a 5% AEP event.	Construction	Environment Manager Foreperson Design Manager Soils Conservationist	REMM SGC07	Section 6.1.1 and Appendix C PESCPs
CSWMSP09	Wastewater or "dirty" water generated during the construction process will be collected, treated, and disposed of by appropriate means, including the installation of sediment barriers downslope of all disturbed areas. In areas where it is not possible to direct dirty water to sediment basins, other sediment controls will be implemented in accordance with Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004) and Volume 2D (NSW DECC 2008).	Construction	Environment Manager Foreperson Soils Conservationist	NSW C15f	Section 6.1.1 and Appendix C PESCPs
CSWMSP10	Clean and dirty water runoff will be adequately separated to avoid mixing where possible using diversions	Construction	Environment Manager Foreperson Soils Conservationist	NSW C15f	Section 6.1.1 and Appendix C PESCPs
CSWMSP11	Sediment basins must be designed and constructed in accordance with Managing Urban Stormwater – Soils and Construction, Volume 1 (Landcom 2004) and Volume 2D (NSW DECC 2008); and Best Practice Erosion and Sediment Control Appendix B (IECA 2018). Basin inlets, outlets and spillways will be constructed in accordance with specifications from HWC unless otherwise advised by the Soil Conservationist and documented in the PESCP.	Pre-construction / Construction	Environment Manager Foreperson Soils Conservationist	REMM SGC07	Section 6.1.1 and Appendix C PESCPs
CSWMSP12	Wherever possible, sediment basins and associated drainage will be installed during the clearing and grubbing phase in that catchment that could cause sediment to leave site (Except where clearing is required for basin installation and site access, material storage and safety requirements to facilitate sediment basin construction).	Pre-construction / Construction	Environment Manager Foreperson Soils Conservationist	REMM TFB15	Section 6.1.1 and Appendix C PESCPs

טו	Measure/Requirement	When to Implement	Responsibility	Reference	Evidence
CSWMSP13	Regular inspections are undertaken to evaluate the effectiveness of erosion and sediment control measures. Action lists are to be produced to address any maintenance requirements or additional controls required. Also, pre and post rainfall event inspections are to be undertaken.	Construction	Environment Manager Foreperson Soils Conservationist	REMM WR02	Inspection records
CSWMSP14	Ongoing risks associated with erosion and sediment control are to be addressed with the workforce during Project briefings, pre-starts and toolbox talks	Construction	Environment Manager Foreperson	Best practice	Project Briefing note Toolbox talk records
CSWMSP15	Sediment and erosion controls (including dust) will be maintained until vegetation cover is established.	Construction	Environment Manager Foreperson Soils Conservationist	REMM WR03	Inspection records
SWMSP16	 JH commit to coordinating with HWC to implement the existing defined controls within HWC documentation to enable implementation of HWCs existing erosion monitoring and mitigation program for dune restoration, as implemented for the adjacent WWTW. including: Site profiling and revegetation following completion of civil works in accordance with the final design which is to comply with the Lake Macquarie Coastal Zone Management Plan (CZMP) (2015) and DLWC (2001). Monitoring of recession and implementation of mitigation measures below as needed: Assist HWC in beach management works such as beach scraping to reshape dunes and increase dune volume/recovery after storms if necessary, if found to be exacerbated or caused by JH disturbance activities. Assist HWC in stabilisation of the frontal dune system by removing invasive species and replacing with locally indigenous dune vegetation. Installation of sediment fences to minimise the movement of sands during construction. Control offroad vehicle access and surface runoff. Potential positive cumulative impact to align these works with Hunter Water's proposed dune protection and restoration project between the Belmont Golf Course and WWTW. 	Construction	Environment Manager Foreperson Soils Conservationist	REMM CP01	Monitoring program results

ID	Measure/Requirement	When to Implement	Responsibility	Reference	Evidence	
Stockpile Management						
CSWMSP17	 Stockpiles will comply with the following: Locate stockpiles outside of the tree protection zone of trees or native vegetation identified for retention and in areas of low ecological or heritage conservation value Locate stockpiles as far as possible from residential dwellings and other noise sensitive areas and at least 5 m from likely areas of concentrated water flows and at least 10 m from waterways that are classified as Class 1 and Class 2 from the DPI Fisheries guideline "Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings" Minimise temporary stockpile durations and ensure slopes no steeper than 2:1 Cover, or otherwise protect from erosion, stockpiles that will be in place for more than 10 days as well as any stockpiles that are susceptible to wind or water erosion, within 10 days of forming each stockpile Keep topsoil that is not contaminated by noxious weeds in stockpiles for later spreading on fill batters and other areas. Other material may also be stockpile for potential growth of weeds Materials must be stockpiled only in sites with appropriate erosion and sediment controls; All stockpiles located within the project EPL premise boundary. Different material types, i.e. VENM/ENM, contaminated, ASS, must be stockpiled separately. 	Pre-construction / Construction	Environment Manager Foreperson Soils Conservationist	SGC08	Soil conservationist inspections Section 6.1.3	
Contaminatio	n					
CSWMSP18	Contaminated Land Management measures (Section 6.1.4) will be implemented throughout construction works to detail areas of known contamination and potential contamination risk, procedures for unexpected contamination finds, processes for management, and disposal requirements.	Pre-construction/ During construction	Environment Manager	REMM SGC03	Section 6.1.4	
CSWMSP19	An Unexpected Finds Procedure for Contamination has been developed and will be implemented throughout construction. Any previously unidentified contaminated material encountered during the works will be managed in accordance with this procedure. Where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site.	Pre-construction/ During construction	Environment Manager Foreperson	REMM SGC04 NSW CoA C23 REMM HH01	Unexpected Contamination Procedure – Appendix E Unexpected Find Reporting	

...

ID	Measure/Requirement	When to Implement	Responsibility	Reference	Evidence
	Material must be waste classified prior to disposal offsite, in accordance with NSW EPA (2014) Waste Classification Guidelines.				Waste Classific Reports
CSWMSP20	Should unexpected, contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA. Outcomes of RAPs and any advice from the site auditor will be followed as required.	Pre-construction/ During construction	Environment Manager Foreperson	REMM SGC04 NSW CoA C23 REMM HH01	Unexpected Contamination Procedure – Ap E Unexpected Fir Reporting Waste Classific Reports
CSWMSP21	Control measures will be implemented to divert any surface water away from contamination and to capture and treat any surface runoff contaminated by exposure to the contamination. Stockpiling of contaminated material during construction will be managed and maintained to prevent any release of liquids and contaminated runoff to stormwater drains, waters, and land. Contamination stockpiles will be kept separate from regular soil stockpiles	Pre-construction/ During construction	Environment Manager Foreperson	REMM SGC03 NSW CoA C15	Section 6.1.2 a ECMs PESCPs
CSWMSP22	Disturbed areas, including site compounds, material storage areas, access and haul roads, will be restored before completion. Restoration will involve spill clean-up, soil remediation, ripping, topsoiling, weed control, seeding, planting, watering, and maintenance as required. A testing and validation regime will be developed to monitor water quality and sediment of existing dams used during construction (if proposed).	During construction	Environment Manager Foreperson	Best practice	Pre and Post C Reports
CSWMSP23	Prior to the commencement of construction, the Proponent must engage a NSW EPA-accredited Site Auditor to provide advice throughout the duration of works in relation to disturbance of A-horizon soils (as shown at Appendix 3) in the south of the site that have not been subject to disturbance and comply with the following requirements:	Pre-construction/ During construction	Environment Manager	CoA C28	Section 6.1.4 Remedial Actio (s) Site Audit State
	 the site investigations must be undertaken, and the subsequent report(s), must be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the Contaminated Land Management Act 1997; the reports must be prepared, or reviewed and approved, by consultants certified under either the Environment Institute of Australia and New Zealand's Certified Environmental Practitioner (Site Contamination) scheme (CEnvP(SC)) or the Soil Science Australia Certified Professional Soil Science Science 				

ID	Measure/Requirement	When to Implement	Responsibility	Reference	Evidence
	 the recommendations of the any Remedial Action Plan and the unexpected finds procedure must be updated following results of further site investigations and implemented throughout duration of project work. 				
CSWMSP24	Drilling fluid and mud will be managed in accordance with a specific procedure to be developed in consultation with the selected drilling contractors. This may result in the construction of a specific drilling fluid retention basin which, if installed, will be emptied and disposed of to an appropriately licenced landfill in accordance with CoA and EPL requirements	Pre-construction/ During construction	Environment Manager	CoA C28	Section 6.1.6
Acid Sulfate	Soils				·'
CSWMSP25	An Acid Sulfate Soils Management Plan (ASSMP) will be implemented throughout the works to handle, treat, manage, and dispose of any potential ASS that may be encountered during works. The ASSMP will be developed as an Attachment to this Plan and will be reviewed by all parties identified for reviewing this Plan. The ASSMP will	Pre-construction/ During construction	Environment Manager	REMM SGC06	Section 6.1.7 Appendix D -
	be implemented throughout the Construction period.				
CSWMSP26	Training will be provided to all project personnel, including relevant subcontractors on acid sulfate soils management practices and the requirements of this Plan through inductions, toolbox talks, and targeted training as required.	Pre-construction/ During construction	Environment Manager WHS Manager Foreperson	Best practice	Section 7.2 Induction rec Toolbox talk
Refuelling, w	ashdown and chemical storage	1		1	I
CSWMSP27	A schedule of all hazardous materials on the construction site will be maintained and complete records will be kept for the duration of the works	During construction	Environment Manager WHS Manager	Best practice	Health and S Management Safety Data S
CSWMSP28	Fuels, chemicals, and other hazardous materials must be stored in suitably located and bunded areas with an impermeable floor to minimise the impact of any spillage or contamination on the Site and adjoining areas. The bunded area must be able to contain 120% of the volume of the largest single stored volume within the bund.	During construction	Environment Manager WHS Manager Foreperson	Best Practice	ECMs
CSWMSP29	All fuels, chemicals, and liquids must be stored on slopes less than 1:10 and at least 50 m away from aquatic habitat.	During construction	Environment Manager WHS Manager	Best Practice	ECMs

ID	Measure/Requirement	When to Implement	Responsibility	Reference	Evidence
CSWMSP30	Sites used for refuelling and chemical storage will be located away from areas of shallow groundwater or appropriately lined and bunded to protect groundwater.	Pre-construction/ Construction	Environment Manager Foreperson	Best Practice	ECMs

6.1.1. Environmental Control Maps

•••

ECMs will be prepared for each construction site and provide detailed content on the type and location of protection measures, exclusion / no-go zones, monitoring requirements, site specific environmental obligations and environmentally sensitive areas. It is the practical application of the proposed control measures and an important tool to communicate these to all personnel including subcontractors.

6.1.2. Progressive Erosion and Sediment Control Plans

As required by CoA C15, Appendix C contains:

- a detailed plan for the containment of all runoff from the site on the site and detail of the management of any overflows;
- Erosion and sediment control measures will be guided by the Erosion and Sediment Control Strategy (ESCS) provided at Appendix C, which has been developed in accordance with the requirements of Managing Urban Stormwater: Soils and Construction Volume 1 (Landcom 2004) and Managing Urban Stormwater: Soils and Construction Volume 2A and 2D (DECC 2008) (the "Blue Book').
- Measures to prevent cross-contamination of clean and sediment laden water.
- Detail all offsite flows from the site
- Describe the measures that must be implemented to manage stormwater and flood flows for small and large sized events, including, but not limited to 1 in 5-year ARI and 1 in 100-year ARI.

In accordance with REMM SGC07, the Erosion and Sediment Control plan includes the following:

- Establish all erosion and sediment control measures before ground disturbance work commences and these are to remain in place until all surfaces have been fully restored and/or stabilised
- Outline the process for stabilisation and progressive revegetation of all disturbed area which will include species consistent with the dune restoration project to be undertaken within the greater Belmont WWTW site.
- Maintenance and inspection program and checklist including:
 - o Conditions that would trigger watering of exposed and revegetated areas
 - Requirements for maintenance of revegetated areas
 - o Maintenance of erosion and sediment controls including clean out before 30% capacity remaining
 - o Limiting traffic movements on disturbed areas
 - Exposed areas that is susceptible to wind generated dust particles, shall be progressively vegetated or watered. Where vegetation is not yet possible, dust suppression by watering shall be provided
- Install a 40% porous, open weave barrier fence as a wind-break on the eastern side of the Project area (including the new area identified for the Proposed Modification where the 11 kV powerline connection will be located) in accordance with Standard Drawing SD6-15 (Blue Book)
- Provide a clean water diversion around disturbed areas
- Procedures for how any sediment laden water will be treated prior to leaving the Project area.

The ESCS will guide the development of site-specific Progressive Erosion and Sediment Control Plans (PESCPs). PESCPs are planning documents that clearly show the site layout and location of erosion and sediment control structures onsite. They are produced for construction stages from initial vegetation clearing to rehabilitation when erosion and sediment control devices are no longer required and are removed. PESCPs will be developed and implemented prior to commencing activities at all work areas where there is a risk of erosion and sediment loss.

PESCPs may be produced in conjunction with an Activity Method Statements (AMS) or associated ECMs to provide more detailed site-specific management measures. PESCPs will be developed by suitably qualified environment staff in consultation with the Foreperson, and other relevant site personnel, as required. All PESCPs are to be prepared in accordance with the Blue Book - Managing Urban Stormwater: Soils and construction - Volume 2D.

The appointed CPESC will approve PESCPs in consultation with the Project Soil Conservationist in the first instance. Minor changes thereafter will be approved by the appointed CPESC during regular inspections in consultation with the Project Environment Manager, as required.

PESCPs will be developed for all work areas prior to commencing activities and maintained for currency throughout the duration of the works, until site stabilisation has been achieved and there is low risk of erosion and sediment loss.



Regular inspections will be undertaken to evaluate the effectiveness of controls and where deficits are identified make changes to the controls, refer to Section 7.4. A register of inspection and maintenance of erosion control and sediment capture measures will be maintained.

In accordance with CoA D22, JH will ensure that adequate provisions are made to collect and discharge stormwater drainage during construction. The prior written approval of Council must be obtained to connect or discharge site stormwater to Council's stormwater drainage system or street gutter.

6.1.3. Stockpile Management Protocol

•••

The following outlines the locational criteria used to guide the placement of temporary stockpiles and provides both standard and site-specific mitigation measures to be implemented to minimise impacts on the environment. Stockpile sites may typically be required to store material including, but not limited to:

- Temporary storage of excavated material to be reused in fill embankments and other design features
- ASS subject to treatment prior to reuse
- Temporary storage of excavated material unsuitable for reuse on the Project, including contaminated soils/materials
- Excess concrete, pavement, rock, steel and other material stored for either future use on the Project or prior to removal from site
- Topsoil, mulch, excess timber for landscaping and revegetation works
- Gravels, fill and asphalt profiling's.

Waste classification of soils that require offsite disposal using the six-step process and criteria detailed in Waste Classification Guidelines – Part 1: Classification of Waste (NSW EPA 2014), and will be managed in accordance with the Construction Waste Management Plan.

6.1.3.1. Stockpile location

Stockpile sites are proposed within the construction footprint. Potential stockpile areas will be required for imported material, mulch, topsoil, and unsuitable spoil. Potential stockpile areas will also be suitable for the temporary storage of other materials such as unsuitable material, cleared vegetation mulch, rock and excess concrete.

Stockpiles on the Project will be located within an active construction zone within the construction footprint.

Where stockpiling is proposed to occur outside the Project boundary, or where impacts related to stockpiling are not assessed under the EIS, approval is required as per the mechanisms outlined within the CEMP.

6.1.3.2. Stockpile Management

Prior to the establishment of any stockpile for the Project, the person responsible will ensure that:

- The source of the stockpile and potential contamination and/or ASS status is known so that potential or known contaminated material can be kept separate. This includes the Environment Manager (or delegate) and foreperson observing excavations and differentiating between fill and natural material.
- Site-specific mitigation measures, where they are necessary to further reduced impacts, are identified.

Mitigation measures for each stockpile site, to be included as a minimum, are detailed below in Table 6-2.

ID	Mitigation Measure	Responsibility
SMP01	Materials will not be stockpiled under the drip lines trees or native vegetation to be retained, and never pushed up around the base of trees. Mulch stockpiles are exempt from this requirement as they do not erode and are light, and area considered to have minimal impact on compaction of the root systems.	Foreman Environment Manager
SMP02	Erosion and sedimentation controls will be erected between the stockpile and any drainage lines.	Foreman Environment Manager
SMP03	Cover, or otherwise protect from erosion, stockpiles that will be in place for more than 10 days as well as any stockpiles that are susceptible to wind or water erosion, within 10 days of forming each stockpile	Foreman Environment Manager
SMP04	Stockpiles will be located separate from other material types to minimise waste, the potential for cross contamination and encourage resource recovery	Foreman

Table 6-2: Stockpile Mitigation Measures

ID	Mitigation Measure	Responsibility
	(e.g. ASS stockpile, topsoil, contaminated material, concrete wastes, natural soils/VENM etc.). The different waste streams are identified in the Waste Management Plan, and in situ waste classifications will be carried out where required. Waste Classification will be undertaken in accordance with the approved EPA Waste Classification Guidelines and/or Resource Recovery Orders.	Environment Manager
SMP05	Testing of topsoil will include as a minimum fertility, sodicity and aluminium	Foreman
	toxicity.	Environment Manager
SMP06	PASS or ASS treatment areas will be lined and bunded in accordance with the Guidelines for the Management of Acid Sulfate Materials (RTA 2005) and the Acid Sulfate Soil Manual (ASSMAC 1998) to prevent runoff or leachate contaminating groundwater or surface water	Foreman Environment Manager
SMP07	Stockpiles containing potentially contaminated material will be on hardstand or	Foreman
	lined areas and be bunded to prevent runoff or leachate contaminating surrounding land, groundwater, or surface water.	Environment Manager
	Any leachate or runoff water captured within the bunded area will be treated to meet the Water Quality Objectives of the receiving waters prior to discharge. Otherwise the water must be disposed of to an appropriately licenced facility as liquid waste.	

6.1.4. Contaminated Land Management Plan

6.1.4.1. Areas of Known Contamination

Contaminated land will require management in accordance with the CoAs and the REMMs, and relevant guidance made or approved by the EPA under Section 105 of the CLM Act.

In accordance with CoA D33, an additional contamination assessment has been completed and relevant mitigation measures incorporated below. A RAP will be prepared to manage the identified contamination (non-friable ACM fragments on surface soils and sub-soils). Remediation actions as provided within the RAP and any advice from interim site audit advice will be implemented by JH.

Remediation will occur prior to commencement of bulk earthworks or construction, where practical.

Following the completion of the remediation works, ECMs will clearly outline the areas where contamination specific management is to be implemented (i.e. if contamination has been capped and requires management). These will be updated as the Project progresses.

In-situ waste classification will occur where practical and be completed to allow material to be excavated and transported offsite to an appropriate facility. However, some stockpiling of material will be required. The project will mitigate the risks of the migration of contaminated materials and the associated exposure to human and ecological receptors. The in-situ classification will also allow for strategic planning of excavation, storage, and transport minimising the risk of occupational health exposure, environmental harm, and cross-contamination.

If development of an environmental management plan is part of a proposed remediation method, consideration will be given to feasibility of encapsulation (as risk described in CoA D34) and legal enforceability.

6.1.4.2. Contamination Management Overview

In accordance with REMM SGC03, this CSWMP includes contamination mitigation measures in the following sections. These mitigation measures describe excavation, validation and disposal requirements for potentially contaminated soils. Waste classification of soils that require offsite disposal will be carried out using the six-step process and criteria detailed in Waste Classification Guidelines – Part 1: Classification of Waste (NSW EPA 2014).

To ensure contamination management activities are completed in accordance with relevant guidelines and legislation, an EPA NSW accredited Site Auditor (Site Auditor) will be engaged for the duration of the works to provide reviews of contaminated land documents as required.

The contaminated land consultant will prepare validation reports/letters following completion of remediation and validation. These will be submitted to HWC and the Site Auditor.


A Site Audit Report, which states that the contaminated land disturbed by the works has been made suitable for the intended land use, will be submitted to the Planning Secretary and relevant council after remediation.

In the event contamination is caused by the project the Incident and Emergency Management Procedure and associated Spill response management procedure, detailed within Construction Groundwater Management Plan, will be implemented.

6.1.4.3. Contamination Management Mitigation and Management Measures

Where contamination is known or expected, mitigation and management measures will be implemented to manage and prevent the spread of contamination within and beyond the construction site. These measures will be site specific and where appropriate will be documented in ESCPs and associated ECMs for the individual sites. Mitigation and management measures include the following:

- Establishment and maintenance of a Contamination Register and plans to list and identify contamination locations, proposed future land use, and track investigations and their findings
- Tracking of spoil both within and off site as detailed in the WRMP
- · Installation of asbestos specific WHS controls during remediation activities
- Asbestos controls include:

•••

- asbestos awareness induction for construction workers
- an unexpected contamination procedure given the potential for surface ACM that may be identified in areas
 of the Site that could not be assessed due to thick vegetation (Appendix E).
- Management of asbestos risks present on site may also require ongoing air monitoring to be undertaken during proposed excavation and construction works.
- Managing onsite stormwater runoff in accordance with the Blue Book
- Stockpile management (e.g. siting/location, stockpile height, etc) as detailed in 6.1.3
- Establishing and maintaining erosion control and sediment capture measures with regular review and update of the ESCP (when required)
- Diversion of offsite stormwater
- Signage and exclusion / no-go zones
- Odour controls (if required).

In accordance with CoA D34, JH will ensure the proposed development does not result in a change of risk in relation to any pre-existing contamination on the site that would result in significant contamination.

In accordance with CoA C23, JH have prepared an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed (refer to Appendix E). Where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site.

6.1.4.4. Waste Classification and Offsite Disposal

The waste classification and disposal of contaminated material will be carried out in accordance with WRMP and Earthworks Management Plan and the NSW EPA (2014) Waste Classification Guidelines.

In accordance with CoA D21, JH will:

- ensure that only VENM, ENM, or other imported material approved in writing by EPA.
- · keep accurate records of the volume and type of fill to be used; and
- make these records available to the Planning Secretary upon request.

Engineered materials / products brought onto site for construction purposes are exempt from this requirement.

6.1.5. Acid Sulfate Soils Management Plan

An Acid Sulfate Soils Management Plan has been developed to address the requirements of REMM SGC06. A copy of the Acid Sulfate Soils Management Plan is provided at Appendix D. It is noted that the Acid Sulfate Soils Management Plan controls align with those in Table 6-1.

Where ASS are encountered, they will be effectively managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998) and the National Acid Sulfate Soils Guidance (Sullivan et al, 2018). The manual includes procedures for the investigation, handling, treatment, and management of such soils.



6.1.6. Swale Drains and Site Sequencing

Construction phase drains and controls will be designed and constructed such that they will not intercept the groundwater table. Controls will be sized using the design considerations provided in the EIS and technical design information provided by the Detailed Design. Water that is collected onsite will be tested and treated (as required) in accordance with the Project water discharge process. This is further detailed in the Dewatering Management Procedure in the Construction Groundwater Management Plan.

Swale drains will routinely be inspected and maintained in accordance with the below:

- Removal of accumulated sediment from swales and traps in such a manner as not to damage the structures. Dispose of the sediment removed in such locations that the sediment will not be conveyed back into the construction areas, into watercourses or off site.
- Provide and maintain suitable access to swales and sediment traps to allow cleaning out in all weather conditions.

Removal of all construction swale drains and sediment traps will be completed progressively to restore the ground disturbed by the construction of the swale drains/traps to a similar condition to that previously existing. They will not be removed prior to all upstream areas being vegetated or otherwise stabilised. ESCP's will be updated to reflect the decommissioning and removal of construction swales and traps.

Drilling fluid and mud will be managed in accordance with a specific procedure to be developed in consultation with the selected drilling contractors. This may result in the construction of a specific drilling fluid retention basin which, if installed, will be emptied and disposed of to an appropriately licenced landfill in accordance with CoA and EPL requirements.

6.2. Soil and Water Management in Design

There are several CoA and REMMs that are to be managed as part of the Project detailed design preparation and review process. These will be subject to a design review process, including a review on compliance with relevant Project requirements.

JH -will work closely with the design team and HWC to coordinate appropriate technical inputs from the broader Project team and relevant subject matter experts, to ensure that design related REMMs and CoA are met.



7. Compliance Management

.

7.1. Roles and Responsibilities

The Project Team's organisational structure and overall roles and responsibilities are outlined in the CEMP. Specific roles not mentioned in the CEMP but required for the implementation of soil and surface water management controls are detailed in Table 7-1.

Table	7-1:	Roles	and	respo	nsibilities	specific	to	this	Plan
1 0010		1 10/00	ana	10000	1010111000	00000000		0.00	i ionii

Role	Responsibilities
Soil Conservationist	Review and approve ESCPsUndertake regular site inspections
Contaminated Land Consultant	 Complete contaminated land risks assessments Develop and implement SAQPs Complete any additional DSI, RAP, Site Condition / Validation Reporting (as required) Waste Classification (as required) ASS sampling, verification, and validation reporting (as required)
Site Auditor	• Review and approve RAPs, Site Condition / Validation Report (as required) in the form of interim site audit advice and site audit statements, site audit reports.

7.2. Training

All Project personnel, including employees, contractors and utility staff working onsite, will undergo site induction training relating to soil and surface water management issues. The induction training will address elements related to soil and surface water management including:

- Erosion and sediment control
- Stockpile management
- Contaminated land management
- ASS management
- Sediment basin construction and operation
- Water discharge management
- Unexpected Contamination Procedure

Targeted training in the form of toolbox talks or specific training will be provided to personnel with a key role in soil and surface water management. See Table 7-2 for details specific to this Plan.

Table 7-2: Traii	ning responsibilities	relevant to this F	Plan
------------------	-----------------------	--------------------	------

Training	Delivery
Erosion and sediment control plans, implementation, and maintenance Sediment and water quality basin construction. Stockpile management protocol requirements	Environment Manager (or delegate) Soil Conservationist.
Contaminated land management requirements ASS management requirements	Environment Manager (or delegate) Contaminated Land Consultant (As required)
Record-keeping to ensure accurate record-keeping, including how to document monitoring data, mitigation measures, and communication with stakeholders.	Environment Manager (or delegate)
Hunter Water reporting obligations for water licensing and EPL.	Environment Manager (or delegate) Foreperson
Planning, equipment use, clean-up, emergency response, regulatory compliance, communication, and record-keeping.	Environment Manager (or delegate) Foreperson Equipment Supplier (if applicable)

Further details regarding staff induction and training are outlined in the CEMP.



7.3. Complaints Management

•••

In accordance with CoA Part B, all community feedback, enquiries, and complaints will be managed via the Communication Strategy and Complaints Management System. Further details of this processes are outlined in the CEMP.

A variety of communication tools will be used throughout construction to consult and inform stakeholders and the local community of impacts, including but not limited to:

- Tailored messaging regarding increased traffic volumes on detour routes and expected delays
- Meetings/briefing with MPs, local councils, local businesses, and other community organisations
- Information sessions and pop-up displays
- · Functional advertising through print, radio, television, and digital channels
- Project website updates.

The Environment Manager (or delegate) will complete a site inspection and record observations and weather conditions in response to any community complaints associated with soil and surface water management. Actions or rectification (if required) will be undertaken by the construction team as soon as reasonably practicable.

7.4. Monitoring and Inspection

Monitoring, inspections, and reporting requirements are outlined in Table 7-3. Further soil and surface water monitoring may be required to meet the conditions of the EPL. Additional requirements and responsibilities relating more broadly to monitoring and inspections are documented in the CEMP.

Table 7-3: Monitoring, Inspection and Reporting Requirements

Туре	Frequency	Standards	Location	Reporting	Responsibility
Inspections					
Weekly inspections	Once a week during environmental inspections	Weekly inspections which, as part of the weekly environmental inspection further outlined in the CEMP, will include inspection of the environmental controls and mitigation measures outlined in Section 6 of this Plan. Action lists are to be produced to address any maintenance issues or additional controls required, and a register of all actions raised and detailing the close out of actions is to be maintained.	Site-wide	Weekly environmental inspection	Environment Manager (or delegate) Foreperson
Pre rainfall and Post rainfall inspections	Pre-rainfall forecast 20mm. Post rainfall event inspections to be undertaken within 4 hours (normal work hours) or within 48 hours (outside of normal work hours) and during periods of prolonged rainfall.	Inspections are undertaken to evaluate the effectiveness of erosion and sediment control measures. Action lists are to be produced to address any maintenance requirements or additional controls required. A review of all controls will also be undertaken to ensure the controls are adequate for the expected conditions (as much as reasonably practical). This will include inspection of nearby drainage lines for potential impact from the project.	Site-wide	Inspection Report	Environment Manager (or delegate) Foreperson

CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

Туре	Frequency	Standards	Location	Reporting	Responsibility
Soil Conservationist Inspection	Fortnightly – unless otherwise agreed with HWC based on erosion and sedimentation risk	Inspections will be undertaken on erosion and sediment controls with regards to current works and upcoming works.	Site-wide	Inspection Report	Soil Conservationist Environment Manager (or delegate)
Monitoring	- -		·	·	
Meteorological monitoring	Daily	 Daily check of: Daily BoM Hunter Forecast including 3- day look ahead. BoM Latest Weather Observations for Belmont 	Site Wide	Pre-starts - Weather notifications	Environment Manager (or delegate) Foreperson
ASS monitoring	As required	ASS Management Plan, Sullivan et al 2018 for open excavations and treated, and validated material and associated water run-off / leachate.	Treatment pad and water collection points Open excavations	Monitoring records	Environment Manager (or delegate) Foreperson

All environmental monitoring equipment (if required) will be maintained and calibrated according to the manufacturer's specifications, and appropriate records will be kept. Non-conformance reporting protocols are outlined in Section 7.7 of this Plan and the CEMP.

7.5. Auditing

•••

Audits (both internal and independent) will be undertaken to assess the effectiveness of environmental controls, compliance with this Plan, CoA and other relevant approvals, licenses, and guidelines. These audits will be undertaken at planned intervals to provide information on whether the Project:

- Is meeting its compliance obligations
- Conforms to this Plan
- Determines if this Plan is effectively implemented and maintained.

The approach to internal and independent audits, including audit requirements and the auditing schedule, are detailed in the CEMP.

Note that this section does not apply to Contaminated Land Auditing under the meaning of the Contaminates Land Management Act.

7.6. Reporting

Table 7-4 presents the reporting requirements specific to soil and surface water management. A full list of reporting requirements and responsibilities are documented in the CEMP.

		9		
Report	Requirement	Timing	Responsibility	Recipient
ER, HWC and / or EPA environmental inspection reports	Response to matters raised in ER, HWC and/or EPA site inspections.	As required. Typically, every two weeks for ER and HWC inspection reports and monthly for EPA inspection reports.	Project Environment Manager Project Construction Director	ER, HWC and/or EPA
Contaminated Land Reporting	Contaminated Land Management Plan. Contaminated Land Reporting	Prior to construction Post remediation	Project Environment Manager	HWC / DPE

Table 7-4 Reporting requirements specific to soil and surface water management

CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

				J <u>o</u> hn Holland
Report	Requirement	Timing	Responsibility	Recipient
	 must be undertaken to determine the nature and extent of contamination and to assess whether the contamination has the potential to pose an unacceptable risk to human health or the environment on or offsite. Reporting may include the following: DSI RAP Post remediation validation report Revised contaminated land risk assessment. Interim Audit Advice Site Audit Report / Site Audit Statement. 		Contaminated Land Consultant Site Auditor	
ASS Validation Reporting	ASS Management Plan. ASS reporting must be undertaken and address treatment methods and validation for onsite reuse or disposal, disposal records, waste classification) must be provided in the validation / condition report.	Post treatment	Project Environment Manager Contaminated Land Consultant (if required)	Area Manager Foreperson
Waste classification	NSW EPA (2014) Waste Classification Guidelines	As required	Project Environment Manager Contaminated Land Consultant	Area Manager Foreperson
Incident reporting	Environmental incident classification, notification, and reporting. Refer CEMP Section 4.9.	As specified in the CEMP	Environment Manager (or delegate)	HWC Relevant Regulatory Agencies
	Environmental incident notification to the Planning Secretary that causes or threatens to cause material harm as defined within the CoA. Refer CEMP Section 4.9 and CoA	As soon as possible and no later than 24 hours after becoming aware. Refer CEMP and CoA.	Environment Manager (or delegate)	HWC DPE
Complaint Reporting	Complaint management and reporting in accordance with the Communication Strategy.	As specified within the CEMP and the Communication Strategy.	Environment Manager (or delegate) Community and Stakeholder Manager	HWC
RAP	Remediation Action Plans. Reporting on remediation must be undertaken to ensure commitments in the RAP and any advice from the site auditor statements are being implemented as required.	As required	Environment Manager (or delegate)	ER, HWC



CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

7.7. Non-compliance and Non-conformance

.

An environmental non-compliance is defined as one or more of the following:

- An occurrence, set of circumstances or development that is a breach of the Project Approval
- For auditing purposes, the independent auditor has determined that one or more specific elements of the conditions or requirements have not been complied with within the scope of the audit (Independent Audit Post Approval Requirements [DPHI, 2020])
- Failure to implement for the duration of construction the CEMP and CEMP sub-plans (Condition of Approval D8).

Where environmental non-compliances are identified, they will be communicated to the HWC Project Environment Team. HWC will report in accordance with CoA A28 – A30 and via Appendix 1 of the CoA (written notification requirements) where required. This will then be recorded in the Project database. An environmental action list will be developed and issued to the relevant Project team personnel for implementation and close out. Actions will be assigned an implementation priority in a collaborative way by the Project Environment Team based on the environmental risk. Timeframes will be set to ensure any damage incurred is rectified and any chance of recurrence is eliminated as soon as practicable. Following corrective action, the Project Environment Team will close out the non-compliance.

HWC will notify the Secretary of any non-compliance as follows:

- Notification of a non-compliance will take place via the Major Projects Website within seven days of the Project being made aware of the non-compliance
- The notification will identify the SSI (including the application number) and the name of the SSI, set out the condition/s that is non-compliant, the nature of the breach; the reason for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

A non-compliance that has already been notified as an incident does not need to also be notified as a noncompliance. The ER will also include environmental non-compliances within the Environmental Representative Monthly Report.

Where a non-compliance/non-conformance is detected or monitoring indicates risks directly attributable to the Project (i.e. are influenced by factors under the direct control of the Project, e.g. water discharge, scour, contamination, etc.), the process will typically include:

- An analysis of the results by the Project Environment Manager or delegate in more detail, with the aim of determining possible causes
- A site inspection by the Project Environment Manager or delegate
- Advising relevant personnel of the problem
- Identifying and agreeing on actions to resolve or mitigate the risk
- Implementing actions to rectify or mitigate the risk.
- Monitor and review effectiveness of actions and/or additional measures.

The timing for any improvement will be agreed between the Foreperson and Project Environment Manager based on the level of risk (e.g. a significant risk will require immediate action).



8. Review and Improvement

8.1. Continuous Improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives, and targets for the purpose of identifying opportunities for improvement.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- · Verify the effectiveness of the corrective and preventative actions
- Document any changes in procedures resulting from process improvement
- Make comparisons with objectives and targets.

8.2. ESCP Review

The effectiveness of PESCPs will be reviewed, at minimum:

Fortnightly

·••

• Immediately after each rainfall event exceeding 20 millimetres.

PESCPs will be updated following each review to address any identified deficiencies in the adequacy of the existing control measures and review the appropriateness of the design parameters used for Blue Book calculations. The ESCP will be kept updated to reflect any changes in the existing controls.

8.3. CSWMSP Version Control

In accordance with CoA C31, this plan will be reviewed and updated as required within three months of:

- a) the submission of a compliance report under condition A34;
- b) the submission of an incident report under condition A27;
- c) the submission of an Independent Audit under condition D36 or D37;
- d) the approval of any modification of the conditions of this approval; or
- e) the issue of a direction of the Planning Secretary under condition A2 which requires a review, the strategies, plans and programs required under this approval must be reviewed, and the Planning Secretary and the ER and Certifier must be notified in writing that a review is being carried out.

Review of this plan will also be undertaken following significant design changes or amendments to licencing conditions (i.e. EPL).

Only the Environment Manager (or delegate) has the authority to approve changes to the requirements of this Plan. Minor amendments to the Plan may be approved by the ER in accordance with CoA. Amendments not considered minor by the ER need to be approved by the Planning Secretary.

A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure, as detailed in the CEMP.





·••

0



CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

Lake Macquarie City Council engagement per CoA C15a and CoA A8

Date	Details of Engagement / Attempted Engagement
14/08/2024	Meeting held with JH and LMCC to discuss upcoming plans and project.
11/09/2024	Draft plans were provided by JH for LMCC review and comment
11/09/2024	JH attempted contact via phone to confirm LMCC had received draft plans. No response was received by JH
12/09/2024	JH attempted contact via phone to confirm LMCC had received draft plans. No response was received by JH
18/09/2024	JH contacted LMCC via phone. LMCC provided a commitment to confirm plans were under review. No response was received by JH
26/09/2024	JH contacted LMCC via text message. No response was received by JH
01/10/2024	JH sent LMCC an email detailing comments received from TfNSW regarding the Plan. No response was received by JH
24/10/2024	JH Contacted LMCC final correspondence stating we were submitting to Planning

Comment Raised	Project Response	Where addressed	Status
N/A			



Appendix B – Site Auditor Review and Interim Site Audit Advice



Audit review and site inspection

Site:	Belmont Desalination Plant Project, 12A Ocean Park Road, Belmont South	Accredited Auditor:	Ben Wackett, Cavvanba Consulting		
Proposed Development:	Desalination Plant	Date of Review:	11 September 2024 -		
Proposed Land Use:	Commercial/industrial	Scope of review:	Soil and Surface Water Management Sub-Plan; and Unexpected Contamination and Asbestos Finds Procedure.		
Client:	John Holland Group	Date of Auditor site inspection:	N/A		
Nature of interim advice	To act as site auditor for this project, John Ho Protection Authority (EPA) accredited site audito of this engagement is to deliver a site audit stat of the site audit. This audit review makes comments only and do in the assessment and management of contan considered pre-emptive of the final site audit current review of available site information. The auditor comments appear in the table below Refer to Attachment 1 for information regardin part of this audit review.	olland Group has engo or, employed by Cavva ement (SAS) and asso pes not constitute a SA nination issues at the conclusions, but rathe w, and it is expected t ng the scope of site au	aged Ben Wackett, a New South Wales Environment nba Consulting Pty Ltd (Cavvanba). The final outcome ciated site audit report (SAR), based on the objectives AS or SAR. It is provided to assist John Holland Group site. The information provided herein should not be er represents the site auditor's opinion based on the hat the consultant will address each comment. udits and associated limitations. Attachment 1 forms		
Audited Reports:	John Holland Group (2024) Belmont Desalination Plant Project, Appendix C – Soil and Surface Water Management Sub-Plan (Ref. CS1135-WT-BEL-EN-PLN-0021 Rev B) word document; John Holland Group (2024) Belmont Desalination Plant, Unexpected Contamination and Asbestos Finds Procedure (Ref. CS1135-WT-BEL-EN-PRO-0004 Rev B); and John Holland Group (2024) Belmont Desalination Plant, Appendix D – Acid Sulfate Soil Management Plan (Ref. CS1135-WT- BEL-EN-PLN-0018 Rev B).				
Consultant:	John Holland Group	Audit Number:	1508-2402		

CAVVANBA

Comment No.	Auditor comment (11 September 2024)	Consultant response	Action					
Soil and	Soil and Surface Water Management Sub-Plan							
1	Please check abbreviations and terminologies. For example:	Updated reference to CSWMSP	Closed					
	The title is abbreviated as SSWMSP, however the abbreviation used is CSWMSP. The word document and the pdf appear to have different titles and the references throughout the document have been updated.	Updated to align with REMMS -i.e. `site' replaced with `soil'						
	SGC02 refers to a contaminated site management plan (CSMP)	Updated as per above comment						
	SGC03 also refers to a CSMP however it is a contaminated <u>soil</u> management plan.	Abbreviations updated to include CSWP						
	CSMP is not listed in the terms and abbreviations. Check interchangeable use of <i>unexpected contamination finds procedure</i> and <i>unexpected contamination and asbestos finds procedure</i> .	Checked and updated to refer to 'Unexpected Contamination Procedure' to align with CoA C23						
2	Section 1.4: Given the scope of CoA C28, it is also a requirement for the auditor to review this plan.	Section 1.4 updated to include reference to Cavvanba	Closed					
3	Section 3.1: The acid sulfate soil guidance should be consistent with the documents described in the ASSMP.	Section .1 updated to align with documents described in ASSMP	Closed					
4	Section 4.2.4: CoA D34 refers to "the proposed development must not result in a change of risk in relation to any pre-existing contamination". It is recommended that adequate investigation is undertaken and a contaminated land report is prepared which makes specific reference to this requirement and the proposed development. This should be reviewed by the site auditor. This aspect should be discussed in Section 4.2.4, and included in SGC02.	Further investigation not considered to be required at this stage. Existing contamination identified at the site i.e. asbestos A-horizon soils area will be remediated. For the remainder of the site, no further contamination is anticipated because of implementation of mitigation measures i.e. Spill prevention and response and erosion and sediment controls	Closed					
5	Section 4.2.4: It is recommended that the reporting process outlined in NSW EPA (2020) Consultants reporting on contaminated land is included here.	Reference to EPA guideline included here.	Closed					

CAVVANBA

Comment	Auditor comment (11 September 2024)	Consultant response	Action
NO.	This section would also benefit from a description of the role of the site auditors and consultants which is described in Section 1.5 of the Auditor Guidelines. These guidelines also describe a multi-stage audit in Section 3.6.2, which is relevant to this project.		
6	Section 6.1: Check CSWMSP23 reference to Section 6.1.5 (assumed 6.1.4). It is recommended that evidence of Auditor review for relevant construction phase contaminated land aspects are "interim site audit advice" rather than Site Audit Statement (SAS).	Reference updated Wording updated to refer to interim site audit advice	Closed
7	Section 7.5. It is worth including a note here that this section does not apply to Contaminated Land Auditing under the meaning of the CLM Act.	Note included.	Closed
8	 Section 6.1.4.1: If development of an environmental management plan EMP) is part of a proposed remediation method, consideration needs to be given to: feasibility of encapsulation (as risk described in CoA D34); and legal enforceability. 	Wording included in section 6.1.4.1	Closed
Unexpe	cted contamination and asbestos finds procedure		
9	<i>Section 4.1:</i> The listed asbestos removal techniques should be referred to as investigation techniques, or sampling methods for evaluating asbestos contamination.	Updated to refer to 'investigation' techniques	Closed
Acid Su	lfate Soils Management Plan		
10	Section 4: The ASSMP and the liming requirements should be updated to take into account the findings of the ASS investigation – i.e. GHD (2023).	Noted – background information from CSWMP has been included in ASSMP	Closed
11	<i>Section 5.6:</i> Consideration should be given to the use of reducible chromium suite, rather than SPOCAS, in case accordance with best practice and Dept. of Agriculture, Waste and the Environment, 2022 guidance.	Reference to reducible chromium suite included s an option in section 5.6	Closed

Attachment 1 – Scope and limitations to site audits

Scope of audits

Whereas interim site audit advice is provided to assist in the assessment and management of contamination issues at the site, the interim site audit advice should not be regarded as 'approval' of any proposed investigations or remedial activities, as any such approval is beyond the scope of an independent review.

In NSW, the site assessment and audit process consists of:

- (i) the contaminated land consultant, or other relevant party, *designs and implements* the site assessment and, where required, all remediation and validation activities to achieve the stated objectives; and
- (ii) the site auditor *independently reviews* the works undertaken to ensure that they comply with current regulations, standards and guidelines, and that the site has been assessed, remediated and validated to a standard appropriate to the proposed landuse.

Therefore, the contaminated land consultant and other relevant parties should be satisfied that the work to be conducted conforms to all appropriate regulations, standards and guidelines and is suitable based on the site history and the proposed landuse.

Provision of interim site audit advice addressing assessment reports, management plans and the like does not constitute approval of these documents or actions proposed therein. 'Approval' is inconsistent with the concept of a site audit, that is an independent third party review.

Rather, where interim site audit advices describe such documents as appropriate or similar, this means that the site audit is in general agreement that the document fulfils the intended purpose, consistent with the scope of site audits described above. 'Approval' of reports or plans is by definition a statutory function, and the *Contaminated Land Management (CLM) Act* 1997 does not provide accredited site auditors authorisation for statutory functions.

Limitations to site audits

This site audit relates only to those matters relevant to the CLM Act, which describes that "The general object of this Act is to establish a process for investigating and (where appropriate) remediating land areas where contamination presents a significant risk of harm to human health or some other aspect of the environment".

Contaminated land site audits do not seek to provide an opinion regarding:

- other aspects of the environment not related to site contamination; or
- to the suitability of the site in regard to landuse planning and legal use of the land; or
- the occupational health and safety legislation; or
- the suitability of any engineering design.

Accordingly, reviews of such information are only in relation to the contaminated land aspects of any projects or sites. If specialist technical review of such documents is required, these should be obtained by appropriate specialist.

By definition, site auditing involves the review and critique of consultants' and contractors' work, including, amongst others, site histories, site surveys, subsurface investigations, chemical and physical analyses, and risk assessments and modelling. Accordingly, Cavvanba relies on the experience, expertise and integrity of the relevant organisations. The information sources referenced have been used to determine site history and local subsurface conditions. While Cavvanba takes reasonable care to avoid reliance on data and information that is inaccurate or unsuitable, Cavvanba is not able to verify the accuracy or completeness of all information and data made available.

Sampling and chemical analysis of environmental media are based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based

on the regulatory requirements and site history, not on sampling and analysis of all media at all locations for all potential contaminants.

Limited environmental sampling and laboratory analyses were undertaken as part of the investigations reviewed by Cavvanba, as described herein. Ground conditions between sampling locations may vary, and this should be considered when extrapolating between sampling points. Except at each sampling point, the nature, extent and concentration of contamination is inferred only. Furthermore, the test methods used to characterise the contamination at each sampling point are subject to limitations and provide only an approximation of the contaminant concentrations. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this site audit are based on the available information at the time of the investigations.

As environmental sampling is based on achieving suitable sampling densities, rather than sampling all media at all locations, and analysis is based on site histories and likely contaminants of concern, rather than analysis of all media at all locations for all potential contaminants, the absence of any identified hazardous or toxic materials at the site should not be interpreted as a warranty or guarantee that such materials do not exist at the site. Therefore, future work at the site which involves subsurface excavation should be conducted based on appropriate management plans. These should include, *inter alia*, environmental management plans, including unexpected findings protocols, hazardous building materials management plans, and occupational health and safety plans.

Appendix C – Erosion and Sediment Control Strategy

·••

0

Refer to CS1135-WT-BEL-EN-PLN-0019 - Erosion and Sediment Control Plan



CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE





Belmont Desalination Plant

Erosion and Sediment Control Plan

Document Number: CS1135-WT-BEL-EN-PLN-0019 Revision Number: 0 Issue Date: 17/09/2024

PREPARED BY SOS ENVIRONMENTAL ON BEHALF OF JOHN HOLLAND PTY LTD





Revisions and Distribution

Revisions

•••

Draft issues of this document are identified as Revision A, B, C, etc. Upon initial issue (generally Contract Award) this will be changed to a sequential number commencing at Revision 0. Revision numbers will continue at Revision 1, 2, etc.

Rev	Date	Prepared By [Name]	[Signature]	Reviewed By [Name]	[Signature]	Approved By [Name]	[Signature]	Remarks
A	06.05.2024	S. Grunsell	SG	A. Grant	AG	J Nisbet	JN	HWC and ER Submission
В	14.08.2024	B Rice	BR	A. Grant	AG	S MacNish	SM	Update post modification
0	17.09.2024	B Rice	BR	A. Grant	AG	S MacNish	SM	Update post HWC and ER comments

Distribution List

Client's Representative	S Farrar
Project Director	S MacNish
Project Construction Manager	J Nisbet
Project Environment Manager	A Grant
Environmental Representative	D. Bone

The controlled master version of this document is available for distribution as appropriate and maintained on the document management system being used on the Project, available to all Project workers. All circulated hard copies of this document are deemed to be uncontrolled.





Table of Contents

Revis	ions and Distribution	2					
1. I	NTRODUCTION	4					
1.1.	Purpose of Strategy	4					
1.2.	Impacts of Erosion and Sedimentation	4					
2. 3	SCOPE OF THIS STRATEGY	4					
3. E	EROSION AND SEDIMENTATION HAZARD	5					
4. 3	SUPPORTING DOCUMENTATION	5					
5. ł	KEY MANAGEMENT STRATEGIES	6					
5.1.	Professional Expertise	6					
5.2.	Training	6					
5.3.	Minimising Extent and Duration of Disturbance	6					
5.4.	Control of Stormwater Flows onto, through and from the Site	6					
5.5.	Erosion Control Measures to Prevent On-Site Damage	7					
5.6.	Sediment Control Measures to Prevent Off-Site Damage	7					
5.7.	Stabilisation and Revegetation	7					
5.8.	Inspection and Maintenance	7					
5.9.	Documentation and Recording	8					
5.10). General	8					
6. 3	SPECIFIC CONTROLS / MEASURES	.8					
6.1.	Bio-Swales	8					
6.2.	Excavated Sediment Traps	9					
6.3.	Culvert Construction	9					
6.4.	Sediment Fences	9					
6.5.	Mulch Bund Sediment Traps / Blankets	.9					
6.6.	Stormwater Pits	.9					
6.7.	Water Reuse	10					
7. (CONCLUSION	10					
ATTA	CHMENT 1	11					
ATTA	CHMENT 2	12					
ATTA	CHMENT 3	13					
ATTA	ATTACHMENT 4						
ATTA	ATTACHMENT 5						
ATTA	18 ATTACHMENT 6						
ATTA	CHMENT 7	19					

ATTACHMENTS

- Register of Progressive Erosion and Sediment Control Plans. 1.
- Awareness Training Program. 2.
- Sample Inspection Report for Project Soil Conservationist. Project Concept Erosion and Sediment Control Plan 3.
- 4.
- 5. Typical arrangement sketch for an excavated sediment trap
- Temporary Culvert Crossing Sketch 6.
- Typical Arrangement sketches for mulch bund sediment trap 7.





1. INTRODUCTION

1.1. Purpose of Strategy

The purpose of this Erosion and Sediment Control Strategy is to provide detailed guidance on the approach to mitigating the risks of erosion and sedimentation associated with the specific project works and local environment associated with the Belmont Desalination Plant Project ('The Project'). The strategy is aimed at topsoil stockpiles and exposed areas following disturbance from construction and the key management strategies to be implemented for these areas.

This Erosion and Sediment Control Strategy is to be:

- Included as an Appendix of the Soil and Surface Water Management Plan (SSWMP).
- A 'stand-alone' document.

1.2. Impacts of Erosion and Sedimentation

The construction activities to be undertaken on this project have the potential to impact on soil and water resources of the Belmont Lagoon and dune system adjacent to Blacksmiths Beach. Land to be disturbed or cleared of vegetation is potentially subject to erosion by stormwater and wind action.

Generally, soil particles eroded by stormwater runoff are transported downslope, usually settling in rivers, watercourses and wetlands etc (ie sedimentation). This may result in many adverse environmental impacts including:

- Reduction in water quality and nutrient enrichment of water bodies.
- Damage to vegetation communities.
- Disturbance to aquatic flora and fauna.
- Increased potential for flooding.
- Reduction in recreational values.
- Reduction in aesthetic values.
- Increased maintenance costs.
- Promotion of weed growth.

Additionally, erosion may be caused by wind moving unprotected soil / sand particles. This action may result in adverse impacts including:

- Loss of valuable soil (eg topsoil).
- Safety on and off site (eg traffic hazards).
- Inundation of areas with severe nuisance value.
- Existing Vegetation loss

This Strategy will form the initial document in an ongoing process to minimise on-site erosion and offsite sedimentation and therefore reduce adverse environmental impact.

2. SCOPE OF THIS STRATEGY

This Strategy is a document which describes intentions and fundamental principles for the duration of the entire project.

This Strategy will be complimented by the preparation of more detailed Progressive (Site Specific) Erosion and Sediment Control Plans (ESCP) prepared for:

- The different stages of construction (e.g. Clearing, Grubbing and Stripping & Stockpiling of Topsoil; Bulk Earthworks; Drainage).
- Various work areas (e.g. hardstand, building construction, offices / compounds, ancillary facilities etc).

The Progressive ESCPs will identify risk and be prepared just prior to construction activity and indicate (where relevant):

- Catchment areas (i.e. within and outside the road reserve).
- Construction boundaries.





- Exclusion zones and sensitive areas.
- Contours and drainage paths.
- Access points and tracks (e.g. haulage).
- Temporary drainage line crossings.
- Stockpile sites.
- Temporary work areas.
- Material processing areas.
- Concrete washout pit sites.
- Offices / ancillary facilities / compounds / laydown areas.
- Specific environmental sites (e.g. heritage).
- Permanent and temporary controls (including order of implementation).

In some instances, more than one (1) Progressive ESCP may be required for an activity due to:

- Staging rendering the process complicated.
- Change in the construction process, scope of work or work method.
- Controls are found to be ineffective following rainfall.

Progressive ESCPs will be prepared jointly by both the Project Soil Conservationist and the Contractor's environmental and field personnel to formulate practical documents for field reference. Additionally, Plans will be developed in consideration of other environmental aspects (e.g. sensitive vegetation).

The Progressive Plans will be entered onto a register (refer to **Attachment 1**) and placed behind this ESCP to create a 'living' record of erosion and sediment control.

The Plans will provide design criteria for erosion and sediment controls from the Blue Book (Volumes 1 & 2D) where relevant (e.g. bioswales, diversion banks).

3. EROSION AND SEDIMENTATION HAZARD

Although the topography of the project is undulating across a sand dune system, a generally high erosion and sedimentation hazard will be created during the construction due to a combination of:

- The removal of protective vegetation with large scale disturbance exposing soils to water and wind action.
- Soil types with differing characteristics (e.g. high water erosion hazard, high water tables, seasonal waterlogging, strong acidity (i.e. acid sulphate and potential acid sulphate), dispersive, low fertility).
- Creeks adjacent to the site (Cold Tea Creek).
- Potential flooding impacts from Belmont Lagoon.
- Works on the dune system.
- The sometimes high and torrential rainfall events average annual rainfall between 1100 & 1150 mm with a slight summer dominance.

4. SUPPORTING DOCUMENTATION

This Erosion and Sedimentation Control Strategy is based on the requirements and guidelines contained in the following manuals / documents:

- Department of Housing (1998), Managing Urban Stormwater: Soils and Construction, Vol 1, 4th Edition (ie Blue Book).
- Department of Environment and Climate Change (2008), Managing Urban Stormwater: Soils and Construction, Vol 2D, Main Road Construction (ie Blue Book).
- Belmont Desalination Plant EIS, Submission Report, CoAs and REMMs.
- Environment Protection Licence (EPL).

The strategies and techniques detailed in the above documents are appropriate for the protection of the adjacent environment of this project.



5. KEY MANAGEMENT STRATEGIES

The following list outlines principles and control measures that will be implemented on this project for minimising erosion and sedimentation. These points collectively fulfil the <u>principles of sound soil</u> <u>conservation practice</u> as detailed in the previously mentioned manuals / documents. This will ensure a 'preventative' rather than a 'cosmetic or remedial' approach to erosion and sediment control.

Major emphasis will be placed on:

5.1. Professional Expertise

Roles and responsibilities are identified in the CEMP and Section 7.1 of the SSWMP. Roles related to the management of erosion and sediment control include:

• The engagement of a Professional Soil Conservationist with extensive experience in infrastructure construction, who will co-ordinate and oversee all erosion and sediment control aspects during construction.

5.2. Training

Overall training requirements are addressed within the CEMP and Section 7.2 of the SSWMP. Requirements specifically related to erosion and sediment control include;

- Highlighting the importance of soil conservation issues during site inductions.
- Scheduling awareness seminars early in the project for all personnel involved in construction. The program will cover:
 - Environmental impacts;
 - Relevant legislation;
 - Principles of erosion and sediment control;
 - Techniques of erosion and sediment control.
 - More details on the program appear in Attachment 2.
- Continually addressing relevant matters at regular 'toolbox' meetings during the course of the project (e.g. maintenance of temporary controls).

5.3. Minimising Extent and Duration of Disturbance

- Marking clearing limits.
- Staging of clearing operations.
- Initially clearing and grubbing to leave the soil surface in a reasonably rough condition with some surface vegetative cover.
- Minimising disturbance of vegetation along the road corridor with special emphasis on management of construction activities adjacent to drainage lines / areas of concentrated flow.
- Leaving drainage lines undisturbed until culvert construction has commenced and using the cut-stump method where possible instead of stump removal to further maintain stream bank stability.

5.4. Control of Stormwater Flows onto, through and from the Site

- Separating 'clean' run-on water from 'dirty' (e.g. turbid) construction area run-off.
- Constructing permanent drainage structures early in the project including:
 Sediment traps;
 - Bioswales:
 - Catch drains with permanent linings;
 - Culverts and associated inlet and outlet protection (e.g. dissipators).







- Maximising the diversion of 'dirty' construction runoff into bioswales, sediment traps (e.g. mulch bunds), and swale drains (i.e. temporarily converted to sediment traps).
- Controlling run-off during the construction of embankments (e.g. fill shaping and the construction of temporary bunds and batter drains).
- Diverting formation run-off through sediment traps (e.g. sand / filter bags) and into pits and the stormwater drainage system as soon as practical to reduce surface flow lengths and velocities.

5.5. Erosion Control Measures to Prevent On-Site Damage

- Constructing a range of erosion controls within the various sub-catchments to reduce flow velocities and to compliment and increase the effectiveness and efficiency of sediment controls in the lower areas (e.g. slope breaks, diversion banks, progressive revegetation).
- Using geotextile linings or similar (e.g. soil binder polymer) to provide temporary surface protection in areas of concentrated flows (e.g. batter drains, temporary drains etc).
- Siting stockpiles of soil material in low-hazard areas clear of drainage lines (i.e. at least 50 metres). Additional protection to be afforded with temporary stabilisation, upslope diversion banks and downslope sediment control measures, if required. Toe of stockpiled material to be at least 5 metres from a fence, drain or trees to be retained.
- Stockpiles no greater than 2 metres in height with batters no steeper than 2:1.

5.6. Sediment Control Measures to Prevent Off-Site Damage

- Constructing control measures as close to the potential source of sediment as possible (e.g. sediment fences, mulch bund sediment traps).
- Ensuring the commencement of management of 'dirty' water within 24 hours after rain with one or a combination of:
- Pump-out for construction purposes or dust control preferred;
- Flocculation with gypsum (or approved alternative flocculant).
- Dewatering of sediment traps and swales within a 5-day period following the cessation of rainfall.
- Managing water quality during de-watering activities (e.g. dust suppression, filter techniques, flocculation with gypsum).
- Controlling the deposition of mud and soil material onto local roads.
- Dust suppression via water carts, restricting plant and vehicle movements to designated routes and limiting vehicle speeds etc.
- Undertaking frequent site inspections.

5.7. Stabilisation and Revegetation

- Ensuring the success of the later revegetation program by utilising a good topsoil management program.
- Keying of topsoil to batters with the depth to be 5 to 10 cms.
- Progressively revegetating disturbed areas utilising appropriate species.
- Controlling dust through progressive revegetation techniques.

5.8. Inspection and Maintenance

Monitoring and inspection will occur in accordance with the CEMP and Section 7.4 of the SSWMP. Monitoring and inspection practices specifically related to erosion and sediment control include:

- Ensuring the progressive and continual implementation of temporary erosion and sediment controls (e.g. sediment fences, diversion banks, diversion drains, sediment traps).
- Initiating a program to ensure regular maintenance of all erosion and sediment control measures. Sediment cleaned from structures, including sediment swales, to be deposited in a secure location where further pollution will not occur.





- Arranging regular inspections by the Project Soil Conservationist (i.e. fortnightly) and construction personnel (i.e. weekly) to review and update control measures.
- Additional inspections to be conducted:
 - During significant rainfall events exceeding 20mm and during prolonged rainfall to monitor the functioning of controls.
 - Within 24 hours of cessation of a rainfall event causing runoff to occur on or from the project.
- Surface water quality monitoring (pH, Turbidity) will be undertaken for water discharge events from rock check locations, where water has the potential to leave site.
- pH and Turbidity levels will be compared to Lake Macquarie City Council construction dewatering guideline fact sheet levels (pH 6.5 8.5, Turbidity <60 NTU).

5.9. Documentation and Recording

Documentation and record keeping will occur in accordance with the CEMP. Documentation and record keeping specifically related to erosion and sediment control include;

- Rainfall / climatic records as per Section 7.4 of the SSWMP
- Developing documentation and systems for recording erosion and sediment control activities via:
 - Progressive ESCPs;
 - Inspection reports completed by the Project Soil Conservationist. A sample format for this report appears in **Attachment 3** and includes sections for location, control, recommendation / comment, priority, photograph and close out;
 - Register for Inspections and Maintenance to include volumes of sediment removed and method of disposal etc.
- Site notes distributed internally between environmental and construction personnel.
- Dewatering Management Procedure and associated records.
- Training records.
- Meeting minutes.
- Formal correspondence (e.g. Environment Protection Authority).
- Water quality monitoring results relating to dewatering.

5.10. General

- Monitoring weather forecasts for planning and site 'securing' purposes.
- Ensuring erosion and sediment controls are installed at all sites associated with construction activities including:
 - Access and haulage roads and tracks;
 - Stockpile areas;
 - Office and compound sites;
 - Workshop areas;
 - Temporary work areas.
- Leaving temporary erosion and sediment controls in place until the disturbed catchments have over 70% vegetation cover (i.e. beyond pavements).

6. SPECIFIC CONTROLS / MEASURES

6.1. Bio-Swales

Due to the high water table associated with the location of the Project, bioswales will be used in place of sediment basins to avoid interception of groundwater. Permanent bioswales will be excavated early during works at locations shown in **Attachment 4**. As the 'trigger' for a sediment basin occurs when the 'soil loss' from the catchment is calculated to exceed 150 cubic metres per year, catchments across the project will be minimised as far as possible so that bioswales will effectively manage runoff.







All bioswales are to be designed and constructed in accordance with the 'Blue Book' guidelines (i.e. volumes determined in part by the 5 day 85th percentile rainfall data parameter).

6.2. Excavated Sediment Traps

Excavated sediment traps may be installed where there is no risk of intercepting the water table and as an alternative to a trap within a bioswale.

Sediment traps are installed when the 'soil loss' from a catchment is calculated to be less than 150 cubic metres per year and a robust control is require (e.g. adjacent to a drainage line). As mentioned in Section 6.1 the 'trigger' for a sediment basin is a 'soil loss' calculated to exceed 150 cubic metres per year from a catchment.

A typical arrangement sketch for an excavated sediment trap is shown at Attachment 5.

6.3. Culvert Construction

'Clean' water passage through the works to be achieved via one or a combination of:

- Pump through with geofabric lined bunds upstream and downstream.
- Construction of a temporary geofabric lined diversion channel.
- Temporary pipelines.
- Use of a box culvert excavation stabilised by the blinding layer on the base and geofabric lining on the sides refer to **Attachment 6**.
- The natural drainage line (or sections) where the works are 'offset'.

'Dirty' runoff from the sides to be treated prior to entry to the 'clean' water area via excavated sediment traps or traditional sediment fences etc.

6.4. Sediment Fences

Two (2) types of sediment fences to be installed as follows:

- Traditional sediment fences along the toes of fill batters, behind culvert head and wing walls, along the banks of drainage lines and downslope of stockpiles etc.
- Geofabric sediment fences along the outside toes of bioswales. The sediment fences to be:
 - Secured under the toes of the batters.
 - Minimum one (1) metre in height.
 - Held up the stakes at two (2) metre intervals.
 - Strengthened with a 'top wire' tied to all stakes and along the top of the geofabric.

6.5. Mulch Bund Sediment Traps / Blankets

Mulch bund sediment traps to be used as an alternative to traditional sediment fences away from drainage lines.

Typical Arrangement sketches for mulch bund sediment trap configurations are shown at **Attachment 7**.

Mulch to be spread in thin blankets / layers (i.e. 10 cms) over small bare / disturbed areas for surface stabilisation (e.g. upslope of 'clean' water catch drains).

6.6. Stormwater Pits

Controls at stormwater pits to mainly consist of sandbag diversions, sandbag sediment traps, filters bags, pit bags and sediment fences etc.

Runoff to be diverted via sediment traps into pits and the stormwater systems at frequent intervals to reduce surface flow lengths, flow velocities and scouring potential (i.e. runoff control).





6.7. Water Reuse

In relation to erosion and sediment control, the priority will be the reuse of water from excavated sediment traps and excavations for dust suppression and earthworks rather than discharge from site.

7. CONCLUSION

The strategies presented in this Strategy are considered to appropriately address all issues relevant to erosion and sediment control and to minimise potential impact.

Forward planning, adherence to a system of documentation and training will be key elements to ensure sound performance in the field.



EROSION AND SEDIMENT CONTROL PLAN | CS1135-WT-BEL-EN-PLN-0019 | REV: 0 | 17/09/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION





PROJECT: BELMONT DESALINATION PLANT PROJECT

<u>REGISTER</u> – PROGRESSIVE EROSION AND SEDIMENT CONTROL PLANS

PLAN NO	CHAINAGE / DESCRIPTION	PERSONNEL INVOLVED IN PREPARATION	DATE OF PREPARATION	SOIL CONSERVATIONIST INITIALS & DATE	ENVIRONMENTAL MANAGER INITIALS & DATE	SUPERCEDED BY PLAN NO / COMMENT







PROGRAM

BELMONT DESALINATION PLANT PROJECT

EROSION AND SEDIMENT CONTROL

AWARENESS SEMINAR

- 1 Introduction
- 2 <u>Environmental Impacts</u> This session focuses upon the on-site and off-site environmental impacts of erosion and sedimentation (e.g. water quality, fauna, flora etc). It concludes with an exercise listing all impacts.
- 3 <u>Environmental Legislation</u> This session examines:
 - Relevant legislation (P.O.E.O. Act).
 - Practical application in the field.
- 4 <u>Principles of Erosion and Sediment Control</u> This session covers nine (9) principles which include:
 - Investigation of site features
 - Planning
 - Minimum disturbance
 - Topsoil
 - Control of run-off
 - Minimisation of erosion
 - Trapping sediment
 - Progressive rehabilitation
 - Maintenance
- 5 <u>Techniques of Erosion and Sediment Control</u> This session includes the most common techniques. Aspects covered include:
 - Clearing
 - Topsoil management
 - Drainage and installation of permanent structures (e.g. culverts, catch drains etc)
 - Diversions banks
 - Drains and channels
 - Batter protection
 - Revegetation
 - Bioswales and management
 - Sediment traps
 - Sand bags and their application
 - Maintenance
 - Miscellaneous matters (e.g. mud on local roads, dewatering, dust etc).
- 6 <u>Field Inspection</u> This session examines techniques constructed in the field together with associated discussions on Impacts, Legislation and Principles.





EROSION AND SEDIMENT CONTROL REPORT

REPORT DATE		REPORT No
CLIENT	JOHN HOLLAND	
PROJECT	BELMONT DESALINATION PROJECT	-
DATE OF INSPECTION		
WEATHER CONDITIONS		
ATTENDEES		
REPORT TO		
REPORT BY	Grant Fletcher – Soil Conservationist SOS M:	0416 120963 E: Grant.fletcher@outlook.com.au

No.	LOCATION	CONTROL	RECOMMENDATION / COMMENT	PRIORITY	PHOTOGRAPH	CLOSE OUT
1						
2						





BELMONT DESALINATION PROJECT

PROCEDURE FOR WATER QUALITY MANAGEMENT IN SEDIMENT BASINS

WHY SEDIMENT BASIN MANAGEMENT IS REQUIRED?

An important component of water quality control is effective management of sediment basins from the construction phase through to their conversion to chemical spill traps or water quality ponds post construction.

There is a legal responsibility to ensure that runoff leaving a construction site has an acceptable water quality standard including that water being discharged from sediment basins after storm events.

Unless otherwise amended by an EPL, it is assumed the parameters and limits to be monitored in the management of sediment basins include:

- Total Suspended Solids (T.S.S.) <50mg/l;
- pH 6.5 to 8.5;
- Oil and grease maximum 10mg/l.

It is these water quality parameters that are addressed in this Procedure.

PROCEDURE

To effectively manage the sediment basins the following procedure should be undertaken:

- 1 All sediment basins to be inspected for capacity and water quality immediately following cessation of a rain period. A marker should indicate the top of the sediment storage zone and the bottom of the settling zone.
- 2 If water is to be used for construction purposes (eg compaction, dust control) no treatment is required. However, the water should be removed at least from the settling zone routinely within 4 days.
- 3 If the capacity of the sediment storage zone has been reduced by 60% or more by sediment then desilting to be immediately scheduled with water treatment as per the procedure below.
- 4 If the water level is above the sediment storage zone the parameters of pH, T.S.S. and oil and grease to be tested under the supervision of the Project Environment Manager and addressed as follows:
 - i. <u>pH</u>
 - Test basin water with a calibrated water quality meter.
 - No action if pH reading between 6.5 and 8.5.
 - Lime to be added if pH below 6.5.
 - Hydrochloric Acid (32% Muriatic) to be added if pH above 8.5.
 - Determine volume of water in basin.

• Determine percentage of lime or acid required by taking a 10 litre sample of basin water and adding a known amount of lime or acid (initially 0.004%). If the pH is still not acceptable, vary the amount of lime or acid until within the limits.

SOS

- Once the required percentage has been determined, calculate the actual amount of lime or acid to be added by multiplying the volume of water in the basin by the determined percentage.
- Add the required amount of lime or acid to the basin.
- Mix the water in the sediment basin well.
- Treat for pH prior to T.S.S.

ii. <u>T.S.S</u>

- Test basin water by comparing with water samples contained in jars with representative readings up to 100mg/l created through laboratory testing. This will enable a relatively accurate comparison which will be verified by laboratory testing approximately every six (6) rainfall events.
- No action if T.S.S. reading <50mg/l.
- If basins require flocculation (eg T.S.S. >50mg/l), bulk gypsum as a flocculant to be immediately applied evenly across the top of the water at an acceptable rate (i.e. trial and error as different for each basin). Methods of application to include:
 - a) broadcast by shovels on small basins (ie <200m³);
 - b) mixing in a drum with water and pumping through a hose on large basins (ie >200m³).

iii. Oil and Grease

- Examine surface of water for evidence (eg sheen, discolouration).
- No action if no visual contamination.
- Oil absorbent material to be spread if there is contamination (eg cell-u-sorb).
- 5 Leave basins to compensate for 24 to 48 hours.
- 6 After retesting, and once the above field tests indicate the water quality is acceptable discharge water from basin ensuring water quality is not compromised.
- 7 The process at points 4 and 5 and the retesting at point 6 may need to be repeated if acceptable water quality is not achieved initially.
- 8 Records to be kept of the rainfall events, inspections undertaken, field tests undertaken, dosage rates and when basin water is released etc (refer to the attached checklist).
- 9 The whole process of water quality management in sediment basins should be completed routinely within 4 days of cessation of a rain period.



PROJECT: BELMONT DESALINATION PLANT PROJECT

Document No: _____

SEDIN	EDIMENT BASIN MANAGEMENT																
Rainfall	Allowable Limits: T.S.S. <50mg/l pH 6.5 to 8.5 Days: Days: Days: Desilting >30% reduction in design capacity																
BASIN NO	DESIGN CAPACITY M3	IS WATER TO BE USED FOR CONSTRUCTION	WATEF TREAT	R QUALI' MENT	TY BEFORE	RATE OF LIME ADDED	RATE OF ACID ADDED	RATE OF GYPSUM ADDED	OIL ABSOR -BENT ADDED	WATER QUALITY AFTER D TREATMENT V C		DATE VALVE OPENED	DATED VALVE CLOSED	DESILTING REQUIRED	DATE DESILTED	COMMENTS	
			T.S.S	рН	OIL & GREASE					T.S.S.	рН	OIL & GREASE					

Inspected by / Position

Date

Environmental Manager

Date



CONSTRUCTION

1. REFER TO APPROVED PLANS FOR LOCATION AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE FOUNDATION AREA OF THE OUTLET STRUCTURE (IF ANY), AND INSTALL AS PER SEPARATE INSTRUCTIONS.

3. EXCAVATE THE SETTLING POND IN ACCORDANCE WITH THE APPROVED PLANS. UNLESS OTHERWISE SPECIFIED, THE EXCAVATED PIT SHOULD HAVE A SIDE SLOPE OF 2:1(H:V) OR FLATTER.

4. APPROPRIATELY STABILISE ANY BANK SUBJECT TO DIRECT INFLOW.

5. ESTABLISH ALL NECESSARY UP-SLOPE DRAINAGE CONTROL MEASURES TO ENSURE THAT SEDIMENT-LADEN RUNOFF IS APPROPRIATELY DIRECTED INTO THE SEDIMENT TRAP.

6. TAKE ALL NECESSARY MEASURE TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE.

MAINTENANCE

1. CHECK EXCAVATED SEDIMENT TRAPS AFTER EACH RUNOFF EVENT AND MAKE REPAIRS IMMEDIATELY.

2. INSPECT THE BANKS FOR SLUMPING OR EXCESSIVE SCOUR.

3. IF FLOW THROUGH THE STRUCTURE IS REDUCED TO AN UNACCEPTABLE LEVEL DUE TO BLOCKAGE OF THE OUTLET STRUCTURE (IF ANY), THEN MAKE ALL NECESSARY REPAIRS AND MAINTENANCE TO RESTORE THE DESIRED FLOW CONDITIONS.

4. CHECK THE STRUCTURE AND SURROUNDING CHANNEL BANKS FOR DAMAGE FROM OVERTOPPING FLOWS AND MAKE REPAIRS AS NECESSARY.

5. REMOVE SEDIMENT AND RESTORE ORIGINAL SEDIMENT STORAGE VOLUME WHEN COLLECTED SEDIMENT EXCEEDS 30% OF THE PIT VOLUME.

6. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. WHEN THE UP-SLOPE DRAINAGE AREA HAS BEEN STABILISED, REMOVE ALL MATERIALS INCLUDED DEPOSITED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

2. ALL WATER AND SEDIMENT SHOULD BE REMOVED FROM THE BASIN PRIOR TO THE DAM'S REMOVAL. DISPOSE OF SEDIMENT AND WATER IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

3. BRING THE DISTURBED AREA TO A PROPER GRADE, THEN SMOOTH, COMPACT AND STABILISE AND/OR REVEGETATE AS REQUIRED.



(b) Excavated sediment trap located downstream of a stormwater outlet

1	Drawn:	Date:		
	GMW	Apr-10	Excavated Sediment Trap	EST-01

EROSION AND SEDIMENT CONTROL PLAN | CS1135-WT-BEL-EN-PLN-0019 | REV: 0 | 17/09/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE







MATERIALS

(i) MULCH MUST COMPLY WITH THE REQUIREMENTS OF AS4454.

(ii) MAXIMUM SOLUBLE SALT CONCENTRATION OF 5dS/m.

(iii) MOISTURE CONTENT OF 30 TO 50% PRIOR TO APPLICATION.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN SELECTING THE LOCATION OF A MULCH FILTER BERM, TO THE MAXIMUM DEGREE PRACTICAL, ENSURE THE BERM IS LOCATED:

(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;

(ii) ALONG A LINE OF CONSTANT ELEVATION (PREFERRED, BUT NOT ALWAYS PRACTICAL);

(iii) AT LEAST 1m, IDEALLY 3m, FROM THE TOE OF A FILL EMBANKMENT;

(iv) AWAY FROM AREAS OF CONCENTRATED FLOW.

3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE BERM, OR THE UNDESIRABLE DISCHARGE OF WATER AROUND THE END OF THE BERM.

4. ENSURE THE BERM HAS BEEN PLACED SUCH THAT PONDING UP-SLOPE OF THE BERM IS MAXIMISED. 5. ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TURNED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM.

6. ENSURE 100% CONTACT WITH THE SOIL SURFACE.

7. WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VEGETATE THE BERM.

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL BERMS AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR 1/3 THE HEIGHT OF THE BERM.

5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL (IF REQUIRED)

1. WHEN DISTURBED AREAS UP-SLOPE OF THE BERM ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE BERM MAYBE REMOVED.

2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.



Figure 1 - Typical placement of mulch filter berm

1	Drawn:	Date:		
	GMW	Apr-10	Mulch Filter Berms	MB-01
Belmont Desalination Plant Concept Erosion & Sediment Control Plan

NOTES - Administration & General

- 1. This concept ESCP is to be read in conjunction with the SWMP. ESCP. CEMP. relevant specifications, and procedures.
- 2. Works programming to maximise the mitigation of erosion by the early implementation of permanent drainage measures, temporary and permanent soil surface stabilisation measures, and minimising the area and duration of soil disturbance.
- 3. Bureau of Meteorology weather forecasting to be monitored daily for the local 7-Day weather outlook. Site management measures to be planned for imminent storm/rainfall/flood/wind events include, but are not limited to;
 - avoiding additional soil disturbance immediately prior to an event,
 - provision of additional erosion and sediment controls in critical locations,
 - installing, repairing, and/or adjusting 'clean' (off site water) and 'dirty' (on site) water drainage measures,
 - desilting and re-instating sediment controls as required,
 - implementing stockpile protection measures,
 - stabilising and sealing disturbed soil surfaces,
 - minimising dry soil handling in windy conditions, •
 - evacuating or protecting erodible materials in lower lying area, ٠
 - Slope breaks will be installed to reduce slope length.
- The plan is to be revised as necessary (i.e., progression of works, altered site conditions or weather). The controls depicted are subject to staging 4. and the controls may be progressively implemented or removed according to progression of works.
- 5 All erosion and sediment controls generally to be constructed in accordance with 'Blue Book' specifications and standard drawings
- 6. Specifications being
 - MANAGING URBAN STORM WATER: SOILS AND CONSTRUCTION 4th EDITION, LANDCOM, MARCH 2004;
 - Best Practice Erosion and Sediment Control (IECA 2008); •
- 7. Substitute materials may be utilised in the construction of erosion or sediment controls where functionality is not affected, i.e., compacted mulch bunds in place of sediment fences, stabilised earth berms in place of excavated drains near underground services or timber pegs in place of star pickets where electrical or gas hazards exist.
- Personnel constructing controls to have demonstrated competence and experience. Specific awareness training and workshops to be undertaken 8 by personnel with direct involvement with erosion and sediment control. Toolbox talks to regularly focus on erosion and sediment control for specific works, associated risks, potential impacts and mitigation measures.
- 9 All existing vegetated or undisturbed areas outside of the works area to be regarded as Exclusion zones and to be delineated with fencing, tape or other markers, as required. All site personnel to be instructed to avoid Exclusion zones or damaging installed controls.

Erosion Control

- 10. During the process of clearing, maintain a control bund of cleared vegetation to control run-off as works progress. Boundary sediment controls to be installed as soon as practical as the clearing front advances. Maintain clearing slash and minimise disturbance of ground vegetation, where possible
- 11. Prior to commencement of significant works, install surface drains, sediment traps, sumps & filters, and other surface runoff control measures to control runoff onto, across, and from the works zones to prevent the loss of sediment from the site.
- 12. Construction zones in constrained areas to be managed in smaller, defined sub-catchments to reduce slope lengths and minimise sediment loads to boundary controls.
- 13. Stripped topsoil to be stripped and stockpiled generally as per SD 4-1. Any viable stripped topsoil to be stored in stockpiles, less than two metres in height
- 14. Short term on-site stockpiles to be located away from drains and flow lines and be controlled with sediment fence or storm covers.
- 15. Cover, or otherwise protect from erosion, stockpiles that will be in place for more than 10 days as well as any stockpiles that are susceptible to wind or water erosion, within 10 days of forming each stockpile.
- 16. Any significant (long & steep) cut/fill batters should be progressively overlaid with Rolled Erosion Control Products (RECP's such as jute mesh, coir fibre mesh, etc), mulching, Organic Fibre Mulches (OFM's) or geobinders to reduce erosion and rilling, prior to permanent stabilisation with cover crops, mulching or other long-term surface protection.
- 17. Vehicles transporting bulk materials on public roads are to correctly cover loads to prevent loss of load and/or dust generation.
- 18. Temporary controls in addition to those shown may be required at strategic locations as required by the progression of works or weather conditions

Water Management

- 19. Maximise the interception and diversion of 'clean' (off site water) away from works areas. The 'clean' flows to be conveyed in stabilised drainage lines to suitable discharge points. The flows to be discharged to off-site areas at non-erosive velocities with adequate diffusers, level spreaders, etc. Ensure drainage paths and controls are adjusted as required to maximise the separation of 'clean' (off site) and 'dirty' (on site) water flows through/off site.
- 20. Flows paths with high velocity flows over unstabilised areas to be controlled with:
- applied soil surface stabilisers i.e., geotextile lining, applied soil binders, coarse rock lining, etc suitably constructed check dams (i.e. rock check dams, coir logs etc) placed at intervals to maximise flow suppression and settling of coarse sediment
- 21. Protect all existing and constructed inlets to pits & culverts from sediment ingress.
- 22. Where practical, maintain and/or improve existing stabilised drains to assist in the diversion of 'clean' (off site) flows.
- 23. Flooded excavations, ponded water, etc. to be extracted where required and utilised for site purposes or treated to achieve acceptable water quality prior to discharge.

Sediment Control

- 24. Vegetation to be progressively cleared to minimise disturbance by area and duration. Cleared vegetation to be windrowed parallel to the contour until mulching/removal to control flows across cleared areas.
- 25. The installation of preliminary sediment controls such as perimeter sediment fencing, windrowed vegetation/mulch, excavated sediment traps, check dams, straw bale filters, etc, will be implemented prior to soil disturbance within the catchment.
- 26. Accumulated water in sediment traps/sumps cannot be pumped from site without a Permit to Discharge Water
- 27. Appropriate sediment tracking controls such as an aggregate/geotextile apron, shaker grid, etc. will be installed at exit points from the site. Personnel to monitor roadways & tracked sediments to be removed as required.
- 28. Personnel to ensure visual dust monitoring is maintained during works, and dust suppression is undertaken regularly. Dust control to be regularly conducted with water carts and soil stockpiles to suitably covered. Additional dust suppression measures to be utilised to minimise dust pollution during periods of high winds.
- 29. Temporary 'dirty' water drainage will be adjusted progressively to maximise flows to sediment control devices.
- 30. Site access and egress points to be fitted with rumble grids and/or wheel wash facilities (or similar) to prevent tracking of sediment off site (see ECM for rumble grid locations)

31. Scour protection will be added at the base of permanent and temporary drainage outlets. Contamination

32. Refer to the RAP for details on how to manage contaminated soils (including any advice from site auditor statements). Monitoring & Reporting and Inspection & Maintenance

- 33. Inspections of erosion and sediment controls will occur following rainfall events >20mm (daily on workdays or as soon as practical during site shutdown periods), with any necessary repairs implemented as soon as possible. Design rainfall event is 38.9 mm. 34. Relevant checklists and records to be maintained noting details such as rainfall received, repairs to controls and amounts of sediments
- cleaned from controls
- 35. Sediment traps, sumps and filters are to be desilted when 60% of storage capacity is reached.
- 36. All site personnel are to report any spill, leaks, or other failure to relevant response staff as soon as possible.
- 37. Erosion and sediment controls will be installed and maintained at all worksites and adjacent areas as per site specific ESCPs
- Stabilisation
 - 38. Erosion and sediment controls are to be maintained until the relevant catchments are stabilised, re-vegetated, or sealed adequately to achieve soil surface protection factors as per the 'Blue Book' requirements.
 - 39. Completed earthworks areas will be backfilled and compacted in a staged manner as soon as possible. Adjacent disturbed areas will be suitably trimmed and stabilised as required.
 - 40. Stabilisation of areas is to occur progressively in conjunction with the completion of earthworks.
 - 41. Areas subject to heavy compaction and disturbance from vehicle movements and machinery to be scarified to a depth >100mm prior to topsoiling and seeding.
 - 42. The location of the ASS Pad is a temporary use from approx March 2025 to July 2025, after this time the area will be used as a car park (approx. Aug 2025 onwards) and final use as an operational stormwater basin (mid 2026 onwards)

Version	Drawn by	Date	Signed	Reviewed by	Date	Version	Drawn by	Date	Signed	Reviewed by	Date



Legend											
Off Site Water – Sheet	>	Piped Drainage		Stabilised Topsoil Berm		Sediment basin / large sump		Filter bag or sediment fence		Hydrocarbon boom	
110003			-	(geo/jute/seed)						Turbidity Curtain	
Off Site Water –		Off site water exclusion		Stabilised drain		Filter bag / rock & shade cloth		Coir Log/s		Stabilised site access	
Concentrated Flow/Drain		Stabilised coffer dam		Stabilised spillway	*******	sediment filter		Straw bale or coir log filter			
On Site Water -	\rightarrow	Project Boundary		Vegetated drain	835355555555	Compacted Mulch / Rock &	đ	Compacted mulch bund		Stabilised Haul Road/Compound/Access	
Concentrated Flow/Drain		1 Toject Boundary		Rock lined drain		Geotextile / topsoil sediment trap	<u>M</u>	Timber Windrow	= = =	Track/Waterway Crossing	
On Site Water – Sheet		Level Spreader /	_		B	Excavated sediment trap with spill		Sediment Fence			
Flows	>	Diffuser		Rock Filter Dam	1998 - C	weir		Sand Fence		Vegetated filter	

J<u>o</u>hn Holland

Belmont Desalination Plant - Concept Erosion & Sediment Control Plan









J<u>o</u>hn Holl∧nd



Appendix D – Acid Sulfate Soil Management Plan

.

0

Refer to CS1135-WT-BEL-EN-PLN-0018 - Acid Sulfate Soils Management Plan



CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE



Belmont Desalination Plant

Acid Sulfate Soils Management Plan

Document Number: CS1135-WT-BEL-EN-PLN-0018 Revision Number: 1 Issue Date: 12/11/2024



Revisions and Distribution

Revisions

·••

Draft issues of this document are identified as Revision A, B, C, etc. Upon initial issue (generally Contract Award) this will be changed to a sequential number commencing at Revision 0. Revision numbers will continue at Revision 1, 2, etc.

Rev	Date	Prepared By [Name]	[Signature]	Reviewed By [Name]	[Signature]	Approved By	[Signature]	Remarks
A	06/05/2024	B. Rice	BR	A Grant	AG	J Nisbet	JN	Submission for HW / ER review
В	08/08/2024	B Rice	BR	A Grant	AG	S MacNish	SM	Update post modification
0	01/10/2024	B Rice	BR	A Grant	AG	S MacNish	SM	Update Post ER / HWC Review
1	12/11/2024	B Rice	BR	A Grant	AG	S MacNish	SM	Update Post DPHI Comments

Distribution List

Client's Representative	S Farrar
Project Director	S MacNish
Project Site Manager	J Nisbet
Environment Manager	A Grant
Environmental Representative	D Bone

The controlled master version of this document is available for distribution as appropriate and maintained on the document management system being used on the Project, available to all Project workers. All circulated hard copies of this document are deemed to be uncontrolled.



Table of Contents

•...

Revisions and Distribution	2
Table of Contents	3
Terms and Abbreviations	5
1. Purpose and Objectives	6
1.1. Purpose	6
1.2. Objectives	6
1.3. Environmental Performance Targets	6
2. Environmental Requirements	7
2.1. Guidelines and Standards	7
2.2. Conditions of Approval and REMMs	7
3. Acid Sulfate Soil Background Information	8
4. Acid Sulfate Soil Identification	11
4.1. ASS Identification Procedure	11
4.2. Physical Features of ASS	11
4.3. Chemical Features of ASS	12
4.3.1. Field pH Test	12
4.3.2. Field oxidisation pH Test	12
5. Environmental Control Measures	13
5.1. Acid Sulfate Soil Management (non-technical)	13
5.2. Acid Sulfate Soils Management (technical)	13
5.3. Treatment at the Acid Sulfate Treatment pad	14
5.4. Liming Procedure	15
5.5. Lime handling and storage	15
5.6. Post lime soil treatment testing	16
5.7. Final use of treated ASS / PASS	16
5.8. Decommissioning of Acid Sulfate Treatment pad and sump	16
5.9. Treatment of leachate	16
5.10. Monitoring during Dewatering Activities	16
6. Compliance Management	17
6.1. Monitoring and Inspections	17
6.2. ASS record keeping	17
6.3. Non-compliance and Non-conformance Management	17

Figures

Figure 3-1 Acid Sulfate Soil mapping within proximity to the site	8
Figure 4-2 Acid Sulfate Soil risk mapping and sampling location	10
Figure 4-1 Process for identifying ASS	11
Figure 5-1 Cross-section of typical treatment pad	15



. Tables

•...

Table 2-1: Environmental Management Measures driving requirement for this ASSMP	7
Table 4-1: Physical features of PASS and ASS	11
Table 4-2: Field pHF Values	12
Table 4-3: pHFOX values	12
Table 5-1: Acid Sulfate Soil Management and Mitigation Measures	13
Table 5-2: Acid Sulfate Soil Management Requirements	13
Table 6-1: Monitoring, Inspection and Reporting Requirement Measures	17



Terms and Abbreviations

•...

6

Term/Abbreviation	Definition/Expanded text
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines
ASS	Acid Sulfate Soil
ASSMAC	Acid Sulfate Soil Management Advisory Committee
ASSMP	Acid Sulfate Soils Management Plan
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Land Management Act 1997
CLMP	Contaminated Land Management Plan
CoA	Conditions of Approval
CSWMP	Construction Soils and Surface Water Management Plan
DPI	Department of Primary Industries
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Former Department of Planning, Industry and Environment
ECM	Environmental Control Map
EIS	Environmental Impact Statement
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
EPL	Environment Protection Licence
HWC	Hunter Water Corporation
PASS	Potential Acid Sulfate Soil
PESCP	Progressive Erosion and Sediment Control Plan
PFAS	Per- and polyfluoroalkyl substances
POEO Act	Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
REMM	Revised Environment Management Measures
SSI	State Significant Infrastructure
TARP	Trigger Action Response Plan
TSS	Total suspended solids
WMP	Waste Management Sub-Plan
VENM	Virgin Excavated Natural Material



ACID SULFATE SOILS MANAGEMENT PLAN | CS1135-WT-BEL-EN-PLN-0018 | REV: 1 | 12/11/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

1. Purpose and Objectives

1.1. Purpose

••••

The purpose of this Acid Sulfate Soils Management Plan (ASSMP) is to describe how the Belmont Desalination Plant Project (the Project) will manage Acid Sulfate Soils (ASS) during construction.

It supports the implementation of the requirements of the Construction Soil and Surface Water Management Sub-Plan (CSWMP) to which this ASSMP forms Appendix D.

1.2. Objectives

The key objective of this ASSMP is to provide a framework outlining appropriate environmental controls and procedures to be implemented during construction activities to avoid or reduce potential adverse environmental impacts associated with ASS and Potential Acid Sulfate Soils (PASS) disturbance, handling, treatment, or disposal.

1.3. Environmental Performance Targets

The following targets have been established for the management of ASS during Project construction:

- Minimising the disturbance of ASS where possible
- Manage ASS impacts attributable to the Project (i.e. treat exposed soils and waters)
- Minimise risk arising from the disturbance and excavation of land and disposal of soils, including disturbance to ASS.



2. Environmental Requirements

2.1. Guidelines and Standards

...

The guidelines and standards that relate to acid sulfate soil management include:

- Acid Sulfate Soils Assessment Guidelines (Acid Sulfate Soil Management Advisory Committee, 1998)
- Acid Sulfate Soils Assessment Guidelines (Department of Planning 2008)
- Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines Version 5 (Department of Resources and Department of Environment and Science, Queensland, 2023)
- Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998)
- Waste Classification Guidelines Part 4: Acid Sulfate Soils (EPA. 2014)
- National Acid Sulfate Soils Guidance National Acid Sulfate Soils Sampling and Identification Methods Manual (Department of Agriculture Water and the Environment 2022)
- National Acid Sulfate Soils Guidance National Acid Sulfate Soils Identification and Laboratory Methods Manual (Department of Agriculture Water and the Environment 2022).

2.2. Conditions of Approval and REMMs

Section 3.2 and Section 3.3 of the CSWMP to which this ASSMP is appended, details the relevant Conditions of Approval (CoA) and the measures listed in the EIS as amended by the Submissions Report (known as the Revised Environmental Management Measures (REMMs) relevant to ASS respectively. Specific requirements relevant to development of this ASSMP are addressed in Table 2-1 below.

Outcome Ref # Timing Commitment Document Reference This Plan Acid The Proponent must prepare a Construction Soil and C15(e) Prior to Sulfate Water Management Sub-Plan (CSWMSP), and the plan construction / Section 5 for Soils must address, but not be limited to the following: Construction handling, testing, (e) include an Acid Sulfate Soils Management Plan, if treating and reuse. required, including measures for the management, Section 6 for handling, treatment and disposal of acid sulfate soils. monitoring including monitoring of water quality at acid sulfate soils treatment areas: Acid SGC6 Conduct ASS testing within the Project area to confirm Additional Prior to Sulfate presence of ASS. If the ASSMAC Assessment Guidelines construction investigation was action criteria are triggered an Acid Sulphate Soil Soils completed during Management Plan (ASSMP) will be prepared as part of January 2023 by the CEMP in accordance with the Acid Sulphate Soil GHD. Laboratory Methods and Manual (ASSMAC, 1998). Relevant Include the following as a minimum: information is presented in Section - Method for spoil material testing to confirm presence of ASS during construction and prior to excavation in an area 5. - Conduct laboratory testing to calculate and verify treatment of ASS spoil material if it is to be treated on-site - Locate ASS treatment area within the Project area, which is already disturbed and is outside of flood liable land - Measures to manage any stockpiles of ASS materials, including bunding and cover to minimise leachate - Supervision and certification of treatment prior to removal from treatment areas for re-use.

Table 2-1: Environmental Management Measures driving requirement for this ASSMP



3. Acid Sulfate Soil Background Information

.

The EIS provided reference to the Acid Sulphate Soil (ASS) Risk Map for Swansea (Department of Land and Water Conservation, 1997) and desktop review indicated that the southwestern portion of the Project area is located in an area with a high probability of occurrence of ASS. The northeastern portion of the Project area is mapped as having a low probability of occurrence of ASS.



Figure 3-1 Acid Sulfate Soil mapping within proximity to the site

Shown in the figure above, the following colours are defined as:

- Red HWs1 a high probability of occurrence of acid sulfate soils within 1 m of the ground surface;
- Red HWs2 a high probability of occurrence of acid sulfate soils between 1 and 3 m below the ground surface;
- Orange LWa4 a low probability of occurrence of acid sulfate soils greater than 3 m below the ground surface; and
- Yellow B beach deposits, no known occurrence of acid sulfate soils.

Two additional ASS assessments were completed during 2023:

- Douglas Partners ASS Assessment.
 - The purpose of this assessment was to determine the potential for ASS risk for the project, specifically considering the construction of the shaft and revised pipeline alignment as utilised for the Modification Report. The results of the report indicate that ASS is not likely to be encountered for the shaft and pipeline alignment to the depth of construction proposed.
 - PASS was detected in samples collected at depths between 1.25 2.0 mbgl that were tested for CRS within areas mapped as low and high probability risk of ASS occurrence. Field pH test results show PASS may extend above and below these depths. DP (2023) also detected PASS at 26.5 28.28 mbgl in the onshore bore BH601, with PASS likely extending beyond this depth interval. If these soils were to be disturbed either through excavation or dewatering works development of an ASS Management Plan (ASSMP) would be required (refer to Appendix D).



GHD ASS Assessment

•••

- This additional assessment was undertaken to provide data of potential ASS across the project site to gain additional data prior to construction to meet CoA D33.
- The assessment found that PASS was detected in samples collected at depths between 1.25 and 2.0 mbgl in areas mapped as low and high probability of ASS risk occurrence. If these soils were to be disturbed either through excavation or dewatering works development of an ASSMP would be required (this Plan).

Test pit and sampling locations associated with the assessment undertaken by GHD are shown on Figure 4-2.



10



Figure 4-2 Acid Sulfate Soil risk mapping and sampling location

ACID SULFATE SOILS MANAGEMENT PLAN | CS1135-WT-BEL-EN-PLN-0018 | REV: 1 | 12/11/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

•.

0

11

4. Acid Sulfate Soil Identification

4.1. ASS Identification Procedure

•••

The procedure for the identification of ASS as outlined in section 3 is provided in Figure 4-1.



Figure 4-1 Process for identifying ASS

4.2. Physical Features of ASS

The physical features that could be observed during the visual monitoring and odour detection can be found in Table 4-1 for both undisturbed and disturbed ASS.

Feature	PASS	ASS
Saturation	Always moist to wet, usually entirely saturated and difficult to walk on	Usually dry with a strong blocky structure
Colour	Steely blue-grey, range from pale to dark shades, can sometimes be brown to dark brown	Dark to pale brown or grey
Smell	May have a strong smell of rotten eggs due to hydrogen sulfide (H_2S) gases	May have a strong smell of rotten eggs due to hydrogen sulfide (H ₂ S) gases
Contains	Remnants of plants and grasses may be present	Yellow and orange mottling. Yellow colour is the mineral jarosite, and the orange colour is other iron oxide minerals

Table 4-1: Physical features of PASS and ASS

4.3. Chemical Features of ASS

Through a physical inspection ASS is suspected, chemical tests of the soil pH are key in identifying the present of ASS. The two main pH tests used is the field pH test and the field oxidised pH test. Field pH tests are presence and absence tests only and cannot be used to estimate how much pyrite is in the soil. Laboratory analysis will be required to identify the amount of pyrite in the soils.

4.3.1. Field pH Test

....

The field pH test (pHF) comprises of the following:

- Preparation of a 1 volumetric part soil: 5 volumetric parts distilled water solution in a glass or plastic vial
- Allow approximately 10 minutes for solution to equilibrate
- Measure pH using a pH meter that has been calibrated as per the manufacturer's instructions.

When interpreting pHF results, the results in Table 4-2 are a general guide.

Table 4-2: Field	pHF Values
------------------	------------

pHF value	Description	Possible ASS or PASS
<4	Oxidised acid sulfate soils and is Extremely acidic. Jarosite may be present	ASS
4 – 4.5	Extremely acidic which is likely due to pyrite oxidation. Can also be due to the soil being highly organic or from prolonged fertiliser use	ASS
4.5 – 6	Very acidic soil but not conclusive that low pH is due to pyrite oxidation	PASS or ASS
6 – 7	No actual acidity	PASS
~ 8	Marine influenced samples	PASS

4.3.2. Field oxidisation pH Test

The field oxidisation pH test (pHfox) test comprises of the following:

- Preparation of a 1 volumetric part soil: 5 volumetric parts 30% hydrogen peroxide (H₂O₂) solution in a glass or plastic vial:
 - The H₂O₂ solution will be pre-prepared using laboratory grade H₂O₂ solution and adjusted to pH 5.5 with sodium hydroxide prior to use
 - Refer to associated Safety Data Sheets (SDS) in terms of safe handling and personal protective equipment to be worn
- Allow approximately 10 minutes for the solution to react
- Measure pH using a pH meter that has been calibrated as per the manufacturer's instructions

This test is based upon the premise that the pHfox value is a result of the oxidation of sulfides by H_2O_2 within the plastic or glass vial.

When interpreting the pHfox results, the results in Table 4-3 are a general guide.

pHFOX value	Description	Possible ASS or PASS
<3	Oxidised acid sulfate soils and is Extremely acidic	ASS
3 – 4	Acidic, laboratory analysis will be required to confirm presence of sulfides	ASS
4 – 5	Possible small amounts of sulfides present or the sample might be poorly reactive or fine carbonates are present. Laboratory analysis will be required to confirm presence of sulfides.	PASS
>5	With a minimal difference to pH_{fox} , this is unlikely to be acid sulfate soils unless fine carbonates are present in the sample.	PASS unlikely

ACID SULFATE SOILS MANAGEMENT PLAN | CS1135-WT-BEL-EN-PLN-0018 | REV: 1 | 12/11/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE

5. Environmental Control Measures

...

5.1. Acid Sulfate Soil Management (non-technical)

Measures and requirements to meet the objectives of this ASSMP for non-technical personnel are outlined in Table 5-1.

Table 5-1. Acid	Sulfate	Soil Management and Mitigation Measures
TADIE J-T. ACIU	Sunale	Son management and miligation measures

ID	Measure/requirement	When to implement	Responsibility	Reference	Evidence
SSWMP43	An Acid Sulfate Soils Management Plan will be implemented throughout the works to handle, treat, manage, and dispose of any potential ASS that may be encountered during works.	Pre- construction/ During construction	Environment Manager	REMM SC03	This Plan
SSWMP44	Acid sulfate soils control measures will be included in relevant ECMs, and relevant construction Task Risk Assessments (where required)	Pre- construction/ During construction	Environment Manager Foreperson	Best practice	EWMS ECMs AMS / TRAs
SSWMP45	Training will be provided to all project personnel, including relevant subcontractors on acid sulfate soils management practices and the requirements of this Plan through inductions, toolbox talks, and targeted training as required.	Pre- construction/ During construction	Environment Manager Health and Safety Manager Foreperson	REMM	Induction records Toolbox talk records

5.2. Acid Sulfate Soils Management (technical)

Where ASS is encountered, they will be effectively managed in accordance with the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998) and with reference to the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines Version 5 (2023). The manual includes procedures for the investigation, handling, treatment, and management of such soils.

Measures and requirements to meet the objectives of this ASSMP for technical personnel are outlined in Table 5-2.

ID	Mitigation Measure	Responsibility
ASSMP01	When undertaking activities that pose a risk of exposing ASS material, visual observations shall be undertaken to assist in identification.	Foreperson Environment Manager (or delegate)
ASSMP02	Suitable areas will be identified to allow for contingency management of ASS. The ASS treatment area will include bunds and a limed base. Any runoff from the treatment area will be captured and diverted to a lined/impermeable basin for monitoring and treatment to neutralise acidic water runoff. The optimum location for the treatment area will avoid low-lying areas which may be susceptible to flooding, and away from surface water bodies. Interim measures may be accepted for treatment of minor quantities of ASS or where temporary stockpiling provisions are required, at the discretion of the Environmental Manager.	Foreperson Environment Manager (or delegate)
ASSMP03	If ASS is to be disturbed during construction, neutralisation of material using pure fine agricultural lime shall be undertaken based on the source of the material. For every day that the in-situ excavated surface is in an exposed state, the excavation shall be monitored by the Environmental Manager. ASS and PASS are to be placed in a prepared treatment area with the soil spread in layers up to 300 mm thickness. This is followed by application of lime at an appropriate	Foreperson Environment Manager (or delegate)

13

ID	Mitigation Measure	Responsibility
	rate and mixed with the soil via discing, excavator mixing or rotary hoeing. The rate of lime application will be calculated in accordance with the liming rate calculations as identified within the Acid Sulfate Soil Manual (Acid Sulfate Soil Management Advisory Committee, 1998)	
	PASS may be treated in-situ based on liming rates developed from in-situ testing.	
ASSMP04	Documentation pertaining to the management of ASS inc. treatment methods and validation for onsite reuse or disposal, disposal records, waste classification must be kept.	Foreperson Environment Manager (or delegate)
ASSMP05	For untreated material remaining in-situ, an application of lime can be applied by lightly covering the top surface of the soil following excavation, with the intention of creating a barrier of neutralised soil to prevent significant acid generation. Alternately, where surfaces are exposed for <24hours a soil binder can be applied to the surface to prevent oxidation.	Foreperson Environment Manager (or delegate)
ASSMP06	 PASS may be disposed offsite to a licensed waste receiving facility in water below the permanent water table, provided: This occurs before the soil has oxidised, i.e. within 24 hours of excavation. The materials meet the definition of Virgin Excavated Natural Material (VENM) under the POEO Act, even though they contain sulfidic ores or soils. The disposal facility must be a landfill licensed by the EPA to dispose of potential ASS at least 2 metres below the lowest known historical depth of the water table at the receiving site. Confirmation on requirements for untreated PASS disposal should be made with the receiving facility. It is noted that where soil is identified as ASS and cannot be classified as VENM or where a suitably licenced underwater disposal facility cannot be found, the soil must be treated as documented within this Plan. After treatment the soil can be assessed against the Waste Classification Guidelines Part 1: Classifying waste (NSW EPA 2014) and disposed of to a landfill that can lawfully accept the determined classification of waste provided by the nominated environmental consultant. 	Foreperson Environment Manager (or delegate)
ASSMP07	 Treated/neutralised ASS may be incorporated into the works and emplaced at depth, except in the following locations: Verge or drainage layers. Rip rap or rock linings in drains. Within the upper zone of formation, the top 400 mm of general fill or within the top 0.5 m of a drainage layer. 	Foreperson Environment Manager (or delegate)

5.3. Treatment at the Acid Sulfate Treatment pad

The pad is to be designed to ensure that it is impervious to acid leachate with a leachate /runoff collection system capable of containing all leachate runoff. The treatment area should be graded such that surface water can be collected at a low point and treated as required. Sufficient ASS treatment pad area will be provided onsite, sizing to be increased as required based on ASS testing outcomes during construction. Based on current design development allows for 300-350 m2. This will be further developed and updated sizing if required

The location will be located at least 50m away from any stormwater pits or surface stormwater drains and on land with sufficient grade to ensure leachate is directed towards a sump. Specific details including the location of controls, storage of lime and neutralised Acid sulfate soils will be included in the Earthworks AMS and in the relevant ERSED plans for the stockpile and ancillary areas.

A layer of compacted non-ASS clayey material or impervious plastic placed on the surface of the treatment will reduce the infiltration of leachate to the soil and groundwater. In accordance with the ASSMAC guidelines 1998, if an impervious pad has not been established then as a precautionary measure a guard layer of lime should be applied. This 'guard layer' will be an application of lime at 5 kilograms aglime per m2 per vertical metre of fill.



Stormwater runoff and leachates will be contained within the treatment pad by a perimeter bund; this bund will direct runoff to a collection sump. Both the bund and the sump should be constructed to withstand a 1:5 ARI storm event. The diversion bund and containment sump wall will not be constructed from ASS or PASS. The internal walls of the bunds and the sump (including base) will be maintained with a surface cover of lime to assist with neutralisation of any acidic stormwater. The sump will be constructed in the lowest corner of the treatment pad and will consist of a shallow excavation (<1m), the excavation will be lined with builders plastic or clayey soil as per the pad base described above.



Figure 5-1 Cross-section of typical treatment pad

0

The ASS Treatment Pad is shown on the concept erosion and sediment control figure, attached to the Erosion and Sediment Control Strategy included as part of the Construction Soil and Water Management Sub-Plan (CSWMP). The proposed approximate sequencing for the use of this area is as follows:

- Stage 1: Acid Sulfate Soils (ASS) Management Pad March to June 2025
- Stage 2: Overflow car park, only during peak workforce approximately August 2025 onwards.
- Stage 3: Final Operational Stormwater basin, to be constructed and landscaped in approximately mid 2026 depending on construction staging and progress towards completion

The abovementioned timeframes are approximate only. Exact extents and configuration may vary based on concept design areas shown in the Erosion and Sediment Concept Figure.

5.4. Liming Procedure

- 1. Excavate ASS from site and immediately load and haul to the ASS treatment pad.
- 2. Lime the base of the treatment pad as per Section 5.3;
- 3. spread excavated ASS onto the pad in layer(s) approximately 300 mm thick.
- 4. The ASS must be sufficiently dry before neutralising is commenced so that the lime can be mixed through the soil. Where moisture levels in soil are high, the soil must be dried by spreading and leaving open to the atmosphere.
- 5. Apply lime at a rate as recommended by Lab advice (5kg/m3 could be used as a guide in the interim while waiting on lab results). Windy conditions or where the lime dust is visibly leaving the work area should be avoided for safety and efficiency.
- 6. The lime and ASS should be thoroughly mixed and aerated using, for example, an agricultural lime spreader and excavator. The soil should be treated in layers up to 300 mm thick to encourage aeration.
- 7. Once the batch has been thoroughly mixed with the excavator it is to be tested by laboratory analysis to validate neutralisation as detailed below.

5.5. Lime handling and storage

Ensure an adequate supply of agricultural grade lime is available at short notice for use on site as needed for treatment of ASS. All lime stored on site is to be stored and handled in accordance with the material data sheet (MDS). A copy of the MDS is to be maintained on site at all times. Aglime will be covered with tarpaulin and stored in 'dry areas' to prevent runoff leaching into the surrounding area and to minimise dust.

15

5.6. Post lime soil treatment testing

`•

All excavated ASS or PASS will be stockpiled in the treatment area until it has been neutralised with lime and SPOCAS verification testing confirms effective neutralisation. The validation process will be confirmed by an external specialist consultant. reducible chromium suite or SPOCAS tests will be carried out by a NATA accredited laboratory to assess the adequacy of treatment. The neutralising capacity available in the treated soil should be sufficient to neutralise any existing and potential acidity.

5.7. Final use of treated ASS / PASS

Upon verification of treatment, the neutralised ASS could be re-used on-site for construction (subject to Geotechnical and environmental suitability) or disposed off-site to a suitably licensed waste management facility (additional waste classification analysis / testing may be required). As a precautionary measure when incorporated into general fill it should be buried at least 0.4m from the finished surface level.

The final destination of the neutral soil will be tracked and recorded using a treated ASS Tracking Register. The register will provide details of excavation location, date and volume (m3) as well as liming rate (kg/m3), treatment location, date, SPOCAS verification results post treatment and reinstatement location.

5.8. Decommissioning of Acid Sulfate Treatment pad and sump

As part of the rehabilitation of the Acid Sulfate Treatment area the pad and sump will be tested to the depth of the capping layer prior to topsoiling and revegetation. No further testing will be carried out on samples assessed not to be acid sulfate based on ASSMAC Guidelines. The lime dosing rate will be determined by undertaking SPOCAS testing using a NATA accredited laboratory. Given the amount of lime used at the treatment area it is unlikely that the soil in the sump or treatment pad will be acid generating.

5.9. Treatment of leachate

Acid Sulfate soil leachate captured at the Acid Sulfate Soil treatment area will need to be assessed for water quality treated prior to surface discharge. When the pH of the leachate pond falls below 6.5 the water must be treated prior to discharge using hydrated lime and gypsum. Discharge from leachate capture ponds shall be in accordance with the Dewatering Permit (refer to CGMP).

5.10. Monitoring during Dewatering Activities

During dewatering activities for the onshore shaft, there is a limited chance of ASS forming as a result of drawdown from dewatering. During dewatering, JH will monitor the groundwater to check for changes in pH. If the monitoring does show that acidification is occurring, then dewatering may be ceased and the water monitored to see if pH rebounds to within the normal range. If dewatering can't be ceased, and/or monitoring shows continued evidence of acidification, then treatment can be carried out by pumping lime into the groundwater via wells at a rate per specialist advice.



6. Compliance Management

•••

6.1. Monitoring and Inspections

Consistent monitoring of the site is vital to the early detection of ASS and subsequently decreasing the chances of impact to the surrounding environment. Regular monitoring of areas where ASS is expected will be undertaken to identify the physical signs of sulfide oxidation.

Monitoring, inspections, and reporting requirements are outlined in Table 6-1. Additional requirements and responsibilities relating more broadly to monitoring and inspections are documented in the CSWMP and CEMP.

Table 6-1: Monitoring, Inspection and Reporting Requirement Measures

Туре	Frequency	Standards	Reporting	Responsibility
Inspections				
Site inspection	Weekly	ASSMP Environmental Control Measures Visual/olfactory cues of ASS ASS Identification Procedures	Weekly environmental inspection	Environment Manager (or delegate) Foreperson
Monitoring				
Monitoring of disturbed soils	Daily	Visual until backfilled	Daily Diary	Foreperson
Excavations that are ASS	Daily	Visual	Daily Diary	Foreperson
Monitoring of ASS treatment area	Daily	Visual Weekly and after each rain, field pH testing of leachate and surface water until results show ASS have been neutralised	Daily Diary	Foreperson Environment Manager (or delegate)

6.2. ASS record keeping

A record of treatment of acid generating material will also be kept at the site and will include the following details (where applicable):

- Total final volumes and dimension of disturbed ASS
- · Location of any offsite treatment and/or disposal of ASS and evidence of treatment off site
- Summary of ASS test results for material treated either on or off site
- Location and maps of areas used for burial of potential ASS, depth below finished surface (if applicable)
- Full results of monitoring

6.3. Non-compliance and Non-conformance Management

An environmental non-compliance is defined as one or more of the following:

- An occurrence, set of circumstances or development that is a breach of the Project Approval
- For auditing purposes, the independent auditor has determined that one or more specific elements of the conditions or requirements have not been complied with within the scope of the audit (Independent Audit Post Approval Requirements [DPHI, 2020])
- Failure to implement for the duration of construction the CEMP and CEMP sub-plans (Condition of Approval D8).

Where environmental non-compliances are identified, they will be communicated to the HWC Project Environment Team. HWC will report in accordance with CoA A28 – A30 and via Appendix 1 of the CoA (written notification requirements) where required. This will then be recorded in the Project database. An environmental action list



will be developed and issued to the relevant Project team personnel for implementation and close out. Actions will be assigned an implementation priority in a collaborative way by the Project Environment Team based on the environmental risk. Timeframes will be set to ensure any damage incurred is rectified and any chance of recurrence is eliminated as soon as practicable. Following corrective action, the Project Environment Team will close out the non-compliance.

HWC will notify the Secretary of any non-compliance as follows:

- Notification of a non-compliance will take place via the Major Projects Website within seven days of the Project being made aware of the non-compliance
- The notification will identify the SSI (including the application number) and the name of the SSI, set out the condition/s that is non-compliant, the nature of the breach; the reason for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.

A non-compliance that has already been notified as an incident does not need to also be notified as a noncompliance. The ER will also include environmental non-compliances within the Environmental Representative Monthly Report.

Where a non-compliance/non-conformance is detected or monitoring indicates risks directly attributable to the Project (i.e. are influenced by factors under the direct control of the Project, e.g. contaminated water discharge, odour, etc.), the process will typically include:

- An analysis of the results by the Project Environment Manager or delegate in more detail, with the aim of determining possible causes
- A site inspection by the Project Environment Manager or delegate
- Advising relevant personnel of the problem
- Identifying and agreeing on actions to resolve or mitigate the risk
- Implementing actions to rectify or mitigate the risk.
- Monitor and review effectiveness of actions and/or additional measures.

A Non-compliance/Non-conformance Report may be issued by the Project Environment Manager if it is found to be related to construction. The nature of the non-compliance/non-conformance will also be assessed against the criteria detailed in the Environmental Incident requirements in the CEMP.

The timing for any improvement will be agreed between the Foreperson and Project Environment Manager based on the level of risk (e.g. a significant risk will require immediate action).



Appendix E – Unexpected Contamination Procedure

·•••

Refer to CS1135-WT-BEL-EN-PRO-0004 – Unexpected Contamination Procedure



CONSTRUCTION SOIL AND WATER MANAGEMENT SUB-PLAN | CS1135-WT-BEL-EN-PLN-0021 | REV: 2 | 31/10/2024 WHEN PRINTED THIS DOCUMENT IS AN UNCONTROLLED VERSION | COMMERCIAL-IN-CONFIDENCE



Belmont Desalination Plant

Unexpected Contamination Procedure

Document Number: CS1135-WT-BEL-EN-PRO-0004 Revision Number: 0 Issue Date: 09/09/2024



Revisions and Distribution

Revisions

•••

Draft issues of this document are identified as Revision A, B, C, etc. Upon initial issue (generally Contract Award) this will be changed to a sequential number commencing at Revision 0. Revision numbers will continue at Revision 1, 2, etc.

Rev	Date	Prepared By [Name]	[Signature]	Reviewed By [Name]	[Signature]	Approved By	[Signature]	Remarks
А	06/05/2024	S. Grunsell	SG	A. Grant	AG	J. Nisbet	JN	Submission for HW / ER review
В	12/08/2024	A. Grant	AG	S. Vincent	SV	S. MacNish	SM	Update post modification
0	09/09/2024	A. Grant	AG	J. Nisbet	JN	S. MacNish	SM	Approved for Submission

Distribution List

Client's Representative	S Farrar
Project Director	S MacNish
Project Site Manager	J Nisbet
Environment Manager	A Grant
Environmental Representative	D Bone

The controlled master version of this document is available for distribution as appropriate and maintained on the document management system being used on the Project, available to all Project workers. All circulated hard copies of this document are deemed to be uncontrolled.



Table of Contents

•.

0

Revisions and Distribution	2
Table of Contents	3
Terms and Abbreviations	4
1. Purpose and Objectives	5
1.1. Purpose	5
1.2. Objectives	5
2. Environmental Requirements	6
2.1. Conditions of Approval and REMMs	6
2.2. Induction and Training	6
2.3. Roles and Responsibilities	7
3. Procedure	8
4. Additional measures for unexpected asbestos	10
4.1. Source removal and offsite disposal	10
4.2. Removal of asbestos / asbestos containing material	
5. Records	11
Appendix A Toolbox example	

Tables

Table 2-1: CoAs and REMMs driving requirement for this Unexpected Contamination Procedure	6
Table 4-1 Asbestos Measures	10
Table 4-2 Licence types	10



Terms and Abbreviations

•.

0

Term/Abbreviation	Definition/Expanded text
ACM	Asbestos Containing Material
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
ANZG	Australian and New Zealand Guidelines
ASS	Acid Sulfate Soil
ASSMAC	Acid Sulfate Soil Management Advisory Committee
ASSMP	Acid Sulfate Soils Management Plan
ВоМ	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
CLM Act	Contaminated Land Management Act 1997
CLMP	Contaminated Land Management Plan
СоА	Conditions of Approval
CSWMP	Construction Soils and Surface Water Management Plan
DPI	Department of Primary Industries
DPHI	Department of Planning, Housing and Infrastructure
DPIE	Former Department of Planning, Industry and Environment
ECM	Environmental Control Map
EIS	Environmental Impact Statement
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
EPL	Environment Protection Licence
HWC	Hunter Water Corporation
PASS	Potential Acid Sulfate Soil
PESCP	Progressive Erosion and Sediment Control Plan
PFAS	Per- and polyfluoroalkyl substances
POEO Act	Protection of the Environment Operations Act 1997
RAP	Remediation Action Plan
REMM	Revised Environment Management Measures
SSI	State Significant Infrastructure
TARP	Trigger Action Response Plan
TSS	Total suspended solids
UXO	Unexploded Ordnance
WMP	Waste Management Sub-Plan
	Virgin Excavated Natural Material

1. Purpose and Objectives

1.1. Purpose

.

This Unexpected Contamination Procedure (the Procedure) forms part of the Construction Soil and Water Management Plan details the actions to be taken when potential contaminated soil and/or material is encountered during Work. In the event that contaminated materials are discovered, this Procedure will be implemented.

It is noted that this Procedure does not apply to Acid Sulfate Soils, which will be managed under an Acid Sulfate Soils Management Plan.

Unexpected contamination is considered any elevated level of a contaminant, not previously identified within a Contamination Report (including Preliminary Site Investigation Reports and Detailed Site Investigation Reports), including asbestos containing material (ACM).

A Contaminated Lands consultant will be engaged for the undisturbed 'A' Horizons. The consultant will advise on procedures or processes for the management of contaminated material found during work (including unexpected finds) in these areas. A NSW EPA accredited contaminated land Site Auditor will be engaged, and will review/audit the consultants work and/or advice, and provide interim audit advice (or equivalent) on whether the consultants procedures/processes are appropriate.

Additionally, the procedure references the potential occurrence of unexploded ordinance (UXO), and measures to be taken by John Holland (JH) should this event occur. The potential for UXO within the Project area was assessed as part of the original Environmental Impact Statement (GHD, 2019) and further reviewed by JH specialist (SoteriaSolutions) during pre-construction planning. Determinations from these assessments indicated that there is a low likelihood of UXO presence within the footprint of the project as the Project site was not used for any known military practice or bomb range activities. UXO is included in this Procedure and will be referenced in the relevant site AMS as appropriate in accordance with the Revised Mitigation Measures (REMMs) (refer to Table 2-1).

This Procedure will be implemented for the duration of all Work.

1.2. Objectives

The key objective of this Unexpected Contamination Procedure is to provide a framework outlining appropriate environmental controls and procedures to be implemented during construction activities to minimise risks associated with the disturbance, handling, treatment, or disposal of unexpected contamination.



2. Environmental Requirements

•

2.1. Conditions of Approval and REMMs

Specific requirements relevant to development of this Unexpected Contamination Procedure are addressed in Table 2-1 below.

Table 2 /	1. 00 10	and DEM	a drivina	roguiromont	forthio	Ilpownootod	Contomination	Dragadura
12018 /-	I LOAS	and REIVIN	s anvino	requirement	IOT IT IS	Unexpecieo	Comannanon	PIOCEOUIE
10010 -			o anning	roganomori	101 0110	0110/1000000	0011001101011	1 10000000

Outcome	Ref #	Commitment	Timing	Document Reference
Unexpected Contamination Procedure	C23	Prior to the commencement of earthworks, the Proponent must prepare an unexpected contamination procedure to ensure that potentially contaminated material is appropriately managed. Where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing submitted to the Planning Secretary prior to its removal from the site.	Prior to construction / Construction	This Plan for record keeping.
Site Contamination	D33(d)	The recommendations of any Remedial Action Plan and the unexpected finds procedure must be updated following results of further site investigations and implemented throughout duration of project work.	Construction	This Plan
Exposure to Asbestos containing materials	SGC4	 Include an asbestos finds procedure in the overall CSMP. The asbestos finds procedure will be prepared by suitably qualified person or a competent person as determined under the Work Health and Safety Regulation (2017), and include: Guidance on the identification of asbestos containing materials (ACM) Steps to be undertaken if ACM is identified during works Management and remediation/removal procedures Required health and safety controls Waste disposal requirements Ongoing site management. 	Construction	Section 4 This procedure has been reviewed by Qualtest as part of their review of the overarching CSWMP
Unexpected discovery of contaminated soils	SGC11	Should unexpected contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA. Include contingency plans for unexpected finds protocols for contaminated soils in the CSMP.	Construction	This Plan Section 3
Unexploded Ordinance	SGC5	Management and safe guarding procedures for UXO waste to be included in construction safety documentation.	Construction	This Plan Section 3
Encounter contamination during construction	HH1	Should unexpected contaminated soils be identified during any ground works, seek advice from a suitably qualified environmental consultant and notify the Hunter Water Project Manager. Complete any additional investigations/abatement in general accordance with guidelines developed or endorsed by NSW EPA Include contingency plans for unexpected finds protocols for contaminated soils in the CSMP.	Construction	This Plan Section 3

2.2. Induction and Training

All site personnel (including sub-contractors) are to be inducted and/or toolboxed on the identification of potential contaminated soil/material, including asbestos identification, along with the requirements of this Procedure. An example toolbox is attached as Appendix A.

Site personnel should be informed of the potential sources of contamination within the Project and indications of contamination in soil and groundwater.



2.3. Roles and Responsibilities

The JH Project Environmental Manager (or delegate) will be notified in the event of an unexpected find on site during the works. The JH Project Environmental Manager will ensure that this Procedure is effectively implemented, and all site personnel are aware of the Procedure requirements.

The JH Project Environmental Manager will be responsible for ensuring that in the event that contaminated material is discovered, site personnel are informed immediately and all work in the vicinity of the find ceases. The Construction Supervisor will be advised of any required actions for the control of discovered contamination on site, such as implementation of exclusion zones and signage, and will be responsible for ensuring the actions are undertaken.

Contaminated land consultant (including Occupational Hygienist where required) will conduct assessments and investigations on potential contaminated material and provide advice and direction on the remediation works and validate once remediation works have been completed.

HWC will be informed by JH and will liaise with the relevant government agencies (such as NSW EPA). JH will consult with the Site Auditor where required. The Site Auditor will review relevant documentation e.g. Remediation Action Plan (RAP), if encountered in the A horizon within the undisturbed area of the site. This will include providing written evidence on the contamination risk and the appropriateness of the documentation and any proposed management measures as required.

All site personnel are responsible for reporting any unexpected contamination finds for the duration of the Project.



3. Procedure

This section outlines the tasks that will be carried out in the event that unexpected contaminated material is encountered during Work. Indicators of contamination in soils include:

- Discolouration of the soil, including staining and horizontal layers of discolouration
- Seepage of unusual liquids from soil or rock, or an oily sheen on water leaving soils (or on nearby surface water)
- Odours from soil or water
- Uncontrolled filling / anthropogenic material within fill
- Visible contamination including potential asbestos containing material (including intact services that may be constructed of asbestos, such as pipes)
- Unexpected underground storage tanks, drums, ordinance and other buried waste (noting that buried waste itself may not be considered contamination but could indicate poor contamination disposal practices previously undertaken on the site)

Step 1. Stop work, protect the area and inform HWC

- Cease work in the immediate/affected area
- The Project Manager or Site Supervisor will immediately notify the JH Project Environmental Manager and HWC. The Police to be notified if ordinance is suspected.
- JH Project Environmental Manager will inform the Site Auditor of the potential unexpected finds (if within the A horizon of undisturbed site soils).
- Delineate the area of potential contamination to prevent access by other workers and public, including maintaining a safe distance from the contaminated area. The JH Project Manager or Site Supervisor will be responsible for delineation of an exclusion zone around the affected area using fencing and/or appropriate barriers and signage. The location of the 'no go zone' and any other necessary controls, will be confirmed with the Contaminated Land Consultant and the UXO specialist (and Police as applicable) if triggered.
- When safe to access the area, install environmental controls around the site to contain the contaminated material, which may include diversion of water to minimise potential spread via surface water runoff and/or covering the area. If the unexpected find is asbestos refer to Section 4.0 for additional measures to be implemented. If there are other signs of contamination continue to Step 2. The Environment Manager will report the unexpected find to HWC.

If determined to be UXO, the Police will manage the site in consultation with JH and HWC – once the item is removed JH will review UXO assumptions, procedures and protocols and recommence work as per step 5 below.

Step 2. Contact and engage Contaminated Land Consultant and complete initial assessment and recording of the find

- JH Project Environmental Manager will engage a suitably qualified and experienced Contaminated Land Consultant to identify the potential contaminant in the unexpected find and its potential impact to human health or environment
- Site access will be arranged for the Contaminated Land Consultant to inspect the finding as soon as practical
- The following details will be recorded upon the unexpected finds:
 - Location of the potential contamination
 - Visual appearance
 - Odour (if any)
 - Depth
 - Surrounding materials and works being undertaken at the time of discovering the material
- Should the Contaminated Land Consultant provide advice after the site inspection and initial assessment that no contamination constraint exists, such advice should be provided in writing and confirmed by the Project

Manager or Site Supervisor. The Project Manager will seek written clearance to resume project work from HWC Project Manager

- If it is determined that there is a risk of material harm (POEO Act 1997) from the potential contamination, notification to HWC will occur immediately, in order for HWC to report to external agencies immediately in accordance with Project Approval requirements
- In the event that contamination investigation, management or remediation activities are required a SWMS will be developed.

Step 3. Site Investigation and recommendations for management

- If further site investigation is required, the Contaminated Land Consultant will assess the situation and advise of the approach to be taken (in consultation with the Site Auditor if in the A horizon of undisturbed soils). The Site Auditor would independently review advice from the Contaminated Land Consultant to confirm its appropriateness prior to implementation.
- The Contaminated Land Consultant will provide recommendations on the appropriate management measures to be implemented. This may include leaving contamination undisturbed, capping of contamination, treatment or off-site disposal. Material to be disposed of off-site will be transferred to an appropriately licensed waste facility
- Where asbestos only has been found the licensed asbestos removalist will prepare an Asbestos Removal Control Plan prior to the removal of any asbestos and asbestos containing material in accordance with Section 4.0. The Asbestos Removal Control Plan will be reviewed by the Site Auditor, if in the A horizon of undisturbed soils
- If there is a requirement to notify the NSW EPA in accordance with the Duty to Report provisions under the CLM Act 1997, HWC will undertake the notification.
- If remediation or management of the contamination is required, the RAP will be updated or an addendum to the RAP prepared.

Step 4. Implement management strategy

- Implement agreed management strategy
- Relevant SWMS will be reviewed and updated when required
- JH, or the contaminated land consultant or licensed asbestos assessor (as relevant) will provide appropriate validation to demonstrate remediation has been effective. This will likely include preparation of a validation report/letter for any remediation undertaken.
- The CEMP will be reviewed and will be updated as appropriate with any changes resulting from the find. The updated CEMP will incorporate additional conditions arising from any further approvals, such as Planning Approval Modifications, and consultation if relevant. If an update to the CEMP is required, approval will be sought from the ER and DPHI, in consultation with relevant government agencies, as appropriate.
- Any changes to the CEMP will be included in site induction material. Site workers will be updated during toolbox talks.

Step 5. Recommence works

- Obtain concurrence from the Site Auditor in the form of an Auditor's Interim Advice, that the UFP has been appropriately addressed if in the A horizon of undisturbed soils
- The HWC Project Manager will grant approval for JH to recommence works upon reviewing the documentation provided
- If required, HWC will notify landowners (e.g. such as service providers) where contamination is identified on their land.



4. Additional measures for unexpected asbestos

4.1. Source removal and offsite disposal

Investigation techniques which may be used to remove asbestos containing material in soil are presented in Table 4-1.

Table 4-1 Asbestos Measures

0

Removal Technique	Applicability and Limitations
Hand Picking	 suitable for bonded asbestos containing material in near surface only (ie.,10cm) raking may enhance removal, although only in sandy soils not applicable for friable asbestos less effective in areas of dense vegetation
Tilling	 mechanical tilling to turn over soil following hand picking suitable for bonded ACM in soils to approx. 30 cm in sandy soils not applicable for friable asbestos less effective in areas of dense vegetation, or clayey soils
Mechanical screening	 suitable for large volumes of soil impacted with bonded asbestos containing material susceptible to generate fibres requiring effective dust/fibre control not applicable for friable asbestos
Mechanical excavation	 physical excavation of soil containing asbestos containing material where impact extends beneath surface soils generates larger volume of soil that requires further management (i.e. off-site disposal, screening, spreading and handpicking/tilling)

The JH Project Environmental Manager (or delegate) will attend and monitor any asbestos / ACM removal works or remediation measures undertaken for treatment of asbestos / ACM on site. JH will provide appropriate validation to demonstrate removal of ACM using the above techniques has been successful.

4.2. Removal of asbestos / asbestos containing material

A licensed asbestos removalist will be required for removal works where there is friable asbestos, or the contaminated area is greater than 10 m². There are two types of asbestos removal licences: Class A and Class B. The type of licence required depends on the type and quantity of asbestos or asbestos containing material to be removed, as outlined in the Table 4-2.

Removal Technique	Applicability and Limitations			
Class A	Can remove any amount or quantity or quality of asbestos or asbestos			
	containing material, including:			
	 any amount of friable asbestos or asbestos containing material 			
	any amount of asbestos-contaminated dust or debris			
	any amount of non-friable asbestos or asbestos containing material			
Class B	Can remove:			
	any amount of non-friable asbestos or asbestos containing material			
	Note: A Class B licence is required for removal of more than 10m ² of non- friable asbestos or asbestos containing material but the licence holder can also remove up to 10m ² of non-friable asbestos or asbestos containing material.			
	 asbestos-contaminated dust or debris associated with the removal of non- friable asbestos or asbestos containing material 			
	Note: A Class B licence is required for removal of asbestos contaminated dust or debris associated with the removal of than 10m ² of non-friable asbestos or asbestos containing-material, but the licence holder can also remove asbestos-contaminated dust or debris associated with the removal of up to 10m ² of non-friable asbestos or asbestos containing material.			

Table 4-2 Licence types
Removal Technique	Applicability and Limitations
No licence required	 Can remove: up to 10m² of non-friable asbestos or asbestos containing material asbestos-contaminated dust or debris that is:
	 associated with the removal of less than 10m² of non-friable asbestos or asbestos containing material
	 not associated with the removal of friable or non-friable asbestos and is only a minor contamination.

The licensed asbestos removalist will prepare an Asbestos Removal Control Plan prior to the removal of any asbestos and asbestos containing material. The Asbestos Removal Control Plan documents the specific control measures to be implemented to ensure site personnel and others are not at risk when asbestos removal work is being conducted. It includes how the asbestos removal will be carried out, including the method, tools, equipment and PPE to be used and the asbestos and asbestos containing material to be removed, including the location, type and condition of the asbestos and asbestos containing material.

The HWC Project Manager will be informed prior to excavation or removal of asbestos or asbestos containing material. If the removal activity is to occur in the vicinity of any occupied residence or business, JH's Community Liaison Officer will notify the affected resident/s or business owner/s.

5. Records

JH will maintain a register of any unexpected contamination finds, including a map of all contaminated and/or remediated sites. The register and disposal records will be made available to HWC and Site Auditor on request.

Where any material identified as contaminated is to be disposed off-site, the disposal location and results of testing will be provided to HWC for submission to the Planning Secretary prior to its removal from the site. A waste classification will be provided for the material to be disposed offsite, in accordance with the NSW EPA (2014) Waste Classification Guidelines.

The recommendations of any Remedial Action Plan and the unexpected contamination procedure must be updated following results of further site investigations and implemented throughout duration of project work.



Appendix A Toolbox example

J<u>o</u>hn Holland UNEXPECTED FINDS Behind the Dunny Door Series

Regulated /

Legally

A potential

crime scene

WHAT IS IT

An unexpected find is the discovery of any previously unidentified or otherwise unforeseen item during planning, such as contamination or archaeological finds (Aboriginal and non-Aboriginal), whilst completing activities.

WHY ARE THEY IMPORTANT





IF YOU BELIEVE YOU HAVE MADE AN UNEXPECTED FIND, PLEASE TELL YOUR SUPERVISOR/LEADING HAND IMMEDIATELY



Unidentified services or

markers

chips from making

Typically non-local stone





Unexpected infrastructure or tanks



ste (rubbish.







