



NGH

NEOEN

Soil and Water Management Plan

Culcairn Solar Farm

January 2024

Project Number: 23-166



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NSW • ACT • QLD • VIC
 ABN 31 124 444 622 ACN 124 444 622
 W. www.nghconsulting.com.au
 E. ngh@nghconsulting.com.au

BEGA - ACT & SOUTH EAST NSW

Suite 11, 89-91 Auckland Street
 (PO Box 470) Bega NSW 2550
 T. (02) 6492 8333

BRISBANE

T3, Level 7, 348 Edward Street
 Brisbane QLD 4000
 T. (07) 3129 7633

CANBERRA - NSW SE & ACT

Unit 8, 27 Yallourn Street
 (PO Box 62) Fyshwick ACT 2609
 T. (02) 6280 5053

GOLD COAST

2B 34 Tallebudgera Creek Road
 Burleigh Heads QLD 4220
 (PO Box 424 West Burleigh QLD 4219)
 T. (07) 3129 7633

MELBOURNE

Level 14, 10-16 Queen Street
 Melbourne VIC 3000

NEWCASTLE: HUNTER & NORTH COAST

Level 1, 31-33 Beaumont Street
 Hamilton NSW 2303
 T. (02) 4929 2301

SUNSHINE COAST

Suite 101, Level 2/30 Main Drive
 Birtinya QLD 4575
 T. 13 54 93

SYDNEY REGION

Unit 17, 21 Mary Street
 Surry Hills NSW 2010
 T. (02) 8202 8333

TOWNSVILLE

Level 4, 67-75 Denham Street
 Townsville QLD 4810
 T. (07) 4410 9000

WAGGA WAGGA: RIVERINA & WESTERN NSW

35 Kincaid Street (PO Box 5464)
 Wagga Wagga NSW 2650
 T. (02) 6971 9696

WODONGA

Unit 2, 83 Hume Street
 (PO Box 506) Wodonga VIC 3690
 T. (02) 6067 2533

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Acronyms and abbreviations

AC	Alternating current
AHD	Australian Height Datum
AQP	Appropriately qualified person
AWS	Automatic weather station
BESS	Battery Energy Storage System
BMP	Biodiversity Management Plan
BOM	Bureau of Meteorology
CEBSP	Community Engagement and Benefit Sharing Plan
CoA	Conditions of Approval
DC	Direct current
DPE	Department of Planning and Environment
DPIE	(Former) Department of Planning, Industry and Environment (NSW) (now DPE)
DPI	Department of Primary Industries
EIS	Environmental impact statement
EMS	Environmental Management Strategy
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPA	Environment Protection Authority
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statements
GHSC	Greater Hume Shire Council
GMP	Groundcover Management Plan
GWMA	Groundwater Management Area
IPC	Independent Planning Commission
ha	hectares
kL	Kilolitre

km	kilometres
LEP	Local Environment Plan
LGA	Local Government Area
m	metres
ML	Megalitre
MW	Megawatt
MDB	Murray-Darling Basin
NEM	National Electricity Market
NSW	New South Wales
OEH	(Former) Office of Environment and Heritage (NSW)
PMF	Probable Maximum Flood
POEO Act	<i>Protection of the Environment Operations Act 1997</i>
PV	Photovoltaic
PWMP	Pest and Weed Management Plan
RMP	Rehabilitation Management Plan
RUSLE	Revised Universal Soil Loss Equation
SCRP	Spill and Contamination Response Plan
SEA	Site Environmental Advisor
SSD	State Significant Development
SWMP	Soil and Water Management Plan
TMP	Traffic Management Plan
TSS	Total suspended solids

1. Introduction

1.1. Background

Neoen Australia Pty Ltd (Neoen) (the Proponent) have approval for the construction, operation and decommissioning of a 350 megawatt (MW) alternating current (AC) / 402.5 MW direct current (DC), photovoltaic (PV) solar farm, referred to as Culcairn Solar Farm (the Project). The Project is located on rural land, approximately 4 kilometres (km) southwest of Culcairn, New South Wales (NSW).

The Project was assessed in an Environmental Impact Statement (EIS) in accordance with Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and Schedule 2 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation). It is considered State Significant Development (SSD).

The Proponent received approval for the Project on 25 March 2021 from the Independent Planning Commission (IPC).

Modification Report 1 (SSD-10288 – Mod 1) was prepared and submitted to the Department of Planning and Environment (DPE) October 2023 and was determined on the 22 December 2023 with consolidated Conditions of consent issued. The modification to the Project was for minor alignment revisions and widening of the Project's Development Footprint along Weeamera Road and at two creek crossings. The modification was also for minor amendments to the definitions and wording of Schedule 3 Condition 2 – Transport.

1.2. The Project

The Project will involve the construction and operation of a ground-mounted PV solar tracking array generating approximately 350 MW AC / 402.5 MW DC of renewable energy. The power generated will be exported to the national electricity grid.

Key development and infrastructure components will include:

- Single axis tracker PV solar panels mounted on steel frames over most of the site (maximum tilt 4.2 metres in height)
- Underground and overground electrical conduits and cabling to connect the arrays to the inverters and transformers
- Systems of inverter units and voltage step-up throughout the arrays
- National Electricity Market (NEM) compliant metering arrangements for all energy exported to the grid as well as internal metering to measure battery and solar output
- On site substation, connecting to the existing 330 kilovolt (kV) TransGrid transmission line
- Site office and maintenance building, vehicle parking areas, material laydown area, internal access tracks and perimeter security fencing
- Site access track off Weeamera Road
- Road crossing and easement electrical crossing through underground and/or overhead lines, of Cummings Road and Schoffs Lane
- Vegetative screening at impacted visual receivers and at the intersection of public roads.

The approved Project layout is provided in Figure 1-1. Note, the approved Project layout includes a Battery Energy Storage System (BESS). The BESS is currently not proposed to be constructed and therefore not considered in this management plan.

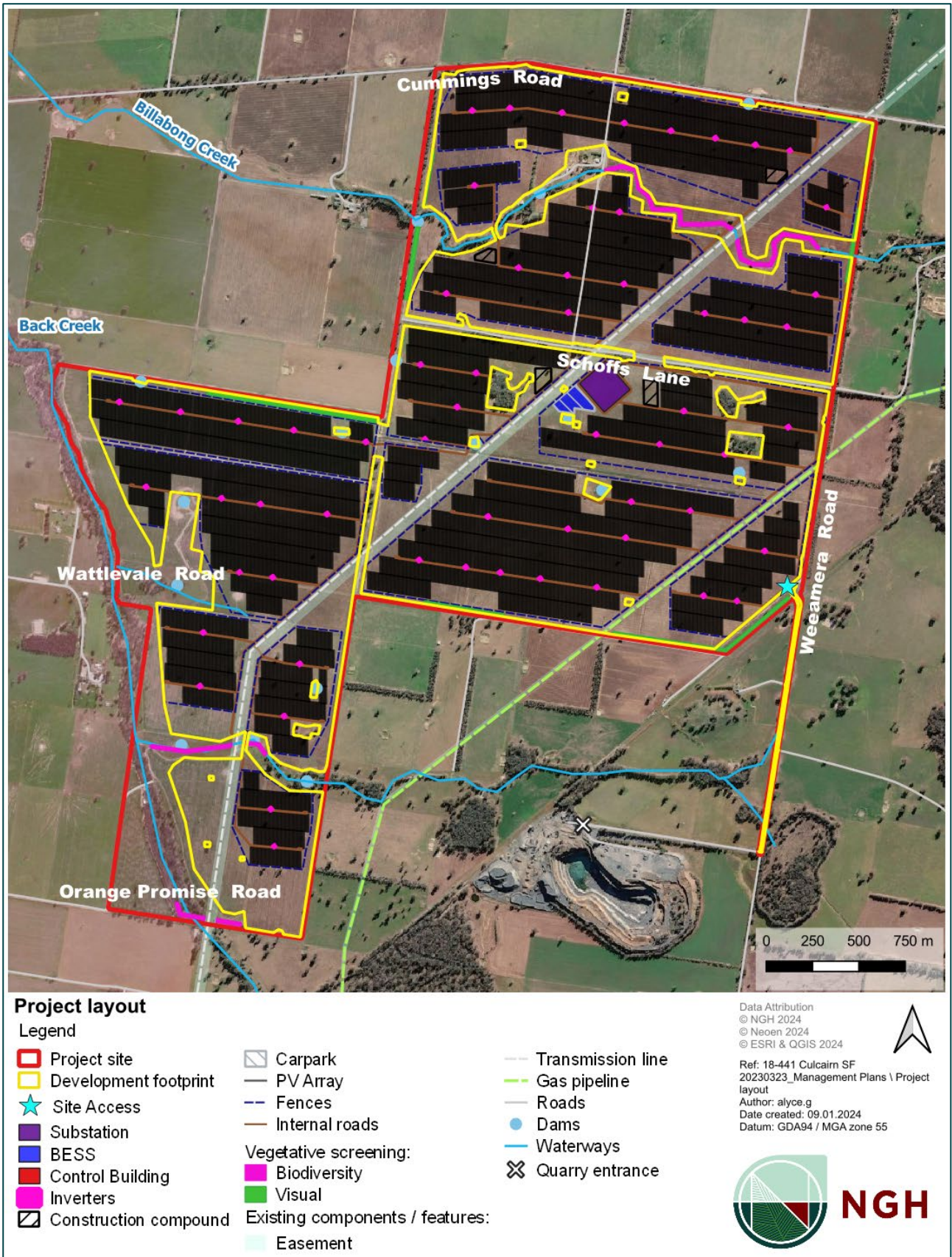


Figure 1-1 Approved Project layout

1.3. Environmental Management Strategy

The Soil and Water Management Plan (SWMP) is part of the Project's overall Environmental Management Strategy (EMS). Mitigation and management measures identified in this SWMP will be incorporated into site or activity-specific Environmental Work Method Statements (EWMS).

When used concurrently, the overarching EMS, SWMP and other subplans, procedures and EWMS form management guides that clearly identify the necessary environmental management actions for reference by Neoen's personnel and contractors.

The review and document control processes for this plan are described in the EMS.

2. Purpose and objectives

2.1. Purpose

The purpose of this SWMP is to describe the approach to the maintenance and management of soil and water quality that will be employed by Neoen and its subcontractors during construction of the Project.

2.2. Objectives

The key objective of the SWMP is to ensure all conditions, mitigation measures and licence/permit requirements relevant to soil and water management are described, scheduled, and assigned responsibility as outlined in:

- The Project EIS (NGH, 2020)
- The Project Submissions Report (NGH, 2020)
- The Project Amendment Report (NGH, 2020)
- Modification Report 1 (NGH, 2023)
- DPE Consolidated Development Consent (determined 22 December 2023).

The Project will be carried out generally in accordance with the EIS and the Conditions of Approval (CoA), if there is any inconsistency between the documents the conditions of the consent will prevail.

3. Planning

3.1. Relevant legislation and guidelines

3.1.1. Legislation

Legislation relevant to the development and implementation of the SWMP includes:

- *Contaminated Land Management Act 1997*
- *Environmentally Hazardous Chemicals Act 1985*
- *Environmental Planning and Assessment Act 1979*
- Environmental Planning and Assessment Regulation 2021
- *Protection of the Environment Operations Act 1997*
- Protection of the Environment Operations (General) Regulation 2009
- *Water Management Act 2000*
- *National Environment Protection Council Act 1994*
- *Dangerous Goods Act 1975 (NSW)*
- *Greater Hume Local Environmental Plan (2012)*

How this legislation is relevant to the SWMP and Project is outlined in Appendix B of the EMS.

3.1.2. Guidelines and standards

Guidelines and standards relevant to the development and implementation of the SWMP include:

- Managing Urban Stormwater: Soils and Construction (The Blue Book) Volumes 1 and 2 (Landcom, 2004)
- Best Practice Erosion and Sediment Control (The White Book) (IECA, 2008)
- Guidelines for Controlled Activities on Waterfront Land (DPE, 2022)
- Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, 2018)
- Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (NSW EPA, 2004)
- AS/NZS ISO 14001:2015 Environmental Management
- AS 1940:2017 – The storage and handling of flammable and combustible liquids.

3.1.3. Conditions of Approval

The Conditions of Approval (CoA) and mitigation measures relevant to the SWMP are listed in Table 2 1. A cross reference is also included to indicate where the requirement is addressed in this Plan or other Project management documents.

Table 3-1 Project conditions of approval and mitigation measures relevant to the SWMP

Reference	Condition requirement	Document reference
Conditions of Approval		
Schedule 3 CoA18	The Applicant must minimise the dust generated by the development	Section 7.5 Table 7-2 Erosion and Sediment Control Plan (ESCP, Appendix C)

Reference	Condition requirement	Document reference
Schedule 3 CoA24	The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply. <i>Note: Under the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.</i>	Section 7.6 Table 7-2
Schedule 3 CoA25	The Applicant must ensure that the development does not cause any water pollution, as defined under Section 120 of the POEO Act.	This Plan ESCP (Appendix C)
Schedule 3 CoA26	The Applicant must: <ul style="list-style-type: none"> (a) Minimise any soil erosion associated with the construction, upgrading or decommissioning of the development in accordance with the relevant requirements in the <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004) manual, or its latest version; (b) Ensure the solar panels and ancillary infrastructure (including security fencing) are designed, constructed and maintained to reduce impacts on surface water, localised flooding and groundwater at the site; (c) Ensure the solar panels and ancillary infrastructure are designed, constructed and maintained to avoid causing any erosion on site; and (d) Ensure all works are undertaken in accordance with the <i>Guidelines for Controlled Activities on Waterfront Land</i> (NRAR, 2018), or its latest version, unless DPIE Water agrees otherwise. 	Section 7.1, Table 7-2 and ESCP (Appendix C) Detailed design, Table 7-2 and ESCP (Appendix C)
Schedule 3 CoA29	The Applicant must store and handle all chemicals, fuels and oils used on-site in accordance with: <ul style="list-style-type: none"> (a) The requirements of all relevant Australian Standards; and (b) The NSW EPA's Storing and Handling of Liquids: Environmental Protection- Participants Handbook if the chemicals are liquids. <p>In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.</p>	Table 7-2
Mitigation measures		
VA4	During construction, dust would be controlled in response to visual cues. Areas of soil disturbed by the project would be rehabilitated progressively or immediately post-construction, reducing views of bare soil.	Section 7.5 Table 7 2 ESCP (Appendix C) Groundcover Management Plan (GMP, NGH, 2023c) Rehabilitation Management Plan (RMP, NGH, 2023f)

Reference	Condition requirement	Document reference
LU6	Construction and operations personnel would drive carefully and below the designated speed limit according to the Traffic Management Plan to minimise dust generation and disturbance to livestock.	Table 7-2 Traffic Management Plan (TMP, Amber, 2023)
WA1	All staff would be appropriately trained through toolbox talks for the minimisation and management of accidental spills.	Table 7-2 Section 8.2 Spill Response Procedure (Appendix B)
WA2	All fuels, chemicals, and liquids would be stored at least 50 m away from any waterways or drainage lines and would be stored in an impervious bunded area.	Table 7-2
WA3	Adequate incident management procedures would be incorporated into the Construction and Operation Environmental Management Plans, including requirement to notify EPA for incidents that cause material harm to the environment (refer s147-153 Protection of the Environment Operations Act).	Appendix B Table 7-2 Environmental Management Strategy (EMS, NGH, 2023b)
WA4	The refuelling of plant and maintenance of machinery would be undertaken in impervious bunded areas.	Table 7-2
WA5	Machinery would be checked daily to ensure there is no oil, fuel or other liquids leaking from the machinery. All staff would be appropriately trained through toolbox talks for the minimisation and management of accidental spills.	Table 7-2
WA6	Erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with Managing Urban Stormwater: Soils & Construction (Landcom 2004).	Section 7.1 Table 7-2 ESCP (Appendix C)
WA7	Ensure appropriate drainage controls are incorporated into the design, to mitigate any impact to watercourses (such as flow diversions from project infrastructure).	Table 7-2 ESCP (Appendix C)
WA8	A Hydraulic Model is required during the detailed design phase. The model must comprise an enveloping technique that considers both regional and local catchment sources of flooding. Once remodelling is complete and new design flood and hazard mapping is produced, infrastructure will be designed and located to be compatible with the flood risks and minimise adverse impacts to surrounding properties.	Table 7-2
WA9	There will be no adverse impacts on the John Holland Rail (JHR) rail corridor by way of its discharge from the site into the rail corridor. If so, the Proponent must provide JHR with written evidence permitting the discharge into the rail corridor.	Table 7-2 ESCP (Appendix C)

Reference	Condition requirement	Document reference
WA10	<p>The proponent must obtain relevant approvals and licences under the <i>Water Management Act 2000</i> before commencing any works which:</p> <ul style="list-style-type: none"> • Exceed 62 ML per annum for construction • Obtain water from a difference source than approved in the EIS • Intercept or extract groundwater or surface water (including from on-site dams where necessary) <p>For any works which have the potential to alter the flow of floodwaters or surface water flow.</p>	<p>Section 7.6</p> <p>Table 7-2</p>
BD1	<p>The following plans are to be prepared and approved by the relevant authorities:</p> <ul style="list-style-type: none"> • Biodiversity Management Plan • Construction and Operational Environmental Management Plan • Weed Management Plan • Erosion and Sediment Control Plan. <p>The plans should include but not be limited to the relevant commitments below.</p>	<p>Biodiversity Management Plan (BMP, NGH, 2023a)</p> <p>EMS (NGH, 2023b)</p> <p>Pest and Weed Management Plan (PWMP, NGH, 2023e)</p> <p>ESCP (Appendix C)</p>
BD8	<p>Adaptive dust monitoring programs to control air quality:</p> <ul style="list-style-type: none"> • Daily monitoring of dust generated by construction and operational activities. • Construction would cease if dust observed being blown from site until control measures were implemented. <p>All activities relating to the proposal would be undertaken with the objective of preventing visible dust emissions from the development site.</p>	<p>Section 7.5</p> <p>Table 7 2</p> <p>ESCP (Appendix C)</p>
BD13	<p>Sediment barriers and spill management procedures to control the quality of water runoff released from the site into the receiving environment:</p> <p>An erosion and sediment control plan would be prepared and implemented in conjunction with the final design. Spill management procedures would be implemented.</p>	<p>Table 7 2</p> <p>ESCP (Appendix C)</p> <p>Spill Response Procedure (Appendix B)</p>
AQ1	<p>Development of a complaints procedure to promptly identify and respond to issues generating complaints.</p>	<p>EMS (NGH, 2023b)</p> <p>Community Engagement and Benefit Sharing Plan (CEBSP, Neoen, 2023)</p> <p>Table 7-2</p>
AQ3	<p>During construction, operation and decommissioning, dust would be monitored and managed to prevent dust leaving the development site. This includes dust from stockpiled materials.</p>	<p>Section 7.5</p> <p>Table 7-2</p>
AQ4	<p>Monitor local weather conditions and manage the site if any conditions will exacerbate air quality (eg. wind).</p>	<p>Section 7.5</p> <p>Table 7-2</p>
AQ5	<p>Fires and material burning are prohibited on the development site.</p>	<p>Table 7-2</p>

Reference	Condition requirement	Document reference
SO1	<p>A Soil and Water Management Plan (SWMP) and Erosion and Sediment Control Plan (ESCP) would be prepared in consultation with DPIE Water, implemented and monitored during the construction and decommissioning of the proposal, in accordance with Landcom (2004), to minimise soil (and water) impacts. These plans would include provisions such as:</p> <ul style="list-style-type: none"> • At the commencement of the works, and progressively during construction, install the required erosion control and sediment capture measures. • Regularly inspect erosion and sediment controls, particularly following rainfall. • Maintain a register of inspection and maintenance of erosion control and sediment capture measures. • Ensure there are appropriate erosion and sediment control measures in place to prevent erosion and sedimentation occurring within the stormwater channel during concentrated flows. • Ensure that machinery arrives on site in a clean, washed condition, free of fluid leaks. • Ensure that machinery leaves the site in a clean condition to avoid tracking sediment onto public roads. • In all excavation activities, separate subsoils and topsoils and ensure that they are replaced in their natural configuration to assist revegetation. • During excavation activities, monitor for increases in salinity, reduce water inputs and remediate the site with salt tolerant vegetation. • Stockpile topsoil appropriately to minimise weed infestation, maintain soil organic matter, and maintain soil structure and microbial activity. • Manage works in consideration of heavy rainfall events. Areas of disturbed soil would be rehabilitated promptly and progressively during construction. 	<p>This document ESCP (Appendix C) Consultation is outlined in Section 4 and Appendix A</p>
SO5	<p>A Spill and Contamination Response Plan (SCRCP) would be developed and implemented during construction, operation and decommissioning to prevent contaminants affecting adjacent surrounding environments. It would include measures to:</p> <ul style="list-style-type: none"> • Manage the storage of any potential contaminants onsite. • Mitigate the effects of soil contamination by fuels or other chemicals (including emergency response and EPA notification procedures and remediation). <p>A protocol would be developed in relation to discovering buried contaminants within the development site (e.g. pesticide containers, if any). It would include stop work, remediation and disposal requirements.</p>	<p>Table 7-2 Spill Response Procedure (Appendix B)</p>
SO7	<p>Sodic soil should be treated with gypsum where required.</p>	<p>Table 7-2</p>
SO8	<p>Best Management Practices should be employed where applicable to reduce the risk of erosion and sedimentation control:</p> <ul style="list-style-type: none"> • Preserve and stabilise disturbed areas, drainageways and steep slopes. • Minimise the extent and duration of disturbance. 	<p>Section 7.1 Table 7-2 ESCP (Appendix C)</p>

Reference	Condition requirement	Document reference
	<ul style="list-style-type: none"> • Install perimeter controls. • Employ the use of sediment control measures to prevent off- and on-site damage. Inspect and maintain sediment and erosion control measures regularly. • Control stormwater flows onto, through and from the site in stable drainage structures. Protect inlets, storm drain outlets and culverts. • Provide access and general construction controls. 	
HA2	<p>Dangerous or hazardous materials would be transported, stored and handled in accordance with AS1940-2004: The storage and handling of flammable and combustible liquids, and the ADG Code where relevant. All potential pollutants kept on-site would be stored in accordance with relevant HAZMAT requirements and banded.</p>	Table 7-2

4. Consultation

In accordance with mitigation measure SO1, this SWMP was provided to DPE Water on 8 August 2023 for consultation. DPE Water provided a response back on the 14 August 2023 with two recommendations. These recommendations and how they have been addressed in this SWMP are outlined in Table 4-1. The letter from DPE Water is provided in Appendix A.

Table 4-1 DPE Water consultation results

DPE Water recommendation	Neoen's response
<p>Confirmation that Council has agreed to supply water for the project should be included in the Soil and Water Management Plan. This water source is critical to the project and appears yet to be confirmed. In accordance with Condition 24 of development consent SSD- 10288, the proponent must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.</p>	<p>Neoen has confirmation from Riverina Water that they will be able supply the Project's daily water requirements via the Henty water filling station. The email is provided in Appendix A.</p>
<p>Ensure all works on waterfront land are undertaken in accordance with the most recent and updated Guidelines for Controlled Activities on Waterfront Land (DPE, 2022). https://water.dpie.nsw.gov.au/licensing-and-trade/controlled-activity-approvals/guidelines</p>	<p>SWMP reviewed and updated to ensure the correct guidelines have been referenced. All works within waterfront land will be undertaken in accordance with the Guidelines for Controlled Activities on Waterfront Land (DPE, 2022).</p>

5. Existing environment

5.1. Topography and soil characteristics

The site is located at an approximate elevation of 200 m – 220 metres Australian Height Datum (AHD). Geology of the site is largely comprised of unconsolidated sedimentary rock of the Shepparton Formation. The Project site is characterised as having extremely low relief with shallow alluvial channels forming an alluvial plain. Two widely spaced shallow ephemeral drainages traverse the site, one is Back Creek and the other is unnamed. Both drainages run into the moderately deep and perennial Billabong Creek which borders the northern extent of the site.

Soils within the Project site are classified as Chromosols under the Australian Soil Classification system (Isbell, 1996). Topsoils within the Project site consist of moderately granular light brown silty loams and white silts. Subsoils consist of medium clays and sandy silty clays.

A soil analysis was prepared by McMahon Earth Science (2018) for the Project site, refer to Table 5-1.

Table 5-1 Analysis of soils within Project site

Description	pH	Salinity rating (EC)	Cation exchange capacity	Exchangeable Sodium Percentage (ESP)	Dispersion	Plant available phosphorus	Phosphorus buffering index	Calcium: magnesium ratio	Soil infiltration /water holding capacity
Topsoil	Moderately acidic 5.4 - 5.9	Very low	Very low to low 3.1 – 11.6 cmol (+)/kg	Non-sodic 1.7% - 4.7%	Low	Very high 41 to 170 mg/kg	Very low - low 33 to 110	1.9 to 5.9	Moderate - high 50 - 90mm/hr
Subsoil	Moderately acidic 4.6 to 6.4	Very low	-	-	Low	-	-	-	Very slow (<5 mm/hr), liable to waterlogging where there is limited topsoil horizon

5.2. Surface water

An unnamed 2nd order tributary of Billabong Creek transects the Project site south of Cummings Road, refer to Figure 5-1. Two unnamed / unclassified tributaries of Back Creek, a 2nd order watercourse, occur within the southern portion of the Project site. All drainages feed into Billabong Creek, which runs in an east – west direction, approximately 1.4 km north of the Project site. Billabong Creek feeds into the Murray River, located approximately 45 km south of the Project site.

Waterways traversing the site are identified as Class 4 under the Waterway Classification System (DPI, 2018). Class 4 waterways are described as:

- Unlikely fish habitat
- Having intermittent flow following rain events only
- Having little or no defined drainage channel, little or no flow or few standing water or pools after rainfall events.

Sixteen (16) farm dams occur within the Project site, refer to Figure 5-1. The Project design has been finalised with the retention of all dams, which will be utilised for watering stock.

5.3. Groundwater

The Project site is situated within an outcropped area of the Lachlan Fold Belt Murray-Darling Basin (MDB) Groundwater Source and falls under the Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources (DPI, 2012).

Groundwater occurs to a depth of approximately 100 m and includes three main productive aquifers within the alluvial formation. There are four (4) groundwater bores located within the Project site (refer to Figure 5-1), which falls within a designated Groundwater Management Area (GWMA) of NSW.

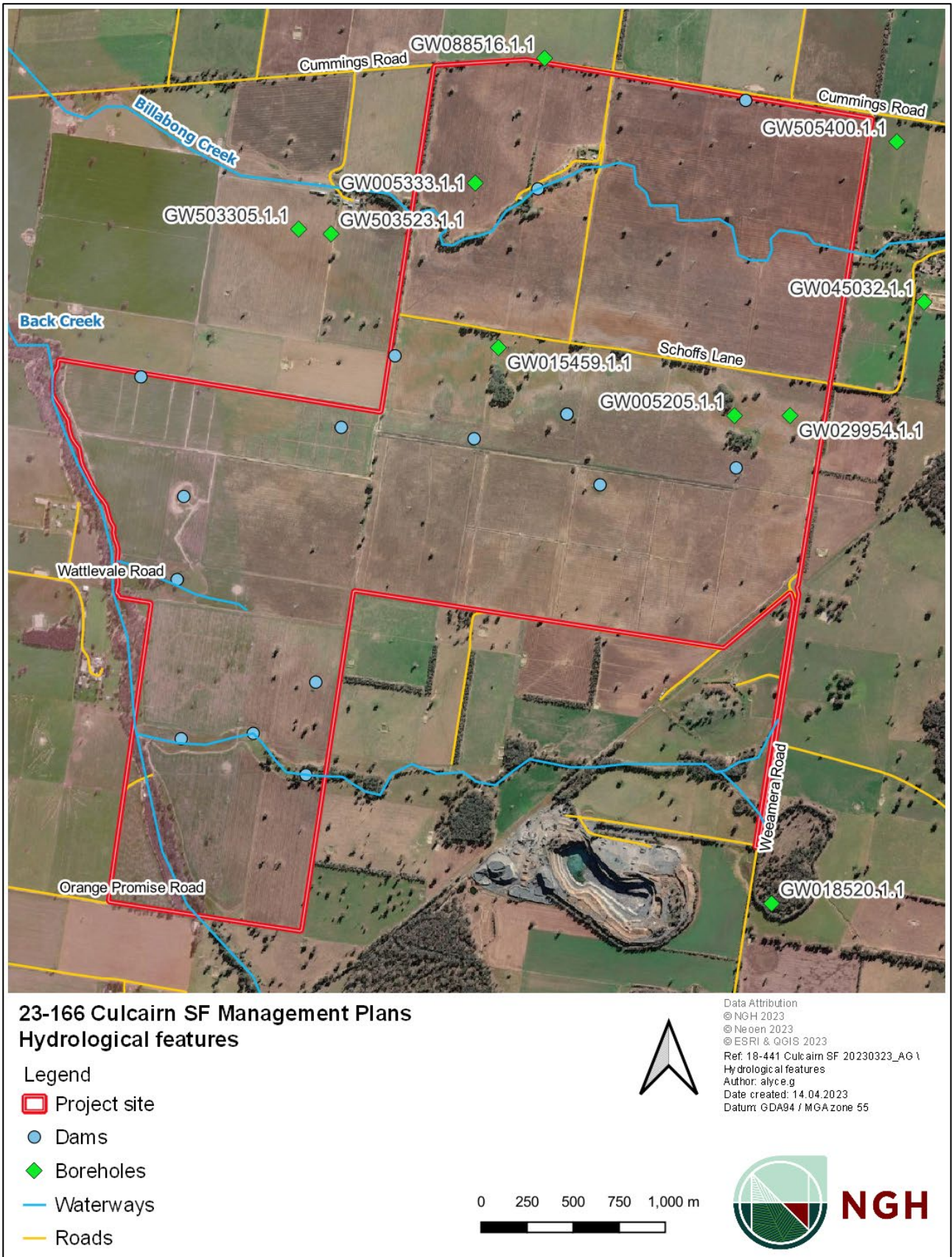


Figure 5-1 Hydrological features

5.4. Rainfall and Climate

The Greater Hume Local Government Area (LGA) is part of the Lower Slopes subregion within the NSW South Western Slopes Bioregion. This bioregion is dominated by a sub-humid climate that generally experiences hot summers and cool wet winters, refer to Figure 5-2 (OEH, 2016).

The Bureau of Meteorology (BoM, 2023) temperature records available from the nearest long-term climate station at Albury Airport AWS (072160) indicate a mean summer maximum of 32.4 °C (January) and a mean winter maximum of 13.2 °C (July)

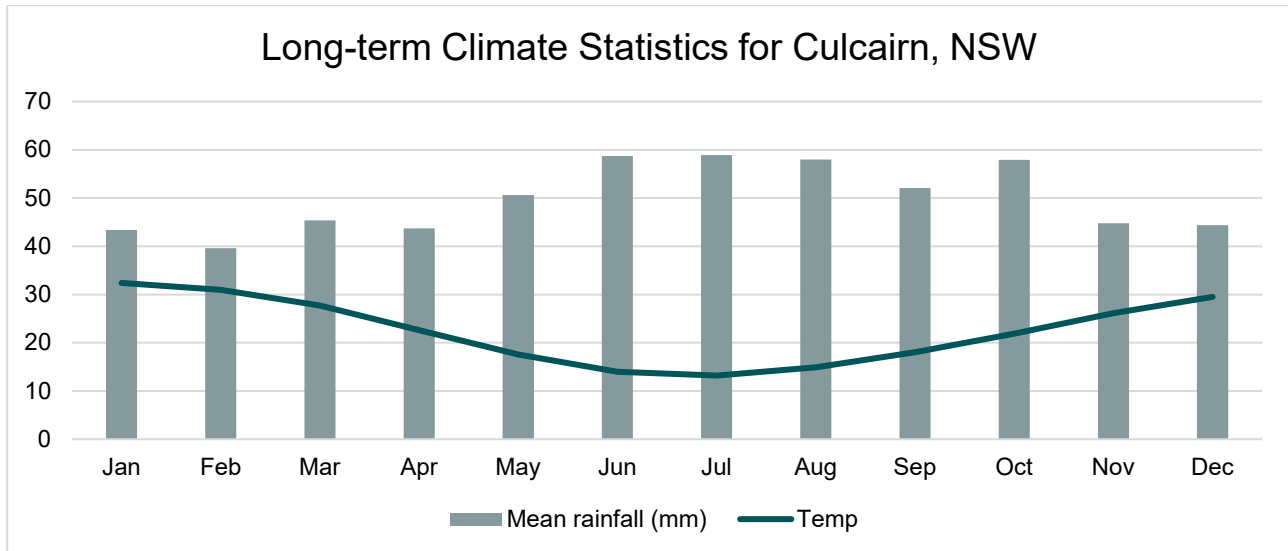


Figure 5-2 Mean rainfall and temperature statistics for Culcairn, NSW (BoM, 2023)

5.5. 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 1483 SI units. Albury is the closest location with detailed R-factor data and is detailed below in Table 5-2 below.

Table 5-2 Monthly % and annual rainfall erosivity (R - factor) values for Albury, NSW (IECA, 2008)

Monthly % and annual rainfall erosivity (R – factor) values													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
%	8.4	9.4	9.8	8.3	7.6	8.5	6.7	6.7	6.5	10.5	8.4	9.2	1483
R - Value	125	139	145	123	113	126	99.3	99.3	96.4	156	125	136	1483

5.6. Flooding

The Project site is not identified as flood prone land under the Greater Hume Local Environmental Plan (LEP) 2012. However, the Billabong Creek system has a history of major floods, with the largest recorded

flood in July 1931. Land around the Project site is subject to the *Billabong Creek Floodplain Management Plan* (DNR, 2006) and the plan suggests that the Project site is outside of the critical flow distribution areas.

Flood modelling undertaken as part of the Project EIS (NGH, 2020) identified that a probable maximum flood (PMF) will cause flooding events of up to 0.13 m in the southern portion of the Project site. For all other flooding events, surface water flows of 0.05 m or less are anticipated.

6. Environmental aspects and impacts

6.1. Construction activities

A variety of construction activities that have the potential to impact upon soil and water quality will be undertaken as part of the Project. These activities include, but are not limited to:

- Vegetation clearing
- Topsoil stripping
- Earthworks, including installation of piles
- Construction of internal access roads
- Construction of inverter transformer stations and onsite substation
- Excavation of trenches for cabling.

6.2. Impacts

The potential for impacts on soil and water will depend on a number of factors including the nature, extent and magnitude of construction activities and their interaction with the natural environment. Potential impacts attributable to construction activities could include:

- Exposure of soils during vegetation clearing and earthworks, creating the potential for offsite transport of eroded sediments and pollutants
- Increased turbidity of waterways and waterbodies due to exposure, erosion, runoff, dust propagation and vegetation removal
- Alteration of surface and subsurface flows that could cause disturbances to hydrology
- Contamination of soils, and surface and groundwater from accidental spills or oil leaks
- Disturbance of contaminated land or water and subsequent generation of contaminated runoff or materials.

7. Environmental mitigation and management measures

7.1. Erosion and sediment control

An ESCP has been prepared for the Project, refer to Appendix C. This ESCP includes site-specific erosion and sedimentation controls, staging advice and stabilisation measures as well as technical notes to guide the installation, function and maintenance of ESC devices.

7.1.1. Drainage control

Drainage control involves the management of both 'clean' stormwater runoff around and through the Project site; as well as 'dirty' stormwater runoff, as defined below:

Clean water	Water that either enters site from an external source and has not been further contaminated by sediment within site; or water that has originated from the site and is of such quality that it does not need to be treated in order to achieve the required water quality standard (IECA, 2008).
Dirty water	Site derived water not defined as clean, thereby requiring treatment with appropriate controls prior to release from site (IECA, 2008).

Drainage control measures (temporary and permanent) will enable the management of stormwater within the Project site. The objectives of these measures are to:

- Enable the diversion of 'clean' up-slope, run-on water either around or through the Project site at non-scouring velocities
- Enable the collection of 'dirty' runoff generated within construction areas and the delivery of this water to an appropriate sediment control measure
- Minimise the risk of soil erosion caused by site-generated flows within the Project site, through the use of 'intermediate' flow treatment and release points
- Control the flow velocity, volume and location of water passing through the Project site along drainage lines and waterway crossings.

7.1.2. Erosion control

Erosion control is the primary approach for the prevention of adverse impacts associated with sedimentation. Construction activities are to be undertaken to reduce the duration of soil exposure to erosive forces (wind and water), either by holding the soil in place or by shielding it.

Erosion control measures to be adopted include construction practices, structural controls and vegetative measures aimed at managing runoff at a non-erosive velocity, and the protection of disturbed soil surfaces.

The specific measures implemented will be based on the sites erosion risk and construction activities. Measures have been documented in the Project ESCP (refer to Appendix C).

Proposed controls include:

- Staging of the works to reduce the overall exposed area as far as practical
- Promptly stabilising exposed areas once the construction stage has been completed (permanent works), refer to the GMP and RMP (NGH, 2023c and f)
- Protection of soil surface (temporary and permanent) including placement of hardstand surfaces, use of soil binder, vegetation establishment (including landscaping), and protection with mats and blankets (e.g., jute, geotextile)

- For high-risk areas during construction (areas that have been disturbed or on slopes), prior to forecast rainfall of > 50 % chance of 10 mm or more in 24 hours, all exposed batters (excluding rock faces) are to be temporarily ground-covered using fabric, polymer or similar
- Dust suppression by wetting of exposed surfaces, application of soil binder, and/or application of soil cover.

7.1.3. Sediment control

Sediment control measures will be installed in combination with drainage and erosion control measures to provide effective pollution management. The Project will adopt a ‘treatment train’ approach, where various control measures are utilised in sequence.

Sediment control measures include systems, procedures and materials to filter, trap and/or settle sediment from sediment-laden waters. In addition to adopting measures as per the Blue Book (Landcom, 2004) and White Book (IECA, 2008) standard drawings, variations may be implemented where it can be demonstrated that they are equally as effective and meet the intent of best practice guidelines.

7.1.4. Plan preparation

The ESCP was prepared by an appropriately qualified person (AQP) in accordance with both the ‘Blue Book’ (Landcom, 2004) and the ‘White Book’ (IECA, 2008).

The ESCP will be revised when work methods change or when control structures or work methods are found to be ineffective or are no longer required. The ESCP will be revised to include identified erosion and sediment control risks and describe how these will be addressed during construction.

7.2. Stockpile management

A number of small material stockpiles are anticipated to arise during construction of the Project. Stockpile management indicators to be monitored during weekly environmental inspections include:

- Installation of erosion and sediment control measures prior to stockpiling material
- Location of temporary stockpiles
- Height of temporary stockpiles
- Temporary stabilisation of stockpiles
- Stockpile separation
- Weed management on stockpiles.

Stockpiles will additionally be managed in accordance with the GMP (NGH, 2023c).

7.3. Waterway crossings and riparian vegetation

Three waterway crossings are required. Refer to the ESCP (Appendix C) for appropriate controls. No development is proposed within proximity to drainage lines. No riparian vegetation will be cleared. A riparian vegetation zone buffer will be retained during the construction and operation of the Project. These no-go zones will be established and maintained as per outlined in the Project’s Biodiversity Management Plan (BMP, NGH 2023a) This vegetation will reduce resulting overland flow during flood events and minimise impacts to waterways arising as a result off channel erosion and sedimentation.

7.4. Dewatering

Minimal dewatering as part of the construction scope is anticipated. In the event that dewatering is required, a dewatering procedure will be prepared and implemented. The procedure will outline discharge water is

limited to vegetated or grassed areas, away from waterways, and within the construction footprint. Preferably, water collected on site that requires dewatering will be utilised on site as dust suppression.

Any water discharged that has the ability to leave the Project boundary via land or water will meet the minimum water discharge criteria limits outlined in Table 7-1 and be accompanied by a discharge permit.

A register will be established to track quantity and quality of extracted.

Dewatering of groundwater onsite is not permitted without approval under the *Water Management Act 2000*.

Table 7-1 Minimum water discharge limits

Parameter	Limit
Total suspended solids (TSS)	50 mg/L
pH	6.5 – 8.5
Oil and grease	No visible trace

7.5. Air quality

In addition to the implementation of erosion measures during periods of rainfall, erosion measures to prevent wind erosion will be employed during the Project. Site-specific measures and controls for the prevention of wind erosion are outlined in the Project ESCP (Appendix C) and include:

- Dust mitigation and suppression measures to be implemented such as the use of water carts
- Maximising use of sealed roads during the transport of construction materials / components
- Material delivery will incorporate full loads and come from local suppliers, where possible
- Methods to manage work during strong winds or other adverse weather conditions
- Monitoring of wind-blown erosion through visual inspections and BOM weather condition reports for predicted high winds
- Progressive rehabilitation of disturbed areas.

Erosion control measures remain the primary method for minimising impacts associated with dust-related air quality. Reducing the time of exposure and prioritising rehabilitation, in combination with dust-suppression measures during earthworks, will minimise the impact of construction activities on surrounding air quality.

7.6. Water sources

Non-potable water will be sourced from standpipes operated by Greater Hume Shire Council (GHSC). Approximately 62 megalitres (ML) of non-potable water will be required during construction of the Project. Approximately 2.5 ML of potable (bottled) water will also be required. Neoen will obtain any required licences/permits to source water or source commercially for construction.

7.7. Weather monitoring

Weather will be monitored by the Site Environmental Advisor (SEA), or delegate, throughout construction. BOM forecasts will be monitored daily, with details of forecast rain or wind events to be communicated by email to the wider Project team as required.

7.8. Management and mitigation measures

Table 7-2 Soil and water management and mitigation measures

ID	Measure	Resources required	Timing	Responsibility	Reference
General					
SWM1	Training will be provided to all Project personnel, including relevant sub-contractors on soil and water management practices and the requirements from this plan through inductions, toolboxes and targeted training.	Training materials	Pre-construction Construction	Site Environmental Advisor (SEA)	Good practice
SWM2	All staff will be appropriately trained through toolbox talks for the minimisation and management of accidental chemical (e.g. fuel) spill including on the location of spill kits and trained how to use them.	Spill Response Procedure (Appendix B) Training materials Training records	Pre-construction Construction	SEA	WA1 WA5 BD13
SWM3	A SWMP and ESCP will be prepared in consultation with DPIE Water, implemented and monitored in accordance with the Blue Book (Landcom, 2004), the White Book (IECA, 2008), the Project EIS / Amendment Report and relevant development consents.	SWMP ESCP (Appendix C)	Preconstruction Construction	Project Manager SEA	SO1 WA6 BD1
SWM4	A SCRPs will be developed and implemented to prevent contaminants affecting adjacent surrounding environments.	This table Spill Response Procedure (Appendix B)	Preconstruction Construction	Project Manager SEA	SO5
SWM5	The Applicant must ensure that the development does not cause any water pollution, as defined under Section 120 of the POEO Act. Adequate incident management procedures will be incorporated into the Construction and Operation Environmental Management Plans, including requirement to notify EPA for incidents that cause material harm to the environment (refer s147-153 POEO Act).	This Plan ESCP (Appendix C) EMS (NGH, 2023b) Spill Response Procedure (Appendix B)	During construction	SEA	WA3 SO5 CoA25
Design					

ID	Measure	Resources required	Timing	Responsibility	Reference
SWM6	A Hydraulic Model will be undertaken during the detailed design phase. The model will consider both regional and local catchment sources of flooding. Once remodelling is complete and new design flood and hazard mapping is produced, infrastructure will be designed and located to be compatible with flood risks, minimising adverse impacts to surrounding properties.		Detailed design	Neoen Project Manager	WA8
SWM7	The solar panels and ancillary infrastructure (including security fencing) are designed, constructed and maintained to reduce impacts on surface water, localised flooding and groundwater at the site		Detailed design Construction	Project Manager SEA	CoA26
SWM8	The solar panels and ancillary infrastructure are designed, constructed and maintained to avoid causing any erosion on site		Detailed design Construction	Project Manager SEA	CoA26
SWM9	Ensure appropriate drainage controls are incorporated into the design, to mitigate any impact to watercourses (such as flow diversions from project infrastructure).	ESCP (Appendix C)	Detailed design Construction	Project Manager SEA	WA7
Water use					
SWM10	The proponent will obtain relevant approvals and licences under the <i>Water Management Act 2000</i> before commencing any works which: <ul style="list-style-type: none"> Exceed 62 ML per annum for construction Obtain water from a difference source than approved in the EIS Intercept or extract groundwater or surface water (including from on-site dams where necessary) For any works which have the potential to alter the flow of floodwaters or surface water flow. 		Pre-construction	SEA	WA10 CoA24
SWM11	The Applicant must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.	Water use record sheet Monthly Environmental Report	Pre-construction Construction	Neoen EPC	CoA24
Weather monitoring					

ID	Measure	Resources required	Timing	Responsibility	Reference
SWM12	Weather forecasts will be monitored daily, with details of forecast rain or wind events to be communicated by email to the wider Project team as required.	BoM Daily diary	Construction	Site Supervisor	AQ3 AQ4 CoA18
SWM13	Rain gauges will be installed at two locations (likely at the site office and substation) to monitor rainfall across the Project site. Rain gauges will be emptied at the end of each day and the results communicated to the Site Environmental Advisor (or delegate) for inclusion in the Project rainfall register	Rainfall register	Pre-construction Construction	Site Supervisor	Best practice
Minimise disturbance					
SWM14	Minimise the area of disturbance; rationalise vehicle movements and restrict the location of activities that compact and erode the soils as much as practical.		Pre- construction Construction	Site supervisor SEA	SO8
SWM15	Establish Project boundary and sensitive areas to be protected as native vegetation, dams and waterways with flagging and 'no go zone' signage. No-go zones and buffers for waterways will be in accordance with <i>Guidelines for Controlled Activities on Waterfront Land</i> (DPE, 2022), or its latest version, unless DPIE Water agrees otherwise.		Pre- construction Construction	Site supervisor SEA	Best practice CoA26
SWM16	Vehicle use and material laydown will be restricted to existing or proposed disturbed areas and outside of tree drip zones.		Pre- construction Construction	Site supervisor SEA	Best practice
SWM17	Access to waterways will be restricted to the minimum amount required for the activity.	BMP	During construction	SEA	Best practice
Erosion and sediment control					
SWM18	Erosion and sediment control measures implemented will be in accordance with <i>Managing Urban Stormwater: Soils & Construction</i> (Landcom 2004).	SWMP ESCP (Appendix C)	Pre- construction Construction	SEA	WA6 BD13 CoA26

ID	Measure	Resources required	Timing	Responsibility	Reference
					SO8
SWM19	At the commencement of the works, and progressively during construction, install the required erosion control and sediment capture measures.	ESCP (Appendix C)	Pre- construction Construction	SEA	SO1
SWM20	Prevention of erosion will be prioritised above sediment control wherever practicable, at all times during works.	ESCP (Appendix C)	Pre- construction Construction	SEA	Best practice
SWM21	<p><u>Drainage:</u></p> <ul style="list-style-type: none"> • Diversion drains shall be installed where required and possible to prevent mixing of on-site run-off with run-off from outside the site • Where possible, off-site run-off shall be diverted to undisturbed areas so that it is filtered through vegetation prior to entering watercourses • Check dams will be installed as necessary to slow concentrated flows and trap sediment through the Project • Sandbag check dams located in flow paths as velocity controls. 	ESCP (Appendix C)	Construction	SEA	Best practice SO8 BD13 SO1 CoA26 SO8
SWM22	<p><u>Sheet flow (e.g., batters):</u></p> <ul style="list-style-type: none"> • Existing vegetation maintained as long as possible • Minimise disturbance areas at any one time • Water shall be directed around disturbed areas where possible to minimise the need for erosion and sediment control devices • Shredded on-site native vegetation may be utilised in sheet flow areas as natural filtration and velocity reduction • Install sediment fences at the top of batters or other suitable control to direct flows away from batter face • Install geotextile batter chutes at appropriate distances to enable road runoff to flow through the work area without interaction with disturbed areas and soil material • Install sediment barriers along the contour with appropriate spacing and returns as required. 	ESCP (Appendix C)	Construction	SEA	Best practice SO8 SO1 CoA26 SO8
SWM23	<p><u>Stockpiles:</u></p> <ul style="list-style-type: none"> • Inspections on stockpiles to be carried out as part of weekly environmental 	ESCP (Appendix C)	Construction	SEA	Best practice

ID	Measure	Resources required	Timing	Responsibility	Reference
	inspections for the Project as per Section 5.2 <ul style="list-style-type: none"> • Limit stockpiling on site where practicable • No stockpiling is to be sited within 40 m of a drainage line or waterbody • Install sediment fences on the downhill side of stockpiles • Stockpiles shall be located to prevent erosion and sediment entering waterways or drainage lines (e.g., out of flow paths) • Topsoil will not be stockpiled at a height greater than two (2) metres to prevent structural decline of the soil. • Temporary equipment laydown areas and stockpiles required during construction, will be confined to crop/exotic pasture areas. • Topsoil will be removed and stockpiled separately for later use in rehabilitation. Stockpiled topsoil will be visually inspected for weed germination and treated where required 	GMP (NGH, 2023c) PWMP (NGH, 2023e) Weekly Environmental Inspections			WA7 SO1 CoA26
SWM24	<u>Wet weather:</u> <ul style="list-style-type: none"> • Drainage paths to be free of obstructions • Site inspections conducted prior to forecast rainfall • All reasonable actions shall be taken that are necessary to minimise the impact of afflux or flow velocities associated with floods 	Environmental inspection records	Construction	SEA	Best practice SO8 CoA26
SWM25	<u>Revegetation :</u> <ul style="list-style-type: none"> • Disturbed areas revegetated or mulched as early as practicable to minimise time that areas are exposed. Work front to be progressively re-vegetated as work progresses where possible. • Construction vehicles kept to well defined haul roads • Maintain in effective working order erosion and sediment control devices until: <ul style="list-style-type: none"> – Re-vegetation of disturbed areas with cover of no less than 70% – Declared weed species are eradicated and other (herbaceous) environmental weeds are controlled – Check dams and sediment fences must be removed from the site once stable grass cover is achieved following completion of earthworks or at the end of the defects liability period (whichever is first). Check dams in particular must not be left to concentrate flows at spillways on the locally 	ESCP (Appendix C) GMP (NGH, 2023c) RMP (NGH, 2023f) TMP (Amber, 2023) Environmental inspection records	Construction Post Construction	SEA	Best practice SO8 SO1 VA4

ID	Measure	Resources required	Timing	Responsibility	Reference
	erosive soils – Soil is suitably stabilised with no evidence of erosion gullies.				
Soil management and contamination					
SWM26	Machinery is to leave the site in a clean condition to avoid tracking sediment onto public roads. Sediment transport onto public roads is to be cleaned up.	Environmental inspection records	Construction Post Construction	Site Supervisor SEA	SO1
SWM27	In all excavation activities, separate subsoils and topsoils and ensure that they are replaced in their natural configuration to assist revegetation.		Construction	Site Supervisor SEA	SO1
SWM28	Sodic soils identified during trenching works will be treated with gypsum as required, at a minimum rate of 10 tonnes per hectare. Actual rates to be determined following soil testing (Clay content, ECEC and EC). During excavations, monitor for increases in salinity, reduce water inputs and remediate the site with salt tolerant vegetation if required.	SWMP	Construction	SEA	SO1 SO7
SWM29	If contaminated material (including asbestos containing material) is identified on-site, a stop work order will be issued and the Unexpected Finds Procedure will be followed.	Unexpected Finds Procedure (Appendix D) Waste Management Plan (WMP, NGH, 2023g)	Construction	SEA	SO1 SO5
Dewatering					
SWM30	There is to be no release of dirty, impacted or otherwise, water into drainage lines and/or waterways.		Construction	SEA	Best practice
SWM31	There will be no adverse impacts on the John Holland Rail (JHR) rail corridor by way of its discharge from the site into the rail corridor. If so, the Proponent must provide JHR with written evidence permitting the discharge into the rail corridor.	Community Engagement and Benefit Sharing Plan (CEBSP) ESCP (Appendix C)	Construction	Neoen SEA	WA9

ID	Measure	Resources required	Timing	Responsibility	Reference
SWM32	Water collected on site that requires dewatering will be utilised on site as dust suppression or for other construction activities as priority over discharge from site.		Construction	SEA	Best practice BD13
SWM33	In the event that dewatering is required, a dewatering procedure will be prepared and implemented. The procedure will outline discharge water is limited to vegetated or grassed areas, away from waterways, and within the construction footprint.		Construction	SEA	Best practice
SWM34	If water is to be discharged from onsite, water must meet the criteria below prior to discharge: <ul style="list-style-type: none"> • TSS – 50mg/L • pH – 6.5 – 8.5 • Oil and grease – no visible trace. 	Dewatering procedure	Construction	SEA	Best practice
Spill and chemical management					
SWM35	All chemicals, fuels and oils used on-site must be stored and handled in accordance with: <ul style="list-style-type: none"> (a) The requirements of all relevant Australian Standards; and (b) The NSW EPA's Storing and Handling of Liquids: Environmental Protection- Participants Handbook if the chemicals are liquids. In the event of an inconsistency between the requirements listed from (a) to (b) above, the most stringent requirement must prevail to the extent of the inconsistency.	Australian Standard EPA's Storing and Handling of Liquids: Environmental Protection- Participants Handbook	Preconstruction Construction	Site Supervisor SEA	CoA29
SWM36	All fuels, chemicals, and liquids will be stored at least 50 metres away from any waterways or drainage lines and will be stored in an impervious bunded area.	Environmental inspection records	Preconstruction Construction	Site Supervisor SEA	WA2 SO5
SWM37	The refuelling of plant and maintenance of machinery will be undertaken in impervious bunded areas.	Environmental inspection records	Preconstruction Construction	Site Supervisor Operators SEA	WA4 BD13

ID	Measure	Resources required	Timing	Responsibility	Reference
SWM38	Ensure that machinery arrives on site in a clean, washed condition, free of fluid leaks. Machinery will be checked daily to ensure there is no oil, fuel or other liquids leaking from the machinery.	Plant inspection checklists	Preconstruction Construction	Site Supervisor Operators	WA5 BD13 SO1
SWM39	An emergency spill kit is to be kept on site at all times.	Spill kit Spill Response Procedure (Appendix B)	Preconstruction Construction	SEA	Best practice BD13
SWM40	If concrete washout is required onsite, a dedicated concrete washout facility will be provided during construction at least 50 metres away from drainage lines and waterways. The facility or pit will collect the run-off from the washing of concrete machinery and equipment and disposed of at an appropriate waste facility.		Construction	All personnel	Best practice
SWM41	Dangerous or hazardous materials will be transported, stored and handled in accordance with AS1940-2004: The storage and handling of flammable and combustible liquids, and the ADG Code where relevant. All potential pollutants kept on-site will be stored in accordance with relevant HAZMAT requirements and banded.		Preconstruction Construction	Site Supervisor	HA3
Dust management					
SWM42	Dust will be monitored visually and via weather reports throughout construction. If dust is observed to be leaving the site boundary during works, relevant works will be stopped until control measures (wetting of exposed surfaces, application of soil binder, and/or application of soil cover) are implemented. Works can recommence when controls have been implemented and dust is no longer observed to be leaving the site boundary.	Environmental inspection records BOM Water cart Soil binder	Preconstruction Construction	Site Supervisor SEA	AQ3 CoA18 AQ4 VA4 BD8
SWM43	All personnel will drive below the speed limit designated in the Traffic Management Plan to minimise dust generation and disturbance to livestock at all times during works.	Environmental inspection records TMP	Preconstruction Construction	All personnel	LU6 CoA18

ID	Measure	Resources required	Timing	Responsibility	Reference
SWM44	Complaints received regarding dust will be management through the Project's complaints procedure.	EMS (NGH, 2023b) Community Engagement and Benefit Sharing Plan (CEBSP, Neoen, 2023)	Preconstruction Construction	Project Manager Site Supervisor SEA	AQ1
SWM45	Fires and material burning are prohibited on the development site		Construction	SEA	AQ5
Inspections and maintenance					
SWM46	Daily visual and weekly overall assessments of erosion and sediment control structures will be undertaken to verify their condition and effectiveness. Any issues will be rectified as soon as practicably possible.	Environmental inspection records	Construction	SEA	Best practice SO1
SWM47	All temporary erosion and sediment control measures, including drainage control measures, will be fully operational and maintained in proper working order at all times as reasonably practical.	Environmental inspection records	Construction	SEA	Best practice
SWM48	Site inspections will be conducted at least 24 hours prior to forecast rainfall to ensure all controls are in place, in working order and have capacity for the rainfall event.	Pre -rainfall inspection checklist	Construction	SEA	Best practice SO1
SWM49	Post-rainfall inspections will be undertaken within 24 hours (if practicable and in consideration of site safety requirements) of a rainfall event (>10mm in 24hr) and restorative actions taken should any controls be compromised from the event.	Post -rainfall inspection checklist	Construction	SEA	Best practice EMS SO1

8. Compliance management

8.1. Roles and responsibilities

Section 4.8 of the EMS describes the roles and responsibilities of Neoen's Project team in relation to environmental management. Specific responsibilities for the implementation of environmental controls are detailed in Section 7 of this Plan.

8.2. Training

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

- Existence and requirements of this Plan, as well as associated and supporting documentation such as EWMS and the ESCP
- Relevant legislation
- Roles and responsibilities for soil and water management
- Water quality management and protection measures
- Procedure to be implemented in the event of an unexpected discovery of contaminated land (Appendix D).

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in soil and water management. Examples of training topics include:

- ESC measure installation methodology
- Working near or in drainage lines and creeks
- Emergency response measures in high rainfall events
- Preparedness for high rainfall and flood events
- Spill response
- Stockpile location criteria
- Identification of potentially contaminated spoil and fill material
- Sensitive environments within and nearby to the Project site.

Further details regarding staff induction and training are outlined in Section 7 of the EMS.

8.3. Monitoring and inspections

Requirements and responsibilities in relation to monitoring and inspections are documented in Section 10 of the EMS. Monitoring requirements specific to the SWMP are detailed in Table 8-1.

Table 8-1 Soil and water quality monitoring requirements for the Project

Monitoring	Record	Responsibility	When
Regular visual monitoring will be undertaken during site inspections for the following: <ul style="list-style-type: none"> • Any visible signs of erosion • Drainage and erosion & sediment controls are in place and in good working order 	Environmental Site Inspection Checklist (Appendix F of the EMS)	SEA	Weekly or as required

Monitoring	Record	Responsibility	When
<ul style="list-style-type: none"> Soil stockpiles and excavations are being protected Sediment has been removed following large storm events and controls maintained for indications of sediment-laden waters, waste waters or pollution (e.g., grease/oil, effluent) due to a spill or that have left site 			
Pre-rainfall inspection	Pre-rainfall inspection checklist (Appendix G of the EMS)	SEA	Within 3 hours of the start of a rainfall event during work hours Within 24 hours of the start of a rainfall event (or on the following working day) Rainfall event being greater than 80% potential for 10mm or more with 24 hours
Post-rainfall inspection	Post-rainfall inspection checklist (Appendix G of the EMS)	SEA	Within 24 hours of rainfall event occurring with consideration of site safety requirements.

8.4. Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this sub plan, infrastructure approval and other relevant approvals, licences, and guidelines. Audit requirements are detailed in Section 10.3 of the EMS.

8.5. Reporting

Reporting requirements and responsibilities are documented in Section 10.4 of the EMS.

Details on incident reporting is included in Section 8.3 of the EMS. Environmental incidents relating to soil and water management may include but not be limited to:

- Discharge of turbid water to a waterbody within the Project site
- Discharge of turbid water outside of the Project site
- Observation of dust plumes outside of the Project site resulting from Project works
- Transport of contaminants through surface runoff
- Impact upon groundwater quality, levels and flows
- Structural erosion within work areas.

8.5.1. Incident reporting

In accordance with Condition 7 of Schedule 4 of the Development Consent, the Planning Secretary must be notified in writing via the Major Projects website immediately after Neoen becomes aware of an incident.

Written notification of an incident must:

- Identify the development and application number
- Provide details of the incident (date, time, location, a brief description of what occurred and why it is classified as an incident)

- c) Identify how the incident was detected
- d) Identify when the applicant became aware of the incident
- e) Identify any actual or potential non-compliance with conditions of consent
- f) Describe what immediate steps were taken in relation to the incident
- g) Identify further action(s) that will be taken in relation to the incident
- h) Identify a project contact for further communication regarding the incident.

As per Appendix 7 of the CoA (Incident Notification and Reporting Requirements), within 30 days of the date on which the incident occurred or as otherwise agreed to by the Planning Secretary, the Applicant must provide the Planning Secretary and any relevant public authorities (as determined by the Planning Secretary) with a detailed report on the incident addressing all requirements below, and such further reports as may be requested.

The Incident Report must also include:

- a) A summary of the incident
- b) Outcomes of an incident investigation, including identification of the cause of the incident
- c) Details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence
- d) Details of any communication with other stakeholders regarding the incident.

All written requirements of the Planning Secretary or relevant public authority, which may be given at any point in time, to address the cause or impact of an incident must be complied with, within any timeframe specified by the Planning Secretary or relevant public authority.

Non-compliances

Non-compliances will be reported in accordance with Section 10.4 of the EMS, and the Planning Secretary (DPE) must be notified in writing via the Major Projects website within seven days after the Applicant becomes aware of any non-compliance.

A non-compliance notification must identify:

- The development and the application number for it,
- Set out the condition of consent that the development is non-compliant with,
- The way in which it does not comply
- The reasons for the non-compliance (if known) and
- What actions have been, or will be, undertaken to address the non-compliance.

It should be noted that as per the requirements of Schedule 4, Condition 10, a non-compliance which has been notified as an incident, does not need to also be notified as a non-compliance.

9. Review and improvement

9.1. Continuous improvement

Continuous improvement of this SWMP will be achieved through ongoing evaluations 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.

9.2. SWMP update and amendment

A document review process ensures that environmental documentation including this SWMP is updated as appropriate for the specific works that are occurring on-site. Reviews of the SWMP are expected to be triggered as relevant, by:

- Independent Environmental Audit
- Internal audits
- Additional environmental aspects and risks
- Environmental near misses and incidents
- Project stage change between construction, operation, and decommissioning.

Should the document review process identify any issues or items within the documents that are either redundant or in need of updating, it is the responsibility of the Neoen Project Manager or delegate to prepare the revised documents.

In accordance with Condition 2 of Schedule 4 of the Development Consent, within 1 month, unless otherwise agreed with the Planning Secretary, of:

- The submission of an incident report under Condition 7 of Schedule 4
- The submission of an audit report under Condition 11 of Schedule 4
- Any modification to the conditions of this consent.

The Neoen Project Manager or delegate must review, and if necessary, revise the strategies, plans, and programs required under the Development Consent to the satisfaction of the Planning Secretary.

Where this review leads to revisions in any such document, then within four weeks of the review, the revised document will be submitted to the Planning Secretary for review and approval, unless otherwise agreed with the Planning Secretary.

In accordance with Condition 3 of Schedule 4 and agreement of the Planning Secretary, revised strategies, plan or programs may be prepared without undertaking consultation with all parties nominated under the applicable condition in this approval.

Only the Neoen Project Manager, or delegate, has the authority to change any of the environmental management documentation.

In addition, the processes described in Section 11 of the EMS may result in the need to update or revise this Plan. This will occur as needed.

A copy of the updated plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure – refer to Section 12.2 of the EMS.

10. References

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Appendix A Consultation

Our ref: OUT23/12918

Alexis Good
Email: alexis.good@neoen.com

14 August 2023

Subject: Culcairn Solar Farm - Soil and Water Management Plan and Erosion Sediment Control Plan (SSD-10288-PA-7)

Dear Alexis Good

I refer to your request for advice sent on 8 August 2023 to the Department of Planning and Environment (DPE) Water about the above matter.

DPE Water has reviewed the Soil and Water Management Plan and the Erosion Sediment Control Plan and has the following recommendations:

- Confirmation that Council has agreed to supply water for the project should be included in the Soil and Water Management Plan. This water source is critical to the project and appears yet to be confirmed. In accordance with Condition 24 of development consent SSD- 10288, the proponent must ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of the development to match its available water supply.
- Ensure all works on waterfront land are undertaken in accordance with the most recent and updated Guidelines for Controlled Activities on Waterfront Land (DPE, 2022).
<https://water.dpie.nsw.gov.au/licensing-and-trade/controlled-activity-approvals/guidelines>

Should you have any further questions about this matter, please do not hesitate to contact DPE Water Assessments water.assessments@dpie.nsw.gov.au.

Yours sincerely



Rose-Anne Hawkeswood
A/Manager Assessments, Knowledge Division
Department of Planning and Environment: Water

From: [Truman Carroll](#)
To: [Nicholas Fox](#)
Subject: Water Supply
Date: Wednesday, 27 September 2023 2:33:38 PM
Attachments: [riverina_logo_1a7f970e-c97c-4d07-b43a-a9eca23aef4b.png](#)
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Hi Nicholas,

I am pleased to confirm that, based on the proposed daily consumption of 165 kiloliters for the Solar Farm project at lot 1/575478 Culcairn, Riverina Water has the capacity to supply this volume of water through our Henty filling station located on the Olympic Highway between Third and Fourth Street, Henty.

We have reviewed the projects daily requirements and assessed our resources, and we are confident that our Henty water filling station can meet the demand for the 24 month project duration. Obtaining water from outside Henty water filling station would be disadvantageous to both our network and existing customers.

If you have any further questions or require additional information, please don't hesitate to reach out to me directly or to our team at Riverina Water.

Kind regards,



Truman Carroll
Development Engineering Officer



E tcarroll@rwcc.nsw.gov.au
P 02 69220628 | **M**
91 Hammond Ave (PO Box 456)
Wagga Wagga NSW 2650



www.rwcc.nsw.gov.au



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Appendix B Spill Response Procedure

Pollution Incidents that are to be notified

A pollution incident is required to be notified to the EPA if there is a risk of 'material harm to the environment', which is defined in section 147 of the POEO Act as:

- a. harm to the environment is material if:
 - i. it involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
 - ii. it results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (or such other amount as is prescribed by the regulations), and
- b. loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment.

Where spills or pollution incidents have far reach or consequences incident notification may be required to:

- NSW EPA – 131 555
- Fire and Rescue NSW – 000
- SafeWork NSW – 131 050
- Albury Wodonga Hospital – 02 6058 4444
- Greater Hume Council – 02 6036 0100

Types of pollution incidents that are to be notified

Spills and pollution incidents that could potentially occur at a construction site, and that are covered by this plan include:

- Material, such as waste materials, fuel etc.
- Discharge to waters from site.

Small spills that do not leave the site boundary and are cleaned up without material environmental harm or residual environmental impact are most likely not required to be notified to the EPA or other authorities. However, all such incidents are to be recorded and reported in accordance with client and/or organisational requirements.

An environmental incident may include a major spillage or leak, failure of a pollution control device such as a bund or basin, major settlement, collapse of a bank or embankment, or catastrophic events.

The Site Environmental Advisor is responsible for classifying the level of incident. The incident will be classified and reported to Neoen as per Section 8.3 of the EMS.

Spill Response Procedure

Pollution incidents caused by spills of chemicals and oils will be managed in accordance with the following:

1. Identify incident has occurred
2. Stop work immediately
3. Delegation: The senior member of the team present when a pollution incident occurs is to take charge and become the Emergency Controller; this person will delegate the main assisting roles of the emergency response i.e., Safety controller, information controller, combat assistant, communications clean up and waste management
4. Control the source of the incident, e.g., stop the fuel leaking
5. Contain the incident using appropriate spill kits and adequate measures

6. Site staff to report to environment team and all other relevant personnel including FRV
7. **NOTIFY** the agencies **immediately** if material environmental harm has occurred. Where the public has been, or could potentially be, impacted the public will be notified
8. Plan clean up and implement strategy, this may involve specialist external spill subcontractors
9. Undertake incident investigation to determine cause and include measures to minimise potential for incident reoccurring
10. Findings of the incident investigation to be briefed to all relevant staff.

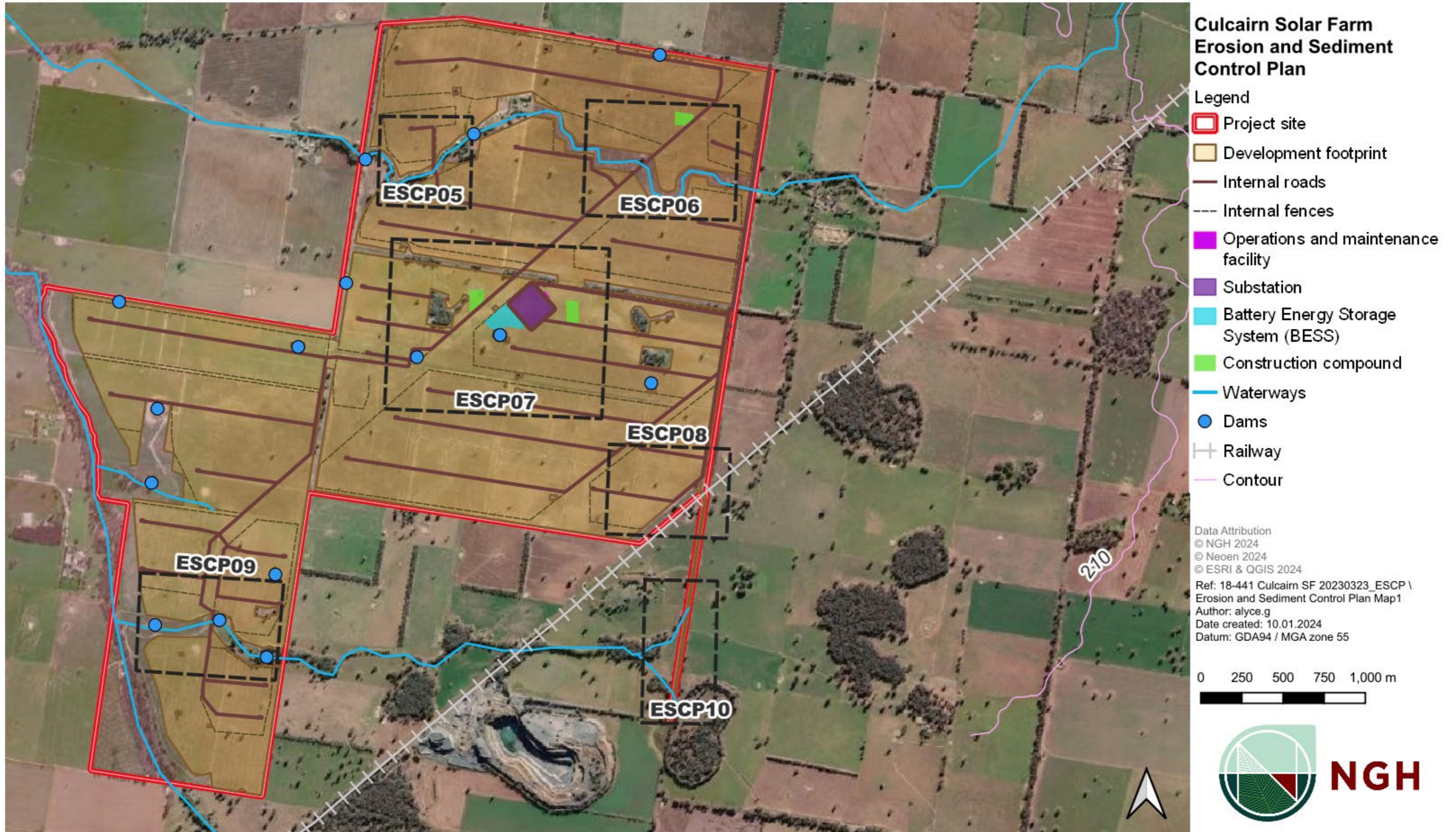
The emergency response procedure will be tested one month after construction commences, and every six months after that.

The Engineering, Procurement and Construction (EPC) Contractor will provide all records of the environmental incidents and regulatory action to Neoen.

The Contractor will induct all staff and subcontractors working on the Site about the potential environmental emergencies and provide training in implementing the relevant environmental safeguards and risk mitigation measures.

Appendix C Erosion and Sediment Control Plan

CULCAIRN SOLAR FARM CONSTRUCTION EROSION AND SEDIMENT CONTROL PLAN



Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH ↑	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)			REV Draft V1.0	DATE 29/03/23	DRN AG	DRAWING NO. ESCP01	Job No: 230166 Doc. No: 230166 ESCP Final v1
		SCALE (ON A3 ORIGINAL): NTS			Final V1.0	27/07/23	AG		
					Final V.2	10/01/2024	AG		

Revised Universal Soil Loss Equation (RUSLE)

To assess the erosion hazards at the Project site, the RUSLE (Revised Universal Soil Loss Equation) has been used. One RUSLE calculation for the greater Project site was determined as sufficient to ensure that appropriate controls are implemented for the planned works as values used have been conservatively selected. The equation for calculating predicted annual average soil loss is:

$$A = R \times K \times LS \times C \times P$$

Table 1 RUSLE values for the Project site

Parameter	Definition	Project value
A	Total calculated soil loss (t/ha/yr)	115
R	Rainfall erosivity factor	1483 (Albury)
K	Soil erodibility factor	0.05
LS	Slope length and gradient factor	Max. 1.19 assumed
P	Conservation practice factor	Max. 1.3 assumed
C	Groundcover factor	Max. 1.0 assumed
Erosion hazard (IECA, 2008)		Very low

As specified in the White Book (IECA, 2008), sediment control standards based on predicted soil loss rate are as outlined in Table 2. The site has anticipated erosion risks of 'very low' in accordance with soil loss rates calculated above, and as described in Table 3.

The Project footprint is noted to generally have low salinity and sodicity of topsoils and subsoils, in accordance with Appendix K of the EIS (McMahon Earth Science, March 2019).

Technical Notes

General

1. Additional erosion and sediment control measures must be implemented and a revised ESCP must be prepared in the event that site conditions or project design change significantly from those considered within this plan.
2. In the event that serious or material environmental harm may occur as a result of sediment leaving site, appropriate additional erosion and sediment control measures must be implemented such that all reasonable and practicable measures are being taken to prevent or minimise such harm.
3. The construction schedule must aim to minimise the duration that all areas of soil are exposed to the erosive effects of wind, rain and surface water.
4. Land-disturbing activities must not cause unnecessary soil disturbance if an alternative construction process is available that achieves the same or equivalent outcomes at an equivalent cost.

Site Access


5. All site access points will be stabilised in accordance with SD 6-14.
6. Access points exiting onto Weeamera Road will be monitored for sedimentation, particularly after rainfall. Any sedimentation on sealed, public roads must be removed in a timely manner via sweeping or washing into an installed sedimentation control e.g., rock checks within existing swale.

Clearing and Groundcover Removal

7. Any clearing required is to be delayed as long as possible prior to the commencement of works, particularly adjacent to watercourses.
8. All reasonable and practicable efforts must be taken to delay the removal of, or disturbance to, existing groundcover (organic or inorganic) prior to the commencement of works.
9. Groundcover removal and clearing is to be staged in a way that minimises ground exposure timeframes. Arborist clearing of trees and shrubs may occur ahead of construction if stump and groundcover removal are delayed until the commencement of construction.
10. Clearing and grubbing must be immediately followed by specified temporary stabilisation measures prior to commencement of construction.
11. Sedimentation controls must be installed, where practicable, prior to the commencement of clearing and grubbing.

Erosion Control

12. Prevention of erosion will be prioritised above sediment control wherever practicable during the work.
13. Dust suppression will occur when visible dust is sighted. Sediment-laden runoff from dust suppression must not run off site, cause a traffic hazard or environmental issues.
14. All temporary earth bunds and flow diversion systems must be machine-compacted and stabilised with polymer or landscaping techniques (seeding, hydromulch etc.).
15. Where ground is disturbed and works are not likely to commence within 10 days, or less if a significant rainfall event is forecast, polymer spray (P-47 or similar) should be applied at 5% dilution, or 7% - 10% for steep slopes (>15%). Alternate groundcover materials may be utilised for areas not within the site drainage line or adjacent banks.
16. Where initial disturbance reflects final levels and access is not required for adjacent construction works, landscaping should occur as soon as practicable.

Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH ↑	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698) SCALE (ON A3 ORIGINAL): NTS	REV	DATE	DRN	DRAWING NO. ESCP02	 Job No: 230166 Doc. No: 230166 ESCP Final v1
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			Final V1.0	27/07/23	AG		
			Final V.2	10/01/2024	AG		

Sediment Control

17. All reasonable and practicable measures must be taken to prevent, or at least minimise, the release of sediment from the site.
18. Any necessary drainage structures will be constructed in accordance with Table 4 of this plan.
19. Suitable all-weather access must be provided to all sediment control devices for maintenance purposes.
20. Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event, whether natural or as part of site works, if the device's sediment retention capacity falls below 75% of its design retention capacity.
21. Sediment deposited off site as a result of works must be collected and the area appropriately cleaned/rehabilitated as soon as reasonable and practicable, in a manner that gives appropriate consideration to the safety and environmental risk associated with the sediment deposition.
22. Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm.
23. Dirty water sumps will be dewatered as soon as practicable following a rain event, with water to be utilised for dust suppression as first preference.
24. No hay or straw bales will be used as sediment controls during construction works.

Stockpile Management

25. Stockpiling on site is to be limited where practicable and no stockpiling is to be sited within 40 m of a drainage line or waterbody as outlined in Section 6.8 of the Project SWMP .
26. All stockpiles must have sediment controls (earth bund, sediment fence) installed on the downslope side immediately following material placement.
27. All stockpiles must have flow diversion controls (earth bund or similar) installed on the upslope side to minimise erosion of material.
28. All stockpiles of erodible material, particularly topsoil and general fill, will be stabilised with polymer spray, rock or alternative material is not to be disturbed for >10 days.

Waterway Protection

29. All chemicals, including fuel, will be stored outside of drainage lines. If any chemicals or fuels are required within the work area they will be stored in an impervious, bunded container and removed and covered prior to rainfall. Drip trays will be used for refuelling.
30. During concreting works, a concrete washout pit will be available at least 50 m away from drainage lines and waterbodies. Alternately, trucks may washout off site.
31. General disturbance of drainage lines and adjacent slopes, including plant and vehicle access, will be minimised to that required for construction.

Trenching Works (if required)

32. Temporary velocity checks (coir logs as per FR-01, rock checks or similar) may be utilised in trenches to prevent structural erosion.
33. All areas disturbed during trenching works to be stabilised with polymer, rock or alternative groundcover material as soon as practicable after exposure and prior to forecast rainfall. Revegetation will be commenced as soon as practicable following completion of trenching works.
34. During trenching works, erosion control will be prioritised to lessen the requirement for sedimentation devices due to small and rapidly changing work areas.

Landscaping

35. No completed earthwork surface will remain exposed for longer than 15 days without the application of groundcover treatment.
36. Groundcovers applied will be in accordance with Section 6.3 of the GMP.
37. A minimum of 70% ground cover must be achieved, as outlined in Section 6.3 of the Project GMP. If groundcover has not germinated within three weeks of seeding, follow up works will be considered (refer to GMP).

Site Maintenance

38. All erosion and sediment control measures, including drainage control measures, must be maintained in proper working order at all times during their operational lives.
39. All drainage, erosion and sediment controls must be inspected:
 - a. at least daily (when work is occurring on site);
 - b. at least weekly (when work is not occurring on site);
 - c. within 24 hours of expected rainfall; and
 - d. within 24 hours of a rainfall event of sufficient intensity and duration to cause runoff on site, with consideration to site safety requirements.Inspections of the controls will be recorded in an environmental inspection checklist.
40. Temporary sediment controls may be removed once 70% groundcover has been achieved in exposed areas and in accordance with Section 6.5 of the Project GMP.


Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH ↑	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698) SCALE (ON A3 ORIGINAL): NTS	REV	DATE	DRN	DRAWING NO. ESCP03	 NGH	Job No: 230166 Doc. No: 230166 ESCP Final v1
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			Final V1.0	27/07/23	AG			
			Final V.2	10/01/2024	AG			

Table 2 Sediment control standard (default) based on soil loss rate (IECA, 2008)

Catchment area (m ²) [1]	Soil loss (t/ha/yr) [2]			Soil loss (t/ha/month) [3]		
	Type 1	Type 2	Type 3	Type 1	Type 2	Type 3
250	N/A	N/A	[4]	N/A	N/A	[4]
1000	N/A	N/A	All cases	N/A	N/A	All cases
2500	N/A	> 75	75	N/A	> 6.25	6.25
> 2500	> 150	150	75	> 12.5	12.5	6.25
> 10,000	> 75	N/A	75	> 6.25	N/A	6.25

Notes:

[1] Area is defined by the catchment area draining to a given site discharge. Sub-dividing a given drainage catchment shall not reduce its 'effective area' if runoff from the sub-areas ultimately discharges from the site at the same general location. The 'area' does not include any 'clean' water catchment that bypasses the sediment trap. The catchment area shall be defined by the 'worst case' scenario, i.e. the largest effective area that exists at any instance during the soil disturbance.

[2] Soil loss defines the maximum allowable soil loss rate (based on RUSLE analysis) from a given catchment area. A slope length of 80m should be adopted within the RUSLE analysis unless permanent drainage or landscape features reduce this length.

[3] RUSLE analysis on a monthly basis shall only apply in circumstances where the timing of the soil disturbance is/shall be regulated by enforceable development approval conditions. When conducting monthly RUSLE calculations, use the worst-case monthly R-factor during the nominated period of disturbance.

[4] Refer to the relevant regulatory authority for assessment procedures. The default standard is a Type 3 sediment trap.

[5] Exceptions to the use of sediment basins shall apply in circumstances where it can be demonstrated that the construction and/or operation of a sediment basin is not practical, such as in many forms of linear construction where the available work space or Right of Way does not provide sufficient land area. In these instances, the focus must be erosion control using techniques to achieve an equivalent outcome. The 'intent' shall always be to take all reasonable and practicable measures to prevent or minimise potential environmental harm.

Table 3 Suggested erosion risk based on soil loss classes (IECA, 2012)


Soil loss class	Soil loss (t/ha/yr)	Erosion risk
1	0 – 150	Very low
2	151 – 225	Low
3	226 – 350	Low-moderate
4	351 – 500	Moderate
5	501 – 750	High
6	751 – 1500	Very high
7	> 1500	Extremely high

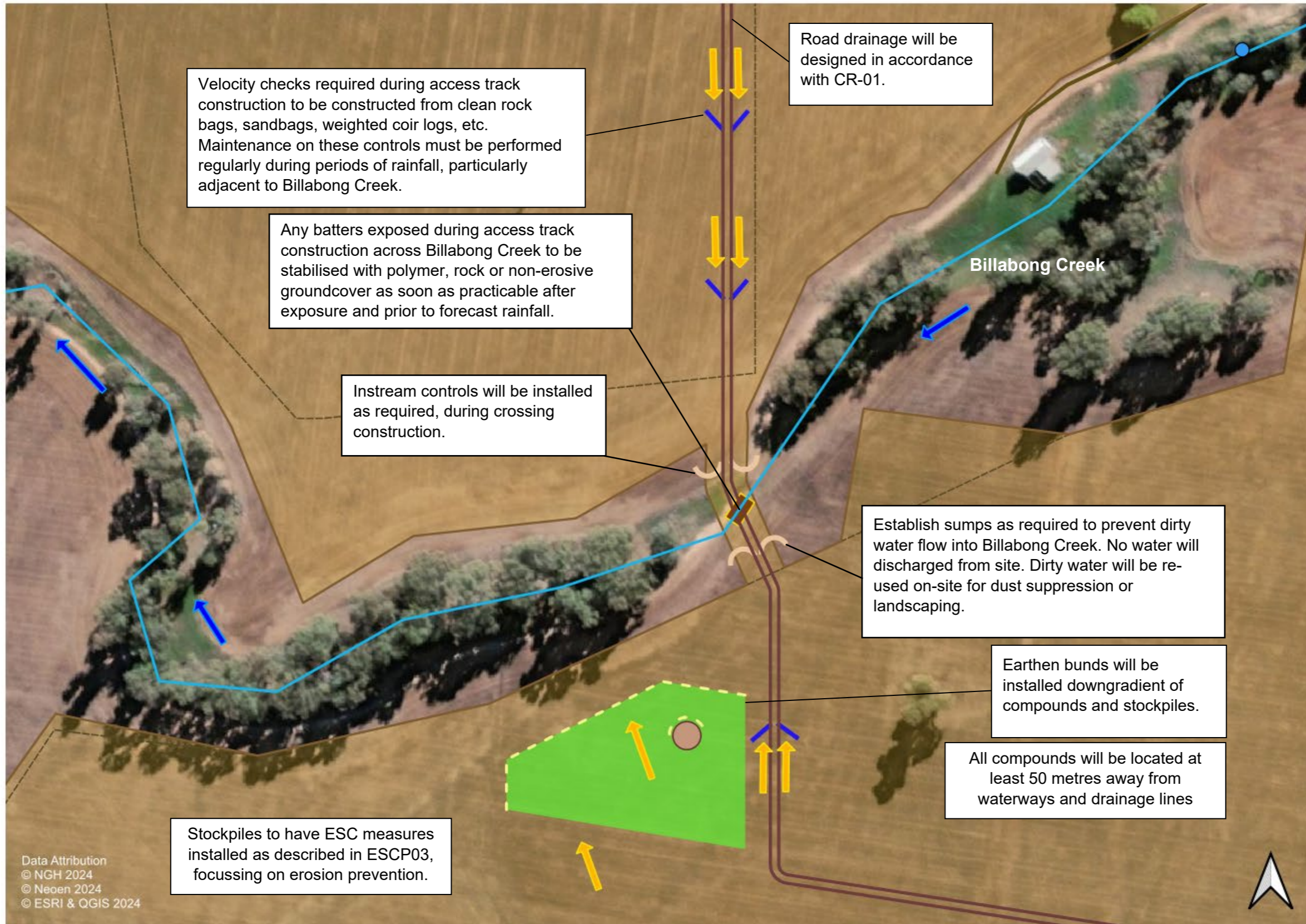
Table 4 Drainage design standard for temporary drainage works (IECA, 2012)

Drainage structure	Anticipated design life		
	< 12 months	12 – 24 months	> 24 months
Temporary drainage [1] structures in NSW, Vic, Tas, SA and southern WA.	1 in 5 year ARI	1 in 10 year ARI	1 in 10 year ARI

Notes

[1] Design capacity excludes minimum 150mm freeboard

<p>Culcairn Solar Farm</p> <p>Construction Erosion and Sediment Control Plan</p>	<p>NORTH</p> <p>↑</p>	<p>REVISION DETAILS</p> <p>DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)</p> <p>SCALE (ON A3 ORIGINAL): NTS</p>	REV	DATE	DRN	<p>DRAWING NO.</p> <p>ESCP04</p>		<p>Job No: 230166</p> <p>Doc. No: 230166 ESCP</p> <p>Final v1</p>
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			Final V1.0	27/07/23	AG			
			Final V.2	10/01/2024	AG			



Velocity checks required during access track construction to be constructed from clean rock bags, sandbags, weighted coir logs, etc. Maintenance on these controls must be performed regularly during periods of rainfall, particularly adjacent to Billabong Creek.

Road drainage will be designed in accordance with CR-01.

Any batters exposed during access track construction across Billabong Creek to be stabilised with polymer, rock or non-erosive groundcover as soon as practicable after exposure and prior to forecast rainfall.

Instream controls will be installed as required, during crossing construction.

Establish sumps as required to prevent dirty water flow into Billabong Creek. No water will be discharged from site. Dirty water will be re-used on-site for dust suppression or landscaping.

Earthen bunds will be installed downgradient of compounds and stockpiles.

All compounds will be located at least 50 metres away from waterways and drainage lines

Stockpiles to have ESC measures installed as described in ESCP03, focussing on erosion prevention.

Culcairn Solar Farm Erosion and Sediment Control Plan

- Legend
- Project site
 - Development Footprint
 - Construction compound
 - Material stockpile
 - Batters
 - Velocity checks
 - Sumps
 - Earth bund (CB-01) or sediment fence (SD-6-8)
 - ➔ Clean water flow
 - ➔ Dirty water flow
 - Dams
 - Waterways
 - Internal roads
 - Fences

Ref: 18-441 Culcairn SF 20230323_ESCP \ ESCP Map 2
 Author: alyce.g
 Date created: 10.01.2024
 Datum: GDA94 / MGA zone 55



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Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH 	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)			REV Draft V1.0	DATE 29/03/23	DRN AG	DRAWING NO. ESCP05		Job No: 230166 Doc. No: 230166 ESCP Final v1
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					Final V.2	10/01/2024	AG			
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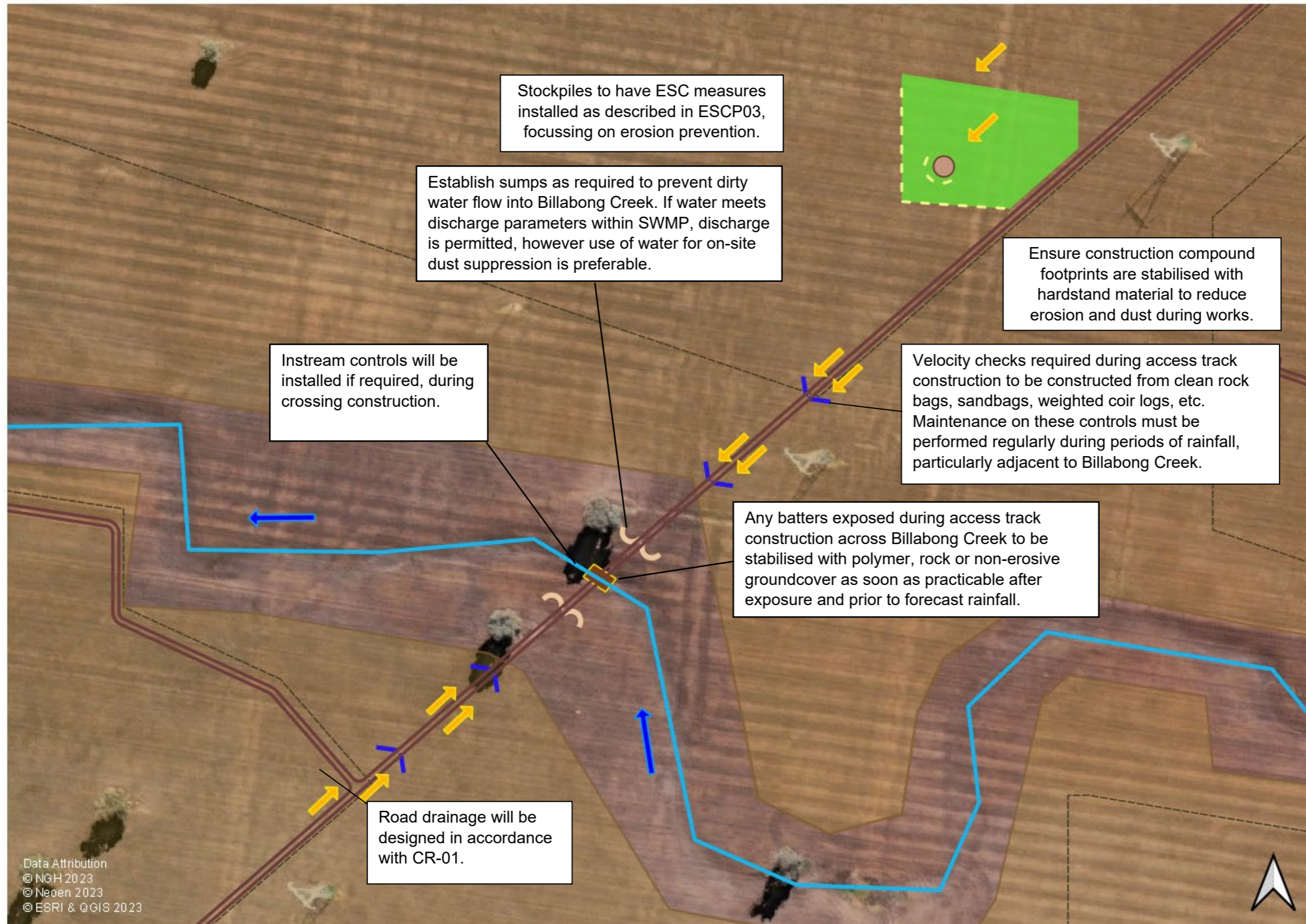
Culcairn Solar Farm Erosion and Sediment Control Plan

Legend

- Project site
- Development footprint
- Construction compound
- Material stockpile
- Batters
- Velocity checks
- Sumps
- Earth bund (CB-01) or sediment fence (SD-6-8)
- ➔ Clean water flow
- ➔ Dirty water flow
- Waterways
- Internal roads
- Fences

Ref: 18-441 Culcairn SF
20230323_AG_ESCP\ESCP Map 3
Author: alyce.g
Date created: 10.07.2023
Datum: GDA94 / MGA zone 55

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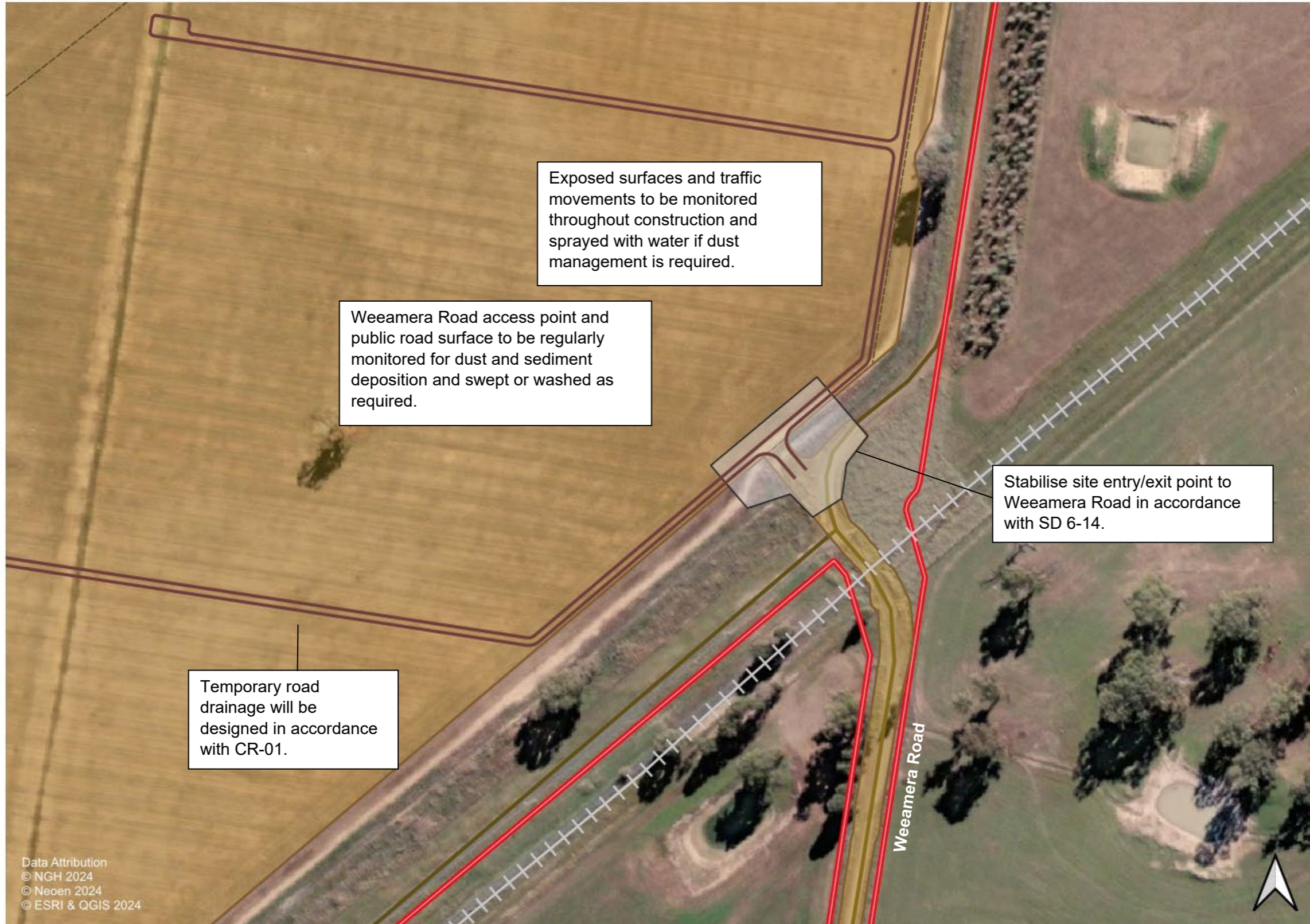


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Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH ↑	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)			REV Draft V1.0 Final V1.0 Final V.2	DATE 29/03/23 27/07/23 10/01/2024	DRN AG AG AG	DRAWING NO. ESCP06		Job No: 230166 Doc. No: 230166 ESCP Final v1
		SCALE (ON A3 ORIGINAL): NTS								



<p>Culcairn Solar Farm Construction Erosion and Sediment Control Plan</p>	<p>NORTH ↑</p>	<p>REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)</p>			<p>REV</p>	<p>DATE</p>	<p>DRN</p>	<p>DRAWING NO. ESCP07</p>	<p>NGH</p>	<p>Job No: 230166 Doc. No: 230166 ESCP Final v1</p>
		<p>SCALE (ON A3 ORIGINAL): NTS</p>			<p>Draft V1.0</p>	<p>29/03/23</p>	<p>AG</p>			
					<p>Final V1.0</p>	<p>27/07/23</p>	<p>AG</p>			
					<p>Final V.2</p>	<p>10/01/2024</p>	<p>AG</p>			

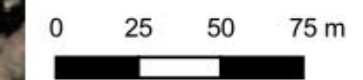


Culcairn Solar Farm Erosion and Sediment Control Plan

Legend

- Project site
- Development Footprint
- Entry / exit pad
- Internal roads
- Fences
- Railway

Ref: 18-441 Culcairn SF 20230323_ESCP \\
 ESCP Map 5
 Author: alyce.g
 Date created: 10.01.2024
 Datum: GDA94 / MGA zone 55



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Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH 	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)			REV	DATE	DRN	DRAWING NO. ESCP08	NGH	Job No: 230166 Doc. No: 230166 ESCP Final v1
		SCALE (ON A3 ORIGINAL): NTS			Draft V1.0	29/03/23	AG			
					Final V1.0	27/07/23	AG			
					Final V.2	10/01/2024	AG			

Culcairn Solar Farm Erosion and Sediment Control Plan

Legend

- Project site
- Development Footprint
- ➔ Dirty water flow
- ➔ Clean water flow
- ▬ Batters
- ▬ Velocity checks
- ▬ Sumps
- Dams
- ▬ Waterways
- ▬ Internal roads
- Fences

Velocity checks required during access track construction to be constructed from clean rock bags, sandbags, weighted coir logs, etc. Maintenance on these controls must be performed regularly during periods of rainfall, particularly adjacent to Billabong Creek.

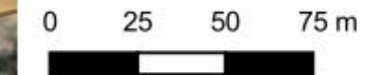
Any batters exposed during access track construction across Billabong Creek to be stabilised with polymer, rock or non-erosive groundcover as soon as practicable after exposure and prior to forecast rainfall.

Instream controls will be installed if required, during crossing construction.

Establish sumps as required to prevent dirty water flow into Billabong Creek. If water meets discharge parameters within SWMP, discharge is permitted, however use of water for on-site dust suppression is preferable.

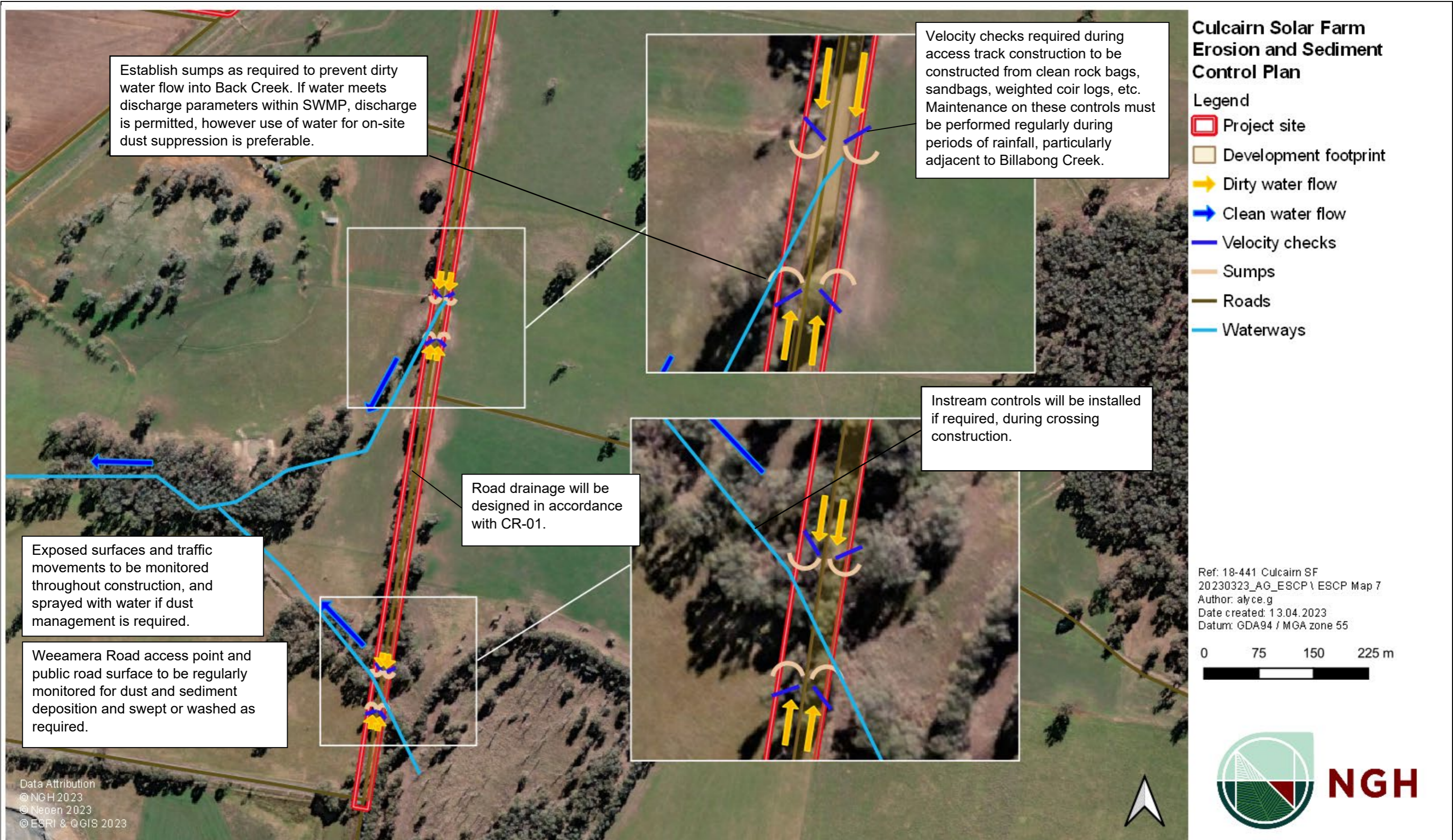
Road drainage will be designed in accordance with CR-01.

Ref: 18-441 Culcairn SF 20230323_ESCP \ ESCP Map 6
 Author: alyce.g
 Date created: 10.01.2024
 Datum: GDA94 / MGA zone 55



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Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH 	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698)			REV Draft V1.0	DATE 29/03/23	DRN AG	DRAWING NO. ESCP09		Job No: 230166 Doc. No: 230166 ESCP Final v1
		SCALE (ON A3 ORIGINAL): NTS			Final V1.0	27/07/23	AG			
					Final V.2	10/01/2024	AG			



**Culcairn Solar Farm
Erosion and Sediment
Control Plan**

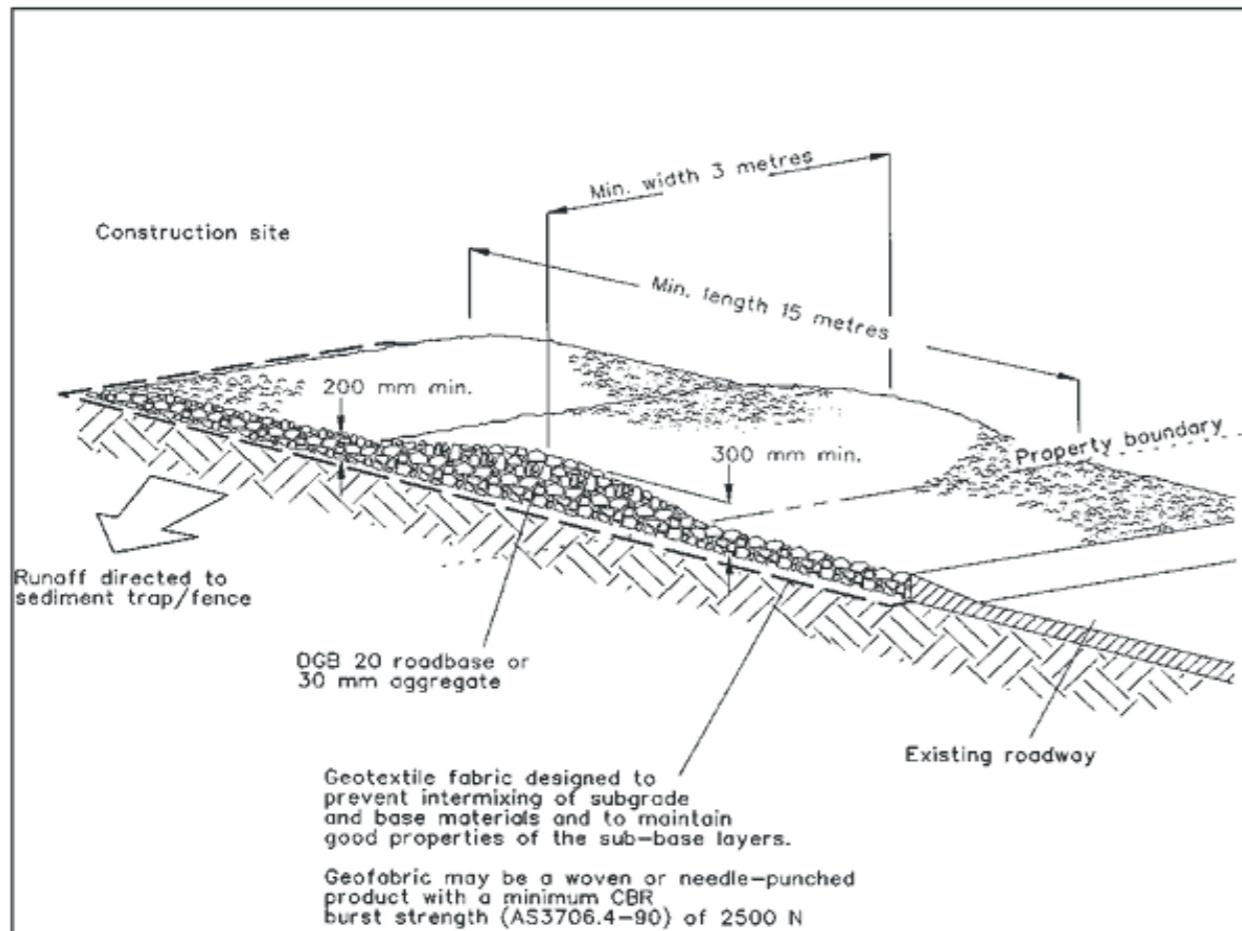
- Legend**
- Project site
 - Development footprint
 - ➔ Dirty water flow
 - ➔ Clean water flow
 - Velocity checks
 - ⤿ Sumps
 - Roads
 - Waterways

Ref: 18-441 Culcairn SF
20230323_AG_ESCP\ ESCP Map 7
Author: alyce.g
Date created: 13.04.2023
Datum: GDA94 / MGA zone 55



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<p>Culcairn Solar Farm Construction Erosion and Sediment Control Plan</p>	<p>NORTH ↑</p>	<p>REVISION DETAILS</p>			<p>DRAWING NO. ESCP010</p>		<p>Job No: 230166 Doc. No: 230166 ESCP Final v1</p>					
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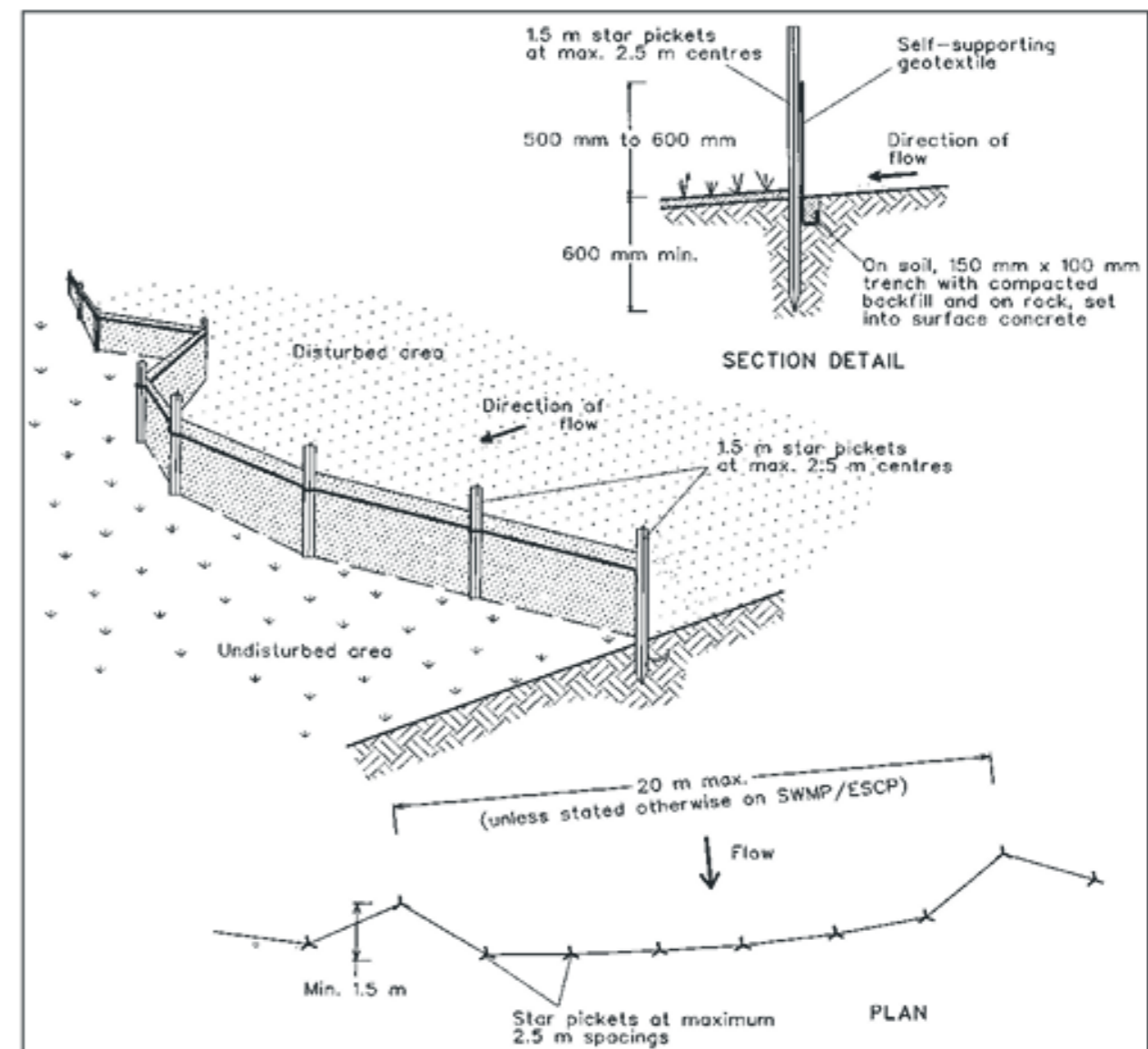


Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

STABILISED SITE ACCESS

SD 6-14




Construction Notes

1. Construct sediment fences as close as possible to being parallel to the contours of the site, but with small returns as shown in the drawing to limit the catchment area of any one section. The catchment area should be small enough to limit water flow if concentrated at one point to 50 litres per second in the design storm event, usually the 10-year event.
2. Cut a 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 metre long star pickets into ground at 2.5 metre intervals (max) at the downslope edge of the trench. Ensure any star pickets are fitted with safety caps.
4. Fix self-supporting geotextile to the upslope side of the posts ensuring it goes to the base of the trench. Fix the geotextile with wire ties or as recommended by the manufacturer. Only use geotextile specifically produced for sediment fencing. The use of shade cloth for this purpose is not satisfactory.
5. Join sections of fabric at a support post with a 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

SEDIMENT FENCE

SD 6-8

Culcairn Solar Farm Construction Erosion and Sediment Control Plan	NORTH ↑	REVISION DETAILS DRAWN BY: Alyce Gill Whitney Heiniger (CPESC-IT 9698) SCALE (ON A3 ORIGINAL): NTS	REV	DATE	DRN	DRAWING NO. ESCP011		Job No: 230166 Doc. No: 230166 ESCP Final v1
			Draft V1.0	29/03/23	AG			
			Final V1.0	27/07/23	AG			
			Final V.2	10/01/2024	AG			

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
2. CLEAR THE LOCATION FOR THE BERM, CLEARING ONLY THE AREA THAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND EQUIPMENT.
3. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY.
4. FORM THE BERM FROM THE MATERIAL, AND TO THE DIMENSION SPECIFIED IN THE APPROVED PLANS.
5. IF FORMED FROM SANDBAGS, THEN ENSURE THE BAGS ARE TIGHTLY PACKED SUCH THAT WATER LEAKAGE THROUGH THE BAGS IS MINIMISED.
6. CHECK THE ALIGNMENT OF THE BERM TO ENSURE POSITIVE DRAINAGE IN THE DESIRED DIRECTION.
7. ENSURE THE BERM DISCHARGES TO A STABLE OUTLET.
8. ENSURE THE BERM DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

MAINTENANCE

1. INSPECT FLOW CONTROL BERMS AT LEAST WEEKLY AND AFTER RUNOFF-PRODUCING RAINFALL.
2. INSPECT THE BERM FOR ANY SLUMPS, WHEEL TRACK DAMAGE OR LOSS OF FREEBOARD. MAKE REPAIRS AS NECESSARY.
3. CHECK THAT FILL MATERIAL OR SEDIMENT HAS NOT PARTIALLY BLOCKED THE DRAINAGE PATH UP-SLOPE OF THE EMBANKMENT. WHERE NECESSARY, REMOVE ANY DEPOSITED MATERIAL TO ALLOW FREE DRAINAGE.
4. DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
5. REPAIR ANY PLACES IN THE BERM THAT ARE WEAKENED OR IN RISK OF FAILURE.

REMOVAL


1. WHEN THE SOIL DISTURBANCE ABOVE THE BANK IS FINISHED AND THE AREA IS STABILISED, THE FLOW CONTROL BERM SHOULD BE REMOVED, UNLESS IT IS TO REMAIN AS A PERMANENT DRAINAGE FEATURE.
2. DISPOSE OF ANY SEDIMENT OR EARTH IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
3. GRADE THE AREA AND SMOOTH IT OUT IN PREPARATION FOR STABILISATION.
4. STABILISE THE AREA BY GRASSING OR AS SPECIFIED IN THE APPROVED PLAN.

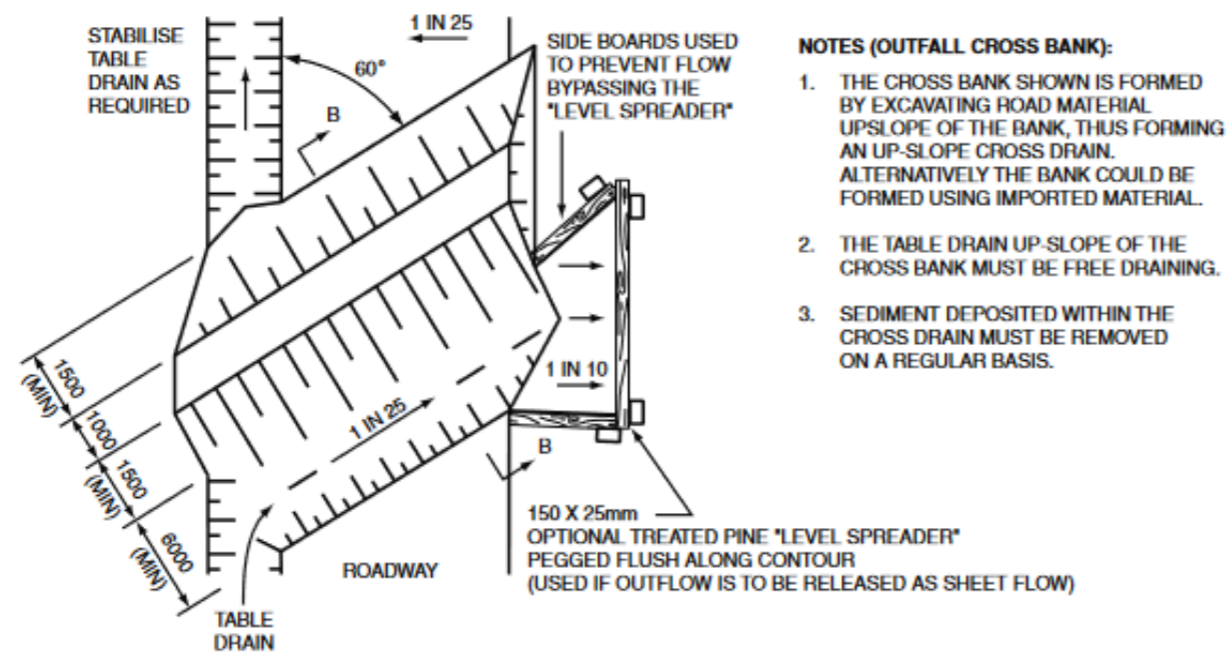
Table 1 - Recommended dimensions of flow control berms

Parameter	Earth banks	Vegetated banks	Compost berms	Sandbag berms
Height (min)	500 mm	500 mm	300 mm	N/A
Top width (min)	500 mm	500 mm	100 mm	N/A
Base width (min)	2500 mm	2500 mm	600 mm	N/A
Side slope (max)	2:1 (H:V)	2:1 (H:V)	1:1 (H:V)	N/A
Freeboard	300 mm	150 mm	100 mm	50 mm

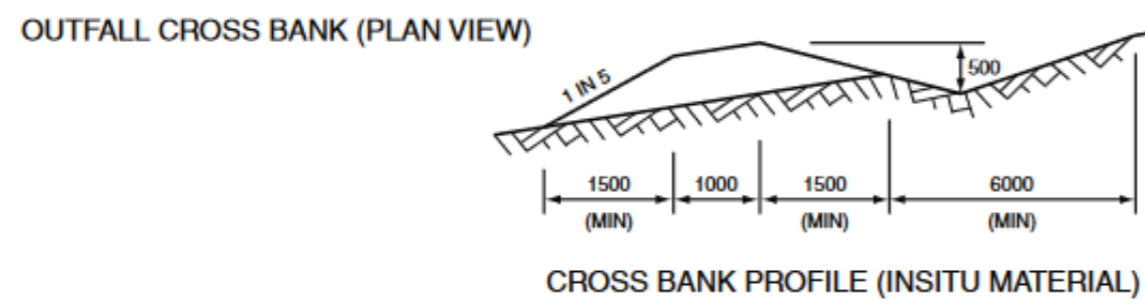
Drawn: GMW	Date: Dec-09	Flow Control Berms	CB-01
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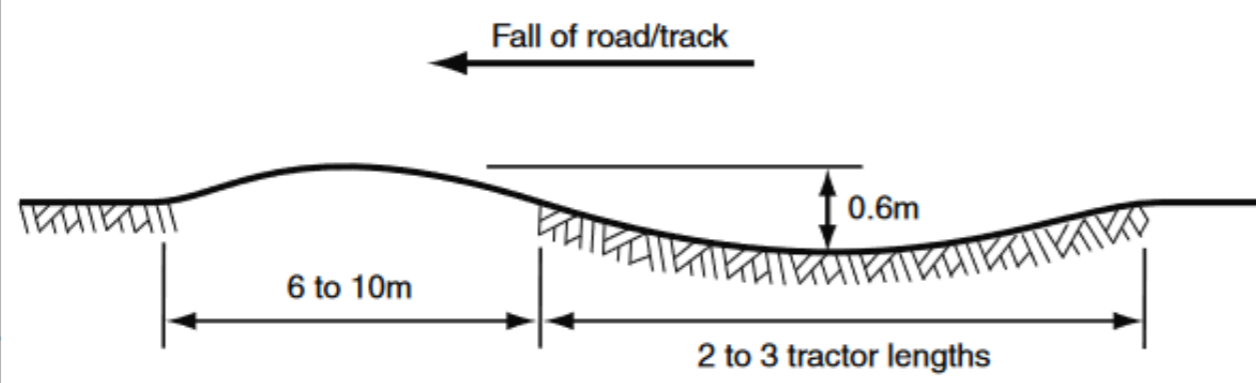
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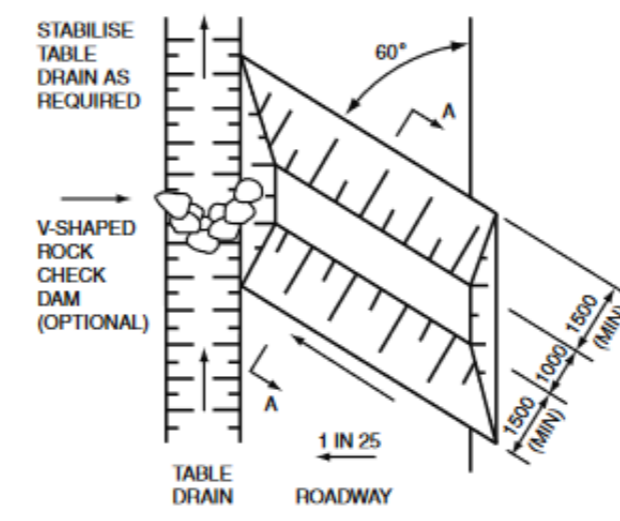
- NOTES (OUTFALL CROSS BANK):**
1. THE CROSS BANK SHOWN IS FORMED BY EXCAVATING ROAD MATERIAL UPSLOPE OF THE BANK, THUS FORMING AN UP-SLOPE CROSS DRAIN. ALTERNATIVELY THE BANK COULD BE FORMED USING IMPORTED MATERIAL.
 2. THE TABLE DRAIN UP-SLOPE OF THE CROSS BANK MUST BE FREE DRAINING.
 3. SEDIMENT DEPOSITED WITHIN THE CROSS DRAIN MUST BE REMOVED ON A REGULAR BASIS.



(a) Outfall cross-bank for low speed tracks



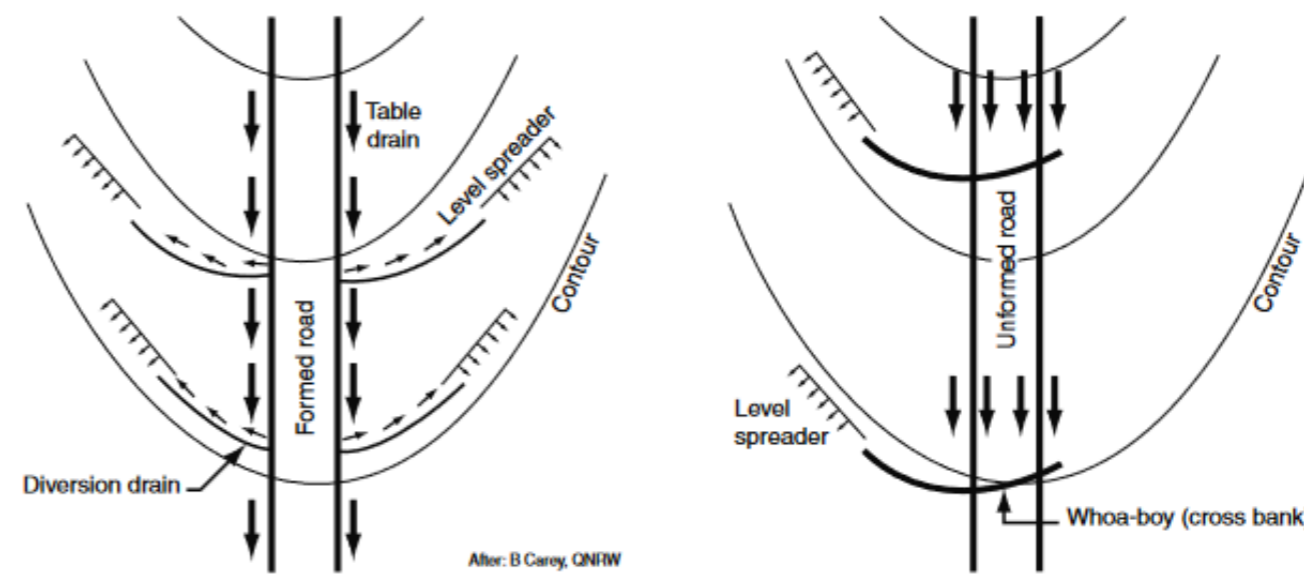
(e) Typical cross-bank profile for low speed tracks



- NOTES (INFALL CROSS BANK):**
1. THE CROSS BANK SHOWN IS FORMED USING IMPORTED MATERIAL AND THUS DOES NOT REQUIRE ANY EXCAVATIONS INTO THE ROAD UP-SLOPE OF THE BANK. ALTERNATIVELY, THE BANK COULD BE FORMED USING INSITU MATERIAL.
 2. ROCK CHECK DAMS OR OTHER STABILISATION MEASURES PLACED IN THE TABLE DRAIN MUST NOT CAUSE PONDING ON THE ROAD.

INFALL CROSS BANK (PLAN VIEW) CROSS BANK PROFILE (IMPORTED MATERIAL)

(b) Infall cross-bank for low speed tracks



(c) - (d) Drainage options for ridge tracks

- General notes:**
1. Drainage structures are applicable to unsealed roads and tracks.
 2. Design details vary with traffic volume and speeds.

Drawn: GMW	Date: Dec-09	Construction Road Drainage	CR-01
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MATERIALS

FIBRE ROLLS: TYPICALLY 200 TO 250mm JUTE, COIR OR STRAW ROLL TIED WITH SYNTHETIC OR BIODEGRADABLE MESH.

STAKES: MINIMUM 25 x 25mm TIMBER STAKES.

INSTALLATION

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

2. WHEN PLACED ACROSS NON-VEGETATED OR NEWLY SEEDED SLOPES, THE ROLLS MUST BE PLACED ALONG THE CONTOUR.

3. IF PLACED ON OPEN OR LOOSE SOIL, ENSURE THE FIBRE ROLLS ARE TRENCHED 75 TO 125mm IN SANDY SOILS AND 50 TO 75mm IN CLAYEY SOILS.

4. ENSURE THE OUTER MOST ENDS OF THE FIBRE ROLL ARE TURNED UP THE SLOPE TO ALLOW WATER TO ADEQUATELY POND UP-SLOPE OF THE ROLL, AND TO MINIMISE FLOW BYPASSING.

5. WHEN PLACED ACROSS THE INVERT OF MINOR DRAINS, ENSURE THE SOCKS ARE PLACED SUCH THAT:

- (i) THE CREST OF THE DOWNSTREAM ROLL IS LEVEL WITH THE CHANNEL INVERT AT THE IMMEDIATE UPSTREAM SOCK (IF ANY);
- (ii) EACH ROLL EXTENDS UP THE CHANNEL BANKS SUCH THAT THE CREST

OF THE FIBRE ROLL AT ITS LOWEST POINT IS LOWER THAN THE GROUND LEVEL AT EITHER END OF THE ROLL.

6. ENSURE THE ANCHORING STAKES ARE DRIVEN INTO THE END OF EACH ROLL AND ALONG THE LENGTH OF EACH ROLL AT A SPACING NOT EXCEEDING 1.2m OR SIX TIMES THE ROLL DIAMETER, WHICHEVER IS THE LESSER. A MAXIMUM STAKE SPACING OF 0.3m APPLIES WHEN USED TO FORM CHECK DAMS.

7. ADJOINING ROLL MUST BE OVERLAP AT LEAST 450mm, NOT ABUTTED.

MAINTENANCE

1. INSPECT ALL FIBRE ROLLS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING STORMS OR OTHERWISE AT WEEKLY INTERVALS.

2. REPAIR OR REPLACE DAMAGED FIBRE ROLLS.

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

REMOVAL

1. ALL EXCESSIVE SEDIMENT TRAPPED BY THE ROLLS MUST BE REMOVED FROM THE DRAIN OR SLOPE IF SUCH SEDIMENT IS LIKELY TO BE WASHED AWAY BY EXPECTED FLOWS.

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

3. THE BIODEGRADABLE CONTENT OF THE STRAW ROLLS MAY NOT NECESSARILY NEED TO BE REMOVED FROM THE SITE.

4. ALL SYNTHETIC (PLASTIC) MESH OR OTHER NON READILY BIODEGRADABLE MATERIAL MUST BE REMOVED FROM THE SITE ONCE THE SLOPE OR DRAIN IS STABILISED, OR THE ROLLS HAVE DETERIORATED TO A POINT WHERE THEY ARE NO LONGER PROVIDING THEIR INTENDED DRAINAGE OR SEDIMENT CONTROL FUNCTION.

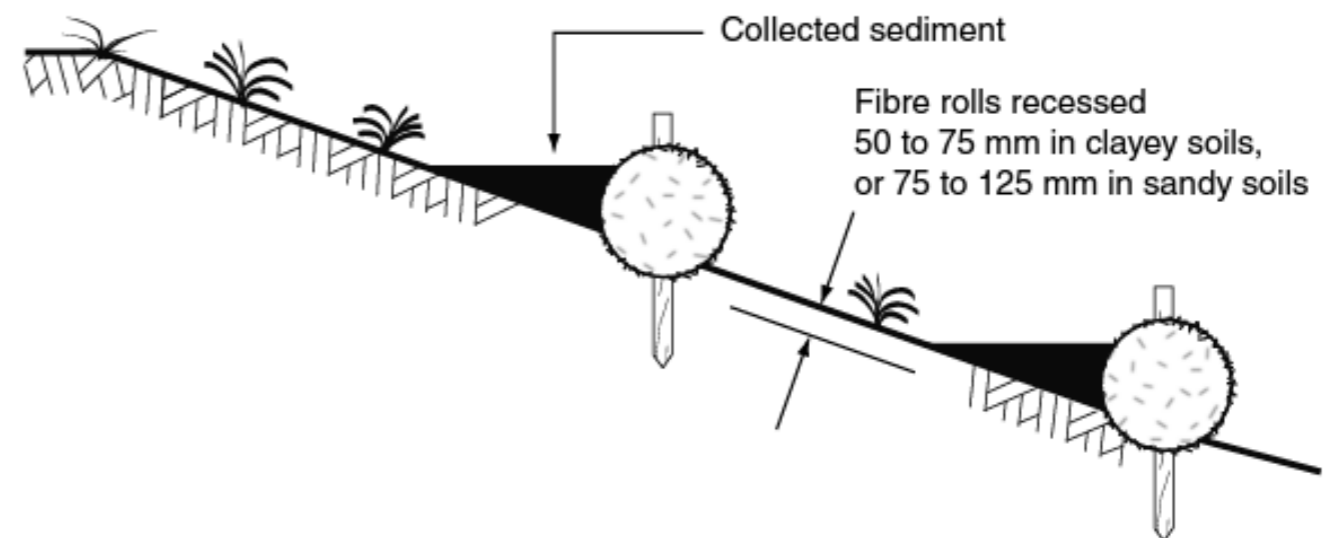


Figure 1 - Typical installation of fibre rolls

Drawn:	Date:		
GMW	Apr-10	Fibre Rolls	FR-01

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REV	DATE	DRN										
Draft V1.0	29/03/23	AG										
Final V1.0	27/07/23	AG										
Final V.2	10/01/2024	AG										

Appendix D Unexpected Finds Procedure for contaminated soils

To prevent further disturbance, follow these measures:

- Stop works in the potentially hazardous area immediately, including excavations or drilling
- Isolate material or spill from further movement, where practicable
- Move to a designated meeting point or safe area
- Notify the SEA OR Construction Foreman OR Superintendent OR Environmental Manager OR Person in control of the workplace
- Make the area temporarily “safe”
- Use dust suppression to dampen the area for any suspected asbestos impacted soil
- Cover the unexpected finds if safe to do so (wearing PPE) and covering using geofabric or plastic
- Delineate an exclusion zone around the area using fencing and appropriate barriers and signage. The exclusion zone should be at least a 10-metre buffer from the unexpected find.

Examples of signage include:



Inspection and investigation

- Assess the potential risk to human health and the environment posed by the unexpected find and assess if evacuation or emergency services need to be contacted.
- A suitably experienced environmental consultant should undertake an assessment of any unexpected finds and determine any further actions required e.g., sampling and/or validation of material, potential for remediation and/or management.
- Construction Foreman to arrange inspection by SEA /and external environmental consultant to assess the unexpected find and provide advice as follows:
 - Preliminary assessment of the find and need for immediate management controls (if any)
 - What further assessment and / or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines and management procedures
 - Preparation of a Remedial Action Plan for large scale contamination or specification for smaller or minor volumes of material (if necessary)
 - Remediation works required (where applicable)
 - Validation works required following remediation works (if applicable).

Remediation Action Plan

- If the SEA and external environmental consultant determine there is a risk to human and environmental health, remediation and validation is required. The site validation report must be forwarded to the EPA for review and endorsement prior to occupancy of the site.
- If required by the SEA / external environmental consultant, a Remedial Action Plan (RAP) will be prepared and implemented in accordance with the following endorsed guidelines as a minimum:
 - National Environmental Protection Measure, Assessment of Contaminated Sites, 2013 (NEPM 2013)

- NSW EPA Consultants Reporting on Contaminated Land – Contaminated Land Guidelines 2020 (NSW EPA 2020)
- NSW EPA Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme 2017 (3rd Edition) (NSW EPA 2017)
- NSW EPA Duty to Report Contamination under the Contaminated Land Management Act 1997 (CLM Act 1997).
- Works are not to recommence in the affected area until appropriate advice has been obtained from the environmental consultant or suitably qualified person and they have provided clearance.
- Intrusive works (excavation and drilling) will not recommence until the extent of the contamination has been assessed and, if necessary, a RAP has been prepared and the site has been validated.

Validation

- Recommencement of development activities in an area requiring remediation and validation cannot take place until the EPA has reviewed and endorsed the consultant's validation report into the suitability if the area for its permitted uses.
- If it is deemed safe to do so, the environmental consultant will provide clearance for works to proceed in the affected area. If it is not considered to be safe, works must remain on hold until appropriate assessment, remediation and / or validation measures have been actioned.
- The material will be separated from other materials and stockpiled for assessment. Sampling of the materials will be undertaken in accordance with the relevant guidelines or professional judgement where justification is applied. Samples will be analysed for a range of analytes as required.
- Laboratory results will be assessed to determine the appropriate waste classification of the material in accordance with the NSW EPA Waste Classification Guidelines – Part 1: Classification of Waste (NSW EPA 2014).
- Depending on the classification, material already excavated and stockpiled will be transported to an appropriate waste facility that is licensed to accept waste of the relevant classification or beneficially reused if appropriate.
- A waste tracking system recording the volume of material, waste classification status, removal documentation and truck and receiving landfill facility details must be recorded to ensure all waste is accounted for and disposed of appropriately in accordance with NSW EPA requirements.
- Any unexpected finds must be documented in the validation report to be prepared at the completion of construction, if required. For 'ad-hoc' and minor volumes of materials identified (i.e., <10m³) records must be kept on file.
- Keep a record of the unexpected find. Any validation reports or remedial works will also act as a record of works undertaken to minimise risks to human health and the environment. The record must include exact location / GPS coordinates of the find.