

**CONCEPTUAL EROSION AND  
SEDIMENT CONTROL PLAN**

Wallerawang Quarry

**VERSION 4**

May 2024







## CONCEPTUAL EROSION AND SEDIMENT CONTROL PLAN

Wallerawang Quarry

### VERSION 4

Prepared by  
Umwelt (Australia) Pty Limited  
on behalf of  
Walker Quarries Pty Limited

Project Director: Adam Williams  
Project Manager: Kelsy Sammons  
Report No. 4433/R16  
Date: January 2024



#### Lithgow

PO Box 307  
Lithgow NSW 2790  
ABN 82 003 061 890

T | 02 6352 3377  
E | [accounts@walkerquarries.com.au](mailto:accounts@walkerquarries.com.au)

[www.walkerquarries.com.au](http://www.walkerquarries.com.au)

#### Newcastle

75 York St  
Teralba  
NSW 2284

T | 1300 793 267  
E | [info@umwelt.com.au](mailto:info@umwelt.com.au)

[www.umwelt.com.au](http://www.umwelt.com.au)



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**Document Status**

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
1	Melissa Swan, Adam Williams	17 May 2024	Melissa Swan	17 May 2024

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CONCEPTUAL PRIMARY EROSION AND SEDIMENT CONTROL PLAN

NOTES 1 - SCOPE

- This Conceptual Primary Erosion and Sediment Control Plan (ESCP) has been prepared to satisfy Schedule 3, Condition 18(d) of Development Consent DA 344-11-2001 for Wallerawang Quarry (the Quarry), owned and operated by Walker Quarries.
- This ESCP details the management of rainfall and runoff (Stormwater Management), management of erosion and sediment control (Erosion and Sediment Control Management) and mitigation of associated impacts, during the operation of the Quarry.
- The ESCP has been prepared with reference to:
  - The Quarry Soil and Water Management Plan (Umwelt, 2024) and should be read in conjunction with this document.
  - Managing Urban Stormwater: Soils and Construction, Vol. 1 Second ed., Landcom, NSW, Sydney (Landcom, 2004) ("the Blue Book").
  - Managing Urban Stormwater: Soils and Construction, Volumes 2C and 2E (DECC, 2008)
  - Managing Urban Stormwater: Council Handbook (EPA, 1997) ("the Council Handbook") (in lieu of a Stormwater Management Plan for the Cocks River Catchment).
- The ESCP describes the Best Management Practices (BMPs) that will be employed to minimise soil erosion and discharge of sediment and other pollutants to lands and/or waters associated with activities at the Quarry.
- The BMPs, i.e. diversion banks, sediment fencing, drains and sediment basins are to remain in place and be maintained for the life of the Quarry or unless otherwise instructed.
- The ESCP is valid for the Establishment and Modified Operations Phases (as defined by **Figure 1.1** – refer to **Sheet 10**), however, will be reviewed (and updated as necessary):
  - If site conditions change or if controls outlined within this document are not operating effectively.
  - In the event of progression to the Future Operations Phase (as defined by **Figure 1.1**).
  - Following any incident resulting in water pollution.
  - On request by the Department of Planning, Housing and Infrastructure (DPHI) or relevant government regulator.

- Additional erosion and/or sediment control works are to be constructed, as may become necessary to ensure the desired protection is given to downslope lands and waterways, i.e. making ongoing changes to this Primary ESCP where it proves inadequate in practice or is subject to changes in conditions at the work site or elsewhere in the catchment.

**MANAGEMENT OBJECTIVES**

The objectives of this Primary ESCP are:

- To minimise the water quality impacts from erosion and sedimentation through implementing BMP techniques, specifically:
  - To minimise the loss of topsoil from areas disturbed by mining activities.
  - To ensure runoff from disturbed (and unrehabilitated) catchments is controlled and captured by sediment control systems.
  - To prevent active erosion of stabilised areas.
  - To ensure no increase in sediment deposition of receiving waters.
- To minimise any potential detrimental impact on the water quality of downstream watercourses and water bodies as a result of quarry operations.

**PRINCIPLES OF SURFACE WATER MANAGEMENT**

**Stormwater Management**

- The ESCP is based on the three broad management principles for stormwater management identified by **Table 4.1** of Managing Urban Stormwater: Council Handbook (EPA, 1997) ("the Council Handbook") (refer **figure S1**).
- These management principles are applied in a hierarchical manner, whereby valuable features of the natural environment are identified and retained or restored.
- Preventative measures (e.g. retaining groundcover) are implemented initially with 'end of pipe' measures (e.g. sediment controls) only applied for residual impacts that cannot be cost-effectively mitigated by source control.

**PRINCIPLES OF SURFACE WATER MANAGEMENT (Continued)**

**Erosion and Sediment Control Management**

Erosion and Sediment Control Management is based on the broad management principals of *Section 3.2* of Volume 2E of the Blue Book.

Planning Phase

- Identify and assess the soil and water impacts during project planning.
- Plan for erosion and sediment control before any earthworks begin, including assessment of site constraints.

Operations Phase

- Minimise the area of soil disturbed and exposed to erosion.
- Conserve topsoil for later site rehabilitation or regeneration (in a stabilized stockpile).
- Control water flow through the project area by diverting up-slope 'clean' water away from disturbed areas and ensuring concentrated flows are below erosive levels and water exposed to disturbed (erodible) surfaces is captured.
- Undertake progressive rehabilitation, where possible, in accordance with the Rehabilitation Management Plan (RMP).

**PRINCIPLES OF SURFACE WATER MANAGEMENT (Continued)**

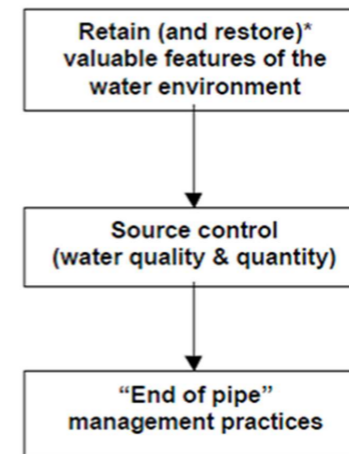
**Erosion and Sediment Control Management (Continued)**

Maintenance and Rehabilitation Phase

- Rehabilitate disturbed lands as soon as possible following disturbance, in accordance with the RMP.
- Maintain erosion and control measures appropriately.

**STORMWATER MANAGEMENT TECHNIQUES**

- Five broad environmental aspects which may be impacted by erosion and/or sedimentation have been considered as part of this ESCP. These include:
  - Flow
  - Channel Morphology
  - Water Quality
  - Riparian Vegetation
  - Aquatic Habitat
- Table S1** (refer to **Sheets 02** and **03**) identifies the stormwater management techniques to be applied for each of the five environmental aspects and with reference to the principles of stormwater management hierarchy.



\*if degraded

Table 4.1 – Stormwater Management Hierarchy

Source: EPA (1997)

Figure S1

STORMWATER MANAGEMENT HIERARCHY

REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS		CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN - NOTES 1		
1	17 May 2024	KS/MS	AW/MS	New ESCP	DESIGN BY:	N/A					WALLERAWANG QUARRY
					DRAWN BY:	N/A					
					APPROVAL	N/A					
					APPROVAL	N/A					

EROSION AND SEDIMENT CONTROL PLAN

Table S1 Conceptual Stormwater Management Techniques



Environmental Aspect	Management Principles			Monitoring and Maintenance
	Retention and Restoration	Source Control	End-of-Pipe Mitigation	
Flow	Reduce the catchment of the Quarry by diverting runoff around and through the Quarry.	Reduce the total disturbed catchment of the Quarry (reduction in flow) by only clearing in immediate advance of extraction.	Install rock-lining or other stabilizing medium at discharge points (refer to BMP Notes on <a href="#">Diversion Drains</a> ).	<p>Implement a Self-Auditing Program to confirm the continued implementation of the nominated management techniques, in particular 'Source Control' and 'End-of-Pipe Mitigation' techniques (refer to BMP Notes - <a href="#">Self-Auditing Program</a>).</p> <p>Inspect erosion and sediment control structures at least monthly and immediately following heavy rainfall.</p> <p>Implement maintenance measures in accordance with BMP Notes - <a href="#">Monitoring and Maintenance</a>.</p> <p>If repeated failures of structures are identified, engage a qualified Erosion and Sediment Control specialist to review design and implement recommended modifications or additions.</p>
		Construct clean water drains to control accumulated flow and allow for non-erosive discharge to the catchment.	Construct sediment basins in accordance with SD 6-4, i.e. wet basin (water retention) structure, in the locations nominated in <b>Figure 1.1</b> , with the minimum capacities nominated in <b>Table S4</b> and in accordance with BMP Notes - <a href="#">Sediment Basins</a> .	
Channel Morphology	Reduce the erosive force of flows within diversion drains and discharge points to natural drainage by establishing and maintaining ground cover.	Establishing ground cover to achieve the C-Factor nominated in <b>Table S2</b> .	Maintain diversion drains as identified on <b>Figure 1.1</b> in accordance with design features nominated in BMP Notes on <a href="#">Diversion Drains</a> .	
		Where groundcover cannot be established, install rock check dams to reduce flow velocity.	Install rock-lining or other stabilizing medium at discharge points (refer to BMP Notes on <a href="#">Diversion Drains</a> ).	
			Construct level spreader discharge points in accordance with SD 5-6 and in accordance with design features nominated in BMP Notes on <a href="#">Diversion Drains</a> .	
Water Quality	Divert runoff away from disturbed ground of the Quarry.	Construct and maintain clean water diversion drains upslope of disturbance.	Install and maintain sediment fences downslope of disturbance areas in accordance with <b>Table S2</b> (refer to BMP Notes - <a href="#">Sediment Fencing</a> ).	
	Reduce runoff from disturbed catchments of the Quarry.	Reduce the total disturbed catchment of the Quarry (reduction in flow) by only clearing in immediate advance of mining or ancillary activities.	Establish No Go barriers (refer to BMP Notes on <a href="#">Facility Access and Barrier Fencing</a> ).	
	Ensure only water compliant with the water quality criteria of the WMP discharged from the Quarry (under rainfall conditions not exceeding 56 mm in 5 days).	Reduce the requirement for controlled discharge by storing and distributing water as discussed in Water Usage, Sources and Distribution - <a href="#">Water Distribution and Transfer</a> (refer to <b>Sheet 04</b> ).	Progressively rehabilitate non-operational areas of the Quarry, where available.	
		Maximise the storage capacity in Quarry sediment basins and water storages above the minimum storage capacity requirements (of <b>Table S4</b> ).	Undertake sampling and analysis in accordance with a Surface Water Monitoring Program (refer also to BMP Notes - <a href="#">Monitoring and Maintenance</a> ).	
	Sample and analyse water contained within SD1 and SB2 prior to 'controlled discharge'.			

REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS		CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN - NOTES 1	
1	17 May 2024	KS/MS	AW/MS	New ESCP	DESIGN BY:	N/A		WALLERAWANG QUARRY		
					DRAWN BY:	N/A				
					APPROVAL	N/A				
					APPROVAL	N/A				
									Sheet No. 02	V1

**EROSION AND SEDIMENT CONTROL PLAN**

**Table S1 (Continued) Stormwater Management Techniques**

Environmental Aspect	Management Principles			Monitoring and Maintenance
	Retention and Restoration	Source Control	End-of-Pipe Mitigation	
<b>Riparian Vegetation</b>	Retain and prevent disturbance to native vegetation external to disturbance areas nominated in DA 344-11-2001.	None required.	Not applicable.	Not required.
<b>Aquatic Habitat</b>	Reduce the catchment of the Quarry by diverting clean water runoff around disturbed areas.	Construct clean water drains in accordance with BMP Notes - <u>Diversion Drains</u> to control accumulated flow and allow for non-erosive discharge to the catchment.	Construct sediment basins in accordance with SD 6-4, with the minimum capacities nominated in <b>Table S4</b> , and in accordance with BMP Notes on <u>Sediment Basins</u> .	Implement maintenance measures in accordance with BMP Notes - <u>Monitoring and Maintenance</u> . If repeated failures of structures are identified, commission an appropriately qualified Erosion and Sediment Control specialist to review design and implement recommended modifications or additions.
	Ensure the quality of water discharged under conditions not exceeding 56 mm in 5 days meets the water quality criteria of EPL 13172.	Sample and analyse water contained within SD1 and SB2 prior to 'controlled discharge'.	Undertake sampling and analysis in accordance with a Surface Water Monitoring Program, as nominated in the approved SWMP.	Undertake sampling and analysis in accordance with a Surface Water Monitoring Program, as nominated in the approved SWMP (refer also to BMP Notes - <u>Monitoring and Maintenance</u> ).

REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS			CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN - NOTES 1	
1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A				 	WALLERAWANG QUARRY
					DRAWN BY:	N/A					
					APPROVAL	N/A					
					APPROVAL	N/A					
										Sheet No. 03	V1



**EROSION AND SEDIMENT CONTROL PLAN**

**NOTES 2- WATER USAGE, SOURCES AND DISTRIBUTION**

**EROSION HAZARD AND ESC DESIGN STANDARDS**

<p><b>Water Usage</b></p> <p>Water is required at the Quarry for four principal purposes:</p> <ol style="list-style-type: none"> <li>Dust suppression of active and exposed areas, e.g. internal roads, hardstand surface and stockpile areas.</li> <li>Dust suppression of crushing operations.</li> <li>Sand washing.</li> <li>Evaporative losses from water storages and stockpiles.</li> </ol> <p><b>Water Sources</b></p> <p>Water at the Quarry is collected and distributed from three sources as follows:</p> <ol style="list-style-type: none"> <li>Rainfall and runoff from the disturbance footprint of the Quarry. This 'dirty water' runoff is directed as follows: <ul style="list-style-type: none"> <li>Extraction Area. Runoff is collected within sumps and pumped to the Main Storage Dam (SD1) as required.</li> <li>Main Stockpile Area. Runoff is directed to Sediment Basin 1 (SB1). Overflow is to SD1.</li> <li>Western Stockpile Area. Runoff from the upper tier flows to SB6 with overflow discharging to the lower tier and to SB1 via overland flows and several coarse sediment retention basins.</li> <li>Eastern Stockpile Area. Runoff is retained on this stockpile area by an earth bund. Accumulated water can be pumped to the water management system as required.</li> <li>Office, Weighbridge and Carpark Area. Runoff is directed to SB1 with overflow to SD1.</li> <li>SD2 is used as an additional water storage dam as required.</li> </ul> </li> </ol>	<p><b>Water Sources (Continued)</b></p> <ul style="list-style-type: none"> <li>Supplementary Stockpile Area. Runoff flows to the Bottom Working Dam (SB2) which also accepts runoff from uncleared areas between the extraction area and SB2, and part of the Great Western Highway.</li> </ul> <ol style="list-style-type: none"> <li>Runoff from undisturbed areas of the Quarry or sources external to the Quarry: <ul style="list-style-type: none"> <li>Runoff from the Great Western Highway to the west of the Quarry office discharges to highway stormwater culverts which discharges onto the Quarry and is directed via pipes and stabilised drains through the Quarry.</li> <li>A small portion of Great Western Highway runoff to the east of the Quarry office discharges to a highway stormwater culvert which is directed onto the Quarry and into SB2.</li> <li>Runoff from a small area of undisturbed ground between the extraction area and SB2 is directed to SB2.</li> </ul> </li> <li>Groundwater. Groundwater is pumped from a bore located on Lot 7 DP 872230 to a water tank located within the Eastern Stockpile Area.</li> </ol> <p><b>Water Distribution and Transfer</b></p> <ul style="list-style-type: none"> <li>Water for dust suppression and washing is drawn from SD1.</li> <li>Water used in the wash plant is predominantly recycled within the facility, with any excess to discharge to SD1.</li> <li>Groundwater is periodically pumped from the groundwater bore to the water tank on the Eastern Stockpile Area. WAL 42390 allows for the extraction of up 100 ML per year.</li> <li>Water is pumped from the water tank on the Eastern Stockpile Area to SD1 as required, to ensure water is available for washing and dust suppression.</li> </ul>	<p><b>Water Distribution and Transfer (Continued)</b></p> <ul style="list-style-type: none"> <li>As water accumulates in the Sediment Basins (SBs) and reaches the minimum settlement and storage capacity, water will be pumped to another storage or use.</li> <li>Under conditions where rainfall is below the minimum design criteria of the sediment basins, i.e. 56 mm which is the 5-day 95<sup>th</sup> percentile rainfall event for the locality, the priority of transfer / usage options for water accumulated in the sediment basins is as follows. <ol style="list-style-type: none"> <li>Transfer to SD1.</li> <li>Transfer to SD2.</li> <li>Irrigation of the Quarry amenity bund or other areas of the Quarry where vegetation is being established.</li> <li>Transfer to another SB (which has capacity).</li> <li>Discharge from SD1 or SB2, i.e. the Licensed Discharge Points (LDPs), subject to achieving water quality criteria of EPL 13172.</li> </ol> </li> <li>Under conditions where rainfall exceeds 56 mm over 5 days, the priority of transfer/usage options is as follows. <ol style="list-style-type: none"> <li>Transfer to SD1.</li> <li>Transfer to SD2.</li> <li>Discharge via either LDP.</li> </ol> </li> </ul>	<p><b>EROSION HAZARD ASSESSMENT</b></p> <ul style="list-style-type: none"> <li>Erosion hazard has been assessed using the Revised Universal Soil Loss Equation (RUSLE) (Landcom, 2004) for each catchment of the Quarry – refer to the Quarry SWMP (Umwelt, 2024) for details.</li> </ul> <p><b>TEMPORARY DRAINAGE (EROSION) CONTROLS</b></p> <ul style="list-style-type: none"> <li>All temporary drainage controls are to be designed to have a non-erosive hydraulic capacity to convey runoff from a 20-year critical duration ARI storm event (i.e. peak flow from a 20-year time of concentration (tc) storm event), as per Table 6.1 of Volume 2E of the 'Blue Book'.</li> </ul> <p><b>TEMPORARY SEDIMENT CONTROL MEASURES</b></p> <ul style="list-style-type: none"> <li>Temporary sediment controls will be designed to be structurally sound during a 20-year ARI storm event in accordance with Table 6.1 of Volume 2E of the 'Blue Book'.</li> </ul> <p><b>SEDIMENT BASINS</b></p> <ul style="list-style-type: none"> <li>Sediment basin minimum conceptual design standards are detailed on Notes 6 within this ESCP.</li> <li>Sediment basins are to be sized as per the following. <ul style="list-style-type: none"> <li>Type D sediment basins.</li> <li>Duration of disturbance &gt; 3 years.</li> <li>Design Storm Event – 5-day, 95th percentile event with 'sensitive' receiving waters.</li> <li>Design Storm Event Rainfall Depth (mm) – 56 mm.</li> <li>Sediment Basin Embankment and Spillways to be structurally sound in a 100-year ARI event.</li> <li>Sediment Zone Capacity to be designed for a 2-month soil loss as calculated using the Revised Universal Soil Loss Equation (RUSLE).</li> </ul> </li> </ul>
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**Commented [KS1]:** Wayne: Can you please confirm if the water tank is still in use, or is it pumped directly to SD1?

REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS			CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN - NOTES 2	
1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A				<p align="center"><b>WALLERAWANG QUARRY</b></p>	
					DRAWN BY:	N/A					
					APPROVAL	N/A					
					APPROVAL	N/A					
									Sheet No. 04	V1	

**EROSION AND SEDIMENT CONTROL PLAN**

**NOTES 3 - IMPLEMENTATION**

<p><b>GENERAL</b></p> <p>1. All water management structures, i.e. erosion and sediment control structures, table drains and pipes, are to remain in place and be maintained for the duration of the Quarry unless otherwise instructed.</p> <p><b>STAGING</b></p> <p>Works are to proceed in the following order:</p> <p>A. Install or maintain erosion and sediment control measures for the <b>Stage 1 Extraction Phase (Figure 1.1)</b>.</p> <p>B. Implement erosion and sediment control measures for the period of operations covered by <b>Figure 1.1</b>.</p> <p>C. Review, adapt and update the ESCP prior to extraction proceeding beyond the extents of <b>Figure 1.1</b>.</p> <p><b>STAGE 1 EXTRACTION PHASE</b></p> <p>Works are to proceed in the following order:</p> <p>1. Maintain No Go Areas with barrier fence, sediment fence, tape, diversion bank or other suitable means in the areas nominated on <b>Figure 1.1</b> (refer to BMP Notes – <u>Facility Access and Barrier Fencing</u>).</p> <p>2. Restrict access within the land defined by the ESCP as nominated in <b>Table 1.1</b> (refer to <b>Sheet 09</b>).</p> <p>3. Ensure all fuel, oil and chemicals are stored with containment bunds.</p> <p>4. Implement a Monitoring and Maintenance Program (refer to BMP Notes – <u>Monitoring and Maintenance</u>).</p> <p>5. Continue to restrict access within the land defined by the ESCP as nominated in <b>Table S2</b>.</p> <p>6. Delineate additional No Go Areas with barrier fence, sediment fence, tape, diversion bank or other suitable means in the areas nominated on <b>Figure 1.1</b> (refer to BMP Notes – <u>Facility Access and Barrier Fencing</u>).</p> <p>7. Establish additional sediment fencing downslope of any new disturbance, unstabilised stockpiles or cleared areas in advance of extraction around the extraction area perimeter (refer to BMP Notes - <u>Sediment Fencing</u> and BMP Notes - <u>Stockpiling</u>).</p> <p>(The sediment fencing is to be retained until the stockpile or cleared area is stabilised with vegetation in accordance with <b>Table S3</b> – refer to <b>Sheet 09</b> and <b>Step 17</b>, or the extended extraction area drains to internal catchment).</p> <p>8. Review and enlarge sediment basins to provide the minimum water settlement and sediment storage capacities of <b>Table S4</b>.</p>	<p>9. Identify the minimum basin capacity requirements using vertical markers or other means (refer to BMP Notes - <u>Sediment Basins</u>).</p> <p>10. Maintain outlet protection on the discharge point from sediment basins (refer to BMP Notes - <u>Outlet Protection</u>).</p> <p><b>STAGE 1 EXTRACTION PHASE (Continued)</b></p> <p>11. Maintain low flow drainage channels identified on <b>Figure 1.1</b> to divert disturbed catchment runoff to the sediment basins (refer to BMP Notes - <u>Diversion Drains</u>). Ensure drainage is to the nominated sediment basin.</p> <p>12. Remediate and stabilise all drains and batters as nominated by BMP Notes - <u>Diversion Drains</u>.</p> <p>13. Fell trees, clear groundcover and strip topsoil from the new areas of disturbance in accordance with the following protocols and procedures.</p> <ul style="list-style-type: none"> <li>Implement vegetation clearing protocol of the Quarry <i>Biodiversity Management Plan</i>.</li> <li>Strip when soils are moist (not dry or wet).</li> <li>Place the groundcover and topsoil in separate windrow stockpiles within the approved disturbance footprint of the Quarry.</li> <li>The locations of stockpiles are at the discretion of the Quarry Manager but will be located away from steep slopes and concentrated runoff.</li> <li>The stockpiles are to be constructed and maintained as nominated by SD 4-1 (refer to <b>Sheet 12</b>) (refer also to BMP Notes - <u>Soil Stockpiling</u>).</li> <li>As works progress, ensure each stockpile is stabilised in accordance with <b>Table S3</b>.</li> <li>Ensure all dirty water drains to the relevant sediment basin.</li> </ul> <p>Refer also to BMP Notes - <u>Soil Stripping</u>, <u>Soil Stockpiling</u> and <u>Soil Respreding</u>.</p> <p>14. Construct and stabilize stockpiles. Establish a cover of vegetation on soil stockpiles equivalent to 70% coverage within 60 days of establishment (unless the soil is to be used in in rehabilitation within 6 months) (refer to BMP Notes - <u>Soil Stockpiling</u>).</p> <p>15. Commence extraction (mining) in accordance with DA 344-11-2001.</p>	<p><b>STAGE 1 EXTRACTION PHASE (Continued)</b></p> <p>16. Mine rehabilitation to be completed in accordance with the Quarry RMP. Install sediment fencing down-slope of rehabilitation under maintenance (see also SD 6-8 on <b>Sheet 15</b>) (refer to BMP Notes - <u>Sediment Fencing</u>).</p> <p>17. Once stabilisation of rehabilitated land (with 70% groundcover) (refer to BMP Notes - <u>Soil Respreding</u>) is achieved, downslope sediment controls can be removed.</p> <p><b>FUTURE OPERATIONS PHASE</b></p> <p>Prior to commencement of disturbance beyond the extent of the Stage 1 Extraction Phase, the ESCP (and SWMP) will be updated to provide more specific details on locations and technical specifications, e.g. basin sizes, drain design, of the referenced BMPs.</p>	<p><b>ONGOING MANAGEMENT</b></p> <p>1. Dust suppression is to be carried out as required (refer to Notes on <u>Dust Suppression</u>).</p> <p>2. Ensure all monitoring and maintenance procedures are implemented and adhered to (Refer to BMP Notes - <u>Monitoring and Maintenance</u>).</p> <p>3. Undertake a self-auditing program (refer to BMP Notes - <u>Self-auditing Program</u>).</p> <p>4. On stabilisation of rehabilitated land (with 70% groundcover) (refer to BMP Notes - <u>Soil Respreding</u>), downslope sediment controls can be removed.</p>
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REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS			CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN - NOTES 3	
1	17 May 2024	KS/ MS	MS/ AW	New ESCP	DESIGN BY:	N/A		WALLERAWANG QUARRY	<p align="center">Sheet No. 05</p> <p align="center">V1</p>		
				DRAWN BY:	N/A						
				APPROVAL	N/A						
				APPROVAL	N/A						

EROSION AND SEDIMENT CONTROL PLAN

NOTES 4 - BEST MANAGEMENT PRACTICES (BMP)

**FACILITY ACCESS AND BARRIER FENCING**

- A sealed access road will be maintained to ensure all vehicles entering and leaving the Quarry use the designated site entrance.
- Internal access and haul roads delineate access to operational areas of the Quarry.
- Access beyond the defined impact footprint of the Quarry (No Go Areas) is defined by **Figure 1.1** and delineated by barrier fencing, sediment fencing, bunds or drains.
- Barrier fencing can simply be made from tape wound around star pickets or stakes. Alternatively, flagging, site fence or chain wire fences can be used for this purpose if so desired.
- The soil erosion hazard on the site will be kept as low as practicable by minimizing land disturbance and staging works (see **Table S2**).

**SEDIMENT FENCING**

- Sediment fencing is to be established down-slope of any new disturbance where earth bank diversion drains are not established.
- Install sediment fencing as described by SD 6-8 (see **Sheet 15**). Returns may be constructed every 100 m where slope <10%.
- Sediment fences must be firmly trenched into the ground for their entire length.

**SOIL STRIPPING**

- The area stripped of soil at any one time will be minimised consistent with operational requirements.
- Where a layer of soil is identified, this will be stripped to a depth of at least 200 mm ahead of excavation (subject to review/availability).
- All areas to be stripped of topsoil will be clearly identified in advance and the depth of topsoils and subsoils available determined.
- Soil stripping will not be undertaken during hot, windy conditions.
- Stripped topsoil will either be temporarily stockpiled (refer to BMP Notes - **Soil Stockpiling**) or immediately transferred to completed and profiled sections of the Extraction Area (refer to BMP Notes - **Soil Respreading**).

**DUST SUPPRESSION**

- Where construction works generate dust, all reasonable and practicable measures are to be undertaken to prevent dust.
- Areas are to be stripped progressively and only where it is necessary for works to occur.
- Where practicable, disturbed areas are to be stabilised to a C-factor of less than 0.15 (e.g. greater than 50 percent grass cover) on all lands, stockpiles and other exposed materials scheduled to remain unattended for more than 20 working days.
- Disturbed areas are to be dampened with a light water spray as required.
- Vehicle movements are to be restricted to designated access roads.
- All loads are to be covered when transporting material, where practical.

**SOIL STOCKPILING**

- All stockpiles will be constructed in accordance with SD 4-1 (refer to **Sheet 12**).
- Soil stockpiles will remain less than 3 m in height.
- Slopes of the stockpiles will be battered to provide a 2:1 (H:V) slope.
- Stockpiles will have sediment fencing, straw bale protection or a grass buffer strip installed around the downslope base.
- Stockpiles will be at least 5 m from a watercourse.
- Stockpiles will be stabilized to achieve a C-Factor of 0.1 within 60 days of formation (refer to **Table S3**).
- Stockpiles to be retained in excess of 60 days will be protected through installation of sediment fencing or straw bale protection (refer to BMP Notes - **Sediment Fencing**).
- Soil stockpiles will be located at the discretion of the Quarry Manager within the defined disturbance footprint of the Quarry.

**SOIL RESPREADING**

- Wherever possible, topsoil will be directly transferred onto areas requiring rehabilitation. This approach will encourage the germination of the contained propagules, maximise the success of rehabilitation and reduce the need for soil stockpiling.

**SOIL RESPREADING (Continued)**

- Prior to respreading of the topsoil layer, the combined subsoil / imported soil profile layer will be ripped or scoured to allow keying of the topsoil.
- Sow with native species seed mix as seasonal conditions dictate. Seedbed preparation will be carried out, i.e. in accordance with SD 7-1 (see **Sheet 15**) and the RMP.

**MITRE DRAINS**

- The construction and compaction of Quarry haul roads will create drainage paths for runoff.
- To prevent concentrated flows, construct mitre drains in accordance with the following:
- Construct the mitre drain as illustrated by **Figure S2**.
  - The 'tail' of the mitre drain should extend at least 5 m from the road.
  - Construct with V-shaped cross section and grade of 1% or less.
  - If erosion within the mitre drain is observed, install a rock check dam (see SD 5-4 of **Sheet 12**) approximately midway between the road and discharge point of the drain.

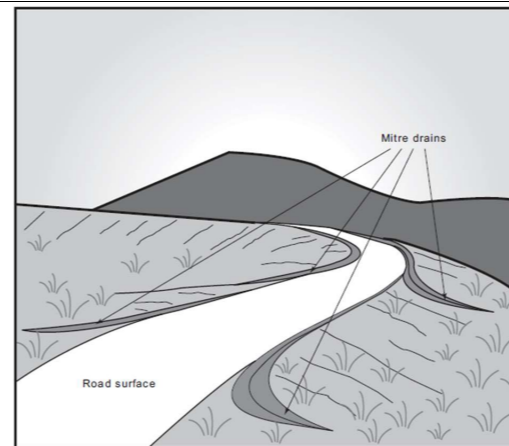


Figure 5.9 Runoff dispersal using mitre drains (redrawn from Gatten 1988)

Figure S2

**SCHEMATIC ILLUSTRATION OF MITRE DRAIN**

Source: *Figure 5.9 of Managing Urban Stormwater: Soils and Construction Vol 2C*.

**DIVERSION DRAINS**

- Two types of diversion drains will be constructed.
  - Clean Water Diversion Drains will be constructed and maintained to divert surface flows from land undisturbed by the Quarry.
  - Dirty Water Diversion Drains will be constructed and maintained to capture runoff from disturbed areas and divert to sediment basins (refer to Notes on **Sediment Basins**).
- Clean water from the Great Western Highway is diverted away from the disturbed Quarry catchment by rock lined drains.
- The discharge point of each Clean Water Diversion Drain will be constructed and maintained as a Level Spreader with dimensions meeting the design standards of SD 5-6 (see **Sheet 13**), namely:
  - Drain slope of <1% for >6m on approach to discharge;
  - Sill width of >4m;
  - Sill grade of 0%; and
  - Sill to be maintained with grass cover.
- Dirty water diversion drains will be constructed in accordance with SD 5-5 (see **Sheet 13**).
  - The channel and bank will be grassed where practical to achieve a C-Factor of 0.05 (see **Table S3**).
  - If grassing of channel and bank not possible, rock check dams (constructed in accordance with SD 5-4) will be constructed at regular intervals.
- Where the channel slope of the diversion drain exceeds 10% (~6°), rock check dams will be installed in accordance with SD 5-4 (see **Sheet 12**).

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1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A			WALLERAWANG QUARRY	Sheet No. 06	V1
				DRAWN BY:	N/A						
				APPROVAL	N/A						
				APPROVAL	N/A						

**EROSION AND SEDIMENT CONTROL PLAN**

**Notes 5: BEST MANAGEMENT PRACTICES (BMP)**

**SEDIMENT BASINS**

- Sediment Basins will be constructed and maintained to accept, store and settle (prior to reuse or discharge) runoff from the disturbed catchments of the Quarry in accordance with SD 6-4 (see **Sheet 14**).
- The design rainfall event considered for the purpose of sediment basin design (5-day, 95<sup>th</sup> percentile of 56 mm) assumes the receiving waters to be 'sensitive'.
- The volumetric runoff coefficient (Cv) for each catchment has assumed Soil Hydrologic Group D (high runoff potential) for the design rainfall even in accordance with *Appendix F* and *Table F2* of Vol. 1 of the Blue Book.
- **Table S4** provides the conceptual minimum storage and settlement capacities for the sediment basins of the Quarry Site (for the Stage 1 Extraction Stage).
- A marker will be maintained within each sediment basin near the discharge point / emergency identifying minimum freeboard requirement.
- The emergency spillway will have a C-factor of 0.05 (equivalent to a groundcover of >70%) or be lined with rock exceeding 100mm in diameter (where groundcover cannot be established).
- Except during, and for a maximum of five days after a rainfall event, the water level within each sediment basin will not exceed this mark.
- Accumulated water within the sediment basins will be removed as nominated in Water Usage, Sources and Distribution Notes - Water Distribution and Transfer.
- If flocculation is required prior to discharge, this will be undertaken in accordance with *Appendix E* of Vol. 1 of the Blue Book and the SWMP.
- If applied manually, the flocculating agent is to be spread evenly over the entire pond surface.
- Do not exceed manufacturer's recommended dosing rates or, if using gypsum, apply it at the rate of (initially) 30kg per 100m<sup>3</sup>.

**SEDIMENT BASINS (Continued)**

- Accumulated sediment will be removed from the sediment basins periodically and placed within the stockpile area.
- Once dried, the accumulated sediment will be used in progressive rehabilitation of the site.
- A return to the minimum water settlement capacity requirements nominated in **Table S4** (and identified by the marker) will be achieved within 5 days of accumulation of water within each.
- Accumulated sediment will be periodically excavated and, subject to screening for contaminants, used elsewhere on the property.

**SITE STABILISATION**

- Progressive stabilisation of disturbed ground surfaces will be completed as these areas become inactive (refer to **Table S2**).
- Stabilisation measures and products will comply with *Table A3* of Landcom, 2004) (refer to **Sheet 11**).
- Appropriate seedbed preparation will be carried out, i.e. in accordance with SD 7-1 (refer to **Sheet 15**) and the RMP.
- Diversion drains will retain a C-Factor of 0.05 (refer to **Table S3**).
- As surfaces are stabilized, temporary water management structures can be removed, e.g. diversion drains (or portions of).

**BMP DECOMMISSIONING AND REHABILITATION**

- All installed controls will remain in place until at least 70% ground cover (equivalent to a c-factor of 0.05) is achieved across the catchment draining to the installed control. Once this condition has been met, controls may be decommissioned as described below.

**Sediment Fencing**

- Remove sediment fencing taking care not to damage the material (such that it can be reused if in suitable condition).
- Lightly scarify along the contour where required to level off surface and spread any vegetative debris.





**BMP DECOMMISSIONING AND REHABILITATION (Continued)**

**Diversion Drains**

- Gently push bank component of the drain into the channel and grade using dozer blade, excavator bucket or other means until level.
- Lightly scarify and allow to reseed naturally.

**Sediment Basins**

- Backfill with available screening reject or other stockpiled material, or reshape area and allow to consolidate.
- Cover with 100 mm (or appropriate alternative) and either sow with seed mix as per the RMP.

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1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A		 		WALLERAWANG QUARRY		
					DRAWN BY:	N/A						
					APPROVAL	N/A						
					APPROVAL	N/A						
										Sheet No. 07	V1	

**EROSION AND SEDIMENT CONTROL PLAN**

**Notes 6: MONITORING AND MAINTENANCE AND REVISION AND UPDATE OF ESCP**

**MONITORING AND MAINTENANCE**

**Erosion and Sediment Control**

- Erosion and sediment control structures constructed or installed to manage surface water flows will be inspected to ensure these have not been damaged, are not eroding or causing erosion.
- Inspections will be undertaken.
  - Fortnightly,
  - Prior to forecasted rainfall events greater than or equal to 10 mm in a 24-hour period, and
  - After rainfall events greater than or equal to 10 mm in a 24-hour period.
- All inspections are to be documented on a check sheet (refer to Appendix C) and all actions identified are to be closed out within a reasonable and practical time frame. The check sheet requires:
  - Recording the condition of every sediment control employed
  - Recording maintenance requirements (if any) for each sediment control
  - Recording the volumes of sediment removed from sediment retention systems, where applicable
  - Recording the site where the sediment is disposed.
- All ESCs, including drainage control measures, must be always maintained in proper working order during their operational lives. All ESCs shall be maintained in a functioning condition during construction until all construction activities are completed, and full stabilisation of the site is achieved.
- If erosion observed within drains, install rock check dams (see SD 5-4 of **Sheet 12**).
- Ensure there is no build-up of sediment or vegetation against sediment fencing. If present, remove as soon as practically possible.
- Confirm germination of seed sown over completed sections of the landform. If poor success, areas will be re-sown or fertiliser added.

**MONITORING AND MAINTENANCE (Continued)**

**Discharge Water Quality**

- Discharge of water from the Quarry will be avoided by diversion of runoff to sediment basins (refer to BMP Notes - Sediment Basins).
- Water discharged (to natural drainage) from the sediment basins will be sampled and analysed for the parameters identified in **Table S5** (see **Sheet 09**).
- SD1 and SB2 are LDPs.
- As identified in **Table S5**, sampling and analysis of water is to be undertaken monthly when discharge occurs.
- In the event sampled water exceeds the criteria nominated above, this will be identified as a pollution incident and managed in accordance with a *Pollution Incident Response Management Plan*.

**SELF-AUDITING PROGRAM**

A self-auditing program will be initiated. The Quarry Manager is to inspect the site at least fortnightly, or following significant rainfall, and maintain a written log of inspections.

Particular attention is to be paid to:



- Ensure the stability of the storages.
- Ensure barrier fencing is maintained and No Go Areas are being observed.
- Identify areas of localised soil erosion and take appropriate remedial measures. These might include:
  - Planting additional stabilising vegetation or wind breaks;
  - Stabilising soils with mulches or alternative soil binders;
  - Taking steps to minimise any unnecessary concentrated stormwater flow: or
  - Installing formalised drainage channels or pipes. Remove spilled soils or other materials and dispose to safe areas, e.g. stabilized stockpile.
- Maintain erosion and sediment control measures in their functioning condition for the duration of the excavation works.
- Construct additional erosion and/or sediment control works as necessary to ensure the desired water control is achieved.

**REVISION AND UPDATE OF ESCP**

This Primary ESCP is to be updated as required if the site conditions change or if controls outlined within this document are not operating effectively. Alternatively, the Primary ESCP will be updated and approved prior to the commencement of a new stage of works that significantly changes or impacts the intent of the Primary ESCP. Additional erosion and/or sediment control works are to be constructed, as may become necessary to ensure the desired protection is given to downslope lands and waterways, i.e. making ongoing changes to this Primary ESCP where it proves inadequate in practice or is subject to changes in conditions at the worksite or elsewhere in the catchment.

**REFERENCES**

- International Erosion Control Association (Australasia) (2008). Best Practice Erosion and Sediment Control.
- Landcom (2004). Managing Urban Stormwater – Soils and Construction Volume 1, 4th Edition.
- Umwelt (2024) Wallerawang Quarry Soil and Water Management Plan

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1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A		Walker Quarries		WALLERAWANG QUARRY	Sheet No. 08	V1
					DRAWN BY:	N/A						
					APPROVAL	N/A						
					APPROVAL	N/A						

**EROSION AND SEDIMENT CONTROL PLAN**

**Table S2 Limitations to Access During Construction**

Land Use	Limitation	Remarks
Construction Areas	Limited to 5m from the edge of any essential construction activity as shown on the engineering plans	All site workers should clearly recognise these areas that, where appropriate, are identified with barrier fencing (upslope) and sediment fencing (downslope) or similar materials.
Access Areas	Limited to a maximum width of 5m.	The site manager will determine and mark the location of these zones on the site. They can vary in position so as to best conserve existing vegetation and protect downstream areas while being considerate of the needs of efficient works activities. All site workers will clearly recognise these boundaries.
Remaining lands including revegetation areas	Entry prohibited except for essential management works.	Thinning of growth might be necessary in accordance with bushfire management requirements or weed reduction strategies.

**Table S3 Maximum Acceptable C-Factors at Nominated Times During Works**

Lands	Maximum C-Factor	Remarks
Waterways and other areas subjected to concentrated flows e.g. drains, post construction and during operation.	0.05	Applies after ten working days from completion of formation and before they are allowed to carry any concentrated flows. Flows will be limited to those shown in <i>Table 5.2</i> of Vol. 1 of the Blue Book. Foot and vehicular traffic will be prohibited in these areas.
Stockpiles and batters, post construction and during operation.	0.10	Applies after ten working days from completion of formation. Maximum C-Factor of 0.10 equals 60% ground cover.
All lands, including waterways and stockpiles during construction and operation.	0.15	Applies after 90 working days of reseeded. Maximum C-Factor of 0.15 equals 50% ground cover. Modified after <i>Table 7.2</i> of Vol. 1 of the Blue Book.
All lands, including waterways and stockpiles during construction and operation.	0.05	Applies after 120 working days of reseeded Maximum C-Factor of 0.05 equals 70% ground cover. Modified after <i>Table 7.2</i> of Vol. 1 of the Blue Book.

**Table S4 Minimum Required Conceptual Design Capacities For Sediment Basins (Current Phase)**

Basin	Catchment Catchment	Basin Parameters Area (ha)	Method of Calculation Basin Volume (m <sup>3</sup> )	Minimum Capacity Requirement (m <sup>3</sup> )		Total (m <sup>3</sup> )	
				Water Settlement Zone	Sediment Storage Zone		
SB1	3/4	8.63	3908	Revised Universal Soil Loss Equation (RUSLE)	3579	329	3908
SB2	1	3.41	2115	RUSLE	1828	287	2115
	GWH1	1.0		RUSLE			
SB6	6a	0.67	325	RUSLE	277	48	325

Note 1: Includes 1.0 ha of runoff from the Great Western Highway

**Table S5 Water Monitoring Limits and Frequency**

Pollutant	Unit	Limit	Frequency	Method
pH	pH unit	6.5-8.5	Quarterly, or monthly during discharge	Grab Sample
Total Suspended Solids (TSS)	mg/L	30		
Electrical Conductivity	µS/cm	1,500		
Grease and Oil	mg/L	10		
Turbidity	NTU	25		
Sulfate	mg/L	250		

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1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY: N/A DRAWN BY: N/A APPROVAL N/A APPROVAL N/A		WALLERAWANG QUARRY	Sheet No. 09	V1

EROSION AND SEDIMENT CONTROL PLAN

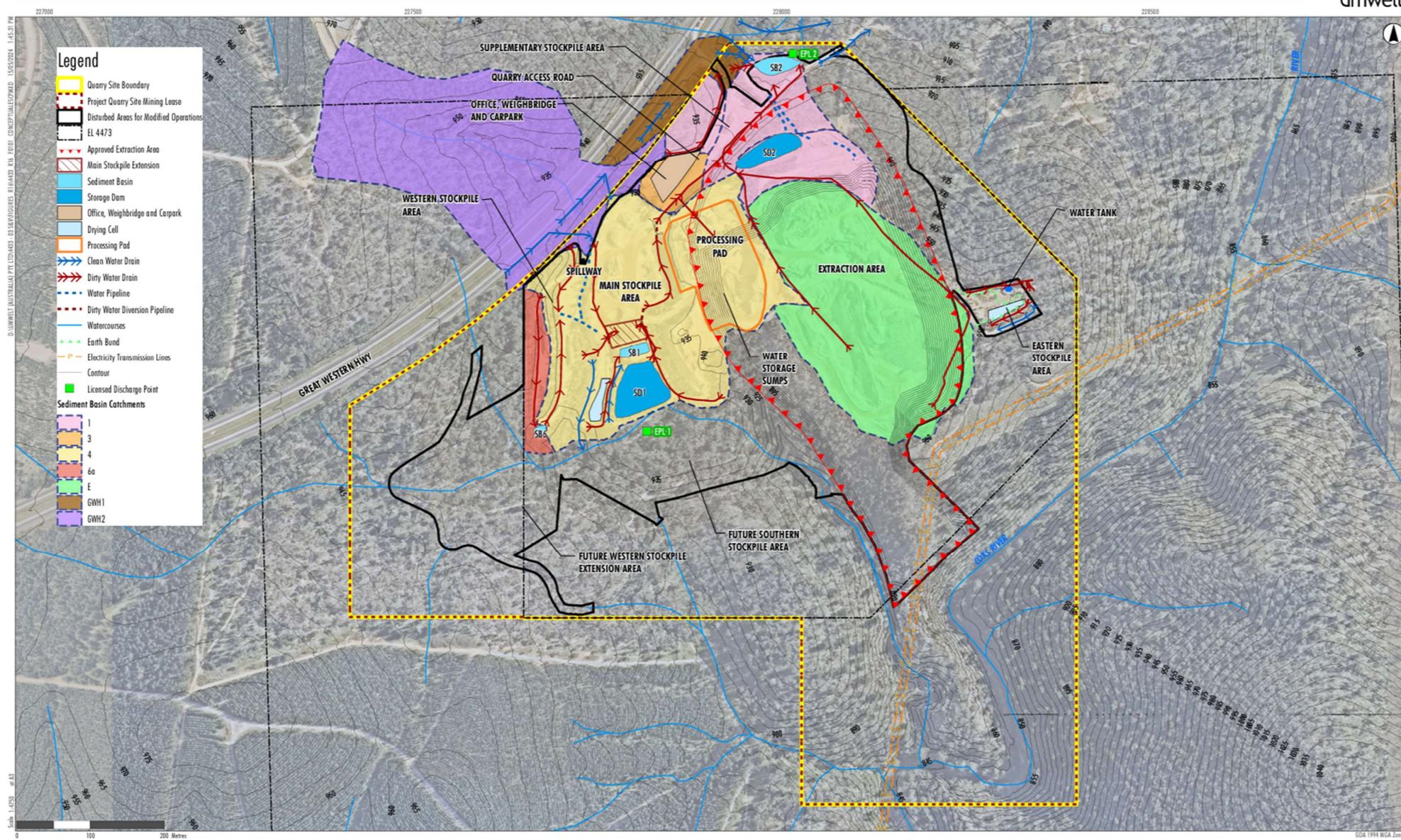


FIGURE 1.1  
Conceptual Erosion and Sediment Control Plan

Commented [KS2]: Figure requires update: New boundary lines will be provided next week.

Image source: Newsmap (Jan 2021); Data source: Walker Quarries (2016); Umwelt (2016); NSW LPI DTDR (2015); CH Survey (November 2016)

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1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A				WALLERAWANG QUARRY	Sheet No. 10
				DRAWN BY:	N/A						
				APPROVAL	N/A						

### EROSION AND SEDIMENT CONTROL PLAN

Table A3 Soil Stabilisation Control Matrix (adapted from various sources, including Meyer and Ports (1976), Israelson et al. (1980), Goldman et al. (1986), URS Greiner Woodward Clyde (1999) and the North American Green website).

Class	Type	Suitable for Vegetation Type <sup>(1)</sup>	Design Life (months)	Use in Concentrated Flow <sup>(2)</sup>	Availability (days) <sup>(3)</sup>	Relative Cost Bracket <sup>(4)</sup>	Residual Impact <sup>(5)</sup>	C-factor <sup>(6)</sup> <33%, <6m	C-factor <33%, 6-15m	C-factor <33%, >15m	C-factor 33-50%, <6m	C-factor 33-50%, 6-15m	C-factor 33-50%, >15m
<b>BIODEGRADABLE MULCHES<sup>(7)</sup></b>													
Straw (anchored)	4.5 tonnes per hectare	Grass	1 to 6	No	< 5days	Low	Moderate	0.17	0.17	0.20	0.20	0.20	0.20
Wood Chip	16 tonnes per hectare	Grass/Shrubs	1 to 6	No	< 5days	Low	Moderate	0.08	0.08	0.08		No data	
Wood Chip	27 tonnes per hectare	Shrubs	1 to 6	No	< 5days	Low	Moderate	0.05	0.05	0.05		No data	
Wood Chip	56 tonnes per hectare	Shrubs	1 to 6	No	< 5days	Low	Moderate	0.02	0.02	0.02	0.02	0.02	0.02
Hydromulching	1.5 tonnes mulch + 300 litres binder per hectare	Grass	1 to 3	No	< 5days	Low	Low	0.00	0.03	0.07	0.03	0.06	0.10
Bonded Fibre	5 tonnes fibre per hectare	Grass	1 to 6	No	< 5days	Low	Moderate	0.00	0.03	0.07	0.03	0.06	0.10
<b>ROLLED EROSION CONTROL PRODUCTS (RECPs)<sup>(7)</sup></b>													
Biodegradable	Jute mesh	Grass	6 to 12	Yes	< 5days	Low	Moderate	0.10	0.20	0.40	0.20	0.40	0.60
	Coconut fibre mesh	Grass	6 to 12	Yes	< 5days	Low	Moderate	0.10	0.20	0.40	0.20	0.40	0.60
	Curled wood fibre	Grass	6 to 12	Yes	< 5days	Medium	Moderate	0.01	0.05	0.10	0.10	0.15	0.20
	Jute matting (~350 gsm)	Grass	6 to 12	Yes	< 5days	Medium	Moderate	0.00	0.03	0.07	0.03	0.06	0.10
	Jute matting (~600 gsm)	Shrubs	6 to 12	Yes	< 5days	Medium	Moderate	0.00	0.03	0.07	0.03	0.06	0.10
	Coconut fibre matting (~450 gsm)	Grass	6 to 12	Yes	< 5days	Medium	Moderate	0.00	0.03	0.07	0.03	0.06	0.10
	Coconut fibre matting (~900 gsm)	Shrubs	6 to 12	Yes	< 5days	Medium	Moderate	0.00	0.03	0.07	0.03	0.06	0.10
Photodegradable	Mesh (< 5 mm openings)	Grass	1 to 6	Yes	< 5days	Low	Moderate	0.01	0.05	0.10	0.10	0.15	0.20
Non Biodegradable	Plastic fibres with netting	Grass	> 12	Yes	< 5days	High	High	0.00	0.05	0.10	0.03	0.05	0.10
	Composite with biodegradable	Grass/Shrubs	> 12	Yes	< 5days	High	High	0.00	0.03	0.07	0.03	0.06	0.10
<b>HYDRAULIC SOIL STABILISERS<sup>(7)</sup></b>													
	Polymers/Polyacrylamide (rate depends on type)	Grass	1 to 6	No	< 5days	Low	Low	0.01	0.05	0.10	0.10	No data	
	Bitumen emulsion (12,000 l/ha)	Grass	1 to 6	No	< 5days	Low	Low	0.01	0.05	0.10	0.10	No data	
<b>TEMPORARY SEEDING</b>													
	Annual	NA	6 to 12	No	< 5days	Low	Low	0.05	0.05	0.10	0.10	No data	
	Perennial	NA	> 12	No	< 5days	Low	Low to moderate	0.05	0.05	0.10	0.10	No data	
<b>INSTANT TURF<sup>(7)</sup></b>													
	Kikuyu	Grass	> 12	Yes	< 5days	Medium	Low	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Reinforced turf (pregrown)	Grass	> 12	Yes	5 - 15 days	High	High	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

**Notes**

1 Whether vegetation is required and its type if so, will affect the technique used. Biodegradable mulches, RECPs and hydraulic soil stabilisers can all be used on their own to provide short term protection. However, their effectiveness is less when used in isolation than when used with vegetative growth. Most techniques are used to help establish vegetative growth using sown grasses. Should the client specify shrubs (primarily planted as tubestocks), then thicker mulches, RECPs or biodegradable mulches should be used. Non biodegradable RECPs are used to reinforce grasses (turf) permanently. They are not suitable for use with individual shrubs. They can work synergistically with the established grass to increase its resistance to shear stress and, therefore, increase its resistance to erosion by concentrated flow.

2 Products might or might not be suitable for use in areas of concentrated flow. All products are suitable for sheet flow conditions, although some would be over designed in such cases.

3 Whether or not a product is readily available is critical to the selection process. Many RECP and hydraulic soil stabiliser techniques use products that might be "off the shelf" and available from several suppliers. Biodegradable mulches can be affected by seasonal variation, although they might also be available on site after initial clearing and grubbing. Temporary seeding might also be seasonal.

4 For any given technique, cost can vary greatly depending on geographic location, size of project and installation requirements. In addition, costs can vary over time. Because of these factors, giving accurate installed costs is not possible. However, if a product is relatively inexpensive to purchase and install close to its point of manufacture, it will still be relatively inexpensive to purchase and install remote from it.

5 This criterion relates to the impact that a particular practice might have on construction activities once they are resumed on an area that was temporarily stabilised.

6 The performance of an erosion control technique is quantified by assigning it with a C-factor (Appendix A). The C-factor will vary from close to zero for full cover, to 1.0 for no cover on highly disturbed soils. The C-factor strongly affects the soil loss calculation (RUSLE) and users need to be careful in specifying its value, particularly when values <0.01 are quoted. Note that the C-factor does not apply to concentrated flow.

Values for the C-factor are given for various slopes gradients and lengths and show that it can change dramatically with them. The values given are compiled from existing data and from inference between products of a similar nature. They are given as a guide only and do not profess to be accurate in all respects. Overall, accurate C-factors are only available for manufactured products, primarily from the USA (RECP's in particular) where extensive independent testing has been undertaken. Unfortunately, very little data is available for the "lower cost" options such as biodegradable mulches, jute mesh and hydraulic soil stabilisers. Wherever possible, the manufactures should be contacted for their latest data on acceptable C-factors.

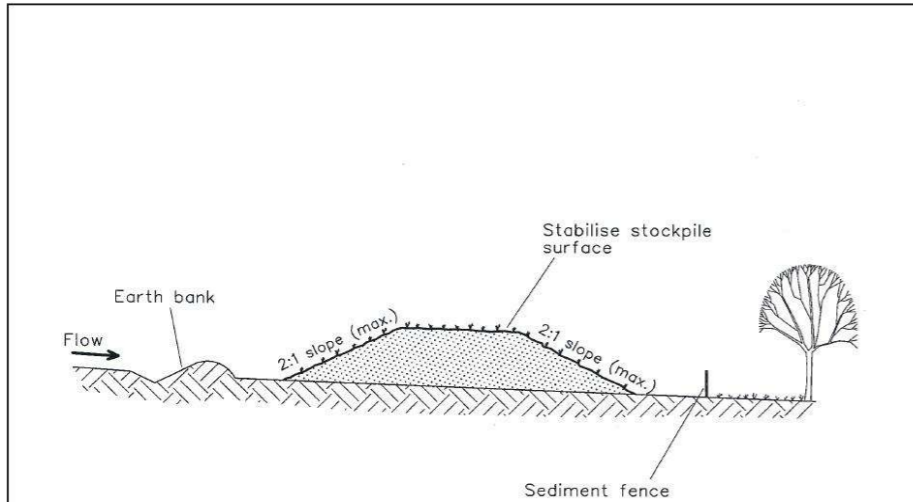
For the RECP's in particular, the C-factors given here are for the product as installed with no vegetation. Note however that lower C-factors can be expected if vegetation is promoted with many RECP's. Indeed, non biodegradable RECP's are designed to work synergistically with turf and must be used with it.

7 For information on trade names and suppliers of these products, please phone the office of Australasian Chapter of the International Erosion Control Association on 1800 354 322 or (+61 2) 4677 0901.

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1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY: N/A DRAWN BY: N/A APPROVAL: N/A APPROVAL: N/A	Walker Quarries	WALLERAWANG QUARRY	Sheet No. 11	V1



EROSION AND SEDIMENT CONTROL PLAN – STANDARD DRAWINGS 1

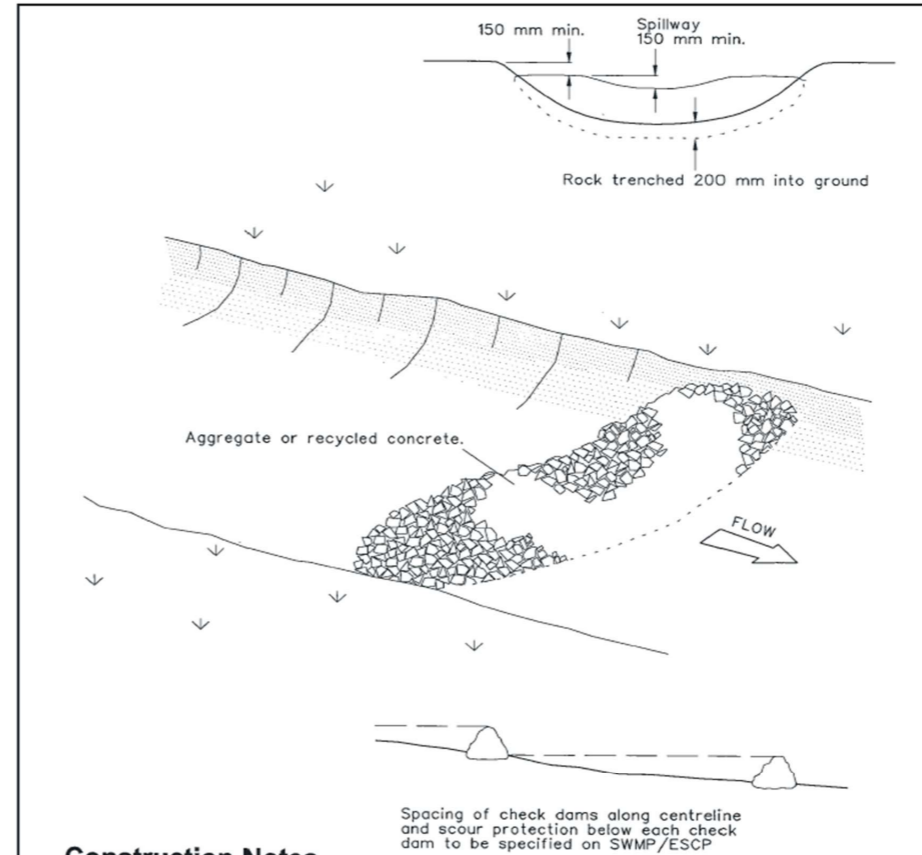


**Construction Notes**

1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

**STOCKPILES**

**SD 4-1**



**Construction Notes**

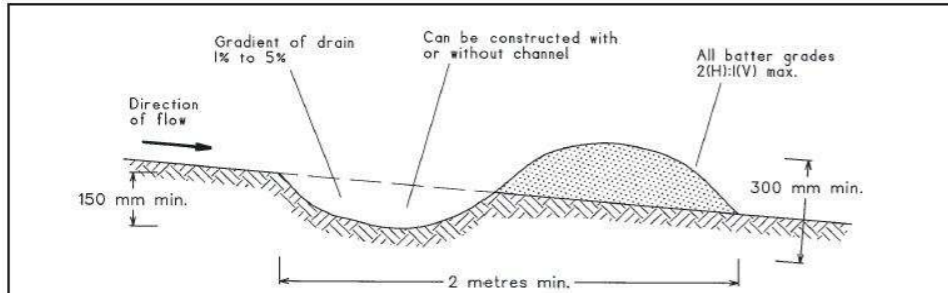
1. Check dams can be built with various materials, including rocks, logs, sandbags and straw bales. The maintenance program should ensure their integrity is retained, especially where constructed with straw bales. In the case of bales, this might require their replacement each two to four months.
2. Trench the check dam 200 mm into the ground across its whole width. Where rock is used, fill the trenches to at least 100 mm above the ground surface to reduce the risk of undercutting.
3. Normally, their maximum height should not exceed 600 mm above the gully floor. The centre should act as a spillway, being at least 150 mm lower than the outer edges.
4. Space the dams so the toe of the upstream dam is level with the spillway of the next downstream dam.

**ROCK CHECK DAM**

**SD 5-4**

REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS		CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN – Standard Drawings 1	
					DESIGN BY:	N/A			Sheet No. 12	V1
1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A	Walker Quarries	WALLERAWANG QUARRY		
					DRAWN BY:	N/A				
					APPROVAL	N/A				
					APPROVAL	N/A				

EROSION AND SEDIMENT CONTROL PLAN – STANDARD DRAWINGS 2



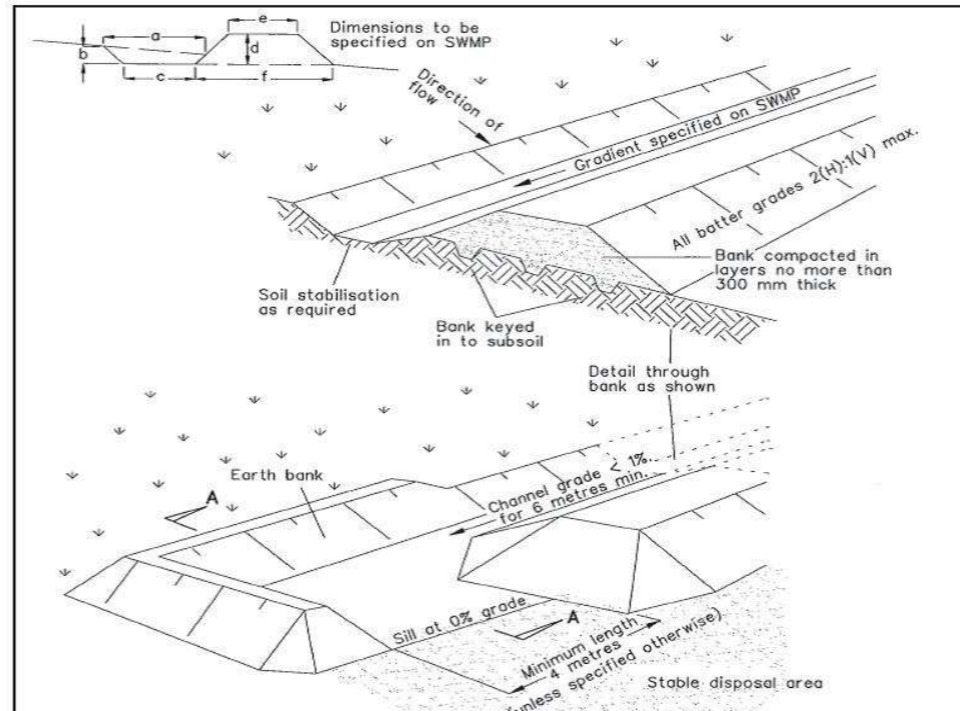
NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

**Construction Notes**

1. Build with gradients between 1 percent and 5 percent.
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V shaped.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction.

**EARTH BANK (LOW FLOW)**

**SD 5-5**



**Level Spreader (or Sill)**

**Construction Notes**

1. Construct at the gradient specified on the ESCP or SWMP, normally between 1 and 5 percent
2. Avoid removing trees and shrubs if possible - work around them.
3. Ensure the structures are free of projections or other irregularities that could impede water flow.
4. Build the drains with circular, parabolic or trapezoidal cross sections, not V-shaped, at the dimensions shown on the SWMP.
5. Ensure the banks are properly compacted to prevent failure.
6. Complete permanent or temporary stabilisation within 10 days of construction following Table 5.2 in Landcom (2004).
7. Where discharging to erodible lands, ensure they outlet through a properly constructed level spreader.
8. Construct the level spreader at the gradient specified on the ESCP or SWMP, normally less than 1 percent or level.
9. Where possible, ensure they discharge waters onto either stabilised or undisturbed disposal sites within the same subcatchment area from which the water originated. Approval might be required to discharge into other subcatchments.

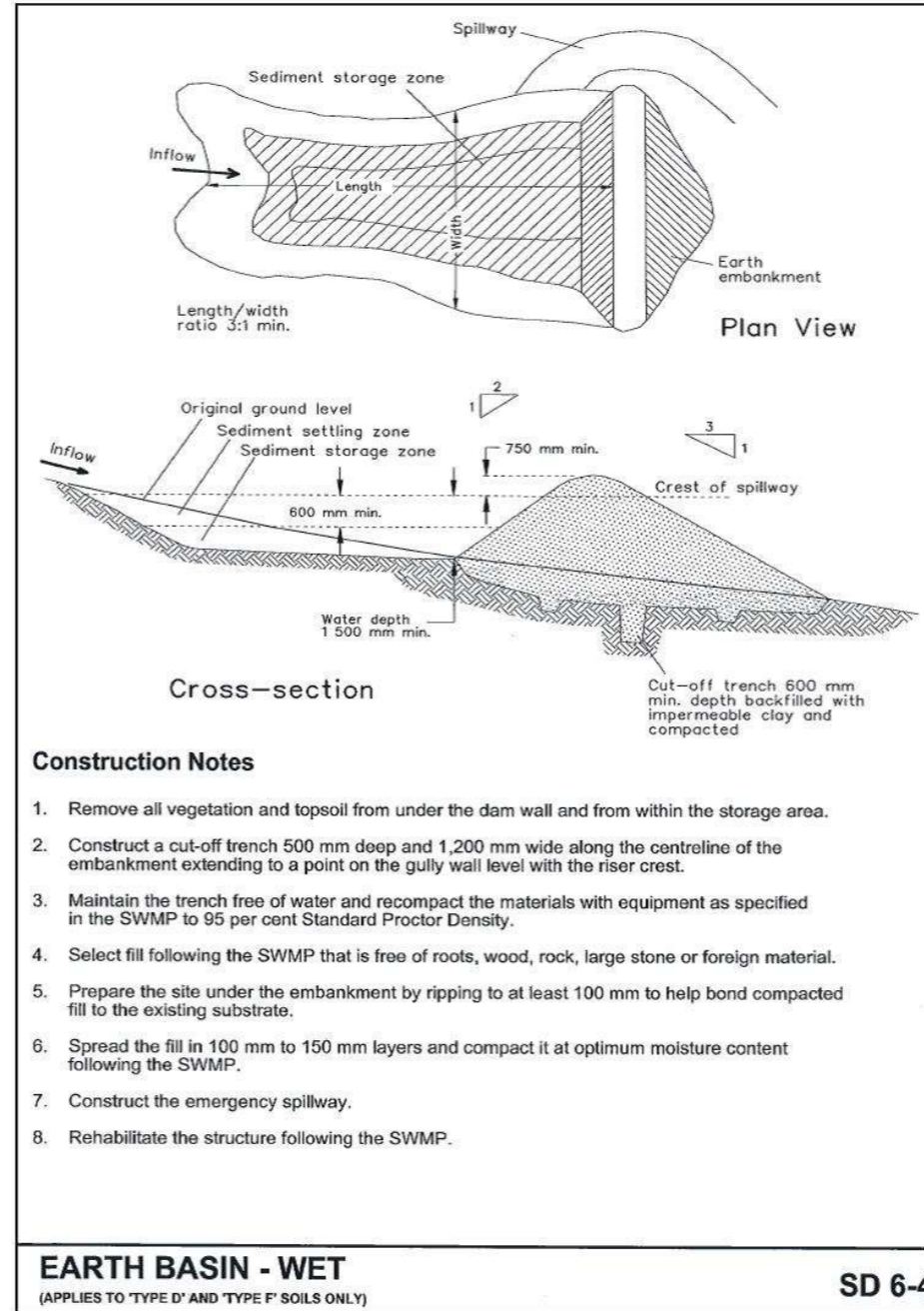
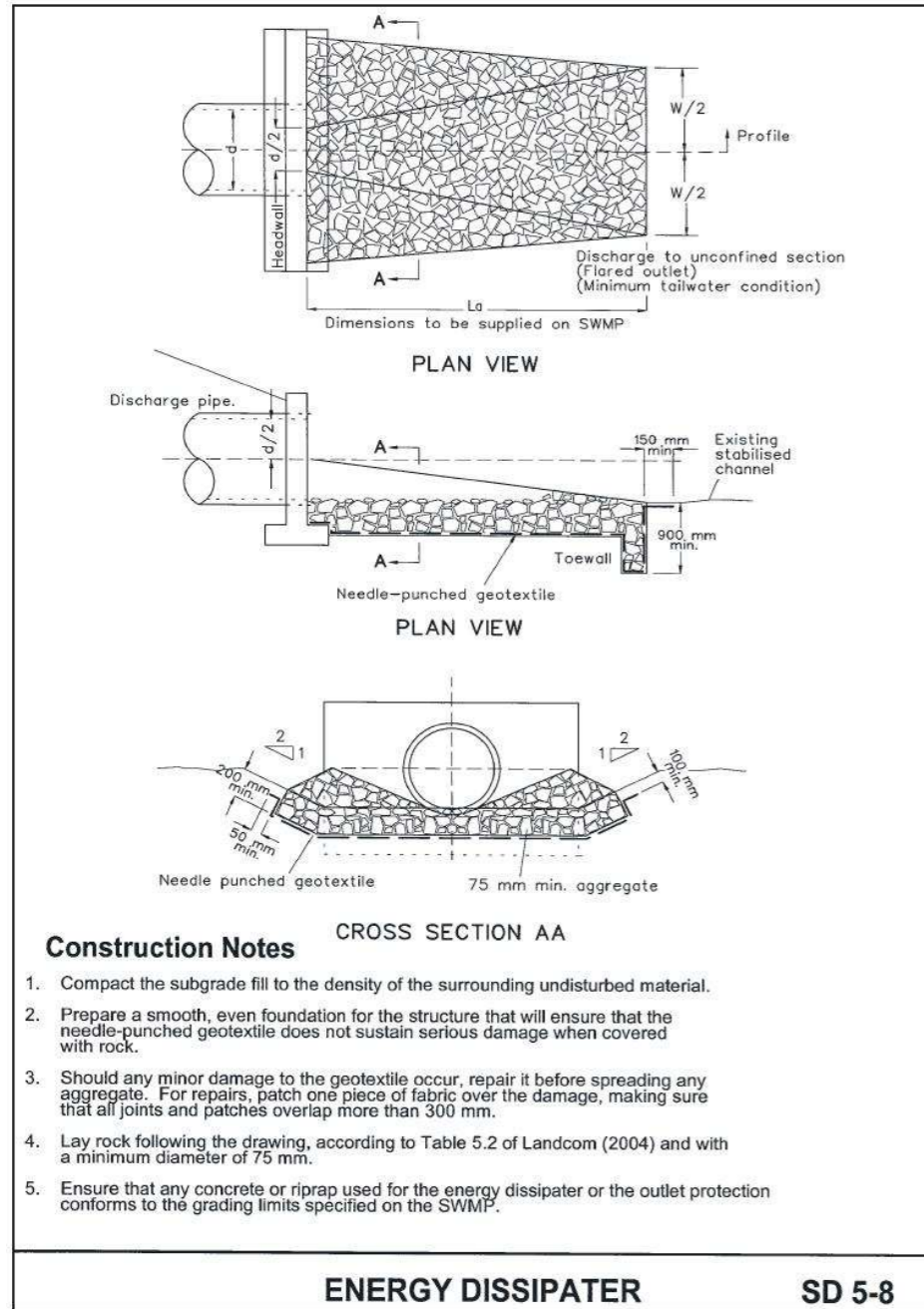
**Section AA**

**EARTH BANK (HIGH FLOWS)**

**SD 5-6**

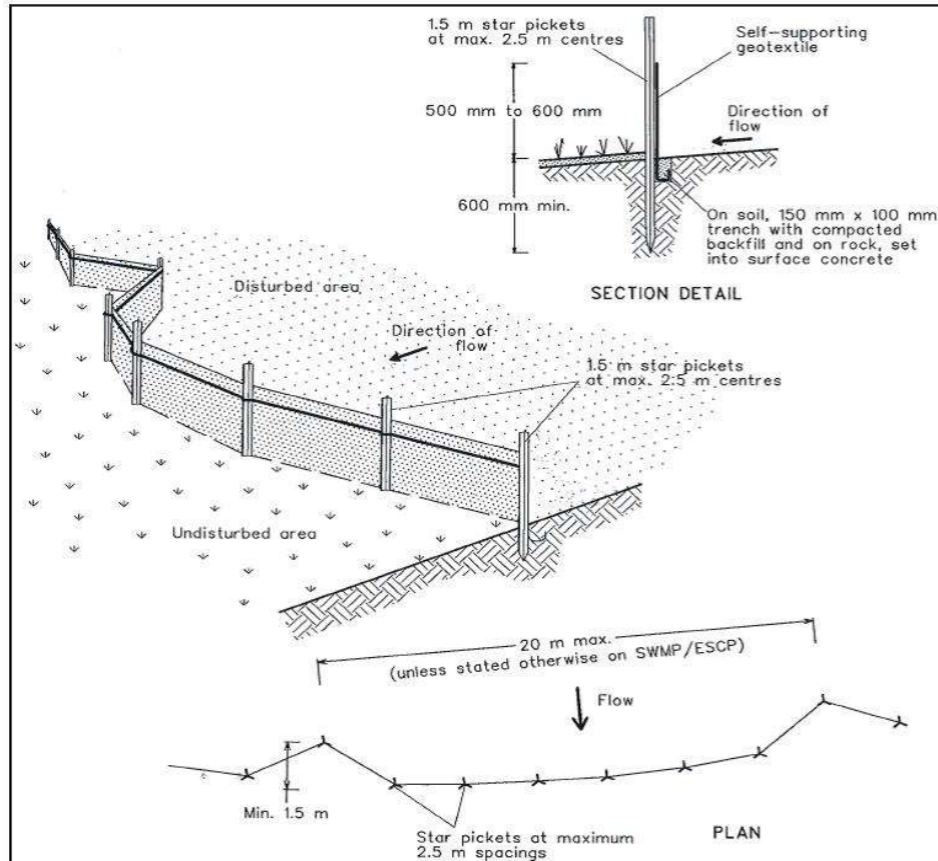
REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS		CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN – Standard Drawings 2		
1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A			WALLERAWANG QUARRY	Sheet No. 13	V1
				DRAWN BY:	N/A						
				APPROVAL	N/A						
				APPROVAL	N/A						

EROSION AND SEDIMENT CONTROL PLAN – STANDARD DRAWINGS 3



REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS		CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN – Standard Drawing 3	
1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY:	N/A			WALLERAWANG QUARRY	3
					DRAWN BY:	N/A				
					APPROVAL	N/A				
					APPROVAL	N/A				
									Sheet No. 14	V1

EROSION AND SEDIMENT CONTROL PLAN – STANDARD DRAWINGS 4

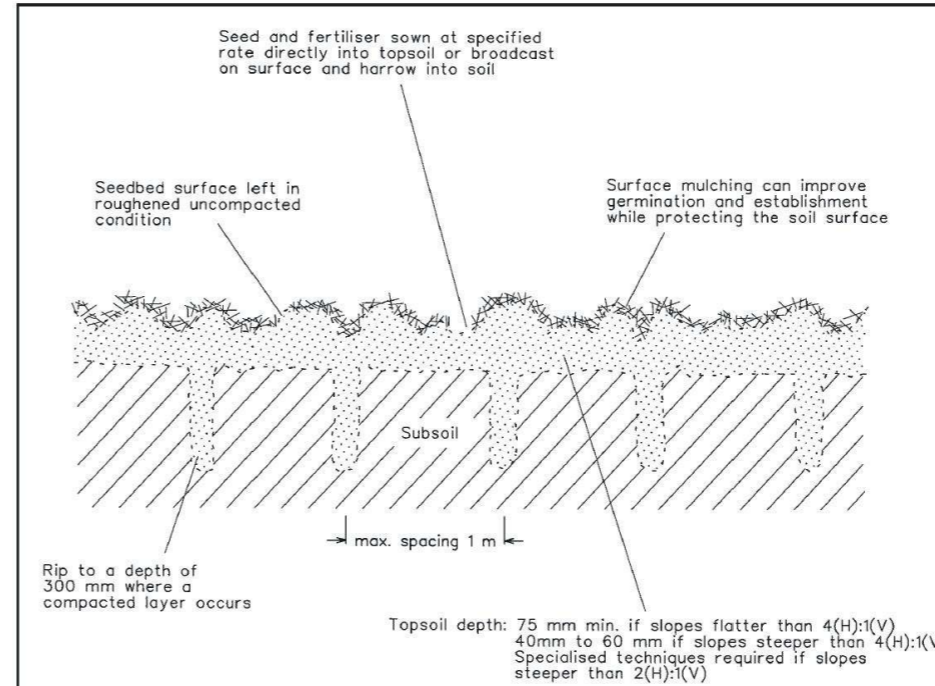


**Construction Notes**

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**



**Construction Notes**

1. Loosen compacted soil before sowing any seed. If necessary, rip the soil to a depth of 300 mm. Avoid rotary hoe cultivation.
2. Work the ground only as much as necessary to achieve the desired tilth and prepare a good seedbed.
3. Avoid cultivation in very wet or very dry conditions.
4. Cultivate on or close to the contour where possible, not up and down the slope.

**SEEDBED PREPARATION**

**SD 7-1**

REV	DATE	BY	APP.	REVISION DETAILS	DRAWING STATUS	CLIENT	PROJECT TITLE	EROSION AND SEDIMENT CONTROL PLAN – Standard Drawing 4		
1	17 May 2024	KS/MS	MS/AW	New ESCP	DESIGN BY: N/A			WALLERAWANG QUARRY	Sheet No. 15	V1
					DRAWN BY: N/A					
					APPROVAL N/A					
					APPROVAL N/A					



