



Newman Quarrying Pty Ltd

Quarry Expansion at Lot 2 DP 1055044, Tullymorgan-
Jackybulbin Road, Mororo
Soil and Water Management Plan

May 2017

Table of contents

1.	Introduction.....	2
1.1	Objectives	2
1.2	Targets.....	2
1.3	Consultation	2
2.	Relevant legislation	3
2.1	Legislation	3
2.2	Guidelines	3
2.3	Conditions of approval	3
3.	Existing environment and impacts	6
3.1	Existing environment.....	6
3.2	Site water balance	7
4.	Environmental control measures	10
5.	Monitoring and reporting	13
5.1	Environmental inspections and monitoring	13
5.2	Contingency plan	15
5.3	Reporting	15
6.	Review and improvement.....	17

Table index

Table 2-1	Conditions of approval relevant to this SWMP	3
Table 3-1	Adopted MUSIC node parameters (Source Nodes >10 Ha)	7
Table 3-2	Catchment characteristics	8
Table 3-3	Quarry operational site water balance	9
Table 4-1	Environmental control measures	10
Table 5-1	Typical erosion and sediment control monitoring program.....	13

1. Introduction

This Soil and Water Management Plan (SWMP) forms part of the Environmental Management Strategy (EMS) for Sly's Quarry located at Lot 2 DP 1055044, Tullymorgan – Jackbulbin Road, Mororo. This SWMP has been prepared to meet the requirements of the Ministers Conditions of Approval (CoA) outlined in Development Consent SSD 6624, the mitigation measures outlined in the Environmental Impact Statement (EIS) for Sly's Quarry and all relevant legislation.

1.1 Objectives

The key objective of the SWMP is to ensure that impacts on soil and water quality during operations are minimised and within the scope permitted by the development consent.

1.2 Targets

The following targets have been established for the management of soil and water impacts during the operational lifetime of Sly's Quarry:

- Ensure full compliance with the relevant legislative requirements and CoA.
- Meet Environment Protection Licence (EPL) water quality discharge parameters for all planned discharges.
- Ensure training on soil and water management is provided to all relevant personnel through site inductions.

1.3 Consultation

Extensive consultation was undertaken with the local community during preparation of the EIS. Any concerns identified by relevant stakeholders were addressed in the EIS and mitigation measures developed which have been incorporated into this SWMP. As per CoA 20(b), Schedule 3, the Environment Protection Authority (EPA) and Department of Primary Industries – Water (DPI Water) were consulted in relation to the SWMP. Evidence of the consultation is provided in Appendix A.

2. Relevant legislation

2.1 Legislation

Legislation relevant to soil and water management includes:

- Protection of the Environment Operations Act 1997 (POEO Act)
- Water Management Act 2000 (WM Act)
- Fisheries Management Act 1994 (FM Act)
- Water Act 1912 (Water Act).

Further discussion of the above legislation is covered in Section 3 of the EMS, as well as the EIS.

2.2 Guidelines

The following guidelines have been consulted during development of this SWMP:

- Landcom (Blue Book) (2004) Soils and Construction, Managing Urban Stormwater, Volume 2E Mines and Quarries, 4th Edition

2.3 Conditions of approval

The CoA relevant to this SWMP are listed below in Table 2-1. A cross reference is also included to indicate where the condition is addressed in this SWMP or other environmental management documents.

Table 2-1 Conditions of approval relevant to this SWMP

Condition No.	Requirement	Reference
Schedule 3, Condition 20	The Applicant must prepare a Soil and Water Management Plan for the development to the satisfaction of the Secretary. This plan must:	This plan
	(a) be prepared by suitably qualified and experienced person/s approved by the Secretary;	Appendix A
	(b) be prepared in consultation with the EPA and DPI Water;	Appendix A
	(c) be submitted to the Secretary for approval within 6 months of the date of this consent, unless otherwise agreed by the Secretary; and	Noted
	(d) include the EPA's requirements as set out in Appendix 5;	Refer below
	(e) include a:	Section 3.2
	(i) Site Water Balance that includes: <ul style="list-style-type: none">• details of:<ul style="list-style-type: none">– sources and security of water supply;– water use and management on site;– any off-site water transfers; and– reporting procedures; and• measures that would be implemented to minimise clean water use on site;	
	(ii) Surface Water Management Plan, that includes: <ul style="list-style-type: none">• a program for obtaining detailed baseline data on surface water flows and quality in water• bodies that could potentially be affected by the development;• a detailed description of the surface water management system on site including the:<ul style="list-style-type: none">– clean water diversion system;– erosion and sediment controls;	Section 4

Condition No.	Requirement	Reference
	<ul style="list-style-type: none"> - dirty water management system; - water storages; and - mitigation measures outlined in the EIS; and • a program to monitor and report on: <ul style="list-style-type: none"> - any surface water discharges; - the effectiveness of the water management system, - the quality of water discharged from the site to the environment; - surface water flows and quality in local watercourses; 	
	<p>(iii) Groundwater Management Plan that includes:</p> <ul style="list-style-type: none"> • a provision that requires the Applicant to obtain appropriate water licence(s) to cover the volume of any unforeseen groundwater inflows into the quarry from the quarry face or floor; and • a monitoring program to manage potential impacts, if any, on the alluvium and associated surface water source near the proposed extraction area that includes: <ul style="list-style-type: none"> - a minimum of three monitoring bores with automatic water level recording instrumentation or other method agreed with DPI-Water; - identification of a methodology for determining threshold water level criteria; - contingency measures in the event of a breach of thresholds; and - a program to regularly report on monitoring. 	Section 4
Schedule 3, Condition 21	The Applicant must implement the approved Soil and Water Management Plan as approved from time to time by the Secretary.	Noted
Schedule 5, Condition 3	The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:	
	(a) detailed baseline data;	Section 3
	(b) a description of:	Section 2
	<ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; 	Section 5 Section 5
	(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Section 4
	(d) a program to monitor and report on the:	Section 5.1
	<ul style="list-style-type: none"> • impacts and environmental performance of the development; and 	

Condition No.	Requirement	Reference
	<ul style="list-style-type: none"> effectiveness of any management measures (see (c) above); 	
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	Section 5.2
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time;	Section 6
	(g) a protocol for managing and reporting any: <ul style="list-style-type: none"> incidents; complaints; non-compliances with statutory requirements; and exceedances of the impact assessment criteria and/or performance criteria; and 	Section 5.3
	(h) a protocol for periodic review of the plan. <i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	Section 6
Appendix 5	The Soil and Water Management Plan required under condition 20 of Schedule 3 must:	Section 4
	a) describe stormwater management measures to control pollutants at the source and contain them within the site;	
	b) describe erosion and sediment control measures to minimise disturbance of land, minimise water flow through the site and filter, trap or detain sediment;	Section 4
	c) describe measures to maintain and monitor any stormwater controls;	Section 5
	d) describe methods of storage of topsoil and associated erosion and sediment control measures;	Section 4
	e) describe waste water treatment measures, including systems for the reuse and/or recycling of waste water and measures for treating the unavoidable discharges from the site to meet specific water quality requirements;	Section 3.2 Section 4
	f) describe the size and location of sediment basins for each stage of the quarry development in accordance with the sizing requirements of the <i>Managing Urban Stormwater Soils and Construction: Volume 1 and 2E</i> guidelines based on a minimum standard of 90 th percentile five-day rainfall event (75 mm); and	Appendix A
	g) include a water balance to ensure the design of the volume of sediment basins required for stormwater capture and treatment is not compromised by water storage required for re-use purposes. Such dual purpose basins must be designed and managed to accommodate both stormwater management and water re-use objectives.	Section 3.2

3. Existing environment and impacts

The following sections summarise the existing environment, based upon the information provided in Section 6.5.1 of the EIS.

3.1 Existing environment

3.1.1 Soil

The area surrounding the quarry is undulating with an elevation ranging from approximately 40 m Australian Height Datum (AHD) (near Tullymorgan-Jackybulbin Road) to approximately 229 m AHD at the peak of Mount Doubleduke outside the northern boundary of the quarry site.

The geology of the area is 'Kangaroo Creek' sandstone formations. The area generally has poor soils of sandy composition, mostly derived from the underlying sandstone. In lower-lying areas soils may be derived from stream deposition.

Clarence Valley Council (CVC) mapping indicates the site does not contain acid sulfate soils.

3.1.2 Surface water

The site is located within the Clarence River catchment with unnamed ephemeral drainage lines flowing in a southwest direction to Tabbimoble Creek. Tabbimoble Creek drains via the Bundjalung National Park marshes to the Clarence River near Iluka. A State Environmental Planning Policy (SEPP) 14 Coastal Wetland No. 153a is located on Tabbimoble Creek, about 1 km to the east of the Pacific Highway. The Woolgoolga to Ballina Pacific Highway Upgrade EIS (Roads and Maritime, 2014) determined that Tabbimoble Creek is key fish habitat with the potential for threatened species habitat, although it has not been mapped as such or found (through field survey) to contain Oxleyan Pygmy Perch.

For the existing quarry:

- The ephemeral drainage lines in the vicinity of the site are diverted around the works area and bypass the site sediment basins, discharging to Tabbimoble Creek under Tullymorgan-Jackybulbin Road.
- Surface water from within the works area, the pit floor and stockpiled areas is directed to an initial sediment pond (approx. 2.4 ML), which overflows to the main sediment basin.
- Surface waters from the site office, weighbridges, wash plant and other outbuildings along the site is directed to three smaller sediment basins (total approx. 0.55 ML). These basins also overflow to the main sediment basin.
- The main sediment basin (7m deep, approx. 12.6 ML) is the primary discharge point from the site.

Limited water quality information is available, however Roads and Maritime (2014) notes that existing data indicates that the majority of the waterways in the area have a history of water quality problems, with conditions commonly found to be below the standards required for protection of aquatic ecosystems. The occurrence of poor water quality can be attributed to a number of factors, including modification of channel structure, macrophyte and weed growth, soil erosion, acid sulfate soils and nutrient enrichment as a result of runoff from agricultural land. Samples taken from Tabbimoble Creek in 2009 failed to meet the ANZECC guidelines for electrical conductivity and dissolved oxygen (RTA, 2010). Furthermore, Tabbimoble Creek was found to have high concentrations of aluminium, which could be a result of aluminium leaching from soils due to the effects of acid sulfate soils.

3.1.3 Groundwater

The primary aquifers in the vicinity of the site are the Quaternary alluvial / colluvial groundwater source and the porous and fractured rock groundwater source.

The alluvial/colluvial groundwater source in the site forms a shallow, unconfined aquifer with reported thickness up to 17 metres to the east of the site.

Bores located to the east of the site within the alluvial groundwater source indicate that depth to groundwater is in the order of 2 metres below ground level (bgl). This suggests the groundwater elevation in the alluvial aquifer is approximately 23 m AHD. These bores are located down gradient of the site and therefore alluvial / colluvial groundwater would be anticipated to be slightly higher in the vicinity of the site. Porous and fractured rock aquifer underlies the alluvial/colluvial aquifer and outcrops across the site.

The level of extraction in the existing quarry pit has reached a level of 44 m AHD and the quarry has reportedly remained free from groundwater inflows. This indicates that the water table is below a level of 44 m AHD.

A search of the NSW Groundwater Bore Database was undertaken to identify registered bores within a 5 km radius of the site. The search identified six bores, with three bores being registered as domestic stock or stock, two bores registered as monitoring bores and one bore registered for oil exploration.

3.2 Site water balance

In order to assess the water quantity discharging from the site due to the proposed works, a MUSIC model was developed for the site. MUSIC node parameters were adopted from the Draft NSW MUSIC Modelling Guidelines in order to best represent the surface types and conditions present on the site.

For the purpose of this assessment, parameters adopted are based on the site being rural in nature, with the majority of surfaces best described as unsealed road and eroding gullies. The parameters adopted are shown in Table 3-1

Table 3-1 Adopted MUSIC node parameters (Source Nodes >10 Ha)

Parameters	Value (Mean Annual Rainfall >1000 mm)
Impervious Area Parameters	
- Daily Rainfall Threshold Values (mm)	1.5
Pervious Area Parameters	
- Soil Storage Capacity (mm)	175
- Initial Storage (% of capacity)	30
- Field capacity (mm)	55
- Infiltration Capacity Coefficient – a	215
- Infiltration Capacity Coefficient – b	2.4
Groundwater Properties	
- Initial Depth (mm)	10

Parameters	Value (Mean Annual Rainfall >1000 mm)
- Daily Recharge Rate (%)	55
- Daily Base Flow Rate (%)	10
- Daily Deep Seepage Rate (%)	0

Under existing conditions surface runoff from a natural catchment area (17.36 Ha) upstream of site is diverted around the quarry area and discharges into the downstream receiving waterway, bypassing the existing large sediment basin on site.

The proposed works will expand the quarry footprint to include some of these upstream areas which will become part of the operating quarry footprint. These areas will then discharge to the existing large sediment basin on site, instead of bypassing the basin. In order to mitigate the expected increase inflow from the proposed larger catchment under developed conditions, the existing large sediment basin is proposed to be expanded. The expansion would require doubling the existing basin volume in order to manage runoff volumes discharging from the site. Catchment characteristics are summarised below in Table 3-2.

To model the existing and proposed scenarios, both the existing and developed quarry footprints are assumed to have limited hardstand areas, however a portion of the quarry footprint is likely to be impervious exposed sandstone and therefore some impervious surfaces would be present within the quarry. The existing large sediment basin was included in the model for both scenarios, however in the proposed scenario the basin volume was doubled. The basin configuration details were based on findings from site inspections, details provided by existing quarry operators and the basin footprint area calculated from aerial imagery.

Table 3-2 Catchment characteristics

	Existing Scenario	Developed Scenario
Catchment Area (Ha)	12.73 (+17.36 Ha undeveloped)	30.08
Impervious Area (%)	15	15
Basin footprint (m ²)	2,700	5,700
Estimated Basin Capacity (m ³)	12,590	25,000
Basin Depth (m)	7	7
Basin outlet (diam.)	NA	NA
Basin weir length (m)	20	20

Where available, and of appropriate quality, the quarry operation will use recycled runoff for quarry activities. A site water balance was undertaken during preparation of the EIS, with estimated operational water requirements (amenities, road/site dust control and crushers) provided in Table 3-3. The extraction rates are based on an annual extraction of 500,000 t/year achieved under maximum production and average production over a full year. The latter requiring significantly more water for dust control over a longer time frame.

The results in Table 3-3 show that sufficient runoff would be generated from the quarry operational area to meet operational water requirements. In addition, surplus water captured in the settling basin on site will need to be discharged to remove excess runoff.

Table 3-3 Quarry operational site water balance

Extraction Rate	Runoff from proposed quarry operational area	Discharge from site	Water Demand
4000 t/day (maximum production i.e. 125 days operation)	136.16 ML/year (average year)	92.05 ML/year (average year)	4.05 ML/year
1500 t/day (production over a full year)	11.40 ML/year (dry year)	0.65 ML/year (dry year)	6.81 ML/year
	292.90 ML/year (wet year)	248.23 ML/year (wet year)	

4. Environmental control measures

Environmental requirements and control measures are identified in the Conditions of Approval and the EIS. Specific measures and requirements to address soil and water quality impacts are outlined in Table 4-1 below.

Table 4-1 Environmental control measures

Ref	Environmental Management Measure	Timing	Responsibility
Soil			
SW01	Extract the resource in stages to minimise the area of disturbance at any one time.	Operation	Quarry Manager
SW02	Remove soil and stockpile for use in the rehabilitation works.	Operation	Quarry Manager
SW03	Implement erosion and sediment controls in accordance with <i>Managing Urban Stormwater Soils and Construction – Volume 2e Mines and quarries</i> (Landcom, 2004) (Appendix B).	Construction Operation	Quarry Manager
SW04	Implement the rehabilitation plan.	Post-operation	Quarry Manager
Surface water			
SW05	Comply with all relevant EPL conditions relating to soil and water management.	Operation	Quarry Manager
SW06	Where available, and of appropriate quality, the quarry operation will use recycled runoff for quarry activities.	Operation	Quarry Manager
SW07	Erosion and sediment controls are to be implemented in accordance with <i>Managing Urban Stormwater Soils and Construction – Volume 2e Mines and quarries</i> (Landcom, 2004) (Appendix B).	Construction Operation	Quarry Manager
SW08	The capacity of the existing sediment basin will be increased to 40ML.	Construction	Quarry Manager
SW09	Designated, impervious bunded facilities will be provided for cleaning and/or maintenance of vehicles, plant or equipment. These facilities will be located at least 20 metres away from natural and built drainage lines.	Construction	Quarry Manager
SW10	All chemicals, fuels and oils stored at the premises must be contained within appropriately designed bunded areas that meet the following requirements:	Construction Operation	Quarry Manager

Ref	Environmental Management Measure	Timing	Responsibility
	a) comply with any relevant Australian Standards for the liquids being stored b) have impervious flooring and walls c) have a minimum capacity of 110% of the volume of the largest container stored within the bund.		
SW11	Spill kits will be provided at all chemical storage facilities/compound sites and staff trained in their use	Operation	Quarry Manager
SW12	Where refuelling on site is required, the following management practices will be implemented: <ul style="list-style-type: none"> – Refuelling will be undertaken on level ground, within the designated refuelling areas with appropriate bunding and/or absorbent material, at least 20 metres from drainage lines, waterways and/or environmentally sensitive areas – Spill kits will be readily available and personnel trained in their use. – Hand tools will be refuelled within lined trays of site vehicles wherever possible Any contaminated material will be disposed at an appropriately licensed facility and used spill kit materials replaced	Operation	Quarry Manager
SW13	Regular checks of vehicles working at the quarry will be conducted to ensure that no oils or fuels are leaking.	Operation	Quarry Manager
SW14	A suitable meteorological station is to be installed in the vicinity of the site that complies with the requirements in the <i>Approved Methods for Sampling of Air Pollutants in New South Wales</i> guideline.	Operation	Quarry Manager
SW15	Mulch stockpiles will be constructed with an impervious perimeter bund at least 300mm high, a sump capable of capturing 75 mm of rainfall and a stable outlet.	Operation	Quarry Manager
Groundwater			
SW16	All new and existing monitoring bores require licencing under Part 5 of the Water Act 1912.	Operation	Quarry Manager

Ref	Environmental Management Measure	Timing	Responsibility
	If the quarry intercepts groundwater, DPI Water will be contacted to obtain the appropriate licence	Operation	Quarry Manager
SW17	Install the three wells, shown on Figure 5-1, in accordance with <i>Minimum Construction Requirements for Water Bores in Australia</i> (NUDLC, 2011).	Pre Operation	Quarry Manager

5. Monitoring and reporting

5.1 Environmental inspections and monitoring

General environmental inspection requirements are detailed in Section 8 of the EMS. Inspections, monitoring and reporting specific to the management of soil and water that will be implemented during operation of the quarry are listed below in Table 5-1, along with who is responsible. Records of all monitoring shall be maintained.

Table 5-1 Typical erosion and sediment control monitoring program

Aspect	Frequency	Details	Responsibility
Weather	Daily	<p>Weather forecasts will be monitored to inform quarry operations, for example:</p> <ul style="list-style-type: none"> • If rain is forecast, sediment and erosion controls will be checked and maintained • If dry weather and winds are forecast, dust controls will be implemented. 	Quarry Manager
Rainfall	Daily	Rainfall at the premises must be measured and recorded in millimetres per 24 hour period, at the same time each day.	Quarry Manager
Erosion and sediment controls	Weekly and following rain (>10mm in 24hr)	Erosion and sediment controls are to be monitored and maintained, as required.	Quarry Manager
Baseline monitoring*	Following rain (>10mm in 24hr)*	<p>Baseline monitoring locations (WQ1 and WQ2) are shown on Figure 5-1. Water quality samples are to be collected and analysed for:</p> <ul style="list-style-type: none"> • Oil and grease – Visible • pH • TSS 	Quarry Manager
Basin monitoring	When discharging either naturally or manually (ie pumped) but not if reused on site (eg dust suppression, wash plant)	<p>The Monitoring Point (MP1) is the outlet of the main basin, as shown in Figure 5-1.</p> <p>The MP1 is to be monitored for TSS, pH and oil and grease. The following concentration limits must be achieved before discharge offsite:</p> <ul style="list-style-type: none"> • Oil and grease – Visible • pH – 6.5-8.5 • TSS – 50mg/L 	Quarry Manager

Aspect	Frequency	Details	Responsibility
		<p>If the above concentration limits are not achieved, the water will need to be treated in accordance with Appendix D.</p> <p>Note: Monitoring and the above concentration limits do not apply, if rainfall exceeding 75 mm falls over any consecutive five day period.</p> <p>Note: Turbidity can be used in place of TSS, as per the EPL</p>	
Basin capacity	Following rain	<p>The volume of water in the sediment basin is to be monitored (e.g. via a permanent stake in the dam) following rain. As per the EPL, if, within 5 days of rainfall, the remaining capacity of the basin is insufficient, the basin must be discharged to restore capacity.</p> <p>The volume of sediment is to be monitored (e.g. via a permanent stake in the dam with a mark showing depth of sediment) and removed to maintain an 80% capacity within the sediment storage zone.</p>	Quarry Manager
Spill kit	Monthly and following use	The spill kit is to be checked and any missing materials to be replaced.	Quarry Manager
Groundwater	Quarterly*	<p>The groundwater monitoring wells (GW1, GW2, GW3) are shown on Figure 5-1.</p> <p>The location of the monitoring wells is to focus on impacts to the alluvial groundwater source.</p> <p>Water level (using a data logger*), pH and Electrical conductivity is to be monitored.</p>	Quarry Manager

* If after two years of monitoring the results indicate the quarry has no influence, the frequency of monitoring can reduce and the dipping of wells replace the use of data loggers, with the approval of DPE and DPI Water.

5.2 Contingency plan

If the above monitoring detects an impact, a contingency plan or trigger and response plan is to be implemented, as shown below.

Aspect	Trigger	Response
Baseline monitoring	WQ2 results are more than 20% different than WQ1	The controls at the quarry will be inspected in detail and improved, as required. If the change persists for three consecutive months, engage an Environmental Consultant to undertake an investigation.
Groundwater	A greater than 20% difference in groundwater level or quality between GW1 and GW2 or GW3 in two successive monitoring events	Increase monitoring frequency to monthly. If the change persists for three consecutive months, engage a Hydrogeologist to undertake an investigation

5.3 Reporting

The general reporting requirements are described in Section 8.5 of the EMS. In relation to the monitoring results, the records must include:

- a) the date(s) on which the sample was taken
- b) the time(s) at which the sample was collected
- c) the point at which the sample was taken
- d) the name of the person who collected the sample.

A sampling record form is provided in Appendix D.



LEGEND

- GW# GROUNDWATER MONITORING LOCATION
- WQ# SURFACE WATER MONITORING LOCATION
- MP# MONITORING POINT



NEWMAN QUARRYING
SLYS QUARRY

MONITORING LOCATIONS

Job Number 22-17528
Revision B
Date OCT 2016

Figure 5-1

6. Review and improvement

Continuous improvement of this SWMP will be achieved in accordance with Section 9 of the EMS, through the ongoing evaluation of environmental management performance against environmental policies, objectives and targets.

The continuous improvement process is 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; and make comparisons with objectives and targets

Appendices

Appendix A – Agency Consultation

Ben Luffman

From: Scott Ensbey <Scott.Ensbey@epa.nsw.gov.au>
Sent: Monday, 14 November 2016 5:28 PM
To: Ben Luffman
Subject: RE: EPL 11649

CompleteRepository: 2217528
Description: Sly's Quarry EIS
JobNo: 17528
OperatingCentre: 22
RepoEmail: 2217528@ghd.com
RepoType: Job

Hi Ben,

Sorry, I thought I'd spoken to you about the plan review issue.

I understand that it's a condition of consent that Newman's consult with the EPA on the development of the plans. The EPA does not typically review/endorse Environmental Management Plans, Noise Management Plans, etc. It is up to the licensee (usually via their consultant) to ensure that the plans comply with the relevant guidelines. In this case, the SWMP needs to be based on the Blue Book, Volumes 2 and 2E, the Noise Management Plan should be guided by the principles of the Industrial Noise Policy.

I'm happy to discuss this position if needed, otherwise I'll leave it with you.

Regards

Scott Ensbey

Operations Officer – North Coast

NSW Environment Protection Authority

(02) 6640 2522 MOB: 0447142916

scott.ensbey@epa.nsw.gov.au www.epa.nsw.gov.au [@EPA_NSW](https://twitter.com/EPA_NSW)

Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555



From: Ben Luffman [mailto:Ben.Luffman@ghd.com]
Sent: Friday, 11 November 2016 4:45 PM
To: Scott Ensbey <Scott.Ensbey@epa.nsw.gov.au>
Subject: RE: EPL 11649

Hi Scott,

How are you going with the review of the plans? Another discrepancy between the EPL and consent is the consent allows for receiving 10,000 tonnes of topsoil and 5,000 m3 of mulch during any calendar year but the EPL does not.

Ben Luffman

From: Christie Jackson <christie.jackson@dpi.nsw.gov.au>
Sent: Wednesday, 26 April 2017 2:31 PM
To: Ben Luffman
Subject: Re: Sly's Quarry

CompleteRepository: 2217528
Description: Sly's Quarry EIS
JobNo: 17528
OperatingCentre: 22
RepoEmail: 2217528@ghd.com
RepoType: Job

Ben,
Once the references to WaterNSW is changed, it is fine to submit to DPE.
Christie

Kind regards

Christie Jackson, Water Regulation Officer
Water Regulation North North Coast
Department of Primary Industries - Water
4 Marsden Park Road Calala NSW 2340 | PO Box 550 | Tamworth NSW 2340
T: 02 6763 1426 | **F:** 02 6701 9682
E: christie.jackson@dpi.nsw.gov.au
W: www.water.nsw.gov.au

Part Time: Monday-Thursday



On 26 April 2017 at 14:24, Ben Luffman <Ben.Luffman@ghd.com> wrote:

Hi Christie,

No problem, I'll change the reference as requested. Once done, would you like to see it again or is it ok to submit to DPE for approval?

Regards

Ben Luffman
Senior Environmental Scientist/Planner

GHD

[WATER](#) | [ENERGY & RESOURCES](#) | [ENVIRONMENT](#) | [PROPERTY & BUILDINGS](#) | [TRANSPORTATION](#)

 Please consider the environment before printing this email

1 ream of paper = 6% of a tree / 5.4kg CO2 in the atmosphere | 3 sheets of A4 paper = 1 litre of water

From: Christie Jackson [mailto:christie.jackson@dpi.nsw.gov.au]
Sent: Monday, 24 April 2017 2:07 PM
To: Ben Luffman <Ben.Luffman@ghd.com>
Subject: Re: Sly's Quarry

Hi Ben,

I apologise for the delayed response. DPI Water notes you have included our requirements from my previous email into the Soil and Water Management Plan for Sly's Quarry. I did notice you had made reference to WaterNSW, these references should be changed to DPI Water.

Kind regards,

Christie

Kind regards

Christie Jackson, Water Regulation Officer

Water Regulation North North Coast

Department of Primary Industries - Water

4 Marsden Park Road Calala NSW 2340 | PO Box 550 | Tamworth NSW 2340

T: 02 6763 1426 | **F:** 02 6701 9682

E: christie.jackson@dpi.nsw.gov.au

W: www.water.nsw.gov.au

Part Time: Monday-Thursday

On 10 April 2017 at 16:09, Ben Luffman <Ben.Luffman@ghd.com> wrote:

Hi Christie,

Please find attached the revised SWMP for Slys Quarry. In summary, our response to the WaterNSW comments are:

- The monitoring locations in the EIS were existing wells which are inappropriate for monitoring. The proposed wells have been located to monitor the alluvial aquifer
- Water quality parameters updated to be the same as suggested in the EIS.
- Inclusion of the ability to reduce the frequency of sampling following 2 years of stable results and consultation with WaterNSW
- Inclusion of data loggers
- Appendix B reference updated
- No existing monitoring wells to be used
- Inclusion of a reference to the proposed wells being constructed in accordance with Minimum Construction Requirements for Water Bores in Australia (NUDLC, 2011).

I trust the above addresses WaterNSW comments but let me know if you have any questions.

Regards

Ben Luffman
Senior Environmental Scientist/Planner

GHD

T: [+61 2 6650 5613](tel:+61266505613) | V: 225613 | M: [+61 415 271 319](tel:+61415271319) | E: ben.luffman@ghd.com
PO Box 1340 Coffs Harbour NSW 2450 | Level 1 230 Harbour Drive Coffs Harbour NSW 2450 Australia | www.ghd.com

[WATER](#) | [ENERGY & RESOURCES](#) | [ENVIRONMENT](#) | [PROPERTY & BUILDINGS](#) | [TRANSPORTATION](#)

 Please consider the environment before printing this email

1 ream of paper = 6% of a tree / 5.4kg CO2 in the atmosphere | 3 sheets of A4 paper = 1 litre of water

From: Christie Jackson [mailto:christie.jackson@dpi.nsw.gov.au]
Sent: Tuesday, 21 March 2017 2:01 PM
To: Ben Luffman <Ben.Luffman@ghd.com>
Subject: Sly's Quarry

Hi Ben,

I apologise for the delay.

I spoke with DPI Water's hydrogeologist about your request to monitor Sly's Quarry more frequently in the first two years and then decrease water quality monitoring after two years.

DPI Water's Hydrogeologist said the proponent can submit a request to reduce the frequency of water quality monitoring with justification after 2 years assuming they are at the lowest proposed depth of the quarry. This request will need to identify trigger levels for further action and a return to increased sampling.

In relation to your request regarding data loggers, DPI Water's Hydrogeologist said the proponent can submit a request to go from loggers to dipped levels with justification after 2 years assuming they are at the lowest proposed depth of the quarry. This request will need to identify trigger levels for further action and a return to logger collection.

Kind regards

Christie Jackson, Water Regulation Officer

Water Regulation North North Coast

Department of Primary Industries - Water

4 Marsden Park Road Calala NSW 2340 | PO Box 550 | Tamworth NSW 2340

T: 02 6763 1426 | **F:** 02 6701 9682

E: christie.jackson@dpi.nsw.gov.au

W: www.water.nsw.gov.au

Part Time: Monday-Thursday

This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

This e-mail has been scanned for viruses

CONFIDENTIALITY NOTICE: This email, including any attachments, is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person. GHD and its affiliates reserve the right to monitor and modify all email communications through their networks.

This message is intended for the addressee named and may contain confidential information. If you are not the intended recipient, please delete it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of their organisation.

This e-mail has been scanned for viruses

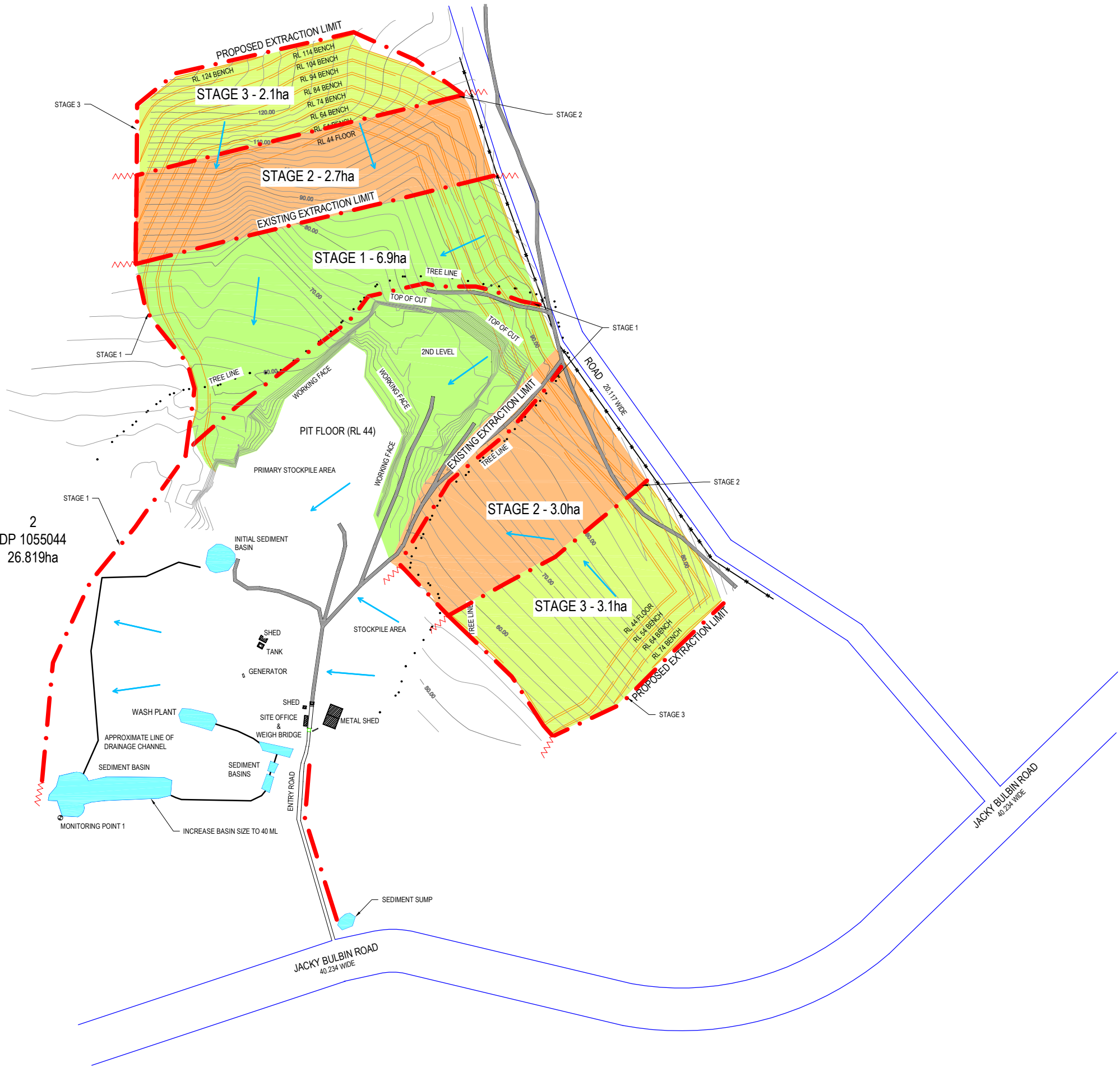
Appendix B - Soil and Erosion Control Plan

BASIN CALCULATIONS

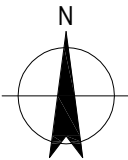
CATCHMENT (Ha)	30
SOIL TYPE	D
5 DAY/90%	74.9
SOIL LOSS (m³/Ha/yr)	226
SETTLING ZONE (m³)	2604
SEDIMENT STORAGE ZONE (m³)	17751
TOTAL VOLUME (m³)	20355

LEGEND

- STAGE 1 - EXISTING EXTRACTION LIMIT
- STAGE 2 - INTERIM STAGE
- STAGE 3 - PROPOSED EXTRACTION LIMIT
- EXISTING VEHICLE TRACK
- TREE LINE
- POND
- BUILDING
- PROPOSED FINAL BATTER
- PROPOSED FENCE
- DIVERSION BUND WITH CHECK EVERY 40r
- DISSIPATOR / LEVEL SPREADER
- WATER FLOW DIRECTION
- OVERFLOW CHANNEL



0 20 40 60 80 100m
SCALE 1:2000 AT ORIGINAL SIZE



PRELIMINARY

A	INITIAL ISSUE		
rev	description	app'd	date

NEWMAN QUARRYING
SLYS QUARRY
SOIL AND EROSION PLAN

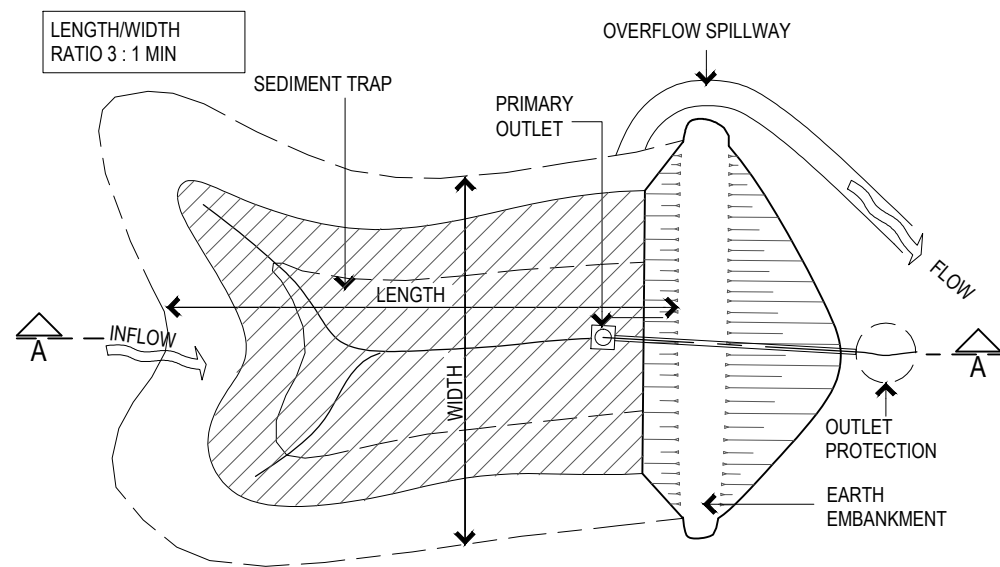


230 Harbour Drive Coffs Harbour
NSW 2450 Australia
T 61 2 6650 5600 F 61 2 6650 5601
E cfsmail@ghd.com W www.ghd.com

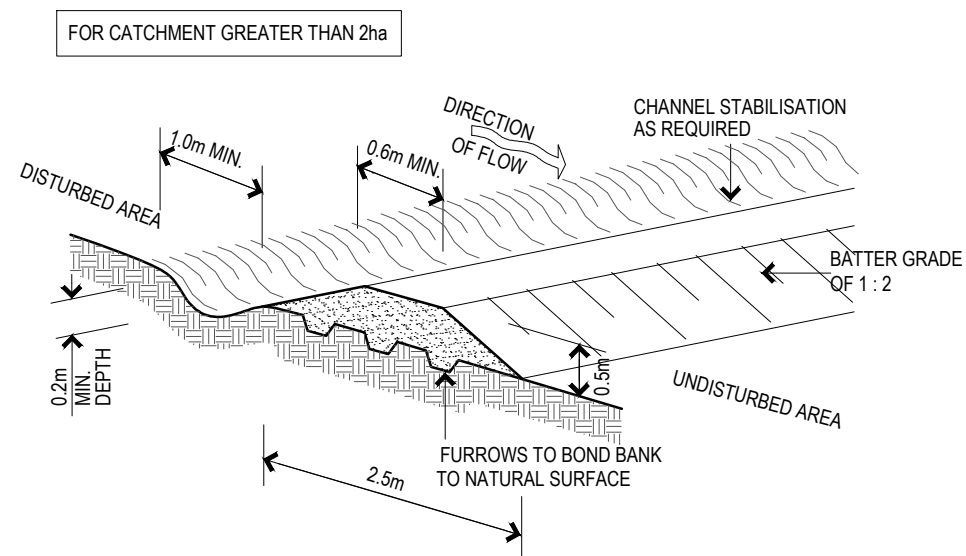
GHD Limited
Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.

scale | 1:2000 for A3 job no. | 22-17528
date | OCTOBER 2016 rev no. | A

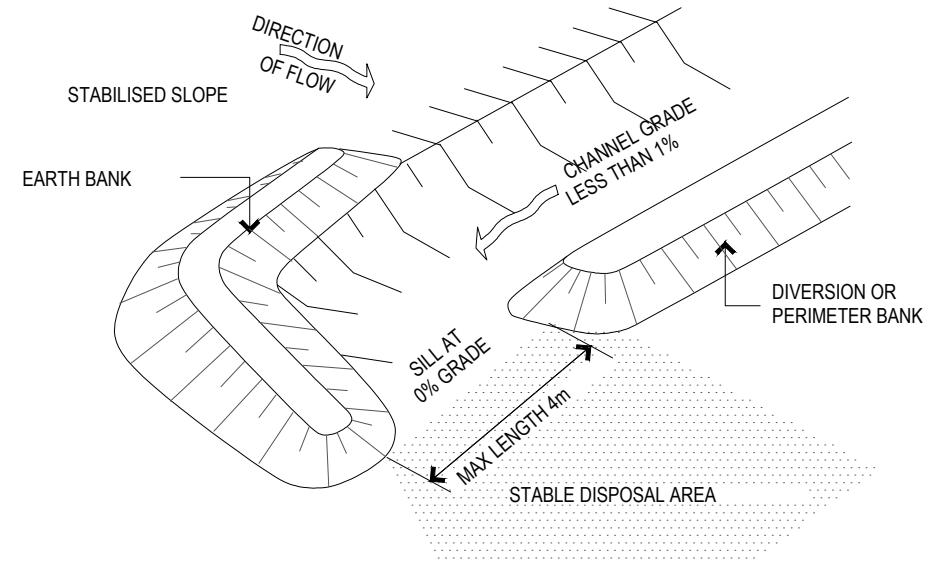
approved (PD)



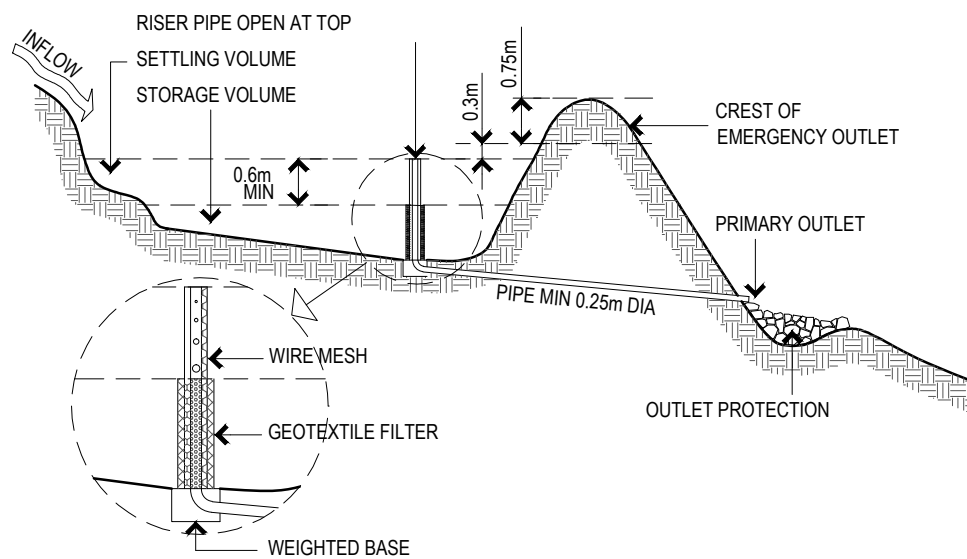
SEDIMENT BASIN PLAN



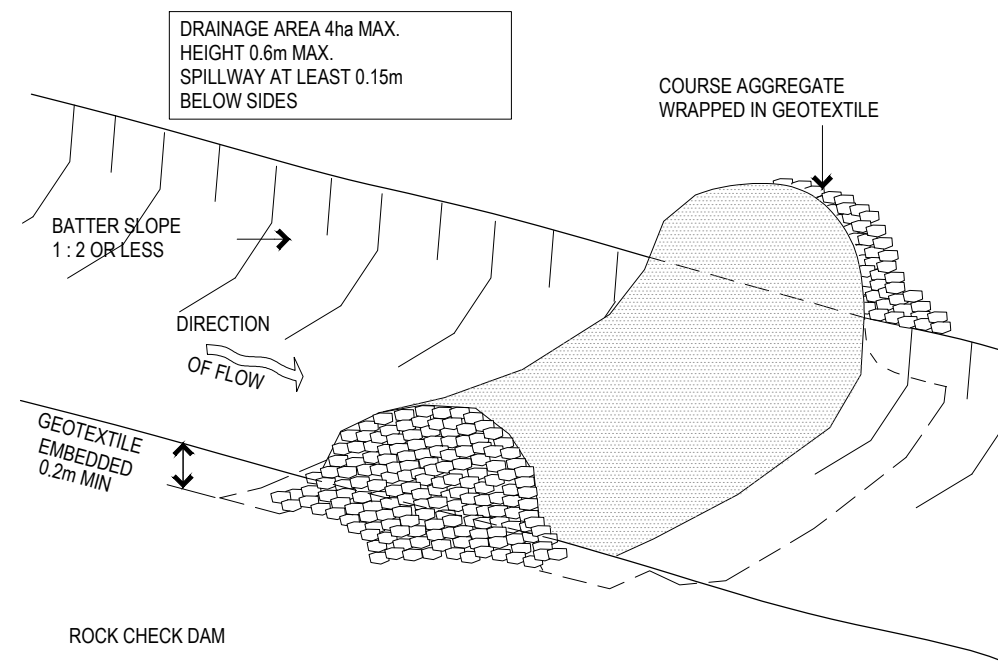
DIVERSION BANK AND CHANNEL



LEVEL SPREADER



SEDIMENT BASIN SECTION A.A



ROCK CHECK DAM

rev	description	app'd	date
A	INITIAL ISSUE		

NEWMAN QUARRYING SLYS QUARRY EROSION CONTROLS DETAIL DRAWINGS



230 Harbour Drive Coffs Harbour
NSW 2450 Australia
T 61 2 6650 5600 F 61 2 6650 5601
E cfsmail@ghd.com W www.ghd.com

Conditions of Use: This document may only be used by GHD's client (and any other person who GHD has agreed can use this document) for the purpose for which it was prepared and must not be used by any other person or for any other purpose.

scale | NTS for A3 job no. | 22-17528
date | OCTOBER 2016 rev no. | A

approved (PD) SK005

Appendix C – Water treatment procedure

pH Treatment

- Treat for pH prior to T.S.S.
- Hydrochloric acid (32% Muriatic) or sulfuric acid will be used to lower pH when the pH exceeds 8.5.
- Agricultural Lime (Aglime) or Hydrated lime will be used to treat water with a pH lower than 6.5.
- Determine the volume of water in basin.
- Determine percentage of lime or acid required by taking a 10 litre sample of basin water and adding a known amount of lime or acid (initially 0.004%). If the pH is still not acceptable, vary the amount of lime or acid until within the limits.
- Repeat the above procedure to confirm the amount of acid or lime required.
- Once the required percentage has been determined, calculate the actual amount of lime or acid to be added by multiplying the volume of water in the basin by the determined percentage.
- Add the required amount of lime or acid to the basin
- Mix the water in the sediment basin well
- Test water to confirm it is within pH of 6.5 to 8.5

TSS Treatment

- If the basin requires treatment/flocculation (e.g. T.S.S. >50mg/l), gypsum is to be immediately applied evenly across the top of the water at the manufacturers recommended dosage initially, then at an acceptable rate should more flocculants be required.
- The basin should be monitored daily after flocculation until desired TSS is achieved and to assist in determination of optimal dosage levels.
- Methods of application involves mixing in a drum with water and spraying across the whole surface of the basin
- When spraying flocculants, the mixture must hit the water at between 10 to 20 degrees to increase surface areas exposure to the water column.
- When using liquid gypsum such as “Hydra-Gyp” the solution must be mixed before use to ensure gypsum is evenly suspended throughout mixture. This is best achieved using an aeration device at 3 bars of pressure for approximately 15 minutes.
- Flocculation of sediment basins must occur within 24 hours of the conclusion of each rain event. Ongoing visual monitoring of the basins should occur during this time.
- Test water to confirm it is less than 50mg/L.
- Alternative flocculation agents may be investigated if gypsum is found to be unsuitable. Use of alternative flocculating agent will only occur after approval from the EPA.

Appendix D – Monitoring Record Forms

Water Quality Monitoring

Monitoring Date :	Inspection Conducted By:
Weather Conditions: Dry <input type="checkbox"/> Slight Wind <input type="checkbox"/> Calm <input type="checkbox"/> Rain <input type="checkbox"/> Strong Wind <input type="checkbox"/>	
Rainfall (Past 24 hours):	
Rainfall (Past 5 Days):	

Monitoring Point	Discharging?	TSS/Turbidity	pH	Oil/Grease	Treated?	Dishcharged
Criteria		50mg/L	6.5 to 8.5	Visible		

Comments:

Water Quality Monitoring

Monitoring Date :	Inspection Conducted By:
Weather Conditions: Dry <input type="checkbox"/> Slight Wind <input type="checkbox"/> Calm <input type="checkbox"/> Rain <input type="checkbox"/> Strong Wind <input type="checkbox"/>	
Rainfall (Past 24 hours):	
Rainfall (Past 5 Days):	

Monitoring Point	Discharging?	TSS/Turbidity	pH	Oil/Grease	Treated?	Dishcharged
Criteria		50mg/L	6.5 to 8.5	Visible		

Comments:

Groundwater Monitoring

Monitoring Date :	Inspection Conducted By:
Weather Conditions: Dry <input type="checkbox"/> Slight Wind <input type="checkbox"/> Calm <input type="checkbox"/> Rain <input type="checkbox"/> Strong Wind <input type="checkbox"/>	
Rainfall (Past 24 hours):	
Rainfall (Past 5 Days):	

Monitoring Point	Water level (m below top of casing)

Comments:

Groundwater Monitoring

Monitoring Date :	Inspection Conducted By:
Weather Conditions: Dry <input type="checkbox"/> Slight Wind <input type="checkbox"/> Calm <input type="checkbox"/> Rain <input type="checkbox"/> Strong Wind <input type="checkbox"/>	
Rainfall (Past 24 hours):	
Rainfall (Past 5 Days):	

Monitoring Point	Water level (m below top of casing)

Comments:

GHD


230 Harbour Drive
Coffs Harbour NSW 2450
T: (02) 6650 5600 F: (02) 6650 5601 E: cfsmail@ghd.com

© GHD 2017

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

N:\AU\Coffs Harbour\Projects\22\17528\WP\16978.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	B Luffman	M Pignatelli		S Lawer		03/05/2017

www.ghd.com

