HUME HIGHWAY SOUTHERN ALLIANCE

Rockley Falls Quarry

REQUEST FOR MODIFICATION TO CONDITIONS OF APPROVAL TO AMEND SEDIMENT BASIN DESIGN CRITERIA

- Final
- 1 May 2009

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Abigroup Project Number: 221330
RTA Project Number: D/00310/T/SA
SKM Project Number: IN90304

A Team consisting of RTA, Abigroup and SKM
to duplicate the Hume Highway from Woomargama to Table Top

Contents

Executive Summary

The Hume Highway Southern Alliance (HHSA), on behalf of Abigroup Contractors Pty Ltd (Abigroup) is seeking a modification to the Conditions of Approval for Rockley Falls Quarry. This modification is sought in relation to Condition 20 of the Project Approval. Condition 20 details the design criteria for the erosion and sediment control structures at Rockley Falls Quarry.

In particular, this modification is sought to ensure that the design criteria stipulated within Condition 20 reflects the requirements of the Landcom publication - *Managing Urban Stormwater: Soils and Construction* (the Blue Book). Volume 2E of the Blue Book relates specifically to mines and quarries. This publication is recognised state-wide as the industry standard for the design and implementation of erosion and sediment controls.

The HHSA is seeking the modification for the following reasons:

- to ensure that the MCoA reflect what was proposed within the Environmental Assessment (prepared by Blueprint Planning for Abigroup, February 2008) (EA). The EA recommended:
    - that the basins be built in accordance with the Concept Erosion and Sediment Control Plan, particularly the detailed design of the basins. The Concept ERSED Plan has been adhered to in the design and construction of the basins;
    - that basin 1 be 500m^3 in volume and basin 2 400m^3. The volumes of the basins as currently constructed are each more than three times these recommended volumes. The effect of the duration period detailed in MCoA 20 would mean that these volumes would be considered to be insufficient;
    - that the basins be constructed to provide for a 20ARI rainfall event, however there was no duration detailed or referenced within the EA. This figure is in conflict with the volumes recommended in the EA (refer Figure 3.6.4 of the EA). Further to this, it is the duration period applied within MCoA 20 which significantly alters the interpretation and effect of Condition 20 and of the volume required;
- the implication of applying a 1:20 ARI 24 hour duration is significant. The basins have been constructed to be more than three times the volume recommended within Section 3.6.4 of the EA, however this would still be considered insufficient when applying a duration of 24 hours. Basins would need to be significantly rebuilt (more than doubled in size - which would have the net effect of making them six times the volume recommended in the EA) in order to meet this requirement. This would have significant implications for the project without any demonstrable environmental benefit. This is further discussed in Section 3.4 of this submission;
- the EA provides the basis for the Statement of Commitments (SOC). The SOCs require that works are carried out in accordance with the Concept Erosion and Sedimentation Control (Appendix 1);

- the basins as constructed meet and exceed the standards recommended both within the Blue Book, and those detailed within the recently released Volume 2E of the Blue Book (DECC, 2008). These guidelines are considered state-wide to be the most appropriate industry guideline for use in determining appropriate sizing of sediment controls;
- there are no known erosion and sediment control guidelines which recommend that 1:20 ARI, 24 hour duration be used for sizing basins. The 1:20 ARI 24 hour duration design criteria appears well above current industry standards as determined by the requirements of the Blue Book Vol 2E for mines and quarries;
- the receiving environment is highly modified and consists of grassed agricultural land used for grazing. Given this context, potential risks can be very adequately mitigated and managed with basins sized according to the requirements of the Blue Book.

1. Introduction

1.1 Background

In June 2008, approval was granted to Abigroup Contractors Pty Ltd (Abigroup) to establish and operate Rockley Falls Quarry (the quarry) near Holbrook, New South Wales (NSW). The approval was based on the Environmental Assessment Report for the Establishment of Rockley Falls Quarry (the EA) prepared by Blueprint Planning, February 2008. Abigroup is a participant of the Hume Highway Southern Alliance (HHSA) that has been formed to construct the duplication of the Hume Highway between Woomargama and Table Top. The quarry is supplying material to the HHSA duplication project, and is now being operated by the HHSA (on behalf of Abigroup) under Project Approval 07-0078 (dated 16 June 2008) and Environment Protection Licence (EPL) No. 12884 issued by the Department of Environment and Climate Change (DECC).

The Minister's Conditions of Approval (MCoA) detail the following conditions relating to the design criteria for erosion and sediment control structures at Rockley Falls Quarry.

Condition 20

> *The Proponent shall ensure that the erosion and sediment control structures for the development are designed, constructed and operated to capture and treat polluted waters from storm events of less than, and including 1:20 year average recurrence interval, 24 hour duration.*

Condition 24

> *The Erosion and Sediment Control Plan shall:*
>
> *(a) be consistent with the requirements of Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004 (Landcom);*
>
> *(b) identify activities that could cause soil erosion and generate sediment;*
>
> *(c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;*
>
> *(d) describe the location, function, and capacity of erosion and sediment control structures;*
>
> *(e) demonstrate that the design capacity of basins will not be compromised by storage of operational water;*
>
> *(f) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time; and*
>
> *(g) include details of a program to monitor the effectiveness of the Erosion and Sediment Control Plan.*

To date, two sediment basins have been constructed at the quarry to capture stormwater runoff from the disturbed area. These sediment basins were designed in accordance with:

(i) the recommendations of Section 3.6.4 of the Environmental Assessment (EA) submitted as part of the original project application for Rockley Falls Quarry. This is discussed in further detail in Section 3.3 of this submission;

(ii) the Concept Erosion and Sediment Control Plan prepared as part of the EA;

(iii) the Statement of Commitments (SOC) detailed both within the EA and within Appendix 3 of Project Approval 07-0078. SOC 3 relates to Water Quality and Hydrology and, in terms of controls, recommends that the Concept Erosion and Sediment Control Plan be implemented (refer **Appendix 1**);

(iv) the conditions originally imposed within EPL 12884 issued by DECC. During a subsequent variation, DECC amended this condition citing that it needed to ensure consistency with the MCoA. DECC also advised that it would consider amending this EPL condition if DoP modified MCoA 20;

(v) Landcom's publication - *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (the Blue Book). The Blue Book is recognised as the industry standard for erosion and sediment control and basin sizing. Further to this, DECC has recently released Volume 2E of the Blue Book that relates specifically to mines and quarries. The basins have been constructed to ensure compliance with the requirements of both of these documents. This is discussed in further detail in Section 3.4 of this submission; and

(vi) further to this, the MCoA were originally interpreted such that, when designing and sizing the sediment controls (through preparing the PESCP), the requirements of the Blue Book were to be applied.

In February 2009, the HHSA sought clarification from the Department of Planning (DoP) in relation to the appropriate criteria for sediment basin sizing. At that time it was communicated that there was a possibility of different interpretations of the MCoA that would result in basin sizes that could be very different; specifically in relation to the duration event (24 hour duration) that was applied to the 1:20 ARI within Condition 20. The duration event had not been detailed previously within the EA or EPL. Additionally, this recommended design criterion does not reflect any accepted erosion and sediment guidelines that are applied within NSW or Australia. The inclusion of a duration event completely alters the effect and outcome of the ARI and consequently, the requirements of this condition.

Following a meeting with DoP on 13 February 2009 regarding this issue, DoP communicated its view on 4 March 2009 that Conditions 20 and 24 are capable of being read and applied without contradiction. It was recommended by DoP that the options for HHSA were to apply the requirements of Condition 20 when sizing basins, or seek a modification to the approval under s.75W of the *Environmental Planning & Assessment Act 1979.*

1.2 Purpose of this submission

This submission has been prepared to support a request for a modification to the Condition 20 of the MCoA, in relation to the design criteria for the erosion and sediment control structures (i.e. sediment basins).

The HHSA (on behalf of Abigroup) requests that Condition 20 be modified such that the design criteria reflect the requirements of *Managing Urban Stormwater: Soils and Construction* (the Blue Book). This is justified as the Blue Book is a well-known, prominent and reputable guideline used commonly in NSW in the design and construction of erosion and sedimentation controls and typically referenced as the appropriate guideline for ERSED control and management work by DECC and the Soil Conservations Service.

Furthermore, Volume 2E of the Blue Book has recently been published and released by the Department of Environment and Climate Change (DECC). Volume 2E relates specifically to Mines and Quarries and recommends the appropriate sizes of basins to be installed.

It is requested that MCoA 20 is amended to reflect this latest guideline.

1.3 Content of this submission

The submission addresses the following aspects:

- a description of the receiving environment;
- justification for the modification including:-
  - reasons for requesting the modification;
  - current basin design;
  - the EA requirements;
  - the requirements of the Blue Book.

2. Receiving Environment

Rockley Falls Quarry is situated approximately 4 kilometres northeast of Holbrook on the western escarpment and foothills of the 'Cromer Hills' as shown in **Figure 1**. The subject site and surrounding area have been extensively modified and used for agricultural purposes, primarily grazing of sheep and cattle. To the west of the site, neighbouring properties are dominantly pastoral with cropping increasing to the west of the Hume Highway.

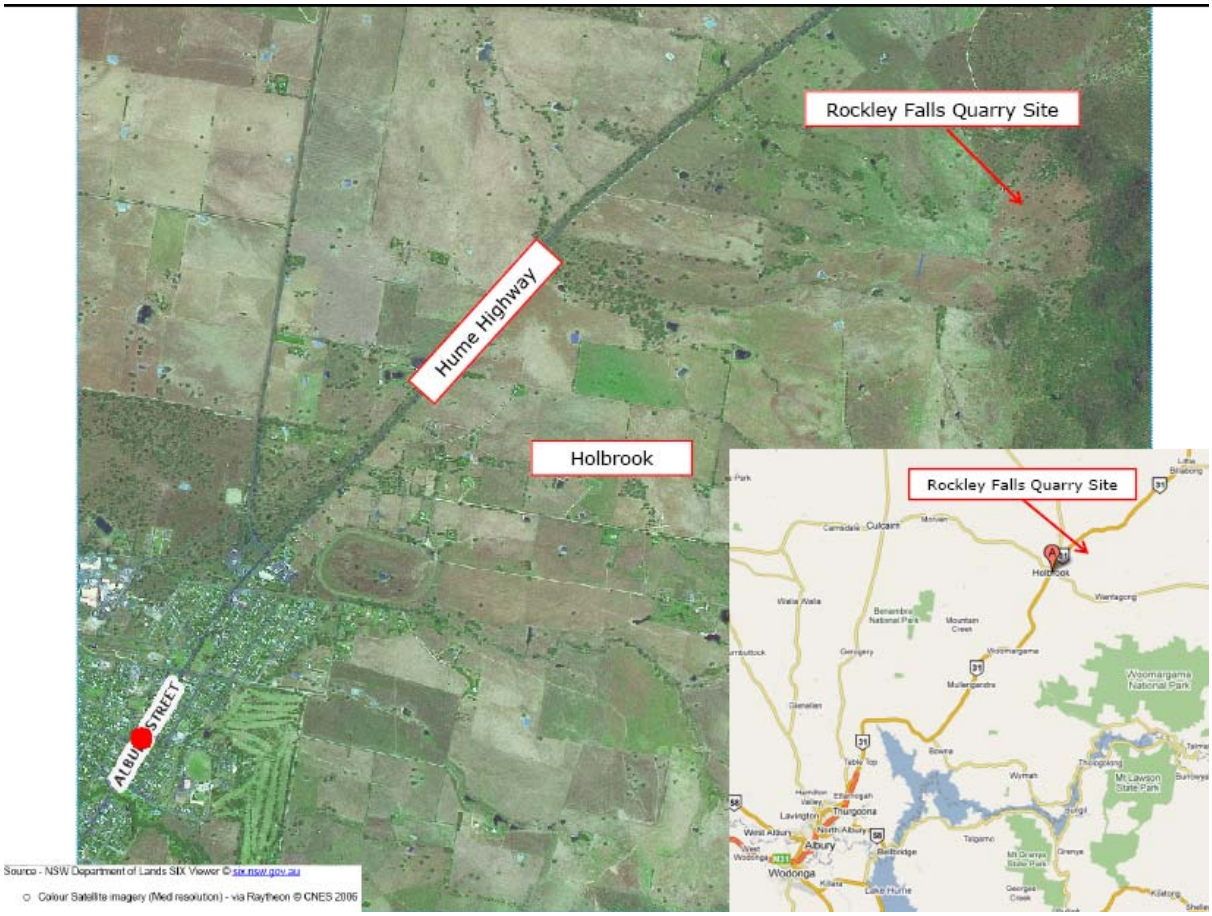


Figure 1. Site Location

Two small ephemeral drainage lines run along the site before entering Billabong Creek approximately 2.1km to the northwest of the site. The road works associated with the Hume Highway Duplication project also drain into the Billabong Creek. Billabong Creek flows to the west and ultimately drains to the Murray River some 350 kilometres to the west of Holbrook.

The locations of the sediment basins currently installed at the quarry are illustrated in **Figure 2**.

Basin 1 is located on Lot 1 DP1116210 and captures runoff from the crushing plant and production stockpile area. It discharges to the unnamed drainage line at the southern end of the site. This drainage line rarely flows because of the sandy soils within the bed of the creek.

Basin 2 is located on Lot 113 DP753340 and captures runoff from the stockpiling and loading area. It discharges to a cleared paddock to the south.

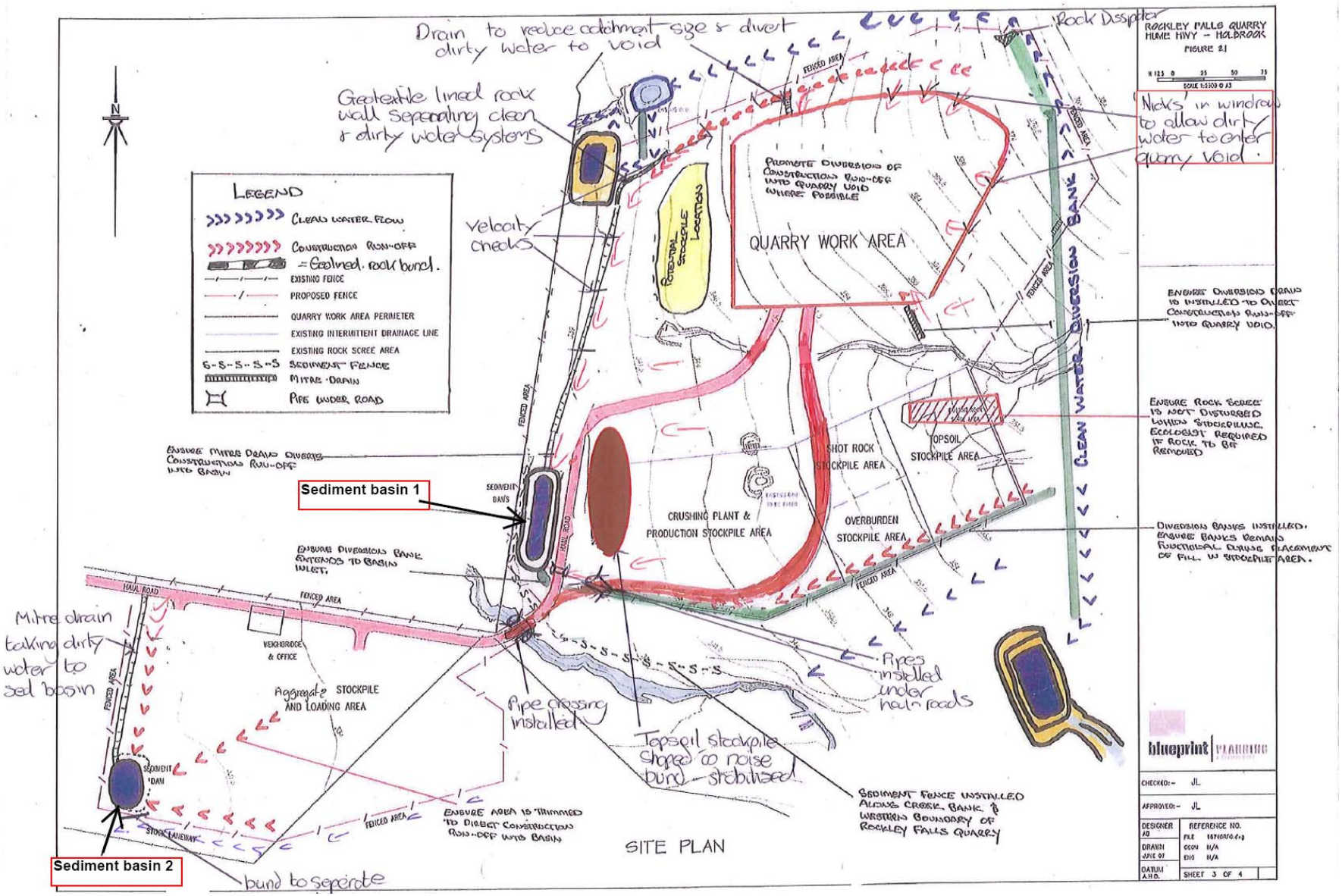


Figure 2. Location of sediment basins at the quarry (***Source**: Rockley Falls Quarry Progressive Erosion and Sediment Control Plan from Rockley Falls Environmental Management Plan, March 2009*).

3. Justification for modification

3.1 Reasons for requesting the modification

The HHSA is seeking a modification to the design criteria for the erosion and sediment control structures at Rockley Falls Quarry for the following reasons:

- to ensure that the MCoA reflect what was proposed within the Environmental Assessment (prepared by Blueprint Planning for Abigroup, February 2008) (EA). The EA recommended:
    - that the basins be built in accordance with the Concept Erosion and Sediment Control Plan, particularly the detailed design of the basins. The Concept ERSED Plan has been adhered to in the design and construction of the basins;
    - that basin 1 be 500m^3 in volume and basin 2 400m^3. The volumes of the basins as currently constructed are each more than three times these recommended volumes. The effect of the duration period detailed in MCoA 20 would mean that these volumes would be considered to be insufficient;
    - that the basins be constructed to provide for a 20ARI rainfall event, however there was no duration detailed or referenced within the EA. This figure is in conflict with the volumes recommended in the EA (refer Figure 3.6.4 of the EA). Further to this, it is the duration period applied within MCoA 20 which significantly alters the interpretation and effect of Condition 20 and of the volume required;
- the implication of applying a 1:20 ARI 24 hour duration is significant. The basins have been constructed to be more than three times the volume recommended within Section 3.6.4 of the EA, however this would still be considered insufficient when applying a duration of 24 hours. Basins would need to be significantly rebuilt (more than doubled in size - which would have the net effect of making them six times the volume recommended in the EA) in order to meet this requirement. This would have significant implications for the project without any demonstrable environmental benefit. This is further discussed in Section 3.4 of this submission;
- the EA provides the basis for the Statement of Commitments (SOC). The SOCs require that works are carried out in accordance with the Concept Erosion and Sedimentation Control (Appendix 1);
- the basins as constructed meet and exceed the standards recommended both within the Blue Book, and those detailed within the recently released Volume 2E of the Blue Book (DECC, 2008). These guidelines are considered state-wide to be the most appropriate industry guideline for use in determining appropriate sizing of sediment controls;
- there are no known erosion and sediment control guidelines which recommend that 1:20 ARI, 24 hour duration be used for sizing basins. The 1:20 ARI 24 hour duration design criteria appears well above current industry standards as determined by the requirements of the Blue Book Vol 2E for mines and quarries;
- the receiving environment is highly modified and consists of grassed agricultural land used for grazing. Given this context, potential risks can be very adequately mitigated and managed with basins sized according to the requirements of the Blue Book.

3.2 Current basin design methodology

As stated previously, the sediment basins have been constructed in accordance with:

(i) the volumes recommended within Section 3.6.4 'Sediment dam system design methodology' of the EA;

(ii) the Concept Erosion and Sediment Control Plan prepared as part of the EA;

(iii) the Statement of Commitments (SOC);

(iv) the conditions originally imposed within EPL 12884 issued by DECC;

(v) *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (the Blue Book);

(vi) *Managing Urban Stormwater: Soils and Construction, Volume 2E – Mines and quarries*;

(vii) Condition of Approval 24.

The requirements of the EA are discussed in Section 3.3 of this submission.

The basins are part of an overall Soil and Water Management Strategy for the quarry and are used in conjunction with other erosion and sediment control measures which are detailed in the progressive erosion and sediment control plan for the quarry (refer to **Figure 2**).

It is also noted that the quarry void itself acts as a large sediment basin. The void is currently approximately 230,770m^3 in size and as quarrying continues, this capacity will only increase.

A number of parameters were taken into account when designing and sizing the sediment basins and these are listed in **Table 1**. With reference to the NSW Soil Landscape plans for Albury, a conservative estimate for soil erodibility was assumed due to the absence of site specific soil test results. The assumed rainfall depth input for the basin sizing corresponds to the 95th percentile which is a conservative value listed in the Blue Book. The required total basin volume includes the volume for both the Settling Zone and the Sediment Storage Zone. The sediment storage zone was estimated using the Revised Universal Soil Loss Equation (RUSLE) assuming a sediment yield time period of 2 months.

Table 1 - Sediment Basin Design Parameters

Site Constraints / Characteristics	Value/Rating used in the Revised Universal Soil Loss Equation (RUSLE)
Rainfall Erosivity (ability of rainfall to cause erosion – Site specific)	R = 1250
2 year ARI, 6 hour rainfall intensity (I_2)	6.5 mm/hr
Rainfall Distribution Zone (to determine if special controls apply for various months of the year depending on soil loss classes)	Zone 10
Soil Erodibility (Subsoils)	Moderate to High (k=0.05 assumed)
Typical slope gradient in works area	4 % to 6%
Calculated annual soil loss rate	265 tonnes/ha per year.
Soil loss class (Erosion Hazard)	Class 3
Soil texture Group/Type	**Type D** soils have been adopted for all sediment basins. Ie. (fine and dispersible) >30% of particles are finer than 0.02mm.
5 day, 95th percentile rainfall depth	**42.7 mm** (derived from averaging Albury and Wagga Wagga rainfall values from the Bluebook)
Volumetric run-off coefficient (Cv)	**Cv= 0.5**
Total Catchment Area	Basin 1 = 6.84ha Basin 2 = 5.4ha
Disturbed Area	Actual disturbed area is equal to the total catchment area as external 'clean' runoff is diverted away from disturbed areas and the sediment basins.
Soil Cover Factor (C)	1
Soil Conservation Practices (P)	1.3
Assumed sediment yield time period	2 months
Assumed slope length	L = 300m

The design methodology described above was applied, as it is the most reliable and commonly used procedure to determine requirements for sediment basins. It is also the procedure recommended within the Blue Book and is used commonly by designers who size either permanent or temporary construction basins.

A sediment basin cannot be designed solely from a figure of 1:20 ARI, 24 hour duration as this would simply produce a rainfall depth (in this case 94.3mm). Furthermore, the advantage of using the Blue Book methodology is that it incorporates other important design criteria that directly influence the effectiveness of the controls (such as soil type) that are not reflected in the 1:20ARI. By way of further

explanation, to determine the basin volume based on ARI, the 94mm would have to be entered into the calculations provided within the Blue Book and essentially requires 'working back' through the calculations to then determine volume.

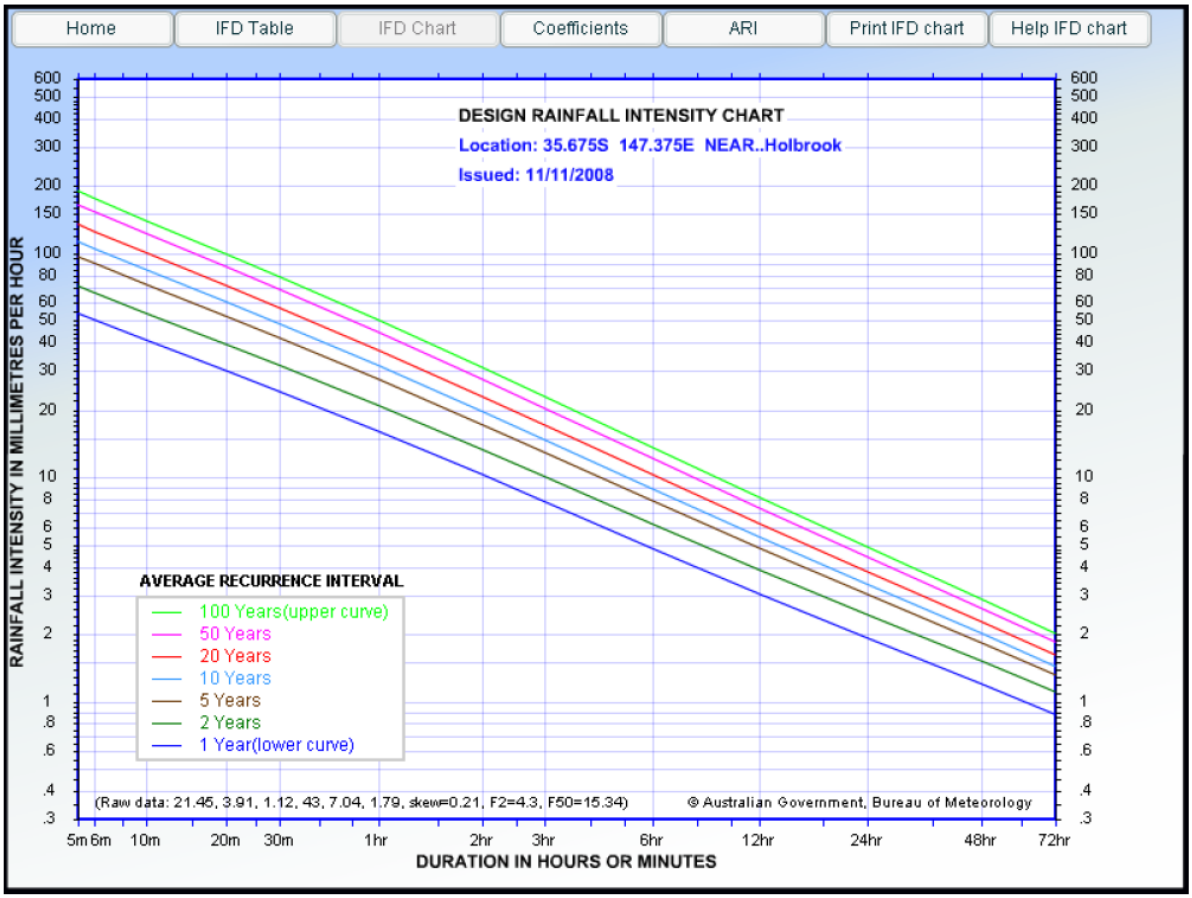


Figure 3 – ARI figures for Holbrook (***Source**: Bureau of Meteorology (www.bom.gov.au)*)

The capacities of the sediment basins that have been constructed are shown in **Table 2**. For purposes of comparison, the derived Blue Book 95th percentile figure of 42.7mm has been substituted with the 1:20ARI, 24 hour duration figure of 94.3mm and the calculated sediment basin capacities are also shown in **Table 2**.

This demonstrates that in order to meet the specifications of the 1:20 ARI, 24 hour figure (MCoA 20) the sediment basins would have to be double their present volume.

Table 2: Basin Sizing

Basin number	Current volume (95^{th} percentile) (m^3)	Blue Book recommended (90^{th} percentile) (m^3)	EA recommended (m^3)	1:20 ARI (24 hour duration) (m^3)
Basin 1 (Crushing plant and production stockpile area)	**1697 m^3** (~ 1.7ML)	1341.66 m^3	500 m^3	3462 m^3 (approx) (~3.4ML)
Basin 2 (Stockpiling and loading area)	**1290 m^3** (~ 1.2ML)	1002.71 m^3	400 m^3	2720 m^3 (approx) (~2.7ML)

3.3 Consideration of EA recommendation

Section 3.6.3 of the EA for the project, provides details of the drainage and sedimentation control works recommended for the quarry. The EA states that the erosion and sedimentation control plan should be the primary resource document for all related earthworks and extraction operations. A Concept Erosion and Sedimentation Control Plan is provided in Figure 2.7.3 of the EA, and within **Appendix 1** of this submission. Implementation of the Concept Erosion and Sediment Control Plan is the mitigation measure recommended within section 3.6.5 of the EA to reduce impact on surface water quality.

Although Section 3.6.3 of the Environmental Assessment (2008) notes that the sediment dams will be constructed to provide for the maximum catchment of 17ha given a 20ARI, the EA does not link this to an associated time period (i.e. the 24hrs duration noted in MCoA 20). The EA simply states 20 ARI.

Furthermore, Figure 3.6.4 provides a table for 'Sediment Basin Design Methodology' and quotes basin sizes of 0.5ML (basin 1) and 0.4ML (basin 2). The current basin sizes are well in excess of these sizes (refer to Table 1). It is also noted that the calculations for the current basin sizing have used a slightly larger catchment area to that noted in the EA and a lower rainfall intensity, and the basins are still considerably larger than those referenced in the EA.

The EA also recognises that with basins installed at this size, given the drought conditions of south-western NSW, it is anticipated that all collected sediment water will be reused with a high percentage being lost to evaporation and transport off-site in moist product (crushed rock and fines).

The basins currently installed comply with the Concept Erosion and Sediment Control Plan in terms of location. One large basin has been installed for Basin 1 in replacement of the suggested two small basins directly adjacent to one another.

3.4 DECC guidelines for stormwater management

Managing urban stormwater: soils and construction, Volume 2E for mines and quarries was published in June 2008 by DECC to provide guidelines, principles and recommended minimum design standards for erosion and sediment control at mines and quarries. Many of the principles and recommendations from Volume 1 of *Managing urban stormwater: soils and construction* (Landcom 2004b) have been tailored and transferred to Volume 2E. Hence, Volume 2E is still to be read in conjunction with Volume 1.

It is recognised within Volume 2E that quarries generally have a greater operational life than urban subdivision construction, hence higher standards of design and construction of sediment basins are applied.

Table 3 reproduces Table 6.1 of Volume 2E of the Blue Book provides the recommended minimum design criteria for sediment control measures on mines and quarries. For disturbance of greater than 3 years in duration (and type F or D sediment retention basins), the recommendation for a standard receiving environment is a basin capable of containing a 90th percentile storm event.

For a sensitive receiving environment a basin capable of containing a 95th percentile storm event is recommended. A 'sensitive' receiving environment is defined as one that has a high conservation value, or supports human uses of water that are particularly sensitive to degraded water quality.

Taking this definition into consideration and in view of the receiving environment at Rockley Falls Quarry, the standard receiving environment and 90th percentile design storm event category is applicable.

Given that the basins currently constructed at the quarry are constructed to the 95th percentile volume, it is evident that the basins are demonstrably larger than that recommended in Volume 2E of the Blue Book.

Table 3. Design criteria for sediment basins recommended in Volume 2E of the Blue Book.

Table 6.1 Recommended minimum design criteria for temporary erosion and sediment control measures at mines and quarries

	Minimum average recurrence interval (ARI) of design storm event (unless otherwise indicated)							
Duration of disturbance	**< 6 months**		**6–12 months**		**1–3 years**		**> 3 years**	
Sensitivity of receiving environment ('standard' or 'sensitive')[1]	**standard**	**sensitive**	**standard**	**sensitive**	**standard**	**sensitive**	**standard**	**sensitive**
Temporary drainage (erosion) controls[2]								
– designed to have a non-erosive hydraulic capacity to convey	2 yrs	5 yrs	5 yrs	10 yrs	10 yrs	20 yrs	20 yrs	20 yrs
Temporary sediment control measures[3]								
– should be constructed to remain structurally sound in:	2 yrs	5 yrs	5 yrs	10 yrs	10 yrs	20 yrs	20 yrs	20 yrs
Type C sediment retention basin								
– designed to achieve required water quality for flows up to:	0.5 x 1 yr	1 yr	1 yr	2 yrs	1 yr	2 yrs	1 yr	2 yrs
– embankment and spillway designed to be structurally sound in[4]:	10 yrs	20 yrs	20 yrs	50 yrs	50 yrs	100 yrs	50 yrs	100 yrs
Type F or D Sediment retention basin								
– designed to achieve required water quality for storms up to nominated five-day duration percentile event:[5]	75th	80th	80th	85th	80th	85th	90th	95th
– designed to achieve required water quality for storms up to nominated five-day duration percentile event with enhanced erosion controls[6]:	75th	75th	75th	80th	75th	80th	90th	95th
– embankment and spillway designed to be structurally sound in[4]:	10 yrs	20 yrs	20 yrs	50 yrs	50 yrs	100 yrs	50 yrs	100 yrs

[1] A 'sensitive' receiving environment is one that has a high conservation value, or supports human uses of water that are particularly sensitive to degraded water quality.
[2] e.g. diversion banks, perimeter banks, catch drains, level spreaders, check dams, batter drains and chutes.
[3] e.g. sediment fences, stacked rock sediment traps etc. on small catchments where used as a 'last line of defence' (i.e. without a down-slope sediment basin).
[4] This is indicative only – consider the risks of basin failure for each basin to determine appropriate spillway design flow.
[5] For a five-day management period. Adjustment factors to the five-day volumes for alternate management periods are 85% for two-days, 125% for 10 days and 170% for 20 days.
[6] Enhanced erosion controls are described on **vol.1** section 6.3.4(g).

Source: *Table 6.1 from Managing urban stormwater: soils and construction, Volume 2E for mines and quarries (Department of Environment and Climate Change NSW, 2008)*

Table 4 reproduces Table 6.2 from Volume 2E of the Blue Book that presents the indicative average annual sediment basin overflow (or spill) frequency for the various five-day duration design storms. As shown, for a basin designed to the 95th percentile, the annual average spill frequency is 1–2 spills/year. This is a very low occurrence and therefore it is expected that the overflows from the basins at the Rockley Falls Quarry would not have a significant impact upon the already highly modified receiving environment (rural pastures).

Table 4 – Average sediment basin overflow frequency specified in Volume 2E of the Blue Book

Table 6.2 Indicative average annual sediment basin overflow frequency

Design storm event	Average annual overflow frequency
75th percentile	8–11 spills/year
80th percentile	6–8 spills/year
85th percentile	4–6 spills/year
90th percentile	2–4 spills/year
95th percentile	1–2 spills/year

Adapted from Evans and Peck (2007)

Source: *Table 6.2 from Managing urban stormwater: soils and construction, Volume 2E for mines and quarries (Department of Environment and Climate Change NSW, 2008)*

3.5 Review of recent Part 3A approvals and EPLs

A review of extraction projects granted approval under Part3A of the *EP&A Act* between 2006 to 2009 revealed three (only) approvals that specify conditions relating to sediment basin design. These include:

1. Sunnyside Coal Mine 2008, Naromi –design criteria for a 90th percentile for a 5 day storm event.
2. Gunlake Quarry 2008, Marulan –design criteria for a 95th percentile storm event.
3. Boral Resources hard rock quarry 2007, Marulan South –conditions stating dirty water dams should be designed to accommodate 1 in 100 year ARI 24 hour event; and other dams/water management should be designed to accommodate 1 in 20 year ARI 24 hour event. It is noted that this site borders a National Park.

A number of land-based extraction EPLs in the Murray Riverina and Murrumbidgee catchment management areas, which includes Albury and Greater Hume Local Government Areas, were also reviewed. Of the 33 reviewed, 25 didn't specify any design criteria for sediment basins, 6 referenced the 'Managing Urban Stormwater: Council Handbook' or the 'Managing Urban Stormwater: Soils and Construction Handbook' and the remaining 2 specified site specific management plans.

It was concluded through this review, that sediment basins at quarries and mines most recently approved in NSW appear mostly to have either no specific requirements in relation to design criteria or the Blue Book principles are applied.

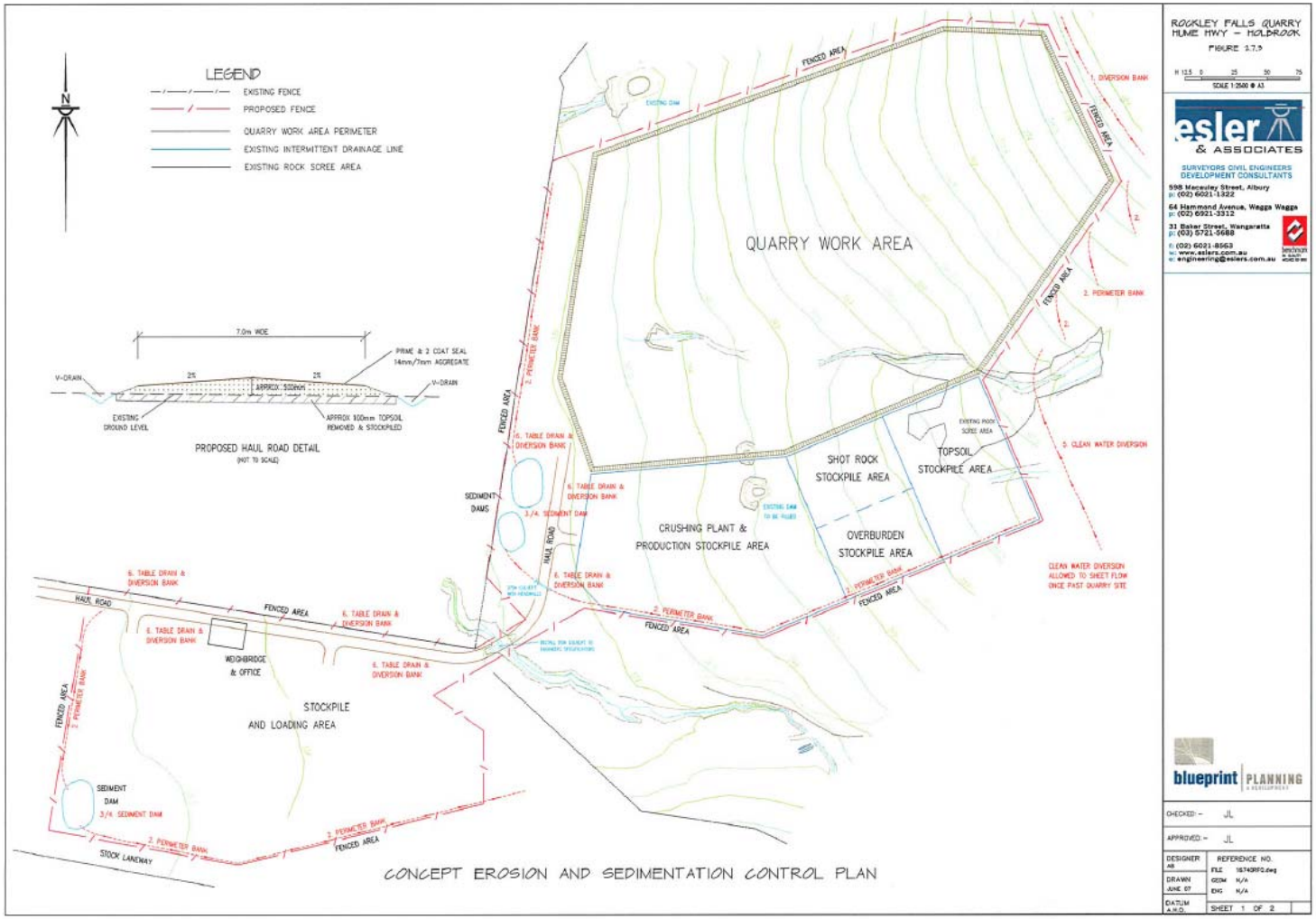
Within this submission it has been demonstrated that the requirement of Condition 20 for the quarry, in relation to the 1:20ARI is greater than that recommended in the Blue Book. While it is recognised that each site will have differing risks and that the receiving environments will be site specific, it is a reasonable expectation that there will be consistency in approach to management requirements across the industry. It is noted that the Rockley Falls Quarry is located in an area currently under drought conditions and that the receiving environment are highly modified, rural grazing pastures. Given that context, potential risks can be very adequately mitigated and managed with basins sized according to the requirements of the Blue Book.

4. Conclusion

The HHSA, on behalf of Abigroup, seeks to modify Condition of Approval 20 which relates to the design criteria for the erosion and sediment control structures (i.e. sediment basins). The HHSA specifically requests that the design criteria be amended to reflect the requirements of the *Managing Urban Stormwater: Soils and Construction* (the Blue Book).

The 1:20ARI, 24 hour duration does not reflect what was assessed and described in the EA to be a reasonable and adequate management approach. The highly modified receiving environment surrounding the Rockley Falls Quarry and the current industry standards as determined by the requirements of the Blue Book Vol 2E for mines and quarries are important factors in considering the request for modification. The request for modification can be justified on this basis and also taking into account that the requirements of the Blue Book provide a very adequate and satisfactory approach to control and management of erosion and sediment control for the quarry development.

Appendix 1 Concept ERSED plan



Source: *Figure 2.7.3 from the Environmental Assessment Report for the Establishment of Rockley Falls Quarry, Blueprint Planning, February 2008.*