

# Landscape Management Plan

for the East Guyong Quarry



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# 1. Introduction

This Landscape Management Plan (the Plan) has been prepared by R.W. Corkery & Co. Pty Limited (RWC) on behalf of Hanson Construction Materials Pty Ltd (Hanson) for the East Guyong Quarry (the Quarry). The Quarry is located approximately 22km southeast of Orange and 36km west of Bathurst (**Figure 1**).

This Plan has been prepared in satisfaction of Conditions 31 to 33 of Schedule 3 of Project Approval (PA) 06\_0193 and describes the following.

- The activities approved under PA 06\_0193.
- The consultation undertaken during preparation of this Plan.
- The legal and other requirements associated with rehabilitation and landscape management within the Quarry.
- The objectives and key performance outcomes for this Plan and the Quarry.
- Roles and responsibilities.
- Competence training and awareness.
- Surrounding vantage points with the potential for views of disturbed sections of the Site.
- A Rehabilitation and Biodiversity Management Plan, including:
  - the short, medium and long-term rehabilitation measures to be implemented;
  - the short, medium, and long-term measures to retire biodiversity credits and manage remnant vegetation and fauna habitat at the Quarry and in any offset areas; and
  - measures to establish, maintain, and integrate the Western Boundary Visual Screen with surrounding vegetation.
- The Long-term Management Strategy for Quarry closure and post-quarry land use.
- Rehabilitation-related monitoring that will be undertaken.
- Performance and completion criteria for biodiversity management actions, site rehabilitation and site landscaping.
- Evaluation of compliance with identified rehabilitation performance and closure criteria.
- Publication of monitoring information.
- Plan review.

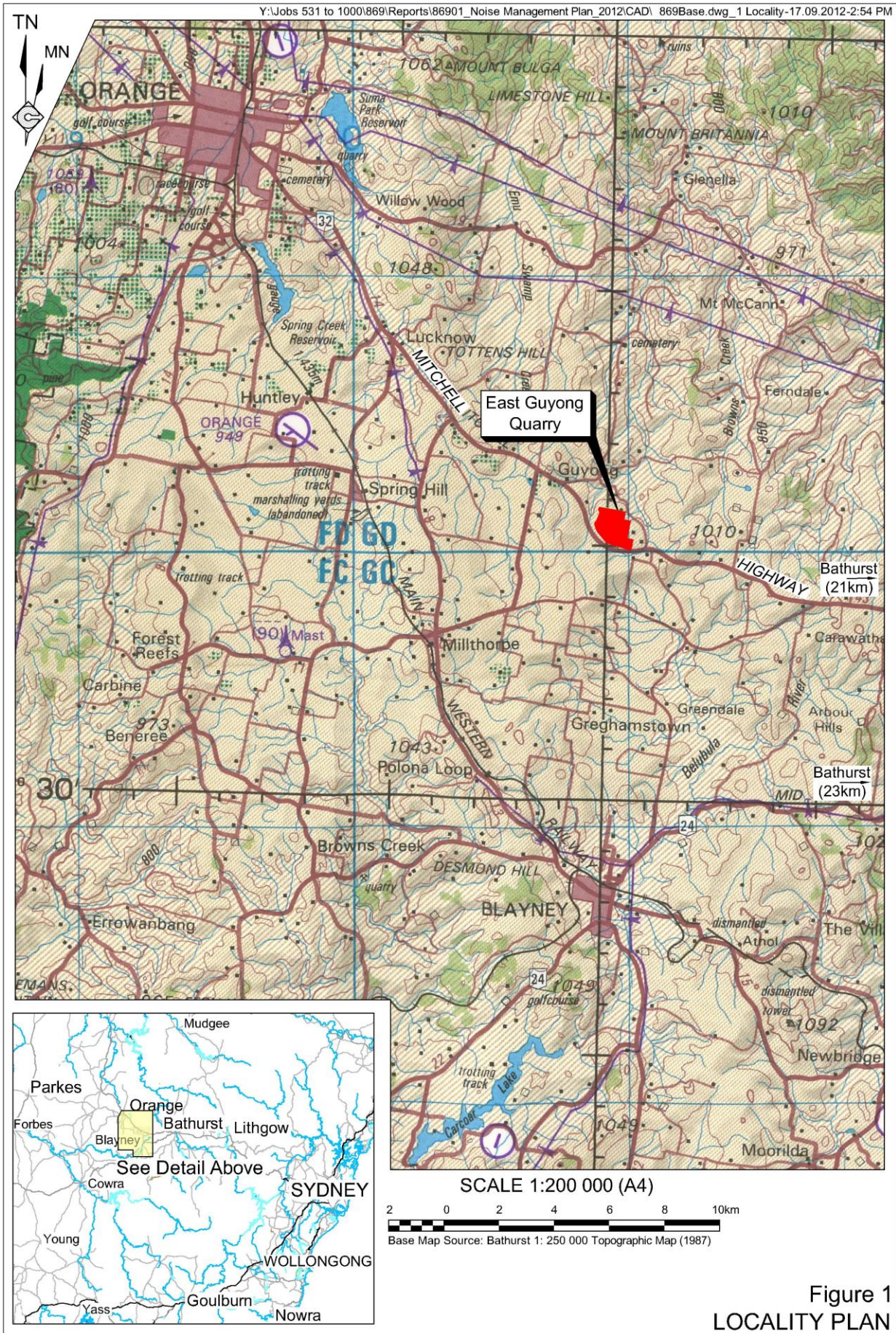
The approved Quarry is fully described in the following documents. No further background information is provided in this Plan.

- Environmental Assessment dated September 2009 and associated technical reports prepared to support the application for PA 06\_0193 (hereafter referred to as EA 2009).
- Environmental Assessment dated November 2012 and associated technical reports
- Environmental Assessment dated September 2018 and associated technical reports prepared to support the application for Modification 2 (MOD 2) to PA 06\_0193 (hereafter referred to as EA 2018).
- Response to Submissions report Part A and Part B, dated November 2018 and December 2018 respectively (Referred to hereafter as RTS A 2018 and RTS B 2018).

In addition, a range of other management plans have also been prepared to guide operations within the Quarry. These include the following.

- Environmental Management Strategy.
- Asbestos Management Plan.
- Blast Management Plan.
- Air Quality Monitoring Program.
- Soil and Water Management Plan.
- Noise Management Plan.
- Aboriginal Cultural Heritage Management Plan.
- Pollution Incident Response Management Plan.
- Traffic Management and Driver Conduct Plan.







## 2. Approved Activities

The approved activities at the Quarry comprise the following (**Figure 2**).

- Establishment of an Extraction Area to extract basalt using standard drill, blast, load and haul techniques.
- Construction and use of a processing plant within an identified Infrastructure Area to process the extracted basalt to produce a range of quarry products, including aggregates and road base, and stockpiling of the resulting products adjacent to the processing plant.
- Construction of a site access road and intersection with the Mitchell Highway.
- Transportation of up to 600 000t per year of quarry products via the Mitchell Highway using truck and dog and B-Double trucks.
- No more than 30 laden trucks despatched from the Quarry in any hour, no more than 160 laden trucks despatched from the Quarry on any day (Monday to Friday) and no more than 60 laden trucks despatched from the Quarry on a Saturday.
- Construction of a range of visual bunds and establishment of native vegetation to provide visual screening for the quarry operations.

In addition, the following activities would be undertaken as ancillary activities associated with the approved activities.

- Establishment of a range of soil stockpile areas for storage of subsoil and topsoil for use during rehabilitation operations.
- Establishment of a Growth Medium Storage Area for storage of weathered overburden for use as growth media under the stockpiled soil material on the final landform. This material will be retained for rehabilitation activities within the Site and would not be sold as a product or removed from Site.

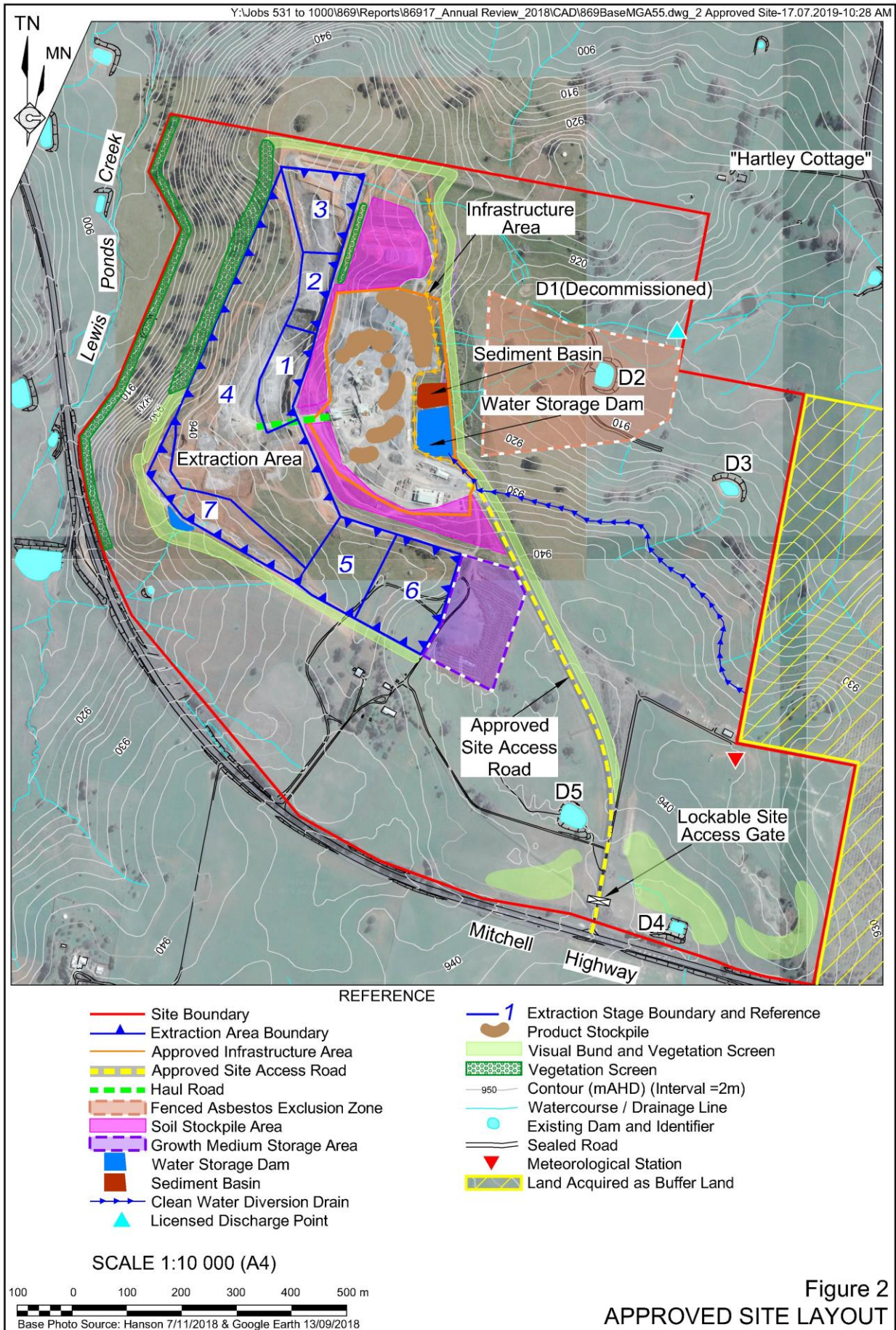
The approved quarry life is until 31 December 2042 and the approved hours of operation are as follows.

- Monday to Friday (non-daylight savings) – 6:00am to 6:00pm.
- Monday to Friday (daylight savings) – 6:00am to 8:00pm.
- Saturdays – 7:00am to 1:00pm.
- Sundays and public holidays – nil.

Product despatch between 5:00am and 10:00pm, Monday to Saturday is permitted following negotiation of agreements with the seven surrounding landholders nominated Condition 6 of Schedule 3 of PA 06\_0193 and the notification of the Department in writing of the terms of these agreements.

**Figure 2** also presents indicative staging of extraction within the approved extraction area. Hanson has committed to maintain an extraction schedule that would enable the following.

- Extraction from the crest of the ridge to the west to retain for as long as possible topographic features that screen views of the operating areas from properties to the west and the Mitchell Highway. The final stage of extraction would involve extraction of the final benches in the south east of the Quarry, such that a topographic barrier remains through the majority of the Quarry life.
- Extraction of benches on the eastern boundary of the extraction area would be prioritised to enable these areas to be revegetated as soon as possible. This would ensure that views from the west of the Quarry are more likely to be of revegetated areas.
- Prior to commencing extraction in the area the subject of Modification 2, Hanson would establish a tree screen along the western extraction area boundary and ensure the revegetation on the eastern boundary of the extraction area was 75% complete.





# 3. Consultation

The following government agency consultation was undertaken during the preparation of this Plan.

- Correspondence outlining planned updates to the Plan as well as consultation requirements was sent to DPE on 21 June 2019. Ms Melanie Hollis of DPE responded on 24 June 2019 advising that the Plan was to be submitted within 3 months of approval of Modification 2 and that any updates or consultation regarding the Plan should be forwarded to DPE at a later date.
- In accordance with Condition 31 of Schedule 3 of PA 06\_0193, a preliminary draft of this Plan was provided to the Office of Environment and Heritage (OEH), the Department of Industry Land and Water and Cabonne Council on 17 July 2019. Comments received from these government agencies will be addressed in future drafts of the Plan.





**Table 1 (Cont'd)**  
**Rehabilitation and Landscape Management-related Project Approval Requirements**

Schedule (No.)	Condition	Plan Section
<b>LANDSCAPE (CONT'D)</b>		
3(32)	The Rehabilitation and Biodiversity Management Plan must include:	
	(a) the objectives for the site rehabilitation and site landscaping;	5, 14
	(b) a description of the short, medium, and long-term measures that would be implemented to rehabilitate and landscape the site;	10.3, 10.4 and 11
	(b1) a description of the short, medium, and long-term measures to be undertaken to:	12
	(i) retire the credits in Table 9;	
	(ii) manage any remnant vegetation and fauna habitat on the site and in any offset areas;	
	(b2) a description of the measures that would be implemented to establish and maintain the Western Boundary Visual Screen to integrate with surrounding vegetation and align with Plant Community Type 275.	10
	(c) detailed performance and completion criteria for biodiversity management actions, site rehabilitation and site landscaping;	13
	(d) a detailed description of the measures that would be implemented over the next 3 years, including the procedures for:	
	▪ progressively rehabilitating disturbed areas;	10.3.4
	▪ landscaping the site to minimise visual impacts;	10.3.3
	▪ protecting vegetation and soil outside the disturbance areas;	10.3.5
	▪ undertaking pre-clearance surveys;	10.3.2
	▪ salvaging and reusing material from the site for habitat enhancement;	10.3.2
	▪ managing impacts on fauna;	10.3.2
▪ conserving and reusing topsoil;	10.3.2	
▪ controlling weeds and feral pests;	10.3.5, 10.3.6	
▪ controlling access; and	10.3.7	
▪ bushfire management;	10.3.8	
(e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;	14	
(f) a description of the potential risks to successful rehabilitation, and a description of the contingency measures that would be implemented to mitigate these risks; and	10.2, 14	
(g) details of who would be responsible for monitoring, reviewing, and implementing the plan.	6	
3(33)	The Long-Term Management Strategy must:	
	▪ define the objectives and criteria for quarry closure and post-extraction management;	5, 11.2, 14
	▪ investigate and/or describe options for the future use of the site;	11.3
	▪ describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and	10.3 and 11.4
▪ describe how the performance of these measures would be monitored over time.	12, 14	

**Table 1 (Cont'd)**  
**Rehabilitation and Landscape Management-related Project Approval Requirements**

Schedule (No.)	Condition	Plan Section
<b>LANDSCAPE (CONT'D)</b>		
3(40A)	Within 6 months of the approval of Modification 2, the Proponent must establish the Western Boundary Visual Screen, as shown in Figure 1 of Appendix 1. The Proponent must maintain the visual screen for the life of the project.	10.3.3
3(46)	<b>Bushfire Management</b> The Proponent must:	
	(a) ensure that the project is suitably equipped to respond to any fires on-site;	10.3.8
	(a1) provide for asset protection in accordance with the relevant requirements in the <i>Planning for Bushfire Protection</i> (RFS, 2006) guideline, and;	10.3.8
	(b) assist the rural fire service and emergency services as much as possible if there is a fire on-site.	10.3.8
5(2)	<b>Management Plan Requirements</b> The Proponent must ensure that the Management Plans required under this approval are prepared in accordance with any relevant guidelines, and include:	
	(a) a summary of relevant background or baseline data;	Not Applicable
	(b) a description of:	
	▪ the relevant statutory requirements (including any relevant approval, licence or lease conditions);	4
	▪ any relevant limits or performance measures/criteria; and	14
	▪ the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures;	14
5(2) (Cont'd)	(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	10.3, 10.4, 11.4, 14
	(d) a program to monitor and report on the:	
	▪ impacts and environmental performance of the project; and	13, 14
	▪ effectiveness of any management measures (see (c) above);	13, 14
	(e) a contingency plan to manage any unpredicted impacts and their consequences;	14
	(f) a program to investigate and implement ways to improve the environmental performance of the project over time;	15
	(g) a protocol for managing and reporting any:	
	▪ incidents;	17
	▪ complaints;	16
	▪ non-compliances with statutory requirements; and	N/A
	▪ exceedances of the impact assessment criteria and/or	N/A
	▪ performance criteria; and	14
	(h) a protocol for periodic review of the plan.	19
	<i>Note: At the discretion of the Secretary, some of these requirements may be waived where they are either not relevant or necessary.</i>	



**Table 2** presents the relevant rehabilitation and landscape management-related commitments from the Statement of Commitments incorporated within PA 06\_0193 and where each is addressed in this document.

**Table 2  
Statement of Commitments Requirements**

	<b>Commitment</b>	<b>Plan Section</b>
Operational Controls	<ul style="list-style-type: none"> <li>▪ The quarry will be rehabilitated, and the final land form will be constructed as per Figure 4 of Appendix 1. A comprehensive Rehabilitation and Decommissioning Plan will be prepared to ensure rehabilitation objectives are achieved to a reasonable extent. The Plan will include:               <ul style="list-style-type: none"> <li>▪ the rehabilitation program;</li> </ul> </li> </ul>	10 and 11
	<ul style="list-style-type: none"> <li>▪ native vegetation and fauna habitat management;</li> </ul>	10.3, 10.5
	<ul style="list-style-type: none"> <li>▪ feral animal control;</li> </ul>	10.3.6
	<ul style="list-style-type: none"> <li>▪ fire management;</li> </ul>	10.3.8
	<ul style="list-style-type: none"> <li>▪ weed management;</li> </ul>	10.3.5
	<ul style="list-style-type: none"> <li>▪ minimisation of edge effects;</li> </ul>	10.5
	<ul style="list-style-type: none"> <li>▪ stormwater control;</li> </ul>	Soil and Water Management Plan
	<ul style="list-style-type: none"> <li>▪ control of public access; and</li> </ul>	10.3.7
	<ul style="list-style-type: none"> <li>▪ monitoring; and</li> <li>▪ funding.</li> </ul>	12 6
Flora and Fauna	<ul style="list-style-type: none"> <li>▪ In order to minimise the impact of vegetation clearing the proponent will commission and commence a Vegetation Clearance Management Plan, Revegetation Plan, Feral Animal Control Management Plan, and Weed Management Plan prior to commencement of quarrying activities. These plans will be developed by a suitable qualified and experienced person and take into consideration the following:               <ul style="list-style-type: none"> <li>▪ Implications of meta-population dynamics;</li> <li>▪ Implications of transitional zone dynamics;</li> <li>▪ Episodic high disturbance events;</li> <li>▪ Loss of functional role of species;</li> <li>▪ Clearing of native vegetation; and removal of dead wood and dead trees;</li> <li>▪ Bush rock removal;</li> <li>▪ Invasion of exotic perennial grasses; and</li> <li>▪ Predation by European Red Fox, Feral Cats and Rabbits.</li> </ul> </li> </ul>	10.3, 10.4 and 11.3
Visual	<ul style="list-style-type: none"> <li>▪ Trees will be planted to screen the plant area, as it has been previously cleared for grazing. The topsoil from this area will be stockpiled for use around the site and will be used in the rehabilitation of worked-out areas. The proposed base level for the plant site is at 924 m AHD [note – since completion of the Statement of Commitments, the base level for the Infrastructure Area has been adjusted to 931m AHD], as shown on the plant layout plan (Figure 1 of the Preferred Project Report).</li> </ul>	10.3.3
	<ul style="list-style-type: none"> <li>▪ The plant site will be screened by a large continuous mound extending right around the infrastructure area and along the eastern side of the site entry road to within of 200m of the Mitchell Highway (as shown on Figure 1 of the Preferred Project Report). This large natural screen has been purposely located to avoid areas of high risk of encountering asbestiform materials at depths of less than 5m, and away from the boundaries of adjoining neighbours who will benefit from the retention of views of the valley slope.</li> </ul>	10.3.3

# 5. Objectives and Outcomes

Table 3 presents the objectives and key performance outcomes for this Plan and the Quarry.

**Table 3  
Objectives and Key Performance Outcomes**

OBJECTIVES	KEY PERFORMANCE OUTCOMES
<b>Rehabilitation and Landscape Management</b>	
(a) To ensure compliance with all relevant project approval conditions, statements of commitment and reasonable community expectations.	(i) Compliance with all relevant criteria and reasonable community expectations, as determined in consultation with the relevant government agencies.
(b) To implement appropriate progressive rehabilitation and landscape management and mitigation measures during all stages of the Quarry	(ii) All identified rehabilitation and landscape management and mitigation measures are implemented in a timely manner.
(c) To appropriately manage site preparation works to ensure that suitable rehabilitation material remain for rehabilitation operations during all stages of the Quarry	(iii) Sufficient, viable rehabilitation materials are available for rehabilitation operations throughout all stages of the Quarry
(d) To ensure that the visual amenity of residences and public vantage points is not unacceptably impacted by Quarry-related activities.	(iv) Visual amenity management measures are effective and implemented in a timely manner.
(e) To establish a final landform that is consistent with that identified in PA 06_0193.	(v) Final landform is safe, stable, non-polluting and, with the exception of the Extraction Area, requires land management practices that are equivalent to those required for nearby agricultural land.
(f) To establish an appropriate final soil profile and vegetation community on the final landform	(vi) Final soil cover and vegetation has similar soil viability/microbial activity, litter depth, species composition as nearby agricultural land.
(g) To establish an appropriate beneficial final land use consistent with surrounding land uses.	(vii) Final landform is suitable for an appropriate beneficial land use that is consistent with surrounding land uses at the time of Quarry closure.
(h) To appropriately manage those sections of the Site that would not be used for Quarry-related activities.	(viii) Identified areas are managed in a manner that ensures appropriate beneficial use of that land.
(i) To implement appropriate weed, pest and bushfire management measures	(ix) Weeds, pests and bushfire risks are appropriately managed in consultation with neighbouring landholders.
(j) To implement an appropriate complaints handling and response protocol	(x) Complaints (if any) are handled and responded to in an appropriate manner.
(k) To implement appropriate corrective and preventative actions, if required.	(xi) Corrective and preventative actions are implemented in a timely manner, if required
(l) To implement an appropriate incident reporting program, if required.	(xii) Incidents (if any) are reported in an appropriate manner.



# 6. Roles and Responsibility

Table 4 presents the roles and responsibilities for the implementation of this *Landscape Management Plan*.

**Table 4  
Roles and Responsibilities**

<b>ROLES</b>	<b>RESPONSIBILITIES</b>
Regional Manager	Must ensure adequate resources are available to enable implementation of the Plan.
Quarry Manager	Accountable for the overall environmental performance of the East Guyong Quarry operations, including the following outcomes of this Plan. <ul style="list-style-type: none"> <li>▪ Implement all short, medium and long-term management measures identified in Sections 10.3, 10.4 and 11 of this Plan.</li> <li>▪ Implement the monitoring and evaluation measures identified in Sections 13 and 15 of this Plan.</li> <li>▪ Ensure all relevant information is made available to relevant government agencies and the public as described in Sections 17 and 18 of this Plan.</li> </ul>
Quarry Supervisor	Manage the implementation of the following components of this Plan. <ul style="list-style-type: none"> <li>▪ Short and medium-term management measures identified in Sections 10.3 and 10.4 of this Plan.</li> <li>▪ Monitoring requirements identified in Section 13 of this Plan.</li> <li>▪ Publication of monitoring data and reports as outlined in Section 18.</li> <li>▪ Review of this Plan as outlined in Section 19.</li> </ul>
All personnel	Ensure training and awareness induction has been undertaken. Compliance with this Plan.
Source: Hanson Construction Materials Pty Ltd.	

# 7. Competence Training and Awareness

All Company personnel and contractors and their employees will undergo Company and site-specific inductions, incorporating basic information in relation to the operation of this plan as a component of the site induction program. The following areas will be covered in the induction.

- Areas for which approved access only is permitted, typically, the non-operational sections of the Site.
- Areas to be progressively rehabilitated, including areas requiring construction of visual bunds and vegetation screens.
- Biodiversity offset areas (if any).

The Quarry Manager will be responsible for ensuring the appropriate training is included in the induction.



# 8. Surrounding Vantage Points

**Figure 3** displays the locations of surrounding residences and publicly accessible vantage points within 2km of the Site. Section 10.3.3 provides a detailed description of the anticipated visual amenity impacts from a range of vantage points, as well as the visual amenity-related management measures that will be implemented to minimise the impacts to the greatest extent practicable.

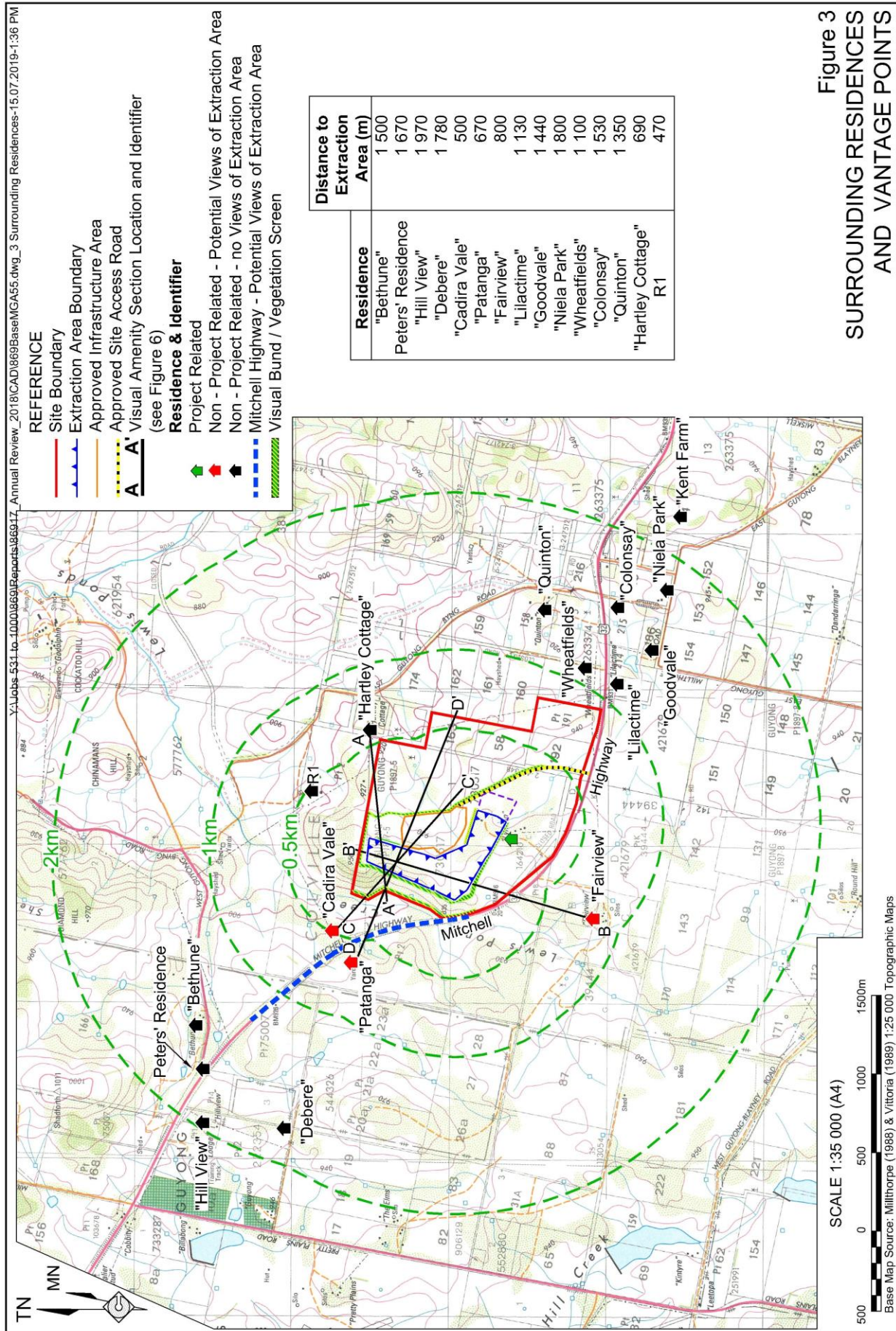


Figure 3  
SURROUNDING RESIDENCES  
AND VANTAGE POINTS

# 9. Quarry Development – Next 5 Years

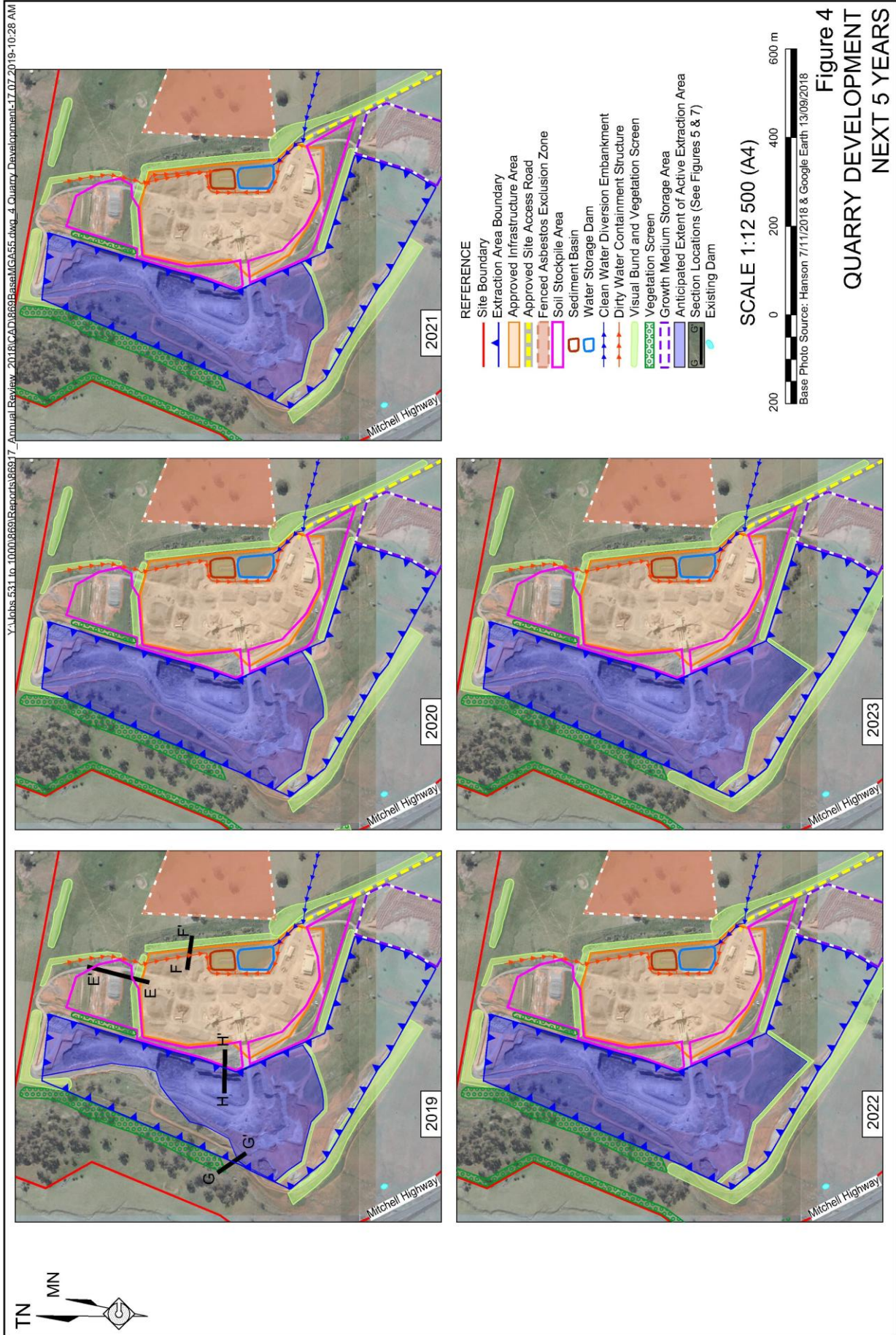
Over its life, the Quarry will be developed in seven stages as indicated on **Figure 2**. The Quarry has been operating for six years with the existing operations providing valuable information and experience regarding the management of extraction and processing activities as well as an indication of market demand.

The Company has completed indicative quarry planning for the next five years of extraction operations. **Figure 4** identifies the anticipated annual progression of extraction operations, quarry development and progressive rehabilitation during that period.

In summary, during the next five years the Quarry will continue to develop to the northern extent of the extraction area, with deepening of this area through the development of a second bench within the disturbed area before the operations continue to the south. The area recently added to the approved extraction area (the subject of the Modification 2 application) would be subject to extraction to remove safety risks with the current design (principally relating to the width of access and operation. Hanson has committed to the development of a tree screen on the western boundary of the extraction area and to revegetating the benches on the eastern boundary of the extraction area before commencing extraction in this location. It is anticipated that the vegetation screening on the western boundary of the extraction area would have established within the next six months and vegetation planting on the upper benches on the eastern side of the extraction area would be established in a similar time frame.



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# 10. Biodiversity and Rehabilitation Management Plan

## 10.1 Introduction

This section provides an overview of the short-term (next 5 years) and medium-term (following 5 years) rehabilitation activities that will be undertaken. These activities reflect and build on those identified in EA (2009) and EA (2018) and have been developed in response to the rehabilitation and landscape management objectives and outcomes outlined in Section 5.

Long-term management strategies, including for Quarry closure and post-Quarry land uses, are presented in Section 11.

## 10.2 Rehabilitation Risks

Condition 35(f) of Schedule 3 of PA 06\_0193 requires that this Plan include a description of the potential risks to successful rehabilitation, and a description of the contingency measures that would be implemented to mitigate these risks. This sub-section has been prepared in satisfaction of that requirement.

For the purpose of this Plan, rehabilitation risk is the potential for events to occur that will have an adverse impact on the successful completion of progressive or final rehabilitation operations. The following analysis of rehabilitation risks has been prepared generally in accordance with the requirements of AS/NZS ISO 31000:2009 *Risk Management – Principles and Guidelines*.

Typically, risk is measured in terms of the likelihood (or probability) of the event occurring and the consequence (or severity) if it does. This analysis results in a range of risk ratings from low to extreme. It is noted that the likelihood and consequence are initially determined in the absence of any controls or management measures and, therefore, result in an unmitigated risk. Potential events with an extreme or high risk rating are then managed as a priority, thereby reducing their mitigated risk to an acceptable level, while potential events with a low or moderate risk are managed with a lower priority.

**Table 5** provides an overview of the relevant rehabilitation-related risks associated with the Quarry and the measures / activities that would be implemented to mitigate these risks.

**Table 5  
Rehabilitation Risk Analysis**

<b>Risk Source / Event</b>	<b>Consequence</b>	<b>Likelihood</b>	<b>Unmitigated Risk Rating</b>	<b>Mitigation Measure or Activity(ies)</b>	<b>Mitigated* Risk Rating</b>
Contaminated land remains post-closure.	<b>Moderate</b> Potential to result in temporary environmental harm and moderate remediation cost.	<b>Possible</b> Could occur.	<b>High</b>	Implement appropriate hydrocarbon and reagent handling and storage operation. Test for contaminated land in the final landform and either remove from site or treat on-site.	<b>Low</b>
Final slopes on rehabilitated landform too steep or do not conform with approved final landform.	<b>Moderate</b> Likely failure of rehabilitation or significant cost to rectify.	<b>Unlikely</b> Could occur but not expected.	<b>Moderate</b>	Ensure all final slopes to be revegetated are less than 1:1.5 (V:H). Provide appropriate training of mobile equipment operators and provision of final landform plan. Inspection and survey of final slopes prior to spreading soil.	<b>Low</b>
Ineffective sediment and erosion control.	<b>Moderate</b> Potential for discharge of sediment-laden water.	<b>Possible</b> Could occur.	<b>High</b>	Construct all structures in accordance with the standards identified in the <i>Soil and Water Management Plan</i> . Inspect sediment and erosion control structures upon their completion and regularly thereafter.	<b>Low</b>
Inadequate ground preparation.	<b>Moderate</b> Potential for poor preparation of the final landform to limit the success of rehabilitation.	<b>Unlikely</b> Could occur but not expected.	<b>Moderate</b>	Ensure appropriate planning for final landform design. Ensure appropriate training of mobile equipment operators and that they are aware of the requirements of this Plan.	<b>Low</b>
Insufficient soil/growth medium.	<b>Moderate.</b> Potential for failure of rehabilitation and importation of soil at significant cost.	<b>Unlikely</b> Could occur but not expected.	<b>Moderate</b>	Ensure soil is stripped, handled and stockpiled in accordance with Section 10.3.2 of this Plan. Review and update (if necessary) soil inventory annually.	<b>Low</b>
Soil is adversely affected by long term storage.	<b>Minor</b> Potential effect on rehabilitation success without application of ameliorants.	<b>Unlikely</b> Could occur but not expected.	<b>Low</b>	Ensure soil is stockpiled in accordance with Section 10.3.2 of this Plan.	<b>Low</b>
Poor seed/tube stock quality or ineffective revegetation techniques.	<b>Minor</b> Potential effect on rehabilitation success without further application of seed.	<b>Unlikely</b> Could occur but not expected.	<b>Low</b>	Ensure appropriate seed and/or tube stock is obtained from a reputable nursery or seed store. Ensure that revegetation techniques meet best practice.	<b>Low</b>



**Table 5 (Cont'd)**  
**Rehabilitation Risk Analysis**

<b>Risk Source / Event</b>	<b>Consequence</b>	<b>Likelihood</b>	<b>Unmitigated Risk Rating</b>	<b>Mitigation Measure or Activity(ies)</b>	<b>Mitigated* Risk Rating</b>
Inappropriate species types chosen for the type of rehabilitation.	<b>Moderate</b> Reduces biodiversity value of rehabilitation.	<b>Unlikely</b> Could occur but not expected.	<b>Moderate</b>	Ensure species utilised in rehabilitation are equivalent to those occurring on surrounding agricultural land (for areas to be used for agriculture) or those consistent with the identified Plant Community Types (see <b>Table 6</b> for areas to be used for native vegetation).	<b>Low</b>
Infestation of rehabilitation by weeds.	<b>Minor</b> Potential effect on rehabilitation success.	<b>Possible</b> Could occur	<b>Moderate</b>	Undertake, in consultation with surrounding landholders, weed control throughout the life of the quarry.	<b>Low</b>
Infestation of rehabilitation by feral animals	<b>Minor</b> Potential effect on rehabilitation success.	<b>Possible</b> Could occur	<b>Moderate</b>	Undertake, in consultation with surrounding landholders, pest control during and following the life of the quarry.	<b>Low</b>
Site infrastructure, including processing plant, buildings and ancillary equipment inappropriately or not completely removed.	<b>Minor</b> Unlikely to result in environmental harm.	<b>Unlikely</b> Site infrastructure will have residual value at the end of quarry life and will be removed to another site or for scrap.	<b>Low</b>	Appropriate contractual arrangements and close supervision of the demolition contractor. Inspection of quarry prior to finalising payment of contractor.	<b>Low</b>

\* Assumes adoption of mitigation measure(s) or activity(ies).

## 10.3 Short Term Rehabilitation Management– Next 5 years

### 10.3.1 Introduction

Condition 32(d) of Schedule 3 of PA 06\_1093 requires a detailed description of the rehabilitation and landscape management measures that would be implemented over “the next three years.” Given that the Company has prepared a five year operations plan for the Quarry (see Section 9), this sub-section provides a range of management measures and detailed performance and completion criteria that would be implemented during the next five years of extraction operations.

The following text relates to the site preparation activities, progressive rehabilitation, management of visual amenity and non-operational areas within the Site.

### 10.3.2 Vegetation Clearance and Site Preparation Management Plan

As indicated in Section 9 and on **Figure 4**, the Quarry would be developed in a series of development stages, with land typically prepared in annual campaigns for the following 12 months production. The following activities will be undertaken during each site preparation campaign, namely during vegetation removal, soil stripping and stockpiling and initial overburden removal.

- Clearly mark on the ground all areas of approved disturbance to be cleared to ensure that all equipment operators are aware of the areas to be prepared and that areas outside of the approved areas of disturbance are protected.
- Inspect areas to be prepared and identify and mark any trees with hollows.
- Inspect all hollows, if present, and relocate any nesting or roosting fauna using a suitably experienced and qualified wildlife handler.
- Remove large vegetation, if present, using a bulldozer with its blade positioned just above the surface so as not to disturb the groundcover and topsoil.
- Place large vegetation / woody debris within and immediately adjacent to areas identified as vegetation screens and vegetated visual amenity bunds to provide habitat for fauna (see **Figure 9**). As outlined in Section 11.3.4, these areas would be retained as nature conservation areas in the final landform.
- Remove surface rocks and stockpile adjacent to areas identified as vegetation screens and vegetated visual amenity bunds for subsequent use during rehabilitation to re-establish habitat for reptiles and small mammals (see **Figure 9**).
- Strip groundcover vegetation and topsoil in all areas of disturbance, where practicable, using a bulldozer or scraper. Topsoil, where it exists, should typically be stripped to a depth of approximately 0.15m.
- Strip subsoil, where it exists, in all areas of disturbance, using a bulldozer or scraper. Subsoil, where it exists, should typically be stripped to a depth of approximately 0.6m below the base of the topsoil.
- Strip soil materials only when they are moderately moist to preserve soil structure, refraining from soil stripping and placement during overly dry or wet conditions.
- Stockpile topsoil and subsoil materials separately.
- Construct soil stockpiles as low, flat mounds with side slopes of 1:3 (V:H) or less as indicated on **Figure 5**. Topsoil stockpiles will be less than 2m high and subsoil stockpiles will be less than 3m high.
- Limit the operation of machinery on soil stockpiles to minimise compaction and degradation of soil structure.
- Remove all overburden and rock material that is not suitable for processing operations and use as follows (in priority order).
  - For fill within the Infrastructure Area.
  - To construct the visual bunds as indicated on **Figures 4 and 5**. The visual bunds will be between 3m and 4m high, with side slopes of 1:3 (V:H) or less and will be revegetated with native species as soon as practicable following construction.
  - To create the Growth Medium Storage Area for later use during rehabilitation operations on the benches and floor of the Extraction Area.

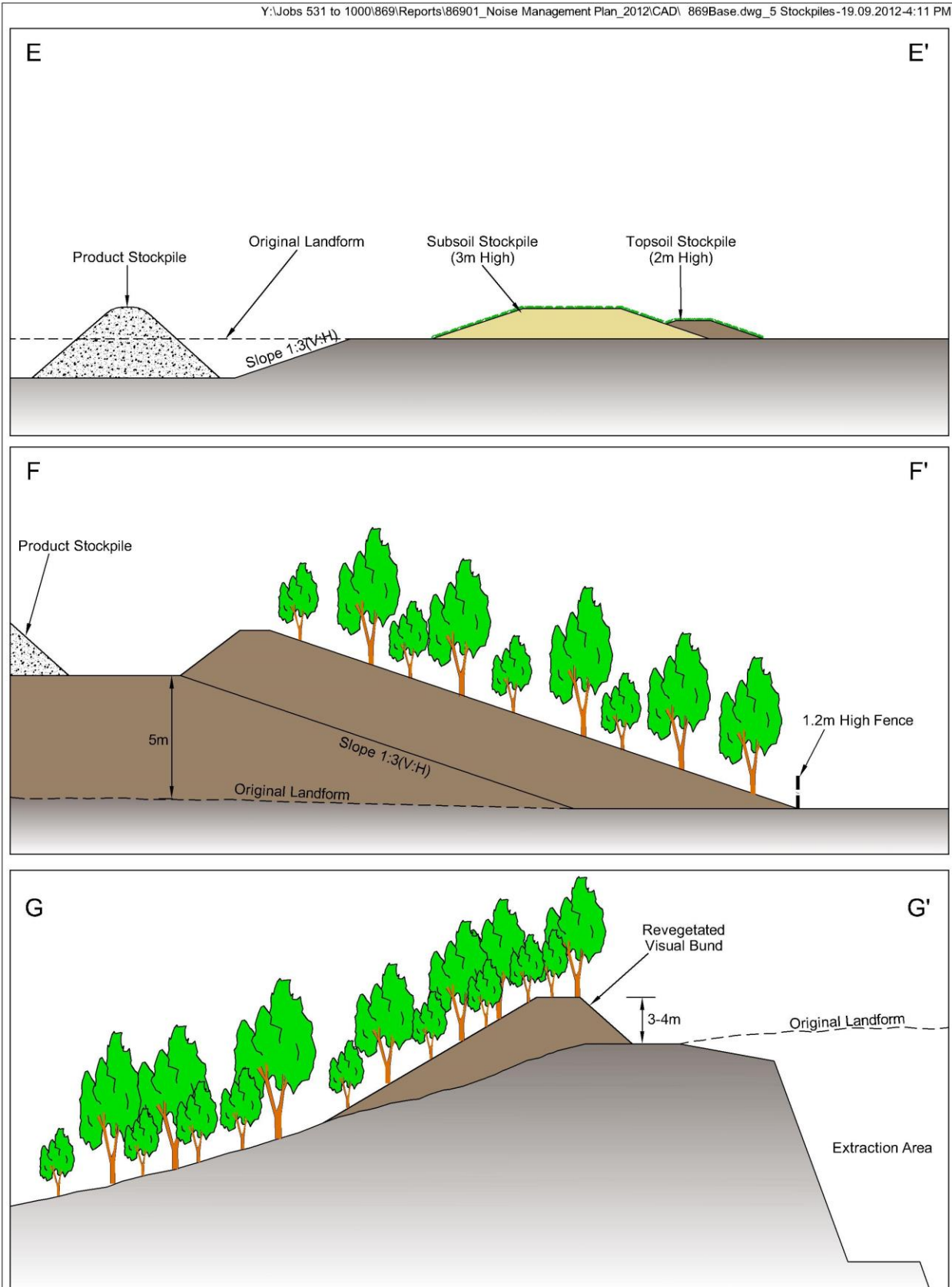
The Company anticipates that limited topsoil material will be able to be stripped from the Extraction Area because of weathered and unweathered rock exposed at or near the surface. It will be critical to ensure that soil material is stockpiled appropriately to ensure that rehabilitation of the Infrastructure Area can be achieved following completion of the life of the Quarry.

### 10.3.3 Management of Visual Amenity

The Quarry is located on a north-south orientated ridgeline with views to the northeast, northwest, west and southwest. **Figure 3** identifies a range of public vantage points and residences surrounding the Site. **Figure 6** presents visual amenity sections and views respectively from the following selected vantage points.

- A - “Hartley Cottage”, northeast of the Site.
- B – “Fairview”, southwest of the Site.
- C – Cadira Vale, northwest of the Site.
- D - “Patanga”, west of the Site.

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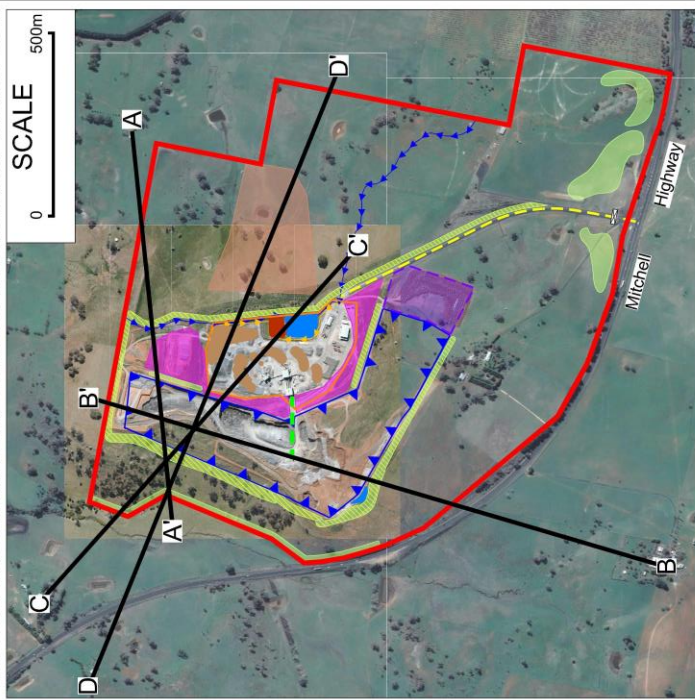
**Note:** See Figure 4 for section locations

**Figure 5**  
**SOIL STOCKPILES AND VEGETATION**  
**ESTABLISHMENT ZONE**

Not to Scale

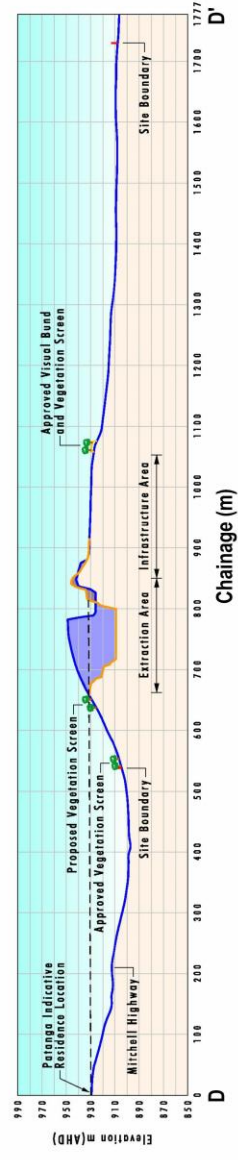
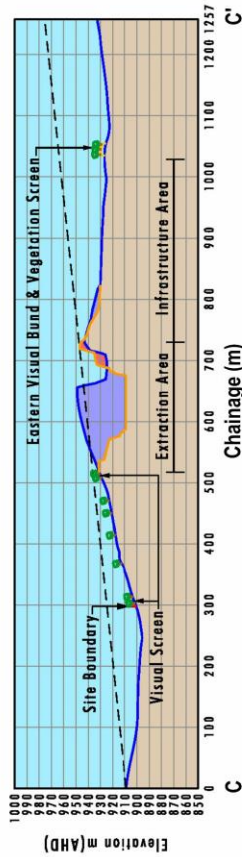
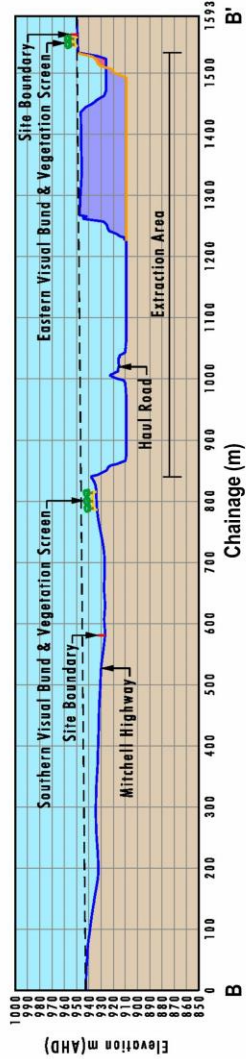
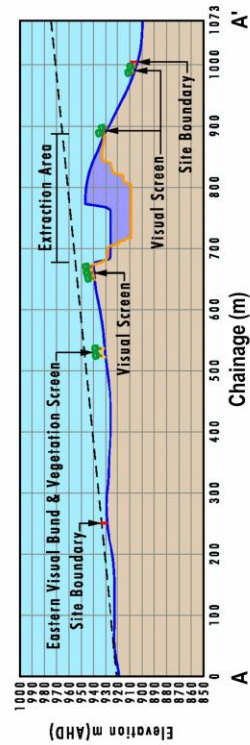
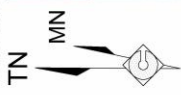


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Base Photo Source: Hanson 7/11/2018 & Google Earth 13/09/2018

- REFERENCE**
- Site Boundary
  - - - Extraction Area Boundary
  - - - Approved Infrastructure Area
  - - - Fenced Site Access Road
  - - - Fenced Asbestos Exclusion Zone
  - - - Soil Stockpile Area
  - - - Sediment Basin
  - - - Water Storage Dam
  - - - Clean Water Diversion Embankment
  - - - Dirty Water Containment Structure
  - - - Visual Bund / Vegetation Screen
  - - - Growth Medium Storage Area
  - - - Section Line



**Figure 6**  
**VISUAL AMENITY SECTIONS**

Section Source: Umwelt (November 2018) - Figures 2.2 & 7.9

Section 7.13.2 of EA (2009), Section 7.9 of EA (2018), and RTS A (2018) provided assessments of the visual amenity impacts of the Quarry. In summary, the following views of the operational sections of the Site will, in the absence of management and mitigation measures, be available during Stages 1 to 7 of the Quarry from the following locations.

- A - “Hartley Cottage”, northeast of the Quarry - No views of the Infrastructure Area, Site Access Road or Extraction Area will be available from the residence, however, clear views of the Infrastructure Area will be available a short distance from the “Hartley Cottage” residence.
- B – “Fairview”, south of the Quarry - Views of active sections of the site will not be available until completion of Stage 4 of the Quarry, when distant views of the northern face of the Extraction Area may be available.
- C – Cadira Vale, northwest of the Quarry – Views of the upper eastern face of the Extraction Area will be available from the Mitchell Highway and the nearby Cadira Vale residence. Views of mobile plant will also be available at times during topsoil stripping and overburden removal activities, however mobile equipment will largely be shielded as the active face advances towards the west during ridge removal.
- D - “Patanga”, west of the Quarry - Views of the upper eastern face of the Extraction Area will be available from the “Patanga” property. Views of mobile plant will also be available at times during topsoil stripping and overburden removal activities, however mobile equipment will largely be shielded as the active face advances towards the west during ridge removal.

Visual amenity for vehicles travelling along the Mitchell Highway would be consistent with those at Cadira Vale or Patanga.

Visual amenity impacts associated with the final landform are addressed in Section 11.4.12.

In order to minimise adverse visual amenity impacts associated with the Quarry during development, the following management and mitigation measures will be adopted.

- Allow establishment of vegetation screens to shield the later stages of extraction from views from the west, south, west and northeast.
- Progressively establish a series of visual bunds as indicated on **Figure 4**. The bunds will be between 3m and 4m high, with side slopes of 1:3 (V:H) or less. Spread soil on the visual bunds and revegetate as described below.
- Establish a range of canopy, understory, shrub and groundcover species as vegetation screens as indicated on **Figures 4** and **5**. Indicatively, the vegetation will be established using a mixture of tube stock and seed sourced from both Site nursery and suppliers as close as possible to the Site. **Table 6** presents the indicative species and the approximate proportion of each to be used during vegetation establishment. Typically, tube stock will be planted at 4m centres or less, with direct seeding (hand casting of a mixture of seed and bulking agent such as sand or sawdust) of shrub species between plantings.
- Establish and maintain the Western Boundary Visual Screen such that species align with those present in Plant Community Type (PCT) 275 – ‘Herbaceous White Box – Apple Box valley woodland of the NSW central western slopes.’ **Table 6** presents the indicative species and the approximate proportion of each to be used during vegetation establishment, with species selected based on their identification during field surveys as outlined in RTS B (2018).
- Undertake revegetation programs annually, typically during late winter to early spring. If required, water the areas of revegetation until the tube stock become established using the spray from the water cart.
- Inspect all areas undergoing vegetation establishment annually and implement corrective action in the event that the vegetation does not become established. If required, specialist advice will be sought from relevant experts in soil management, rehabilitation or revegetation.

It is noted that the results of field surveys outlined in RTS B (2018) indicated that areas of PCT 275 within the Quarry Site were categorised as either:

- Moderate/Good\_Poor Condition – comprising low condition woodland characterised by small patches of trees forming a native canopy over a predominately exotic grassy understorey; or
- Low Condition – comprising a very disturbed grassland formation characterised by a predominately exotic grassy understorey.

Benchmark values for PCT 275 (NSW Western Slopes) specified by the BioNet Vegetation Classification system indicate a tree cover of 18% and a shrub cover of 1%. Additionally, a mean foliage cover of 10-30% is specified for PCT 275. These values have been adopted as criteria for the Western Boundary Visual Screen in order to ensure that both species composition and the structure of upper- and mid-stratum vegetation is consistent with benchmark values for PCT 275 (see **Table 9**).

Initial planting densities for both upper and mid stratum species within the Western Boundary Visual Screen will be higher than benchmark values for PCT 275 in order to account for losses associated with tubestock mortality and unfavourable climatic conditions. The Western Boundary Visual Screen will be assessed regularly and managed in accordance with measures outlined in **Table 9** to ensure that planted vegetation densities converge with the benchmark density and cover values identified above.

**Table 6  
Indicative Species for Revegetation**

Scientific Name	Common Name	Proportion of each species	
		Mid- and upper-slopes, ridge tops and quarry benches	Lower slopes and valleys
<b>General Vegetation Screens</b>			
<b>Canopy species</b>			
<i>Eucalyptus viminalis</i>	Ribbon Gum	50%	-
<i>Eucalyptus bridgesiana</i>	Apple Box	30%	-
<i>Eucalyptus melliodora</i>	Yellow Box	-	50%
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	20%	50%
<b>Shrub Species</b>			
<i>Acacia dealbata</i>	Silver Wattle	25%	25%
<i>Acacia melanoxylon</i>	Blackwood	25%	25%
<i>Acacia decora</i>	Western Golden Wattle	25%	25%
<i>Acacia buxifolia</i>	Box-leaved Wattle	25%	25%
<b>Western Boundary Visual Screen</b>			
<b>Canopy species</b>			
<i>Eucalyptus bridgesiana</i>	Apple Box	50%	50%
<i>Eucalyptus viminalis</i>	Ribbon Gum	50%	50%
<b>Groundcover Species</b>			
<i>Austrostipa scabra</i>	Speargrass	20%	20%
<i>Einadia nutans</i>	Climbing Saltbush	20%	20%
<i>Geranium solanderi</i> var. <i>solanderi</i>	Austral Cranesbill	20%	20%
<i>Chenopodium album</i>	Fat Hen	20%	20%
<i>Bothriochlona macra</i>	Red Grass	20%	20%
Source: GCNRC (2006) – After Section 8.2.1 and RTS B (2018) – After Section 3.2.1 and Appendix B.			

### 10.3.4 Progressive Rehabilitation

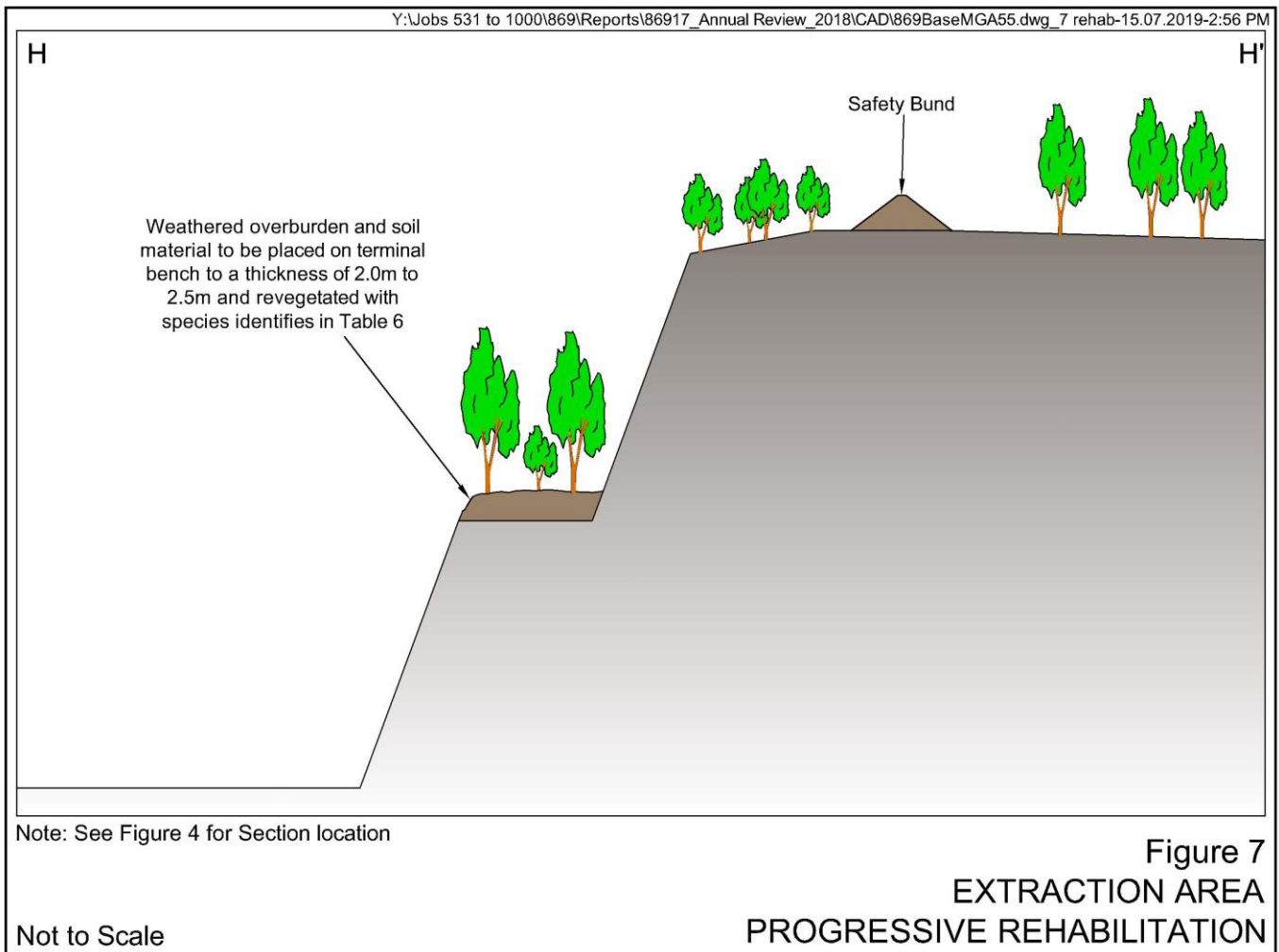
Limited progressive rehabilitation will be undertaken during development of the Quarry. However, the following progressive rehabilitation will be undertaken.

- Establishment of the vegetation screens and rehabilitation of the visual bunds as they are constructed.
- Establishment of vegetation on the upper batter and benches of the Extraction Area.

Establishment of the vegetation screens and rehabilitation of the vegetation bunds is described in the previous sub-section.

Establishment of vegetation on the batter and benches of the northern and eastern sections of the Extraction Area will provide further visual screening for the Quarry faces and, if undertaken during initial extraction operations, can be completed in a relatively cost effective manner. **Figure 7** presents an overview of the progressive rehabilitation that will be undertaken on the batter and benches within the Extraction Area.

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Note: See Figure 4 for Section location

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In summary, the following will be undertaken.

- During initial extraction operations, low-slope upper batters may be required where unweathered rock does not extend to the surface to ensure the stability of the upper section of the Quarry face. This batter will be stabilised, ripped parallel to the contour (where possible), a suitable growth medium will be spread and direct seeded with shrub species as identified in **Table 6**. This will be undertaken concurrently with the initial extraction operations to ensure safe access for personnel and equipment to the batter.
- As soon as practicable after the establishment of the final northern and eastern faces of the Extraction Area, and prior to commencement of the next bench, between 2.0m and 2.5m of weathered overburden will be placed on the terminal bench. The overburden material will then be covered with approximately 0.15m of soil material and the berm will be planted out as described in the previous sub-section.

Vegetation screen coverage of approximately 75% will be achieved on the eastern and northern faces of the extraction area prior to commencing extraction in the western section of the Extraction Area as approved under MOD 2.

### 10.3.5 Weed Management Plan

The following management measures will be adopted to ensure appropriate management of weeds within the Quarry.

- Quarry personnel are to undertake quarterly visual inspections of weed infestation and presence within the Quarry Site.



- Implement an annual weed treatment and reporting program. The program will be undertaken by a suitably qualified and experienced person and the resulting report will provide the following.
  - An overview of the weed management measures implemented since the last report (second and subsequent reports only).
  - The weeds identified during the site inspection, including a plan showing distribution of weeds within the Site, focusing particularly on noxious weeds.
  - An assessment of weed management progress against the performance indicators and completion criteria outlined in **Table 9**.
  - Recommendations in relation to weed management measures to be implemented during the subsequent 12 month period.
- Implement the weed measures identified in the above report, in consultation with surrounding landholders and other stakeholders, as required.
- Should the quarterly visual inspections identify weed infestations, additional weed control programs will be undertaken.

### 10.3.6 Feral Animal Management Plan

It should be noted that the Company has not experienced any feral animals within the Quarry Site since operations commenced. While this does not necessarily mean that feral animals are not present, management of feral animals will occur following sightings by Quarry personnel, neighbours or through other reports. Any feral animal management campaign will be undertaken in consultation with the relevant landowners, Local Land Services and/or OEH.

Should it be required, the following management measures will be adopted to ensure appropriate management of feral animals within the Quarry.

- Commission a program of inspection and baiting/trapping. The program will be undertaken by a suitably qualified and experienced person and the resulting report will provide the following.
  - An overview of the actions taken for the program.
  - The feral animals identified during the site inspection, including a plan showing locations within the Quarry Site.
  - Recommendations in relation to ongoing management measures to be implemented during the subsequent 12 month period.
- Implement the measures identified in the above report, in consultation with surrounding landholders and other stakeholders, as required.

### 10.3.7 Management of Site Access

Active sections of the Site will be accessible only via the Site Access Road. A lockable gate will be installed across the Site Access Road. The gate will be locked outside the approved operating hours and will be installed approximately 40m from the Site boundary (**Figure 2**). This will allow parking for two B-Double trucks off the Mitchell Highway should such vehicles arrive at Site prior to opening of the gate.

As indicated in Section 10.5.4, the Site Access Road will be fenced, and gates installed for the purposes of managing grazing operations. All gates will be kept locked.

Access to the Infrastructure Area will be restricted to inducted personnel, with all visitors and non-inducted personnel required to park in the vicinity of the weighbridge and sign in. Appropriate inductions will be provided at that stage depending on the purpose of the visit.

Access to the Site outside the approved operating hours will be restricted to approved personnel undertaking non-audible activities only.

## 10.3.8 Bushfire Management

### 10.3.8.1 Introduction

Management of bushfire risks within the Site will be undertaken in consultation with the local Rural Fire Service and surrounding landholders. In summary, however, when managing for bushfire there are two aspects that need to be understood and managed, namely:

- the risks associated with ignition and progression of a bushfire (bushfire prevention); and
- the hazards associated with managing an active bushfire.

## 10.3.9 Bushfire Prevention

For a bushfire to occur there are three factors which must be present, namely oxygen, fuel and an ignition source, and several other factors which affect the progress of a bushfire. While exclusion of oxygen is not feasible, each of the remaining issues will be managed as follows.

- Fuel

Fuel loads within the Site will be managed through grazing, including crash grazing of rehabilitation areas and the fenced asbestos exclusion zone (if required), or slashing operations. In addition, an asset protection zone of 10m will be established around all built structures within the Infrastructure Area, including areas where hydrocarbons may be stored, and the Site Access Road. Within this area, trees and shrubs will be maintained in such a manner that the vegetation is not continuous, taking into account the requirement for an effective visual screen, and grass will be maintained below approximately 10cm in height.

- Ignition Sources

Sources of Company-controlled ignition and the associated management measures that will be implemented include the following.

#### Mobile Equipment

- All Quarry-related activities will be undertaken, where practicable, in cleared areas.
- All mobile equipment will be maintained in good working order with appropriate exhaust and fire suppression systems.
- All mobile equipment working in vegetated areas will be inspected to ensure that they do not pose a risk of starting a bushfire. This will include inspection of exhaust and electrical systems, including, in the case of vehicles using unleaded petrol, catalytic converters.
- Mobile equipment working in vegetated areas will not be left unattended with the engine running.

#### Vegetation Clearing Operations

- Clearing operations will not be undertaken during periods of severe, extreme or catastrophic fire danger.
- At least one water-based and one chemical fire extinguisher of at least 9L will be located in the vicinity of all mobile equipment during vegetation clearing operations.

#### Other Operations

- Welding or cutting operations will, as far as practicable, be conducted within and confined to the main workshop area or within cleared areas in the Infrastructure Area.
- All work areas will be equipped with suitable fire extinguishers and their locations indicated by appropriate signage.
- Hydrocarbons will only be stored within appropriately constructed and bunded hydrocarbon storage areas with suitable fire extinguishers, and appropriate signage, located in the vicinity.

- Weather

The Quarry Manager or their delegate will check the Fire Danger Rating daily during the fire season and will notify site personnel of the increased risk during periods of high, severe, extreme or catastrophic fire danger.

### 10.3.9.1 Active Bushfires

The following measures will be implemented to enable appropriate management of active bushfires.

- Appropriate firefighting equipment will be installed within the Site, including fire extinguishers and a water cart with sprays and water cannon.
- All mobile equipment will be equipped with appropriate communication equipment, including two-way radios and/or mobile telephones.
- Pumps, stand pipes and water filling points will be established in the Infrastructure Area to enable refilling of firefighting equipment, including Rural Fire Service equipment. Any fittings will be compatible with Rural Fire Service standard fittings.

## 10.4 Medium Term Management

Condition 32(b) of Schedule 3 of PA 06\_0193 requires a “description of the ... medium ... term measures that would be implemented to rehabilitate and landscape the site”. Section 10.3 describes in detail the short-term rehabilitation and landscape management measures that would be implemented during the initial five years of the life of the Quarry. This sub-section describes the measures that would be implemented during the subsequent five years of the life of the quarry, namely from Year 6 to Year 10.

In summary, as indicated in Section 9, during the next five years extraction would continue within Stages 1 to 4 (as identified on **Figure 2**). During the subsequent five years, Stages 5 and 6 would be commenced. After this time, extraction would remain within the disturbed area and continue to a depth of 910m AHD (final approved depth). **Figure 8** presents the anticipated development of the Quarry at the end of Year 10. It is noted, however, that many factors may influence the development of the Quarry over that ten year period, including:

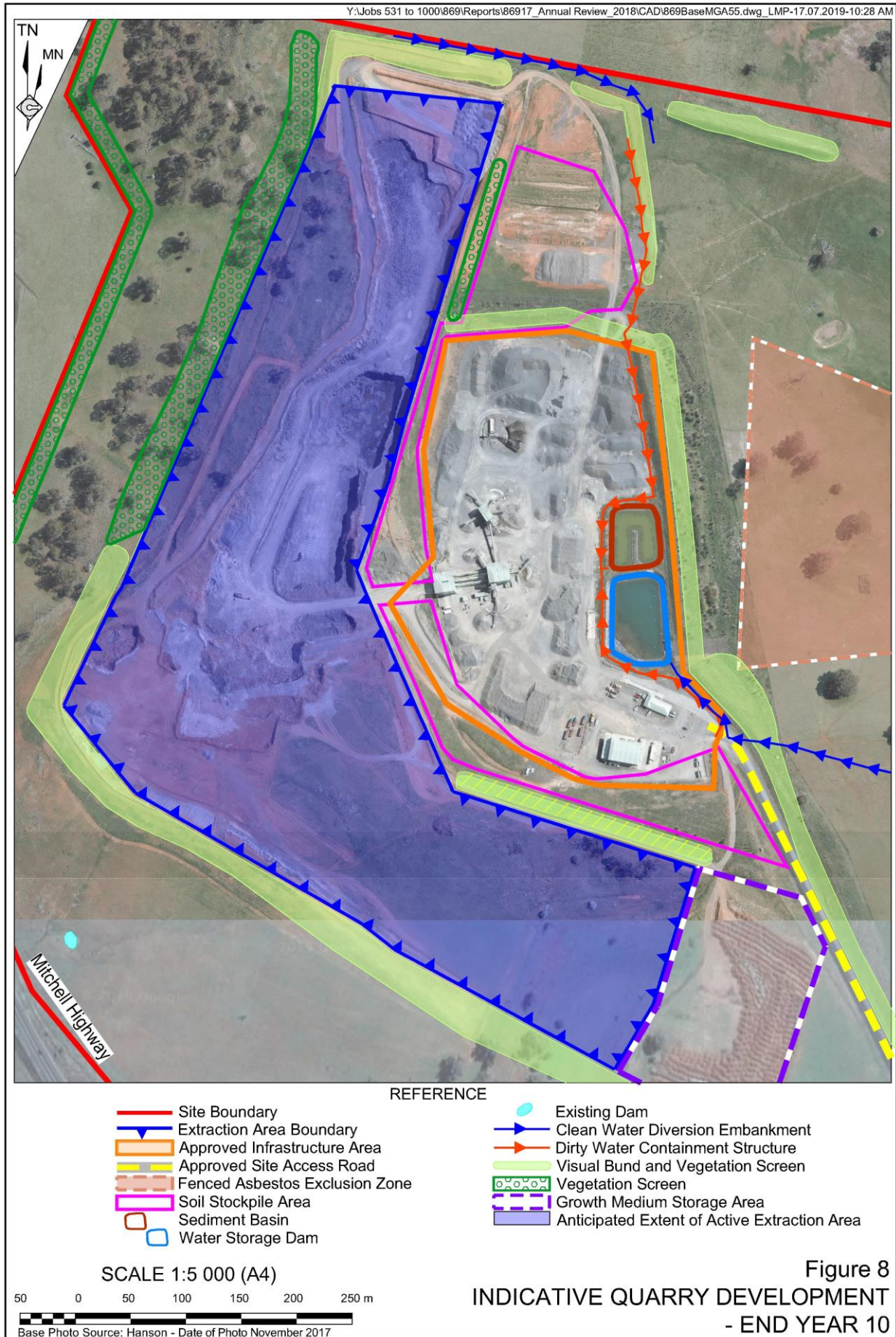
- the rate at which the Extraction Area is developed, which in turn is dependent on market conditions and the rate of extraction;
- resource-related issues, including the distribution, availability and properties of materials within the Extraction Area and the demand for particular products; and
- geotechnical-related issues, including the angle of the final walls which cannot be determined with certainty until Extraction Area operations are well advanced and the behaviour of the material in “real world” conditions is determined.

As a result, the extent of the anticipated extraction operations presented on **Figure 8** is indicative only.

In summary, the management measures identified in Section 10.3 would continue to be implemented during Years 6 to 10 of the life of the Quarry. These would include the following.

- Continued annual site preparation campaigns using the methodology identified in Section 10.3.2, as modified based on experience during the initial years of extraction operations.
- Continued management of visual amenity-related issues as described in Section 10.3.3, with particular focus on maintenance of established vegetation screens and completion of the remaining visual amenity bunds and vegetation screens.
- Continued progressive rehabilitation, with emphasis on evaluation of early programs of progressive rehabilitation to establish the most appropriate and effective rehabilitation methodology.
- Continued management of non-operational sections of the site as described in Section 10.3.5 to ensure continued beneficial uses of that land while not adversely impacting on quarry operations.
- Continued management of weeds and pests in consultation with surrounding landholders as described in Section 10.3.6.
- Continued management of bushfire hazards as described in Section 10.3.8 in consultation with the local Rural Fire Service.







## 10.5 Management of Non-operational Sections of the Site

### 10.5.1 Introduction

Rehabilitation and land management domains including non-operational sections of the Site are shown on **Figure 9**. A range of rehabilitation domains have been established as follows.

- Domain 1 – Extraction Area – Stages 1 to 7
- Domain 2 – Infrastructure Area.
- Domain 3 – Vegetation Screens.
- Domain 4 – Site Access Road.
- Domain 5 – Asbestos Exclusion Zone.
- Domain 6 – Nature Conservation.
- Domain 7 – Soil, Growth Medium and Salvaged Habitat Feature Storage Area.
- Domain 8 – Grazing Area.

Domains 5, 6 and 8 may be viewed as “non-operational domains”, each of which will be fenced off from operational sections of the Site, with lockable gates installed as required. The following describes the specific management measures that will be adopted in each of the non-operational domains. It should be noted that these domains will be subject to the weed management (Section 10.3.5) and feral animal management (Section 10.3.6) protocols implemented for operational areas of the Quarry. In addition, the design and construction of amenity bunds and diversion drains is intended to separate potentially sediment-laden rainfall runoff from clean water that runs off these areas. These management actions are designed to protect existing vegetation and soil resources as well as existing native fauna in accordance with Condition 32(d) of Schedule 3 of PA 06\_0193.

Final rehabilitation of all domains, including operational domains 1-4 and 7, is discussed in Section 11.

### 10.5.2 Domain 5 – Asbestos Exclusion Zone

Management of the asbestiform materials within the Site is fully described in the *Preferred Project Report* (Hanson, 2012) and the *Asbestos Management Plan* (Risktech, 2019). A principal control measure is the establishment of an Asbestos Exclusion Zone which encompasses all areas where there is a risk of encountering asbestiform material with 5m of the surface (**Figure 2**). The following management measures would be implemented within this domain.

- No surface disturbing activities would be adopted within the Asbestos Exclusion Zone.
- Fence all known surface outcrops of asbestiform materials, ensuring that the fences include no gates.
- Fence the wider Asbestos Exclusion Zone, including lockable gates to permit access for approved land management activities.
- Place warning signs on the inner and outer fences warning of the risk of asbestiform materials and prohibiting unauthorised access.
- Implement a task-specific access and works protocol that includes an appropriate risk assessment, job safety analysis, working procedures and access permit system. If required, seek expert advice to develop the protocol on a case by case basis.
- Encourage natural regeneration of native vegetation through the restriction of grazing operations to the minimum required for weed and bushfire management. Indicatively, the Asbestos Exclusion Zone would be crash grazed one to two times per year for short periods in strict compliance with an access and works protocol as identified above. Triggers for implementing crash grazing management measures are outlined in **Table 9**.

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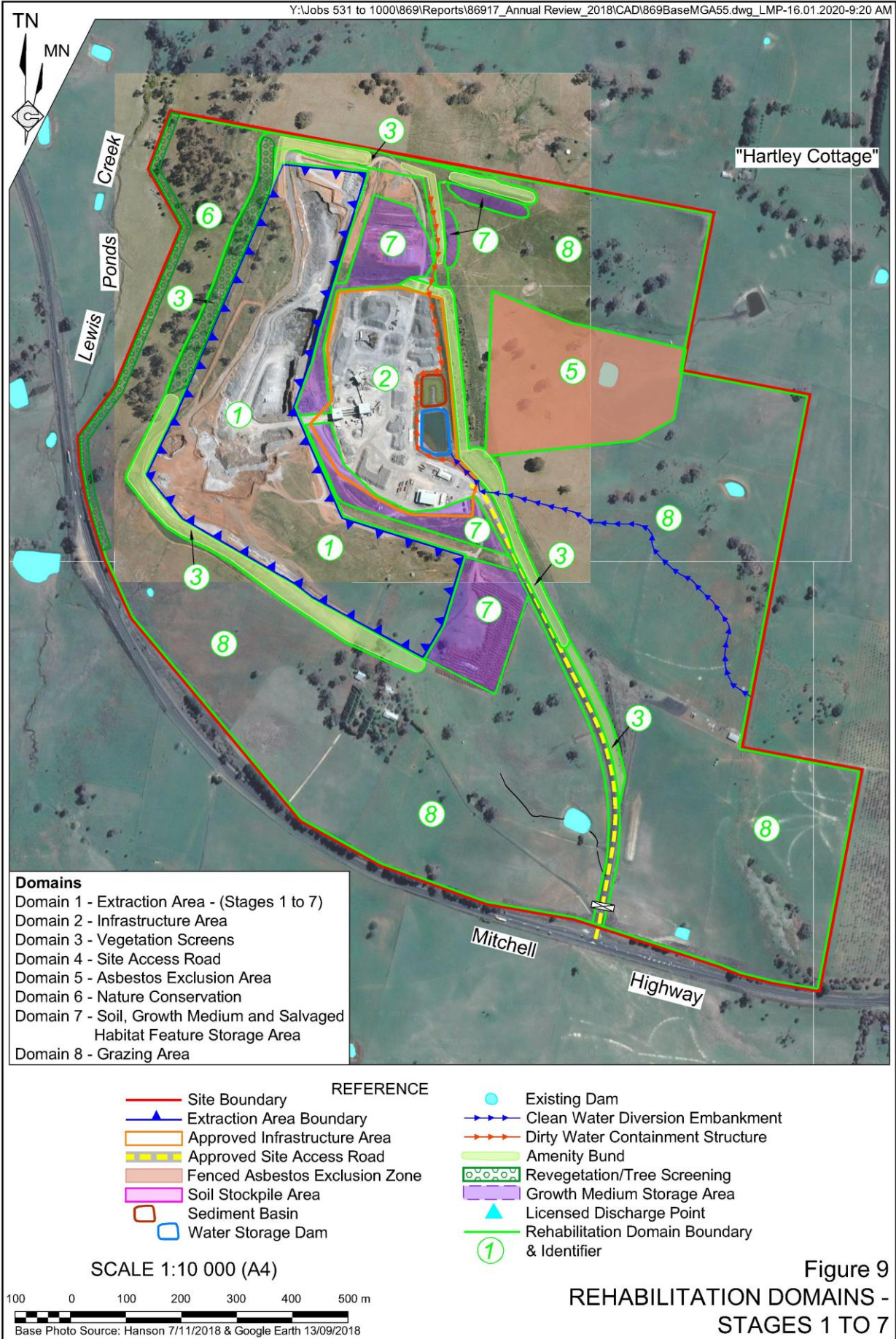


Figure 9  
 REHABILITATION DOMAINS -  
 STAGES 1 TO 7

### 10.5.3 Domain 6 – Nature Conservation

This area is steeply sloped, variably vegetated and unsuitable for regular grazing operations. In addition, this area is highly visible to motorists and others to the west of the Site. As a result, the following management measures would be implemented during Stages 1 to 7 within this domain.

- Encourage natural regeneration of native vegetation through the restriction of grazing operations to the minimum required for weed and bushfire management. Indicatively, the area would be crash grazed one to two times per year for short periods, subject to seasonal conditions. Triggers for implementing crash grazing management measures are outlined in **Table 9**.
- At other times, access would be restricted to authorised personnel only for environmental management and monitoring purposes.

Section 11.3.7 describes the final land use options for this domain and the consequent management measures.

### 10.5.4 Domain 8 – Grazing Areas

This domain is moderately to gently sloped and is generally well grassed. A flat area subject to water logging exists to the southeast of the Extraction Area and west of the proposed site access road. The domain is currently used for grazing. The following management measures would be implemented in this area.

- Continue current grazing operations in a manner that ensures its continued productive use of the domain while ensuring preservation of soil resources and management of weed infestation.
- Fence the site access road to ensure stock do not enter the road or the Mitchell Highway. Gates will be installed and locked to allow stock to be moved around the Site, while limiting potential for inadvertent release into operational sections of the Site.

Domain 8 includes an existing residence which has been converted for use as the Site Nursery, with tubestock delivered to the Site being stored in the nursery until conditions are suitable for planting.



# 11. Conceptual Long-term Management Strategy

## 11.1 Introduction

Condition 33 of Schedule 3 of PA 06\_0193 requires that this document must:

- define the objectives and criteria for quarry closure and post-extraction management;
- investigate and/or describe options for the future use of the Site;
- describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
- describe how the performance of these measures would be monitored over time.

In addition, Condition 30 of Schedule 3 of PA 06\_0193 identifies that the Site must be “rehabilitated in a manner that is generally consistent with the final landform depicted in Figure 4 of Appendix 1 [of the project approval].”

Finally, the note to Condition 31 of Schedule 3 of PA 06\_0193 states that the *Landscape Management Plan* may include a conceptual Long-term Management Strategy, with a timetable for augmentation of the strategy with each subsequent review of the plan. This Section has been prepared in satisfaction of the above requirements. However, it is noted that Sections 10.3 to 10.5 describe the progressive rehabilitation and landscape management measures that will be implemented during the initial 10 years of the life of the Quarry while **Table 4** identifies objectives and criteria for quarry closure, the final landform and final land use. That information is therefore not repeated in this Section.

## 11.2 Approved and Proposed Final Landform

The final landform identified in PA 06\_0193 comprises the following.

- A final void, coincident with the approved Extraction Area, with;
  - rainfall runoff collecting in the final void;
  - an approximately flat floor with an elevation of approximately 910m AHD; and
  - a single access ramp linking the final void to the Infrastructure Area.
- An Infrastructure Area, with all infrastructure not required for the final land use removed and with two water storages retained.
- A range of vegetated screens and bunds.
- A site access road, reduced in width to reflect the final land use.
- A fenced and signposted Asbestos Exclusion Zone.

The proposed final landform is presented in **Figure 10** and **Figure 11** and generally reflects the approved final landform. The proposed final landform would retain the terminal faces within the Extraction Area. In summary, two approximately 15m high faces would be retained, with an intermediate bench approximately 7.5m wide. The angle of the terminal faces would be at least 1:1.5 (V:H) to ensure stability of the Extraction Area faces both during and following the life of the Quarry. These faces would be screened from surrounding views through the establishment of vegetation on the intermediate bench of the Extraction Area.



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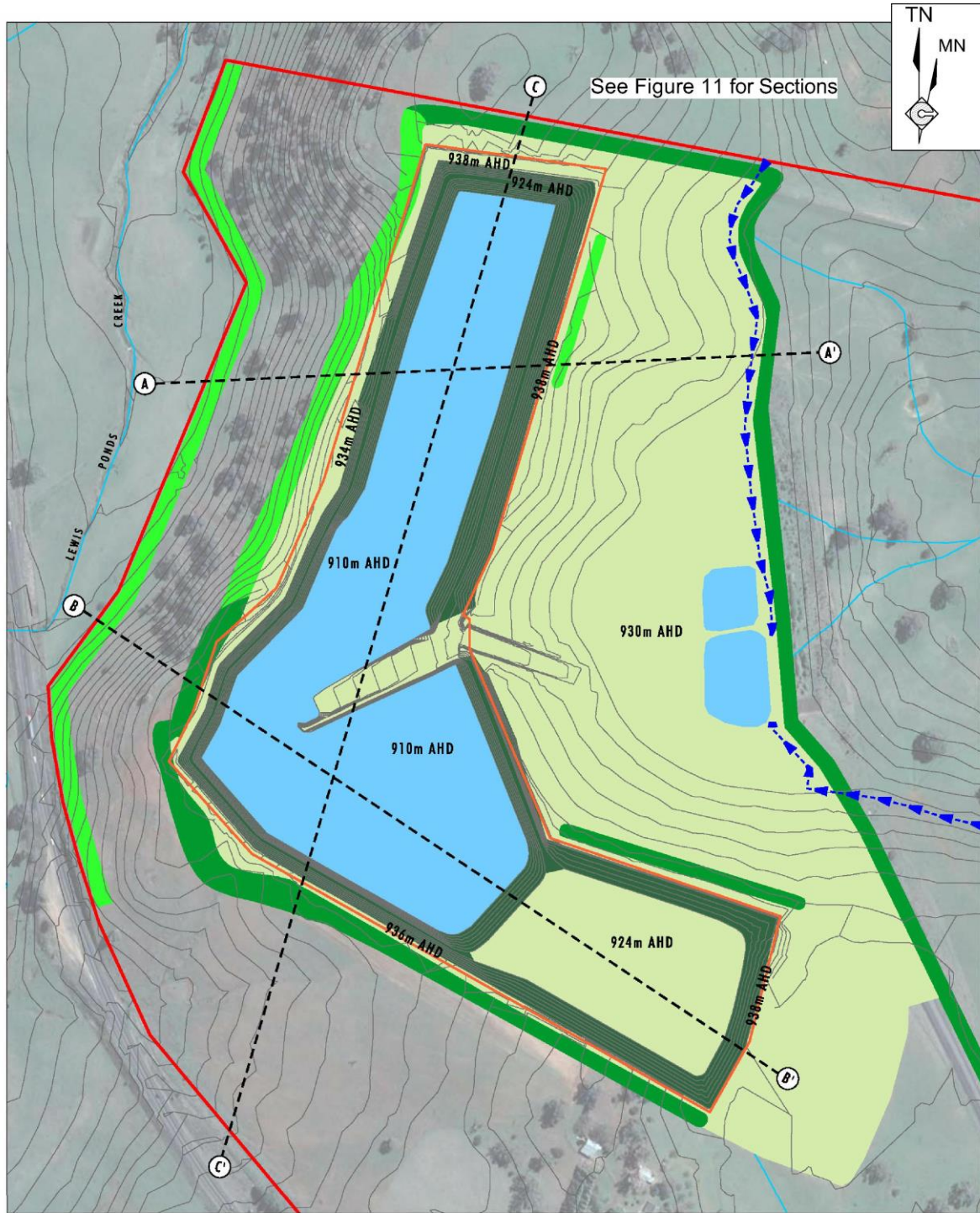


Image Source: Google Earth (2018)  
Data Source: Hanson (2017)

**REFERENCE**

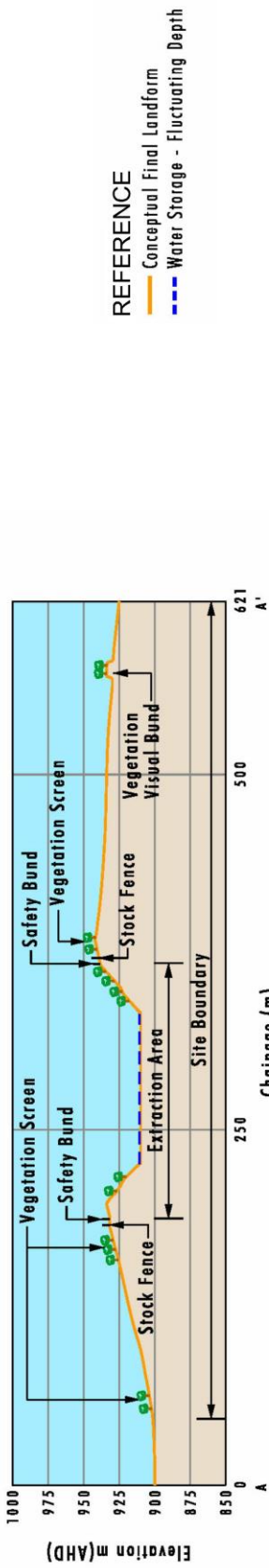
- Site Boundary
- Extraction Area
- Vegetation Screen
- Vegetated Visual Bund
- Revegetated to Pasture
- Revegetated to Native Vegetation

- Water Storage
- - - Clean Drainage Flow Line
- - - Transect Location

Figure 10  
**CONCEPTUAL FINAL LANDFORM**

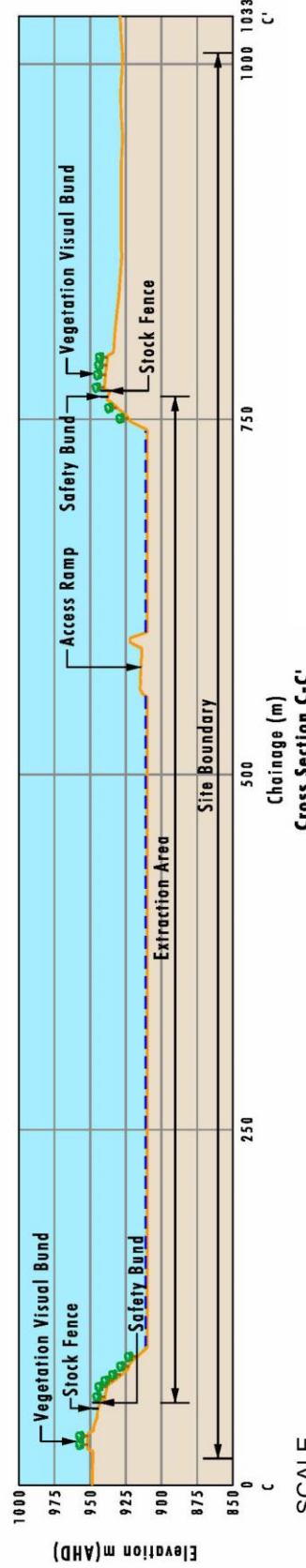
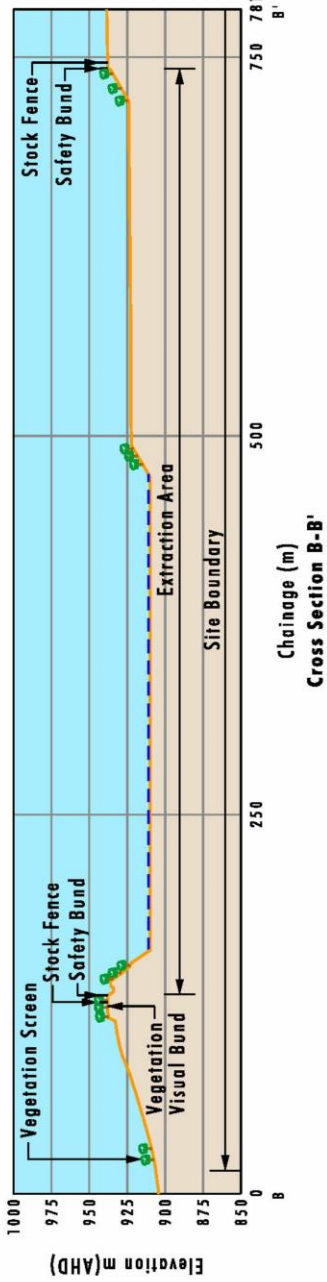
Source: Umwelt (November 2018) - Figure 1

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See Figure 10 for Section Locations

- REFERENCE**
- Conceptual Final Landform
  - - - Water Storage - Fluctuating Depth



**Figure 11**  
**FINAL LANDFORM CROSS SECTIONS**

Section Source: Umwelt (November 2018) - Figure 2

## 11.3 Final Land Use Options Assessment

### 11.3.1 Introduction

In preparation of this final land use options for the Site, the Company has taken into account the anticipated life of the Quarry and length of the project approval, namely until 2042. This assessment, as a result, is intentionally, conceptual. The final land use option will be determined definitively closer to the end of the Quarry life and will depend on the following.

- Remaining quarry resources suitable for extraction.
- Surrounding and potential land uses.
- The needs of subsequent landholders and the surrounding community, including, potentially for industrial or commercial uses of the Site, pending granting of further development consents at that time.
- Consultation with relevant authorities.

As identified in Section 10.5 for the purposes of this the analysis of final land use, as well as for establishment of rehabilitation performance and completion criteria applicable throughout the life of the Quarry, eight rehabilitation domains have been identified (**Figure 9**). These domains have been established to identify sections of the Site that will require similar rehabilitation and will likely have similar final land uses. As a result, the following sub-sections address final land use options for each rehabilitation domain separately.

### 11.3.2 Domain 1 – Extraction Area

As indicated in Section 11.2, at the end of the life of the Quarry, the final landform within the Extraction Area will comprise a final void between 20m and 34m deep, with void faces between 14m and 18m high and benches approximately 7.5m wide (**Figure 10**). The upper crest of the Extraction Area void will be bunded and fenced to prevent inadvertent access by people or livestock. The base of the Extraction Area void will be generally flat, with a step up from 910mAHD in the western section of the void to 924mAHD in the eastern section. The void would collect rainfall runoff, with water levels fluctuating due to evaporation rates and minimal groundwater inflow as the base (910mAHD) is above the local groundwater table. The Extraction Area void would retain a single haul ramp to permit access.

The upper batter and intermediate bench of the Extraction Area would be revegetated as described in Section 10.3.3 and shown indicatively on **Figure 10**.

As a result, final land use options include the following.

- Landfill - This option is not the Company's preferred option because no analysis of the suitability of the site for waste management has been undertaken and it is likely that the permeability of the walls and floor of the quarry would not comply with the relevant requirements. In addition, the proximity of Lewis Ponds Creek would make management of leachate problematic.
- Industrial land use - Potential exists for the Extraction Area (together with the Infrastructure Area) to be used for an industrial purpose, particularly taking into account the fact that the floor of the Extraction Area will be largely flat, will have power very close by and will have excellent access to the Mitchell Highway. However, an assessment of any proposed industrial use has yet to be undertaken and further development approval and possibly re-zoning will be required to permit such a use.
- Mixed agricultural and nature conservation land use – The Company will revegetate the upper batter and intermediate bench of the Extraction Area to native vegetation. Providing water levels can be effectively managed, the Company would also revegetate the base of the Extraction Area with pasture species. This would permit the resumption of the current land use within the Extraction Area, namely a combination of nature conservation and grazing. Achieving such a land use will, however, require sufficient growth media to be stockpiled during the site preparation activities for use during rehabilitation operations as well as ongoing management of water levels.
- Mixed water storage and nature conservation – The Company will revegetate the upper batter and intermediate bench of the Extraction Area to native vegetation (**Figure 10**). The Extraction Area void will store water collected from rainfall runoff, with minimal groundwater input and evaporation likely to result in variable water levels. Options for long-term water storage and potential water uses have not yet been assessed.



In light of the uncertainties in relation to the final land use for the Extraction Area, the rehabilitation performance and completion criteria identified in Section 13 has adopted a final land use of “safe, stable, secure and non-polluting.” This will permit a beneficial final land use to be determined closer to the end of Quarry life.

### **11.3.3 Domain 2 – Infrastructure Area**

The Infrastructure Area will, at the end of Quarry life, comprise a largely flat area approximately 400m long and 175m wide with two water storage dams. Infrastructure to be used during the life of the Quarry will include crushing, screening and stockpiling equipment as well as a weighbridge, office building and power and water supply.

The Company notes that the Water Storage Dam and Sediment Basin will receive clean water flows from rehabilitated sections of the Infrastructure Area. As indicated in Section 8.5 of the *Soil and Water Management Plan*, the Company contends that the Water Storage Dam and Sediment Basin will comply with the requirements of the Site’s Harvestable Right under Section 53 of the *Water Management Act 2000*. As a result, these dams will be retained in the final landform.

In light of the above, potential exists for the domain to be used for an industrial purpose, whether extractive industries-related or not. However, as noted previously, further development consent, and possibly rezoning, would be required to permit this final land use. As a result, for the purposes of this Plan, the Company proposes to return the Infrastructure Area to the existing land use, namely grazing.

### **11.3.4 Domain 3 – Vegetation Screens**

The vegetation screens and vegetated bunds will, at the end of Quarry life, have an ongoing purpose, namely screening of the rehabilitated Extraction Area void from surrounding land. As a result, the final land use for this domain will continue to be nature conservation, with the vegetation to continue to act as a visual screen.

### **11.3.5 Domain 4 – Site Access Road**

The site access road will, at the end of Quarry life, comprise a sealed, two way access road with fences along both sides preventing stock entering the road.

Final use of the access road will depend on the final land use for the Extraction and Infrastructure Areas. Should an industrial land use for these areas be identified, the site access road will remain to permit vehicular access to those areas. However, should that not occur, the site access road will be reduced in width to that required for ongoing management of the Site for agricultural purposes.

As further development consents would be required for any non-quarry related industrial use, the latter use has been adopted for the purpose of this Plan.

### **11.3.6 Domain 5 – Asbestos Exclusion Zone**

The Asbestos Exclusion Zone has been established to assist with the management of risks to health associated with asbestiform materials. As this purpose will continue following completion of Quarry operations, the approved land use of nature conservation will continue.

### **11.3.7 Domain 6 – Nature Conservation**

The final land use for Domain 6 will continue to be nature conservation.

### **11.3.8 Domain 7 – Soil, Growth Medium and Salvaged Habitat Feature Storage Area**

These areas would be used during the life of the Quarry for storage of rehabilitation materials and would be returned to agricultural land use as per Domain 8 (see Section 11.3.9).



### 11.3.9 Domain 8 – Grazing Area

Domain 8 comprises gently sloping to undulating land that is currently used for grazing. A residence and associated farm buildings occur within the domain which is predominantly pasture-covered.

Following the completion of quarrying operations, the domain will continue to be used for agricultural operations.

## 11.4 Management of the Final Landform

### 11.4.1 Introduction

The following sub-sections provide a brief overview of the anticipated environmental impacts associated with final rehabilitation of the Quarry. Where impacts associated with this phase of the life of the Quarry have been assessed as part of the EA (2009), EA (2018) and RTS B (2018), that information is summarised below. Where no assessment was undertaken, a brief impact assessment is also presented. The following sub-sections also present additional management measures that will be implemented to ensure that impacts associated with this phase of the life of the Quarry are appropriately managed.

The order in which environmental issues are presented reflects the order in which they are presented in EA (2009). A more detailed description of anticipated impacts will be provided in the detailed Long-term Management Strategy.

### 11.4.2 Topography and Slopes

The final landform within the Extraction Area will be as described previously in Section 11.2. The Extraction Area will be retained as a final void, with faces between 14m and 28m high and slopes of at least 1:1.5 (V:H) or less.

### 11.4.3 Soils

Final land uses including grazing and nature conservation reflect the dominant surrounding land uses and will have similar effects on soils in these areas following growth medium and vegetation establishment activities.

Management measures that will be implemented to minimise soil-related impacts are as follows.

- Implement the measures identified in Section 10.3.2 of this Plan within all areas to be disturbed.
- Ensure that sediment and erosion control measures are implemented in accordance with Landcom (2004) and DECC (2008), or subsequent guidelines.
- Ensure that soil and water management measures are implemented in accordance with the *Soil and Water Management Plan* for the Quarry.

### 11.4.4 Hydrology

The final landform will collect rainfall runoff and will not intersect the regional groundwater table. As a result, the following management measures will be implemented during the final rehabilitation phase of the Quarry to minimise water-related impacts.

- Construct the final landform within the Extraction Area in a manner that ensures a single discharge location in the event that discharge is generated.
- Retain the haul road access ramp into the Extraction Area void to permit future access for water use or water management activities.

### 11.4.5 Flora

The flora assessment undertaken by Geoff Cunningham Natural Resource Consultants Pty Ltd (GCNRC) (2006), prepared to support EA (2009), identified the following vegetation communities within the footprint of the final rehabilitation area.

- Ribbon Gum – Apple Box Community.
- Cleared lands.

Neither of these communities were identified as being endangered ecological communities. In addition, no threatened flora species were identified.

In light of the above, GCNRC (2006) concluded that there would be no significant flora-related adverse impacts associated with the Quarry.

Additionally, the biodiversity assessment undertaken by Umwelt (2018), prepared for RTS B (2018) to support EA (2018), identified Plant Community Type (PCT) 275 – ‘Herbaceous White Box – Apple Box valley woodland of the NSW central western slopes’ as occurring within the Extraction Area as approved under MOD 2. Umwelt (2018) noted that PCT 275 occurred in both moderate-good and poor conditions at the Quarry Site, with past agricultural land uses resulting in heavily disturbed vegetation communities dominated by exotic groundcover species. Umwelt (2018) also identified cleared land within the Extraction Area development footprint.

Umwelt (2018) note that vegetation within the Extraction Area development footprint does not represent an Endangered Ecological Community (EEC) listed under either the Biodiversity Conservation Act 2016 (BC Act) or the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).

The measures identified in Sections 10.3 to 10.5 of this Plan would be implemented progressively during Stages 1 to 7 of the Quarry to ensure that the biodiversity values of the rehabilitated/revegetated sections of the Site are increased to the maximum extent practicable before commencement of final rehabilitation.

#### **11.4.6 Fauna**

The fauna assessment undertaken by Western Research Institute Limited (WRI) (2006), prepared to support EA (2009), identified 66 vertebrate species, of which 13 species were non-native. No species listed under the NSW *Threatened Species Conservation Act 1995* or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* at the time were identified.

In light of the above, WRI (2006) concluded that taking into consideration the proposed rehabilitation/revegetation program, there would be no significant impacts on threatened fauna species. It is significant that WRI (2006) identify an impact footprint that includes sections of the footprint of the final rehabilitation area.

The fauna assessment undertaken to support RTS B (2018) recorded one threatened species as occurring within the Extraction Area development footprint, with *Hieraaetus morphnoides* (Little Eagle) being listed as vulnerable under the BC Act. Additionally, *Artamus cyanopterus* (Dusky Woodswallow) was recorded adjacent to the Extraction Area development footprint.

The Company will implement the management measures identified in Sections 10.3 to 10.5 in order to ensure that fauna-related impacts are minimised to the greatest extent practicable.

#### **11.4.7 Aboriginal Heritage**

The heritage assessment undertaken by Archaeological Surveys and Reports Pty Ltd (Appleton) (2002), prepared to support EA (2009), did not identify any objects or sites of Aboriginal heritage significance within the Site. As a result, Aboriginal heritage-related impacts associated with the final rehabilitation area will not be significant.

The Company will implement the management measures identified in the *Aboriginal Cultural Heritage Management Plan* to ensure that the risks of adverse impacts to as yet unidentified Aboriginal objects are minimised to the greatest extent practicable.

#### **11.4.8 Strategic Planning and Encroachment**

The strategic planning assessment undertaken by Geolyse (2006), prepared to support EA (2009), identified a range of restrictions on the ability of current and future landholders to construct residences surrounding the Site. In summary, Geolyse (2006) identified that:

- limited residences could be built on existing allotments surrounding the Site as a result of restrictions placed on construction of such residences under the *Cabonne Local Environment Plan 1991* and other State, regional and local planning guidelines and policies; and
- limited potential exists for subdivision of existing allotments and establishment of higher density rural residential development surrounding the Site.

Notwithstanding the above, however, potential exists for further residences to be constructed surrounding the Site during the life of the Quarry. It is likely that residences constructed to the west of the Site within the final rehabilitation area visual amenity catchment will have views of the eastern face of the Extraction Area following commencement of final rehabilitation (see Section 11.4.12).

### 11.4.9 Air Quality

The air quality assessment undertaken by Heggies (2007a), prepared to support EA (2009), included an assessment of extraction operations during the final rehabilitation phase of the Quarry. That assessment concluded that deposited dust levels and annual average and maximum 24-hour PM<sub>10</sub> concentrations associated with that phase are expected to be significantly less than the relevant criteria.

Jacobs Group (Australia) Pty Ltd (Jacobs) (2018) assessed air quality impacts associated with the extraction of material from the Extraction Area as approved under MOD 2. Jacobs (2018) concluded that PM<sub>10</sub>, PM<sub>2.5</sub>, total suspended particles (TSP) and deposited dust levels would not exceed the relevant assessment criteria at the nearest private residences to the Quarry.

### 11.4.10 Noise and Blasting

The noise and blasting assessment undertaken by Heggies (2007b), prepared to support EA (2009), included an assessment of extraction operations during the final rehabilitation phase of the Quarry.

The noise component of that assessment concluded that operational noise levels during that phase would be less than or equal to relevant criteria during the day, evening and night, including under adverse weather conditions.

The blasting component of that assessment concluded that based on a minimum distance of 344m from the closest point of the Final Rehabilitation Area to the closest residence, namely “Cadira Vale” and a maximum instantaneous charge of 100kg, the maximum ground vibration and air blast overpressure at that residence is expected to be 4.0mm/s and 119dB Linear respectively. The anticipated maximum ground vibration level of 4.0mm/s is less than the recommended human comfort criteria of 5mm/s. However, the maximum anticipated air blast overpressure level of 119dB Linear exceeds the recommended human comfort criteria of 115dB Linear but does not exceed the maximum human comfort criteria of 120dB Linear.

The blast assessment prepared to support EA (2018) noted that the extension of the Extraction Area under MOD 2 would result in blasting occurring approximately 100m closer to the “Patanga” property compared to the previously approved Extraction Area. The blasting assessment concluded that blasting limits outlined in PA 06\_0193 could be complied with assuming that blasts were appropriately designed and executed and the measures outlined in the *Blast Management Plan* were implemented.

Condition 8 of Schedule 3 of PA 06\_0193 identifies that the recommended human comfort level of 115dB Linear may be exceeded at surrounding residences by only 5% of all blasts undertaken in any 12 month period. As a result, the following management measures will be implemented during final rehabilitation to minimise blast-related impacts and comply with the requirements of Condition 8 of Schedule 3 of PA 06\_0193.

- Ensure that the measures identified in the *Blast Management Plan* are fully implemented.
- Relocate, subject to landholder consent, blast monitoring location B1 to “Cadira Vale” prior to the commencement of final rehabilitation.
- Design all blasts to comply with the criteria identified in Condition 8 and 9 of Schedule 3 of PA 06\_0193. This may require decking of holes or reducing the height of benches to 7.5m.

### 11.4.11 Fly Rock

The fly rock assessment undertaken by Maxam International (Maxam) (2006), prepared to support EA (2018), included an assessment of blasting operations during all stages of the Quarry, including the final rehabilitation phase. That report concluded that the maximum extent of the exclusion zone and hence the maximum extent of risk to humans and infrastructure, is approximately 400m in front of the blast and 150m behind the blast. As a result, the risk of adverse fly rock-related impacts during the final rehabilitation phase may be managed through appropriate blasting practices, including orientating blasts away from residences.

### 11.4.12 Visual Amenity

The visual amenity assessment presented in EA (2009) identified that there would be limited views from the west of the Site. However, there was no assessment of the anticipated visual amenity impacts associated with the final rehabilitation phase of the Quarry.

The visual amenity assessment undertaken to support EA (2018) and RTS A (2018) indicated that ongoing extraction would result in the lowering of the ridgeline within the western section of the Extraction Area by approximately 16m, from 950m AHD to 934m AHD. This lowering of the ridgeline will impact existing views of the Quarry and final landform from the west for both residences and eastbound motorists on the Mitchell Highway.

**Figure 3** presents the potential vantage point for the landform. As a result, potential views of the final rehabilitation area footprint may be available from the west. It is noted in particular that an approximately 1 500m section of the Mitchell Highway currently has clear views of the final rehabilitation area footprint for east-bound motorists.

Views of the site include a hill side partially covered with native vegetation, with the remainder covered by grass. These views are consistent with views of surrounding land. A review of the possible views at the end of Stage 7 is presented in Section 10.3.3. In summary, views of the rehabilitated landscape at the end of Stage 7 will be predominantly of tree screened areas.

**Figure 6** presents the visual amenity section from select vantage points at the end of development of the Quarry. In summary, views of the upper eastern face of the Extraction Area may be available, however it is anticipated that vegetation screens will largely shield views of the exposed face.

As a result, the following management measures will be implemented during the life of the Quarry to minimise visual amenity-related impacts associated with final rehabilitation.

- Implement the measures identified in Sections 10.3.3 and 10.3.4.
- Establish a native vegetation screen along the western boundary of the Final Rehabilitation Area as described in Section 10.3.3.
- Establish native vegetation screens on the upper benches of the eastern and northern Extraction Area faces, with coverage achieving 75% prior to commencing extraction from the expanded Extraction Area as approved under MOD 2.
- Weathered material, spread with subsoil and topsoil material and revegetate as described in Sections 10.3.3 and 10.3.4.

### 11.4.13 Traffic and Roads

The traffic assessment undertaken by McLaren Traffic Engineering (McLaren) (2009), prepared to support EA (2018), assumed an average of 130 truck movements per day to support the transportation of up to 600 000t of quarry products per year. As the proposed transportation rate during the rehabilitation phase of the Quarry would be the same or less as under Stages 1 to 7, the impact assessment and management measures presented in the *Traffic Management and Driver Conduct Plan* for the Quarry remain appropriate and no further assessment is required.

### 11.4.14 Energy

The greenhouse gas assessment undertaken by Jacobs (2018), prepared to support EA (2018), indicated that no significant greenhouse gas emission management measures are warranted for the Quarry. As the proposed greenhouse gas emission generation rate during the final rehabilitation phase would be the same or less than that under Stages 1 to 7, no further assessment or management measures are required.

The Company would continue to implement its company-wide *Energy Efficiency Opportunities Action Plan* at the Quarry to ensure the continued adoption of best practices in sustainable manufacturing and transportation activities.

### 11.4.15 Socio-economic

Socio-economic contributions associated with the rehabilitation phase would remain unchanged from Stages 1 to 7 and, as a result, no further assessment is required here.



### **11.4.16 Conclusion**

In conclusion, the approved final landform, namely the Extraction Area void which would collect rainfall runoff, reflects the conceptual final landform and rehabilitation plan as incorporated in Appendix 1 of PA 06\_0193. Those aspects that were not assessed have been conceptually assessed in the previous sub-sections and, assuming implementation of the identified management measures, the anticipated impacts are determined to be within relevant criteria or reasonable community expectations.

## **11.5 Timetable for Augmentation of This Strategy**

The Long-term Management Strategy will be progressively developed and augmented during the life of the Quarry. Indicatively the Company anticipates that Quarry planning will be undertaken in five year blocks as described in Section 9. As a result, the Company anticipates that the Management Plans will undergo minor revisions during each five year period as identified in Section 19. However, major revisions or replacement of relevant Management Plans, including this Plan, will be undertaken to coincide with each five year planning period. The Company would, at that time, further refine the Long-term Management Strategy, including providing detailed management and Quarry closure measures that will be implemented prior to the commencement of final rehabilitation.

# 12. Biodiversity Offset Strategy

A Biodiversity Assessment Report, presented in RTS B (2018), was prepared to support the application for MOD 2 to PA 06\_0193. The assessment indicated that MOD 2 would result in an increase in the size of the Extraction Area disturbance footprint by approximately 3.2ha and would impact areas of the following two biometric vegetation types (BVTs).

- CW207/PCT275 – Herbaceous White Box – Apple Box valley woodland on the NSW central western slopes – Moderate/Good\_Poor.
- CW207/PCT275 – Herbaceous White Box – Apple Box valley woodland on the NSW central western slopes – Moderate/Good – Low.

It was determined that, assuming management and mitigation measures outlined in this Plan are implemented, a total of 17 ecosystem credits for CW207/PCT 275 – ‘Herbaceous White Box – Apple Box valley woodland of the NSW central western slopes’ would be required to offset impacts associated with MOD 2.

One approach to meeting the offset obligations associated with MOD 2 included the retirement of the offset liability through the purchase of appropriate credits available via the public market. In accordance with the Framework for Biodiversity Assessment, offsetting requirements may be achieved using credits associated with CW207/PCT275 as well as those associated with several other biometric vegetation types as listed in Section 7.2 of RTS B (2018).

On 29 January 2020, the Company retired 17 ecosystem credits of vegetation type CW209 ‘Blakely’s Red Gum – White Box – Yellow Box – Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South Western Slopes Bioregion’. The credit retirement report is presented as **Appendix 1**.

# 13. Monitoring

The following biodiversity-related monitoring will be undertaken during and following the life of the Quarry.

- Annual weed and pest inspection programs will be undertaken as described in Section 10.3.6. The results of the program, including a series of recommendations for management measures to be implemented during the following 12 month period, will be included in a report following completion of the inspection. Those recommendations will be considered by the Company and implemented, in consultation with surrounding landholders as appropriate.
- Monitoring of bushfire/vegetation fuel loads will be undertaken in consultation with the local Rural Fire Service annually in mid to late winter and fuel reduction programs will be undertaken as required.
- An annual aerial photographic program, including photogrammetry to generate site contours, will be undertaken and the results of the program will initially be compared with the annual quarry development plans presented in Section 9.
- Monitoring of the success or otherwise of the establishment of the vegetation screens, including vegetation screens on the upper berm, intermediate bench and final floor of the Extraction Area will be undertaken annually. It is noted that the final rehabilitation phase would not commence until approximately 75% vegetative coverage of the upper eastern and northern faces of the Extraction Area has been achieved.

# 14. Rehabilitation Performance and Completion Criteria

In order to ensure appropriate completion of progressive and final rehabilitation operations, performance and completion criteria are typically required. **Table 7** presents the landscape management and progressive rehabilitation performance and completion criteria for the Quarry. This table incorporates the measures that will be implemented progressively and criteria for management of issues that may be encountered such as dieback of revegetated plants and weed infestation.

It is noted that there are no extractive industries-specific guidelines available for establishing the relevant criteria. As a result, the methodology and criteria identified in the guideline *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* published by the NSW Division of Resources and Geoscience have been adopted and modified to suit the rehabilitation requirements for the Quarry.

In summary, the Interim MOP Guidelines require identification of a range of rehabilitation domains. In addition, the guidelines identify five rehabilitation phases as follows.

- Decommissioning – removal of all infrastructure.
- Landform establishment – shaping of the final landform.
- Growth medium development – spreading of overburden/soil.
- Ecosystem establishment – seeding/planting of vegetation<sup>1</sup>.
- Ecosystem development – vegetation establishment and maintenance

For each domain and rehabilitation phase, a range of rehabilitation indicators and completion criteria are required. **Figure 9** and Section 11.3 identify eight rehabilitation domains. **Table 8** presents end of quarry rehabilitation performance and completion criteria for each of the identified rehabilitation domains during each of the following rehabilitation phases.

- Phase 1 – Decommissioning.
- Phase 2 – Landform Establishment.
- Phase 3 – Growth Medium Development.
- Phase 4 – Ecosystem Establishment.
- Phase 5 – Ecosystem Development.

**Table 9** presents the Trigger Action Response Plan for each of the management measures and performance criteria outlined in **Table 7** and **Table 8**.

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<sup>1</sup> Recognising the most likely ongoing use of the land would be grazing.



**Table 7  
Landscape Management and Progressive Rehabilitation Performance and Completion Criteria**

<b>Management Measure</b>	<b>Performance Measure</b>	<b>Performance Indicator</b>	<b>Monitoring Method</b>	<b>Completion Criteria</b>	<b>TARP Ref. No.<sup>1</sup></b>
Compliance with extraction boundaries to prevent encroachment onto existing vegetation.	No area outside of the approved Extraction Area is subject to disturbance associated with extraction activities.	Area of land outside of approved Extraction Area boundaries subject to extraction activities.	Annual aerial photographic program.	Extraction remains within the approved Extraction Area boundaries.	1
			Quarterly visual inspections using on ground markers.		
Construction and use of site haul roads to contain disturbance to approved areas.	No disturbance outside of approved areas.	Area of land outside of approved disturbance footprint subject to disturbance.	Annual aerial photographic program.	Disturbance is limited to the confines of the approved disturbance footprint.	1
			Quarterly visual inspections using on ground markers.		
Pre-clearance surveys of vegetation.	All vegetation clearing campaigns are preceded by pre-clearance surveys.	Pre-clearance survey report.	Pre-clearance surveys completed by a suitably qualified or experienced person.	-	2, 3
Soil management through appropriate stockpiling of topsoil and subsoil material for future rehabilitation use.	Topsoil and subsoil resources are stockpiled separated within Domain 7 areas.	Separate topsoil and subsoil material stockpiles.	Quarterly visual inspections of topsoil and subsoil material stockpiles.	Topsoil and subsoil stockpiles conform to specified dimensions as shown in <b>Figure 5</b> .	4
	Stockpiles are constructed as low, flat mounds with side slopes of 1:3 (V:H) or less).	Stockpile dimensions.			
	Topsoil and subsoil stockpiles are less than 2m and 3m high respectively.				
Visual monitoring program of weed coverage.	By 2025 to reduce the area of identified noxious weed coverage by 85%.	Area of noxious weed coverage.	Quarterly visual inspections of weed coverage.	All identified noxious weeds removed completely.	5
	By 2025 to reduce the area of identified weed coverage by 50% or to a level similar to surrounding undisturbed areas.	Area of weed coverage.		Weed coverage in undisturbed and rehabilitated areas to represent <5% of foliage cover.	
Weed treatment and management program conducted by a suitably qualified or experienced person.	By 2025 to reduce the area of identified noxious weed coverage by 80%.	Area of noxious weed coverage.	Annual (or more frequently, in accordance with <b>Table 9</b> ) weed treatment and reporting program.	All identified noxious weeds removed completely.	5
	By 2025 to reduce the area of identified weed coverage by 25% or to a level similar to surrounding undisturbed areas.	Area of weed coverage.		Weed coverage in undisturbed and rehabilitated areas to represent <5% of foliage cover.	

**Table 7 (Cont'd)**  
**Landscape Management and Progressive Rehabilitation Performance and Completion Criteria**

<b>Management Measure</b>	<b>Performance Measure</b>	<b>Performance Indicator</b>	<b>Monitoring Method</b>	<b>Completion Criteria</b>	<b>TARP Ref. No.<sup>1</sup></b>
Pest animal inspection and control program conducted by a suitably qualified or experienced person.	No pest animal sightings are recorded, or the number of pest animal sightings is reduced from the previous year.	Number of pest animal sightings.	Pest animal sighting reports from quarry personnel.	The Quarry does not support a population of pest animals.	6
			Annual pest inspection and reporting program.		
Crash grazing implemented in stock exclusion areas to control fuel loads and assist with natural regeneration.	Fuel loads are reduced by approximately 50% following crash grazing campaigns when grass density is identified as	Visual estimate of grass fuel loads (GFL) (GFL = grass height (m) x grass coverage (%)).	Quarterly visual inspections of grass fuel loads.	Fuel loads within stock exclusion areas are maintained at acceptable levels (i.e. GFL <30).	14
Maintenance or replacement of vegetation screens and vegetated visual amenity bunds.	Within 5 years following planting, vegetated screens and visual amenity bunds provide 75% coverage.	Visual coverage (%) provided by vegetated screens and amenity bunds.	Quarterly visual monitoring of vegetated screens and visual amenity bunds.	Vegetation achieves 75% visual coverage.	7, 8
	Prior to extraction within the additional Extraction Area approved under MOD 2, vegetation achieves 75% coverage of the upper eastern and northern Extraction Area faces.				
The Western Boundary Visual Screen is managed to achieve convergence with benchmark values for PCT 275.	By 2030, vegetation species assemblages and densities within the Western Boundary Visual Screen resemble the indicative proportions presented in <b>Table 6</b> .	Vegetation species type and number.	Biennial assessment of vegetation integrity in accordance with the BAM for vegetation in the Western Boundary Visual Screen, undertaken by a suitably qualified person.	Vegetation assemblages and densities match those outlined in <b>Table 6</b> and the benchmark values for PCT 275.	13
		Vegetation density.			
Progressive rehabilitation of completed benches and disturbed areas no longer required for operations.	Areas are rehabilitated and revegetated in accordance with schedules specified in <b>Table 8</b> .	Area of land rehabilitated.	Quarterly visual inspections of rehabilitated areas.	Domain 6 and Western Boundary Visual Screen - Vegetation densities match the benchmark values for PCT 275.	9
				Domains 1 (part), 2, 4, 5, 7 & 8 – 70% groundcover (pasture species) coverage.	
				Domain 3 – 75% visual coverage and 75% of species consistent with <b>Table 6</b> .	

Note 1: See TARP Reference No. in **Table 9**.

**Table 8  
Rehabilitation Performance and Completion Criteria**

Domain	Performance Criteria <sup>1</sup>	Performance Measure	Monitoring Method	Completion Criteria	TARP Ref. No. <sup>2</sup>
<b>Phase 1 - Decommissioning</b>					
1	All mobile equipment and other infrastructure removed within 1 year.	Presence of Quarry-related equipment and infrastructure.	Single occurrence inspection and report including photographs.	All Quarry-related infrastructure removed.	9
	Safety bund and fence installed following the completion of rehabilitation Phase 4.	Presence of safety bund and fence.		All unauthorised / inadvertent access prevented.	
	Site access road blocked by a bund, large rocks or a lockable gate following completion of rehabilitation Phase 4.	Presence of bund, large rocks or lockable gate.			
2	All stockpiled product removed within 1 year.	Presence of product stockpiles.	Single occurrence contamination report prepared by a suitably qualified person.	All stockpiles not required for rehabilitation activities removed from site.	
	All services disconnected and all Quarry-related infrastructure and equipment removed within 2 years.	Presence of Quarry-related infrastructure.		All Quarry-related infrastructure removed.	
	Contamination assessment undertaken and contaminated material removed within 2 years.	Area of contaminated land.		Site is free from contamination.	
3, 5, 6, 8	No actions required.				-
4	Site access road removed following the completion of rehabilitation Phase 4 for all other domains.	Presence of site access road.	Single occurrence inspection and report including photographs.	Haul road removed.	9
7	All overburden, soil and salvaged habitat feature stockpiles removed and utilised for rehabilitation purposes.	Presence of overburden, soil and salvaged habitat feature stockpiles.		All stockpiles removed.	
<b>Phase 2 – Landform Establishment</b>					
1	Extraction area faces and batters are free of active failures.	Presence of active failures.	Single occurrence geotechnical report prepared by a suitably qualified person.	Extraction Area faces and batters are stable.	9
2, 7	Steep slopes reduced to 1:1.5 (V:H) or less within 2 years following rehabilitation Phase 1.	Gradient of final landform surface.	Single occurrence inspection and report, including photographs, prepared by a suitably qualified person.	Final landform topography is achieved.	9, 10
3	Overburden material is used to progressively construct visual amenity bunds to provide visual screening, as required.	Presence of visual amenity bunds.	Quarterly inspections.	Overburden material provides the base for the establishment of vegetated visual amenity bunds in accordance with dimensions in <b>Figure 5</b> .	9

**Table 8 (Cont'd)**  
**Rehabilitation Performance and Completion Criteria**

Domain	Performance Criteria <sup>1</sup>	Performance Measure	Monitoring Method	Completion Criteria	TARP Ref. No. <sup>2</sup>
<b>Phase 2 – Landform Establishment (Cont'd)</b>					
4	Footprint of the site access road is deep ripped parallel to the contour and graded within 1 year following the completion of rehabilitation Phase 4 for all other domains.	Gradient of the final landform surface.	Single occurrence inspection and report, including photographs, prepared by a suitably qualified person.	The site access road footprint blends with surrounding landforms and is consistent with final landform topography.	
5, 6, 8	No actions required.				-
<b>Phase 3 – Growth Medium Establishment</b>					
1	2.0m to 2.5m of overburden and soil placed on upper berm and intermediate bench within 1 year.	Depth (m) of overburden and topsoil material in upper berm and intermediate bench areas.	Single occurrence inspection and report including photographs.	Overburden and soil material provide growth medium capable of supporting vegetation establishment.	9, 10
2, 7	Overburden (minimum depth 150mm) and soil (minimum depth 150mm) material spread within 1 year following rehabilitation Phase 2.	Depth (m) and coverage (%) of overburden and soil in these areas.			
3	Topsoil material is spread (minimum depth of 150mm) on constructed amenity bund surfaces as soon as possible following construction.	Depth (m) of topsoil material on amenity bund surfaces.			
4	Where necessary, topsoil material is spread (minimum depth 150mm) as soon as possible following rehabilitation Phase 2.	Depth (m) of topsoil material within site access road footprint.			
5, 6, 8	No actions required.				-
<b>Phase 4 – Ecosystem Establishment</b>					
1	Vegetation planted on upper berm and intermediate bench areas as soon as possible following rehabilitation Phase 3.	Number of tubestock planted and density of seed sown in upper berm and intermediate bench areas.	Single occurrence inspection and report including photographs.	Vegetation achieves visual coverage of 75% on upper berm and 70% groundcover coverage on intermediate bench.	9
2, 4, 7	Pasture vegetation achieves a minimum 70% coverage of exposed growth medium surfaces within 2 years following rehabilitation Phase 3.	Coverage (%) of exposed growth medium areas.	Quarterly visual inspections including photographs. Single occurrence inspection and report, including photographs, prepared by a suitably qualified ecologist.	Pasture vegetation coverage is similar to coverage on surrounding undisturbed pasture areas.	7, 8



**Table 8 (Cont'd)**  
**Rehabilitation Performance and Completion Criteria**

Domain	Performance Criteria <sup>1</sup>	Performance Measure	Monitoring Method	Completion Criteria	TARP Ref. No. <sup>2</sup>
<b>Phase 4 – Ecosystem Establishment (Cont'd)</b>					
3	Tubestock planted at 4m centres or less and direct seeding of shrub species between plantings as soon as possible following amenity bund construction (weather permitting).	Density of tubestock planting and seed sowing on amenity bunds.	Single occurrence inspection and report including photographs.	Vegetation is progressively established on amenity bunds.	9
5, 8	No actions required.				-
6	Tubestock planted at 4m centres or less and direct seeding of shrub species between plantings to form the Western Boundary Visual Screen prior to extraction within the additional Extraction Area approved under MOD 2.	Density of tubestock planting and seed sowing in the Western Boundary Visual Screen area.	Single occurrence inspection and report including photographs.	The Western Boundary Visual Screen is established.	9
	Species utilised in the establishment of the Western Boundary Visual Screen reflect those listed in <b>Table 6</b> under Western Boundary Visual Screen.	Types and numbers of species planted or sown in the Western Boundary Visual Screen area.	Single occurrence inspection and report, including photographs, prepared by a suitably qualified ecologist.	Species used to establish the Western Boundary Visual Screen align with those present in PCT 275.	13
<b>Phase 5 – Ecosystem Development</b>					
1, 3	Within 10 years following rehabilitation Phase 4, natural recruitment accounts for mortality of vegetation on the upper berm and benches.	Count of individual plant mortality events and count of emergent seedlings (trees and shrubs only).	Quarterly visual inspections.	Vegetation communities are self-sustaining.	12
			Biennial assessments of vegetation integrity in accordance with the BAM.		
			Single occurrence relinquishment inspection and report, including photographs.		
	Within 10 years following rehabilitation Phase 4, vegetation assemblages are similar to those identified in <b>Table 6</b> .	Assessment of species presence/absence and proportional composition of vegetation communities.	Biennial assessments of vegetation integrity in accordance with the BAM.	Species reflect those which were identified on site prior to disturbance.	11
			Single occurrence relinquishment inspection and report, including photographs, prepared by a suitably qualified ecologist.		
2, 4, 7	Within 4 years following rehabilitation Phase 4, grass cover remains at or above 70%.	Grass coverage (%).	Single occurrence relinquishment inspection and report, including photographs.	Pasture vegetation communities are self-sustaining.	8

**Table 8 (Cont'd)**  
**Rehabilitation Performance and Completion Criteria**

Domain	Performance Criteria <sup>1</sup>	Performance Measure	Monitoring Method	Completion Criteria	TARP Ref. No. <sup>2</sup>
<b>Phase 5 – Ecosystem Development (Cont'd)</b>					
	Within 4 years following rehabilitation Phase 4, vegetation assemblages are similar to those of surrounding undisturbed pasture areas.	Assessment of species presence/absence and proportional composition of vegetation communities.	Single occurrence relinquishment inspection and report, including photographs, prepared by a suitably qualified ecologist.	Vegetation is suitable for grazing land uses.	11
5, 8	No actions required.				-
6	Within 10 years following establishment, vegetation densities within the Western Boundary Visual Screen reflect benchmark values for PCT 275.	Assessment of vegetation densities including tree cover, shrub cover and foliage cover.	Quarterly visual inspections.	The composition and structure of vegetation within the Western Boundary Visual Screen aligns with those present in PCT 275.	13
			Biennial assessments of vegetation integrity in accordance with the BAM.		
		Single occurrence relinquishment inspection and report, including photographs, prepared by a suitably qualified ecologist.			
	Within 10 years following establishment, species assemblages within the Western Boundary Visual Screen are similar to those of PCT 275.	Assessment of species presence/absence and proportional composition of vegetation communities.	Biennial assessments of vegetation integrity in accordance with the BAM.		13
			Single occurrence relinquishment inspection and report, including photographs, prepared by a suitably qualified ecologist.		
<p>Note 1: Performance criteria commence once areas are no longer required for operational purposes.</p> <p>Note 2: See TARP Reference No. in <b>Table 9</b>.</p>					

**Table 9  
Trigger Action Response Plan**

<b>Rehabilitation Risk</b>	<b>Trigger</b>	<b>Action</b>	<b>Response</b>	<b>TARP Reference No.</b>	
Extraction disturbance exceeds approved Extraction Area boundaries.	Quarterly visual inspections or inspections of annual aerial photographs indicate disturbance has occurred outside of approved boundaries.	Undertake an inspection of the disturbance area to confirm that disturbance has occurred outside of approved areas.	Disturbance is restricted to approved areas only.	1	
Disturbance occurs outside of approved areas.		If disturbance outside of approved areas is confirmed: <ul style="list-style-type: none"> <li>- immediately notify the relevant authorities of this incident;</li> <li>- review the adequacy of physical boundary markers; and</li> </ul> review the extent of approved disturbance areas with relevant Quarry personnel during training sessions.			
Vegetation clearing results in unacceptable impacts upon fauna.	Pre-clearance surveys are not undertaken prior to vegetation clearing.	Where clearing has not been completed, clearing is immediately halted and a pre-clearance survey is undertaken prior to recommencement.	Clearing of vegetation is only undertaken following the completion of pre-clearance surveys.	2	
		Where clearing has been completed: <ul style="list-style-type: none"> <li>- immediately notify the relevant authorities of this incident; and</li> <li>- clearing protocols are revised and communicated to relevant Quarry personnel during training sessions to ensure that the requirement for pre-clearance surveys is clear.</li> </ul>			
Vegetation is cleared without approval.	Quarterly visual inspections or inspections of annual aerial photographs indicate that vegetation clearing	Undertake an inspection of the disturbance area to confirm that clearing has occurred outside of approved areas.	Clearing of vegetation is only undertaken with the appropriate approval.	3	
		Where clearing of vegetation without appropriate approval is confirmed: <ul style="list-style-type: none"> <li>- immediately notify the relevant authorities of this incident; and</li> <li>- clearing protocols are revised and communicated to relevant Quarry personnel during training sessions to ensure that the requirement for approval prior to clearing is clear.</li> </ul>			
Stockpiled soil resources are not suitable for rehabilitation purposes.	Quarterly visual inspections of subsoil and topsoil material stockpiles identify mixing of topsoil and subsoil materials.	Revise subsoil and topsoil salvage protocols and communicate the requirement for subsoil and topsoil resources to be stockpiled separately to relevant Quarry personnel during training sessions.	Subsoil and topsoil stockpiles are stockpiled separately.	4	
	Quarterly visual inspections of subsoil and topsoil material stockpiles identify stockpiles which do not conform to the specified dimensions.	Reshape irregular stockpiles to conform with dimensions shown in <b>Figure 5</b> .			Subsoil and topsoil stockpiles are constructed and maintained in accordance with the dimensions shown in <b>Figure 5</b> .
		Review stockpile construction techniques and dimensions with relevant Quarry personnel during training sessions.			

**Table 9 (Cont'd)  
Trigger Action Response Plan**

Rehabilitation Risk	Trigger	Action	Response	TARP Reference No.
Weeds impact surrounding undisturbed areas or interfere with the establishment of pasture and nature conservation final land uses.	Annual weed treatment and reporting program identifies an increase in weed coverage.	Review the frequency and intensity of weed treatment programs and visual weed inspections at the Quarry and increase the frequency and/or intensity in necessary.	Weed coverage is similar to surrounding undisturbed areas and does not significantly impede rehabilitation efforts.	5
	Weed coverage has not been reduced by 50% or to levels similar to surrounding undisturbed areas by 2025.	Implement quarterly weed treatment programs, including targeted noxious weed treatment programs, until target weed coverage values are achieved.		
	Noxious weed coverage has not been reduced by 85% by 2025.			
Pest animals impact surrounding undisturbed areas or interfere with rehabilitation activities.	The annual pest inspection and reporting program identifies a new pest species which requires management.	Review the adequacy of current pest species control measures in consultation with a suitably qualified person and revise the measures implemented at the Quarry, if necessary.	Pest animal abundance is similar to that in surrounding undisturbed areas and does not significantly impede rehabilitation efforts.	6
	The annual pest inspection and reporting program identifies a significant increase (≥20% increase) in pest animals at the Quarry.	Review the frequency and intensity of pest animal treatment programs and, if necessary, increase the frequency and/or intensity of such programs.		
Vegetation screens and vegetated amenity bunds fail to provide adequate visual screening.	Quarterly visual monitoring of vegetation screens indicates that visual screening increases are not trending towards 75% coverage within 5 years following planting.	Implement one or more of the following measures, as required: <ul style="list-style-type: none"> <li>- undertake targeted supplementary tubestock planting to fill gaps in visual screens and/or amenity bunds;</li> <li>- increase watering frequencies in order to support vegetation establishment and growth; and/or</li> <li>- engage a suitably qualified ecologist to assess the condition of visual screens and amenity bunds and make recommendations aimed at achieving the required coverage.</li> </ul>	Visual screens and vegetated amenity bunds provide the appropriate level of visual screening at the Quarry.	7
	Vegetation coverage of 75% has not been achieved for the upper eastern and northern Extraction Area faces prior to extraction within the MOD 2 Extraction Area.	Cease extraction activities within the MOD 2 Extraction Area until coverage of 75% has been achieved in these areas. Where coverage is not trending towards the required level, implement the above measures as required.		



**Table 9 (Cont'd)  
Trigger Action Response Plan**

Rehabilitation Risk	Trigger	Action	Response	TARP Reference No.
Vegetation does not achieve the desired coverage level within the specified time period.	Quarterly visual inspections indicate that planted/sown areas are not on track to achieve nominated coverage levels by the specified deadline.	Implement one or more of the following measures, as required: <ul style="list-style-type: none"> <li>- undertake targeted supplementary tubestock planting and/or seed sowing to increase coverage;</li> <li>- increase watering frequencies in order to support vegetation establishment and growth; and/or</li> <li>- engage a suitably qualified ecologist to assess the condition of vegetation and make recommendations aimed at achieving the required coverage.</li> </ul>	Vegetation achieves the nominated coverage levels at the Quarry.	8
	Relinquishment inspections and reports indicate that vegetation coverage has not achieved the nominated coverage levels by the specified deadline.			
Rehabilitation of disturbed areas is not undertaken progressively.	Annual Reviews indicate that progressive rehabilitation has not been undertaken in accordance with the schedules outlined in <b>Table 8</b> .	Review current and emerging opportunities for progressive rehabilitation at the Quarry and implement a rehabilitation program aimed at maximising the area of the Quarry which is in progress or has been rehabilitated. If necessary, revise the schedules outlined in <b>Table 8</b> to reflect site experience and anticipated rehabilitation deadlines.	Progressive rehabilitation at the Quarry is undertaken where possible.  Rehabilitation of areas no longer required for operations is undertaken at the earliest opportunity.	9
Final landform gradients and topography does not align with the approved final landform.	Inspections of surfaces following landform establishment (rehabilitation Phase 2) and growth medium establishment (rehabilitation Phase 3) activities do not conform with criteria outlined in <b>Table 8</b> .	Reshape and/or respread material to achieve the specified gradients and topography in identified problem areas.	Rehabilitation achieves the approved final landform at the Quarry.	10
Vegetation communities in rehabilitated areas do not resemble communities in surrounding undisturbed areas.	Biennial assessments of vegetation integrity indicate that species assemblages in rehabilitated areas are not converging with assemblages identified in surrounding undisturbed areas.	Implement recommendations contained within the vegetation integrity assessment report.	Vegetation communities in rehabilitated areas resemble communities in undisturbed areas.	11

**Table 9 (Cont'd)  
Trigger Action Response Plan**

<b>Rehabilitation Risk</b>	<b>Trigger</b>	<b>Action</b>	<b>Response</b>	<b>TARP Reference No.</b>
Vegetation communities in rehabilitated areas are not self-sustaining.	Biennial assessments of vegetation integrity indicate that recruitment in rehabilitated areas is not sufficient to account for mortality.	Implement recommendations contained within the vegetation integrity assessment report.	Vegetation communities in rehabilitated areas are self-sustaining.	12
Vegetation within the Western Boundary Visual Screen fail to reflect nominated benchmark values.	Biennial assessments of vegetation integrity indicate that vegetation within the Western Boundary Visual Screen is not trending towards meeting the specified species assemblages ( <b>Table 6</b> ) or benchmark values for PCT 275 by 2030.	Implement recommendations contained within the vegetation integrity assessment report.	Vegetation assemblages and densities reflect those outlined in <b>Table 6</b> and the benchmark values for PCT 275.	13
	Vegetation species assemblages within the Western Boundary Visual Screen do not reflect those outlined in <b>Table 6</b> by 2030.			
	Vegetation densities within the Western Boundary Visual Screen do not reflect the benchmark values for PCT 275 by 2030.			
Grass within stock exclusion zones represents a barrier to regeneration and hazardous fuel loads.	Quarterly visual assessments of grass fuel loads (GFL) indicate GFL $\geq 30$ .	Commence crash grazing (maximum of two times per year) at a stocking density of 100 DSE/ha. Crash grazing must cease after a maximum of 5 days or once visual assessment indicates a GFL of $\leq 10$ .	Grass fuel loads are effectively managed to reduce fire hazards and encourage natural regeneration.	14

# 15. Evaluation of Compliance

The Company will collate an *Annual Review*. That report will include the following.

- A copy of the annual weed and pest inspection reports, as well as actions undertaken to implement the recommendations of that report.
- Copies of the representative photographs, including aerial photographs, taken during the previous 12 months, including an analysis of the status of rehabilitation when compared with photographs from previous years. Where rehabilitation has not been successful or corrective action is required, this would be identified also.
- An analysis, where appropriate, of progress towards compliance with the performance and completion criteria identified in Section 14.
- An assessment of the progress against corrective and preventative actions identified in previous reports and timeframes for implementation of remaining actions.

The *Environmental Management and Monitoring Report* will be reviewed by the Quarry Manager and the Operations Manager. Once approved, a copy of the report will be placed on the Quarry website and included in the *Annual Review*.

# 16. Complaints Handling and Response

The *Environmental Management Strategy* as required by Condition 1 of Schedule 5 of PA 06\_0193 includes a detailed complaints management procedure. This sub-section records the procedures that would be implemented following receipt of a rehabilitation, visual amenity or biodiversity-related complaint.

Rehabilitation, visual amenity or biodiversity-related complaints may be received via one of the following methods.

- Directly via the 24-hour, 7 days per week Company's general Emergency Line (1800 882 478). This number will be advertised widely in the local media, on signage at the Site entrance and on the Company web site [www.hanson.com.au](http://www.hanson.com.au).
- Directly via a dedicated email address which will be advertised in a similar manner to the Community Information Line.
- Indirectly via the relevant government agencies.

In addition, consultation will be held with the community as part of the Company's standard consultation procedures, namely informal meeting with surrounding landholders as required and meetings of the Community Consultative Committee. These meetings will provide a further forum at which complaints may be received.

All complaints will be registered in a database and responded to within one business day from the receipt of the complaint. The following information will be recorded in the database (where it can be reasonably obtained).

- The date and time the complaint was made.
- The complainant's name.
- The complainant's contact details (e.g. telephone number, email address).
- Details regarding the nature of the complaint.

Following receipt of any rehabilitation, visual amenity or biodiversity-related complaint, the Company will implement the following procedure.

1. The complaint will be reviewed by the Quarry Manager or their delegate to determine the nature of the complaint. This will include contacting or meeting with the complainant.
2. The Quarry Manager will contact the complainant to further discuss the complaint.
3. Where the complaint relates to a matter of visual amenity, the Quarry Manager will:
  - meet with the complainant at the location where the complainant alleges the visual amenity is being unreasonably impacted;
  - take a series of photographs documenting the view of the Quarry, ideally using an SLR camera with a focal length of 50mm; and
  - discuss and agree with the complainant a range of corrective actions, if required, and a timeframe for implementation and assessment of the success or otherwise of those actions.

All complaints would be recorded using a proforma complaints record sheet and the nature and outcome of the complaint and subsequent investigation provided in summary form to the Community Consultative Committee, in the Annual Review, and on the Company's website which will be updated quarterly. A copy of the complaint report will be supplied to the complainant if requested.

The Quarry supervisor will be responsible for the recording of the complaint, response action requirements and updating of the database and website.



# 17. Incident Reporting

As matters related to rehabilitation and landscape management are typically not covered by the reporting requirements identified in the Quarry's Environment Protection Licence, there will be no requirement to report such incidents under that licence. However, all rehabilitation, landscape management and visual amenity-related issues will be conveyed to the Community Consultative Committee, publicly noted on the Quarry website, and discussed in the *Annual Review*.

# 18. Publication of Monitoring Information

The Company will place a copy of each *Environmental Management and Monitoring Report*, as well as incident investigation reports, on the Quarry website.

In addition, the Company will include all *Environmental Management and Monitoring Reports* as appendices to the *Annual Review*. That document, once approved by the relevant government agencies, will also be published on the Company website.

Finally, the Company will also provide the Community Consultative Committee with a copy of all monitoring reports. The Quarry Manager will be responsible for publication of monitoring information.

# 19. Review

In accordance with Condition 4 of Schedule 5 of PA 06\_0193, this *Landscape Management Plan* will be reviewed and, if required, revised within 3 months of:

- the submission of an annual review under Condition 3 of Schedule 5 of PA 06\_0193;
- the submission of an incident report under Condition 6 of Schedule 5 of PA 06\_0193;
- the submission of an independent environmental audit report under Condition 8 of Schedule 5 of PA 06\_0193; and
- the approval of any modification to the conditions of PA 06\_0193.

The Quarry Manager will be responsible for the review of this Plan.

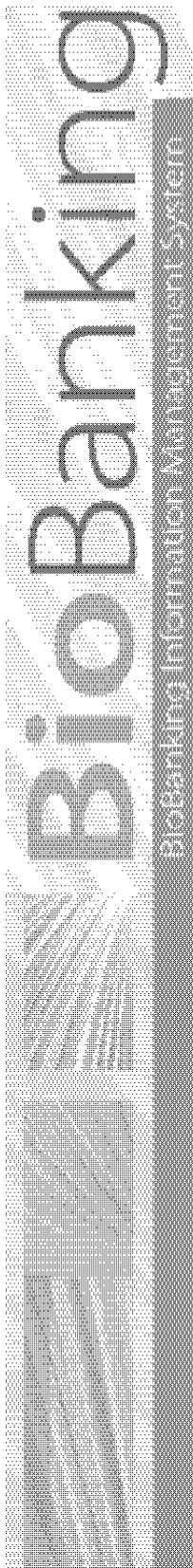
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## Appendix 1 Credit Retirement Report – 29 January 2020



**Credit retirement report**

**Effective date:** 29-January-2020

**Transaction number:** 202001-RT-502

**Credit owners' details**

**Credit owner ID:** 681

**Name of credit holder:** Hanson Construction Materials Pty Ltd

**Other owner(s):**

No other owners

**Reason for retirement:** to comply with a State significant devt or State significant infrastructure project approval

Ecosystem credit(s) retired								
Number of credits	Credit profile ID	Agreement ID	Vegetation code	Vegetation type	CMA subregion	% surrounding vegetation	Patch size	Vegetation formation(see key)
17	1,822	146	CW209	CW209/Blakely's Red Gum - White Box - Yellow Box - Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South Western Slopes Bioregion	Hill End	>70%	>100 ha	GRW

**Key to vegetation formations**

Code	Vegetation formation
ALP	Alpine complex
ASA	Arid shrublands (Acacia)
ASC	Arid shrublands (Chenopod)
DSG	Dry sclerophyll forests (shrub/grass)
DSS	Dry sclerophyll forests (shrubby)
FRW	Forested wetlands
FWW	Freshwater wetlands
GLD	Grasslands
GRW	Grassy woodlands
HLD	Heathlands
MES	Miscellaneous ecosystems
RFT	Rainforests
SAW	Saline wetlands
SWG	Semi-arid woodlands (grassy)
SWS	Semi-arid woodlands (shrubby)
WSG	Wet sclerophyll forests (grassy)
WSS	Wet sclerophyll forests (shrubby)

The credit register provides further information about credit holdings and reports about credit trading activity. To view this information, please visit the public register website at [www.environment.nsw.gov.au/bimspri/index.htm](http://www.environment.nsw.gov.au/bimspri/index.htm)

For more information, please contact the BioBanking Scheme Manager - phone (02) 9995 6753; email [biobanking@environment.nsw.gov.au](mailto:biobanking@environment.nsw.gov.au)