



Aus 10 Rhyolite Pty Limited

ABN: 90 002 325 144

Landscape Management Plan

for the

Tinda Creek Quarry

Prepared by:



R.W. CORKERY & CO. PTY. LIMITED

In conjunction with:



April 2022



Aus 10 Rhyolite Pty Limited

ABN: 90 002 325 144

Landscape Management Plan

for the

Tinda Creek Quarry

Prepared for:

Aus 10 Rhyolite Pty Limited
ABN: 90 002 325 144
Unit 4 Gateway Business Park
63-79 Parramatta Road
SILVERWATER NSW 2128

Telephone: (02) 9647 2866
Fax: (02) 9647 2924
Email: darryl.thiedeke@hy-tec.com.au

Prepared by:

R.W. Corkery & Co. Pty. Limited
Geological & Environmental Consultants
ABN: 31 002 033 712

Telephone: (02) 9985 8511
Email: admin@rwcorkery.com

Brooklyn Office:

1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Orange Office:

62 Hill Street
ORANGE NSW 2800

Brisbane Office:

Level 54, 111 Eagle Street
BRISBANE QLD 4000

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R.W. CORKERY & CO. PTY. LIMITED

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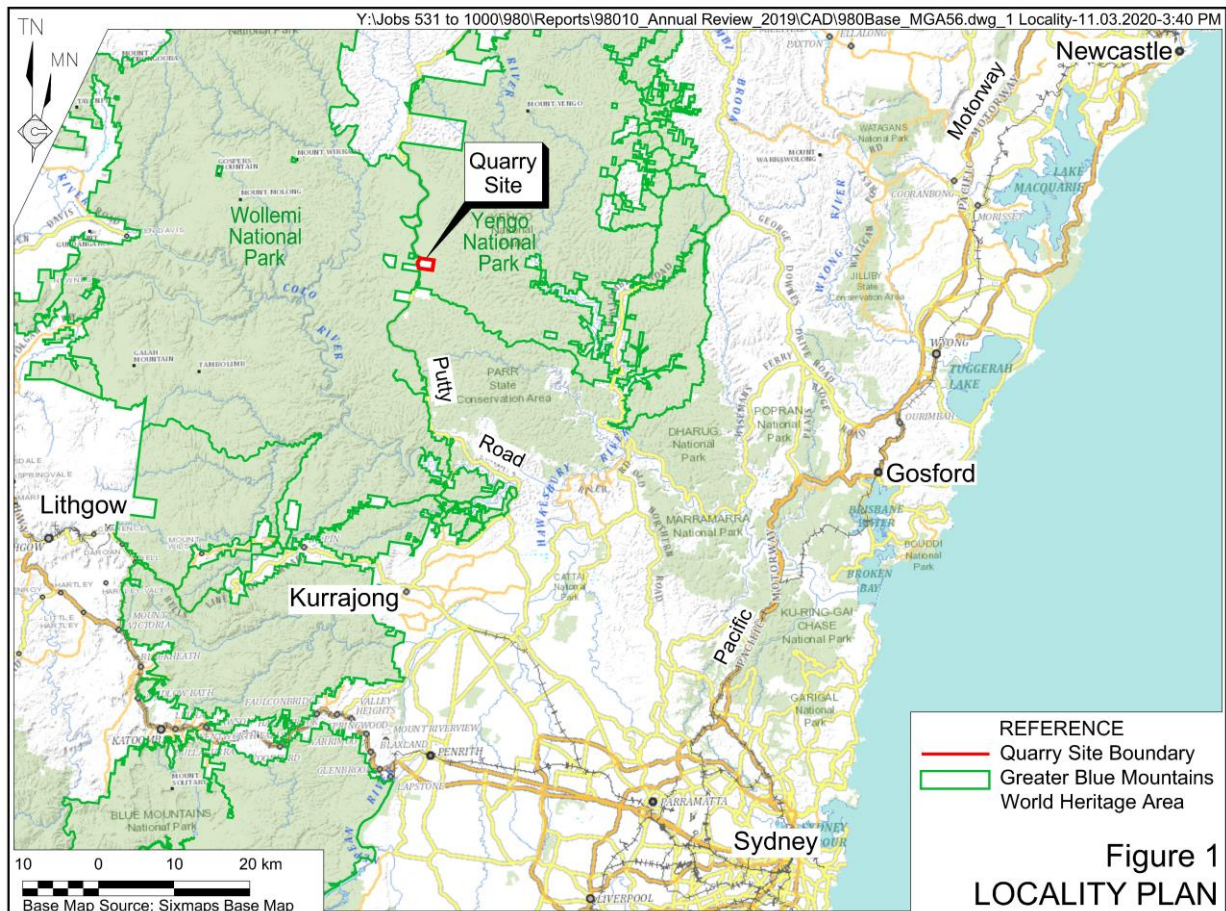
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1. INTRODUCTION

The approved Tinda Creek Quarry Landscape Management Plan (“the LMP”) has been updated in accordance with *Condition 19* of Schedule 3 of Development Consent SSD 4978 (SSD 4978) and as a tool to assist in landscape management, rehabilitation and integration of operational controls and monitoring programs for the operation of the Tinda Creek Quarry (“the Quarry”). It will be used by Hy-Tec Industries Pty Limited (Hy-Tec) personnel as the first point of reference for landscape, rehabilitation and biodiversity management related issues. The management measures identified in the LMP follow on from the commitments presented in the EIS (Umwelt, 2014a) and data obtained during subsequent monitoring programs. The Quarry has been operating in accordance with an LMP approved on 19 May 2017. This LMP is an update to that document.

The Quarry is located on Lot 1, Lot 2 and Lot 3 DP628806 on Putty Road, approximately 23km north of Colo Heights. The Quarry is surrounded on three sides by Yengo National Park. Wollemi National Park is to the west, separated from the Quarry by the Putty Road and private land holdings. Both National Parks are a part of the Greater Blue Mountains World Heritage Area. **Figure 1** presents the locality of the Quarry in relation to coastal areas, the Greater Sydney Region and surrounding National Park reserves.



2. APPROVED QUARRY LAYOUT AND OPERATIONS

Figure 2 presents the approved Quarry Site layout incorporating six extraction domains, a Quarry Access Road and a Biodiversity Offset Area. The Quarry layout also includes approved locations for clean water diversions that will be progressively constructed.

SSD 4978 approves the following activities within the Quarry Site.

- Extraction and processing of no more than 300 000t of sand in any calendar year.
- Extraction to a maximum depth of 15m below ground level.
- Progressive development of six extraction domains.
- Extraction using a dredge and where necessary bulldozing and/or excavation of sand into the dredge pond where dredging alone is not feasible.
- Production of a washed sand product by processing extracted sand to separate the clays and silts.
- Development of a closed water management system with a catchment no greater than 40ha, unless agreed with the Secretary of the Department of Planning and Environment (DPE).
- Progressive development of clean water diversions within the Quarry Site to separate clean water runoff from undisturbed areas from entering active areas of the Quarry.
- Progressive rehabilitation of completed areas of the Quarry Site.

An area of 106.6ha is proposed to be secured for conservation purposes (the Approved Biodiversity Offset Area) in satisfaction of Condition 15 and Condition 16 of SSD 4978 which states the following.

15. The Applicant shall implement the biodiversity offset strategy described in the EIS, as summarised and revised in Table 6, and shown conceptually in Appendix 5, to the satisfaction of the Secretary.

Table 6: Biodiversity Offset Strategy (ha)

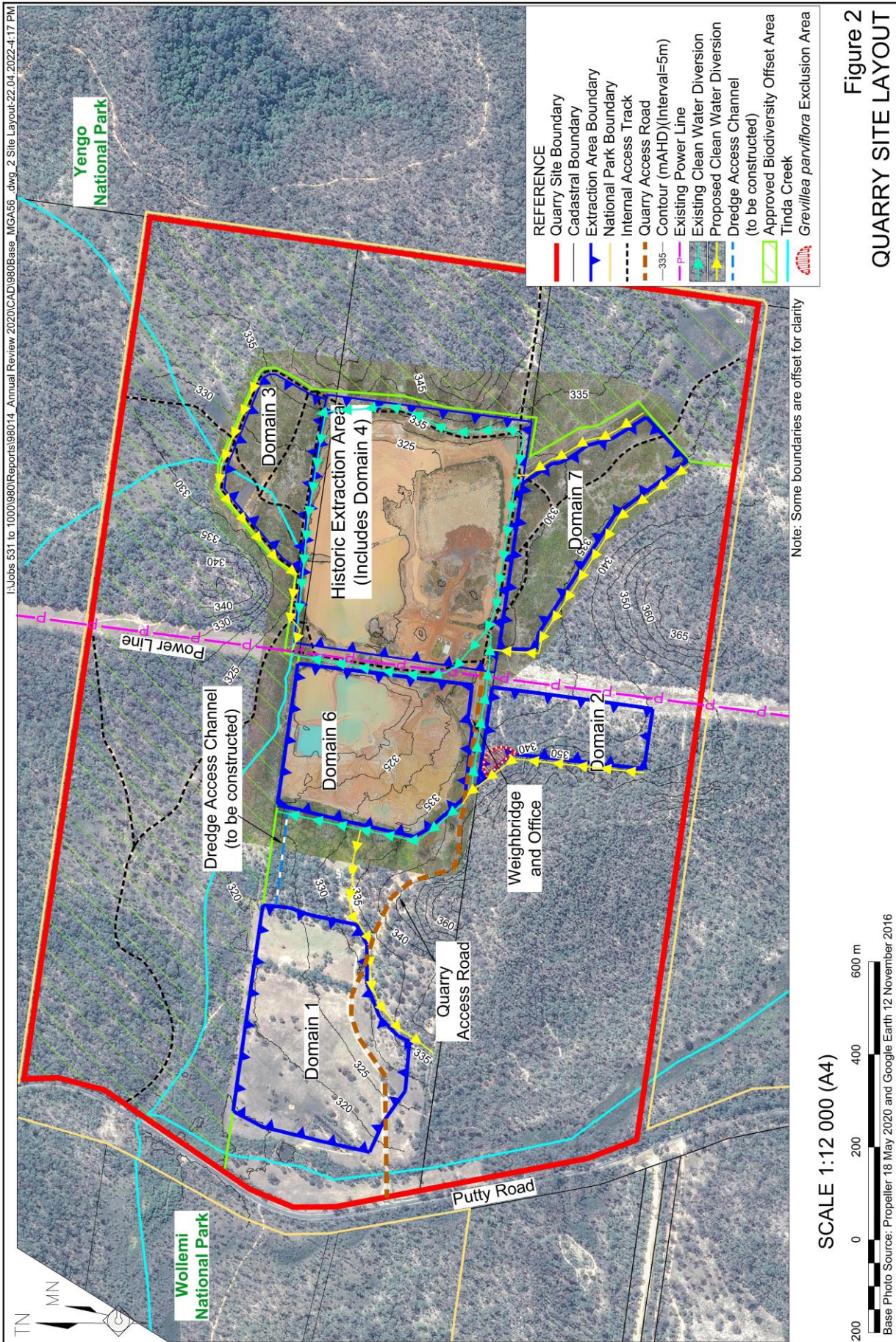
Area	Offset Type	Minimum Size (ha)
On-Site Offset Area	Existing vegetation to be enhanced	106.6

16. “Within 2 years of this consent, unless otherwise agreed with the Secretary, the Applicant shall make suitable arrangements to provide appropriate long-term security for the offset area, to the satisfaction of the Secretary.

Note: Mechanisms to provide appropriate long-term security to the land within the biodiversity offset strategy include a Biobanking Agreement, Voluntary Conservation Agreement or an alternative mechanism that provides for a similar conservation outcome. Any mechanism must remain in force in perpetuity.”

The Approved Biodiversity Offset Area has been subject to environmental management since approval of the Project, with access to the land limited to weed management and feral animal control, ecological monitoring and works to remove waste material left by a previous owner. A mechanism to secure the land to the satisfaction of the Secretary is yet to be determined, however in light of Hy-Tec's ongoing consultation on the matter, DPE has extended the deadline to secure the offset area to 29 April 2022.





3. ACCOUNTABILITIES

Table 1 outlines the roles and responsibilities of personnel with reference to management of rehabilitation and landscape management.

Table 1
Roles and Responsibilities of Personnel

Role	Responsibilities
National Planning and Development Manager	<ul style="list-style-type: none"> • Ensure parties undertaking monitoring and recommending / implementing conservation management measures are suitably qualified and experienced. • Periodically review progress against performance targets.
NSW Operations Manager	<ul style="list-style-type: none"> • Ensure that sufficient resources are allocated for the implementation of this LMP.
Quarry Manager	<ul style="list-style-type: none"> • Ensure that the requirements of this LMP are effectively implemented. • Ensure staff and contractors accessing the Quarry Site are informed and trained. where relevant, in relation to controls on activities within the Quarry Site. • Schedule rehabilitation activities as per this plan. • Authorise internal and external reporting requirements as well as subsequent revisions of this program. • Coordinate the day-to-day implementation of the LMP, including the implementation of all management activities. • Analyse and collate documentation for inclusion in the Annual Review. • Assess the effectiveness of the management strategies and instigate the adaptive management process, as required. • Ensure all internal and external reporting requirements are met. • Ensure that all relevant records are effectively maintained on site. • Ensure that personnel involved in the carrying out and monitoring of the LMP activities are appropriately qualified, licensed and experienced to undertake the task.
All employees and contractors	<ul style="list-style-type: none"> • Undertake all activities in accordance with this LMP. • Undertake training regarding controls on activities within the Quarry Site. • Observe all boundaries when undertaking work within the Quarry Site. • Undertake activities within the Quarry Site in line with directions from the Quarry Manager.

4. COMPETENCE AND AWARENESS TRAINING

All personnel and contractors working at the Quarry will undergo a preliminary and then annual induction. This induction includes information on environmental management including the legal requirements, actions and responsibilities of personnel in achieving the objectives of this LMP.

After completing the induction, workers will be required to sign the induction form and a record of induction would be retained.

Monthly toolbox meetings will be held to discuss whole-of-site production, management, safety and environmental issues. Matters relating to landscaping and rehabilitation are raised during these meetings, when necessary.

5. CONSULTATION

A draft copy of the LMP was provided to the Biodiversity Conservation Division (BCD) on 10 August 2021 and comments were received on 29 October 2021. An updated copy of the LMP was provided to the DPE on 20 December 2021 and comments were received on 18 March 2022.

All feedback received as part of the consultation process has been incorporated, where required, into the final LMP. A copy of all comments received during consultation and Hy-Tec's responses to the matters raised are provided as **Appendix 1**.

6. LEGISLATIVE REQUIREMENTS

6.1 DEVELOPMENT CONSENT SSD 4978

Specific requirements for the LMP are provided under *Condition 19* of Schedule 3 of SSD 4978. More general requirements for the preparation of management plans are also provided by *Condition 3* of Schedule 5. **Table 2** identifies the requirements for the LMP under SSD 4987 and identifies where in the LMP individual requirements have been addressed.

Table 2
Landscape Management Plan Requirements – SSD 4978

Page 1 of 3

Condition No.	Condition of Approval	Section Addressed																		
15	<p>The Applicant shall implement the biodiversity offset strategy described in the EIS, as summarised and revised in Table 6, and shown conceptually in Appendix 5, to the satisfaction of the Secretary.</p> <p><i>Table 6: Biodiversity Offset Strategy (ha)</i></p> <table border="1"> <thead> <tr> <th>Area</th> <th>Offset Type</th> <th>Minimum Size (ha)</th> </tr> </thead> <tbody> <tr> <td>On-site Offset Area</td> <td>Existing vegetation to be enhanced</td> <td>106.6</td> </tr> </tbody> </table>	Area	Offset Type	Minimum Size (ha)	On-site Offset Area	Existing vegetation to be enhanced	106.6	2, 12												
Area	Offset Type	Minimum Size (ha)																		
On-site Offset Area	Existing vegetation to be enhanced	106.6																		
16	<p>Within 2 years of this consent, unless otherwise agreed with the Secretary, the Applicant shall make suitable arrangements to provide appropriate long-term security for the offset area, to the satisfaction of the Secretary.</p> <p><i>Note: Mechanisms to provide appropriate long-term security to the land within the biodiversity offset strategy include a Biobanking Agreement, Voluntary Conservation Agreement or an alternative mechanism that provides for a similar conservation outcome. Any mechanism must remain in force in perpetuity.</i></p>	2, 12																		
17	<p>The Applicant shall rehabilitate the site to the satisfaction of the Secretary. The final landform must:</p> <p>(b) comply with the objectives following objectives.</p> <table border="1"> <thead> <tr> <th>Feature</th> <th>Objective</th> <th></th> </tr> </thead> <tbody> <tr> <td>Site (as a whole)</td> <td> <ul style="list-style-type: none"> Safe, stable and non-polluting Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native species and habitat, including at least 0.35ha of Mellong Sandmass Sedgeland </td> <td>7, 11.1, 14.1, 15.2</td> </tr> <tr> <td>Surface Infrastructure</td> <td>To be decommissioned and removed (unless the Secretary agrees otherwise)</td> <td>7, 11.1, 14.1, 14.3, 15.2</td> </tr> <tr> <td>Final Voids</td> <td> <ul style="list-style-type: none"> Minimise the size, depth, batter slope and the drainage catchment of the final void Ensure that the volume of VENM and ENM detailed in the EIS is imported for rehabilitation of the site Ensure that the surface area of the final voids is no greater than 16ha in total </td> <td>7, 11.1, 11.4, 14.1, 14.3</td> </tr> <tr> <td>Watercourses</td> <td>Restore alignment and hydraulic function, as far as practicable</td> <td>7, 11.1, 14.3, 15.2</td> </tr> <tr> <td>Community</td> <td>Ensure public safety</td> <td>11.1, 14.1, 15.2</td> </tr> </tbody> </table>	Feature	Objective		Site (as a whole)	<ul style="list-style-type: none"> Safe, stable and non-polluting Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native species and habitat, including at least 0.35ha of Mellong Sandmass Sedgeland	7, 11.1, 14.1, 15.2	Surface Infrastructure	To be decommissioned and removed (unless the Secretary agrees otherwise)	7, 11.1, 14.1, 14.3, 15.2	Final Voids	<ul style="list-style-type: none"> Minimise the size, depth, batter slope and the drainage catchment of the final void Ensure that the volume of VENM and ENM detailed in the EIS is imported for rehabilitation of the site Ensure that the surface area of the final voids is no greater than 16ha in total	7, 11.1, 11.4, 14.1, 14.3	Watercourses	Restore alignment and hydraulic function, as far as practicable	7, 11.1, 14.3, 15.2	Community	Ensure public safety	11.1, 14.1, 15.2	
Feature	Objective																			
Site (as a whole)	<ul style="list-style-type: none"> Safe, stable and non-polluting Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native species and habitat, including at least 0.35ha of Mellong Sandmass Sedgeland	7, 11.1, 14.1, 15.2																		
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Watercourses	Restore alignment and hydraulic function, as far as practicable	7, 11.1, 14.3, 15.2																		
Community	Ensure public safety	11.1, 14.1, 15.2																		
18	<p>The Applicant shall rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. Interim stabilisation measures must be implemented where reasonable and feasible to control erosion (both wind and water) in disturbed areas that are not active and which are not ready for final rehabilitation.</p>	9.3.8, 11.1																		

Table 2 (Cont'd)
Landscape Management Plan Requirements – SSD 4978

Page 2 of 3

Condition No.	Condition of Approval	Section Addressed
19	The applicant shall prepare and implement a Landscape Management Plan for the development to the satisfaction of the Secretary. This plan must:	This document
	(a) be prepared in consultation with OEH, and be submitted to the Secretary for approval within 6 months of the date of this consent, unless the Secretary agrees otherwise;	5 Appendix 1
	(b) provide details of the conceptual final landform and associated land uses for the site;	11.2
	(c) describe how the implementation of the biodiversity offset strategy would be integrated with the overall rehabilitation of the site;	12
	(d) include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy and rehabilitation of the site, including triggers for any necessary remedial action;	12.3 11.4
	(e) describe the short, medium and long term measures that would be implemented to: <ul style="list-style-type: none"> – manage remnant vegetation and habitat on site and in the offset area; and – ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent; 	9.2, 9.3, 11.3
	(f) include a detailed description of the measures that would be implemented over the next 3 years (to be updated for each 3 year period following initial preparation of the plan) including the procedures to be implemented for: <ul style="list-style-type: none"> – maximising the salvage of environmental resources within the approved disturbance area, including tree hollows, vegetative and soil resources, for beneficial reuse in the enhancement of the offset area or site rehabilitation; 	9.3.5, 9.2.6, 9.3.6
	– restoring and enhancing the quality of native vegetation and fauna habitat in the biodiversity and rehabilitation areas through assisted natural regeneration, targeted vegetation establishment and the introduction of fauna habitat features;	9.2, 9.3, 10.2, 11.3
	– protecting vegetation and fauna habitat outside the approved disturbance area on-site;	9.2.1, 9.2.2, 10.2.4
	– minimising the impacts on native fauna, including undertaking pre-clearance surveys;	9.2.3
	– ensure only appropriate activities occur within a 40m buffer of the recorded small-flower grevillea (<i>Grevillea parviflora</i> subsp. <i>parviflora</i>), (refer Figure 2 in Appendix 5);	9.2.3
	– establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers;	NA*
	– ensuring minimal environmental consequences for threatened species, populations and habitats;	9.3, 9.3, 10.2, 13
	– collecting and propagating seed;	9.2.6
	– controlling weeds and feral pests;	8.3.3
	– controlling erosion;	8.3.4
	– controlling access; and	8.3.1
	– managing bushfire risk;	8.3.7
	(g) include a Koala Management Plan prepared generally in accordance with SEPP 44, the accompanying guidelines provided in Circular B35 – State Environmental Planning Policy 44 – Koala Habitat Protection, the NPWS Policy and Procedure Statement No. 9 – Policy for the Translocation of Threatened Fauna in NSW and the draft koala plan of management in the EIS;	9
	(h) include a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;	12

Table 2 (Cont'd)
Landscape Management Plan Requirements – SSD 4978

Page 3 of 3

Condition No.	Condition of Approval	Section Addressed
19 (Cont'd)	(i) identify the potential risks to the successful implementation of the biodiversity offset, and include a description of the contingency measures that would be implemented to mitigate these risks; and	11
	(j) include details of who would be responsible for monitoring, reviewing, and implementing the plan.	3
*the Site is screened by naturally occurring vegetation in the road corridor. As such, vegetation screening is regarded as not applicable.		

6.2 COMMONWEALTH APPROVAL EPBC 2013/7028

On 4 October 2016, the Assistant Secretary Assessments (NSW, ACT) and Fuel Branch for the Department of the Environment and Energy approved the Expansion of Existing Sand Quarry, Tinda Creek, NSW under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Quarry was approved with 22 Conditions having effect until 31 December 2045. **Table 3** presents a summary of these conditions and where in the LMP individual requirements have been addressed.

Table 3
EPBC Act Approval Conditions

Page 1 of 3

Condition No.	Condition of Approval	Section Addressed
1	The approval holder must undertake the action within a maximum area of 46.8 hectares and only within the footprint of the action.	8.2.1
2	To minimise impacts to the koala, the approval holder must clear no more than 25.4 hectares of potential koala habitat on the project site.	8.2.1
3	To minimise impacts to the Small-flower Grevillea, the approval holder must remove no more than 3 individuals of Small-flower Grevillea, located within Domain 3 extraction area and identified at Annexure 2.	8.2.1
4	To reduce indirect impacts on Small-flower Grevillea, the approval holder must maintain a buffer distance of at least 40 metres between the footprint and known locations of the species as identified at Annexure 2, except for the 3 individuals of Small-flower Grevillea, located within the Domain 3 extraction area.	8.2.2
5	To prevent impacts to Small-flower Grevillea, the 40 metre buffer zones for Small-flower Grevillea must be clearly marked out by a suitably qualified person prior to any clearing occurring. Buffer zones must be maintained for the life of the approval.	8.2.2
6	To-reduce indirect impacts on World and National Heritage values of the Greater Blue Mountains Area, the approval holder must maintain buffer zones between the impact area and the Greater Blue Mountains Area as identified at Annexure 1, and in accordance with the minimum buffer distances identified at Annexure 1, for the life of the approval.	8.2.2
7	To minimise impacts to the Small-flower Grevillea and the World and National Heritage values of the Greater Blue Mountains Area, the approval holder must not undertake activities other than conservation management activities within the buffer zones.	9.2.2
8	To minimise indirect impacts on World and National Heritage values of the Greater Blue Mountains Area, Small-flower Grevillea and the Koala, the approval holder must implement the Tinda Creek Quarry Final Landscape Management Plan dated August 2016 or as revised under condition 19.	Noted
9	In order to maintain the quantity and quality of water entering the Greater Blue Mountains Area, the approval holder must implement the Tinda Creek Quarry Final Water Management Plan dated August 2016 or as revised under condition 19.	See Water Management Plan

Table 3 (Cont'd)
EPBC Act Approval Conditions

Page 2 of 3

Condition No.	Condition of Approval	Section Addressed
10	To minimise impacts to water quantity and quality within the Greater Blue Mountains Area, the approval holder must comply with Operating Conditions provided by NSW approval condition 12.	Noted
11	In addition to complying with the rehabilitation objectives for the final void in NSW approval condition 17, the approval holder must ensure that water discharging from the project site into the Greater Blue Mountains Area is of equal or better quality to the quality of water upstream of the project site.	See Water Management Plan
12	In order to compensate for impacts on the Koala and Small-flower Grevillea, the approval holder must: <ul style="list-style-type: none"> a) Prior to commencement of the action within the Revised Domains 3 and 7 and Domains 1 and 2, provide written confirmation from the NSW Office of Environment and Heritage or the NSW National Parks and Wildlife Service (OEH/NPWS) to the Department that confirms their agreement to include the offset area, as identified at Annexure 3, within Yengo National Park. If this cannot be provided, then, prior to commencement of the action within the Revised Domains 3 and 7 and Domains 1 and 2, the approval holder must provide an alternative protection mechanism that provides an equal level of protection, including written confirmation from NSW OEH/NPWS that this protection mechanism will be accepted. The approval holder must not commence the action until the Minister has approved the use of the proposed mechanism in writing; b) Provide protection of the offset area, through registration on the title of the offset area of a mechanism in accordance with condition 12a before commencement of the action within the Revised Domains 3 and 7 and Domains 1 and 2. 	Noted 12.2
13	The approval holder must provide the Department with details of the offset area as identified at Annexure 3, including offset attributes, shapefiles, textual descriptions and maps to clearly define the location and boundaries of the offset area, prior to the commencement of the action within the Revised Domains 3 and 7 and Domains 1 and 2.	Noted
14	Within 14 days after the commencement of the action, the approval holder must advise the Department in writing of the actual date of commencement of the action.	Noted
15	The approval holder must maintain accurate records substantiating all activities and outcomes associated with or relevant to the conditions of approval, including measures taken to implement the management plans required by this approval, and make them available upon request to the Department. Such records may be subject to audit by the Department or an independent auditor in accordance with section 458 of the EPBC Act or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The results of audits may also be published through the general media.	15
16	Within three months of every 12 month anniversary of the commencement of the action, the approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published. The approval holder must continue to publish this report until such time as agreed to in writing by the Minister.	15.2
17	The approval holder must notify any non-compliance with this approval to the Department in writing within five business days of becoming aware of the non-compliance.	15.2
18	Upon the direction of the Minister, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Minister. The independent auditor must be approved by the Minister prior to the commencement of the audit. Audit criteria must be agreed to by the Minister and the audit report must address the criteria to the satisfaction of the Minister.	15.2

Table 3 (Cont'd)
EPBC Act Approval Conditions

Page 3 of 3

Condition No.	Condition of Approval	Section Addressed
19	<p>The approval holder may choose to revise a management plan approved by the Minister under conditions 8 and 9 without submitting it for approval under section 143A of the EPBC Act, if the taking of the action in accordance with the revised management plan would not be likely to have a new or increased impact. If the approval holder makes this choice they must:</p> <ul style="list-style-type: none"> i. notify the Department in writing that the approved management plan has been revised and provide the Department with an electronic copy of the revised management plan; ii. implement the revised management plan from the date that the management plan is submitted to the Department; and iii. for the life of this approval, maintain a record of the reasons the approval holder considers that taking the action in accordance with the revised management plan would not be likely to have a new or increased impact. 	Noted
19A	<p>The approval holder may revoke their choice under condition 19 at any time by notice to the Department. If the approval holder revokes the choice to implement a revised management plan without approval under section 143A of the Act, the management plan approved by the Minister must be Implemented.</p>	Noted
19B	<p>Condition 19 does not apply if the revisions to the approved management plan include changes to environmental offsets provided under the management plan in relation to a matter protected by a controlling provision for the action, unless otherwise agreed in writing by the Minister. This does not otherwise limit the circumstances in which the taking of the action in accordance with a revised management plan would, or would not, be likely to have new or increased impacts.</p>	Noted
19C	<p>If the Minister gives a notice to the approval holder that the Minister is satisfied that the taking of the action in accordance with the revised management plan would be likely to have a new or increased impact, then:</p> <ul style="list-style-type: none"> i. Condition 19 does not apply, or ceases to apply, in relation to the revised management plan; and ii. The person taking the action must implement the management plan approved by the Minister. <p>To avoid any doubt, this condition does not affect any operation of conditions 19, 19A and 19B in the period before the day the notice is given.</p> <p>At the time of giving the notice the Minister may also notify that for a specified period of time that condition 19 does not apply for one or more specified management plans required under the approval.</p>	Noted
19D	<p>Conditions 19, 19A, 19B and 19C are not intended to limit the operation of section 143A of the EPBC Act which allows the approval holder to submit a revised management plan to the Minister for approval.</p>	Noted
20	<p>If the Minister believes that it is necessary or convenient for the better protection of the World Heritage property, National Heritage place or listed threatened species and communities to do so, the Minister may request that the approval holder make specified revisions to the management plan specified in the conditions and submit the revised management plan for the Minister's written approval. The approval holder must comply with any such request. The revised approved management plan must be implemented. Unless the Minister has approved the revised management plan, then the approval holder must continue to implement the management plan originally approved, as specified in the conditions.</p>	Noted
21	<p>If, at any time after 5 years from the date of this approval, the approval holder has not commenced the action, then the approval holder must not commence the action without the written agreement of the Minister.</p>	Noted
22	<p>Unless otherwise agreed to in writing by the Minister, the approval holder must publish all management plans 'referred to in these conditions of approval on their website. Evidence of publication must be provided to the Department within 10 days of the publication to the approval holder's website. Each management plan must be published on the approval holder's website within 1 month of being approved and remain on the website for the life of the approval.</p>	Noted

7. OBJECTIVES AND OUTCOMES

Table 4 presents the objectives and outcomes with respect to landscape management, Koala management, rehabilitation works and the biodiversity offset strategy for the Quarry Site. Performance targets are described in detail in later sections of the document and have been selected based on the known biodiversity-related risks, best practice management and to ensure that rehabilitation of the Quarry Site is consistent with the requirements of SSD 4978.

Table 4
Objectives and Outcomes

Objectives	Outcomes
General	
(a) Ensure compliance with the criteria of SSD 4978, EPBC 2013/7028 and reasonable community expectations.	(i) Compliance with all relevant criteria and reasonable community expectations, as determined in consultation with the relevant government agencies.
Landscape Management	
(b) Identify the controls to be implemented to minimise impacts to biodiversity values due to vegetation clearing and remnant vegetation and habitat features.	(ii) Performance targets associated with land disturbance controls achieved (see Section 9.4).
(c) Achieve a soil profile capable of sustaining the specified final land use.	(iii) Performance targets associated with topsoil management achieved (see Section 9.4).
(d) Establish operational management measures to ensure environmental impacts are minimised.	(iv) Performance targets associated with operational controls achieved (see Section 9.4).
Koala Management	
(e) Ensure that potential impacts to Koala are minimised.	(v) Performance targets associated with Koala management achieved (see Section 10.3).
Rehabilitation Works	
(f) Ensure that the Quarry Site is safe, stable and non-polluting.	(vi) Performance targets associated with all phases of rehabilitation achieved (see Section 11.4).
Rehabilitation Works (Cont'd)	
(g) Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native species and habitat, including at least 0.35ha of Mellong Sandmass Sedgeland.	(vii) Nominated revegetation and monitoring activities are undertaken.
(h) Decommission and remove surface infrastructure (unless the Secretary agrees otherwise).	(viii) Surface infrastructure decommissioned and removed unless the Secretary agrees otherwise.
(i) Minimise the size, depth, batter slopes and the drainage catchment of the final void.	(ix) Final voids are constructed generally in accordance with the nominated final landform.
(j) Ensure that the surface area of the final voids is no greater than 16ha in total.	(x) VENM and ENM is imported, as required, to ensure final voids do not exceed 16ha.
(k) Ensure that final voids are separated from the surface water drainage system, unless the Secretary agrees otherwise.	(xi) Final voids are separated from the surface water drainage system.
Biodiversity Offset Strategy	
(l) Establish and secure a Biodiversity Offset Area.	(xii) Biodiversity offset area finalised and dedicated to Yengo National Park.
(m) Maintain and where possible improve biodiversity values within the Biodiversity Offset Area.	(xiii) Performance targets associated with the Biodiversity Offset Area achieved (see Section 12.3).

8. EXISTING BIODIVERSITY VALUES

8.1 LOCAL SETTING

Figure 3 demonstrates the proximity of the Quarry Site to the Greater Blue Mountains World Heritage Area that includes Wollemi National Park and Yengo National Park. It is recognised that these areas are highly valued for their biodiversity values and are of high conservation significance.

8.2 SITE BIODIVERSITY CONTEXT

Surveys undertaken during the preparation of the Ecological Assessment prepared by Umwelt (2014b) and subsequent ecological monitoring undertaken by Niche (2019) and EnviroKey (2020 and 2021) has identified the following biodiversity values within and surrounding the Quarry Site.

- High conservation value native vegetation communities and fauna habitat.
- Known threatened species habitat including the following.
 - Identified habitat for one threatened terrestrial mammal species, the New Holland mouse (*Pseudomys novaehollandiae*), listed as Vulnerable under the EPBC Act.
 - Habitat for the Koala (*Phascolarctos cinereus*) in the area surrounding the proposed disturbance area.

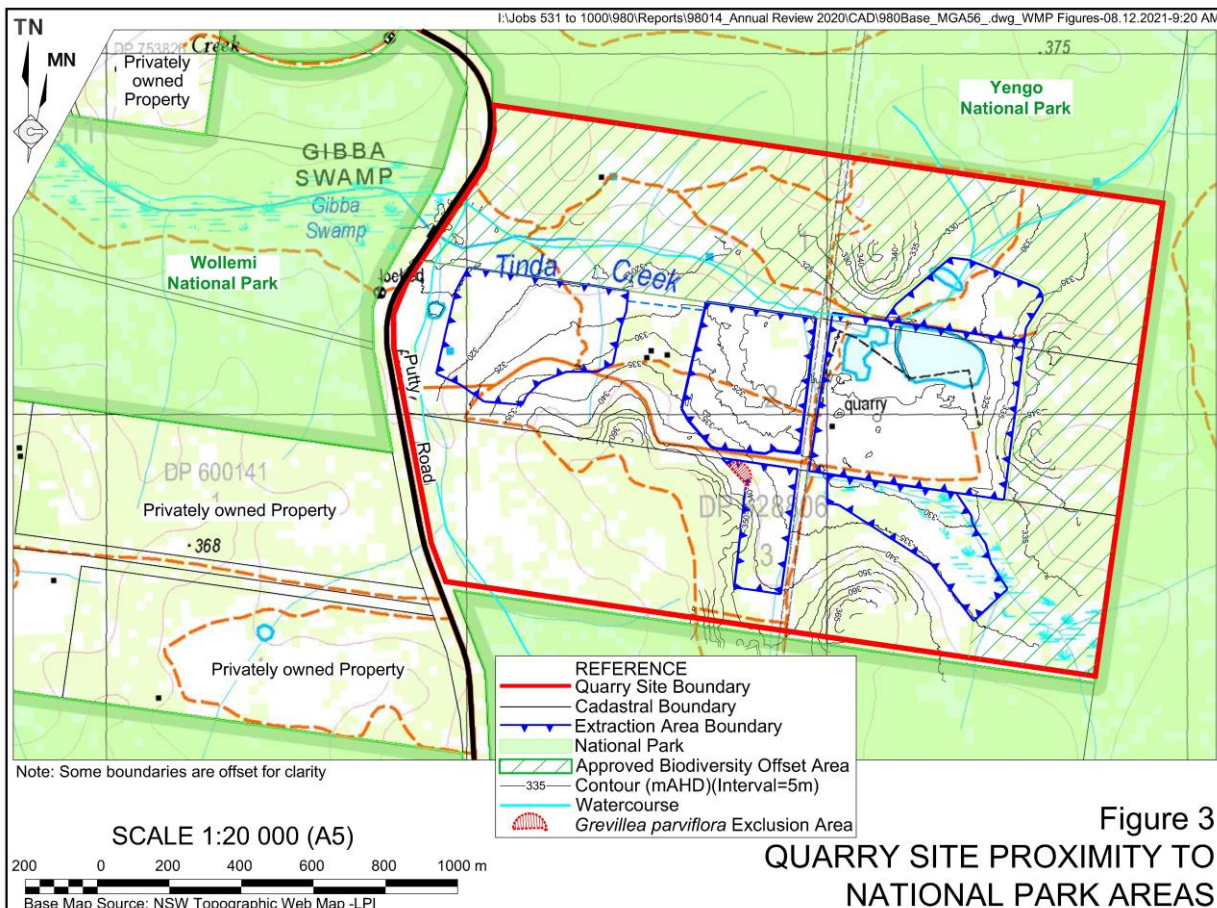
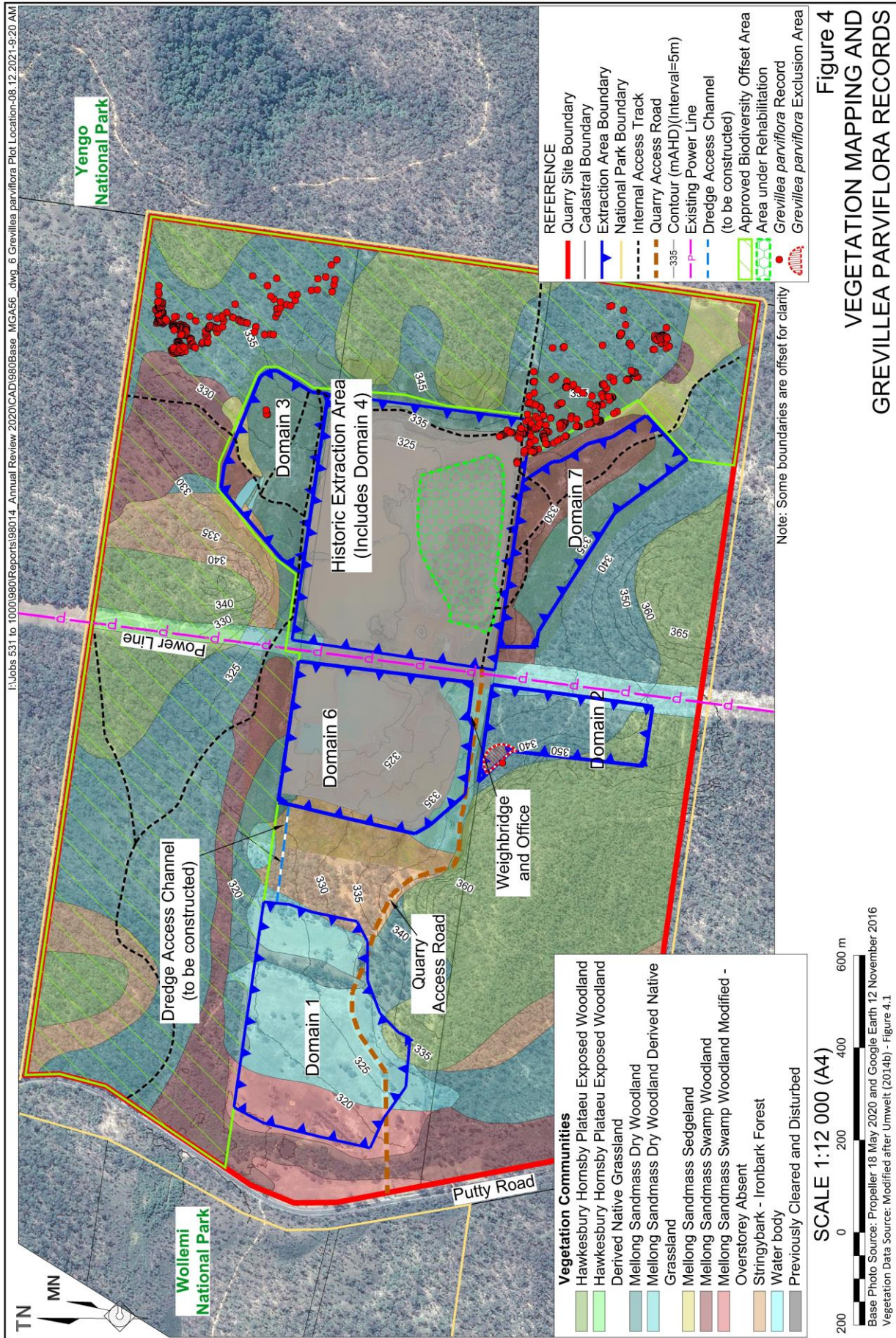


Figure 3

QUARRY SITE PROXIMITY TO NATIONAL PARK AREAS

- Identified habitat of one threatened reptile species, Rosenberg’s goanna (*Varanus rosenbergi*), listed as Vulnerable under the *Biodiversity Conservation Act 2016* (BC Act).
- Identified habitat for two forest owl species, the powerful owl (*Ninox strenua*) and masked owl (*Tyto novaehollandiae*), both listed as Vulnerable on the BC Act.
- A large population of the BC Act and EPBC Act listed *Grevillea parviflora* subsp. *parviflora*, with approximately 849 plants recorded during surveys.
- An area of woodland habitat for threatened woodland birds and micro-bats including (but not limited to) the varied sittella (*Daphoenositta chrysoptera*), scarlet robin (*Petroica boodang*), east coast freetail-bat (*Mormopterus norfolkensis*) and large-eared pied bat (*Chalinolobus dwyeri*).
- Potential winter flowering woodland foraging habitat for the endangered swift parrot (*Lathamus discolor*) and for the critically endangered regent honeyeater (*Anthochaera phrygia*).
- The presence of groundwater dependent ecosystems (GDEs) Mellong Sandmass Swamp Woodland and Mellong Sandmass Sedgeland.
- The presence of hollow dependent fauna habitat, including known habitat of the squirrel glider (*Petaurus norfolcensis*) and the eastern pygmy possum (*Cercartetus nanus*) both listed under the BC Act.
- The presence of other vulnerable species including the Red-crowned Broodfrog (*Pseudophryne australis*), Grey-headed Flying-fox (*Pteropus poliocephalus*), White-bellied Sea-eagle (*Haliaeetus leucogaster*), Dusky Woodswallow (*Artamus cyanopterus*) and the Little Lorikeet (*Glossopsitta pusilla*).

Figure 4 displays the vegetation mapping within the Quarry Site including recorded locations for *Grevillea parviflora* subsp. *parviflora*. **Figure 5** displays the locations of threatened fauna species identified during ecological surveys and/or monitoring.



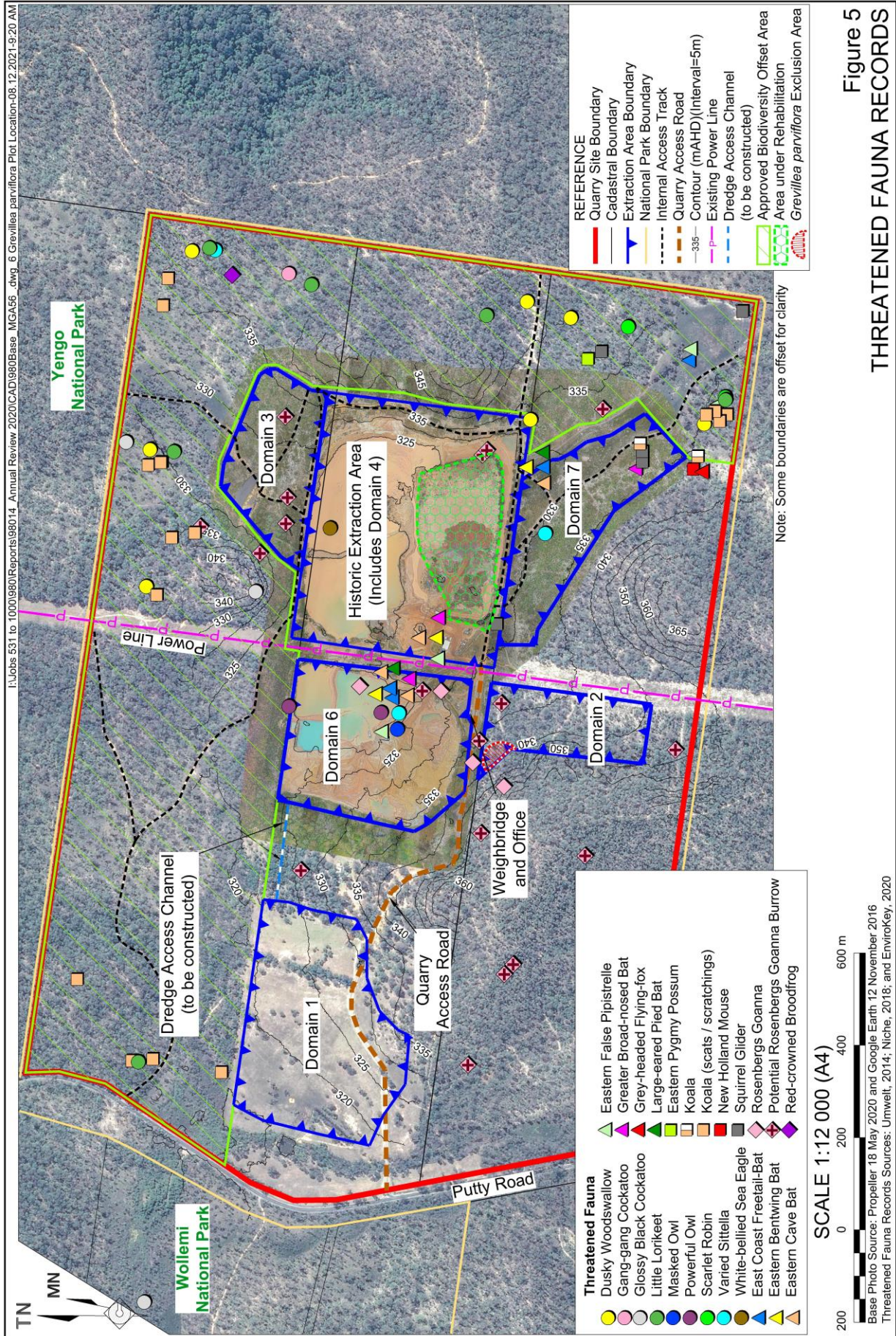


Figure 5
THREATENED FAUNA RECORDS

9. LANDSCAPE MANAGEMENT

9.1 INTRODUCTION

A range of land disturbance and operational controls have been developed for the Quarry to ensure the objectives and targets of the LMP are met. The following subsections present a summary of the strategies to be implemented within the Quarry Site to ensure that potential on-site and off-site impacts are minimised as far as practicable.

Condition 19(e) of Schedule 3 of SSD 4978 requires that short, medium and long-term measures required to manage remnant vegetation and habitat are described within the LMP. For the purposes of the LMP, these time frames are defined as follows.

- Short Term: Measures to be undertaken regularly or at least annually.
- Medium Term: Measures to be undertaken within the next three years.
- Long Term: To project completion.

9.2 LAND DISTURBANCE CONTROLS

9.2.1 Demarcation of Disturbance Limits

Figure 2 displays the approved limit of disturbance which comprises Domains 1, 2, 3, 6 and 7. Areas of active disturbance within operational areas will be marked with star pickets and high-visibility bunting prior to disturbance occurring in these areas to ensure that vegetation clearing does not proceed beyond the approved limit of disturbance.

9.2.2 Implementation of Buffer Zones

The following buffer zones will be maintained by Hy-Tec throughout the life of the Quarry.

- Buffer zones between operational areas and the Greater Blue Mountains World Heritage Area. These buffers will be maintained in order to minimise indirect impact on biodiversity values within the area surrounding the Quarry Site.
- Buffers of at least 40m between areas of operational disturbance and known locations of the small-flowered grevillea (*Grevillea parviflora* subsp. *parviflora*). This does not include those individual plants within Domain 3 that are approved for removal. **Figure 4** displays the locations of the small-flowered grevillea within the Quarry Site. It is noted that Domain 4 is no longer subject to extraction and therefore buffers are not necessary here. An area of 40m would be excluded from activity adjacent to the single small-flowered grevillea identified adjacent to Domain 2.

Buffers will be maintained by ensuring that all operational activities are restricted to within the approved limit of disturbance which will remain clearly demarked as described in Section 9.2.1. It is noted that conservation management actions will be undertaken within buffer zones, as required.

9.2.3 Pre-Clearance Surveys

Surveys of threatened flora and fauna and habitat features will be undertaken no more than 14 days prior to the clearing of vegetation. These surveys will include marking hollow-bearing trees and other notable habitat features e.g. hollow logs, boulders, active nests, dreys or dens and seed-bearing trees for salvage. Detailed searches will also be undertaken for threatened flora and fauna species during pre-clearance surveys including for micro-bats and Koala.

A pre-clearance survey of proposed disturbance areas will be undertaken within seven days of the planned disturbance to identify whether any burrows or termite mounds used by Rosenbergs goanna (*Varanus rosenbergi*) are present. In the event that burrows or termite mounds are present, the ecologist will provide advice on how to ensure that no goannas remain within the burrows and that no goanna eggs or juveniles remain within the mounds during the clearing process.

Where hollow-bearing trees are removed during tree felling activities, the density of tree hollows in the surrounding woodland will be quantified by a suitably qualified ecologist. The ecologist will then determine whether supplementation of tree hollows (using salvaged tree hollows or nest boxes) is required based on the number of hollows lost during felling, the extent of natural hollows in adjacent vegetation and key fauna species that would utilise the hollows.

9.2.4 Tree felling Procedure

The following tree felling procedure will be implemented at the Quarry to minimise the potential for impacts on native fauna species (including threatened species) as a result of the clearing of hollow-bearing trees. The tree felling procedure is designed to minimise impacts to hollow-dependent fauna, particularly the threatened squirrel glider, tree-roosting hollow-dependent micro-bats, eastern pygmy possum, Koala and threatened owls.

- Pre-clearance surveys will be undertaken as described in Section 9.2.3.
- Vegetation identified as not providing tree hollows will be removed on the day of clearing, wherever practicable, to discourage fauna usage of the area and minimise the likelihood of mortality during clearing.
- The canopy of all trees to be removed will be visually inspected by a suitably experienced and accredited wildlife handler on the day of clearing to ensure that fauna are not present during tree felling operations.
- The following procedures will be followed when felling hollow-bearing trees.
 - Felling operations will be supervised by a suitably experienced and accredited wildlife handler. In the event that fauna are injured or a threatened species is identified, personnel are not to attempt to relocate the fauna. The wildlife handler will provide advice on reasonable and feasible actions which will be implemented.
 - Heavy machinery will be used to nudge hollow-bearing trees for a minimum of 30 seconds prior to felling to encourage residence fauna to abandon the tree.
 - Hollow-bearing trees will be lowered as gently as possible with heavy machinery.
 - The wildlife handler will visually inspect all hollows in felled trees.
 - Injured fauna will be assessed and taken to a wildlife carer or vet, if necessary.

- Displaced fauna will be taken to a wildlife carer or vet, if necessary.
- Felled trees will be placed in a manner which reduces the number of hollows blocked against the ground.
- Felled trees will be maintained in place overnight to allow any unidentified fauna to vacate.
- Suitable hollows will be salvaged for treatment and installation within rehabilitation and revegetation areas a compensatory habitat.
- In the event that threatened fauna are located within hollow-bearing trees during initial inspection or tree felling, no works will be undertaken within 25m of the identified tree until the species moves from within the clearing area of its own volition. If the fauna has not moved within three days, WIRES, or another suitable organisation will be contacted to assist with relocation of the animal(s).
- In the event that Koala are spotted, vegetation clearing will not proceed within a 25m buffer of the tree inhabited by the Koala(s). Although vegetation clearing will be allowed to proceed beyond this buffer, a corridor of vegetation will be left in place between the tree and surrounding remnant vegetation to allow the Koala(s) to relocate. If the Koala(s) does not vacate the tree within 72 hours, an accredited wildlife handler will be contacted to advise on appropriate management measures.

All personnel required to capture, handle, house and/or transport native fauna (injured or uninjured) will hold the appropriate NSW Animal Ethics Committee Licence and NSW Scientific Licence.

9.2.5 Topsoil Management

Soil will be stockpiled for use in progressive rehabilitation activities during the progressive development of the Quarry. This material will be used to provide a suitable growth medium and enhance habitat features in areas under rehabilitation. Where topsoil is removed, the following measures will be adopted.

- Topsoil will be stripped when moist to help maintain its viability and reduce dust generation, where practicable.
- Topsoil will be placed directly within areas undergoing rehabilitation areas, where practicable.
- Topsoil stockpiles will be located away from operational areas and watercourses.
- Topsoil stockpiles will be located within the approved limit of disturbance within the boundary of the closed water management system and will be appropriately signed to identify the area and minimise the potential for unauthorised use or disturbance.
- Topsoil stockpiles will be placed on level or gently sloping areas to minimise erosion and potential soil loss.
- Silt-stop fencing will be installed at the base of stockpiles to prevent soil loss, if required.

- Topsoil stockpiles will be generally less than 2m high with a roughened surface to maximise surface exposure and biological activity.
- Topsoil stockpiles to be maintained longer than three months will be sown with a suitable cover crop to minimise soil erosion and invasion of weed species. Short term stockpiles will be sprayed with hydromulch to stabilise the surface.
- Weed growth will be monitored on a monthly basis and controlled either by removing by hand or spraying if large areas (i.e. >25m²) are observed.
- Weed growth will be removed from the top of the stockpiles to minimise the transport of weeds into rehabilitated areas prior to re-spreading.

9.2.6 Seed Collection

A seed collection program has been implemented by Hy-Tec to ensure plentiful supplies of endemic species are available for use in rehabilitation. Seed has and will be collected from within areas to be disturbed during the development of the Quarry. Seed collected from within the Quarry Site will be stored and used in rehabilitation activities.

These measures will be reviewed and updated every three years following implementation of this plan.

9.3 OPERATIONAL CONTROLS

9.3.1 Controlling Access

The following management measures will be implemented to minimise the risk of unauthorised access to Yengo National Park, buffer zones and rehabilitation areas.

- Gates will be installed at access points to the Quarry Site and will be closed during non-operational periods to prevent unauthorised access.
- Areas of remnant vegetation and rehabilitation areas will be clearly marked and signed to ensure that areas are not inadvertently accessed.

9.3.2 Weed Management

The following weed control measures will be implemented to minimise the spread and colonisation of weeds within the Quarry Site.

- Quarterly inspections and weed control programs to:
 - identify any weed infestations including noting areas where weeds cover a contiguous area > 5m x 5m (25m²);
 - undertake appropriate, targeted weed control activities (including hand removal of weeds where feasible); and
 - assess the effectiveness of weed control programs and make any necessary modifications.

- General observations of weeds during monthly inspections of drainage lines and the closed water management system.
- Targeted control of weeds across the Quarry Site, including within the Biodiversity Offset Area, buffer zones and rehabilitation areas.

In the event that a previously unrecorded weed species is discovered as part of quarterly and/or monthly inspections, advice will be sought from a suitably qualified and experienced person on the management and control options for that species.

The specific method selected for weed management will consider the known locations of threatened flora and fauna species, particularly *Grevillea parviflora* subsp. *parviflora*, with passive weed management techniques used within 40m of known threatened species records.

9.3.3 Pest Management

A pest management program will be implemented using best practice techniques such as baiting, trapping, warren ripping and open range shooting, as required. Experienced pest management contractors will be appointed to implement the pest management program for the Quarry. Hy-Tec will also continue to consult with Local Land Services, BCD and NPWS, as required, to develop a strategic approach to pest management.

9.3.4 Sediment and Erosion Control

The Quarry will continue to operate in accordance with the approved Water Management Plan (RWC, 2019). The Quarry will continue to operate in accordance with the approved Water Management Plan (RWC, 2019). In summary, a key feature of the Quarry's erosion and sediment control is the closed water management system which captures all rain that falls in disturbed areas, providing opportunity for settlement to occur and is a barrier to sediment movement off site. Further, a number of other sediment and erosion controls have been implemented to limit sediment movement within clean water diversions, thereby managing areas of the property that are vegetated but feature sandy surface materials. These controls include rock-lined drains, hay bales and sediment fencing.

9.3.5 Nest Box Establishment

Nest boxes will be established in retained vegetation within the Quarry Site to mitigate the loss of hollow-bearing trees, in the event that tree hollows are lost during felling. As described in Section 9.2.3, an assessment of tree hollows to be lost during clearing will be undertaken during pre-clearance surveys by a suitably qualified and experienced ecologist. Where hollow-bearing trees are removed during tree felling activities, the density of tree hollows in the surrounding woodland will be quantified by a suitably qualified ecologist. The ecologist will then determine whether supplementation of tree hollows (using salvaged tree hollows or nest boxes) is required based on the number of hollows lost during felling, the extent of natural hollows in adjacent vegetation and key fauna species that would utilise the hollows.

These measures will be reviewed and updated every three years following implementation of this plan.

9.3.6 Salvage of Habitat Features

Habitat features (such as hollow logs, fallen timber and bush rock) will be salvaged and relocated to rehabilitation areas to augment habitat complexity and make the area more habitable for native species.

As discussed in Section 9.2.3, habitat features suitable for salvage will be identified and marked during pre-clearance surveys. The following procedure will be followed during the salvage and placement of habitat features.

- Hollow-bearing trees and other habitat features identified during pre-clearance surveys will be salvaged where practical and safe to do so.
- Suitable areas will be identified to relocate hollow-bearing trees and other habitat features.
- Hollow bearing trees and other habitat features will be carefully relocated to suitable areas either in small piles or individually, as required.
- Alternatively, hollow-bearing trees and other habitat features will be stockpiled in unused areas until able to be relocated to rehabilitation areas.

These measures will be reviewed and updated every three years following implementation of this plan.

9.3.7 Bush Fire Management

Water for use in fire-fighting is provided for by the site water management system. On-site storage is adequate to ensure that there is sufficient water available on site for normal bush fire-fighting purposes. Fire-fighting equipment, including fire hydrants, extinguishers and hose reels, will continue to be provided within infrastructure areas and mobile equipment.

Hy-Tec will implement appropriate measures to reduce the risk of fire ignition and the spread of bushfire across the site in consultation with the NSW Rural Fire Service (RFS). Fire management within the Biodiversity Offset Area is not proposed unless requested and undertaken in consultation with the RFS and NSW National Parks and Wildlife Service (NPWS). The need for future fire management within the Quarry Site will be determined based on ongoing consultation with the RFS and NPWS.

9.3.8 Progressive Rehabilitation

Approximately 47ha of vegetation will be disturbed by quarrying and processing operation over the life of the Project. The approved limit of disturbance is displayed in **Figure 2** comprising of Domains 1, 2, 3, 6 and 7.

Rehabilitation work will be undertaken progressively as soon as areas become available. Progressive revegetation during operations would be actively undertaken to rehabilitate the areas to native vegetation communities (see **Figure 4**) with the proposed final rehabilitation following closure of the Quarry (see **Figure 8**). Where practical, local provenance endemic species for native communities will be used, with consideration of seed availability (see Section 9.2.6 for a discussion on seed collection protocols).

Measures that will be implemented to restore and enhance the quality of native vegetation and fauna habitat within rehabilitation and biodiversity areas include the following.

- Introduction of fauna habitat features – laying out woody debris over rehabilitation areas to encourage habitat generation for local fauna.
- Assisted natural regeneration – land profiling with the addition of natural habitat features.
- Targeted vegetation establishment – direct seeding to establish vegetation.

Ongoing monitoring of the rehabilitation areas will be undertaken to determine if rehabilitation completion criteria are being met, as described in Section 13.2. A review of rehabilitation undertaken for each 12 month period and rehabilitation proposed for the next 12 month period is presented in each Annual Review, providing a more refined outline of short-term rehabilitation. Rehabilitation has already started in Domain 4.

9.4 PERFORMANCE MANAGEMENT

Table 5 presents proposed performance relevant to land disturbance controls within the Quarry Site over the next three years against completion criteria. Performance targets have been chosen to ensure that the objectives outlined in **Table 4** are achieved.

Table 5
Three Year Performance Targets – Land Disturbance Controls

Action / Aspect	Performance	Target
Demarcation of Disturbance Limits		
Install survey markers at regular intervals around the perimeter of the approved limit of disturbance.	Inspect, confirm and/or replace.	Easily identifiable markers maintained for the life of the Quarry.
Disturbance of vegetation will be restricted to the areas presented in Figure 2.	Completed as a single campaign, if required.	Surveys completed, annual reports submitted and confirmation of compliance.
Pre-clearance Surveys		
Pre-clearance surveys for threatened flora and fauna species and habitat features (including marking hollow-bearing trees).	Completed a maximum of 14 days prior to clearing.	No clearing to be undertaken without pre-clearance surveys.
Pre-clearance surveys for Rosenbergs goanna and habitat features.	Completed within seven days of clearing.	
Tree Felling		
Habitat clearing.	Implement tree-felling procedure as described in Section 9.2.4.	All steps within the tree-felling procedure to be followed. No avoidable injury or mortality to native fauna.
Topsoil Management		
Soil stripping.	Completed as a single campaign, if required.	Sufficient resources available for rehabilitation.
	Implement management as described in Section 9.2.5.	
Soil stockpiling.	Implement management as described in Section 9.2.5.	No erosion. Physical and chemical parameters of soil suitable for establishment and survival of vegetation.
Seed Collection and Storage		
Provenance seed collection.	Seed collection completed prior to clearing.	Sufficient seed collected and stored for rehabilitation activities.

Table 6 presents proposed performance relevant to operational controls within the Quarry Site over the next three years against completion criteria.

Table 6
Three Year Performance Targets – Operational Controls

Action / Aspect	Performance	Target
Controlling Access		
Access to Quarry Site restricted to authorised personnel.	Close gates during non-operational periods.	Maintain access control.
Install survey markers at regular intervals around the perimeter of the approved limit of disturbance.	Inspect, confirm and/or replace.	Easily identifiable markers maintained for the life of the Quarry.
Install appropriate signage in rehabilitation areas, Biodiversity Offset Area and buffer zones to prevent unauthorised access.	Inspect, confirm and/or replace.	Signage maintained for the life of the Quarry.
Weed and Pest Management		
Weed control – Biodiversity Offset Area and buffer zones.	Weed inspections and reporting to be undertaken every three months followed by implementation of control and eradication measures.	There is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m ² in area.
Weed and Pest Management		
Weed control – rehabilitation areas.	Weed inspections to be undertaken every three months followed by implementation of control and eradication measures.	There is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m ² in area.
Feral pest management.	Undertaken in consultation with BCD and NPWS.	The Quarry Site does not become a harbour for feral pest species.
Sediment and Erosion Control		
Sediment and erosion control.	The Quarry will operate in accordance with the approved Water Management Plan.	Sediment-laden runoff is controlled.
Nest Box Establishment		
Nest boxes.	Hollows in trees to be cleared to be assessed and supplemented in surrounding vegetation, as required.	Habitat for fauna that use hollows is maintained.
Salvage of Habitat Features		
Habitat features salvaged.	Habitat features such as hollow logs, fallen timber and bush rock salvaged prior to clearing.	Habitat for fauna is maintained.
Fire Management		
Fire management.	Undertaken in consultation with the RFS, and NPWS.	Risk of bush fire attack and/or ignition is minimised.

10. KOALA MANAGEMENT

10.1 INTRODUCTION

A Koala Plan of Management (KPoM) (RWC, 2021) has been prepared in recognition of the presence of core Koala habitat on or within the vicinity of the Quarry Site and in accordance with the requirements of *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Koala SEPP), as well as the SEPP 44 Circular No. B35 (DUAP, 1995) (see **Appendix 2**). The following subsections present a summary of the strategies to be implemented within the Quarry Site to ensure that potential impacts to Koala are minimised as far as practicable.

10.2 MANAGEMENT MEASURES

10.2.1 Tree Felling Procedure

A robust tree felling procedure will be implemented during vegetation clearance as described in Section 9.2.4. The procedure includes a visual canopy inspection by an accredited wildlife handler on the day of felling to ensure that no Koala are present.

In the event that Koala are spotted, vegetation clearing will not proceed within a 25m buffer of the tree inhabited by the Koala(s). Although vegetation clearing will be allowed to proceed beyond this buffer, a corridor of vegetation will be left in place between the tree and surrounding remnant vegetation to allow the Koala(s) to relocate. If the Koala(s) does not vacate the tree within 72 hours, an accredited wildlife handler will be contacted to advise on appropriate management measures.

10.2.2 Interactions with Traffic

To minimise the risk of interaction between operational activities and Koala, Hy-Tec will install “Koala Warning” and “Injured Wildlife” signs adjacent to the Quarry Access Road. Hy-Tec also enforce a 20km/h speed limit on the Quarry Access Road to ensure adequate reaction time for drivers in the event that a Koala is encountered.

10.2.3 Rehabilitation

The aim of rehabilitation will be to re-establish those vegetation communities and fauna habitats cleared during the extension of the Quarry. Revegetation activities will consider the re-establishment of the following Koala feed trees that occur as dominant and sub-dominant canopy species, as appropriate.

- Forest red gum (*Eucalyptus tereticornis*)
- Drooping red gum (*Eucalyptus parramettensis* subsp. *parramettensis*)
- Grey gum (*Eucalyptus punctata*)

10.2.4 Implementation of Buffer Zones

Buffers between the approved limit of disturbance and Yengo National Park will be maintained throughout the life of the Quarry. Buffers will not be fenced to ensure that Koalas can freely move between Yengo National Park and areas of remnant vegetation within the Quarry Site.

10.3 PERFORMANCE MANAGEMENT

Table 7 presents proposed performance relevant to land disturbance controls within the Quarry Site over the next three years against completion criteria. Performance targets have been chosen to ensure that the objectives outlined in **Table 4** are achieved.

Table 7
Three Year Performance Targets – Koala Management

Action / Aspect	Performance	Target
Koala Management	Implement tree-felling procedure as outlined in Section 9.2.4 and Section 10.2.1.	No Koalas harmed as a result of any tree-clearing practices.
	Install “Koala Warning” and “Injured Wildlife” signs adjacent to Quarry Access Road.	No Koalas harmed as a result of interactions with Quarry-generated traffic.
	Limit speed limit to 40km/h on Quarry Access Road.	
	Rehabilitation targets achieved and monitored to ensure Koala feed trees re-established.	Koala feed trees and habitat re-established.
	Buffer zones maintained.	Potential operational impacts do not result in the alteration to the floristics, structure or condition of non-cleared areas of potential Koala habitat.

11. REHABILITATION

11.1 INTRODUCTION

Condition 17(b) of Schedule 3 of SSD 4978 requires the final landform to meet the objectives for progressive and final rehabilitation of the Quarry. These objectives include the following.

- The Quarry Site is safe, stable and non-polluting.
- Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native species and habitat, including at least 0.35ha of Mellong Sandmass Sedgeland.
- Surface infrastructure is to be decommissioned and removed (unless the Secretary agrees otherwise).
- Minimise the size, depth, batter slope and the drainage catchment of the final void.
- Ensure that the volume of VENM and ENM detailed in the EIS is imported for rehabilitation of the site.
- Ensure that the surface area of the final voids is no greater than 16ha in total.
- Ensure that final voids are separated from the surface water drainage system unless the Secretary agrees otherwise.
- Restore alignment and hydraulic function of watercourses, as far as practical.
- Ensure public safety.

Progressive rehabilitation that will be undertaken during operations is described in Section 9.3.8.

Condition 19(e) of Schedule 3 of SSD 4978 requires that short, medium and long-term measures required to ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations. For the purposes of the LMP, these time frames are defined as follows.

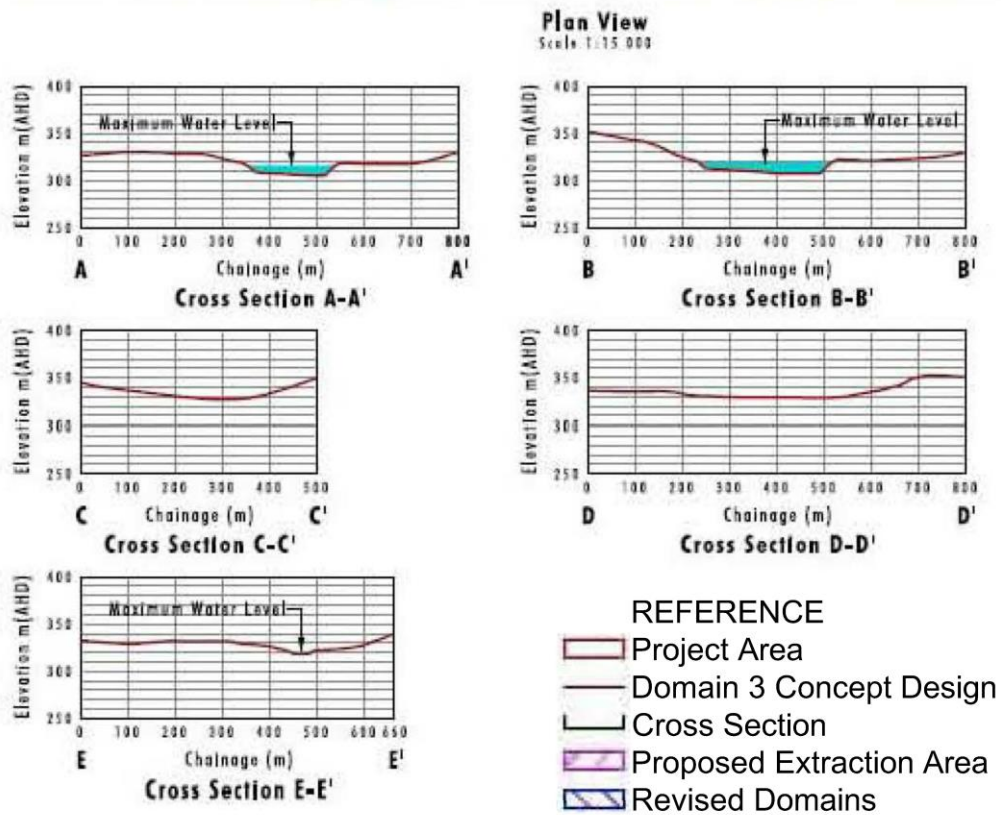
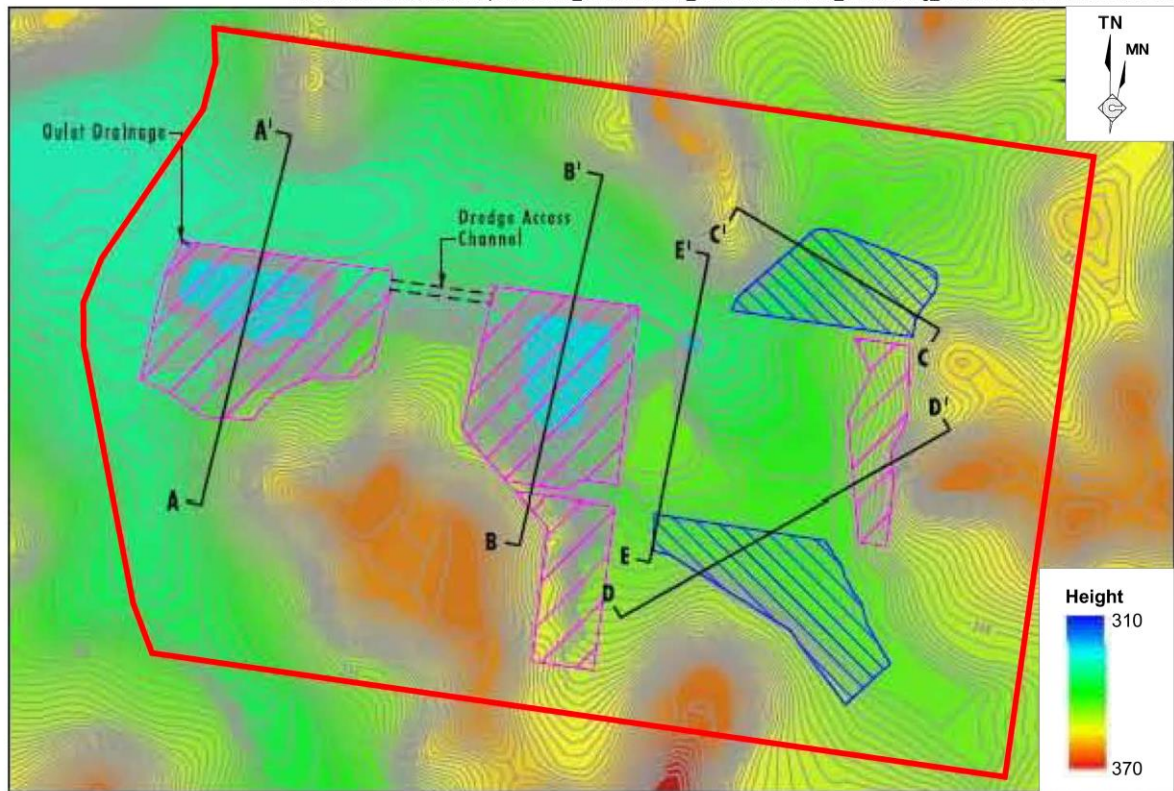
- Short Term: Measures to be undertaken regularly or at least annually.
- Medium Term: Measures to be undertaken within the next three years.
- Long Term: To project Completion.

11.2 PROPOSED FINAL LAND USE

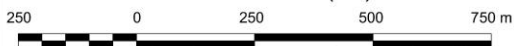
Following the completion of extraction and rehabilitation works, Hy-Tec will establish native vegetation consistent with the surrounding landscape. This will also allow for the establishment of a link between rehabilitated areas and vegetation within the adjacent Biodiversity Offset Area and buffer zones. The indicative final landform identified in **Figures 6** and **7** has been prepared with consideration of the following factors.

- Minimisation of any alteration to the pre-quarry flow regimes of Tinda Creek.
- Minimisation of impacts to water quality within and downstream of the Quarry Site.
- Stabilisation of drainage channels to prevent erosion and maximise the successful rehabilitation of native vegetation communities.
- Maintenance of biodiversity values in the areas surrounding the Quarry Site.

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SCALE 1:15 000 (A4)



Source: SSD 4978 Development Consent - Appendix 4 (Umwelt)

Figure 6
INDICATIVE FINAL LANDFORM





Figure 7
INDICATIVE FINAL LANDFORM, VEGETATION
COMMUNITIES AND BIODIVERSITY OFFSET AREA

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It is noted that a detailed Quarry Closure Plan will be developed approximately three years prior to the cessation of operations. Hy-Tec will investigate alternative land uses at this point to ensure that the final land use is consistent with local and regional land use strategies. Hy-Tec will consult with Council, DPE and the BCD as part of the development of the Quarry Closure Plan.

11.3 IMPLEMENTATION AND MANAGEMENT

11.3.1 Overview

The performance targets and completion criteria for rehabilitation have been developed to achieve the objectives and outcomes identified in Section 7. As rehabilitation is a progressive exercise, with future success influenced by achievement of specific interim goals throughout the process, performance targets are established for the various phases of rehabilitation. Furthermore, performance targets are influenced by the Quarry activity requiring rehabilitation, referred to as 'rehabilitation domains'.

Section 11.3.2 describes the individual phases of rehabilitation and Section 11.3.3 the rehabilitation measures to be implemented within each domain.

11.3.2 Rehabilitation Phases

A hierarchical approach to the rehabilitation of the Quarry Site has been adopted by Hy-Tec with rehabilitation considered as progressive phases, each with its own objectives, criteria for completion and indicators of performance against these criteria.

Decommissioning

The decommissioning phase involves the cessation of infrastructure usage, dismantling or demolition, removal and remediation of the land on which the infrastructure was located.

The objectives associated with this phase of rehabilitation are as follows.

- To decommission and remove all surface infrastructure.
- To remove services not required for the final land use (power, water, communications).
- To ensure that appropriate mechanisms are established to control access and manage public safety following the closure of the Quarry.

Landform Establishment

The landform establishment phase involves the earthworks required to construct the planned final landform, i.e. suitable for the planned final land use and which blends with the adjacent topography.

The objectives associated with this phase of rehabilitation are as follows.

- To provide a low maintenance, geotechnically stable, non-polluting and safe landform suitable for the intended final land use.
- To stabilise all rehabilitated slopes and contour banks.



- To ensure that the surface of the established landform is free from any hazardous materials.
- To ensure that the stability of the final landform is assessed by a qualified engineer to validate that it is stable and does not pose a safety risk.
- To ensure that no runoff is discharged from disturbed areas within the Quarry Site until a stable vegetative cover and appropriate erosion and sediment controls have been established.
- To ensure that downstream water quality is maintained or improved when compared to baseline conditions.
- To ensure that downstream aquatic ecosystems are maintained or improved as demonstrated by annual monitoring.
- To ensure that appropriate bushfire hazard controls, including fire breaks, have been implemented in consultation with RFS and NPWS.

Growth Media Development

The growth media development phase involves the replacement of soil over disturbed areas and preparation of the soil for revegetation including fertiliser or ameliorant application and ripping or scarifying the soil.

The objectives associated with this phase of rehabilitation are as follows.

- To ensure that topsoil or other suitable growth media has been spread uniformly over rehabilitation areas.
- To monitor the development of the soil profile to (e.g. development of organic layer, litter layer).

Native Vegetation Establishment

The native vegetation establishment phase involves the revegetation of the rehabilitated landform with species commensurate with the targeted final land use.

The objectives associated with this phase of rehabilitation are as follows.

- To ensure revegetation areas comprise flora species assemblages characteristic of the desired native vegetation communities.
- To ensure that second generation tree seedlings are present or likely to be, based on monitoring in comparable older rehabilitation sites (i.e. evidence of fruiting of native species observed).
- To ensure that at least 75% of trees are healthy and growing (i.e. have achieved sustained growth and development) as indicated by monitoring and reference to analogue sites.
- To ensure that any weed infestation is comparable to that observed within analogue sites in extant native vegetation.

11.3.3 Rehabilitation Domains

Rehabilitation domains refer to areas of related disturbance based on processes and use prior to rehabilitation and for which decommissioning and rehabilitation activities would be similar. Indicative rehabilitation domains for the Quarry are displayed on **Figure 8** and specific rehabilitation activities for these domains described in the following subsection.

Rehabilitation Domain 1 – Infrastructure Area

This domain includes the processing and stockpiling area and all internal roads. All buildings and processing equipment will be removed from the Quarry Site following the cessation of operations. Roads will be retained in the final landform for access to the transmission line and for bush fire prevention and access.

Following the removal of surface infrastructure, the hardstand surface will be ripped and reshaped and covered with a layer of growth media and previously cleared vegetation. The final landform will then be seeded with seed collected from within the Quarry Site.

Rehabilitation Domain 2 – Extraction Area

The extraction area rehabilitation domain includes all areas disturbed and/or backfilled within Domains 1, 2, 3, 4, 6 and 7 (excluding surface water management infrastructure).

Areas within the extraction area will be progressively backfilled with VENM / ENM and shaped to blend in with the surrounding topography. Rehabilitation areas will be covered with a layer of growth media and previously cleared vegetation prior to seeding.

Rehabilitation Domain 3 – Surface Water Management Structures

This domain includes the dredge pond, silt ponds, clean water ponds, diversion drains and associated infrastructure.

All infrastructure associated with water management will be removed with the exception of three water bodies which will be retained as their use is consistent with the final land use described in Section 11.2. Dams in the final landform would require minor works to ensure the stability of banks.

11.3.4 Rehabilitation Funding

Hy-Tec will fund all rehabilitation activities, as well as any remedial activities required in response to the nominated performance targets not being met.

In order to ensure that sufficient funds are available to complete the nominated rehabilitation activities, Hy-Tec will maintain an appropriate Conservation and Rehabilitation Bond (“the Bond”), to be held by the DPE (or a financial institution approved by the DPE). The current bond was lodged with DPE in December 2017. It has since been reviewed and an estimate provided to DPE for review and approval.

- The Bond consists of a bank guarantee that holds and quarantines funds sufficient to complete the nominated rehabilitation activities assuming continued operations over the next three years. =.
- The Bond value was estimated by a suitably qualified expert (approved by DPE).

- The value of the Bond is reviewed every three years for the life of the Quarry or following an Independent Environmental Audit and will be validated each time by a suitably qualified expert (approved by DPE).

The sum of the Bond will be determined by:

- calculating the cost of implementing the biodiversity offset strategy over the next 3 years,
- calculating the cost of rehabilitating the site, taking into account the likely surface disturbance over the next 3 years of extraction operations; and
- employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Secretary.

In accordance with Schedule 3, Condition 21 of SSD 4978, within 3 months of each Independent Environmental Audit, the sum of the Bond will be reviewed and, if necessary, revised with consideration of:

- the effects of inflation;
- the likely cost of implementing the biodiversity offset strategy and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the development); and
- the performance of the implementation of the biodiversity offset strategy and rehabilitation of the site to date.

As rehabilitation is successfully completed, Hy-Tec will recover this portion of the Bond (noting that until the Quarry approaches completion any reduction in the Bond related to successfully completed rehabilitation is likely to be retained for new disturbance requiring rehabilitation).

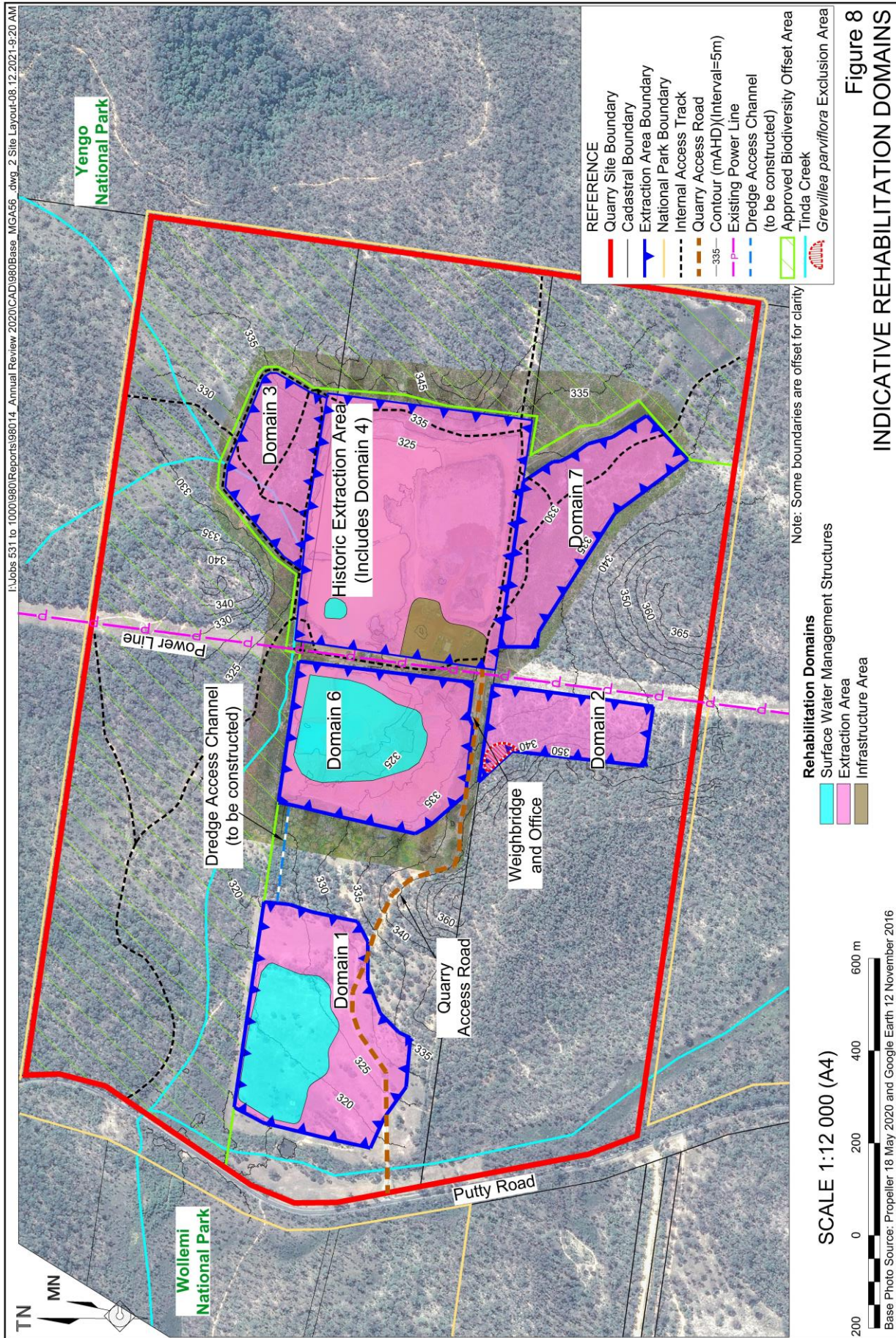
A component of the Bond will cover conservation management activities in the approved Biodiversity Offset Area for which Hy-Tec is responsible over the life of the Quarry. Alternate mechanisms to fund long term management may be identified that supersede the need for a conservation bond for these activities. It is anticipated that the conservation bond will remain in place as long as Hy-Tec is responsible for environmental management activities in the offset area (as described in Section 12).

11.4 PERFORMANCE MANAGEMENT

Table 8 presents proposed performance over the initial three years of Quarry operations under SSD 4978, relevant to rehabilitation and environmental resource salvage, against completion targets. Performance targets have been chosen to ensure that the objectives outlined in **Table 4** are achieved.

Table 8
Three Year Performance Targets – Rehabilitation

Action / Aspect	Performance	Target
Decommissioning		
Infrastructure decommissioning and removal.	Not required.	Infrastructure not required for future land use removed.
Contaminated land identification and remediation.	Not required.	Contamination is identified and remediated.
Access to Quarry Site restricted to authorised personnel.	Close gates during non-operational periods.	Maintain access control.
Landform Establishment		
Landform construction.	Backfilling with VENM / ENM to be undertaken within Domain 4, as required.	The final landform equivalent to Figures 6 and 7 .
Erosion and sediment control.	Erosion and sediment control structures are monitored and maintained.	Runoff from disturbed areas within the Quarry Site discharges to the closed water management system until the area is rehabilitated.
Bush fire hazard.	Maintain fire breaks and ensure fire-fighting equipment is made available to RFS, as required.	Minimise risk from bush fire attack.
Growth Medium Development		
Soil management.	Soil stockpiles are surveyed annually and information retained as part of soil inventory.	Soil is stockpiled in accordance with the management measures described in Section 9.2.5.
		Soil is spread to a depth of approximately 20cm.
		Soil condition does not limit growth medium development and seed application success.
	Inspections of stockpiles and respread soil completed at least quarterly.	Erosion of soil is minimised. Results of inspections reported annually.
Vegetation Establishment		
Vegetation establishment.	Progressive revegetation works to be undertaken within Domain 4.	The established landform and vegetation is sustainable and consistent with the intended land use.



12. BIODIVERSITY OFFSET STRATEGY

12.1 INTRODUCTION

The approved Biodiversity Offset Area is adjacent to Yengo and Wollemi National Parks which form part of the Greater Blue Mountains World Heritage Area (see **Figure 3**). The area will add an additional area of 106.6ha to this contiguous area of vegetation, thus ensuring that biodiversity values within the region are maintained.

12.2 PROPOSED LONG-TERM CONSERVATION MECHANISM

An area of 106.6ha (the Approved Biodiversity Offset Area) is proposed to be secured for conservation purposes in accordance with Condition 15 and Condition 16 of SSD 4978, with an agreement to be made by 29 April 2022 (an extension granted for this process is presented in **Appendix 4**). Once operations at the Quarry have ceased, Hy-Tec will dedicate the land to the NSW NPWS. It is expected that the land would be gazetted as part of the Yengo National Park at this time.

12.3 PERFORMANCE MANAGEMENT

Table 9 presents proposed performance to demonstrate the achievement of biodiversity offsetting objectives. Performance targets have been chosen to ensure that the objectives outlined in **Table 4** are achieved.

Table 9
Three Year Performance Targets – Biodiversity Offset Area

Page 1 of 2

Action / Aspect	Performance	Target
Long-term conservation mechanism	Long-term conservation mechanism finalised as discussed in Section 12.2.	Biodiversity Offset Area offset in perpetuity.
Vegetation Communities and Fauna Habitat	Annual monitoring undertaken and recommendations of monitoring implemented as discussed in Sections 13.3 and 13.4.	No adverse effects of quarrying on vegetation community/fauna habitat extent or condition Nest boxes installed, as required. Persistence of threatened species and their habitat within the Biodiversity Offset Area maintained. Results of monitoring are reported in Annual Reviews.
Water	Monitoring undertaken in accordance with the approved Water Management Plan.	Runoff water quality from the site does not adversely impact Biodiversity Offset Area as determined through monitoring. Results of monitoring are reported in Annual Reviews.
Weeds	Weed control and/or monitoring programs undertaken and recommendations of monitoring implemented as discussed in Section 9.3.2.	There is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m ² in area. Results of monitoring are reported in Annual Reviews.

Table 9 (Cont'd)
Three Year Performance Targets – Biodiversity Offset Area

Page 2 of 2

Action / Aspect	Performance	Target
Pest Species	Monitoring and reporting undertaken with appropriate pest control initiatives implemented in accordance with recommendations as discussed in Section 9.3.3.	No significant populations of pest fauna species present. Results of monitoring reported in Annual Reviews.
Bushfire Hazard	Implemented as per Section 9.3.7.	Appropriate bushfire hazard controls have been implemented, in consultation with RFS and NPWS.
Access	Appropriate mechanisms are established to control access as discussed in Sections 9.2.1 and 9.2.2.	Access controlled.
Monitoring	Monitoring and reporting undertaken in accordance with the LMP as discussed in Section 13.	Results of monitoring reported in Annual Reviews.

13. MONITORING REQUIREMENTS

13.1 OVERVIEW

Table 10 presents a summary of the range of monitoring activities that will be undertaken by Hy-Tec to demonstrate compliance with the objectives and performance targets for rehabilitation, koala and ecosystem management. The following subsections provide more details regarding the required monitoring requirements.

Table 10
Ecological Monitoring Requirements at Tinda Creek Quarry

Type of Monitoring	Parameters Monitored	Frequency	Monitoring Method	Responsibility
Rehabilitation	Inspections of survey markers, drainage lines, water management systems and rehabilitation areas.	Monthly	Visual Inspection	Quarry Manager
	Survey of 9 x BAM plot as per Section 13.2.2.	Annually	Field Survey	Quarry Manager / Ecologist
Koala	Targeted Spot Assessment Technique, Call playback surveys, Spotlight surveys.	Bi-annually (every two years)	Field Survey	Quarry Manager / Ecologist
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Surveys during known flowering period (July to December), stem counts in permanent plots, photo monitoring, habitat quality.	Annually	Field Survey	Quarry Manager / Ecologist
Nest Boxes	Condition assessment.	Annually (if required).	Field Survey	Quarry Manager / Ecologist
Voluntary Undertaking	Natural regeneration.	Annually	Visual Inspection / Photographs	Quarry Manager
Aquatic Monitoring	Stream width and edge habitat, stream features including substrate, vegetation and organic material, site observation including catchment description and local land use practises, and riparian characteristics.	Annually	Field Survey and Photography	Quarry Manager / Ecologist

13.2 REHABILITATION

The objective of rehabilitation monitoring is to evaluate progress towards fulfilling ecological community land use objectives and closure criteria.

13.2.1 Monthly Inspections

Monthly visual inspections of all rehabilitated areas will be undertaken as part of drainage line and water management system inspections and will include an assessment of:

- soil conditions and erosion (i.e. stability);
- drainage and sediment control structures;
- runoff water quality;

- germination rates;
- plant health;
- natural regeneration; and
- weed infestation.

Any required management actions will be identified during monthly visual inspections and implemented within one month of issue identification. Visual inspections will continue until all rehabilitation completion criteria have been satisfied.

13.2.2 Annual Monitoring

Annual monitoring will be undertaken within rehabilitation areas to determine if rehabilitation completion criteria are met. Monitoring will be undertaken within 3 x BAM plots (B1 to B3) that will be established within rehabilitation areas (**Figure 9**). Additional BAM plots will be established as the rehabilitation area expands in consultation with a suitably qualified ecologist.

A total of 6 x BAM plots (B4 to B9) will be established as analogue sites within areas of remnant vegetation to provide a benchmark in terms of species composition, diversity and structure (**Figure 9**). Monitoring will be undertaken annually within analogue sites throughout the life of the Quarry.

Reporting will include the following.

- A comparison of rehabilitation against rehabilitation objectives and targets.
- A discussion of the results of the monitoring program.
- Identification of possible trends and areas for continuous improvement.
- An assessment of the effectiveness of environmental controls implemented.
- Identification of any modifications required to the monitoring program, rehabilitation practices and areas required further research.
- A comparison of flora species against analogue sites.
- An assessment of vegetation health and structure.
- Identification of the types and abundance of weed species.
- An assessment of natural regeneration/recruitment of new species.

The results of monitoring will be recorded in a monitoring report which will be prepared annually and submitted with the Annual Review. The Annual Review will compare trends in monitoring outcomes over subsequent monitoring periods.

A description of what constitutes BAM plot and the data that would be collected at each plot is described in DPE's Biodiversity Assessment Methodology (2020), however this may be updated to ensure current practices are applied.

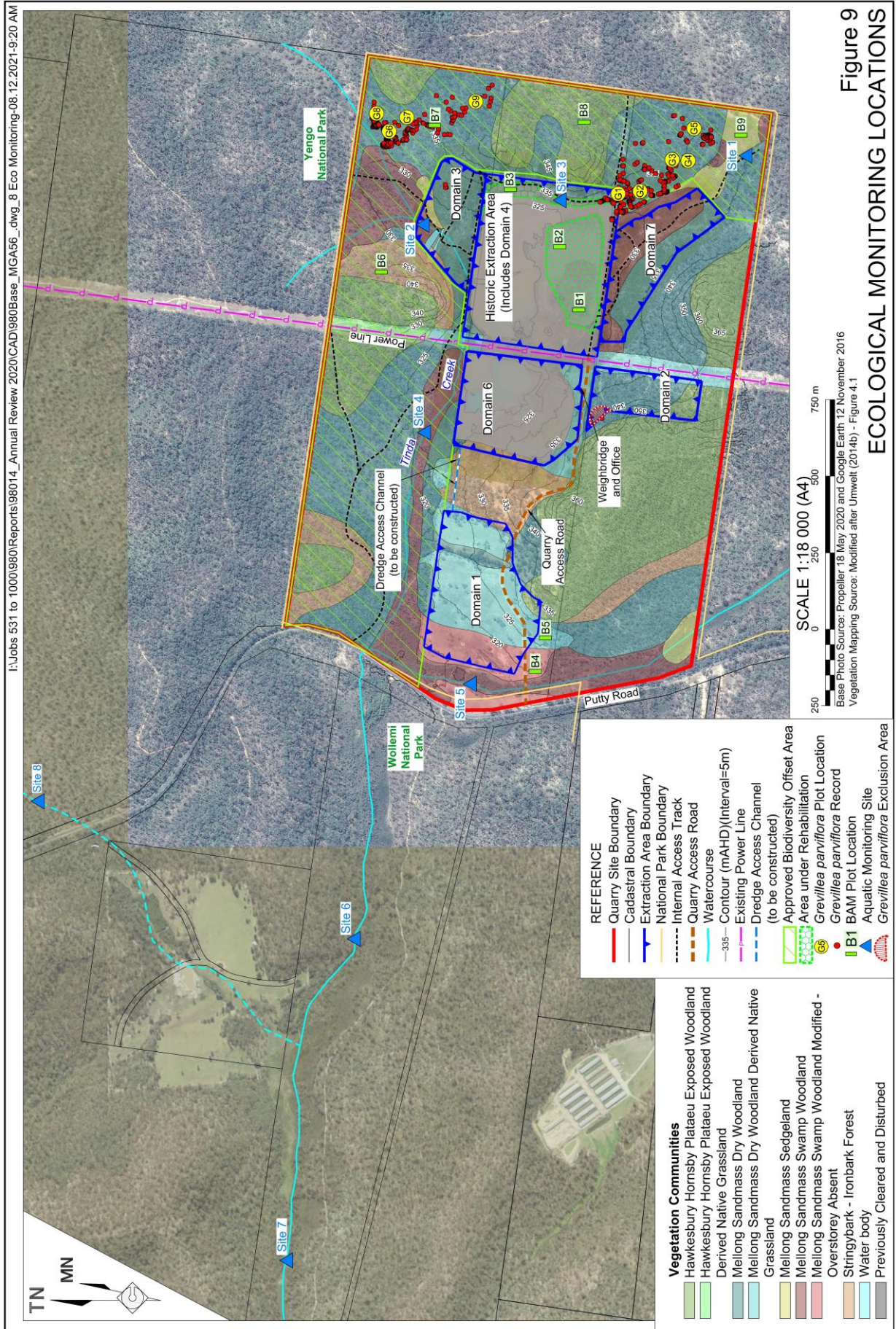


Figure 9
ECOLOGICAL MONITORING LOCATIONS

13.3 KOALA

Koala (*Phascolarctus cinereus*) monitoring will be undertaken bi-annually (every two years) and will include the following specific actions.

- Targeted Spot Assessment Technique surveys.
- Call playback surveys.
- Spotlight surveys.

The results of monitoring will be recorded in a monitoring report which will be prepared annually.

13.4 GREVILLEA PARVIFLORA SUBSP. PARVIFLORA

Monitoring of the Biodiversity Offset Area and the broader Quarry Site will include an assessment of the condition and persistence of small flower grevillea (*Grevillea parviflora* subsp. *parviflora*) specimens. Monitoring for this species will be undertaken during the known flowering period (July to December) and will include the following.

- Stem counts in 9 x permanent plots (G1 to G9).
- Photo monitoring to assist in recording observable changes over time.
- An assessment of habitat quality.

The results of monitoring will be recorded in a monitoring report which will be prepared annually.

13.5 NEST BOXES

Nest box monitoring will be undertaken if and when they are required to be installed to assess the effectiveness of nest boxes as a mitigation strategy for habitat loss. The contents, signs of use and condition of each nest box will be recorded along with an assessment of the effectiveness of the nest box strategy.

The results of monitoring will be recorded in a monitoring report which will be prepared annually.

13.6 VOLUNTARY UNDERTAKING

Hy-Tec entered into a voluntary undertaking (*Undertaking to the Minister for Planning and Environment Given by Aus-10 Rhyolite Pty Ltd*) on 18 December 2017 to promote and report on vegetation growth within an area of historical disturbance within the proposed Biodiversity Offset Area. As part of this undertaking Hy-Tec is required to:

- promote vegetation growth within the affected area either through direct seeding or natural regeneration;
- control unauthorised access;
- report on regeneration of vegetation within affected area; and
- undertake monitoring of *Grevillea parviflora* subsp. *parviflora* within the vicinity of the affected area.

It is noted that the affected area was severely impacted by the Gaspers Mountain Fire in October 2019 as were surrounding areas within the Yengo and Wollemi National Parks. Hy-Tec will internally review ways in which it can improve conditions for local regeneration within the affected area, however, it is considered that management actions would be consistent with those described in the preceding sections for areas within the Biodiversity Offset Area.

Annual visual inspections and reporting will continue to be undertaken within the affected area for a further five years (i.e. until 2025) to demonstrate the progress of natural regeneration. A copy of the “Biodiversity Monitoring Report” is included as **Appendix 3** to this report to demonstrate compliance with the requirement to monitor *Grevillea parviflora* subsp. *parviflora* in the surrounding area.

13.7 AQUATIC MONITORING

Aquatic habitats within the Quarry Site include Tinda Creek and a range of artificial diversion channels and dams. Tinda Creek is an ephemeral watercourse which has been diverted around the eastern and northern boundaries of operational areas via a small earthen drainage channel. Tinda Creek joins with other ephemeral second order streams at the northern boundary of the Quarry Site.

Annual monitoring of aquatic habitat within and downstream from the Quarry Site will be undertaken at 8 x aquatic ecology monitoring sites (A1 to A8) (**Figure 9**) when the creek system contains sufficient water to undertake water quality and macroinvertebrate sampling. The AUSRIVAS Australian Rivers Assessment System (Turak et al. 2004) will be used to describe and measure habitat parameters which will be compared to previous monitoring results and macroinvertebrates and water quality monitoring.

Aquatic monitoring will include the following.

- A record of stream width and a description of edge habitat and riparian vegetation.
- A description of stream features including substrate, vegetation and organic material.
- A record of general site observations, including a description of the catchment and local land uses.

The results of monitoring will be recorded in a monitoring report which will be prepared annually.

14. PERFORMANCE TARGETS AND COMPLETION CRITERIA

14.1 LANDSCAPE MANAGEMENT

The strategic landscape management completion criteria, associated performance targets and monitoring strategy for landscape management are summarised in **Table 11** to align with the objectives outlined in Section 7.

Table 11
Completion Criteria, Performance Targets and Monitoring Strategy – Landscape Management

Page 1 of 2

Objectives	Completion Criteria	Performance Target	Monitoring Strategy
Identify the controls to be implemented to minimise impacts to biodiversity values due to vegetation clearing and remnant vegetation and habitat features.	Survey markers installed at regular intervals around the perimeter of the approved limit of disturbance.	Easily identifiable markers maintained for the life of the Quarry.	Monthly inspections.
	Disturbance of vegetation limited to approved areas.	Monthly inspections completed.	Monthly inspections.
	No significant impacts to threatened flora and fauna species or habitat.	Pre-clearance surveys undertaken, buffer zones maintained and threatened fauna species relocated, as required.	Pre-clearance surveys for threatened flora and fauna species and habitat features as discussed in Section 9.2.3.
		Tree-felling procedure followed as discussed in Section 9.2.4.	Records to be maintained by Quarry Manager.
Achieve a soil profile capable of sustaining the specified final land use.	Soil is stockpiled in accordance with the management measures described in Section 9.2.5.	Soil stockpiles do not exceed 2m in height and are stabilised, as required.	Survey of stockpiles completed.
Establish operational management measures to ensure environmental impacts are minimised.	Access control is maintained to the Quarry Site and rehabilitation areas.	Survey markers are installed and access controlled.	Monthly inspections.
	Exotic weeds or vegetation is not competing or impacting on the intended land use.	There is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m ² in area.	Monthly visual inspections and quarterly inspections / weed management programs.
	Feral pests are not competing or impacting on the intended land use.	Feral pests are not present.	Monthly inspections.
	Sediment-laden runoff is controlled.	Water Management Plan implemented.	Monthly inspections.
	Habitat for fauna is maintained.	Nesting boxes installed, as required and habitat features are salvaged prior to clearing.	Annual surveys.
	Risk of bush fire attack and ignition is minimised.	Fire management measures undertaken in consultation with RFS and NPWS.	As required.
Minimise the size, depth, batter slopes and the drainage catchment of waterbodies in the final landform.	Waterbodies in the final landform are constructed in accordance with the nominated final landform.	The final landform consistent with that presented in Figures 6 and 7 .	Single occurrence inspection post-quarrying.

Table 11 (Cont'd)
Completion Criteria, Performance Targets and Monitoring Strategy – Landscape Management

Page 2 of 2

Objectives	Completion Criteria	Performance Target	Monitoring Strategy
Ensure that the surface area of waterbodies in the final landform is no greater than 16ha in total.	VENM and ENM is imported, as required, to ensure waterbodies in the final landform do not exceed 16ha.	The final landform consistent with Figures 6 and 7 .	Single occurrence inspection post-quarrying.
Ensure that waterbodies in the final landform are separated from the surface water drainage system, unless the Secretary agrees otherwise.	Waterbodies in the final landform are separated from the surface water drainage system.	The final landform consistent with Figures 6 and 7 . Water Management Plan implemented.	Single occurrence inspection post-quarrying.
Ensure watercourses are restored.	The alignment and hydraulic function of watercourses are restored, as far as practical.	The final landform equivalent to Figures 6 and 7 . Water Management Plan implemented.	Single occurrence inspection post-quarrying.
The final landform ensures public safety.	Final landform constructed to ensure public safety through use of signage, safety bunds and other measures.	The final landform is safe to the community.	Single occurrence inspection post-quarrying.

14.2 KOALA MANAGEMENT

The strategic landscape management completion criteria, associated performance targets and monitoring strategy for Koala management are summarised in **Table 12** to align with the objectives outlined in Section 7.

Table 12
Completion Criteria, Performance Targets and Monitoring Strategy – Koala Management

Objectives	Completion Criteria	Performance Target	Monitoring Strategy
Ensure that potential impacts to Koala are minimised.	No significant impacts to Koala or Koala habitat.	Implement tree-felling procedure as outlined in Sections 9.2.4 and 10.2.1.	Monitoring of Koala, as per Section 13.3.
		Install "Koala Warning" and "Injured Wildlife" signs adjacent to Quarry Access Road.	Signs installed.
		Limit speed limit to 20km/h on Quarry Access Road.	Signs installed.
		Rehabilitation targets achieved and monitored to ensure Koala feed trees re-established.	Monitoring undertaken as per Section 13.2.
		Buffer zones maintained.	Monthly inspections.

14.3 REHABILITATION

The strategic rehabilitation completion criteria, associated performance targets and monitoring strategy for rehabilitation are summarised in **Table 13** to align with the objectives outlined in Section 7.

Table 13
Completion Criteria, Performance Targets and Monitoring Strategy – Rehabilitation

Objectives	Completion Criteria	Performance Target	Monitoring Strategy
Ensure that the Quarry Site is safe, stable and non-polluting.	The final landform achieves the nominated design of the EIS or subsequent Rehabilitation Plan.	Completed to the satisfaction of the Secretary.	Survey following completion of landform establishment activities.
	The size, depth, batter slopes and the drainage catchment of the final void are consistent with nominated design of the EIS or subsequent Rehabilitation Plan.		
	The surface area of the final voids is no greater than 16ha in total.		
	Final voids are separated from the surface water drainage system, unless the Secretary agrees otherwise.		
Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native species and habitat, including at least 0.35ha of Mellong Sandmass Sedgeland.	Revegetation within the Quarry Site is generally consistent with the vegetation communities displayed on Figure 8 .	At least 75% of trees are healthy. At least 0.35 of Mellong Sandmass Sedgeland established within Quarry Site.	Monitoring undertaken as per Section 13.2.
Decommission and remove surface infrastructure (unless the Secretary agrees otherwise).	Infrastructure not required for future land use removed.	Completed to the satisfaction of the Secretary.	Survey of infrastructure to be completed.

14.4 BIODIVERSITY OFFSET AREA

The strategic completion criteria, associated performance targets and monitoring strategy for the Biodiversity Offset Area are summarised in **Table 14** to align with the objectives outlined in Section 7.

Table 14
Completion Criteria, Performance Targets and Monitoring Strategy – Biodiversity Offset Area

Objectives	Completion Criteria	Performance Target	Monitoring Strategy
Establish and secure a Biodiversity Offset Area.	Biodiversity Offset Area dedicated to Yengo National Park.	Conservation Agreement established to secure land for conservation.	Monitoring of Koala, <i>Grevillea parviflora</i> subsp. <i>parviflora</i> and nest boxes as per Sections 13.3, 13.4 and 13.5 throughout the life of the Quarry.
Maintain and where possible improve biodiversity values within the Biodiversity Offset Area.	Controlled access to the Biodiversity Offset Area achieved and maintained.	Unauthorised access to the Biodiversity Offset Area is prevented.	Monthly and quarterly inspections and/or weed control programs.
	No significant weed infestation.	There is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m ² in area.	
	Feral animal control.	Site does not harbour feral animals.	Monthly inspections.

15. RISKS TO LANDSCAPE AND REHABILITATION MANAGEMENT AND CONTINGENCY PLANS

15.1 RISK IDENTIFICATION

15.1.1 Rehabilitation

The primary risks to the achievement of the rehabilitation objectives and outcomes (of **Table 11 and 13**) are as follows.

- Biodiversity values are impacted due to vegetation clearing.
- Soil profile is incapable of sustaining final land use.
- Uncontrolled access of the Quarry Site and rehabilitation areas.
- Competition by exotic weed or vegetation species.
- Competition by feral pest species.
- Watercourses alignment and hydraulic function not restored.
- Sediment-laden runoff.
- Unmaintained habitat for fauna.
- Bush fire resulting in the loss of key species and altered composition or formation of the final vegetation community.
- Vegetation communities unhealthy or not self-sustaining.
- Public safety.

Section 15.2 reviews each risk with respect to the achievement of specific performance criteria, and the contingency measures to be applied in each case.

15.1.2 Biodiversity Offset

The primary risks to the achievement of the biodiversity offset objectives and outcomes (of **Tables 11 and 14**) are as follows.

- Adverse effects of quarrying on vegetation community/fauna habitat extent or condition.
- Water that has discharged from the Quarry (runoff) is of poor quality which adversely impacts the biodiversity offset area (BOA).
- Competition by exotic weed or vegetation species.
- Competition by feral pest species.
- Bush fire resulting in the loss of key species and altered composition or formation of the final vegetation community.

Section 15.2 reviews each risk with respect to the achievement of specific performance criteria, and the contingency measures to be applied in each case.

15.2 CONTINGENCY MANAGEMENT

Table 15 reviews each risk to rehabilitation, biodiversity, identifies the relevant performance criteria which could be affected, and nominates contingency management strategies for implementation where performance falls below the nominated measure or indicator (of **Tables 11** to **14**).

Table 15
Risks, Performance Criteria and Contingency Management

Page 1 of 2

Risk	Performance Criteria	Contingency Management
Rehabilitation		
Biodiversity values are impacted due to unapproved vegetation clearing.	No significant impacts to threatened flora and fauna species or habitat outside of areas approved for disturbance.	<ul style="list-style-type: none"> – Monthly inspections completed. – Pre-clearance surveys undertaken, buffer zones maintained and threatened fauna species relocated, as required. – Tree-felling procedure followed as discussed in Section 9.2.4.
Soil profile is incapable of sustaining final land use.	Soil profile is capable of sustaining final land use.	<ul style="list-style-type: none"> – Soil is stockpiled in accordance with the management measures described in Section 9.2.5 – Survey of stockpiles completed. – Soil stockpiles do not exceed 2m in height and are stabilised, as required.
Uncontrolled access of the Quarry Site and rehabilitation areas.	Access control is maintained to the Quarry Site and rehabilitation areas.	<ul style="list-style-type: none"> – Survey markers are installed and access controlled. – Monthly inspections.
Competition by exotic weed or vegetation species.	Exotic weeds or vegetation is not competing or impacting on the intended land use.	<ul style="list-style-type: none"> – Monthly visual inspections and at least quarterly management programs to ensure there is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m² in area. – Commission weed management campaigns / programs. – Results of monitoring are reported in Annual Reviews.
Competition by feral pest species.	Feral pests are not present within the rehabilitation area.	<ul style="list-style-type: none"> – Participation in feral species baiting programs – Monthly inspections. – Results of monitoring are reported in Annual Reviews.
Watercourses alignment and hydraulic function not restored.	Alignment and hydraulic function of watercourses are restored.	<ul style="list-style-type: none"> – Water Management Plan implemented.
Sediment-laden runoff is uncontrolled.	Sediment-laden runoff is controlled to ensure no erosion in rehabilitation area.	<ul style="list-style-type: none"> – Water Management Plan implemented. – Erosion and sediment control measures in place as described in Section 9.3.4.
Unmaintained habitat for fauna.	Habitat for fauna is maintained.	<ul style="list-style-type: none"> – Nesting boxes installed, as required and habitat features are salvaged prior to clearing. – Annual surveys.

Table 15 (Cont'd)
Risks, Performance Criteria and Contingency Management

Page 2 of 2

Risk	Performance Criteria	Contingency Management
Rehabilitation (Cont'd)		
Bush fire resulting in the loss of key species and altered composition or formation of the final vegetation community.	Risk of bush fire attack and ignition is minimised.	– Fire management measures undertaken in consultation with RFS and NPWS as required.
Vegetation communities unhealthy or not self-sustaining.	At least 75% of trees are healthy. At least 0.35 of Mellong Sandmass Sedgeland established within Quarry Site.	– Monitoring undertaken as per Section 13.2.
Public Safety.	The final landform is safe to the community.	– Final landform constructed with signage, safety bunds and other measures.
Local Biodiversity		
Adverse effects of quarrying on vegetation community/fauna habitat extent or condition.	No adverse effects of quarrying on vegetation community/fauna habitat extent or condition	Annual monitoring undertaken and recommendations of monitoring implemented as discussed in Sections 13.3 and 13.4. Nest boxes installed, as required. Persistence of threatened species and their habitat within the Biodiversity Offset Area maintained.
Runoff wWater quality of discharge/runoff from the Quarry adversely impacts the BOA.	Runoff water quality from the site does not adversely impact Biodiversity Offset Area as determined through monitoring.	– Monitoring undertaken in accordance with the approved Water Management Plan. – Results of monitoring are reported in Annual Reviews.
Competition by exotic weed or vegetation species.	Exotic weeds or vegetation is not competing or impacting on the intended land use.	– Monthly visual inspections and at least quarterly management programs to ensure there is no weed infestation greater than exists within the analogue sites and there are no contiguous areas of weeds that are greater than 25m ² in area. – Commission weed management campaigns / programs. – Results of monitoring are reported in Annual Reviews.
Competition by feral pest species.	Feral pests are not present within the rehabilitation area.	– Participate in feral species baiting programs – Monthly inspections. – Results of monitoring are reported in Annual Reviews.
Bush fire resulting in the loss of key species and altered composition or formation of the final vegetation community.	Risk of bush fire attack and ignition is minimised.	– Fire management measures undertaken in consultation with RFS and NPWS as required.

16. REPORTING AND AUDIT REQUIREMENTS

16.1 ANNUAL REVIEW

Hy-Tec must prepare an Annual Review in accordance with *Condition 4* of Schedule 5 of the SSD 4987, by the end of March each year. The report must review the environmental performance of the Quarry, describe the development that was carried out in the previous calendar year and the development that is proposed to be carried out over the current calendar year. A summary of the rehabilitation works, landscape and rehabilitation monitoring outcomes and proposed future rehabilitation works will be included in each Annual Review.

16.2 COMMONWEALTH APPROVAL EPBC 2013/7028

Hy-Tec must comply with the following reporting requirements to satisfy EPBC 2013/7028.

- Hy-Tec must maintain accurate records substantiating all activities and outcomes associated with or relevant to the conditions of the EPBC approval, including measures taken to implement the LMP required by this approval.
- Hy-Tec must publish a report demonstrating compliance with each of the conditions with the conditions of EPBC 2013/7028 within three months of the commencement of the action associated with the project (i.e. by 6 January annually). Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval will also be provided to the Commonwealth Department of Agriculture, Water and Environment (DoAWE) at the same time as the compliance report is published. Hy-Tec will also notify the DoAWE of any non-compliance within five business days of becoming aware of the non-compliance.
- Hy-Tec must publish all management plans within one month of approval.

16.3 INDEPENDENT AUDIT

Condition 9 of Schedule 5 of SSD 4978 requires that Hy-Tec must commission an independent audit of compliance with the conditions of SSD 4978 every three years. The independent auditor must be approved by the Minister prior to the commencement of the audit. The independent audit will include the following.

- A comprehensive review of the monitoring results and complaints recorded over the previous calendar year, which includes:
 - a comparison of these results against the relevant statutory requirements, limits or performance measures/criteria; and
 - the monitoring results of previous years.
- A record of any non-compliances and a description of what actions were (or are being) taken to ensure compliance.
- A review of any trends in the monitoring data over the life of the Quarry.
- An analysis of any discrepancies between the predicted and actual impacts of the Quarry and discussion regarding the potential cause of any significant discrepancy.

17. REVIEW AND IMPROVEMENT

In accordance with Condition 5 of Schedule 5 of SSD 4978, the LMP will be internally reviewed within 3 months of submission of an Annual Review, each independent environmental audit and any modification to SSD 4987 to address feedback from these processes. Should changes to the LMP be required, approval for the modified plan would be sought from DPE.

A comprehensive review of management plans will take place every three years and include review of all management measures to ensure these remain within best practice management. This will ensure the adequacy of these documents and allow for opportunities of adaptive management and continual improvement. This will include a review of landscaping and rehabilitation processes, the overall effectiveness of the LMP and whether it should be modified or scaled back.

18. REFERENCES

Department of Planning, Industry and Environment (2020). *Biodiversity Assessment Method.*

EnviroKey Pty Ltd (2020). *Offset Vegetation, Revegetation and Koala Monitoring Report 2019.*
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R.W. Corkery & Co. Pty Limited (2019). *Water Management Plan.* Prepared on behalf of Aus-10 Rhyolite Pty Ltd.

Turak et al. (2004). *Australian Rivers Assessment System (AUSRIVAS) Sampling and Processing Manual.*

Umwelt (Australia) Pty Limited (2014a). *Environmental Impact Statement for Proposed Expansion of Tinda Creek Sand Quarry.* Prepared on behalf of Aus-10 Rhyolite Pty Ltd.

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Appendices

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- Appendix 1 Government Agency Consultation (24 pages)
- Appendix 2 Koala Plan of Management (26 pages)
- Appendix 3 Offset Vegetation, Revegetation and Koala Monitoring 2020 (58 pages)
- Appendix 4 Biodiversity Offset Extension Request – DPE November 2021 (4 pages)



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Appendix 1

Government Agency Consultation

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Appendix 2

Koala Plan of Management

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Appendix 3

Offset Vegetation, Revegetation and Koala Monitoring 2020

prepared by

EnviroKey Pty Ltd

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Appendix 4

Biodiversity Offset Extension Request – DPE November 2021

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