



Covalent Lithium

Earl Grey Lithium Project

Conservation Plan for
Ironcaps Banksia
Banksia sphaerocarpa var. dolichostyla

EPBC Approval 2017/7950

Covalent Lithium Project					
Document control					
Rev	Originator	Reviewer	Date	Covalent Approval	Date
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1	L Whitley	A Pate	13/1/20	A Pate	13/1/20
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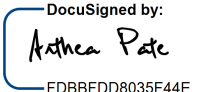
Appendix A Stakeholder Consultation Register



Declaration of Accuracy

I declare that:

1. To the best of my knowledge, all the information contained in, or accompanying this Management Plan (*Earl Grey Lithium Project Conservation Plan for Ironcaps Banksia Banksia sphaerocarpa var. dolichostyla Revision 2*) is complete, current and correct.
2. I am duly authorised to sign this declaration on behalf of the approval holder.
3. I am aware that:
 - a. Section 490 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.
 - b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) where the person knows the information or document is false or misleading.
 - c. The above offences are punishable on conviction by imprisonment, a fine or both.

Signed  FDBBFDD8035F44E...

Full Name Anthea Pate
 Manager Environment and Approvals

Organisation Covalent Lithium Pty Ltd

Date 3/2/2021



1. Introduction

1.1 Project Description

Covalent Lithium (Covalent), a joint venture between Wesfarmers Limited and Sociedad Química y Minera (SQM), are proposing the development of the Earl Grey Lithium Project (the 'Project'), located approximately 105 kilometres (km) south of the town of Southern Cross, in Western Australia. The Project will comprise open cut mining and processing of lithium ore, with transport of a lithium concentrate to an existing port for export to overseas markets or a future potential lithium refinery.

The Project encompasses a total area of 667 hectares (ha) (the 'Development Envelope', Figure 1.1), comprising approximately 386 ha of native vegetation and 281 ha of cleared/disturbed areas from a former mining operation. The additional clearing required for the Project is required for an expansion of the existing mine pit, waste materials landforms and ancillary infrastructure.

The Project was referred under Section 68 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in May 2017 (Covalent Lithium 2017) for assessment of its environmental effects, including to the following 'Listed Threatened Species':

- *Banksia sphaerocarpa* var. *dolichostyla* (Ironcaps Banksia) (EPBC 'Vulnerable')

The Project was subsequently determined by the a delegate of the Federal Minister for the Environment to be a 'Controlled Action' requiring assessment and approval, with approval of the Project under the EPBC Act granted in February 2020 through the EPBC 2017/7950 approval (DAWE 2020).

1.2 Purpose of this Conservation Plan

The Project is expected to remove 2 known individuals of *B. sphaerocarpa* var. *dolichostyla*, with a further 67 known individuals located in close proximity (≤ 50 metres (m)) which may potentially be subject to indirect impacts from the Project.

In order to mitigate direct and potential indirect impacts of the Project to *B. sphaerocarpa* var. *dolichostyla*, Condition 5 of the EPBC 2017/7950 approval (as amended December 2020) requires the preparation and implementation of an 'Ironcaps Banksia Conservation Plan', with the objective to:

- Prevent impacts to *B. sphaerocarpa* var. *dolichostyla*
- Establish at least 69 *B. sphaerocarpa* var. *dolichostyla* plants within the Development Envelope.

This Conservation Plan has been prepared to meet the requirements of Condition 5 of the EPBC 2017/7950 approval for Project impacts to *B. sphaerocarpa* var. *dolichostyla*. The conditions of EPBC 2017/7950 approval are detailed in Table 1.2.

**Table 1.1: EPBC 2017/7950 approval condition requirements**

Condition #	Requirement	Document reference
5	To mitigate significant impacts to the Ironcaps Banksia (<i>Banksia sphaerocarpa</i> var. <i>dolichostyla</i>), the approval holder must prevent impacts to Ironcaps Banksia other than as permitted under Condition 2 and, within 10 years from commencement of the action, establish at least 69 Ironcaps Banksia plants within the development envelope. The approval holder must submit for the Minister's written approval an Ironcaps Banksia Conservation Plan (the Plan) to specify how it will achieve these requirements. The Plan must be prepared consistent with the Department's Environmental Management Plan Guidelines, and must:	This document
a)	to show how the approval holder will prevent impacts to Ironcaps Banksia, other than as permitted under Condition 2:	This document
i.	include maps that clearly show the location of Ironcaps Banksia within the development envelope and in relation to native vegetation to be cleared or otherwise disturbed;	Figure 3.1
ii.	specify the total number and location of each Ironcaps Banksia plant within the development envelope;	Figure 3.1 Section 3.2
iii.	identify potential impacts to Ironcaps Banksia from the action, and describe management measures to avoid and/or mitigate those impacts and corrective actions to be implemented if impacts are detected;	Section 3.3 section 3.4 Table 3.1
iv.	include management triggers for detecting potential impacts to Ironcaps Banksia from the action;	Section 3.5
v.	demonstrate that management measures are consistent with relevant approved conservation advices, recovery plans and threat abatement plans;	Table 1.2
b)	to show how the approval holder will, within 10 years from commencement of the action, establish at least 69 Ironcaps Banksia plants within the development envelope:	Section 3.6
i.	specify a portion of the development envelope, that is contained within an exclusion zone specified in Condition 6-1 of the Western Australian approval, in which Ironcaps Banksia can be established and protected;	Section 4.2
ii.	include shapefiles to clearly define the location and boundaries of the Ironcaps Banksia establishment site (s), coordinates of the boundary points in decimal degrees, and the area of the establishment site (s) in hectares;	Attachment 1
iii.	include establishment criteria for Ironcaps Banksia plants;	Section 4.5 Table 4.2
iv.	include an analysis of the potential risks that may prevent Ironcaps Banksia plants being established and self-sustaining at the proposed establishment site(s);	Section 4.8 Table 4.4
v.	describe management measures to achieve the establishment criteria, and corrective actions to be implemented if establishment criteria have not been, or are unlikely to be, achieved or maintained;	Section 4.3 Section 4.5 Table 4.2
vi.	describe how establishment criteria will be maintained for the period of approval;	Section 4.4 Section 4.5 Table 4.2



Condition #	Requirement	Document reference
c)	include a program that monitors the health of Ironcaps Banksia plants and is designed to detect management triggers and attainment of establishment criteria;	Section 4.7 Section 4.5 Table 4.2 Table 4.3 Section 4.8 Table 4.4
d)	contain a schedule for evaluating and reporting, at least annually, on the health of Ironcaps Banksia plants, the detection of management triggers, progress against establishment criteria, and the effectiveness of management measures; and	Section 4.6 Section 4.5 Table 4.2
e)	include timeframes for implementing corrective actions.	Section 4.8
	The approval holder must not commence the action until the Plan is approved by the Minister in writing. The Plan must be implemented at least until the end date of the period of effect of the approval.	As required

This Conservation Plan has been drafted consistent with the requirements of the DAWE (2014) document '*Environmental Management Plan Guidelines*', the DAWE (2008) document '*Approved Conservation Advice for Banksia sphaerocarpa var. dolichostyla (Ironcaps Banksia)*', as well as having regard to the technical guidance provided by relevant experts in botany, mining and ecological restoration processes. Recovery priorities for this species and the priorities this strategy addresses are described in Table 1.2.

Table 1.2: Offset Strategy alignment with *Approved Conservation Advice for Banksia sphaerocarpa var. dolichostyla*

Recovery Priority	Conservation Plan alignment
Research Priorities	
<ul style="list-style-type: none"> Design and implement a monitoring program, or, if appropriate, support and enhance existing programs. 	A monitoring programme for indirect impacts to individuals and established individuals has been established (Section 3.6 and Section 4.7).
<ul style="list-style-type: none"> More precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes. 	Regional surveys to identify additional locations have assisted in determining <i>Banksia sphaerocarpa var. dolichostyla</i> distribution (Section 2.3). Restoration plan and ongoing monitoring (Section 3.6 and Section 4.7) will assist in determining ecological requirements and impacts of threatening processes.
<ul style="list-style-type: none"> Investigate appropriate fire regimes for Ironcaps Banksia to allow maturation of individuals and promote seed germination. 	Restoration plan and ongoing monitoring (Section 3.6 and Section 4.7) will assist in determining appropriate fire regimes.
Habitat Loss, Disturbance and Modification	
<ul style="list-style-type: none"> Monitor known populations to identify key threats. 	Ongoing monitoring (Section 3.6 and Section 4.7) will assist in determining impacts of threatening processes.
<ul style="list-style-type: none"> Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary. 	Restoration plan and ongoing monitoring (Section 3.6 and Section 4.7) will assist in determining effectiveness of management actions.
<ul style="list-style-type: none"> Minimise adverse impacts from land use at known sites. 	Impact prevention management measures (Table 3.1) will assist in minimising impacts.
<ul style="list-style-type: none"> Identify populations of high conservation priority. 	Regional surveys (Section 2.3) to identify additional locations have identified high conservation priority populations within the Development Envelope.



Recovery Priority	Conservation Plan alignment
<ul style="list-style-type: none"> Ensure mining exploration, mining, road widening and maintenance activities involving substrate or vegetation disturbance in areas where Ironcaps Banksia occurs do not adversely impact on populations. 	Impact prevention management measures (Table 3.1) will assist in minimising impacts.
<ul style="list-style-type: none"> Investigate formal conservation arrangements such as the use of covenants, conservation agreements or inclusion in reserve tenure. 	The restoration site and majority of individuals within Development Envelope have Vegetation Exclusion Zones established (Section 3.2; Table 3.1).
<ul style="list-style-type: none"> Manage any changes to hydrology that may result in changes to the water table levels, increased run-off or salinity. 	Impact prevention management measures (Table 3.1) will assist in minimising impacts.
Fire	
<ul style="list-style-type: none"> Provide maps of known occurrences to local and state Rural Fire Services and seek inclusion of mitigative measures in bush fire risk management plans, risk register and/or operation maps. 	Impact prevention management measures (Table 3.1) will assist in minimising impacts.
Invasive weeds	
<ul style="list-style-type: none"> Identify and remove weeds in the local area, which could become a threat to the species, using appropriate methods. 	Weed surveys have occurred within the Development Envelope and ongoing monitoring (Section 3.6) will occur.
<ul style="list-style-type: none"> Manage sites to prevent introduction of weeds in the local area, which could become a threat to Ironcaps Banksia, using appropriate methods. 	Impact prevention management measures (Table 3.1) will assist in minimising impacts from weeds.
Enable Recovery of Additional Sites and/or Populations	
<ul style="list-style-type: none"> Undertake appropriate seed collection and storage. 	Restoration Plan includes seed collection (Section 4.3.1), as per consultation with DBCA.
<ul style="list-style-type: none"> Investigate options for linking, enhancing or establishing additional populations. 	Restoration Plan includes restoration of a previously disturbed area within a known population (Section 4.2).
<ul style="list-style-type: none"> Implement national translocation protocols if establishing additional populations is considered necessary and feasible. 	The Restoration Plan and associated scientific evidence will support any further translocations.

1.3 Stakeholder Consultation

This Conservation Plan has been informed by consultation between Covalent and external stakeholders and regulators, including DAWE. A composite register of consultation with respect to the protection and restoration of *B. sphaerocarpa* var. *dolichostyla* is provided in Appendix A.

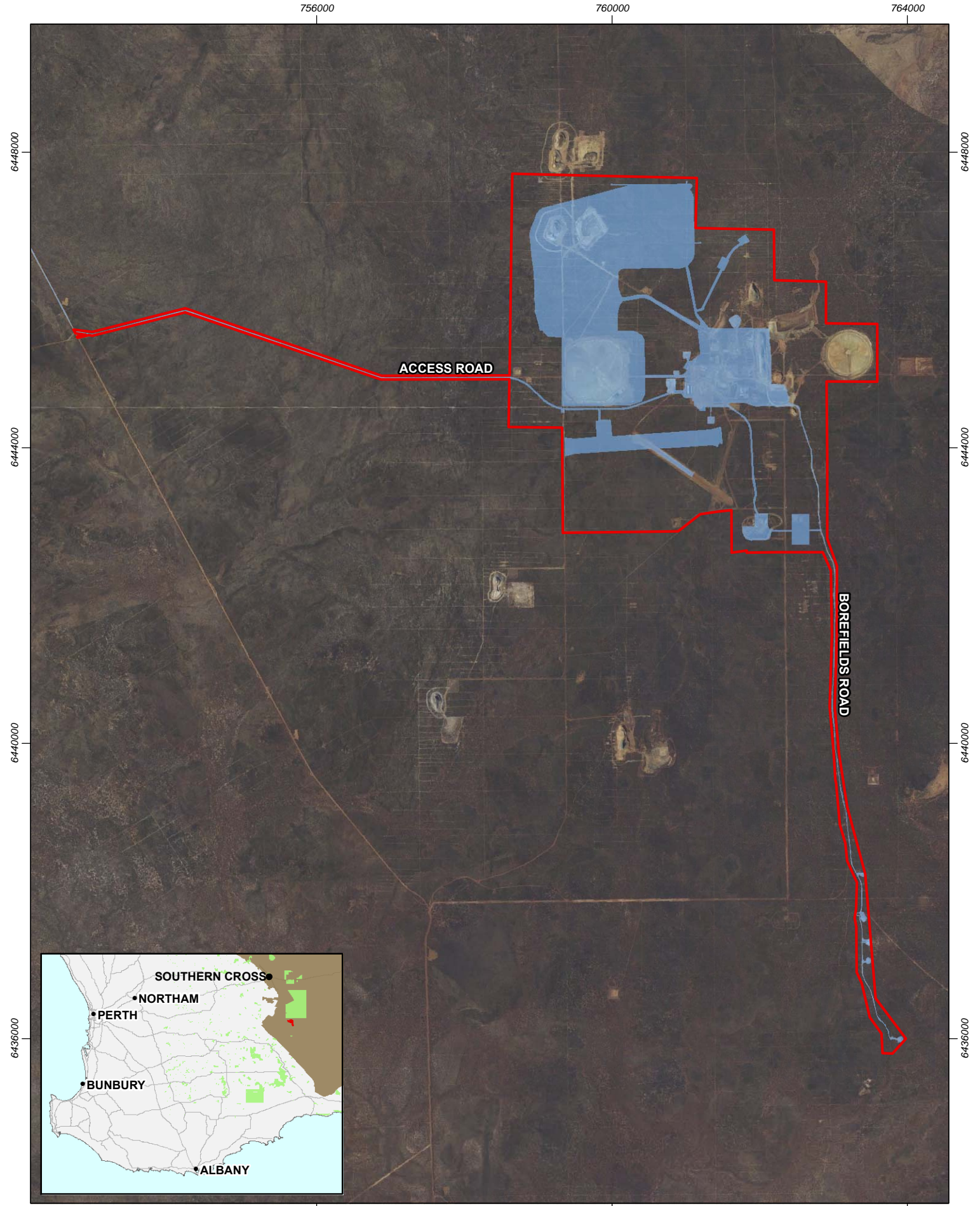


Figure 1.1: Earl Grey Lithium Project Development Envelope

Coordinate System: GDA 1994 MGA Zone 50
Date: 13/11/2020

Legend

- Development envelope
- Greater Western Woodland boundary
- Proposed layout

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2. *Banksia sphaerocarpa* var. *dolichostyla*

2.1 Description

Banksia sphaerocarpa var. *dolichostyla*, also known as 'Ironcaps Banksia', is a dense-canopied shrub or small tree to 4 metres tall with bluish-green and narrowly linear leaves. Flower heads are golden and spherical, and fruiting cones are spherical with often crowded follicles. *Banksia sphaerocarpa* var. *dolichostyla* differs from other related *Banksia* taxa (*B. sphaerocarpa* var. *caesia* and *B. sphaerocarpa* var. *sphaerocarpa*) because of its longer floral whorl and its longer pistil (Brown *et al.* 1998 cited in DAWE 2008).

Images of *B. sphaerocarpa* var. *dolichostyla* are presented in Figure 2.1.



Figure 2.1: *Banksia sphaerocarpa* var. *dolichostyla* Growth Form and Inflorescence (images by Angus D and Gooding H in Strategen 2019)

2.2 Conservation Status

Banksia sphaerocarpa var. *dolichostyla* was declared a Listed Threatened Species of flora at the level of 'Vulnerable' (EPBC-V) under the EPBC Act in July 2000, as assessed using criteria generally consistent with that outlined by International Union for Conservation of Nature (IUCN) (IUCN 2012 as amended). DAWE (2008) has additionally prepared 'Conservation Advice' for *B. sphaerocarpa* var. *dolichostyla* to identify potential threats and outline the key management actions to ensure its long-term conservation.

In addition to the listing under the EPBC Act, *B. sphaerocarpa* var. *dolichostyla* has also been declared as 'Threatened Flora' under the State *Biodiversity Conservation Act 2016* (WA) (under the former *Wildlife Conservation Act 1950* (WA)) (WA Minister for Environment 2018).



2.3 Distribution and Habitat

Banksia sphaerocarpa var. *dolichostyla* has a linear distribution of approximately 70 kilometres, extending from Mount Holland in the north to South Ironcap in the south (Western Botanical 2020). The *Banksia sphaerocarpa* var. *dolichostyla* population comprises >18,300 individuals across 4 locations.

Banksia sphaerocarpa var. *dolichostyla* grows on iron-capped hills and rises on ironstone (lateritic) soil profiles, within associated vegetation of low woodland and low shrubland. Associated vegetation species include *Banksia* spp. and *Allocasuarina* spp. (George 1981, Patrick & Hopper 1982, Taylor & Hopper 1988, Hopper *et al.* 1990, Mollemans *et al.* 1993 and George 1999 all cited in DAWE 2008).

Banksia sphaerocarpa var. *dolichostyla* is one of several variants of the *Banksia sphaerocarpa* group (comprising 6 taxa), which have a broad distribution of approximately 700 km from Geraldton in the north to Albany in the south, and eastwards into the Goldfields region. The *Banksia sphaerocarpa* group occurs across a variety of landforms, vegetation types and soil types.

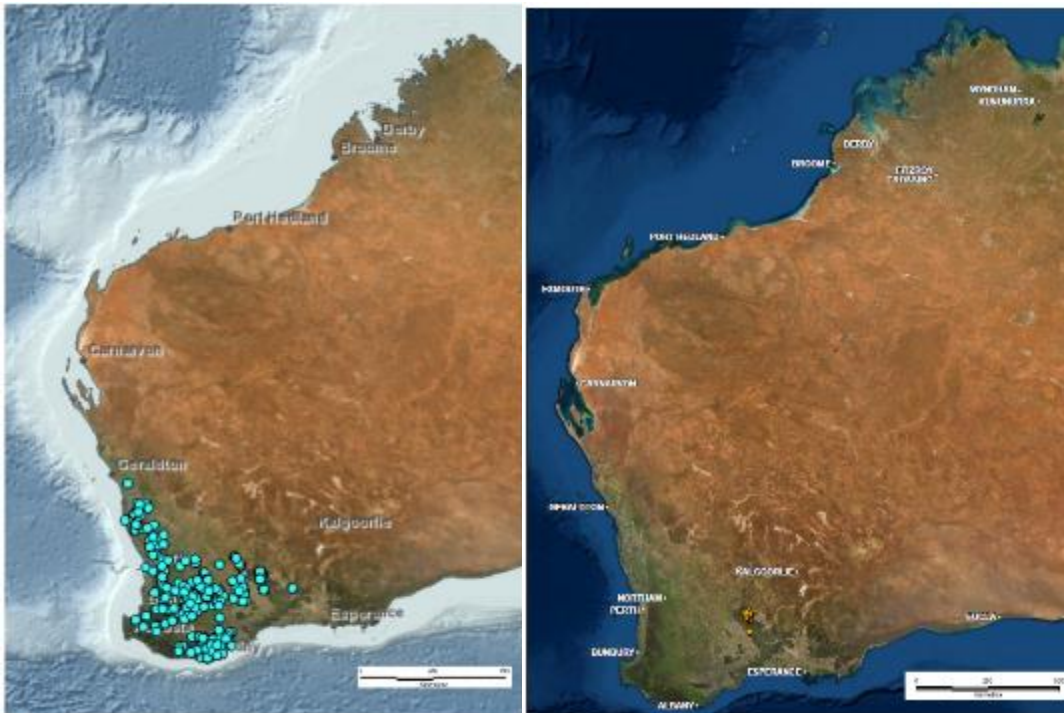


Figure 2.2: *Banksia sphaerocarpa* Group Distribution (left) and *Banksia sphaerocarpa* var. *dolichostyla* Distribution (right) (adapted from DBCA 2020a, 2020b)

2.4 Ecology

As outlined by Covalent Lithium (2019), individuals of *B. sphaerocarpa* var. *dolichostyla* recorded by field surveys were considered generally to be in an 'Excellent' health condition. Individuals ranged from recruiting juveniles though to large mature adult plants and included recruitment within previously burnt and disturbed areas. Based on field observations it was considered *B. sphaerocarpa* var. *dolichostyla* may be a good candidate for restoration in areas with suitable soils. Whilst no previously documented attempts for restoration of *B. sphaerocarpa* var. *dolichostyla* are known, multiple examples of restoration of other taxa in the *Banksia* genus have been well documented



in a variety of habitats (for example, refer to DBCA 2016; Murdoch University 2008, Brundrett *et al.* 2020).

2.5 Threats

The main threats to *B. sphaerocarpa* var. *dolichostyla* include direct removal through mining/exploration, cutting of survey lines, inappropriate fire regimes, weed invasion, changed hydrology, salinisation and fragmentation of locations (Mollemans *et al.* 1993 and NLWRA 2002 both cited in DAWE 2008).

Mining for gold was undertaken at Mt Holland (the site of the Project) between 1988 and 2002, for which the number of *B. sphaerocarpa* var. *dolichostyla* individuals previously removed has not been quantified.

Observations by botanists from Western Botanical (2020 unpublished) and Mattiske (2019) indicated that retained individuals bordering the previous mine operations were in good health; indicating that individuals of *B. sphaerocarpa* var. *dolichostyla* may perhaps be tolerant to indirect impacts from adjacent land disturbance (e.g. dust) and/or that individuals may have a capacity to recover from indirect impacts over time. *Banksia sphaerocarpa* var. *dolichostyla* has been evidenced to re-sprout after fire.



3. Impact Prevention

3.1 Objective

The objective of this section of the Conservation Plan is:

- prevent unauthorised direct and potential indirect effects of the Project to *B. sphaerocarpa* var. *dolichostyla*

Accordingly, the management and monitoring measures proposed by Covalent are to ensure the impact prevention objectives of this Conservation Plan are met.

3.2 Location and Distribution

The Project has been designed to minimise direct and indirect loss of *B. sphaerocarpa* var. *dolichostyla* to the maximum extent practicable. A total of 5,339 individuals of *B. sphaerocarpa* var. *dolichostyla* occur within the 'Development Envelope', of which 5,238 individuals are protected within designated 'Vegetation Exclusion Zones' (VEZ) (excluded from mine operations) for the life of approval.

The VEZ's are a requirement under the Western Australian Ministerial Statement 1118. The VEZs are shown with spatial data on file with the Department of Water and Environmental Regulation (DWER). The Ministerial Statement has the following conditions:

- Ensuring no proposal-related direct or adverse indirect impacts to flora and vegetation within the VEZs
- Ensure a Flora and Vegetation Environmental Management Plan is developed, approved and implemented. The Flora and Vegetation Environmental Management Plan includes trigger and threshold criteria to ensure no proposal-related impact to the VEZs occurs.
- Reporting and investigations of any threshold criteria exceedance of the Flora and Vegetation Environmental Management Plan

The Project is approved to remove at most 2 known individuals within the indicative 'Project Footprint' (clearing area), with a further 67 known individuals located in close proximity (≤ 50 m) which may have the potential to be subject to indirect impacts.

Figure 3.1 identifies the location of the Development Envelope and the indicative Project Footprint in relation to the recorded locations of *B. sphaerocarpa* var. *dolichostyla*. The locations of Vegetation Exclusion Zones for the protection of *B. sphaerocarpa* var. *dolichostyla* are also identified. The locations of each *B. sphaerocarpa* var. *dolichostyla* individuals are detailed in Appendix B.

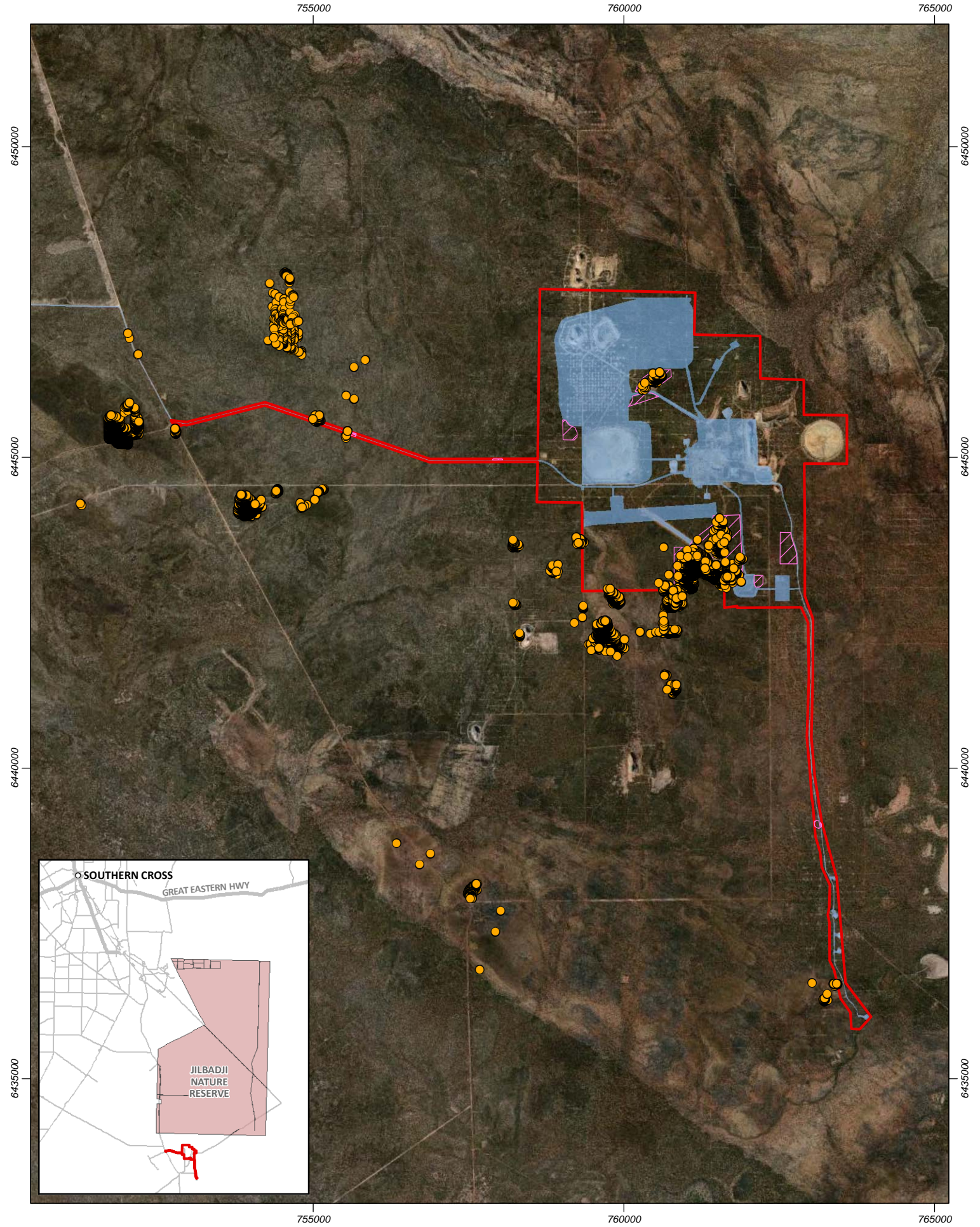

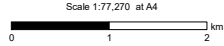







Figure 3.1: Development Envelope, Vegetation Exclusion Zones, Project Footprint and Locations of *Banksia sphaerocarpa* var. *dolichostyla*

 Scale 1:77,270 at A4  Coordinate System: GDA 1994 MGA Zone 50 Date: 2/12/2020	Legend  Development envelope  Proposed layout  Vegetation exclusion zones	Flora species  <i>Banksia sphaerocarpa</i> var. <i>dolichostyla</i>	

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3.3 Potential Impacts

As outlined by the DAWE (2008) document 'Approved Conservation Advice for *Banksia sphaerocarpa* var. *dolichostyla* (Ironcaps Banksia)', the potential impacts (risks) to *B. sphaerocarpa* var. *dolichostyla* relevant to the Project may include:

- Direct effects:
 - clearing for mining operations:
- Potential indirect effects may include:
 - fire
 - introduction / spread of weeds and dieback (*Phytophthora cinnamomi*)
 - changed hydrology / salinisation
 - fragmentation

In addition, assessment of the Project by the State Environmental Protection Authority (EPA) (EPA 2019) identified the potential indirect effects may include:

- dust generation; and
- spills of hydrocarbons or hypersaline water.

Whilst noting 5,339 individuals of *B. sphaerocarpa* var. *dolichostyla* occur within the broader 'Development Envelope', the risk of the Project to *B. sphaerocarpa* var. *dolichostyla* is considered to generally be limited to:

- 2 individuals to be removed (direct effect); and
- 67 individuals in close proximity (≤ 50 m) (i.e. potential indirect effect).

3.4 Management Measures

Table 3.1 identifies the potential impacts, potential risk associated with the management objective to *B. sphaerocarpa* var. *dolichostyla* and proposed management actions to ensure the protection of the retained *B. sphaerocarpa* var. *dolichostyla*.

To note, many of the monitoring and management measures are also applicable to the protection of native vegetation generally.

**Table 3.1: Management Actions for Potential Impacts to the Ironcaps Banksias**

Management Objective	Management Action	Management targets	Monitoring	Risk Rating
Direct Impacts				
No proposal related direct impact to flora and vegetation within a VEZ	Avoidance <ul style="list-style-type: none"> o implementation of an internal clearing permit procedure o implementation of an internal procedure limiting access to VEZs by foot only or only by car where there is an existing track. o VEZs to be delineated with flagging tape, physical barrier, signage or similar to alert all personnel of their location o Inductions of all site personnel to include information on the location of VEZs, management targets, measures and expectations 	<ul style="list-style-type: none"> o No unauthorised clearing within the Development Envelope or VEZs. o No unauthorised access to a VEZ. 	<ul style="list-style-type: none"> o Clearing register. o Survey records of all clearing undertaken during operation of the Project. 	Low – avoidance of VEZ and associated management actions will minimise risk of direct impacts
Indirect Impacts				
Minimise dust deposition on vegetation from mining and related activities	The Proponent will minimise dust deposition on vegetation through: <ul style="list-style-type: none"> o dust suppression on cleared areas o maximise efficiency of loads when transporting ore or concentrate (including haul trucks and conveyers) o use dust covers on machinery and dust suppressants on exposed areas where possible o minimise open area footprint and rehabilitate or cover (using vegetation, rock, water and/or dust suppressant) exposed areas as soon as practicable o design the mine layout to minimise dust emissions to VEZs where practicable 	<ul style="list-style-type: none"> o Dust deposition (present as insoluble solids) at any gauge in excess of 10 g/m²/month. 	<ul style="list-style-type: none"> o Dust deposition rates will be measured monthly using dust deposition gauges for the first 24 months from implementation of the proposal. 	Medium – Whilst dust suppression and minimisation will be implemented, the impacts of dust deposition is unknown.



<p>Minimise spread of weeds / dieback</p>	<p>The Proponent will minimise the risk of introduction of invasive species and spread of dieback through:</p> <ul style="list-style-type: none"> o implementation of a vehicle hygiene procedure, dieback management procedure and weed control o Development Envelope and VEZs will be surveyed for weeds periodically, so that any infestations of invasive species that establish can be eradicated before the plants can flower and set seed o Phytophthora (dieback) controls including signage, cleandown points, vehicle hygiene shall be implemented. 	<ul style="list-style-type: none"> o Minimise new weeds introduced to site. o Prevent spread of weeds to VEZs. o Prevent spread of dieback onsite. 	<ul style="list-style-type: none"> o Annual weed monitoring across Development Envelope. o A Dieback Management Plan will be produced and provided to DBCA, following the completion of baseline monitoring. o Dieback monitoring programme to be developed. o Quarterly observations of plant health on commencement of Proposal for first 12 months. Following the development of a strong dataset over this period, the monitoring methodology, frequency and monitoring sites will be reviewed. o Quarterly health monitoring at vegetation quadrats within VEZs and control sites to include observations for weeds and if the presence of weeds is having a potential indirect impact. 	<p>Low – currently 16 weeds have been identified across the Development Envelope, with no significant impact to <i>B. sphaerocarpa</i> var. <i>dolichostyla</i>. The management actions are considered sufficient to minimise the risk of weed impacts.</p>
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Management Objective	Management Action	Management targets	Monitoring	Risk Rating
Avoid alteration of fire regimes	<p>The Proponent will contribute to fire management at the mine site and in the region through the following measures:</p> <ul style="list-style-type: none"> o Internal procedures to prevent fires and manage the occurrence of fires due to operational activities (emergency response team, automated fire extinguishers on equipment, personnel trained to use firefighting equipment). o implement fire management procedures (e.g. maintenance of fire breaks, Hot Work Permit system, firefighting training, Emergency Response Plan) o firefighting equipment will be located on site and in vehicles o lightning protection equipment will be installed as part of Project design where necessary o coordination with DBCA and Department of Fire and Emergency Services (DFES) to undertake prescribed burns. 	<ul style="list-style-type: none"> o Prevent fires attributed to mining and associated Project activities. 	<ul style="list-style-type: none"> o Incident reports of fire. o Quarterly observations of plant health on commencement of Proposal for first 12 months. Following the development of a strong dataset over this period, the monitoring methodology, frequency and monitoring sites will be reviewed. 	<p>Low – fire management actions are considered sufficient and anecdotal evidence indicates <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> seeds germinate after fire.</p>



Management Objective	Management Action	Management targets	Monitoring	Risk Rating
Avoid alteration surface hydrology	<p>The Proponent will ensure the appropriate design of infrastructure including:</p> <ul style="list-style-type: none"> ○ Drainage measures designed and constructed to minimise changes to natural surface water flow, including diversion drains, rock cladding and contouring as required. ○ Rehabilitation and closure to follow contours of natural landforms 	<ul style="list-style-type: none"> ○ Prevent changes to surface water hydrology attributed to mining and associated Project activities. 	<ul style="list-style-type: none"> ○ Quarterly observations of plant health on commencement of Proposal for first 12 months. Following the development of a robust dataset over this period, the monitoring methodology, frequency, and monitoring sites will be reviewed. ○ Quarterly health monitoring at vegetation quadrats within VEZs and control sites 	<p>Low – an absence of drainage lines which <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> may be reliant upon minimises the risk of impact.</p>



3.5 Management Triggers

Management triggers have been established as shown in Table 3-2 with corrective actions to be taken if they are exceeded.

Where monitoring indicates that unauthorised impacts to *B. sphaerocarpa* var. *dolichostyla* are not being avoided (or are unlikely to be), Covalent will implement additional actions which may include (as appropriate):

- Report internally as a Management Trigger in accordance with internal procedures (within 24 hours of identification to the Covalent Environment Manager).
- Notification to DAWE and other stakeholders if considered a non-compliance or incident (potential to impact on *B. sphaerocarpa* var. *dolichostyla*) (as per Condition 13) within two business days of identification. Further details of the non-compliance or incident are to be provided within ten business days.
- Review monitoring data;
- Review management strategies and implement changes to prevent future occurrences, which will include:
 - Investigation (to identify cause) is completed within 21 days;
 - Audit and review of training and staff inductions (i.e. increase in staff training and awareness on vegetation exclusion zones, legislative requirements, appropriate clearing procedures; and
 - Review and upgrade signage/delineation.
- Review/update of management and monitoring measures/frequency;
- Establish additional *B. sphaerocarpa* var. *dolichostyla* in a VEZ to offset additional impacts, at a 35:1 ratio;
- Reporting of monitoring outcomes against Management Targets with Annual Compliance Report to DAWE (as per Condition 12) within 12 months following date of commencement;
- Revise this plan and submit the revised plan for EPBC Act approval; and



Table 3-2: Management triggers and actions

Management targets	Management trigger	Corrective action	Management trigger justification
<p>No unauthorised clearing within the Development Envelope or VEZs. No unauthorised access to a VEZ</p>	<ul style="list-style-type: none"> • Vegetation clearing without an authorised internal permit within the Development Envelope, but outside of the VEZs • Unauthorised access by personnel to a VEZ 	<ul style="list-style-type: none"> • Report internally as Management Trigger Exceedance in accordance with internal procedures (within 24 hours of identification to the Covalent Environment Manager). • Review proximity of potential disturbance within/to VEZ. • Should disturbance or potential impact occur to <i>B. sphaerocarpa var. dolichostyla</i> as a result of Management Trigger Exceedance, report to DAWE within two business days of identification with further details within 10 business days • Complete investigation within 21 days of identification • Review management strategies and implement changes to prevent future occurrences. Further management measures to be considered will include: <ul style="list-style-type: none"> ◦ Review and upgrade VEZ signage/delineation where appropriate ◦ Audit and review of training and staff inductions (ie. Increase in staff training and awareness to include information on VEZ's, legislative requirements, appropriate clearing procedures) ◦ Ground disturbance permit training competency training ◦ Undertake rehabilitation of unauthorised clearing (ie disturbance from vehicle tracks, vegetation clearing) by appropriately qualified personnel as required, in accordance with rehabilitation procedure. 	<p>The means by which a direct proposal related impact may occur to a VEZ is vegetation clearing. If clearing occurs which has not received an approved internal clearing permit within the Development Envelope, but outside of the VEZ, it is considered a non-compliance or failure of the procedure which is in place to prevent vegetation clearing of the VEZs. Similarly, if personnel access a VEZ without authorisation, it also represents a failure in the procedure and permit to control access to the area.</p>

**Table 3-2: Management triggers and actions**

Management targets	Management trigger	Corrective action	Management trigger justification
Minimisation of dust emissions	Dust deposition results at a single VEZ site exceeds 5 g/m ² for two consecutive months.	<ul style="list-style-type: none"> • Report internally that Management Trigger Exceedance has been met in accordance with internal procedures (within 24 hours of identification to the Covalent Environment Manager). • Should disturbance or potential impact occur to <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> as a result of Management Trigger Exceedance, report to DAWE within two business days of identification with further details within 10 business days • Complete investigation within 21 days of identification • Investigate and determine improvement strategy • Investigate the cause of the exceedance to determine if it is attributable to proposal related activities. • Review dust monitoring program. Determine whether the changes observed in the VEZ are comparable with control monitoring sites. • Review dust mitigation measures 	Whilst 10 g/m ² a month is the adopted management target for dust deposition, adopting an early response trigger limit will identify trends of increasing dust emissions. Also, managing dust deposition to 5 mg/m ² or less will reduce the risk of dust deposition leading to a decline in plant health or function.

**Table 3-2: Management triggers and actions**

Management targets	Management trigger	Corrective action	Management trigger justification
Minimise new weeds introduced to site	One new weed species sighted during annual monitoring but with limited to negligible coverage.	<ul style="list-style-type: none"> • Report internally that Management Trigger Exceedance has been met in accordance with internal procedures (within 24 hours of identification to the Covalent Environment Manager). • Should disturbance or potential impact occur to <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> as a result of Management Trigger Exceedance, report to DAWE within two business days of identification with further details within 10 business days • Complete investigation within 21 days of identification • Review weed monitoring and control program and amend as required. Response actions to be considered will include the following: <ul style="list-style-type: none"> ◦ Review monitoring frequency (quarterly for initial 12 months then annually), adjust accordingly. ◦ Adjust timing of monitoring if appropriate, so that infestations of invasive species that establish can be eradicated before the plants can flower and set seed. ◦ Review suitability of weed monitoring locations, adjust accordingly. ◦ Determine whether the changes observed are comparable with control monitoring sites. ◦ If after the two consecutive monitoring events, a threshold exceedance has not been identified, resume standard monitoring. ◦ Develop and implement of a Weed Management Plan ◦ Staff training and awareness to include information on weed species and preventative measures such as vehicle/ weed hygiene procedures. ◦ Undertake further weed control 	<p>The potential for indirect effect on the health of <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> due to weed impacts is currently unknown as impacts to populations have not been quantified.</p> <p>As population monitoring data is gathered, trending will indicate any threats (including weeds) and acceptable population changes.</p> <p>In the interim, the Management Trigger has been established to identify trends with relation to weeds that could result in a potential indirect impact to <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> and provide an indication if the management actions require review.</p>



Table 3-2: Management triggers and actions

Management targets	Management trigger	Corrective action	Management trigger justification
Prevent fires attributed to mining and associated activities	A fire occurrence within the Development Envelope that impacts on native vegetation.	<ul style="list-style-type: none"> • Report internally that Management Trigger Exceedance has been met in accordance with internal procedures (within 24 hours of identification to the Covalent Environment Manager). • Should disturbance or potential impact occur to <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> as a result of Management Trigger Exceedance, report to DAWE within two business days of identification with further details within 10 business days • Complete investigation within 21 days of identification • Internal audit of fire management plan • Review fire mitigation strategies to limit spread of fire. • Staff training and awareness to include information on the prevention and management of fires. • Investigate the cause of the exceedance to determine if it is attributable to proposal related activities. 	The management actions are considered sufficient to prevent fire impacts to the VEZs. However, in the event a fire occurs within the Development Envelope that impacts on native vegetation, this is an indicator that further refinement of the management actions is required.



3.6 Monitoring

Table 3.1 specifies monitoring that will be undertaken of the health condition of retained *B. sphaerocarpa* var. *dolichostyla*, as well as dust deposition and weed monitoring within the Development Envelope and surrounds. The monitoring program will include monitoring of plant condition, dust deposition and weed monitoring in order to:

- determine if there are any changes occurring to flora and vegetation condition and health in the VEZs
- assess whether any changes in flora and vegetation are due to the Project or external/natural factors
- provide a methodology for ongoing monitoring to enable time-based comparisons.

3.6.1 Plant condition monitoring

Plant condition monitoring to provide a qualitative assessment of the vegetation condition will be undertaken at permanent representative sites within the VEZs and control sites away from any proposal related indirect effects. Each monitoring site will consist of a quadrat 10 m by 40 m arranged linearly with four sub quadrats of 10m x 10m, thereby providing an area equivalent to 20m x 20m and conforming to the recommended quadrat size for the bioregion (EPA Technical Guidance 2016).

The GPS coordinates of approximate quadrats is provided in Table 3-3 and shown by Figure 3.2.

Table 3-3: Monitoring quadrat GPS coordinates

Site #	Type - Pair	Vegetation Community	Dust gauge (Y/N)	Easting	Northing
1	Control - A	W7	N	763363	6443557
2	Impact - A	S1	Y	762678	6443570
3	Control - B	H1	N	761675	6442044
4	Impact - B	W9	N	761794	6443696
6	Impact - C	CL	N	761111	6444662
7	Control - D	Unknown	Y	760130	6451461
8	Impact - D	W13	Y	760120	6444511
9	Impact - E	S3	Y	760476	6446242
10	Control - E	S3	Y	761102	6443126
11	Control - F	W9	Y	761652	6441960
12	Impact - G	W13	N	761457	6443963
13	Control - H	W5	N	758853	6443230
14	Impact - F	W9	Y	761826	6443962
15	Control - G	W5	N	760469	6442964
16	Impact - H	W6	Y	755088	6445627
17	Control - I	Unknown	N	758514	6454004
18	Impact - I	W4	Y	757942	6444937
19	Control - J	W11	N	760666	6442241
20	Impact - J	W11	N	759552	6442928



Within each sub-quadrat, the following will be recorded:

- All plant species, both native and alien, present (this will allow for diversity calculations to be made and compared temporally). A specimen of all plant species recorded is to be collected for verification;
- The average height of each species present; and,
- The percentage foliage cover (dead / alive) of each species.

In addition, a minimum of five (dominant/keystone) species have been tagged, and the following information recorded for each specimen:

- Plant condition score, based on the scales in Table 3-4 and Table 3-5;
- Photographic record (taken from the north side of the quadrat to maintain temporal consistency);
- Reproductive status (vegetative, flowering, fruiting); and,
- Plant height and width.

A minimum of 20 plants will be individually tagged and scored within each quadrat. Conservation significant flora species have been tagged and where possible, the same species have been tagged in each of the sub-quadrats to provide for sample replication.

The visual assessment of a range of parameters to assist in determining plant condition score, is based on a stem classification system which has been used by Mattiske Consulting Pty Ltd on numerous projects, together with a modification of the method of Souter *et al.* (2010), to provide for visual assessments of a range of other characters. The range of visual characters used to assess plants has been designed to reduce inter-operator error when making assessments in the field.

Plant condition will be primarily measured by determining the extent and density of the foliage on the plant, or the crown cover of a tree (Table 3-5). In addition, a range of attributes will be scored to standardise the visual assessment process. Some of the attributes are positive, in terms of plant condition – signs of reproduction or new foliage growth. Some of the attributes are negative, in terms of plant health – increasing levels of leaf discolouration and death, insect damage. The attributes to be scored are:

- Leaf die-off
- New tip growth
- Reproductive state
- Epicormic growth
- Insect damage

These attributes will be assessed using the scale set out in Table 3-4.

Table 3-4: Attributes scale

SCORE	DESCRIPTION
0	Absent - effect is not present
1	Scarce - effect is not obvious in a cursory examination, but is present.
2	Common - effect is clearly visible
3	Abundant - effect dominates the appearance of the shrub / tree

Table 3-5: Plant condition scoring

CONDITION	FACTORS
Healthy (score = 4)	<ul style="list-style-type: none"> • > 90% of foliage present • canopy is intact



CONDITION	FACTORS
	<ul style="list-style-type: none"> • if a tree, then no epicormic growth present • none or little indication of leaf discolouration or loss • none to minor evidence of insect damage, no fungal or other pathogen attack
Slightly stressed (score = 3)	<ul style="list-style-type: none"> • 75% - 90% of foliage present • some minor canopy loss • if a tree, then no epicormic growth • minor evidence of leaf discolouration; potentially some dead leaves on branch tips • minor evidence of insect damage, fungal or other pathogen attack
Stressed (score = 2)	<ul style="list-style-type: none"> • 50% - 75% of foliage present • moderate canopy loss • if a tree, then none to some epicormic growth evident • evidence of leaf discolouration; evident damage to leaves significant • evidence of insect, fungal or other pathogen attack obvious
Very stressed (score = 1)	<ul style="list-style-type: none"> • < 50% of foliage present • major canopy loss • if a tree, then epicormic growth likely • leaf discolouration significant; evident damage to leaves significant • evidence of insect, fungal or other pathogen attack obvious
Dead (score = 0)	<ul style="list-style-type: none"> • plant dead • foliage may present, but is brown and desiccated. If a tree then the bark is still attached (DR – dead recent) • foliage is absent, fine twigs still present. If a tree bark may be present (DM – dead moderate) • foliage and fine twigs absent. If a tree the bark is also absent (DO- dead old)

The condition of the vegetation in each quadrat will also be assessed, based on the vegetation condition scale of Trudgeon (1988), for assessment of disturbance within the Eremaean and Northern Botanical Provinces. The disturbance scale is set out in Table 3-6.

Table 3-6: Vegetation condition scale (adapted from Trudgeon, 1988)

VEGETATION CONDITION	DESCRIPTION
Excellent (Ex)	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very Good (VG)	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good (G)	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor (P)	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Degraded (D)	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely Degraded (CD)	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.

Baseline plant condition monitoring will consist of two baseline monitoring events conducted prior to commencement of construction and operations in spring and summer. On commencement of



the action, plant condition monitoring will be undertaken quarterly for the first 12 months during construction and operations. The data gained over this period will be used to review monitoring and inform the methodology and frequency of future monitoring. Should triggers be exceeded at any point, monitoring intensity shall be reviewed, and potentially increased and remain increased until such time as the trigger is no longer exceeded.

The mean condition monitoring scores will be compared across species and sites and appropriate statistical analysis undertaken to determine if there is a statistically significant difference between VEZs and control sites.

3.6.2 Plant health monitoring

The use of a plant pigment efficiency analyser (PEA) is an increasingly accepted method of determining plant health and function within the mining, forestry and agricultural industries. The PEA records a score of between 0.0 to 1 for Fv/Fm (index of chlorophyll inflorescence) with most plant taxa being considered healthy within a range of 0.7 to 0.8 (Kalaji et al 2014). When plants are experiencing stress, the ratio may decline and potentially represent a reduction in physiological function or healthy function of the plant. To date, it has generally been accepted that a Fv/Fm score of <0.6 in most regions is an indicator a plant is stressed.

Within or adjacent to each of the monitoring quadrats detailed by section 3.6.1, 25 plants (five from each keystone species) will be selected for testing with a PEA. Given control sites will be monitored, the requirement for monitoring prior to commencement of construction and operations is not considered necessary. As per section 3.6.1, monitoring will initially be undertaken quarterly following implementation of the action for the first 12 months to generate a robust dataset. For each monitoring event, the mean of each species Fv/Fm ratio will be compared between VEZs and control sites and appropriate statistical analysis used to determine if a significant difference is apparent. After the first 24 months the dataset will be reviewed and used to inform future monitoring requirements.

3.6.3 Dust monitoring

Dust deposition rates will be measured with dust deposition gauges (DDGs) in accordance with AS/NZS 3580.10.1:2003. Data will be recorded monthly, commencing prior to construction or production enabling a baseline level to be established.

Nine DDGs will be installed at the select monitoring quadrats as detailed by Table 3-3 and shown by Figure 3.2. This will enable a comparison of results between VEZs and control sites and assist with determining any proposal related indirect effects.

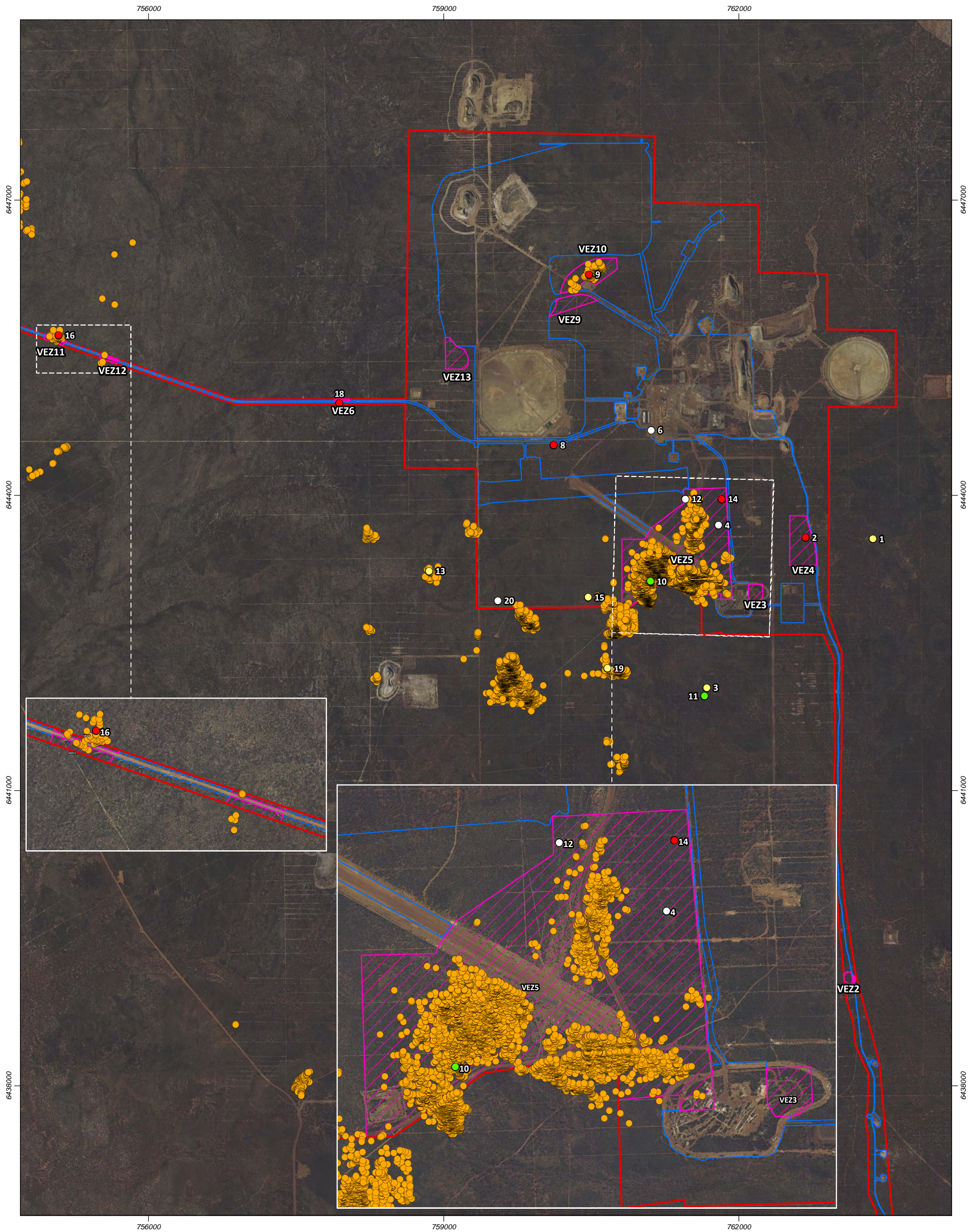
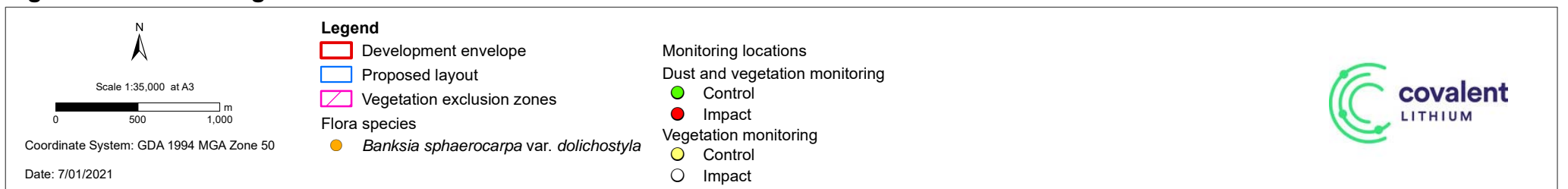


Figure 3.2: Monitoring locations



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4. Restoration Plan

4.1 Objectives and targets

The objective of this section of the Conservation Plan is to:

- Within 10 years of Project commencement, establish at least 69 *B. sphaerocarpa* var. *dolichostyla* plants within the Development Envelope to mitigate significant impacts to the species

The Restoration Plan is designed to mitigate approved direct indirect impacts of the Project on *B. sphaerocarpa* var. *dolichostyla*. Accordingly, the implementation of the management measures and monitoring by Covalent can be expected to ensure the restoration objectives of this Conservation Plan are met.

4.2 Establishment Site

Restoration of *B. sphaerocarpa* var. *dolichostyla* will be undertaken within land currently part of an airstrip in the vicinity of the Project (approximately 3 ha), as identified by Figure 4.1. The airstrip is proposed to be decommissioned, with the southern end to be used for the restoration of *B. sphaerocarpa* var. *dolichostyla* individuals ('Establishment Site').

This Establishment Site has been selected as it is currently cleared and bordered on either side by remnant vegetation in which individuals of *B. sphaerocarpa* var. *dolichostyla* naturally occur. Based on the mapped distribution, it is considered likely that *B. sphaerocarpa* var. *dolichostyla* previously occurred within the area of the airstrip (and as such, indicating that the underlying soil types may be suitable).

The new individuals of *B. sphaerocarpa* var. *dolichostyla* to be established through the restoration process will contribute towards the existing number of naturally occurring individuals at this location and reduce the current fragmentation between individuals caused by the airstrip.

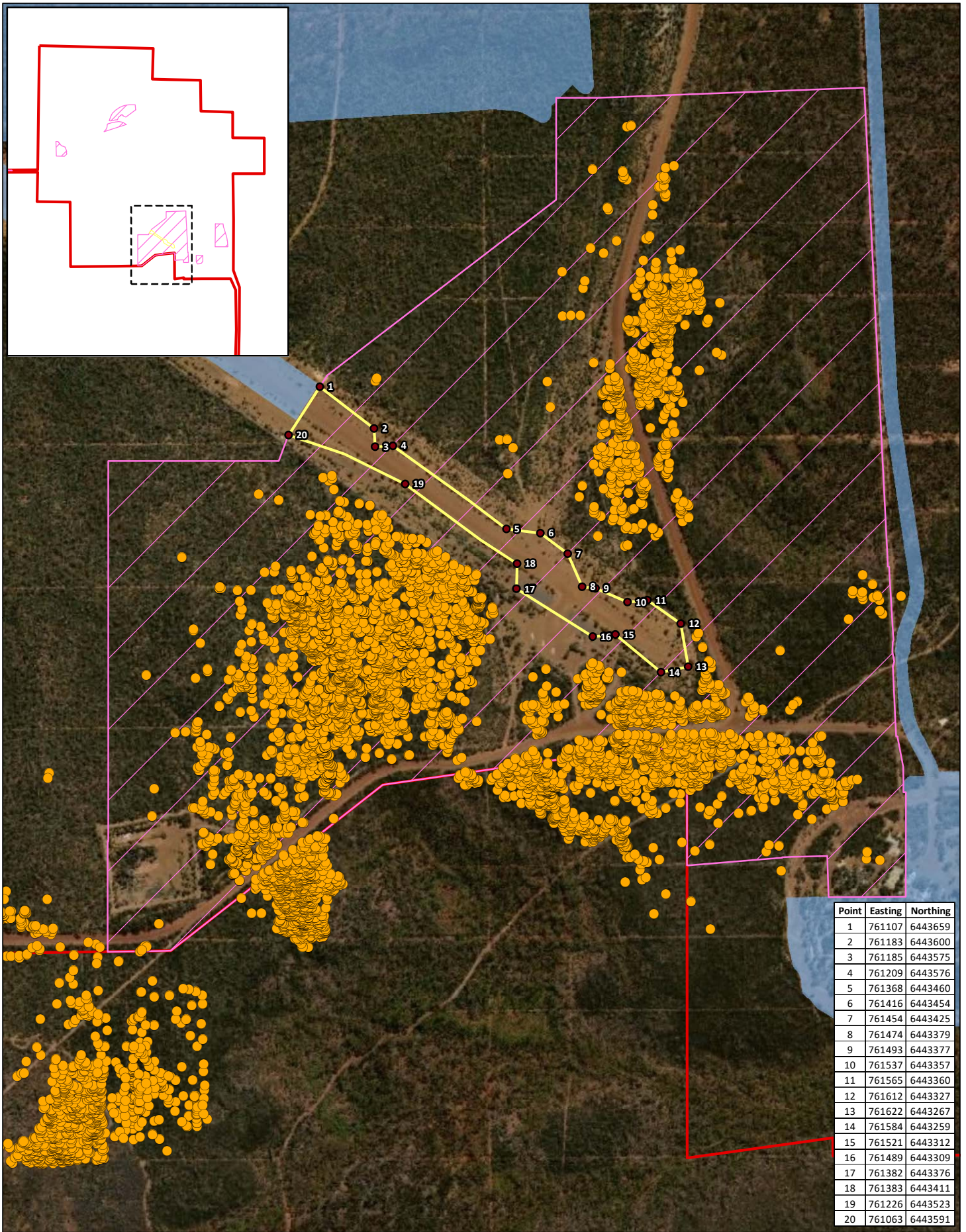
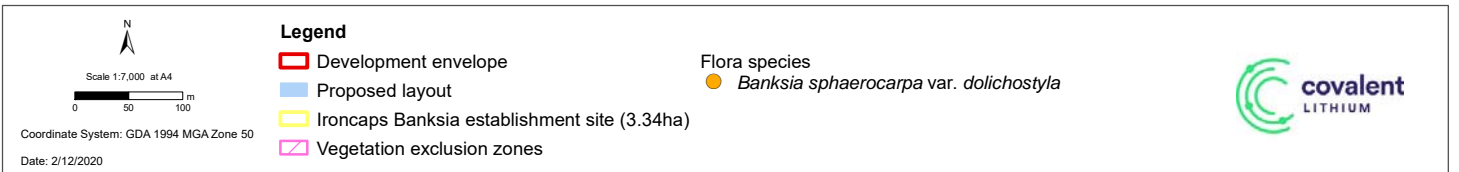


Figure 4.1: *Banksia sphaerocarpa var. dolichostyla* Restoration Site and Vegetation Exclusion Zone



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4.3 Restoration Methodology

Generally, the restoration methodology for *B. sphaerocarpa* var. *dolichostyla* will involve a combination of both direct seeding and the planting of seedlings (tubestock); with the combination of both options expected to provide the best opportunity for successful restoration.

The Establishment Site will be within an existing disturbed area, with a 'staged approach' to the works whereby seeds will be collected (Year 1), then the site will be rehabilitated with native vegetation and *B. sphaerocarpa* var. *dolichostyla* (Year 2+).

The Establishment Site will be fenced to minimise the risk of herbivorous grazing (rabbits and kangaroos) and irrigated with fresh water to aid in the establishment of *B. sphaerocarpa* var. *dolichostyla* seeds/seedlings. The fence will be sufficient to exclude rabbits and kangaroos, therefore may be up to 2 m in height with lapwiring to prevent rabbit access. Fencing will be maintained until Establishment Criteria is met.

4.3.1 Plant Material

Seeds will be collected from naturally occurring individuals located within adjacent Vegetation Exclusion Zone (Figure 4.1, being nominally $\leq 500\text{m}$ of the Establishment Site). The use of seeds from the adjacent naturally occurring individuals will ensure consistent genetic structuring between the restored individuals and the adjacent naturally occurring individuals. Adequate supply of viable seed is available from naturally occurring individuals adjacent to the restoration site.

Seeds will be collected under DBCA Licence TFL 3-1920 (DBCA 2019) (or equivalent) granted under the State *Biodiversity Conservation Act 2016* (WA), with a target of between 500 to 1,000 seeds to be collected. Details of seed usage are included in Table 4.1. Seed will be collected from multiple individuals (≥ 50 individuals) to ensure genetic variation/representation. As identified by Western Botanical (2020), *B. sphaerocarpa* var. *dolichostyla* adjacent to the Establishment Site have been observed to be carrying significant amounts of fully formed fruits containing follicles with up to one seed per follicle; such that it is believed there is a sufficient natural seed resource available to supply the restoration. Routine testing by the State Department of Biodiversity, Conservation and Attractions (DBCA) has indicated the seed to have good viability (pers. comm. Crawford A (Dr.) of DBCA cited in Western Botanical 2020).

Subject to the number of seeds collected, a proportion of the seeds will be germinated into seedlings by a reputable seedling nursery and grown to approximately 1 year of age prior to planting. The remainder of the seed will be temporarily stored, with the seeds to be broadcast/planted later at the same time as the seedlings.

Seed collection and the germination of seedlings will be undertaken over a number of years (minimum 2 years, subject to the initial success of establishment), to enable an ongoing supply of seeds and seedlings should supplementary planting be necessary to achieve the restoration outcome and/or to meet contingency commitments.

Table 4.1: Seed collection

Purpose	Number of seeds
Target Tubestock	400
Target Direct Seeding	400
Additional seeds allowing for 80% germination rate	270
Target DBCA TFSC Seed Lodgement	270
Total	1,340



4.3.2 Site Preparation

Restoration of *B. sphaerocarpa* var. *dolichostyla* will be undertaken within land currently part of an airstrip, which will be decommissioned during implementation of the Project. The Establishment Site will be prepared by the following general methodologies (in sequential order):

- Removal of the airstrip hardstand materials (bitumen and gravel);
- Deep cross-hatch ripping of the subsoil to break-up any existing sub-soil compaction and facilitate water infiltration (consistent with the approach outlined by Western Botanical 2020);
- Import and spreading of topsoil/subsoil mix from recently cleared areas from the Project to provide a growth medium and initial seed store (ideally this material will be direct transfer following clearing, without temporary stockpiling);
- Establishment and operation of the irrigation system (design to be confirmed as either broadcast spray or drip-feed); and
- Signposting of the remainder of the boundary of the Restoration Site to minimise the risk of inadvertent access into the Restoration Site by personnel or machinery.

To note, subject to seed availability and resources, additional broadcast seeding (of multiple flora taxa) will be undertaken within the Establishment Site to supplement the initial soil-stored seed in the topsoil/subsoil material.

4.3.3 Seeding and Seedlings

Seeds will either be broadcast seeded, or physically planted in a randomised pattern (not plantation rows), subject to the availability of the collected *B. sphaerocarpa* var. *dolichostyla* seed resource. The number of seeds broadcast/planted will be noted to assist in latter assessment of the seeding germination rate.

Each restored individual of *B. sphaerocarpa* var. *dolichostyla* (whether from a planted seedling or germinated seed) will be field marked with a numbered stake to allow for ease of field identification and data collection. Planted seedlings will be marked initially when planted, with germinants from seeds later marked when identified during monitoring. Planted seedlings will have seedling guards installed to minimise impacts of grazing.

4.3.4 Irrigation

The Establishment Site will be irrigated with fresh water for a period of 2 years to assist in the establishment of *B. sphaerocarpa* var. *dolichostyla* individuals (Year 2, and potentially Year 3 if necessary).

Seeds and seedlings will be irrigated for a period of 2 years following planting, after which irrigation will cease and the restored individuals allowed to persist in the absence of supplementary watering.

The irrigation system may remain, such as to allow for latter contingency measures (i.e. if additional watering is necessary for continued survival of restored individuals in the event of drought conditions, or to water additional plants).

To note, irrigation has proven a successful technique in the initial establishment and survival of other threatened flora taxa in semi-arid environments (for example, refer to plot irrigation of *Darwinia masonii* (EPBC-V) cuttings as outlined within MGM 2015), and is therefore the preferred methodology over the non-irrigation option.



4.3.5 Experimental Treatments

It is noted that many plant restoration projects may establish a series of experimental treatments to trial the success of differing methodologies (e.g. establishment of seeds compared to seedlings and cuttings, fenced plots compared to unfenced plots, irrigated plots compared to non-irrigated plots); with a view that the trial information will inform a later and larger restoration project. This approach is not being adopted for restoration of *B. sphaerocarpa* var. *dolichostyla* due to the low number of individuals required to be established; rather, well established techniques for successful restoration are being adopted from inception (i.e. seeds plus seedlings, site fenced and irrigated).

4.4 Ongoing Management

Ongoing management of the Establishment Site will occur, as detailed in Table 3-2 for the life of the approval (2069). Additional management measures include:

- Inspection and maintenance of the fence to ensure exclusion of feral animals;
- Inspection and maintenance of irrigation infrastructure;
- Weed inspection and weed control programmes are required; and
- Maintenance of Project site fire breaks to minimise risk of fire.

4.5 Establishment Criteria

Table 4.2 identifies Establishment Criteria for *B. sphaerocarpa* var. *dolichostyla* individuals restored under this Conservation Plan.

The Establishment Criteria will be met where the number of live individuals of *B. sphaerocarpa* var. *dolichostyla* is ≥ 69 with individuals in a 'Good' or better health condition for three consecutive years after irrigation has ceased. In addition, individuals must have reproductive capability observed (i.e. flowering and successfully pollinated) to demonstrate individuals are mature and self-sustaining (i.e. potentially produce second generation individuals).

It is intended that the restored individuals will continue to survive and function as part of the naturally occurring *B. sphaerocarpa* var. *dolichostyla* population (i.e. continue to grow and hold seed within the canopy). Following the Establishment Criteria being achieved (as demonstrated by monitoring and measurement), Covalent will continue to informally inspect the restored individuals over the life of the EPBC approval, in order to confirm and report on their status for the duration of the Project.

Where monitoring indicates that the Establishment Criteria are unlikely to be met, Covalent will implement additional actions at the Restoration Site, which will include (as appropriate):

- additional site preparation works.
- additional seed collection, seeding and/or seedling planting; and/or
- additional irrigation of seeds and seedlings.

Additional actions will be taken as soon as practical; however, action implementation will occur within 12 months of confirming action requirement.

If the above additional actions are considered unlikely to result in the Establishment Criteria being met, then Covalent will consult with DBCA and DAWE on other potential contingency actions which could be implemented. Other contingency actions could include, for example, a change to the



location of the restoration works into areas of native vegetation known to support *B. sphaerocarpa* var. *dolichostyla* (i.e. supplement existing population within existing habitat). Under these circumstances Covalent will review and revise this plan and submit the revised plan for EPBC Act approval.

Table 4.2: Restoration Establishment Criteria

Restoration Plan Objective	Establishment Criteria	Establishment Criteria Measurement	Contingency Actions
≥ 69 individuals of <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> established	69 individuals established	Number of live individuals ≥ 69	<ul style="list-style-type: none"> ○ Additional seed collection and seeding/seedling planting ○ Soil analysis to determine any soil deficiencies and development of a remediation plan (soil amelioration or further soil preparation trials) ○ Review of environmental conditions and investigate additional irrigation requirements
	Individuals are considered healthy	Health condition of 'Good' or better for x2 consecutive years after irrigation has ceased	
	Individuals are considered self-sustaining	Reproductive capability observed (i.e. flowering, successful pollination and seed production)	

4.6 Schedule

The schedule for the restoration of *B. sphaerocarpa* var. *dolichostyla* has been based upon year periods (i.e. Year 1, Year 2; rather than calendar years) following Project commencement. Project commencement is expected to occur in 2021. The commencement date for the implementation of this Conservation Plan will be subject to the commencement date of the Project (i.e. personnel/equipment on site, clearing to provide rehabilitation topsoil/subsoil materials).

Where an action is not undertaken/completed within the specified year, that action will then be undertaken in subsequent years. The likelihood of this occurring is considered low and potential implications to the overall success of the Restoration Plan are low. The implications of other actions not been undertaken or completed are considered low, as the potential result is a delay in meeting Establishment Criteria.

Table 4.3: Restoration Schedule

Year	Restoration Action
Year 1 (2021)	<ul style="list-style-type: none"> ○ Collection of seed material (approximately September to December 2021) ○ Germination of seedlings in nursery
Year 2 (2022)	<ul style="list-style-type: none"> ○ Restoration site preparation: <ul style="list-style-type: none"> ○ fencing of adjacent vegetation ○ removal of airstrip hard cap ○ crosshatch deep ripping ○ Site rehabilitation works (approximately March – April):



Year	Restoration Action
	<ul style="list-style-type: none"> ○ spreading of topsoil/subsoil materials from mining area ○ establishment and operation of irrigation system ○ Planting of seeds and seedlings (early winter) ○ Twice yearly monitoring of site rehabilitation success (to confirm site suitability) ○ Weed control of restoration site (if necessary) ○ Irrigation commences immediately after planting (as required) ○ <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> monitoring commences every two months ○ Collection of additional seed material ○ Germination of additional seedlings in nursery
Year 3	<ul style="list-style-type: none"> ○ <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> monitoring continues every four months ○ Irrigation continues ○ Weed control (if necessary) ○ Supplementary seeding / seedling planting (if necessary)
Year 4	<ul style="list-style-type: none"> ○ <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> monitoring continues every six months ○ Implementation of contingency actions (if necessary) ○ Irrigation ceases
Year 5 +	<ul style="list-style-type: none"> ○ <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> monitoring continues every six months ○ Implementation of contingency actions (if necessary)

4.7 Environmental Monitoring

For each restored individual of *B. sphaerocarpa* var. *dolichostyla* (whether from germinated seed or planted seedling) the following information will be recorded annually:

- survival (number live/dead);
- size (height/width);
- health condition, similar to the methodology presented in Table 3-5;
- reproductive status (flowering/fruiting/setting seed);
- photograph;
- GPS location (for future locating); and
- observations of health/growth constraints (e.g. grazing, weeds).

The purpose of the environmental monitoring will be to demonstrate if the Establishment Criteria have been met. The formal annual monitoring identified above will be in addition to opportunistic visual observations by Covalent environmental personnel on site.

4.8 Risks and contingency measures

Risk factors and contingency actions in relation to the Restoration Plan are described in Table 4.4. Actions will be taken as soon as practical; however, action implementation will occur within 12 months of confirming action requirement.

**Table 4.4: Risk factors and contingency actions for rehabilitation**

Risk factor	Trigger	Contingency action / response
No or insufficient seed germination	Year 1 – 2: <ul style="list-style-type: none"> Germination of <80% of seed Year 2-3: <ul style="list-style-type: none"> Seed and tubestock survival <70% following one year after germination 	<ul style="list-style-type: none"> Review initial germination and survival numbers to determine if further seed collection is required. If required, re-collect seed and undertaken an investigation into potential seed germination failure and survival. Consider other methods of germination to rehabilitate the species. Consider alternate treatments. Liaise with experts (e.g. Botanic Gardens and Parks Authority research division) to develop further trials trial. Consider supplementary planting of seedlings.
No or insufficient establishment	Year 2-4: <ul style="list-style-type: none"> Survival of <50% of each year's plants beyond their first summer Survival of <40% of all plants planted beyond their first three summers 	<ul style="list-style-type: none"> Consider other methods of germination to rehabilitate the species. Consider alternate treatments. Liaise with experts (e.g. Botanic Gardens and Parks Authority research division) to develop further trials trial.
Ongoing survival without irrigation does not occur	Year 5+: <ul style="list-style-type: none"> Survival of <30% of all plants planted <80% of surviving plants are producing viable seed at a rate similar to that of plants in natural populations Plant survivorship and fully formed (effectively pollinated) fruit production is statistically less than that of the adjacent established <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> in undisturbed vegetation. Year 10+: <ul style="list-style-type: none"> <i>B. sphaerocarpa</i> var. <i>dolichostyla</i> healthy individual average heights < 1 m in height after 10 years 	<ul style="list-style-type: none"> Consider supplementary planting of seedlings.
Clearing impacts to established individuals	Refer to Table 3-2. The Establishment Site is protected through the Vegetation Exclusion Zone associated with the Western Australian approval.	
Proposal related indirect impacts to established individuals	Refer to Table 3-2. The Establishment Site is protected through the Vegetation Exclusion Zone associated with the Western Australian approval.	



5. Administration

5.1 Responsibility

Implementation of this Conservation Plan will be coordinated by the Manager Environment and Approvals, with support of the site-based Environmental Officers and Registered Mine Manager, as detailed in Table 5-1.

The implementation of the Conservation Plan will be assisted through an Environmental Management System that will incorporate systems, processes, procedures and work instructions relating to the management, monitoring and reporting components of the Conservation Plan.

Table 5-1: Summary of roles and responsibilities

Role	Responsibility
Covalent	<ul style="list-style-type: none"> Covalent have the overall responsibility for the implementation of this Ironcaps Banksia Conservation Plan if any roles are delegated to a contractor or consultant, Covalent has the responsibility to audit compliance and ensure any contingency actions are implemented.
Covalent Environmental Manager	<ul style="list-style-type: none"> overall accountability for auditing and compliance assessment with this Ironcaps Banksia Conservation Plan during operation to ensure it is maintained and meets objectives and targets provide technical support to all Project personnel to ensure this Ironcaps Banksia Conservation Plan is implemented correctly and complied with implement and maintain this Ironcaps Banksia Conservation Plan, review its effectiveness and review the implementation as required obtain relevant approvals for disturbance as required ensure all personnel involved in the project are inducted and will adhere to FVMP requirements undertaking ongoing monitoring and documenting monitoring results liaise with stakeholders and technical advisors for advice and resolution of management aspects/objectives as required review and close out any contingency actions report as required to regulating authorities may delegate all or part responsibility to an appropriately qualified person
Construction Manager or Registered Manager (if different to Environmental manager)	<ul style="list-style-type: none"> overall accountability for auditing and compliance assessment with this Ironcaps Banksia Conservation Plan during construction to ensure it is maintained and meets objectives and targets overall accountability to ensure this Ironcaps Banksia Conservation Plan is implemented, reported and maintained on-site ensure personnel attend inductions, have sufficient resources and training to meet the requirements of this Ironcaps Banksia Conservation Plan support the Proponent's flora management initiative and culture comply with all legal requirements and the requirements seek advice from the Proponent when in doubt about requirements appoint appropriate consultants to undertake specific activities set out if required.
All personnel	<ul style="list-style-type: none"> must receive induction prior to commencement of work on site comply with all legal requirements and the requirements attend environmental inductions and any other training required participate in toolbox meetings and encourage personnel to suggest improvements.

Covalent will undertake consultation with DBCA's Species and Communities Program related to seeding, germinating, or planting *Banksia sphaerocarpa* var. *dolichostyla* are being considered as part of a translocation proposal. The preparation and approval of a translocation proposal as required in Part 7 of the *Biodiversity Conservation Regulations 2018* will be undertaken, including consultation with DBCA's Species and Communities Program. Impact to threatened flora as outlined in the *Biodiversity Conservation Act 2016* is defined as 'taking all or part of an individual'. Damage to all or any part of a threatened flora individual requires a section 40 authorisation.



5.2 Funding

Funding of the implementation of this Conservation Plan will be provided by Covalent as the proponent for the Project.

5.3 Reporting

Implementation of this Conservation Plan will be reported annually with the Annual Compliance Report required under Condition 12 of the EPBC 2017/7950 approval (DAWE 2019).

The information to be reported will identify:

- Environmental Management -
 - Implementation status of the management actions;
 - Results of the environmental monitoring (health condition, dust, weeds); and
 - Implementation and outcomes of contingency actions (if required).
- Restoration -
 - Implementation status of the restoration actions;
 - Results of the environmental monitoring (live individuals, health condition, reproductive status); and
 - Implementation and outcomes of contingency actions (if required).

Any non-compliances or incidents will be reported to DAWE within two business days, with further details provided within 10 business days as required under Condition 14 of the EPBC 2017/7950 approval.



6. References

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- Mount Gibson Mining Limited (2015) *Mount Gibson Range Mine Operations at Iron Hill Deposits: Environmental Impact Assessment (Public Environmental Review)*. Report prepared by Globe Environments Australia Pty Ltd and Eco Logical Australia. Final. November 2015.
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Appendices



Appendix A Stakeholder Consultation Register



Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received and Issues Raised	Proponent Response and/or resolution	Stakeholder Response to changes
DBCA DWER – EPA Services	1/9/20	Meeting	Helen Butterworth, Garry Ogston (EPA) Nicholas Woolfrey, Murray Baker, Lindsay Bourke (DBCA) Anthea Pate, Brigitta Longbottom (Covalent) Louise Whitley (Strategen JBS&G)	<ul style="list-style-type: none"> Update on Offset Plan and discussion on suitability of sites. Discussion on roles and responsibilities for subdivision, acquisition and transfer process Development a Memorandum of Understanding 	<ul style="list-style-type: none"> Preferred sites were considered suitable, pending site inspections and further information Covalent will facilitate the acquisition and purchase process with an In Principle agreement in place for transfer to DBCA for management and conversion to conservation reserve 	-	-