Appendix 2
Rehabilitation and Closure Plan

Covalent Lithium Earl Grey Lithium Project

REHABILITATION AND CLOSURE PLAN
M77/1065, M77/1066, M77/1067, M77/1068, M77/1080, L77/205, L77/206, L77/208, L77/176, L77/194, G77/37

Prepared by Strategen Environmental Consultants Pty Ltd
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Earl Grey Lithium Project

Rehabilitation and Closure Plan

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Document ID:	WAL18204_01_R006 Rev 4
Submission date:	21 January 2019
Mineral Field:	Yilgarn

January 2019

Mine closure plan checklist

This Rehabilitation and Closure Plan (RCP) has been prepared to accompany the Environment Review Document (ERD) for the Project, for submission to the Environmental Protection Authority (EPA), under Part IV of the Environmental Protection Act 1986 (EP Act). This RCP also represents a draft of an MCP that will support a Mining Proposal, to be submitted to Department of Mines, Industry Regulation and Safety (DMIRS) as required under the Mining Act 1978 (Mining Act), at such a time that the legal instruments allowing the proposed Project to proceed are issued. The DMIRS checklist for a Mine Closure Plan designed to ensure the proponent has submitted the required information has been included at this time for reference only.

No	Mine Closure Plan (MCP) checklist	Y/N/ NA	Section No.	Comments	Changes from previous version (Y/N)	Page No.	Summary
1	Has the Checklist been endorsed by a senior representative within the tenement holder/operating company? (See bottom of checklist.)	N					
PUBLIC AVAILABILITY							
2	Are you aware that from 2015 all MCPs will be made publicly available?	Y	-				
3	Is there any information in this MCP that should not be publicly available?	N	-				
4	If "Yes" to Q3, has confidential information been submitted in a separate document/ section?	-	-				
COVER PAGE, TABLE OF CONTENTS							
5	Does the MCP cover page include: • Project Title • Company Name • Contact Details (including telephone numbers and email addresses) • Document ID and version number • Date of submission (needs to match the date of this checklist)	Y	Cover page				

No	Mine Closure Plan (MCP) checklist	Y/N/ NA	Section No.	Comments	Changes from previous version (Y/N)	Page No.	Summary
SCOPE AND PURPOSE							
6	State why the MCP is submitted (e.g. as part of a Mining Proposal, a reviewed MCP or to fulfil other legal requirements)		As part of the ERD				
PROJECT OVERVIEW							
7	Does the project summary include: • Land ownership details (include any land management agency responsible for the land / reserve and the purpose for which the land/ reserve [including surrounding land] is being managed) • Location of the project; • Comprehensive site plan(s); • Background information on the history and status of the project.	Y	Section 2				
LEGAL OBLIGATIONS AND COMMITMENTS							
8	Does the MCP include a consolidated summary or register of closure obligations and commitments?	N					
STAKEHOLDER ENGAGEMENT							
9	Have all stakeholders involved in closure been identified?	Y	Section 4.1				
10	Does the MCP include a summary or register of historic stakeholder engagement with details on who has been consulted and the outcomes?	Y	Section 4.3				
11	Does the MCP include a stakeholder consultation strategy to be implemented in the future?	Y	Section 4.2				

No	Mine Closure Plan (MCP) checklist	Y/N/ NA	Section No.	Comments	Changes from previous version (Y/N)	Page No.	Summary
POST-MINING LAND USE(S) AND CLOSURE OBJECTIVES							
12	Does the MCP include agreed post-mining land use(s), closure objectives and conceptual landform design diagram?	Y	Section 5.1 Section 5.2				
13	Does the MCP identify all potential (or pre-existing) environmental legacies, which may restrict the post mining land use (including contaminated sites)?	Y	Section 5.1				
14	Has any soil or groundwater contamination that occurred, or is suspected to have occurred, during the operation of the mine, been reported to DER as required under the *Contaminated Sites Act 2003*?	N	-				
DEVELOPMENT OF COMPLETION CRITERIA							
15	Does the MCP include an appropriate set of specific completion criteria and closure performance indicators?	Y	Section 6.1				
				COLLECTION AND ANALYSIS OF CLOSURE DATA			
16	Does the MCP include baseline data (including pre-mining studies and environmental data)?	Y	-	Included in the ERD submitted to EA for Public Review.			
17	Has materials characterisation been carried out consistent with applicable standards and guidelines (e.g. GARD Guide)?	N	-				
18	Does the MCP identify applicable closure learnings from benchmarking against other comparable mine sites?	N	-				
19	Does the MCP identify all key issues impacting mine closure objectives and outcomes (including potential contamination impacts)?	Y	Section 6				
20	Does the MCP include information relevant to mine closure for each domain or feature?	Y	Section 9.1				

No	Mine Closure Plan (MCP) checklist	Y/N/ NA	Section No.	Comments	Changes from previous version (Y/N)	Page No.	Summary
				IDENTIFICATION AND MANAGEMENT OF CLOSURE ISSUES			
21	Does the MCP include a gap analysis/risk assessment to determine if further information is required in relation to closure of each domain or feature?	Y	Section 7.14				
22	Does the MCP include the process, methodology, and has the rationale been provided to justify identification and management of the issues?	Y	Section 9				
				CLOSURE IMPLEMENTATION			
23	Does the MCP include a summary of closure implementation strategies and activities for the proposed operations or for the whole site?	Y	Section 9				
24	Does the MCP include a closure work program for each domain or feature?	Y	Section 9.2				
25	Does the MCP contain site layout plans to clearly show each type of disturbance as defined in Schedule 1 of the MRF Regulations?	N	-				
26	Does the MCP contain a schedule of research and trial activities?	Y	Section 9.2				
27	Does the MCP contain a schedule of progressive rehabilitation activities?	Y	Section 9.2				
28	Does the MCP include details of how unexpected closure and care and maintenance will be handled?	Y	Section 9.3				
29	Does the MCP contain a schedule of decommissioning activities?	N	-				
30	Does the MCP contain a schedule of closure performance monitoring and maintenance activities?	N	-				

No	Mine Closure Plan (MCP) checklist	Y/N/ NA	Section No.	Comments	Changes from previous version (Y/N)	Page No.	Summary
				CLOSURE MONITORING AND MAINTENANCE			
31	Does the MCP contain a framework, including methodology, quality control and remedial strategy for closure performance monitoring including post-closure monitoring and maintenance?	Y	Section 10				
				FINANCIAL PROVISIONING FOR CLOSURE			
32	Does the MCP include costing methodology, assumptions and financial provision to resource closure implementation and monitoring?	N	-				
33	Does the MCP include a process for regular review of the financial provision?	Y	Section 11				
				MANAGEMENT OF INFORMATION AND DATA			
34	Does the MCP contain a description of management strategies including systems and processes for the retention of mine records?	Y	Section 12				

Corporate Endorsement:

Name: COLYN LOUW Signed: [signature]

Position: GENERAL MANAGER ORG DEVELOPMENT Date: 18/1/2019

(NB: The corporate endorsement must be given by tenement holder(s) or a senior representative authorised by the tenement holder(s), such as a Registered Manager or Company Director)

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1. Introduction

Covalent Lithium Pty Ltd Pty Ltd (Covalent) propose to operate the Earl Grey Lithium Project (the Project), located approximately 105 km south–southeast of Southern Cross in the Yilgarn Mineral Field of Western Australia (Figure 1-1). A large, economic pegmatite–hosted lithium deposit was discovered by Kidman Resources Ltd (Kidman) in 2016. The deposit is situated at the previously abandoned Mt Holland mine site, which was operated as a gold mine between 1988 and 2001. The Mt Holland mine site comprises a number of open pits, an underground mine, a processing plant, waste rock dumps, tailings storage facilities (TSF) and other associated infrastructure. The Mt Holland mine site is largely un-rehabilitated, and is currently a liability of the State of Western Australia.

The Earl Grey deposit is proposed to be mined via conventional open cut methods. The pit will be developed in multiple stages over a 40 year period, with the first stage anticipated to provide ore for years 1 to 6. Approximately 100 million tonnes of ore will be mined over the life of mine. Development of the pit will be undertaken using conventional drilling and blasting. The pit will be approximately 1,800 m long by 950 m wide.

Kidman acquired the Project from Convergent Minerals Limited in 2016 and Covalent are currently completing approvals to develop the Project, which occurs within the Mt Holland mine footprint.

In 2015 a Mine Closure Plan (MCP) was prepared to support a Mining Proposal (REG ID 53033) for the Blue Vein Gold Project. The Project was never implemented and the associated closure obligations are not currently relevant. However, as the Mining Proposal 53033 is approved and listed as a tenement condition, the closure obligations will be included in a revised version of this document, in the event that the Mining Proposal 53033 for Blue Vein Gold Project is implemented.

1.1 Scope and purpose of document

The purpose of this Rehabilitation and Closure Plan (RCP) is to inform state government agencies, local government and community groups on how facilities and infrastructure associated within the proposed Earl Grey Lithium Project Development Envelope will be decommissioned, rehabilitated and returned to a land use agreed with the State and community.

This RCP has been prepared to accompany the Environment Review Document (ERD) for the Project, for submission to the Environmental Protection Authority (EPA), under Part IV of the *Environmental Protection Act 1986* (EP Act). This RCP also represents a draft of an MCP that will support a Mining Proposal, to be submitted to Department of Mines, Industry Regulation and Safety (DMIRS) as required under the *Mining Act 1978* (Mining Act), at such a time that the legal instruments allowing the proposed Project to proceed are issued.

This RCP has been prepared based on the information available at the time of writing and complies with the provisions of the Mining Act and to the structure and content requirements outlined in *Guidelines for Preparing Mine Closure Plans* (DMP & EPA 2015). The plan will be progressively amended during the life of the Project through regular reviews, as more information becomes available, or if circumstances relating to mine closure and rehabilitation change.

The Project's proposed Development Envelope is within a historic gold mining operation, adjacent to the Bounty Mine which was operated between 1988 and 2001. In 2001 the operator and lease holder, Viceroy Australia Pty Ltd, went into involuntary administration. The leases were surrendered and associated unconditional performance bonds were called in by the State. Areas disturbed under the retired mining leases, and which are not being utilised by proposed Project activities, remain a State liability.

This RCP applies only to proposed new Project disturbance areas and infrastructure, and previously disturbed areas that are currently proposed to be utilised by Covalent. These include:

- the camp and core yard located on M77/1066, utilised as part of exploration activities
- site access road located on L77/205
- exploration disturbance located on M77/1080, M77/1065, M77/1066, M77/1067 and M77/1068
- the current airstrip located on L77/107.

The RCP has been prepared to assist Covalent in closing the relevant Project areas in an ecologically sustainable manner, consistent with agreed post-mining outcomes and land uses, such that there are no unacceptable environmental legacies post closure.

The scope and structure of this RCP is described in Table 1-1.

Table 1-1: Scope and Purpose of RCP

Document Section	Description of Content
Section 1:	Outlines the scope and purpose of the closure plan.
Section 2:	Provides an overview of the history and status of the project, including land ownership, tenure, location, and an overview of the operations and main infrastructure components.
Section 3:	Summarises the legal obligations and specific legally binding closure commitments relating to the project, with reference to the appended closure obligations register.
Section 4:	Describes the process used to identify stakeholders relevant to mine closure, lists the stakeholders identified and provides a summary of how each has been, and will continue to be, consulted in relation to mine closure.
Section 5:	Identifies the post-mining land use and closure objectives based on the proposed land use.
Section 6:	Describes the development of site-specific completion criteria by which success of closure will be measured.
Section 7:	Provides environmental data relevant to closure, including a summary of baseline studies completed prior to the project commencement and throughout operations. This includes information on the climatic conditions, geology, soils, waste and tailings characterisation, hydrogeology, hydrology, flora and fauna, social environment, rehabilitation and closure studies and key knowledge gaps.
Section 8:	Outlines the risk assessment process for identifying the key closure issues and provides a summary of identified key risks and management measures.
Section 9:	Provides a closure implementation plan, which includes: (i) A description of the domain; (ii) Land use objective, landform designs and completion criteria for each domain; (iii) A schedule of work for research, investigations and trials; (iv) A schedule of progressive rehabilitation tasks; (v) Availability and management of closure material sources: (vi) identification of information gaps; (vii) key tasks for unplanned closure; (viii) decommissioning tasks; and (ix) A schedule of work for performance monitoring and maintenance tasks.
Section 10:	Describes the proposed environmental monitoring program and maintenance response requirements.
Section 11:	Describes the process and methodology undertaken to estimate financial costs of closure of the project.
Section 12:	Provides a description of how closure relevant information and data will be managed during ongoing closure planning and implementation.

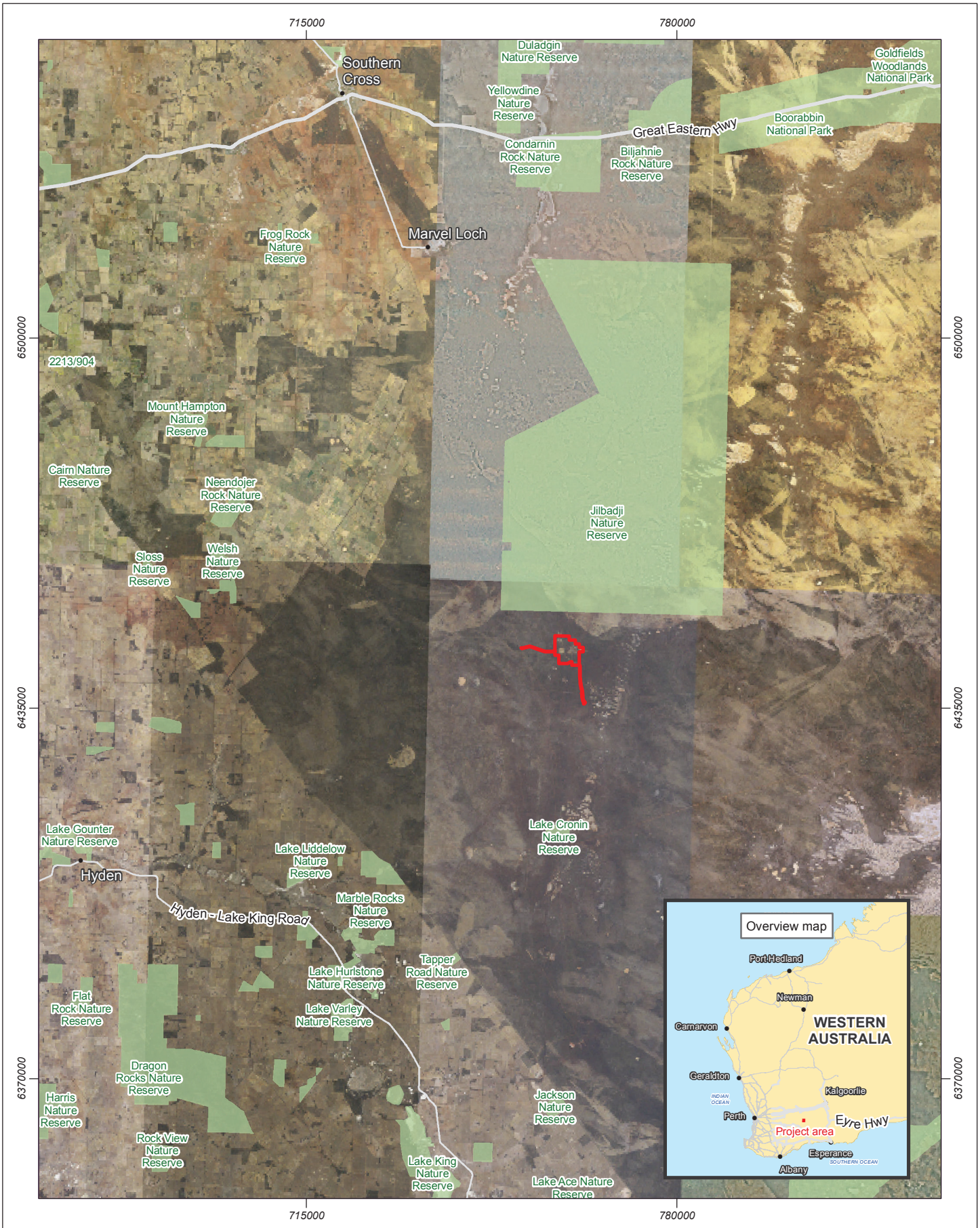

Figure 1-1: Regional location

Scale 1:900,000 at A4

0 6.5 13 19.5 km

N

Legend

- Development Envelope
- Nature reserve

Coordinate System: GDA 1994 MGA Zone 50

Note that positional errors may occur in some areas

Date: 20/07/2018

Author: vdinh

Source: Landgate: Aerial imagery - 2017;
SQM: Development envelop - 17/11/2017.

Path: Q:\Consult\2017\SQM\SQM17406\01_GIS_documents\ArcMap_documents\SQM17406_G001_RevH.mxd

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2. Project summary

2.1 Ownership

The Project was referred in May 2017 under section 38 of the EP Act by Kidman. Subsequent to the referral of the Proposal, Kidman entered into a joint venture with Sociedad Quimica y Minera (SQM) on 11 September 2017. SQM are a global company based in Chile that produces industrial chemicals and plant nutrition. SQM are also one of the world's largest lithium producers. As a result of the formation of the joint venture the Proponent for the Proposal is now Covalent Lithium Pty. Ltd (the Proponent), managing the Proposal on behalf of the joint venture.

All compliance and regulatory requirements regarding this assessment document should be forwarded by email, post or courier to:

Proponent details:	Key contact:
Covalent Lithium Pty. Ltd ACN: 623 090 139 *Address:* Level 18, 109 St Georges Terrace Perth, WA 6000	***Name:*** **Colyn Louw** *Title:* General Manager Organisational Development *Telephone:* +61 8 9230 5415 *E–mail:* colyn.louw@covalentlithium.com.au

2.2 Location, Tenure and Access

The Project is located approximately 105 km south-southeast of Southern Cross in the Yilgarn Mineral Field of Western Australia (Figure 1-1). A generalized layout of the proposed facility, showing previously existing and proposed future infrastructure is shown in Figure 2-1. Access to the site is by road from the Great Eastern Highway via the Parker Range Road or alternatively via Hyden. The entire Project is located within Unallocated Crown Land (UCL). There are no pastoral leases or Native Title claims over the Project area.

Kidman currently holds a number of Mining Leases, General Purpose Leases and Miscellaneous Licences over the Project area. It should be noted that Montague Resources Australia Pty Ltd and MH Gold Pty Ltd are 100% owned subsidiary companies of Kidman Resources Limited. Tenements relevant to the project are listed in Table 2-1.

Table 2-1: Status of mining tenements

Tenement	Tenement Holder	State Liability	Covalent Liability
M77/1065	Montague Resources Australia Pty Ltd	Blue Vein pit, WRD, miscellaneous stockpiles, landfill, access tracks/roads, Bounty TSF 2.	Exploration disturbance.
M77/1066	Montague Resources Australia Pty Ltd	Bounty pits, underground, processing plant, ROM Pad, waste rock dumps (WRDs), water storage dams, internal roads, old camp site, buildings and hardstands.	Exploration disturbance. Exploration Camp. Exploration Coreyard.
M77/1067	Montague Resources Australia Pty Ltd	Razorback pit, ROM Pad and WRD.	Exploration disturbance.
M77/1068	Montague Resources Australia Pty Ltd	Bush Big pit, WRD and haul road.	Exploration disturbance.
M77/1080	Montague Resources Australia Pty Ltd	Earl Grey, Darjeeling and Jasmine open pits, WRDs and access/haul roads.	Exploration disturbance.
L77/205	Montague Resources Australia Pty Ltd	Road.	Access Road.
L77/206	Montague Resources Australia Pty Ltd	Road.	N/A – Not utilised by Kidman Resources Limited.

Tenement	Tenement Holder	State Liability	Covalent Liability
L77/208	Montague Resources Australia Pty Ltd	Road.	N/A – Not utilised by Kidman Resources Limited.
L77/176	MH Gold Pty Ltd	Road.	Access Road.
L77/194	Montague Resources Australia Pty Ltd	Road.	N/A – Not utilised by Kidman Resources Limited.
G77/37	MH Gold Pty Ltd	Track.	N/A – Not utilised by Kidman Resources Limited.

It should be noted that a previous MCP included G77/110, G77/71, G77/72 and G77/73. These tenements were amalgamated into a new larger tenement, G77/129 and the condition requiring a Mine Closure Plan was not transferred. All disturbance on G77/129 is currently a State liability. Covalent is also liable for disturbance associated with the borefield and airstrip, however the associated tenements currently do not have a condition requiring an MCP to be submitted.

2.3 Site History

The Mt Holland Mine Site is a historic gold mining operation centred on the Bounty Mine which forms a central infrastructure area. Between 1988 and 2001, the historic processing plant received ore from numerous open pits within an approximate 10km radius of the site.

Mt Holland was owned and operated by a number of companies during the eighties and nineties, including Aztec Mining Company Limited, Forrestania Gold NL and Lion Ore Mining International Limited. In 1999 the Project was purchased by Viceroy Australia Pty Ltd which subsequently went into involuntary administration in 2002. The majority of leases associated with the Project were allowed to expire and were subsequently surrendered to the State, with associated unconditional performance bonds called in by the State. Applications for new mining leases over the respective mining areas were granted in 2004.

In 2014, Convergent Minerals Limited (Convergent, CVG) acquired the Project tenements and submitted a mining proposal to recommence mining at the Blue Vein Project, approximately 8km south of Bounty Mine. This included development of a processing plant, accommodation village and other support facilities. The Mining Proposal (REG ID 53033) was approved by the, then called, Department of Mines and Petroleum (DMP) in May 2015 however the Project was never implemented and Convergent went into receivership in late 2016.

In 2016, Kidman acquired the Mt Holland tenements and commenced exploration and feasibility studies for the development of the Earl Grey lithium deposit.

The majority of disturbance associated with the mine site is currently the liability of the State of Western Australia until otherwise used by Covalent or another party.

2.4 Current Project Overview

Since Kidman acquired the Project in 2016, exploration has focused on gold and lithium. A large, economic pegmatite-hosted lithium deposit was discovered by Kidman and is known as the Earl Grey Lithium Project. The deposit and proposed Project is situated within the abandoned Mt Holland Project, about 5 km west of the historic plant site. The current resource is 189 million tonnes (at 1.44 % lithium oxide) with a mining inventory of approximately 100 million tonnes.

The Project will comprise open cut mining and processing of lithium ore, with initial transport of a lithium oxide concentrate to an existing Western Australian port for export to overseas markets or for a future potential lithium refinery in Kwinana. Once the concentrate refinery is established, concentrate from the Project will be processed through the refinery to produce a lithium carbonate or lithium hydroxide product.

Within the Development Envelope (1984 ha) the total Proposal footprint is 660 ha with clearing of native vegetation to occur progressively over a 40 year period as the Project develops.

The Project has been designed to maximise the use of existing disturbance areas. The Project requires clearing of 392 ha of native vegetation and would use 268 ha of the existing infrastructure and disturbed areas of the abandoned Mt Holland mine site. The additional clearing is predominately required for excavation of a new mine pit, storage of waste rock in new dumps, storage of tailings from processing in a new integrated waste landform (IWL) and other ancillary infrastructure, including a new airstrip.

The Project is currently being assessed under the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Western Australian EP Act. The key factors that have triggered the formal assessment are the presence of threatened fauna species (the Malleefowl and Chuditch) and a threatened flora species (*Banksia sphaerocarpa* var. *dolichostyla*) within the Project area.

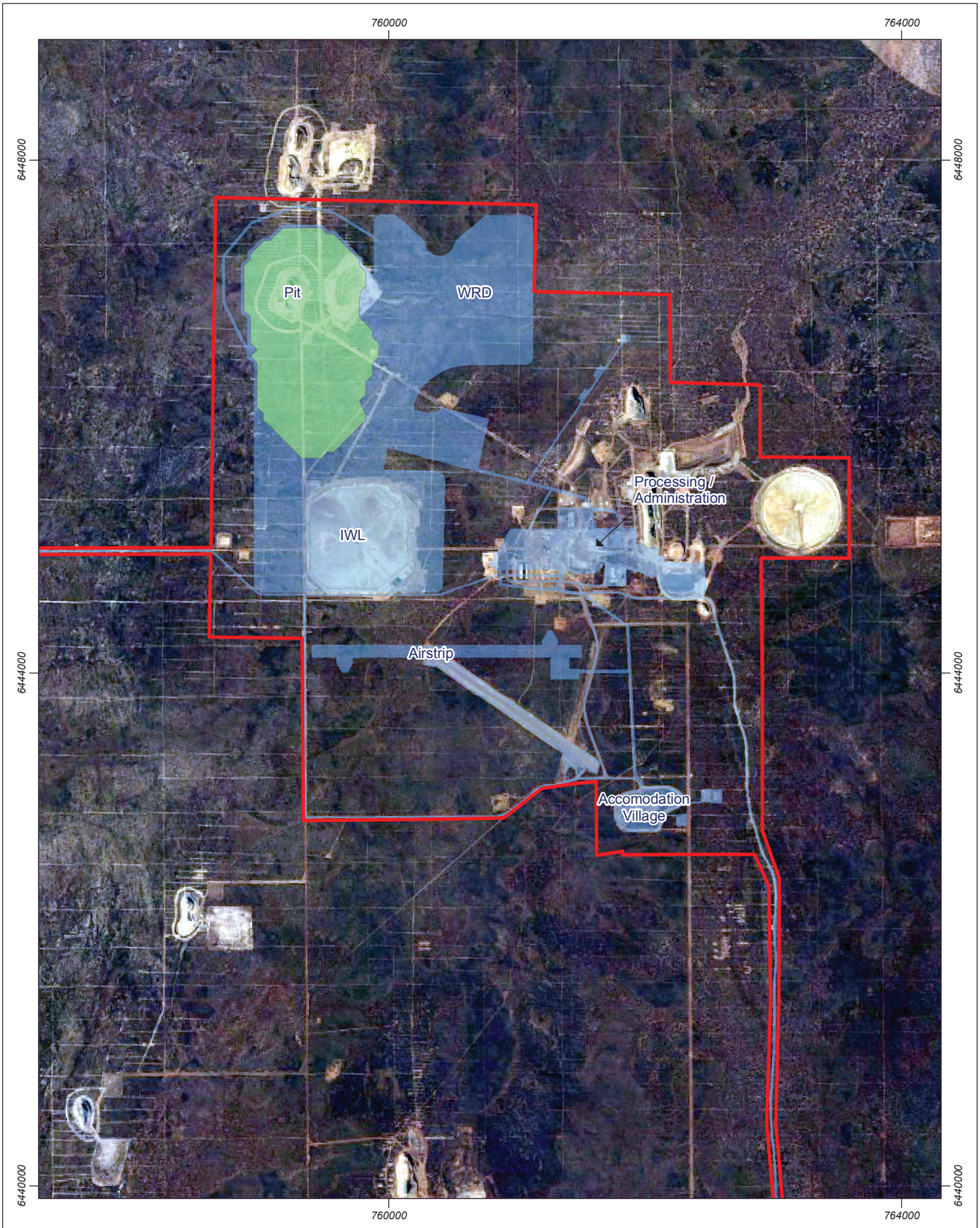

Figure 2-1: Proposed Site Layout

Scale 1:40,000 at A4

0 400 800 1,200 m

Coordinate System: GDA 1994 MGA Zone 50
Note that positional errors may occur in some areas
Date: 20/07/2018

Author: vdinh
Source: SQM: Aerial imagery - 2017,
Development Envelope, Mine layout - 17/11/2017.
Path: Q:\Consult\2017\SQM\SQM17406\01_GIS_documents\ArcMap_documents\SQM17406_G004_Revi.mxd

Legend

- Development Envelope
- Indicative Proposal footprint
- Mine pit

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3. Identification of closure obligations and commitments

3.1 Legal Obligations Register

All closure obligations identified under the various acts and approval documentation, as discussed above, will be collated into a single Closure Obligations Register. The Closure Obligations Register will be a comprehensive checklist for Covalent to use during the closure process and will be updated annually to reflect additional approvals and maintain its relevance.

3.2 Legislation

3.2.1 Mining Act 1978

The Mining Act regulates mining leases, licences, terms and conditions for mines on private and crown land.

Historic Disturbances

The previously held tenements over the Mt Holland Project were surrendered to the State in 2002. As per the *Mining Rehabilitation Fund Regulations 2013*, land in an area of a current mining authorisation (mining tenement) does not incur a rehabilitation liability whereby:

- the disturbance and land use occurred under a previous mining authorisation
- any infrastructure situated on the land has not been used under the current mining authorisation
- there has been no disturbance of the land as a result of activities carried out under the current mining authorisation.

In relation to the Mt Holland Project, any areas of previous disturbance that are utilised by Covalent will become the liability of Covalent under the Mining Act and the *Mining Rehabilitation Fund Act 2012*.

Mining Proposals and Mine Closure Plans

Closure commitments made in Mining Proposals and Supporting Mine Closure Plans become legally binding. Mining Proposal 53033 for the Blue Vein Project was supported by a Mine Closure Plan (53033). As the Mining Proposal has not been implemented, closure obligations associated with the Blue Vein Project are not relevant for the proposed Project.

Tenement Conditions

The Project tenements have several conditions dealing with a range of issues associated with operation, reporting and closure and will be included in the Legal Obligations Register.

3.2.2 Environmental Protection Act 1986

The EP Act provides for the prevention, control and abatement of pollution and environmental harm, for the conservation, preservation, protection, enhancement and management of the environment.

Part IV – Environmental Impact Assessment

The current Mt Holland Project does not contain any instruments issued under Part IV of the EP Act. A proposal to develop the Earl Grey Lithium Project, which is located in the Mt Holland Project area, was referred to the EPA in May 2017. The EPA determined that the Project required assessment at the level of a Public Environmental Review, due to the potential to impact conservation significant flora (the Ironcap Banksia) and fauna (the Malleefowl and Chuditch), which occur within the Mt Holland tenements. The proposal is still under assessment and requires the submission of this RCP to address closure and rehabilitation of the Earl Grey Lithium Project. Closure obligations associated with the Earl Grey Lithium Project will be added to the Project MCP at such a time that the legal instruments allowing the Project to proceed are issued.

Part V – Prescribed Premise, Works Approval and Licences

Part V (Section 52) of the EP Act establishes a range of statutory instruments to permit the assessment and management by the Department of Water and Environmental Regulation (DWER) of environmental outcomes arising from emissions from industry. Prescribed Premise categories are defined in Schedule 1 of the *Environmental Protection Regulations 1987* and include mining-related activities including processing or beneficiation of metals or non-metallic ore, mine dewatering, sewage disposal and solid waste landfill. A works approval was granted for the Blue Vein Project. It does not include any closure-related conditions.

Part V – Clearing of Native Vegetation

Part V (Section 51) of the EP Act specifies that clearing of native vegetation in Western Australia requires a permit. The clearing provisions of the EP Act are described in the *Environmental Protection Amendment Act 2003* (Western Australia) and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. There are no Clearing Permits for the tenements covered under this RCP.

3.2.3 Contaminated Sites Act 2003

The *Contaminated Sites Act 2003* (CS Act) requires that known or suspected contamination is reported to DWER where the substance is present at above background concentrations in the land or waters of a site that presents or potentially presents a risk of harm to human health, the environment or any environmental value.

A search of the DER Contaminated Sites Database indicated that no known contaminated sites have been reported under the CS Act within the Project area. The status of contaminated areas associated with the abandoned Mt Holland Project is currently being investigated as part of development of the Earl Grey Lithium Project.

3.3 Guidelines

3.3.1 ANZMEC/MCA Strategic Framework for Mine Closure

The Australian and New Zealand Minerals and Energy Council (ANZMEC) and Minerals Council of Australia (MCA) developed The Strategic Framework for Mine Closure (Strategic Framework) (ANZMEC and MCA 2000) which is intended to promote a nationally consistent approach to mine closure management in all Australian jurisdictions. The Strategic Framework has established principles for mine closure that are agreed between regulating authorities and the mining industry.

3.3.2 Guidelines for Preparation of MCPs

DMIRS (formally DMP) and the EPA jointly prepared the original Guidelines for the Preparation of Mine Closure Plans that took effect in 2011. These guidelines adopted the objectives and principles of the Strategic Framework, whilst providing further description of how MCPs in Western Australia can meet these objectives and principles. To ensure better environmental outcomes and improve the efficiency of the assessment and approvals process the departments undertake a periodic review of regulatory guidelines in consultation with stakeholders. Subsequently, a revised set of guidelines were release in 2015. This RCP follows the format of the revised guidelines.

4. Stakeholder engagement

The aim of stakeholder consultation is to ensure that appropriate individuals and groups are identified and suitably engaged both throughout the life of the mine and during closure. It assists in the development of mine closure activities that addresses concerns, provides feedback and ultimately meets closure objectives relating to minimising the potential impact of closure on stakeholders. As the focus at Mt Holland is related to developing the Earl Grey Lithium Project, much of the consultation undertaken over the past 12 months is focused on this Project and the associated closure benefits that might eventuate should the Project be implemented.

4.1 Stakeholder Identification

Stakeholder identification and on-going stakeholder consultation are key components of the mine closure process. Early engagement in this process will enable Covalent to better understand and manage stakeholder expectations and the potential risks associated with closure. A list of stakeholders and their primary interest in the Project are identified in the Stakeholder Identification Register (Table 4-1). The Stakeholder Identification Register will be reviewed and updated accordingly throughout the life of the project as new stakeholders are identified.

Table 4-1: Project Stakeholder Identification

Stakeholder Group	Stakeholder	Key Interests
State Government	Department of Water and Environmental Regulation (DWER), including EPA Services and the EPA	• Administration of the EP Act. • Part V (EP Act) Works Approvals and Licencing. • Part IV (EP Act) Environmental Impact Assessments. • Contaminated sites. • Native vegetation clearing.
	Department of Mines, Industry Regulation and Safety (DMIRS)	• Administration of the Mining Act. • Tenement conditions. • Mining proposals and programs of work. • Mining Rehabilitation Fund (MRF). • Closure and rehabilitation. • Safety.
	Department of Biodiversity, Conservation and Attractions (DBCA)	• Administration of the Biodiversity Conservation Act 2016 (BC Act). • Flora, fauna and habitat conservation.
	Department of Planning, Lands and Heritage (DPLH)	• Native title and indigenous requirements. • Heritage sites. • Final end land use.
	Department of Fire and Emergency Services (DFES)	• Emergency services. • Fire breaks. • Fire reduction.
	Main Roads Western Australia (MRWA)	• Use of public roads.
	Department of Jobs, Tourism, Science and Innovation	• Regional Infrastructure. • Projects of State Significance.
Federal Government	Department of the Environment and Energy (DoEE)	• Administration of the EPBC Act. • Referral and assessment of environmental impact assessments of matters of national environmental significance.
Local Government	Shire of Yilgarn and Shire of Kondinin	• Use of public roads and infrastructure.
Non-government organisations and interest groups	Conservation Council of Western Australia Wilderness Society National Malleefowl Recovery Team	• Protection of conservation significant species. • Potential interest in baseline flora and fauna survey data.

4.2 Stakeholder Communication Strategy

The purpose of the stakeholder closure communication strategy is to mitigate impacts of mine closure both on workers and the broader community. The communication strategy is targeted at the different stakeholder groups listed in Table 4-1 to ensure closure information is distributed in a timely and coordinated manner and will be updated as the operation progresses and key stakeholder groups change. Covalent's closure communication strategy is summarised in Table 4-2.

Table 4-2: Stakeholder Communication Strategy

Stakeholder Group	Proposed Consultation Timing (minimum)	Proposed Consultation Methods	Topics Likely to be Addressed
Covalent			
Covalent management	Ongoing	• Management meetings. • Review of RCP.	• Cost of closure. • Future liabilities. • Closure and rehabilitation methodology. • Sustainability (refers to environmental, social and economic factors).
Shareholders	Annually with increasing detail as time to closure decreases	• Annual Report. • Company Announcements.	• Cost of closure. • Future liabilities. • Sustainability.
Employees	One year prior to closure	• Workshops. • Questionnaires. • Training services.	• Transition following mine closure. • Training.
Community			
Local businesses and services	Ongoing	• Shire Council meetings. • Site / community meetings.	• Contracting opportunities. • Transition to post-mining business.
Shire of Yilgarn	Annually	• Shire council meetings. • Site / community meetings.	• End land use. • Transition to post-mining business. • Sustainability.
Other community groups	Annually	• Shire council meetings. • Site / community Meetings.	• Sustainability. • Transition to post-mining business.
State			
DMIRS	Ongoing	• Review of MCP (every three years). • Annual Environmental Report (AER). • Site inspections. • Meetings to discuss Project development and approvals.	• Decommissioning. • Safety. • Rehabilitation progress and bonds. • Closure criteria. • Surface water and groundwater management. • Landform stability. • Sustainability. • Final land use.
DWER	Ongoing	• AER. • Site inspections. • Meetings to discuss Project development and approvals.	• Pollution control. • Contaminated sites. • Sustainability. • Final land use.
Other			
Other Departments (e.g. EPA, DoEE)	As required	• Meetings. • Review of MCP. • Site inspections.	• Sustainability. • Final land use.

4.3 Stakeholder Consultation Register

A stakeholder engagement register has been developed for the Project and is provided in Table 4-3. As previously stated, due to the focus at Mt Holland being to develop the Earl Grey Lithium Project, much of the consultation undertaken over the past 12 months is focused on this Project and the associated closure benefits that might eventuate should the Project be implemented. Consultation that was listed in the previous MCP's is also included in the stakeholder engagement register.

Table 4-3: Summary of Key Stakeholder Consultation

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of Mines, Industry, Regulation and Safety (DMIRS)	16/02/2017	Meeting	**DMIRS**: Ian Mitchell (Team Leader – Operations, Environment), Richard Smetana (Environmental Officer). **Kidman**: Chris Williams (General Manager), Siobhan Pelliccia (Environmental Advisor, Blueprint Environmental Strategies).	Overview of project presented to DMIRS, focusing on proposed operations, environmental setting, baseline study results, presence of Chuditch, Malleefowl and threatened flora, opportunities for rehabilitation of abandoned mine site.	DMIRS commented on the potential positive outcomes associated with rehabilitation of historic disturbances. DMIRS suggested a pre–referral meeting be held with the Office of the Environmental Protection Authority to discuss conservation significant species.
Department of Water and Environmental Regulation– Environmental Protection Authority Service Unit (EPASU) and DMIRS	9/03/2017	Meeting	**EPASU**: Robert Hughes (Manager, Mining and Industrial South Branch) Helen Butterworth (Acting Principal Environmental Officer, Mining and Industrial South Branch). **DMIRS**: Ian Mitchell. **Kidman**: Chris Williams, Siobhan Pelliccia and James Cumming (Environmental Advisor, Blueprint Environmental Strategies).	Kidman delivered a presentation that provided details on: the Project (location, access, history); the abandoned mine status of the project; the proposed mining operation; the environmental setting, completed baseline studies and preliminary impact assessment; potential impacts on threatened species, focusing on the Chuditch, Malleefowl and Banksia; consultation that has occurred to date; the approvals pathway.	The EPASU recommended that Kidman consult with the Department of Parks and Wildlife the Commonwealth Department of the Environment and Energy, due to the presence of conservation significant species. DMIRS reaffirmed that any Mining Proposal would be referred to DBCA and/or the EPASU for advice due to the presence of conservation significant species.
Department of Biodiversity, Conservation and Attractions (DBCA) – Environmental Management Branch	9/03/2017	Phone Call	**Kidman**: Siobhan Pelliccia (Blueprint). **DBCA:** Daniel Coffey.	Informed DBCA of meeting with the EPASU and DMIRS and requested a meeting to discuss the conservation significant species in the Project area.	DBCA communicated that although the Project was of interest, DBCA could not meet with proponents unless their project was located in DBCA managed land, or a formal request was made by DMIRS or the EPASU through a formal process.
Department of the Environment and Energy (DoEE)	20/03/2017	Meeting in Canberra	**DoEE:** Dionne Cassanell (Senior Assessment Officer, Project Assessments West Section), Angela Gillman (Assistant Director, Project Assessments West Section), Karen Mexon (Assessment Officer), Cassandra Elliott (Assessment Officer). **Kidman**: Chris Williams, Michael Green (Exploration Manager), Siobhan Pelliccia, James Cumming.	Summary of project presented to DoEE (as described above for the EPASU) with a focus on matters of national significance, including the Chuditch, Malleefowl and *Banksia sphaerocarpa var. dolichostyla*.	Discussed possible approval pathways. DoEE commented that provision of fauna management plans would assist in the assessment process. DoEE would want to have a clear understanding of impacts and measures to avoid or minimise impacts and any residual impact remaining after implementation of management measures.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
DBCA – Western Shield Group	5/05/2017	Meeting	**DBCA**: Ashley Millar. **Kidman**: Chris Williams, Siobhan Pelliccia, Jill Woodhouse (Environmental Advisor) and Jenny Wilcox (Western Wildlife – Lead Zoologist).	Overview of Project presented with focus on findings of fauna survey, in particular, occurrence of Malleefowl and Chuditch.	Information on the Western Shield Program and ways in which Kidman can assist in the program through sponsorship and provision of survey results.
Non–Government Organisations	16/05/2017	Letters	**Conservation Council of WA**: Piers Verstegen (Director). **National Malleefowl Recovery Team**: Tim Burnard (National Coordinator). **Wilderness Society:** Peter Robertson (State Coordinator).	Introduction to Kidman and the Project. Recognition of stakeholder status. Invitation to meet to discuss the Project.	No comments received at time of submission.
DWER – EPA Service Unit	25/07/2017	Meeting	**EPASU**: Richard Sutherland (Principal Environmental Officer, Mining and Industrial Assessments (South)). Nyomi Bowers (Senior Assessment Officer). **Kidman**: Chris Williams, Lance Bosch, Siobhan Pelliccia, James Cumming.	Discussion covered: • Key preliminary factors for the project. • Process and timeframe for a public environmental review. • Public and agency comments on the referral. • Perceived gaps in the environmental review document. • Approvals process for preliminary works.	Meeting minutes were taken and reviewed by EPA. Record maintained by Blueprint.
Department of Jobs, Tourism, Science and Innovation (DJTSI) & DMIRS	11/08/2017	Meeting	**DJTSI:** Gary Simmons (Executive Director) and Dylan Lipinski (General Manager – Strategic Projects). **DMIRS**: Ryan Hepworth (Senior Office – Environment), Tyler Sujdovic (Senior Office – Environment). **Kidman**: Kevin Dockery, Siobhan Pelliccia, Lance Bosch.	Discussion covered: • Overview of the project presented. • Discussion regarding hold up of PoWs – exploration.	DJTSI/DMIRS suggested: • Prepare a brief memo that describes the proposed work (i.e. the necessity to complete resource drilling and sterilization drilling), but also gives more context in terms of it being within a surrounding disturbed area (brownfields site etc.). • Described how impacts to threatened flora/fauna will be managed. • Provide maps etc. • Provide the memo firstly to DMIRS to review and comment and then forward to the DoEE (cc'ing in JTSI, DMIRS and EPA). • DMIRS and JTSI will then most likely contact the EPA to discuss further if there are any issues.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
DMIRS	18/08/2017	Memorandum	**Sent to:** **DMIRS:** Ryan Hepworth (Senior Office – Environment), Tyler Sujdovic (Senior Office – Environment). **Sent from:** Siobhan Pelliccia on behalf of Kidman.	Memorandum that described the proposed exploration activities at the Earl Grey Lithium Project. Provided for review and comment before being forwarded to the EPA and the DoEE.	• The document provides a good overview of the exploration activities that you are proposing, and how potential impacts to MNES will be avoided or managed. • Based on the information provided in the memo, the activities appear to be low–impact in nature and DMIRS would not consider the exploration programmes to be an implementation of the broader Earl Grey Lithium project.
DWER (EPASU) and DoEE	28/08/2017	Memorandum	**Sent to:** **EPASU**: Richard Sutherland (Principal Environmental Officer, Mining and Industrial Assessments (South)). Nyomi Bowers (Senior Assessment Officer). **DoEE:** Dionne Cassanell (Senior Assessment Officer, Project Assessments West Section). **Sent from:** Siobhan Pelliccia on behalf of Kidman.	Memorandum that described the proposed exploration activities at the Earl Grey Lithium Project. Provided for review and comment before being forwarded to the EPA and the DoEE.	• EPASU: No response. • DoEE: As these activities are not within the scope of the current referral, it is appropriate that you conduct a self-assessment to determine whether there are, or are likely to be significant impacts to matters of national environmental significance. If you consider the activities are likely to have significant impacts, the activities should be separately referred to us. • The Department advised the safest approach, which provides legal certainty, would be to refer the action separately. The referral should include the proposed avoidance and mitigation measures discussed including the outcome of the onsite targeted survey for the Malleefowl proposed early in September 2017.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
DMIRS – Environmental Branch	28/08/2017	Meeting	**DMIRS**: Clare Grosser (Acting General Manager Minerals – South), Ryan Hepworth. **Kidman**: Chris Williams, Siobhan Pelliccia.	Kidman delivered a presentation that provided: • An introduction to Kidman Resources Limited. • An overview of the Project (location, access, history). • A description of the abandoned mine status of the project. • A description of the proposed mining operation. • A description of the environmental setting, completed baseline studies and preliminary impact assessment. • A discussion of potential impacts on threatened species, focusing on the Chuditch and Malleefowl. • An overview of consultation that has occurred to date. • A discussion about the approvals pathway.	• The area is considered to have unique biodiversity values. Kidman should consider looking at other Projects in the area that have been through a formal assessment process (e.g. Koolyanobbing Project). • Kidman should ensure they have a sound understanding of the contaminated sites status of the project. • Re. PER, DMIRS will predominantly be providing input on aspects relating to waste rock management and mine closure. • Regarding potential early works, it is possible that existing mining proposals that have been approved could be implemented, however approval is still required from the EPA and the Commonwealth Department of the Environment and Energy. • Early works are generally limited to those that can be implemented through programs of work (e.g. borefield drilling, camp, exploration). • It may be possible for the Mining Proposal to be assessed in parallel with the PER, however the Mining Proposal cannot be approved until after the Ministerial determination.
National Malleefowl Recovery Team	12/09/2017	Meeting	**National Malleefowl Recovery Team**: Dr Elizabeth Kington (Project Officer, WA). **Kidman**: Chris Williams, Siobhan Pelliccia, Belinda Bastow (Environmental Advisor, Integrate Sustainability).	Overview of project presented, focusing on proposed operations, environmental setting, baseline study results, presence of Chuditch, Malleefowl and threatened flora, opportunities for rehabilitation of abandoned mine site.	• Mound data being incorporated into the national data. • Project adopting the national mound monitoring protocol. • Joining the national mound monitoring network. • Approach adopted for remotely identifying mounds. • Project participating in the national adaptive management/predator control study. • No obvious concerns about the project.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Greening Australia	12/09/2017	Meeting	**Greening Australia**: Dr Blair Parsons (Director of Conservation – WA/NT), David Timmel (Business Development Manager). **Kidman**: Chris Williams, Siobhan Pelliccia, Belinda Bastow (Environmental Advisor, Integrate Sustainability).	Overview of project presented, focusing on proposed operations, environmental setting, baseline study results, presence of Chuditch, Malleefowl and threatened flora, opportunities for rehabilitation of abandoned mine site.	• Opportunities for traditional owner or aboriginal in the project. • Proximity to the Jilbadji Nature Reserve. • Intensity of the Malleefowl surveys. • Potential opportunities for GA to provide services to project in areas such as offsets, on–ground environmental work and rehabilitation work. • No obvious concerns about the project.
DMIRS – MRF Branch	14/09/2017	Meeting	**DMIRS:** Damian Montague (Acting Manager Abandoned Mines Program), Ryan Hepworth. **Kidman**: Chris Williams, Siobhan Pelliccia.	• Overview of Project abandoned site status and proposed operations. • Understanding of liabilities.	• DMIRS to seek advice on application of the MRF to areas that will be utilised by Kidman, in particular, where Kidman is rehabilitating liability landforms (such as the TSFs), how will MRF apply. • Kidman to prepare a memorandum that provides an overview of the proposed operation with respect to abandoned infrastructure and set out queries regarding assumed liabilities and application of the MRF, for DMIRs to follow up on.
DWER – EPA Services and Board	15/11/2017	Meeting	**EPA Board**: Tom Hatton. **EPA Services**: Anthony Sutton, Robert Hughes, Nyomi Bowers. **Kidman**: Chris Williams. **SQM**: Nicolas Velar, Ignacio Torrejon. **Strategen**: Darren Walsh, Mat Brook.	• Provided overview of the Mt Holland project and introduced Kidman, SQM and the JV.	• Discussion regarding project timing and Draft Environmental Scoping Document.
DMIRS	24/11/2017	Meeting	**DMIRS**: David Smith (Director General), Phil Gorey (Acting Deputy Director General). **Strategen**: Mat Brook. **Kidman**: Chris Williams.	• Discussion of stakeholder engagement conducted by Kidman with local shires and other local agency stakeholders. • Discussion of SQM operations and role of SQM in the Project.	• Enquiries regarding trucking and shipping of material, waste and existing liabilities. • Discussion of market for lithium and regional outlook.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Mt Holland Multi-Agency Site Visit	07/12/2017	Site Visit	**EPA Services**: Robert Hughes. **DMIRS**: Ryan Hepworth. **DoEE:** Angela Gillman, Mallory Owen, Denis Snowden. **DWER:** Tim Gentle, Louise Lavery. **DJTSI**: Steve Cosgrove, Steve Dawson. **Kidman**: Chris Williams. **SQM**: Nicolas Velar. **Strategen**: Mat Brook, Matthew Jones.	• Site inspection and discussion of project, outcomes of environmental surveys.	• Offsets need to be considered. • Management plans need to be outcome focused.
Board Meeting	14/12/2017	EPA Board Meeting Presentation	**EPA Board and EPA Services**. **Kidman**: Chris Williams. **SQM**: Nicolas Velar. **Strategen**: Mat Brook.	• Provided overview of the Mt Holland project and introduced Kidman, SQM and the JV. • Discussion of outcomes of environmental surveys.	• Discussion regarding project timing and Draft Environmental Scoping Document.
DWER – EPA Services	29/03/2018	Meeting	**EPA Services**: Robert Hughes, Nyomi Bowers. **Covalent**: David English. **Kidman**: Chris Williams. **Strategen**: Kane Moyle.	• Notification of formalisation of joint venture and joint venture management entity, WA Lithium (now known as Covalent Lithium Pty Ltd.). • Discussion of proposed changes to site layout. • Discussion of outcomes of environmental work and proposed surveys. • Discussion of anticipated residual impacts. • Discussion of proposed timeline and next steps.	
Department of the Environment and Energy (DoEE)	10/05/2018	Meeting in Canberra	**DoEE:** Dionne Cassanell (Senior Assessment Officer, Project Assessments West Section), Rod Whyte (Director, Project Assessments West Section). **Covalent**: David English. **Kidman**: Chris Williams. **Strategen**: Matthew Jones.	• Notification of formalisation of joint venture and joint venture management entity, WA Lithium (now known as Covalent Lithium Pty Ltd.). • Discussion of proposed changes to site layout. • Discussion of outcomes of environmental work and recent surveys. • Discussion of anticipated residual impacts and potential offsets for MNES. • Discussion of proposed timeline and next steps.	• Offsets need to be considered. Proposals for offsets need to be consistent and provide certainty for both parties.
DWER – EPA Services	18/09/2018	Meeting	**EPA Services:** Anthony Sutton, Nyomi Bowers, Robert Hughes. **Covalent:** David English, Colyn Louw. **Strategen:** Kane Moyle**.**	• Update of proposed project timelines and next steps. • Anticipated receipt of DMA comments. • Potential Minor and Preliminary Works application.	• DMA comments to be received in October 2018. • Covalent to send updated approvals schedule to EPA.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
DMIRS	5/10/2018	Meeting	**DMIRS:** Karen Caple, Mike Wilde, Dan Endacott. **Covalent:** Colyn Louw, Nicholas Vickery. **Strategen:** Kane Moyle. .	• Timing for the Mining Proposal submission. • Minor and Preliminary Works. • Interfaces with the EPA approvals.	
DWER – EPA Services	10/10/2018	Meeting	**EPA Services:** Robert Hughes, Nyomi Bowers, Bec Ryan. **Covalent:** Jan de Jage. **Strategen:** Kane Moyle, Tristan Sleigh, Matthew Jones.	• Discussion on DMA comments. • Adequacy of flora surveys for significant species • Statistical Comparison of Vegetation within the Earl Grey Lithium Project with the Ironcap Hills Vegetation Complex. • Environmental offsets and consideration in the ERD.	• Covalent to consider additional targeted surveys for significant flora.
DWER – EPA Services	19/10/2018	Meeting	**EPA Services**: Nyomi Bowers. **Covalent**: Colyn Louw. **Strategen**: Matthew Jones. **Mattiske**: David Angus.	• Review of DMA comment regarding targeted surveys for significant flora. • Field survey methods for proposed additional targeted flora surveys.	• Covalent to conduct additional targeted surveys in November 2018 for significant flora. • Results to be incorporated into the updated ERD.
DWER – EPA Services	14/11/2018	Meeting Memorandum	**EPA Services**: Robert Hughes, Nyomi Bowers. **Covalent**: Susanna Beech, Colyn Louw. **Strategen**: Matthew Jones.	• Discussion of additional targeted significant flora survey results. • Timing of resubmission of the updated ERD.	
DoEE	28/11/2018	Telephone	**DoEE:** Dionne Cassanell. **Covalent:** Susanna Beech.	• Discussion of a review conducted on the Offsets section in the ERD.	
Office of Honourable Minister Stephen Dawson MLC Minister for Environment and Disability Services	28/11/2018	Meeting	**Minister's Office:** Darren Forster. **Covalent:** Susanna Beech, Mark Fones. **Cannings Purple Strategic Communications:** Michael Cairnduff.	• Discussion of the Proposal and status of approvals.	• Recommendations for key stakeholders were provided.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Wilderness Society Wildflower Society of Western Australia Great Western Woodlands	13/12/18	Meeting	**Wilderness Society:** Kit Sainsbury. **Wildflower Society of Western Australia:** Brian Moyle. **Great Western Woodlands:** Peter Prices. **Covalent:** Susanna Beech, Colyn Louw. **Strategen:** Kane Moyle, Louise Whitley. **Mattiske Consulting:** David Angus. **Western Wildlife:** Jen Wilcox.	• Discussion of the Proposal and status of approvals.	• Recommendations for conservation group engagement were provided.

5. Post-mining land use and closure objectives

5.1 Post Mining Land Use

The Mt Holland Project is located on Unallocated Crown Land (UCL). There are no pastoral leases or Native Title Claims that coincide with the tenure.

Mining has been the principal land use in the Mt Holland region for several decades. Prior to mining, the area comprised natural wooded and scrubland ecosystems.

In consideration of the historic and permanently altered landforms, the aim at closure will be to return the Mt Holland Project areas, where utilised by Covalent, as far as practical to a natural ecosystem (vegetation, habitat, surface water drainage) in the form of Unallocated Crown Land (UCL) as the post-mining land use. While a return to a natural ecosystem is the ultimate end land use for the greater Mt Holland region, it is likely that further mining and mineral exploration by prospective companies will take place.

Based on the review of information pertaining to closure, there are not considered to be any significant legacies that will prevent the successful return of the Project areas utilised by Covalent to a near pre-mining land use. Details associated with the proposed final land use will be determined closer to the planned closure date as detailed within revised MCPs and in consultation with relevant stakeholders.

5.2 Closure Objectives

The objectives of this RCP aim to facilitate well-planned and effective mine reclamation, closure and decommissioning (and therefore mine closure) for the project by providing a process to (adapted from ANZMEC / MCA 2000):

- enable all stakeholders to have their interests considered during the mine closure process
- allow closure to occur in an orderly, cost-effective and timely manner
- enable the cost of closure to be adequately represented
- provide clear accountability and adequate resources for closure
- establish a set of indicators which will demonstrate the success of the closure process
- reach a point where Covalent has met agreed closure criteria to the satisfaction of the relevant authority.

The closure aim will be to return areas used by Covalent, as far as practicable, to the pre-mining land use of UCL available for exploration and mining activity as well as supporting natural habitats. This will be achieved through appropriate stakeholder consultation, removal of all infrastructure not required by other users, implementation of effective safety controls, remediation of any soil or water contamination and rehabilitation of remaining disturbances.

The overarching closure objective is to establish safe, physically and chemically stable landforms, with a self-sustaining and resilient vegetative cover similar to that of the surrounding landscape. Specific closure objectives are listed in Table 5-1.

Table 5-1: Summary of Closure Objectives

Aspect	Objectives
Safety	Ensure waste and materials / infrastructure from operational areas are disposed or buried upon decommissioning such that they do not pose a risk to human safety. Ensure contaminated materials are managed in a manner such that no impacts to human health or the environment will occur.
Physical Stability	Ensure long-term stability of final landforms. Ensure long-term stability and functionality of drainage structures. Attain stable landforms with conditions suitable for the natural establishment of a self-sustaining vegetation community.
Chemical Stability	Rehabilitated structures/landforms containing waste materials that may cause adverse environmental impacts if released to the environment are stable in the long term and do not preclude the post mining land use.
Ecological Function	To re-establish self-sustaining ecological communities on disturbed areas. Rehabilitate habitat supporting *Banksia sphaerocarpa* var. *dolichostyla*, conservation significant flora species (including *Microcorys* sp. Mt Holland (D. Angus DA 2397)), Malleefowl and Chuditch.
Visual Amenity	Final landforms integrate with the natural surroundings as far as practical.
Final Land Use	Any known mineral resources with potential value to future generations is, where practically possible, preserved for potential future exploitation. Retain transport facilities considered of value to stakeholders, where practical.
Water Quality	Ensure that the medium to long term water quality of local and regional surface and groundwater resources are not compromised.
Groundwater Regime	Mining not to have any long term detrimental impact on local or regional groundwater resources.
Closure Planning	Cost effective implementation of RCP/MCP resulting in final relinquishment of Mining Leases / Tenements.

6. Completion criteria

Completion criteria for the Mt Holland Project are listed in Table 6-1.

Completion criteria for the Project have been developed, following the S.M.A.R.T principle (ANZMEC/MCA 2000):

- specific enough to reflect a unique set of environmental, social and economic circumstances
- measurable to demonstrate that rehabilitation is trending towards analogue indices
- achievable or realistic so that the criteria being measured are attainable
- relevant to the objectives that are being measured and the risks being managed and flexible enough to adapt to changing circumstances without compromising objectives
- time-bound so that the criteria can be monitored over an appropriate time frame to ensure the results are robust for ultimate relinquishment.

Due to the Project being classified as an abandoned site, only small areas of previous disturbance associated with carrying out exploration activities are the liability of Covalent, as well as the disturbance associated with the proposed Project are relevant in this RCP. The completion criteria have been developed to relate to the Project.

For each site, a specific set of completion criteria needs to be developed to determine whether the rehabilitation end point has been reached. Where possible, completion criteria need to be developed from actual rehabilitation trials and site experience rather than arbitrary baseline studies conducted on analogue (local pristine) sites, which may have little edaphic or physical/chemical similarity to mine soils.

The significant earthworks and disturbance associated with mining often results in post mining landforms with soil structure and properties significantly different to the pre-mining state. These differences may mean that return of pre-mining ecosystems is not readily achievable. It is crucial that closure planning is based on results of field evaluations and trials to ensure that rehabilitation methods are effective, durable and achievable. In most cases, appropriate methodologies may take years to develop and may be markedly different to initial concepts.

Completion criteria will be achieved when monitoring data trends recorded at rehabilitated areas progress towards trends observed during successful field trials. Data collected and recorded through monitoring successful field trials sites and rehabilitated sites will be analysed to develop specific closure criteria relevant to the project.

6.1 Interim Completion Criteria

Interim closure criteria that will be used to measure the success of achieving the stated closure objectives for the project are shown in Table 6-1. Initial assessments will further establish closure criteria for inclusion into subsequent revisions of this document.

Table 6-1: Interim Completion Criteria

Item	Objective	Completion Criteria Descriptions	Measurement Tool
Public Safety	Ensure waste and materials / infrastructure from operational areas are disposed or buried upon decommissioning such that they do not pose a risk to human safety. Ensure contaminated materials are managed in a manner such that no impacts to human health or the environment will occur.	Rehabilitated areas will be free of any man made items which pose a risk to public safety (including infrastructure, contaminated materials and excavations). Block access points, abandonment bund and signage where appropriate. All exploration excavations (e.g. exploration sumps, landfill) will be backfilled.	As-built landform survey data. Audit of compliance following decommissioning and rehabilitation.

Item	Objective	Completion Criteria Descriptions	Measurement Tool
Physical Stability	Ensure long-term stability of final landforms. Ensure long-term stability and functionality of drainage structures. Attain stable landforms with conditions suitable for the natural establishment of a self-sustaining vegetation community.	Monitoring indicates rehabilitated areas are not prone to significant erosion. Drainage structures not prone to erosion or sedimentation, with unrestricted surface flow. • Rock armouring / buttressing of retaining embankments. • Surface water drainage control. • Materials characterisation included in TSF cover design work. • Landform stability modelling. No surface water impacts (flooding, water diversion) to impact on conservation significant species.	Geotechnically stable over 300 year time frame. Visual observations and photographic monitoring sites. Audit to confirm compliance with rehabilitation specifications. Species specific rehabilitation monitoring assessment.
Chemical Stability	Rehabilitated structures/landforms containing waste materials that may cause adverse environmental impacts if released to the environment are stable in the long term and do not preclude the post mining land use.	• All contaminated material is identified, analysed and effectively contained as per engineering designs. Any potentially contaminated soils remediated in accordance with DWER guidelines.	Soil sampling and analysis of areas that have the potential to be contaminated. Visual observation of vegetation. All sample analysis done by NATA accredited laboratories.
Ecosystem Function	To re-establish self-sustaining ecological communities on disturbed areas.	Monitoring results trend towards comparative analogue sites, specifically: • Plant density. • Species diversity. • Erosion rate. • Weed density.	Site specific rehabilitation monitoring assessment.
Conservation Significant Species	Rehabilitate habitat supporting *Banksia sphaerocarpa* var. *dolichostyla*, conservation significant flora species (including *Microcorys* sp. Mt Holland (D. Angus DA 2397)), Malleefowl and Chuditch.	Monitoring results trend towards comparative analogue sites, specifically: • Flora populations and density. • Fauna species density. • Malleefowl breeding observances. • Feral fauna density. No net loss in *Banksia sphaerocarpa* var. *dolichostyla* individuals of the known local population Habitat fragmentation minimised by rehabilitation focussing on soil and vegetation species to extend fauna habitat and vegetation communities. Measured against analogue sites	Species specific rehabilitation monitoring assessment. Rehabilitation monitoring - vegetation and fauna mapping.
Visual Amenity	Final landforms integrate with the natural surroundings as far as practical.	• All mine infrastructure (excluding the IWL, pit and any infrastructure retained in agreement with stakeholders) will be removed at closure.	• Photographic monitoring.

Item	Objective	Completion Criteria Descriptions	Measurement Tool
Final Land Use	Any known mineral resources with potential value to future generations is, where practically possible, preserved for potential future exploration or mining activity. Retain transport facilities considered of value to stakeholders, where practical.	• Agreement by DMIRS on proposed future landuse. • Formal agreement on transfer of land ownership. • Formal agreement on management and maintenance of remaining infrastructure (roads, landing strip, etc.). • Inspections indicate vegetation and rehabilitated landforms blend into the surrounding landscape.	• Site specific rehabilitation monitoring assessment. Verification by Company Legal Team.
Water Quality	Ensure that the medium to long term water quality of local and regional surface and groundwater resources are not compromised.	• No surface discharge of waters beyond the assimilative capacity of the local environment based on surrounding land systems.	Analysis done in accredited laboratory. • IWL seepage recovery. • Groundwater monitoring.
Groundwater Regime	Mining not to have any long term detrimental impact on local or regional groundwater resources.	• No contamination of groundwater resources beyond agreed levels. • No depletion of groundwater resources to the extent that has a detrimental environmental or social impact .	• Seepage water balance models. • Groundwater monitoring. • IWL groundwater seepage recovery modelling. • Vegetation monitoring. • Stakeholder engagement with potential water users.
Closure Planning	Cost effective implementation of RCP/MCP resulting in final relinquishment of Mining Leases / Tenements.	• Government approval of MCP. • Closure cost model. • Decommissioning Plan. • Relinquishment Plan.	• Annual (internal) up-date of this document. • Preparation of Decommissioning Plan 12-months prior to planned closure. • Annual up-date of Closure Provision. • Preparation of Relinquishment Plan.

7. Collection and analysis of closure data

Information provided in this Section provides an overview of the Project's environmental setting. It includes information that has been collected as part of feasibility studies relating to the Project, where the information is considered relevant to the current liability held by Covalent.

7.1 Regional Setting

The Project is located in the Southern Cross subregion of the Coolgardie Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion. The bioregion is characterised by subdued relief, comprising gently undulating uplands dissected by broad valleys with bands of low greenstone hills and numerous saline playa lakes. The vegetation is dominated by Eucalyptus woodlands, shrublands of Allocasuarina and Acacia, and mixed heath of Melaleuca and Acacia.

Approximately 10 km north of the historic processing plant is the Jilbadji Nature Reserve which is also classified as an Environmentally Sensitive Area (ESA). The Project area is highly disturbed from previous mining operations. There are no pastoral leases or other significant land uses within the vicinity of the Project.

7.2 Climate

The regional climate is one of extremes, where droughts and major floods can occur within a few years of each other. The Bureau of Meteorology (BoM) Lake Carmody rainfall station (No. 10670) is located approximately 51 km southwest of the Project and provides 77 complete years of data.

The climate is semi-arid with a mean annual rainfall varying from 300 mm to approximately 350 mm, with mean and median annual rainfalls of 332 and 329 mm respectively. The rainfall that occurs during the early winter months of June and July tends to be more reliable and generally of a greater total amount than the less dependable, but more intense, summer rainfalls from January to March. Remnant tropical cyclones and associated depressions can occasionally bring heavy rains to the region; however, they are erratic in nature and occur infrequently. Minimum and maximum annual rainfalls of 156.2 and 558.3 mm respectively have been recorded at the Lake Carmody rainfall station.

On average, there are approximately 66 rain days each year, although this may be as low as 15 days and as high as 130 days. The longest period without rain was 138 days, between 1 November 1920 and 19 March 1921.

Temperatures recoded at the BoM Hyden synoptic station, situated approximately 88 km west-southwest of the Project indicate the following:

- mean daily maximum temperatures range from 33.7°C in January to 16.4°C in July
- mean daily minimum temperatures range from 15.9°C in February to 4.6°C in July
- highest and lowest daily temperatures of 48.6°C and -5.6°C have been recorded in February (2007) and July (1982) respectively
- typically there will be in the order of 10 days each year with daily maximum temperatures in excess of 40°C, approximately 8.5 of which will occur in December, January and February
- on average 31 days each year can be expected when minimum temperatures will be 2°C or less and light ground frosts are possible. Two thirds of such days will occur in June, July and August.

In the absence of a local evaporation record, the average of pan evaporation data for the Merredin and Salmon Gums Research Stations has been applied to the Project. This provides a mean annual pan evaporation of some 1,867 mm.

7.3 Geology

7.3.1 Regional Geology

The Project is located in the Mt Holland Gold Field, which covers southern sections of the Archaean Southern Cross – Forrestania Greenstone Belt. The belt extends over 300 km and generally strikes NNW. Regional mapping identified two distinct lithostratigraphic units within the Belt; an ultramafic metavolcanic suite, and a sequence of overlying immature clastic metasediments. These units are regionally folded with a north plunging synform, steep east and shallow west limbs (East and West ultramafic-mafic domains) with a core of ultramafic-mafic-sedimentary rocks (central domain).

The greenstones are predominantly mafic and ultramafic flows, generally intercalated with banded iron formations (BIF), cherts, and clastic sediments. Regional metamorphism is recorded at amphibolite grade, with local areas of retrograde chlorite metamorphic facies. The Belt is enclosed by syntectonic granitoids.

The Eastern Domain mafic-ultramafic basal rocks comprise a thick sequence of tholeiitic basalts with minor high-magnesium basalts and exhalative sediments. The basal rocks overlie a granitoid basement, and are overlain by the Bounty sequence. The Bounty sequence is approximately 600 m thick and consists of komatiitic peridotite flows and basalts which are intercalated with BIFs. This sequence is host to the Bounty Gold mine and the nickel mineralisation within the Forrestania Belt. A dolerite sill overlies the Bounty sequence and is the basal unit of the uppermost ultramafic suite, which also contains tholeiitic basalts and minor exhalative sediment horizons.

The basal rocks of the Western Domain consist of clastic metasediments which lie upon a younger intrusive granitoid (west). Stratigraphically above the basal metasediments are a thick package of (from bottom to top) komatiitic high MgO olivine orthocumulate; then a low MgO pyroxenite with locally developed dolerite-gabbro differentiates and intercalated flow sediments; then finally a unit of high MgO basalts with intercalated flow sediments.

The Central Domain consists mainly of pelitic and psammitic schists (± garnet), thin BIF lenses and bands of graphitic schists. Two major shear zones in the Forrestania Belt separate the three domains. The Mt Holland Shear defines the Central and Eastern Domains. Likewise, the Van Uden Shear separates the Central and Western Domains. Additional shear zones are recorded as parallel and crosscutting stratigraphy dominantly orientated north south; and north north-west to south southeast.

Lastly, NNE striking sets of Proterozoic dykes cut the three domains.

7.4 Soils

As part of feasibilities studies to support the Earl Grey Lithium Project, a soil assessment was undertaken by MBS Environmental in 2017. The assessment included the collection and analysis of different soil types (depths, locations) within the Mt Holland Project. Two main soil and landform units were identified during the assessment:

- gently undulating sandplains. The dominant soil type within this unit is described as a duplex sandy gravel
- broad valleys and drainage lines. The dominant soil type within this unit is described as a yellow/brown loamy duplex.

Duplex sandy gravel soil profiles consist of a shallow gravelly sand A-horizon over compacted lateritic gravel in sandy clay matrix B-horizon. This soil type is present on topographically elevated areas and usually identified by association with sandplain heath vegetation, with sparse to scattered low eucalypts. Its typical profile is strongly acidic throughout (with lower pH in the B-horizon), non-saline and low sodicity. Deeper sand phases, indicated by the presence of Banksia species, may become water repellent when dry.

Yellow/brown loamy duplex soil profiles consist of a shallow sandy loam A-horizon over a compacted sandy clay to clay loam B-horizon. This soil type is present on lower lying landscapes and drainage lines within the Project area and usually identified by association with low eucalypt woodland and Melaleuca shrubs. The duplex character of profiles of this soil type is reflected by a circum-neutral, non-saline A-horizon over an alkaline, saline and highly sodic B-horizon.

Topsoil (A-horizon) of both soil types and root-bearing gravels of the duplex sandy gravel soil type within the footprint of the proposed open pit and waste rock dump are suitable for rehabilitation of disturbed areas at mine closure.

The gravelly subsoil material from the duplex sandy gravel soil type is not considered a highly valued rehabilitation material by virtue of very high acidity and a lack of coarse gravel, however it could be used as a gravelly construction material (e.g. road base or construction of the ROM pad and bunds).

Subsoil clay material from the yellow/brown loamy duplex soil type is not suitable for mine site rehabilitation because of its alkaline, saline and highly sodic characteristics. This material may be suitable for use in construction or can otherwise be managed as mine waste (MBS 2017).

As part of progressive rehabilitation trials, soil cover material shall be investigated with the intent of aligning with current vegetation and fauna habitats and to assess long-term stability.

7.4.1 Topsoil

A minimum of 200mm of topsoil is expected across the Development Envelope, however given that existing disturbed areas are been utilised, minimal topsoil is expected around the plant and accommodation areas.

In addition, the root bearing gravels of the duplex sandy gravel soil type should be stockpiled. Whilst it has a high natural acidity and lack of course gravel, it may be suitable for road base and construction material.

Clearing shall involve dozing of larger vegetation and raised blade clearing of smaller vegetation into stockpiles. Topsoil shall be dozed and stockpiled in piles no greater than 2 m tall and shall be separated from vegetation stockpiles. Stockpiles shall be strategically placed in locations for rehabilitation activities.

As part of progressive rehabilitation, rehabilitation trials shall occur.

7.4.2 Waste characterisation

Waste rock characterisation has been undertaken by MBS Environmental in 2017 (2017b). A summary of results are:

- all fresh rock waste (comprising mafic and contact zone rock types), was classified NAF and geochemically benign with very low levels of soluble metals and metalloids and no considered risk of any seepage or runoff adversely impacting the surrounding environment. The material is suitable for use in mine use, rock armouring or other purposes as required
- all clay rich oxide overburden material (mafic and pegmatite) within 30 m of the surface is highly saline to extremely saline and highly acidic with significant levels of exchangeable aluminium acidity. Although low in other soluble toxicants, these properties make the material unsuitable as growth medium. Deeper transitional material from approximately 30 to 45 m is circum-neutral and slightly to moderately saline. This material is better suited (compared to highly weathered oxide) as growth medium (e.g. subsoil)
- due to the elevated fines content and sodic nature, all oxide and transitional waste is either spontaneously dispersive or likely to become so if placed in exposed (surface or near surface) locations where the salt which currently stabilises clay aggregates will gradually leach from the material. Weathered mafics have an elevated fines content and are likely to be prone to erosion if placed on slopes (erosion being a somewhat different process to dispersion)
- management of oxide waste should avoid placing the material on sloped surfaces in order to prevent erosion. Suitable options would include returning waste materials into the pit void and/or encapsulation with the competent mafic rock waste in an above ground landform

- tailings were predicted to be NAF and although enriched in beryllium, tin, tantalum and rubidium, have very low solubility of metals, metalloids and fluoride (based on ore samples). Any net seepage from the tailings material is not considered to be a risk to the surrounding environment and saline groundwater.

Waste rock suitability for rehabilitation will be taken into account as part of waste rock management during operations. Suitable rehabilitation materials will be stockpiled for later use.

7.5 Landforms

The Project is located within the Southern Cross Zone, with the border of the Norseman Zone approximately 6 km to the east (defined by the Department of Agriculture and Food). The Southern Cross Zone is characterised by undulating plains and uplands (with some salt lake and low hills) on deeply weathered mantle, colluvium and alluvium over greenstone and granitic rocks, and is located the eastern Wheatbelt/south-western Goldfields between Bullfinch and Mt Holland. The Norseman Zone is characterised by undulating plains and uplands (with some sandplains and salt lakes) on granitic rocks of the Yilgarn Craton, located in the southern Goldfields between Koolyanobbing, Menzies, Zanthus (Trans-Australian Railway), Norseman and Lake Hope (MBS 2017).

Locally, there are no distinct, recognisable natural landforms in the Project area or surrounds. Topography within the Project area is generally subdued, with elevations ranging between 463 m RL AHD (Australian Height Datum) in the northwest and 390 m RL AHD in the southeast (borefield area). The average elevation across the Project area is approximately 435 m RL AHD. Natural gradients across the Project area are very gentle, typically less than 2°. The steepest natural gradients (5 - 6°) in the Project area are associated with a subtle ridgeline located to the northeast of the accommodation village. Steeper gradients are associated with the historic mining operation, where slope angles range from 15 - 20° on waste rock dumps, 20 - 35° on the TSFs or over 80° in abandoned pits. Elevations of these landforms typically do not exceed 35 m above surrounding ground levels.

7.6 Hydrogeology

7.6.1 Regional Hydrogeological Setting

The Project is within the Westonia Groundwater Area of the Southern Cross Province. Regionally the main groundwater sources in the Southern Cross Province are derived from the following sources:

- regional catchment controlled flow systems in fresh and weathered fractured rock
- tertiary palaeochannel sands
- calcrete units that commonly overlie palaeochannel deposits
- shallow alluvium.

Paleochannel, calcrete and shallow alluvial deposits can form significant aquifer types in the Southern Cross region, although the groundwater quality varies considerably, with salinity tending to increase downstream along the drainage lines. The lowest salinity groundwater tends to occur beneath the catchment divides. In the vicinity of the Project, Tertiary paleochannel sediments comprise gypsiferous silt and sands to the east of the Project area.

The deep weathering profile of the ultramafic and basaltic sequences characteristic of the Southern Cross region, result in a thick siliceous caprock. Modest supplies of groundwater can be derived from this weathered zone. Fractured basement aquifers are characterised by secondary porosity and permeability, resulting in complex fracturing enhanced by chemical dissolution. The storage capacity and hydraulic conductivity of these aquifers is largely related to the degree of fracture intensity. In the vicinity of the Project fracturing below the caprock is prevalent, with the development of siliceous magnesite veins. The groundwater supplies are typically saline to hypersaline.

Small quantities of potable water are known to occur in fractures within granite outcrops in the Southern Cross province. The limited exposure of granite indicates there is limited recharge potential and consequently is not considered sustainable as a project supply. No fresh water supplies have been identified near the Project area.

7.6.2 Bounty Mine Water Supply Hydrogeological Setting

The Bounty water supply supplemented the borefield and operated between 1988 and 2001. Numerous studies were undertaken over this period and the hydrogeology is therefore well understood. Dewatering was achieved by a combination of pumping from the Bounty underground mine and abstraction bores near the underground portal. Inflows were associated with fractures, shear zones and other structural features including a cross cutting pegmatite vein. At the end of mining in 2001, the abstraction volume for the Bounty mine was approximately 2,400 kL/day, or 876,000 kL/annum (GRM 2014). Groundwater quality of the Bounty water supply is hypersaline, varying between 75,000 and 140,000 mg/L TDS and has a circum-neutral pH of between 6.2 and 7.6 (GRM 2014).

7.6.3 Southern Borefield Hydrogeological Setting

An existing borefield is located approximately 8 km southeast of the accommodation village and was operated between 1988 and 2002. The borefield is situated in the Mt Hope caprock aquifer located on the eastern flank of the Forrestania-Southern Cross Greenstone belt. The geology in this area is characterised by a north-northwest striking, steeply dipping Archaean succession of altered mafics and ultramafic volcanic flows with associated metasediments (URS 2002).

The ultramafic lava flows have been structurally deformed, and in places, extensively weathered, resulting in the development of a fractured, silicified, vuggy caprock aquifer of limited vertical and lateral extent. Current knowledge of the aquifer indicates that it is relatively narrow but extensively developed along strike. The aquifer has a known strike of 4,500 m and is 20 to 40 m thick, underlain by slightly weathered ultramafic or basaltic lavas. Fractures and shear zones in strata adjacent to the ultramafic caprock may increase the extent of this aquifer and the volume of available groundwater resource (URS 2002).

The caprock aquifer is highly anisotropic, with permeability being controlled by the scale and extent of fracturing, weathering and alteration. Test pumping data suggests that aquifer conditions range from semi-unconfined with delayed yield to semi-confined with leakage effects, subject to local conditions. During operations, the borefield operated at up to 3,000 kL/day (GRM 2014). Recoverable storage volumes of the aquifer have been estimated to be approximately 20,000,000 kL (URS 2002).

The static water level in the borefield is typically between 7 and 18 m below ground level and the water quality is hypersaline, with TDS values ranging between 73,000 mg/L and 87,000 mg/L (URS 2002).

7.7 Hydrology

The Project is located within the upper headwaters of the Department of Water Lake Eva sub-catchment of the Avon/Yilgarn Basin (No. 615). The Lake Eva sub-catchment has an area of approximately 15,240 km2 within the 58,000 km2 basin. Local creeks and drainages are ephemeral in nature, occurring periodically during the summer months from January to March, when the potential exposure to high intensity cyclonic or tropical depression related rainfall is greatest. Consequently, on occasion, flows may be high and may cause localised flooding if appropriate measures are not in place. The Project area was subject to previous mining between 1988 and 2001. A combination of earth bunds and landforms dating from these earlier operations forms an effective drainage diversion around most of the site. Recent aerial imagery and site photos indicate no new watercourses or significant erosion gullies have formed as a result of flow concentration by these structures in the 20 years or more they have been in place.

Within the Project area, there are very few surface water features due to a limited total upper catchment area of less than 1,000 ha and the subdued relief. The only notable surface water feature is a constructed ephemeral drainage line that starts at the northwest tip of the airstrip and runs northeast past the processing plant area. Apart from this constructed drainage line, the Project area does not intersect any other identifiable drainage lines or creeks, with runoff generally occurring as sheetwash in a north-easterly direction. A small sub-catchment containing the southern end of the airstrip and accommodation village drains to the south.

7.8 Flora and Vegetation

7.8.1 Studies

Several assessments of flora and vegetation in the vicinity of the Project area have been completed (Table 7-1) The surveys were done in accordance with the standards set out in *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016b) and *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016a).

Table 7-1: Flora and vegetation studies completed for the Proposal

Investigation	Scope	Number of Personnel	Survey Effort (Person Days)
Mattiske Consulting Pty Ltd (2018d).	Mattiske Consulting and Strategen Environmental conducted targeted floristic surveys focused on Priority 1 flora, range extensions and new species with potential to be impacted by the Proposal in November 2018. Species of noted focus due to potential presence in the Development Envelope and potential impacts included: • *Brachyloma stenolobum* (P1) • *Grevillea lissopleura* (P1) • *Grevillea marriottii* (P1) • *Labichea rossii* (P1) • *Microcorys* sp. Mt Holland (D. Angus DA 2397) (P1) • *Acacia* sp. 1 (undescribed) • *Acacia* sp. Mt Holland (B. Ellery BE1147) (P1) • *Eremophila verticillate* (Threatened) (previously stated as *Eremophila* sp. aff. *verticillate)* • *Hibbertia* aff. *oligantha* (undescribed) • *Acacia undosa (P3)* • *Eutaxia lasiocalyx (P2)* • *Hakea pendens* (P3) • *Dicrastylis capitellata* (P1) • *Daviesia newbeyi* (P3) • *Stenanthemum bremerense* (P4) • *Daviesia sarissa subsp. redacta* (P2) • *Olearia laciniifolia* (P2) • *Orianthera exilis* (P2) • *Chorizema circinale* (P2) • *Callitris verrucosa* (range extension) • *Centrolepis strigosa subsp. rupestris* (range extension). Targeted surveys were conducted both within and outside the Development Envelope to characterise local context in addition to understanding the direct impacts of the Proposal.	5	25

Investigation	Scope	Number of Personnel	Survey Effort (Person Days)
Mattiske Consulting Pty Ltd (2018b).	Mattiske Consulting Pty Ltd was commissioned between April and June of 2018 by Western Australian Lithium Pty Ltd to undertake a survey of the threatened *Banksia sphaerocarpa* var. *dolichostyla* both within the Earl Grey Lithium Development Envelope and within the broader region surrounding the proposal area. 18 individual populations of *Banksia sphaerocarpa* var. *dolichostyla* were recorded during the surveys. A total of 16,503 *Banksia sphaerocarpa* var. *dolichostyla* individuals were recorded across all the areas surveyed. When the estimated numbers are included (6,083), the estimated local population is potentially 22,586 plants.	3-4	36
Mattiske Consulting Pty Ltd (2018a).	Flora and vegetation surveys have been conducted within the Earl Grey Lithium Project development envelope, a 1 km area around the development envelope and 200 m either side of the centre line of the access routes. The total area surveyed was 4,417.83 ha, of which 1,993.59 ha was within the Earl Grey Lithium Project development envelope. A total of 214 vegetation survey quadrats were established and surveyed across the survey area.	4	36
Blueprint Environmental Strategies (2017).	In April 2017, Goldfields Landcare Services conducted surveys for *Banksia sphaerocarpa* var. *dolichostyla* within proposed landform and infrastructure areas of the Development Envelope.	2	6
Mattiske Consulting Pty Ltd (2017).	The assessment of the flora and vegetation of the Earl Grey, Irish Breakfast and Prince of Wales prospects at Mt Holland was undertaken by Mattiske, from the 24 to 26 October 2016 and 9 to 10 November 2016. A total of 43 vegetation survey quadrats were established.	2	10
Native Vegetation Solutions (2016).	In September 2016, Native Vegetation Solutions conducted surveys for *Banksia sphaerocarpa* var. *dolichostyla* within proposed exploration areas of the Earl Grey deposit.	Not defined	Not defined
Native Vegetation Solutions (2014).	Native Vegetation Solutions (NVS) conducted surveys for *Banksia sphaerocarpa* var. *dolichostyla* around existing infrastructure areas (including roads, the historic camp, landfill and airstrip) of the site.	Not defined	Not defined

The results, where relevant to this proposal, are discussed in the following sections.

7.8.2 Flora

A total of 450 plant taxa were identified in the desktop assessment as having the potential to occur within the EGLP (Mattiske 2017b). These 450 taxa are representative of 54 families and 160 genera. The most commonly represented families were the Myrtaceae (115 taxa), Fabaceae (72 taxa), Proteaceae (40 taxa), Asteraceae (20 taxa), and Scrophulariaceae (13 taxa). The most commonly represented genera were Eucalyptus (50 taxa), Acacia (40 taxa), and Melaleuca (29 taxa).

A total of 369 vascular plant taxa which are representative of 140 genera and 49 families were recorded within the Development Envelope and surrounding vicinity. The majority of taxa recorded were representative of the Myrtaceae (73 taxa), Fabaceae (48 taxa), Proteaceae (42 taxa), Asteraceae (19 taxa), Rutaceae (17 taxa), and Ericaceae (11 taxa) families. The majority of the taxa recorded were widespread both locally and more broadly within the associated biogeographical subregion. A number of conservation significant taxa have been recorded in the Development Envelope (Mattiske 2017a, Blueprint 2017, Mattiske 2018a).

7.8.3 Vegetation Communities

The majority of the Proposal is situated on sandy, sandy clay or clay loam flats and gentle slopes supporting Eucalyptus mallee woodlands over Melaleuca shrublands.

Twenty-six local vegetation communities were defined by Mattiske (2017b) in the 2016 and 2017 surveys of the vicinity of the Proposal, including a buffer which extended 1 km beyond the boundary of the development envelope area and 200 m either side of the centre line of the access routes, as listed in Table 7-2. Of these, twenty-three communities were identified within the Development Envelope.

Table 7-2: Vegetation communities within the Proposal Survey Area

Code	Area (ha)	Description
Woodlands		
W4	235.8	*Eucalyptus flocktoniae* subsp. *flocktoniae*, *Eucalyptus eremophila* low open mallee woodland over *Melaleuca depauperata*, *Callitris canescens*, *Melaleuca phoidophylla* mid-tall sparse shrubland over *Acacia tetraptera*, *Grevillea acuaria* low isolated heath shrubs on orange brown sandy clay soils with ironstone or quartz pebbles on flats and slopes.
W5	138.7	*Eucalyptus rigidula*, *Eucalyptus burracoppinensis* low open mallee woodland over *Micromyrtus erichsenii*, *Persoonia helix, Hakea erecta* mid sparse heathland over *Hibbertia rostellata*, *Hibbertia stowardii* low isolated shrubs on gravelly orange brown clayey sand soils on flats and slopes.
W6	82.3	*Eucalyptus burracoppinensis, Allocasuarina acutivalvis*, *Allocasuarina spinosissima* tall open mallee woodland over *Hakea erecta*, *Petrophile stricta*, *Banksia laevigata* subsp. *fuscolutea* mid sparse heathland over *Drummondita hassellii*, *Hibbertia exasperata*, *Psammomoya choretroides* low sparse shrubland on yellow brown sandy soils on flats.
W7	85.2	Burnt *Eucalyptus* sp. (*E. cylindriflora, E. flocktoniae* subsp. *flocktoniae, E. prolixa, E. salmonophloia, E. eremophila, E. capillosa* subsp. *polyclada*) low open woodland over *Melaleuca hamata*, *Melaleuca eleuterostachya* mid sparse shrubland over *Daviesia argillacea*, *Acacia hemiteles*, *Acacia deficiens* low sparse heathland on orange brown sandy clay soils on flats.
W8	259.0	*Eucalyptus prolixa*, *Eucalyptus salmonophloia*, *Eucalyptus urna* mid mallee woodland over *Santalum acuminatum*, *Daviesia argillacea*, *Melaleuca eleuterostachya* mid sparse heathland over *Acacia merrallii*, *Daviesia argillacea*, *Microcybe multiflora* subsp. *multiflora* low sparse shrubland on red brown sandy clay flats.
W9	559.0	*Eucalyptus urna*, *Eucalyptus ravida*, *Eucalyptus prolixa* low mallee woodland over *Melaleuca pauperiflora*, *Dodonaea stenozyga*, *Daviesia argillacea* mid sparse shrubland over *Acacia merrallii*, *Grevillea acuaria*, *Microcybe multiflora* subsp. *multiflora* low sparse shrubland.
W10	49.0	*Eucalyptus* sp. (*E. urna, E. cylindrocarpa, E, rigidula, E gracilis*) low mallee woodland over *Melaleuca pauperiflora*, *Daviesia scoparia* mid sparse shrubland over *Acacia merrallii*, *Grevillea huegelii*, *Olearia muelleri* low sparse shrubland on red clay soils on flats.
W11	600.1	*Eucalyptus eremophila*, *Eucalyptus rigidula*, *Eucalyptus flocktoniae* subsp. *flocktoniae* low mallee woodland over *Melaleuca lateriflora*, *Melaleuca eleuterostachya*, *Melaleuca acuminata* subsp. *acuminata* mid sparse shrubland over *Grevillea acuaria*, *Acacia hystrix* subsp. *hystrix*, *Microcybe ambigua* low sparse shrubland on orange brown clay soils on flats.
W12	186.8	*Eucalyptus cylindriflora*, *Eucalyptus cylindrocarpa*, *Eucalyptus prolixa* low open mallee woodland over *Melaleuca eleuterostachya*, *Melaleuca lateriflora*, *Daviesia argillacea* mid sparse shrubland over *Grevillea acuaria*, *Acacia merrallii*, *Acacia camptoclada* low sparse shrubland on yellow brown to red brown sandy clay soils on flats.
W13	370.4	*Callitris canescens*, *Eucalyptus rigidula* low open mallee woodland over *Micromyrtus erichsenii*, *Persoonia helix*, *Allocasuarina spinosissima* mid tall sparse shrubland over *Beyeria sulcata*, *Drummondita hassellii* low sparse shrubland on yellow brown to orange brown clayey sands on flats and slopes.
W14	61.0	Burnt *Eucalyptus salmonophloia*, *Eucalyptus eremophila* mid open woodland over *Santalum acuminatum, Senna artemisioides* subsp. *filifolia* mid sparse shrubland over *Acacia hemiteles*, *Olearia muelleri* low sparse shrubland on orange brown clay spoils on flats.
W15	174.3	Burnt *Allocasuarina acutivalvis*, *Eucalyptus* sp. (*E. cylindriflora, E. eremophila, E, gracilis, E. rigidula, E. burracoppinensis*) low open mallee woodland over *Hakea minyma*, *Melaleuca cordata*, *Melaleuca hamata* mid sparse shrubland over *Dampiera sacculata, Pimelea sulfurea*, *Hybanthus floribundus* subsp. *floribundus* low sparse forbland.
W16	113.7	Burnt *Eucalyptus* sp. (*E. cylindriflora, E. tenuis, E. burracoppinensis, E. eremophila*) low open mallee woodland over *Persoonia helix, Gastrolobium spinosum*, *Acacia assimilis* mid sparse shrubland over *Dampiera tenuicaulis* subsp. *curvula*, *Glischrocaryon aureum*, *Dampiera eriocephala* low sparse forbland on orange red gravelly sandy loam soils on flats.
W17	2.8	Burnt *Eucalyptus* sp. (*E. cylindriflora, E. tenuis, E. burracoppinensis, E. eremophila*) low open mallee woodland over *Persoonia helix, Gastrolobium spinosum*, *Acacia assimilis* mid sparse shrubland over *Dampiera tenuicaulis* subsp. *curvula*, *Glischrocaryon aureum*, *Dampiera eriocephala* low sparse forbland on orange red gravelly sandy loam soils on flats.

Code	Area (ha)	Description
W18	69.3	*Eucalyptus rigidula*. *Eucalyptus platycorys*, *Callitris canescens* low open mallee woodland over *Melaleuca hamata*, *Allocasuarina spinosissima*, *Hakea erecta* mid sparse shrubland over *Hibbertia gracilipes*, *Phebalium obovatum*, *Cyathostemon heterantherus* low sparse shrubland on yellow brown sandy soils on flats.
W19	68.6	*Eucalyptus prolixa* low open mallee woodland over *Daviesia argillacea*, *Santalum acuminatum* mid sparse shrubland over *Acacia merrallii*, *Microcybe ambigua*, *Grevillea acuaria* low sparse shrubland on orange-red brown sandy clay soils on flats.
W20	48.3	Burnt *Eucalyptus urna*, *Eucalyptus salmonophloia*, *Eucalyptus tenuis* mid open mallee woodland over *Melaleuca pauperiflora* mid sparse shrubland over *Acacia deficiens*, *Daviesia argillacea*, *Daviesia grahamii* low sparse shrubland on red brown clay soils on flats.
W21	21.3	*Eucalyptus eremophila*, *Eucalyptus flocktoniae* subsp. *flocktoniae* low open mallee woodland over *Melaleuca hamata* over *Acacia acanthoclada* subsp. *acanthoclada*, *Dampiera sacculata*, *Westringia cephalantha* subsp. *cephalantha* low sparse shrubland on grey brown clayey sand soils on flats and slopes.
W22	66.0	*Eucalyptus eremophila* low open mallee woodland over *Melaleuca hamata*, *Melaleuca eleuterostachya*, *Melaleuca laxiflora* mid sparse shrubland over *Hibbertia exasperata*, *Cyathostemon heterantherus*, *Acacia sphacelata* subsp. *sphacelata* low sparse shrubland on slightly gravelly yellow-orange brown clay soils on flats and slopes.
Mallee Woodlands		
MW6	112.0	*Eucalyptus burracoppinensis, Eucalyptus eremophila mid open mallee woodland over Thryptomene kochii, Melaleuca laxiflora, Acacia acuminata mid open shrubland over Drummondita hasseli, Microcybe ambigua low sparse heathland on grey–brown to orange–brown clay to clay sand, often with scattered ironstone pebbles on flats.*
MW7	63.1	*Eucalyptus capillosa* subsp. *polyclada* mid open mallee woodland over *Allocasuarina spinosissima*, *Callitris canescens*, *Hakea minyma* mid tall sparse shrubland over *Phebalium megaphyllum* low sparse shrubland on orange brown clay soils on flats and slopes.
MW8	2.5	*Eucalyptus eremophila* low open mallee woodland over *Melaleuca hamata*, *Leptospermum erubescens*, *Melaleuca lateriflora* mid sparse shrubland over *Thomasia* sp. Salmon Gums (C.A. Gardner s.n. PERTH 02708639), *Darwinia* sp. Karonie (K. Newbey 8503) low sparse shrubland on orange brown clay in minor drainage channel.
Shrubland		
S1	65.0	*Allocasuarina acutivalvis, Allocasuarina spinosissima* tall closed shrubland over *Hakea subsulcata, Melaleuca cordata, Micromyrtus erichsenii* mid sparse heathland on lateritic orange-red clay soils on flats and lower slopes.
S2	228.2	*Allocasuarina acutivalvis, Allocasuarina spinosissima, Eucalyptus burracoppinensis* tall open shrubland over *Thryptomene kochii, Persoonia helix, Micromyrtus erichsenii* mid sparse heathland over *Cyathostemon heterantherus, Hibbertia exasperata, Drummondita hassellii* low sparse shrubland on orange brown clayey sand soils on flats.
S3	106.0	*Allocasuarina acutivalvis*, *Eucalyptus burracoppinensis* tall sparse shrubland over *Banksia purdieana*, *Hakea subsulcata*, *Melaleuca cordata* mid sparse shrubland over *Micromyrtus erichsenii*, *Persoonia helix* low isolated shrubs on gravelly yellow brown to orange brown clay to clayey sand soils on flats.
Heathland		
H1	2.0	*Melaleuca cliffortioides*, *Allocasuarina campestris*, *Dodonaea adenophora* mid open heathland over *Grevillea lissopleura* (P1), *Trymalium myrtillus* subsp. *myrtillus* low sparse shrubland on rocky red-brown sandy clay soils on slopes.
Cleared or Degraded		
CL	647.4	Cleared land, includes isolated small patches of degraded ruderal vegetation.

Overall, the vegetation communities mapped and species recorded in the survey area were consistent with the historical mapping of Beard (1972, 1990) and the more recent localised surveys (Craig 2006, Native Vegetation Solutions 2014, Convergent Minerals Limited 2014, Native Vegetation Solutions 2016). The majority of the Proposal is situated on sandy, sandy clay or clay loam flats and gentle slopes supporting *Eucalyptus* mallee woodlands over *Melaleuca* shrublands, interspersed with dense *Allocasuarina* scrub. No banded ironstone formations or vegetation associated with such formations was identified during surveys of the Development Envelope and surrounding areas.

Within the area mapped as cleared are smaller patches of highly degraded, ruderal vegetation. While still comprised of native species, these areas were deemed functionally within the cleared zone given the size of the vegetation patches and spatial context within existing cleared areas. Overall, the species recorded during the field survey, and the vegetation communities subsequently defined, are typical of the flora and vegetation which has been previously reported historically in the Forrestania region by Beard (1972, 1990), and in the more recent surveys in the vicinity of the Project.

The Development Envelope is situated wholly within the designated area for Ironcap Hills Vegetation Complexes (Mt Holland, Middle, North and South Ironcap Hills, Digger Rock and Hatter Hill) (banded ironstone), a Priority 3 ecological community. Banded ironstone formations or any form of outcropping is not present within the Development Envelope. The terrain of the Project is gently undulating flats with occasional low rises, none of which exhibited any outcropping that would be indicative of the PEC. Two studies of the community have been done by Gibson (2004) and Thompson and Allen (2013), with the more recent study focused on the Mt Holland area in the vicinity of the proposal.

A qualitative review of species and vegetation communities observed within the Development Envelope as compared to the Ironcap Hills vegetation complexes defined by Thompson and Allen (2013) is shown in Table 7-3. The comparison reveals a poor correlation between the identified vegetation communities, dominant vegetation types and representative species associated with Ironcap Hills Vegetation Complexes in addition to the lack of comparative landforms and geology associated with the PEC. Notable in Table 7-3 as compared to surveyed dominant vegetation described in Table 7-2 for the Development Envelope is the lack of correlation between dominant groupings. Even when dominant vegetation shows some degree of correlation, such as Community types 2 and 4 in Table 7-3, the dominant species were found to correlate to dominance in disparate surveyed communities under Table 7-2, often with notable geographic separation. The most notable correlation was between Community type 4 and local vegetation community W11, which still lacks a level of significance to suggest the presence of the PEC in the Development Envelope.

Based on the lack of a strong correlation between surveyed vegetation communities and species composition within the Development Envelope to the Ironcap Hills Vegetation Complexes, coincident with a lack of associated landforms, would support the proposition that the Proposal is not of consequence in relation to the Ironcap Hills PEC.

Table 7-3: Comparison of Ironcap Hills vegetation complexes (Thompson and Allen 2013) to vegetation communities within the Development Envelope

Ironcap Hills PEC surveyed community	Geology/Landform	Dominant Vegetation	Representative Species found in Development Envelope
Community #1	Predominantly **upland basalt/laterite** sites with **gentle gradients**	***Allocasuarina acutivalvis*** and *Acacia yorkrakinensis* subsp. *acrita* over *Melaleuca calyptroides,* ***Thryptomene kochii****, Hibbertia exasperata* and ***Drummondita hassellii.***	33 of 81 Present (41%)
Community #2	Upland sites characterised by granular or banded ironstone coarse fragments	***Allocasuarina campestris*** over ***Calothamnus quadrifidus*** **subsp. *seminudus***, *Hakea subsulcata* and ***Melaleuca cordata*** over *Stenanthemum stipulosum* and *Stylidium sejunctum.*	25 of 63 Present (40%)
Community #3	Upland laterite and weathered ironstone sites	***Eucalyptus eremophila***, *Acacia castanostegia*, *Baeckea crispiflora*, ***Beyeria sulcata***, *Hakea multilineata*, ***Melaleuca hamata*** and *Stenanthemum stipulosum* over *Phebalium filifolium* and *Platysace maxwellii* over *Lepidosperma* sp. A2 Inland Flat.	26 of 61 Present (43%)
Community #4	**Laterite and basalt sites with gentle slopes**	***E. flocktoniae*** and ***Allocasuarina acutivalvis*** over *Dodonaea bursariifolia*, ***M. acuminata*** **subsp. *acuminata***, ***M. hamata***, ***M. lateriflora*** **subsp. *lateriflora*** and ***Grevillea acuaria***.	27 of 64 Present (42%)

Ironcap Hills PEC surveyed community	Geology/Landform	Dominant Vegetation	Representative Species found in Development Envelope
Community #5	Coarse rock fragments predominantly basalt and undifferentiated greenstone with slight presence of exposed bedrock recorded as basalt	*E. salubris* over ***D. stenozyga***, ***Trymalium myrtillus* subsp. *myrtillus*** and ***G. acuaria*** with *Thysanotus patersonii*.	20 of 40 Present (50%)
Community #6	**Footslopes and pediments with little slope**	*E. calycogona* subsp. *calycogona*, *Exocarpos aphyllus* and ***Santalum acuminatum*** over ***D. stenozyga, G. acuaria*** over *Acacia erinacea* and *Wilsonia humilis.*	36 of 84 Present (43%)
Community #7	Most widespread distribution characterised by the presence of calcrete in the substrate and low species richness	*Eucalyptus extensa* over ***A. merrallii***, *Daviesia articulata* and ***Dodonaea stenozyga*** with *W. humilis*.	24 of 59 Present (41%)
Community #8	**Plains with little or no gradient**	***E. salmonophloia*** over ***Santalum acuminatum*** over ***A. merrallii***, ***Daviesia scoparia***, *Eremophila ionantha* and ***Olearia muelleri*** with *Austrostipa elegantissima*.	24 of 59 Present (41%)

* – PEC indicators found within the Development Envelope are highlighted in **bold**.

7.8.4 Conservation Significant Species

A number of conservation significant taxa have been recorded in the Project area (Mattiske 2017, Mattiske 2018b, Mattiske 2018d, Blueprint 2017). The species are listed in Table 7-4.

Table 7-4: Conservation Significant Flora Species Recorded in the Development Envelope

Species	Conservation Status		Records in 2014–2018 Surveys
	BC Act/DBCA Priority List	EPBC Act	
Banksia sphaerocarpa var. *dolichostyla*	Threatened (Vulnerable)	Vulnerable	16,503 records from targeted surveys. 5,220 plants recorded within the Development Envelope, 92 of these occur within the Proposed Layout (Mattiske 2018b). Infrastructure has been located to avoid this species to the maximum extent practicable.
Brachyloma stenolobum	Priority 1	NA	One individual recorded within the Development Envelope, but outside of the Proposed Layout.
Labichea rossii	Priority 1	NA	212 records from targeted surveys. 210 plants recorded within the Development Envelope, but outside of the Proposed Layout (Mattiske 2018d).
Microcorys sp. Mt Holland (D. Angus DA 2397)	Priority 1	NA	8,353 records from targeted surveys. 5,692 plants recorded within the Development Envelope, 1,799 of these occur within the Proposed Layout (Mattiske 2018d).
Daviesia sarissa subsp. *redacta*	Priority 2	NA	Four records from targeted surveys. Four plants recorded within the Development Envelope, but outside of the Proposed Layout (Mattiske 2018d).
Eutaxia lasiocalyx	Priority 2	NA	One record. One plant recorded within the Proposed Layout (Mattiske 2018d).
Orianthera exilis	Priority 2	NA	One plant recorded within the Development Envelope, but outside of the Proposed Layout.
Acacia undosa	Priority 3	NA	21 records from targeted surveys. Six plants recorded within the Development Envelope, four of these occur within Proposed Layout (Mattiske 2018d).
Hakea pendens	Priority 3	NA	225 plants recorded from targeted surveys. 216 occur within the Development Envelope and one within the Proposed Layout. (Mattiske 2018d).

Species	Conservation Status		Records in 2014–2018 Surveys
	BC Act/DBCA Priority List	EPBC Act	
Centrolepis strigosa subsp. *rupestris*	Range Extension	NA	Two plants recorded from targeted surveys. One occurs within the development envelope but outside the Proposed Layout.
Verticordia stenopetala	Priority 3	NA	Two plants recorded from targeted surveys. One occurs within the development envelope but outside the Proposed Layout.

***Banksia sphaerocarpa* var. *dolichostyla* (Threatened)** is an easily identified shrub 2 to 4 m tall, with bluish green leaves and golden inflorescences. It is confined to an area east of the cleared wheatbelt within the Narrogin and Merredin Districts. It occurs on Vacant Crown Land north from Digger Rocks through Forrestania to Mt Holland. This species prefers iron–capped rises on ironstone profiles. It is found in low woodlands to low shrublands with associates which include *Dryandra* and *Allocasuarina* species.

Banksia sphaerocarpa var. *dolichostyla* is currently known to be distributed between Mt Holland and South Ironcap, east of Hyden, Western Australia. Its preferred habitat is lateritic gravel on hills and rises. It commonly grows in association with *Banksia* spp., *Allocasuarina* spp., and *Hakea* spp. (Brown et al.1998, Collins et al. 2008, WAH 1998-). *Banksia sphaerocarpa* var. *dolichostyla* is currently listed as a threatened species under the BC Act and is listed as Vulnerable under EPBC Act.

Targeted surveys in 2018 (Mattiske 2018b) recorded 16,503 individuals in the Proposal survey area occurring within 18 distinct populations, nine of which occur outside of the Development Envelope.

Table 7-5: *Banksia sphaerocarpa* var. *dolichostyla* surveyed within the Development Envelope, and the local vicinity of the Proposal

Location	Individual Plants	Populations	Notes
Within the Development Envelope	5,220	7	Based on targeted surveys for *Banksia sphaerocarpa* var. *dolichostyla* across the entire Development Envelope in 2018, (Mattiske 2018b).
Local population	16,503	8	Targeted survey records. Mattiske (2018b) estimated 22,586 individuals in the vicinity of the Development Envelope

***Microcorys* sp. Mt Holland (D. Angus DA2397)** was first recorded by Mattiske Consulting during a reconnaissance survey of the Earl Grey prospect in 2016 (Mattiske 2017). A total of 8,353 individual *Microcorys* sp. Mt Holland (D. Angus DA2397) have been recorded across a range of areas both within and external to the Development Envelope. Within the Development Envelope, 5,692 individuals have been recorded, of which 1,799 individuals have been recorded within the Proposed Layout. However, based on local population estimates, the currently known local population has been estimated as 41,492 individuals with 7,498 potentially occurring within the Proposed Layout.

Within the Development Envelope, *Microcorys* sp. Mt Holland (D. Angus DA2397) was principally recorded within the S3 vegetation community. This species was also recorded within the MW7 vegetation community immediately downslope from the adjacent S3 community, but was not recorded elsewhere within the MW7 vegetation community. The S3 vegetation community is also the vegetation community which is the principal habitat of *Banksia sphaerocarpa* var. *dolichostyla*. *Microcorys* sp. Mt Holland (D. Angus DA2397) was recorded growing on disturbed track edges in parts of the proposed accommodation village and externally in vegetation inferred to correspond to the W6 vegetation community. Therefore, the *Microcorys* sp. Mt Holland (D. Angus DA2397) tends to be highly associated with areas where *Banksia sphaerocarpa* var. *dolichostyla* is growing.

Microcorys sp. Mt Holland (D. Angus DA2397) was recorded within the Jilbadji Nature Reserve, as well as S3 type vegetation external to the Development Envelope where *Banksia sphaerocarpa* var. *dolichostyla* is known to be present. *Microcorys* sp. Mt Holland (D. Angus DA2397) was recorded growing on sandplain areas within the Jilbadji Nature Reserve.

The potential impacts to *Microcorys* sp. Mt Holland (D. Angus DA2397) will be more restricted to the boundaries associated with the former taxon's distribution. The majority of potential impacts to the S3 vegetation community are associated with the waste rock dump on the eastern side of the mine pit.

Brachyloma stenolobum was recorded from one location (one individual) across the surveys completed by Mattiske Consulting (2018a and 2018d). The individual was recorded inside the Development Envelope. The present regional distribution of this taxon is at the southern edge of the Southern Cross IBRA sub-region.

Regionally, *Brachyloma stenolobum* is presently only known to occur within the Coolgardie IBRA region. Given the single individual recorded across multiple surveys, there is a low probability of further specimens of this taxon being recorded within the Development Envelope. Regionally, the majority of the recorded locations for this taxon are within the Forrestania area, on yellow sandy loam soils. This soil type is present in the vegetation along sections of the main access route from the Forrestania Rd to the Development Envelope. This access road is a wide access road and there may be little need to engage in further roadworks which would require further clearing of native vegetation.

Labichea rossii had four individuals and a further 208 individuals recorded by the surveys in 2017 and 2018 respectively (Mattiske 2018a and 2018d). The individuals recorded were within the Development Envelope but outside the Proposed Layout. However, based on local population estimates, the currently known local population has been estimated as 2,153 individuals with 189 potentially occurring within the Proposed Layout.

Regionally, records of *Labichea rossii* exist in the Southern Cross IBRA sub region, in the vicinity of the Development Envelope. The records were located within the S3 and W9 vegetation communities. The S3 vegetation community is also the main vegetation community in which *Banksia sphaerocarpa* var. *dolichostyla* is located. Impacts to *Labichea rossii* are likely to be minimal as the Proponent recognises the need to avoid disturbances to this vegetation community. Twenty-five recordings of *Labichea rossii* were made in the W9 vegetation community, located to the south of the S3 vegetation community, and external to the Development Envelope. The species was present on a slope comprising rocky clay soils which was situated downslope from the adjacent S3 vegetation community. Hence it is likely that this area may represent an ecotone between the S3 and W3 vegetation communities in this area. Consequently, impacts to *Labichea rossii* would be minimal in this vegetation community.

Daviesia sarissa subsp. redacta had one individuals and three individuals recorded by the surveys in 2017 and 2018 respectively (Mattiske 2018a and 2018d). The individuals recorded were within the Development Envelope but outside the Proposed Layout.

Regionally, records of *Daviesia sarissa subsp. redacta* exist within the Southern Cross IBRA sub region, to the north of the Development Envelope. The individuals have been recorded in the W13 and S3 vegetation communities. The current Proposed Layout has the potential to result in 11.23% of the W13 vegetation community being impacted.

Eutaxia lasiocalyx had one individual recorded by the surveys in 2017 (Mattiske 2018a and 2018d). The individual recorded was within the Development Envelope and the Proposed Layout.

Regionally, records of *Eutaxia lasiocalyx* exist both to the north and south of the Development Envelope, principally within the Coolgardie and Avon Wheatbelt IBRA regions. The preferred habitat for this species is described as red sandy loam, laterite and quartz gravel on gentle slopes (WAH 1998-). This soil type and landform has not been observed within the Development Envelope. Given the lack of records of this taxon being made during the present survey, it is likely that if it is present it may be so in very low numbers and on an occasional basis.

Orianthera exilis had one individual recorded by the survey in 2017 (Mattiske 2018a and 2018d) within the Development Envelope, however outside the Proposed Layout.

Regionally, scattered records of *Orianthera exilis* occur within 72 km to the north, east and south of the Development Envelope, within the Coolgardie and Mallee IBRA regions. The individual recorded within the Development Envelope was located within the W15 vegetation community in the southern section of the Development Envelope. W15 is calculated to have potentially 0.32% of its current extent impacted by Proposal. Given the isolated record of Orianthera exilis, in the vicinity of the borefields access route in a vegetation community which will be minimally impacted by Proposal.

Acacia undosa had 21 individuals recorded by the survey in 2017 (Mattiske 2018a) within the MW6, MW8, S2, W7, and W8 vegetation communities. Six individuals recorded were within the Development Envelope with four inside the Proposed Layout. However, based on local population estimates, the currently known local population has been estimated as 265 individuals with 30 potentially occurring within the Proposed Layout.

The MW8, W7, and W8 vegetation communities are calculated to have potential clearing impacts of between 0% and 0.12%. Both the MW6 and S2 vegetation communities are calculated to have 47.85% and 30.26% respectively of their present extent potentially cleared.

Regionally, records of *Acacia undosa* exist in both the Avon Wheatbelt and Mallee IBRA regions up to 230 km from the Development Envelope.

Hakea pendens had 225 individuals recorded by the survey in 2017 (Mattiske 2018a). Within the Development Envelope, 215 individuals were recorded and one individual within the Proposed Layout. A single, large population of *Hakea pendens*, comprising 214 plants was located within the W17 vegetation community on the eastern boundary of the Development Envelope.

Regionally, 74 records of *Hakea pendens* exist scattered through the Coolgardie IBRA region, with the majority of the known locations being situated to the north of the Development Envelope. The large population of *Hakea pendens* associated with the W17 vegetation community represents the single largest recording of this taxon.

The known habitat for *Hakea pendens* is stony loam soils and ironstone ridges (WAH 1998-), the former of which corresponds to the soils in the W17 vegetation community.

Centrolepis strigosa subsp. rupestris had two individuals recorded by the survey in 2017 (Mattiske 2018a) inside of the Development Envelope, however outside the Proposed Layout, within the MW8 vegetation community. MW8 will not be impacted as part of the Proposal.

The recording of *Centrolepis strigosa* subsp*. rupestris* represents an approximately 200 km southerly extension to the known range of this taxon.

Given MW8 is described as a drainage area and damper, it is possible other winter wet areas may provide a habitat for *Centrolepis strigosa* subsp*. Rupestris*. However, based on current results, it is unlikely that there would be impacts to this taxon. Notwithstanding this, given its widespread distribution across the Coolgardie, Avon Wheatbelt ad Murchison IBRA regions, impacts to this taxon regionally would be low.

Verticordia stenopetala was recorded opportunistically in the 2018 survey (Mattiske 2018d) outside the Development Envelope in the W6 vegetation community. A second recording of this taxon was made on the boundary of the S3 vegetation community on the south of the planned waste rock dump area within the Proposed Layout. The current distribution of this taxon is within the Coolgardie, Avon Wheatbelt and Mallee IBRA regions.

7.8.5 Introduced Species

Within the context of a site with a long history of clearing and development, the observed incidence of invasive weeds within the Development Envelope is very low. Only one introduced (exotic) plant taxon, *Centaurium tenuiflorum*, was recorded in the Development Envelope by Mattiske (2017a) at –32.077429, 119.756233. This taxon is listed as Permitted (s11) pursuant to the *Biosecurity and Agriculture Management Act 2007* (Department of Agriculture and Food Western Australia [DAFWA] 2017).

Centaurium tenuiflorum (*Gentianaceae*) is an erect hairless herb that can grow to 50 cm high. It produces pink flowers from the months of August to December and is known to occur along drainage lines, in swamp, and disturbed areas (Mattiske 2017a). The observation within the Development Envelope is at the very northern boundary of the site within existing vegetation and is not clearly associated with the developed footprint of the previous mine. The location of the observed *Centaurium tenuiflorum* is also outside of proposed site layout.

7.9 Terrestrial Fauna and Habitat

7.9.1 Studies

Western Wildlife was commissioned to complete a detailed fauna and habitat assessment of the Project area. Three field trips were completed as part of the study as described in Table 7-6. The surveys covered a broad study area, with more concerted trapping in the Project area as well as regional trapping and habitat assessment. A summary of the survey methods and findings are described below.

Table 7-6: Fauna and Habitat Surveys

Date	Survey Type and Extent	Survey Details
10 – 15 Oct 2016	Reconnaissance survey with targeted searches for Malleefowl and Chuditch.	Literature review and database searches. Opportunistic records taken. Habitats recorded and mapped. Chuditch: 12 baited camera traps established for 5 nights totalling 60 trap nights at Earl Grey. Malleefowl: 269 km of transects completed by 4 personnel at 10 m spacing.
21 Nov – 4 Dec 2016	Detailed survey (trapping and targeted searches).	Trapping – 12 sites established comprising: 10 pitfall traps, 10 baited funnel traps, 10 baited Elliott traps and 2 baited cage traps for 8 nights. Each site had 80 pitfall trap-nights, 80 funnel trap-nights, 80 Elliott trap-nights and 16 cage trap-nights. The survey had 960 trap-nights for pitfalls, funnels and Elliott traps, and 192 trap-nights for cages. Birds: 7 x 20 minute surveys undertaken at each trapping site. Bats: SM2 ultrasonic bat detectors deployed for 1 night at each trapping site and the camp. Spotlighting: 2 nights, 6 people in 3 teams using road-spotting and head-torching. Opportunistic records taken. Habitats recorded and mapped. Chuditch: 45 baited camera traps for 4 or 5 trap nights totalling 189 trap nights. Malleefowl: 314km of transects completed by 6 personnel at 10 m spacing.
15 Jan – 25 Feb 2017	Regional Chuditch survey.	Chuditch: 44 baited camera traps deployed for 13 to 24 nights resulting in 794 trap nights . Vegetation and habitat descriptions taken at camera trap locations. Malleefowl: Opportunistic only.

7.9.2 Habitat

Three broad fauna habitats were defined by Western Wildlife (2017) in the Development Envelope. Habitats were identified during the fauna surveys and on the basis of vegetation mapping (Mattiske 2017a), and are listed below:

Mallee woodland

Mallee woodland is a very common habitat, both within the Development Envelope and in the Regional Survey Area. The 'mallee woodland' habitat describes a structural type, and within that the habitat there is much variability in plant species composition and the density and composition of the shrubland understory, ranging from minimal understory to dense shrubland Mallee woodlands have been sub-divided into three habitats on the basis of the underlying soil type, sands, sandy-clays or clay-loam, as this impacts the ground-dwelling fauna that may occur. Note that even within these subdivisions the soil surface can be variable.

As the mallee trees are relatively small in diameter, this habitat generally lacks tree hollows, though scattered hollow-bearing trees are present. Where the understory is dense, it provides nesting habitat for small birds. The reptile assemblage is likely to vary depending on the substrate (e.g. clay or gravelly sand). Mallee woodland potentially supports conservation significant fauna including the Malleefowl (*Leipoa ocellata*), Chuditch (*Dasyurus geoffroii*), Inland Western Rosella (*Platycercus icterotis*), Lake Cronin Snake (*Paroplocephalus atriceps*) and Central Long-eared Bat (*Nyctophilus major tor*).

Salmon Gum woodland

Salmon Gum woodland is less common in this mallee-dominated region. These woodlands occur mostly in the eastern and southern parts of the Development Envelope, and are characterised by an open canopy of Salmon Gum (*Eucalyptus salmonophloia*), sometimes with Merrit (*Eucalyptus flocktoniae*), Sand Mallee (*Eucalyptus eremophila*), *Eucalyptus urna* or other eucalypts, over a sparse shrub understorey on clay flats. Salmon Gum woodlands were also noted to occur patchily in the Regional Survey Area. Much of this habitat is recently burnt.

Salmon Gum woodland is significant for the tall hollow-bearing trees and large fallen logs that provide shelter and nesting opportunities for a range of fauna. This habitat potentially supports conservation significant fauna including the Chuditch (*Dasyurus geoffroii*), Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*), Inland Western Rosella (*Platycercus icterotis xanthogenys*), and Central Long-eared Bat (*Nyctophilus major tor*).

Shrubland

Shrublands are common but patchy in occurrence in the Development Envelope, as well as in the Regional Survey Area. Shrublands occur on sandy-clay flats, gravelly sands and lateritic rises and vary in composition, but are usually dominated by species of *Allocasuarina*, *Hakea, Acacia, Banksia* and/or *Melaleuca*. Although sparse low mallee eucalypts may be present, this habitat lacks large trees. The dense structure of the vegetation provides shelter and nesting habitat for ground-dwelling birds. When in flower, shrubland habitats are likely to attract a suite of nectar-feeding bird species. Shrublands also occur in small patches throughout the Mallee Woodland habitat, at a scale too small to be mapped.

Shrublands potentially support conservation significant fauna including the Malleefowl (*Leipoa ocellata*), Chuditch (*Dasyurus geoffroii*), Rainbow Bee-eater (*Merops ornatus*), Western Brush Wallaby (*Macropus irma*) and Lake Cronin Snake (*Paroplocephalus atriceps*).

It is important to recognize that the fauna habitats are extremely variable on the local scale. For example, within the mallee woodland are small patches of shrubland that are too small to be separately mapped, but can provide Malleefowl breeding habitat within a matrix of less suitable habitat. This variability within the habitats contributes to the richness of the faunal assemblage.

Mattiske Consulting (2017) noted that the vegetation communities in the Development Envelope are typical of those reported in the Forrestiana region both historically (Beard 1972, 1990) and in recent flora and vegetation surveys. None of the habitats were considered to be restricted or unique in the region. Although the fauna habitats identified are extensive in the region, they are regionally significant in that they are part of the relatively continuous area of habitat known as the Great Western Woodlands.

Uncommon habitat types, such as granite outcrops, salt lakes or freshwater wetlands, are absent from the Development Envelope. Historically cleared areas, waste dumps and open pits, are present and only likely to support a small complement of native fauna. Cleared areas, including tracks, can provide access for feral predators.

Parts of the Development Envelope and Regional Survey Area were recently burnt at the time of survey. The fire that intersects the eastern and southwestern parts of the Development Envelope occurred in 2015. Earlier fires burnt the northwest quarter of the Regional Survey Area in about 2009, and a portion of the southern Regional Survey Area in 2016. While these areas are recovering after fire, they are likely to support a different faunal assemblage to that in long-unburnt habitats. Unburnt habitats are important, providing habitats for fauna that favour structurally dense habitats and a source from which fauna can recolonise burnt areas. For both Malleefowl and Chuditch fire is identified as a threatening process and therefore has been included as it relates to describing the quality of the habitat in the local environment.

7.9.3 Fauna Assemblage

The faunal assemblage is diverse as it contains elements from both the Eremaean (arid with irregular rainfall) and Bassian (southwest with regular winter rainfall) regions. The results of the fauna survey, supplemented with database records and published information, indicate that there are up to nine frogs, 67 reptiles, 108 birds and 32 mammals (27 native mammals) that have the potential to occur. A large proportion of these were recorded during the fauna surveys. Overall, one frog, 38 reptiles, 70 birds 18 native mammals and five introduced mammals were recorded from the Development Envelope and regional areas covered in the survey.

7.9.4 Conservation Significant Fauna

Twelve vertebrate fauna of conservation significance have the potential to occur in the Development Envelope and surrounds. These species are listed in Table 7-7.

Table 7-7: Conservation Significant Species That May Occur in the Development Envelope

Species	Conservation Status		Notes
	Western Australia	Commonwealth EPBC Act	
Reptiles			
Lake Cronin Snake *Paroplocephalus atriceps*	Priority 3	NA	Not recorded during fauna survey, but potentially occurs in woodland or shrubland habitats within the Development Envelope.
Woma *Aspidites ramsayi*	Priority 1	NA	Likely to be locally extinct. Potential habitat occurs outside of the Development Envelope, but not in the Development Envelope.
Birds			
Malleefowl *Leipoa ocelata*	Vulnerable BC Act	Vulnerable	Known to occur; 5 bird sightings, 4 active mounds and 16 inactive mounds were recorded within the study area of which 1 bird sighting, 1 active mound and 8 inactive mounds (including mound attempts) occurred in the Development Envelope.
Carnaby's Black–Cockatoo *Calyptorhynchus latirostris*	Endangered BC Act	Endangered	On the eastern limit of known distribution, this species may occur outside Development Envelope in the Van Uden area. It was not recorded in the Development Envelope. Development Envelope may provide foraging habitat.

Species	Conservation Status		Notes
	Western Australia	Commonwealth EPBC Act	
Peregrine Falcon *Falco peregrinus*	Schedule 7 BC Act	NA	Likely to occur, was recorded outside of the Development Envelope during fauna surveys, may utilise man–made structures like pits for nesting.
Rainbow Bee–eater *Merops ornatus*	Schedule 5 BC Act	NA	Known to occur, this common and widespread species was recorded in the Development Envelope, and may breed in sandy soils, however the Development Envelope is unlikely to be of significance to this species.
Fork–tailed Swift *Apus pacificus*	Schedule 5 BC Act	Migratory	Largely aerial species, the study area is unlikely to be of significance to this species.
Inland Western Rosella *Platycercus icterotis xanthogenys*	Priority 4	NA	Known to occur, recorded in the Development Envelope during the survey, the species may forage in the area however the Development Envelope does not constitute significant breeding habitat.
Mammals			
Chuditch *Dasyurus geoffroi*	Vulnerable BC Act	Vulnerable	Known to occur–Eighteen individual Chuditch trapped in the study area (ten adult and eight dispersing young), of which 16 were trapped within the Development Envelope. Of the 101 camera traps deployed, 44 traps recorded Chuditch within all habitat types, but with a preference for unburnt habitats. Of these, 14 were located in the Development Envelope.
Red–tailed Phascogale *Phascogale calura*	Endangered BC Act	Endangered	Although there is a historical record from 10 km south, this species is considered to have a low likelihood of inhabiting the Development Envelope, and no individuals were captured during trapping.
Western Brush Wallaby *Macropus irma*	Priority 4	NA	Likely to occur, this species was recorded outside of the Development Envelope.
Central Long–eared Bat *Nyctophilus major tor*	Priority 4	NA	May occur in the area, there are records from Jilbadji Nature Reserve, however none were recorded in the development area during the surveys.

Of the species listed in Table 7-7, the Malleefowl, Peregrine Falcon, Rainbow Bee–eater, Chuditch, Inland Western Rosella and Western Brush Wallaby were recorded by Western Wildlife within the Development Envelope and/or regional surrounds. Each of these species is discussed in the following sub–sections.

Malleefowl

The Malleefowl was sighted and active mounds were recorded in the fauna surveys. The fauna survey for Malleefowl included 269 km of intensively searched transects at 10 m spacing. In 2016 the search effort was focused on the location of potential deposits; Earl Grey, Irish Breakfast and Prince of Wales. In 2017 the survey effort covered the entire area of the Development Envelope to fully characterize habitat utilization. It is considered the inventory of mounds within these areas is near complete, but some mounds may remain unrecorded.

One active mound was recorded in the Development Envelope and three outside of the Development Envelope; eight inactive mounds (including mound attempts) recorded in the Development Envelope and nine outside of the Development Envelope; one bird was sighted in the Development Envelope and four outside of the Development Envelope.

Malleefowl in the study areas are likely to range over all habitats, favoring patches of shrubland on gravelly sands for mound construction. Although birds may forage in recently burnt habitats, unburnt areas are required for mound construction. Habitat loss, habitat fragmentation and feral predators are recognized as current threats. Large–scale fires are also likely to impact this species, resulting in loss of leaf–litter to build their mounds.

Based on the ecology of the Malleefowl and the results of the surveys, it is likely the Development Envelope contributes to supporting a small (less than 20 individuals) local population of birds at any given time. Locally, populations are likely to occur broadly across the bioregion with preference to areas not recently burned.

Chuditch

Eighteen individual Chuditch were trapped (ten adult and eight dispersing young), of which 16 were trapped within the Development Envelope. Chuditch were also recorded on 44 of the 101 camera traps, showing a preference for unburnt habitats. Factors that may have positively influenced Chuditch numbers in the survey include low numbers of feral predators and the presence of long–unburnt habitats within the Development Envelope to provide shelter and denning sites relative to the surrounding area. Individuals are likely to have a core home range of 1,500 ha (males) or 300 – 400 ha (females), though they are likely to range even more widely and the core home–ranges are likely to overlap (Serena and Soderquist 1989). Chuditch are likely to occur in all habitats in the study areas, and may use hollow logs, burrows and old White–browed Babbler nests as den sites, as well as man–made structures such as rocky bund walls. Current threats are habitat loss, habitat fragmentation and feral predators. Large–scale fires impact this species through loss of den sites and prey.

In 2016 surveys, 18 individual Chuditch were trapped (ten adult and eight dispersing young) and Chuditch were recorded on 44 of the 101 camera trap locations showing a preference for unburnt habitats. In 2017 surveys, 10 individual Chuditch were trapped (three adult and seven dispersing young) and Chuditch were recorded on 52 of the 136 camera trap locations.

Based on the ecology of the Chuditch and the results of the surveys, it is likely the Development Envelope contributes to supporting a small (less than 50 individuals) local population of Chuditch at any given time. Locally, populations are likely to occur broadly across the bioregion with preference to areas not recently burned.

Other conservation significant fauna species

Peregrine Falcon – is a widespread bird of prey that globally has a very large range and a very large population that appears to be secure, as in Western Australia, though this species may experience reductions at a local level due to human disturbance at nesting sites. The species is likely to forage in open habitats and often takes advantage of man–made structures nest on ledges in open pits. The Peregrine Falcon was recorded outside of the development area during the fauna surveys; it potentially nests in the existing open pits.

Rainbow Bee–eater – is a common species that migrates south in summer to breed, it is likely to be a breeding summer visitor to the area. The population is large and secure, it is widespread in Western Australia and was recorded in the Van Uden study areas during the fauna survey. The Rainbow Bee–eater may forage anywhere over the Development Envelope, but is only likely to breed where there are lighter soils in which to burrow, potentially breeding alongside tracks or in open patches in shrublands or woodlands. As the Rainbow Bee–eater has an extremely large range and an extremely large population size that does not appear to be, it is unlikely that the Development Envelope is of particular significance for this species.

Inland Western Rosella – is endemic to southern Western Australia. The population is stable in the Great Western Woodlands. This species occurs in eucalypt and Casuarina woodlands, nesting in tree hollows. The Inland Western Rosella was recorded in the Development Envelope and the bird is considered likely to forage in the greater study area in both woodlands and shrublands. The Development Envelope does not constitute significant breeding habitat as it lacks large trees that may contain hollows. The greater study area includes habitats with tall, hollow–bearing eucalypts that are potential breeding habitat (Western Wildlife 2017).

Western Brush Wallaby – is endemic to the southwest of Western Australia. The Western Brush Wallaby is likely to occur throughout the mallee woodlands and shrublands and occurs in open forests or woodlands. The home–range size of this species has been estimated at about 9.9 ha for males and 5.3 ha for females. There are several local historical records of the Western Brush Wallaby in Forrestania and Jilbadji Nature Reserve. This species was observed in the greater regional area opportunistically and recorded on camera traps. The Western Brush Wallaby is likely to occur in shrubland and woodland habitats, including recently burnt habitats (Western Wildlife 2017).

7.10 Short Range Endemics

Short range endemic (SREs) invertebrates are species with naturally limited distributions of less than 10,000 km^2 (Harvey 2002). SREs' limited distributions are typically a result of poor dispersal powers, confinement to discontinuous or rare habitats, slow growth and low fecundity (Harvey 2002). The phenomenon is considered to be widespread. Western Australian invertebrate groups that consist principally of SREs include *Gastropoda* (snails and slugs, both freshwater and terrestrial), *Oligochaeta* (earthworms), *Onychophora* (velvet worms), *Araneae* (mygalomorph spiders), *Schizomida* (schizomids), *Diplopoda* (millipedes), *Phreatoicidea* (phreatoicidean crustaceans), and *Decapoda* (freshwater crayfish).

A desktop review of SRE and listed invertebrates was conducted for the Development Envelope and surrounding habitats (Bennelongia 2017). At least 48 species from SRE Groups have been recorded in the 100 km x 100 km vicinity of the Proposal. No confirmed SRE invertebrate species have been recorded in this area. Of the species recorded, 23 are widespread, six are potential but unlikely SRE species and 19 are potential SREs. Potential SRE species include 15 mygalomorphs, two isopods, a pseudoscorpion and a millipede. Bennelongia, based on professional judgement, considers many of these potential SRE species are likely to be widespread, but current records are insufficient to accurately predict their distributions. No listed invertebrate species has been recorded in the search area and it is highly unlikely that any occur.

Potential SRE habitat units were assessed based on the Western Wildlife (2017) and Mattiske (2017) assessments, in addition to broad-scale habitat units from Beard et al (2013) and modified based on the context of SRE species. The faunal habitats and vegetation communities were assessed for SRE habitat suitability based on the availability of moisture, soil structure, geological diversity, vegetation type and extent of shade and shelter.

Six habitat units were determined and are detailed below:

1. Mallee woodland on clay/sandy clay soils on flats and slopes - is an amalgamation of four vegetation communities characterised by low and mid mallee woodland over sparse shrubland or heathland on red, orange and brown clays or sandy clays on flats and slopes. This habitat type covers 30% of Development Envelope, and is likely to occur as part of regionally extensive vegetation associations outside the Development Envelope. Although SRE groups are likely to occur in deposits of leaf litter, this unit is of low prospectivity for SRE species due to its wide extent and good regional connectivity.
2. Open mallee woodland/woodland on clay/sandy clay on flats and slopes is the most common and widespread SRE habitat type, combining 15 mallee and two non-mallee open woodland communities and covering 33% of the Development Envelope. It is characterised by open mallee woodland (or less commonly open non-mallee or gimlet woodland) over sparse shrubland or heathland on grey, brown, orange, yellow and red clays and sandy clays on flats and slopes. Due to the wide extent both within and beyond the development envelope and wider region, a low degree of prospectivity for SRE species is inferred.

3. Open mallee woodland on lateritic clayey sand on slopes and ridges comprises a single vegetation association, W17, and covers less than 1% of the Development Envelope. However, it was not identified in the mapped area outside the Development Envelope. The separation of this habitat from other open mallee woodland units is based on the presence of lateritic surface rocks that may offer some specialist microhabitats for a range of specialist species, such as selenopid wall crab spiders, pseudoscorpions and burrowing species such as mygalomorphs and *Urodacus* scorpions that may favour rocky substrate. In reality, however, the absence of outcropping rock reduces the likelihood of species being restricted to this small area of habitat, with species instead being likely to utilise microhabitats present in surrounding mallee woodland. In addition, SRE Group species are likely to reside in deposits of bark and leaf litter, especially at the bases of larger trees. The significance of this small area of laterite within the local landscape is unclear, although is likely to be low on a regional scale. A moderate degree of prospectivity for SRE species is inferred for this habitat, although this may be overestimated by desktop and species from SRE Groups utilising this small pocket of habitat may also occur in surrounding mallee woodlands.
4. **Open mallee woodland on sandy clay with pebbles on flats and slopes** comprises a single vegetation community, W4, which cover 1% of the Development Envelope, although there may be some justification for its amalgamation into habitat 2. Although similar to habitat 2 in terms of vegetation, habitat 4 is separated on the basis of having some rocks (mainly ironstone and quartz pebbles), which may alter the structure of soil in such a way as to favour some specialised species that burrow in rocky substrate, at the expense of generalist burrowing species or those that prefer finer soils (such as those in habitat 2). It is also possible, although unlikely, that non-burrowing specialist species that favour rocky habitats (such as some spiders and pseudoscorpions) occur in this unit. This habitat is highly likely to occur within regionally extensive and interconnected vegetation associations. Therefore, it is inferred to have a low degree of prospectivity for SRE species.
5. **Open heathland on rocky, sandy clay with on slopes** comprises a single vegetation association, H1, covering 2 ha in the southern portion of the Development Envelope. It is absent from within the development envelope and as such will not be threatened by the Proposal. Given the general lack of eucalypts or other species that would generate significant amounts of leaf litter and provide cover, this habitat is highly exposed, and few (if any) moist microhabitats are present. Rocky substrate may provide some, though probably limited, habitat for specialist species including burrowing forms and, to a lesser extent, non-burrowing rock specialists. Given the absence of regionally significant geological features and high degree of exposure, this habitat is considered to have low prospectivity for SRE species, although species from SRE Groups may occur in low abundance. Larger areas of heathland occur outside the Proposal area in vegetation associations 1148 and 2048 and possibly amongst areas of mallee woodland.
6. **Tall shrubland on clay soils with some rocks on flats and slopes** is made up of three similar vegetation associations and is characterised by tall shrubland (ranging from open to closed) over sparse heathland and shrubland on clay soils. It covers 10% within the Development Envelope as well as occurring in externally in the mapped area and probably also in regionally extensive vegetation associations. Significant microhabitats for SRE species are unlikely to occur in this habitat, with larger trees that would provide leaf litter, bark and shade cover absent. Significant surface rocks are absent, although soils are pebbly or gravelly in places, possibly favouring burrowing species that prefer coarse media over generalists. Overall, a low degree of prospectivity is inferred.

The extent of the habitats beyond the Development Envelope were assessed, as well as extent of habitat connectivity and the presence of habitat isolates, which might restrict dispersal of SRE.

These units generally have low prospectivity for SRE species, although widespread species belonging SRE Groups are likely to utilise the habitats. All units extend outside the Proposal with the exception of habitat 3 (open mallee woodland on lateritic clayey sand on slopes and ridges), although in reality it is likely that this habitat also occurs regionally outside the area covered by habitat/vegetation mapping. It is also considered unlikely that habitat 3 provides truly specialised habitat usually necessary to indicate prospectivity for SRE species due to a its lack of truly distinguishing geological features, such as outcropping rock, granites or BIF.

7.11 Troglofauna

Troglofauna, or troglobites, are obligate terrestrial subterranean fauna that inhabit air chambers in underground caves or other smaller voids in sub-surface regolith above the water table and are characterised by a lack of eyes and body pigment. Where small subterranean voids are present, the pattern of their occurrence will affect the density and distribution of troglofauna. Geological features such as major faults and dykes may block off the continuity of subterranean habitat and thus act as barriers to below-ground dispersal of troglofauna, causing species to have highly restricted ranges.

The geology of the strata above the water table within the Project area consists of predominantly weathered pegmatite which is considered to have limited potential to support troglofauna populations.

7.12 Stygofauna

Stygofauna are obligate, groundwater dwelling fauna known from a number of habitats in a variety of rock types including karst, larval tubes, alluvial sediments and subterranean carbonate deposits (calcrete aquifers) with alluvial and carbonate deposits typically thought to be the most productive habitats.

Available hydrogeological information (described in Section 7.6) indicates a very low likelihood of stygofauna being present due to:

- groundwater in the vicinity of the pit being saline to hypersaline, with total dissolved solids (TDS) varying between approximately 17,000 mg/L and 120,000 mg/L
- groundwater associated with the borefield being hypersaline (between 73,000 mg/L and 87,000 mg/L TDS) and above the general tolerance level of stygofauna
- low yielding aquifers associated with the pit, with an absence of suitable habitat.

7.13 Social Environment

7.13.1 Social Setting and Land Use

The Project is located in the Yilgarn Shire which covers 30,720 km^2. The Shire is sparsely populated, with the total population estimated at 3,000. Southern Cross is the major town centre of the Shire of Yilgarn.

The two major industries in the Shire are mining and agriculture. Gold, gypsum, salt and iron ore are mined, while grain, wool, sheep, cattle and pigs are the focus of the agricultural industry.

There are no pastoral leases or associated agricultural activities occurring in close proximity to the Project. The nearest towns are Marvel Loch, located 80 km north of the Project and Hyden, located approximately 100 km southwest of the Project. The Project is not located within any registered Native Title claims.

7.13.2 Heritage

Aboriginal Heritage

An ethnographic survey of M77/1065, M77/1066, M77/1067, M77/1080, G77/109, G77/110, L77/193 and L77/194 was undertaken from 28 August to 18 December 2004. The survey was completed by an anthropologist, Wayne Glendenning from Western Heritage Research Pty Ltd and the following three Aboriginal groups:

- the Central West native title claimant group
- the Gubrun People
- the Ballardong native title claimant group.

No ethnographic sites were identified by any individual or group during the ethnographic survey (Western Heritage Research Pty Ltd 2005).

A search of the Department of Aboriginal Affairs Aboriginal Heritage Inquiry System was completed in May 2017. There are no registered native title claims in the Project area.

In 2017, Kidman commissioned Land Access Solutions (LAS 2017) to complete an archaeological survey of the Project area. No Aboriginal sites were recorded and the LAS concluded that there was a low likelihood of archaeological material being identified in the area due to:

- the Survey Area not containing sufficient natural resources to attract Aboriginal occupation
- an absence of perennial water sources located in the Survey Area
- the absence of prominent hills or vantage points
- the absence of outcrops that could yield material suitable for the manufacture of stone tools.

The Project area does not have any registered Native Title Claims or Indigenous Land Use Agreements in place.

European Heritage

Searches of the following databases have been undertaken for the Project:

- National Heritage List
- Register of the National Estate
- Commonwealth Heritage List
- World Heritage List
- Western Australian Register of Heritage Places.

The Project is not within the boundaries of any gazetted heritage places. The Great Western Woodlands are nominated as a natural place under the National Heritage List (discussed in Section 7.9.2). The Great Western Woodlands in the semi-arid inland of Western Australia's south-west are one of the largest remaining, and most intact, temperate woodlands left on Earth, covering an area of more than 16 million ha.

7.14 Knowledge Gaps and Further Studies

Table 7-8 summarises the knowledge gaps, proposed studies, timeframes and current status of key items that are required to conduct closure activities at the Project.

Table 7-8: Key Knowledge Gaps

Knowledge Gap	Proposed Studies	Proposed Timeframes	Current Status
Stakeholder acceptability of final land use and mine closure criteria.	Undertake specific consultation in relation to final land use and mine closure with those Stakeholders identified in Table 4-1 as having a primary interest in these areas.	Operational phase	As part of ongoing exploration and feasibility studies to develop the Project, Covalent has conducted serval meetings with relevant stakeholders to discuss mine closure planning. The MCP that will be submitted to DMIRS with the Earl Grey Project approval application will further delineate and refine closure criteria and final land use expectations.

Knowledge Gap	Proposed Studies	Proposed Timeframes	Current Status
Materials balance.	Prior to next iteration of MCP determine materials balance for all closure domains.	Prior to next iteration of MCP	As part of exploration activities, any vegetation and soils that is removed, is stockpiled for respreading following completion of exploration activities. A materials balance for this component of work is therefore not required. A detailed materials balance is required to ensure adequate suitable materials are available for rehabilitation for other closure domains. Numerous miscellaneous stockpiles of topsoil and subsoil material are located throughout the Project. While no detailed materials balance has been completed, it is anticipated that a significant proportion of rehabilitation can be completed using material sourced from these stockpiles. Progressive rehabilitation of the short term disturbed areas will be conducted once the material resources have been accessed.
Rehabilitation material performance	Undertake progressive rehabilitation trials to determine suitable rehabilitation cover methods.	Operational phase	Waste rock characterisation has been completed with management recommendations. However, the ability of rehabilitation materials to result in appropriate vegetation communities that are stable is un-tested. Progressive rehabilitation trials will be undertaken to determine suitable cover material and design to meet completion criteria (particularly associated with conservation significant species habitat).
Species mix for rehabilitation.	Determine appropriate seed mixed for rehabilitation of IWL and other disturbed areas.	Prior to rehabilitation.	Appropriate seed mixes for the IWL and other disturbance areas will be determined prior to their rehabilitation. Additional flora studies conducted in 2016 provide further information to assist in this determination.
Banksia sphaerocarpa var. *dolichostyla* rehabilitation	Research program and rehabilitation trials into the effectiveness of propagation and translocation of *Banksia sphaerocarpa* var. *dolichostyla*	Prior to rehabilitation.	Banksia sphaerocarpa var. dolichostyla has been identified as a good candidate for seeding in rehabilitation areas with suitable soils. It has been observed to be a recruiting species in previously burnt and disturbed areas. Currently no further research or trials have occurred, therefore uncertainty exists
Rehabilitation monitoring	Determine locations and scale of rehabilitation monitoring programme.	Prior to next iteration of MCP	Sufficient vegetation mapping surveys have been completed to establish appropriate analogues for vegetation monitoring. However, the operational footprint requires finalisation prior to confirming monitoring locations.
Conservation Significant Species Monitoring	Determine locations and scale of conservation significant species monitoring programme.	Prior to next iteration of MCP	Sufficient surveys have been completed to understand the baseline for conservation significant flora and fauna species. However, the operational footprint requires finalisation prior to confirming monitoring locations.

Knowledge Gap	Proposed Studies	Proposed Timeframes	Current Status
IWL.	Determine: • Predicted tailings consolidation. • Reclamation material requirement balance. • Erosion potential of IWL embankments.	Prior to next iteration of MCP	Predicted tailings consolidation will be conducted prior to the submission of an MCP to DMIRS. Consolidation testing on the deposited tailings is to be conducted prior to closure to determine the likely settlement due to consolidation of the tailings. The final consolidation profile of the tailings will need to be taken into account during capping of the facility.
WRD.	Determine: • Reclamation material requirement balance. • Erosion potential of WRD embankments.	Prior to next iteration of MCP	Conceptual designs for WRD rehabilitation are known, however the ability of rehabilitation materials to result in appropriate vegetation communities that are stable is un-tested. Progressive rehabilitation trials will be undertaken to determine suitable cover material and design to meet completion criteria.
Pit.	Groundwater recovery trends in pit and whether final groundwater level will remain below floor of the pit. Development of a groundwater balance model that includes a water quality component.	Operational phase	Geotechnical assessment will be conducted once pit is complete to confirm correct location of final abandonment bund.
Contaminated sites.	Detailed as-built site layout that accurately defines all contamination control measures.	Prior to closure	• Contaminated sites investigation and update contaminated sites register • Maintenance of an infrastructure inventory.

8. Identification and Management of Closure Issues

8.1 Risk Assessment Scope

The scope of the closure risk assessment is limited to the current Project liabilities.

8.2 Risk Assessment Process

To identify closure issues and management associated with the Mt Holland Project, a risk assessment was undertaken in accordance with Australian Standards (AS / NZS 31000:2015).

Key environmental risks associated with the Project areas have been identified through:

- preliminary assessment of key closure and environmental features
- review of historic documentation associated with the Mt Holland project
- site visits to identify potential closure issues and management solutions
- stakeholder consultation.

Through this assessment and consultation process, a number of management and mitigation measures have been incorporated into the closure design to reduce the risk to environmental receptors.

8.3 Risk Definitions

Risk categories were determined using a five by five risk matrix, with pre-defined environmental criteria for "Likelihood" and "Consequence" categories (Table 8-1). Consequence definitions focus on environmental and safety impacts associated with closure. Identification of key issues specific to each domain is provided in the Closure Task Register (Table 9-3) along with domain-specific management measures.

8.4 Summary of Identified Risks

Key risks associated with closure of the Mt Holland Project are summarised in Table 8-2. This includes a summary of:

- the event, cause and environmental / stakeholder / safety impact
- key knowledge and management and mitigation measures.

The most significant closure risks for the Project relate to:

- **Safety of Closure Team**. The closure aim is to close the project in a safe and stable manner. The safety of the closure team is always of paramount importance in and around mining infrastructure. Effective implementation of a Safety Management Plan during the operational phase and adaptation of the MCP to closure conditions, together with development and implementation of the Closure Risk Management Plan during decontamination and demolition works, will ensure this risk is mitigated
- **Public safety in and around the underground mine.** The pit and associated access roads will be sealed off, signposted and made geotechnically stable, during the closure phase. The abandonment bund will be compliant with DMIRS guidelines to ensure public safety post closure can be achieved
- **Responsible Corporate Governance**. The establishment of effective management decision making strategies, corporate key performance indicators, timely stakeholder consultation and financial planning for closure activities will ensure closure objectives are achieved. Well executed corporate governance will assist in eliminating problems before they become a liability
- **Closure of the IWL**. The IWL will remain a permanent feature of the landscape. Safe closure of the IWL will rely on appropriate materials being sourced and correct construction to design specifications to include armouring of outer embankments with competent waste rock.

The net effect of the above risks not being minimised is the inability to relinquish the project tenements as they may not meet the DMIRS criteria of safe, stable (low eroding) and ecologically sustainable ecosystems. This RCP aims to reduce these risks through timely and effective management and monitoring.

Table 8-1: Risk Definitions

Likelihood		Consequences				
		1 - Insignificant	2 - Minor	3 - Moderate	4 - Major	5 - Catastrophic
		Environment No detectable impact to fauna/flora, habitat, soil, & land ecosystems and/or beneficial water uses. Requires very minor or no management. **Safety and Community** Minor Injury – typically first aid and no medical treatment. Isolated community complaint resolved via existing site procedures. No damage to reputation or relationships with stakeholders.	**Environment** Detectable but minor impact to fauna/flora, habitat, and soil & land ecosystems and/or water uses. Requires some management. **Safety and Community** Typically a medical treatment. Unresolved low level community dissatisfaction. Short-term damage to relationship with one or more stakeholders.	**Environment** Change exceeds natural variation with moderate impact on fauna/flora, habitat, and soil & land ecosystems and/or water uses. Requires a moderate level of management. **Safety and Community** Reversible injury or moderate irreversible damage or impairment to one or more persons. Community dissatisfaction and/or social harm with business implications. Reversible damage to relationship with stakeholders and reputation.	**Environment** Change exceeds natural variation with major impact on fauna/flora, habitat, and soil & land ecosystems and/or water uses. Requires a significant level of management. **Safety and Community** Fatality and/or severe irreversible disability or impairment to one or more persons. Significant social harm. Regional/state media interest. Significant damage to stakeholder relationships and reputation.	**Environment** Severe impact on fauna/flora, habitat, and soil & land ecosystems and/or water uses. Serious, irreversible long-term impact on valued ecosystem and its function. Requires major levels of ongoing management. **Safety and Community** Multiple fatalities or permanent health impacts to multiple persons. Permanent or irreversible social harm. National media interest. Irreversible damage to stakeholder relationships and reputation.
1	**Rare** The event is extremely unlikely, only a slight chance of occurring.	Low	Low	Medium	High	High
2	**Unlikely** The event could occur but it is very improbable.	Low	Low	Medium	High	Extreme
3	**Possible** The event could occur but there is a higher percentage chance that it will not occur.	Low	Medium	High	High	Extreme
4	**Likely** The event should occur and there is a higher percentage chance that it will occur.	Medium	Medium	High	Extreme	Extreme
5	**Almost Certain** The event is expected to occur in most circumstances.	Medium	High	High	Extreme	Extreme

Table 8-2: Identified Risks with Closure of the Mt Holland Project

Area	Event	Cause	Impact	Inherent Risk Assessment			Key Knowledge and Management/Mitigation	Residual Risk Assessment		
				Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
All	Poor closure design and planning.	Lack of stakeholder communication and closure design expertise.	Public safety/reputation and media impacts, community and government trust.	Unlikely	Major	High	Concept design, research and trials, range analysis. Closure plan approval and ongoing discussions continue with DMIRS.	Rare	Moderate	Medium
	Unplanned or early closure.	Economic changes, commodity price changes.	Closure plans not fully developed or funded.	Unlikely	Insignificant	Low	Investment evaluation process, closure planning integrated into asset planning, closure accounting provision.	Unlikely	Insignificant	Low
	Residual contaminated material.	Spills. Residual hydrocarbons.	Soil contamination. Prevention of vegetation growth. Potential for run-off into local drainages /surrounding environment. Potential threat to flora and fauna.	Possible	Minor	Medium	Potentially contaminated areas will be investigated and managed in accordance with DWER Contaminated Sites Management Series.	Unlikely	Insignificant	Low
	Rubbish/infrastructure remaining.	Inadequate disposal of rubbish. Inadequate removal of infrastructure (e.g. – concrete footings).	Potential safety risk. Potential harm to native fauna.	Possible	Minor	Medium	Delineation of disposal areas prior to closure works. Appropriate operational landfill management prior to closure. Use of suitable material to cover landfill.	Unlikely	Insignificant	Low
	Compaction of soils.	Compaction through equipment and machinery use.	Prevents revegetation. Increased erosion.	Possible	Minor	Medium	All heavily compacted areas will be deep ripped, including hardstand, haul roads and roads.	Unlikely	Insignificant	Low
	Insufficient growth of vegetation.	Insufficient growth medium. Inappropriate species used. Poor rehabilitation techniques implemented.	Dust generation, Visual impact (aesthetics). Erosion. Loss of habitat.	Possible	Minor	Medium	Soil sources identified. Available topsoil will be used on hardstand surfaces. Local species used in seed mix where required. Seeding prior to rains.	Unlikely	Insignificant	Low
Exploration Disturbance	Open drill holes/monitoring bores remaining post closure.	Rehabilitation of drill holes not completed within appropriate timeframes.	Impacts on native fauna.	Possible	Moderate	High	All drill holes to be plugged and rehabilitated within appropriate timeframes.	Unlikely	Minor	Low

Area	Event	Cause	Impact	Inherent Risk Assessment			Key Knowledge and Management/Mitigation	Residual Risk Assessment		
				Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
	Exploration tracks and drill pads fail to revegetate.	Inappropriate or lack of rehabilitation of exploration tracks and drill pads.	Loss of habitat, weed infestations, dust.	Possible	Moderate	High	All exploration tracks and drill pads to be rehabilitated within appropriate timeframes using an appropriate methodology.	Unlikely	Minor	Low
Mine landforms	Failure or instability of landform .	Inappropriate or lack of design, research and trials, range analysis.	Erosion, loss of material to the environment and damage to vegetation.	Possible	high	Medium	• Refine/update completion criteria. • continue engagement with regulatory stakeholder to confirm acceptance of designs and completion criteria if changes occur in 5 yearly review. • Resubmit Closure Plan.	Unlikely	Minor	Low
	Mismanagement of waste materials during operations.	Inadequate management controls and processes.	Closure plans unachievable or costly.	Possible	high	Medium	Review long term dump schedule annually. Waste characterization completed and a waste rock disposal strategy will be completed that takes into account suggested management controls.	Unlikely	Minor	Low

9. Closure implementation

Final mine closure occurs in two distinct stages. The first stage, decommissioning, involves removal and appropriate disposal of all infrastructure and contaminated material. The second, rehabilitation, includes undertaking of specific earthworks to create appropriate landforms and subsequent re-vegetation of those landforms.

9.1 Closure Domains

Closure domains are established by grouping similar disturbance areas together. They have been defined for this project based on rehabilitation closure requirements and objectives, and common closure issues associated with each disturbance or infrastructure type. The various Closure Domains are summarised in Table 9-1.

Table 9-1: Closure Domains

Domain Number	Domain Name	Tenements	Components
1	Exploration Disturbance	M77/1080, M77/1065, M77/1066, M77/1067 and M77/1068.	Drill holes Drill Pads and sumps Tracks Sample pads and bags
2	Access Roads	L77/205	Unsealed road Culverts Windrows Bitumen roads Compacted parking areas
3	Camp and Core cutting area	M77/1066	Office Temporary accommodation units Core cutting area Miscellaneous laydown areas Landfill
4	Pit	M77/1080	Open cut pit void and ramps Pit administration and monitoring buildings
5	IWL	M77/1065	Perimeter waste rock embankments Tailings storage facility Topsoil stockpile areas
6	Waste Rock Landform		Waste Rock Landform Topsoil stockpile areas
7	Plant and administration area	M77/1066	Processing plant and associated piping, pumping, structures and equipment Reagent and concentrate storage Crushed ore stockpile and conveyor infrastructure Fuel storage Administration, laboratory, metallurgy maintenance and mine buildings, offices, stores Heavy vehicle workshop including contractor workshop and explosives area Light vehicle workshop and vehicle wash-down bays Local power transmission lines, access roads and tracks Core farms
8	ROM Pads and Stockpiles	M77/1066	ROM Pad and various stockpiles

Domain Number	Domain Name	Tenements	Components
9	Borefield	L77/96, L77/207	Southern and Bounty borefields Associated borefield infrastructure including roads, powerlines, pipelines and pumps
10	Service Corridors		Power, water pipelines, telecommunication services, underground service infrastructure and minor access roads
11	Water Services	M77/1066	Desalinisation plant, WWTP plant and irrigation, groundwater bores, turkeys nest, process water tanks, groundwater tanks, pipelines, pump stations
12	Airstrips	L77/200, L77/107, M77/1065	Runways, fuel storage and terminal
13	Landfill and Disturbed Land	M77/1066	Landfill, bioremediation pad and any other disturbed land

9.2 Planned Closure

Planned closure takes place at the end of mine life when no further exploitable mineral resource remains. Closure implementation will follow a project schedule outlined in the final Decommissioning Plan. Planned closure may see mineral processing extend for some time after all actual mining ceases. This will allow for an orderly withdrawal of mining crews from the mining activities. All salvageable equipment and infrastructure will be removed as the miners retreat out of the mine. All services to mine workings (including dewatering operations) will cease and all access points and any underground openings sealed. An appropriate abandonment bund will be constructed around the pit.

Rehabilitation activities will then commence with the intent of meeting the Closure Objectives and Completion Criteria. Table 9-1 relates the individual domains to the Closure Objectives and Completion Criteria.

The draft closure task register for planned closure is provided in Table 9-3.

To assist with the implementation of the planned strategy, a detailed Closure Execution Plan will be developed three years prior to expected operation cessation. Following cessation of mining operations the MCP will be updated to become the final decommissioning plan for the overall closure objectives.

Table 9-2: Closure Objectives, Completion Criteria and associated Domains

Item	Objective	Completion Criteria Descriptions	Exploration Disturbance	Access Roads	Camp and Core cutting area	Pit	IWL	Waste Rock Landform	Plant and administration area	ROM Pads and Stockpiles	Borefield	Service Corridors	Water Services	Airstrips	Landfill and Disturbed Land
Public Safety	Ensure waste and materials / infrastructure from operational areas are disposed or buried upon decommissioning such that they do not pose a risk to human safety. Ensure contaminated materials are managed in a manner such that no impacts to human health or the environment will occur.	Rehabilitated areas will be free of any man made items which pose a risk to public safety (including infrastructure, contaminated materials and excavations).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Block access points, abandonment bund and signage where appropriate.	✓	✓		✓	✓	✓							
		All exploration excavations (e.g. exploration sumps, landfill) will be backfilled.	✓												
Physical Stability	Ensure long-term stability of final landforms.	Monitoring indicates rehabilitated areas are not prone to significant erosion.					✓	✓							
	Ensure long-term stability and functionality of drainage structures.	Drainage structures not prone to erosion or sedimentation, with unrestricted surface flow. · Rock armouring / buttressing of retaining embankments. · Surface water drainage control. · Materials characterisation included in TSF cover design work. · Landform stability modelling.				✓	✓	✓							
	Attain stable landforms with conditions suitable for the natural establishment of a self-sustaining vegetation community.	No surface water impacts (flooding, water diversion) to impact on conservation significant species.				✓	✓	✓							
Chemical Stability	Rehabilitated structures/landforms containing waste materials that may cause adverse environmental impacts if released to the environment are stable in the long term and do not preclude the post mining land use.	All contaminated material is identified, analysed and effectively contained as per engineering designs.	✓		✓	✓	✓	✓	✓	✓		✓		✓	✓
		Any potentially contaminated soils remediated in accordance with DWER guidelines.	✓		✓	✓	✓	✓	✓	✓		✓		✓	✓

Item	Objective	Completion Criteria Descriptions	Exploration Disturbance	Access Roads	Camp and Core cutting area	Pit	IWL	Waste Rock Landform	Plant and administration area	ROM Pads and Stockpiles	Borefield	Service Corridors	Water Services	Airstrips	Landfill and Disturbed Land
Ecosystem Function	To re-establish self-sustaining ecological communities on disturbed areas.	Monitoring results trend towards comparative analogue sites, specifically: · Plant density. · Species diversity (preferred species to align with adjacent vegetation communities where appropriate). · Erosion rate · Weeds.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Conservation Significant Species	Rehabilitate habitat supporting *Banksia sphaerocarpa* var. *dolichostyla*, conservation significant flora species (particularly *Microcorys* sp. Mt Holland (D. Angus DA 2397), Malleefowl and Chuditch.	Monitoring results trend towards comparative analogue sites, specifically: · Flora populations and density. · Fauna species density. · Malleefowl breeding observances. · Feral fauna density.		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		No net loss in *Banksia sphaerocarpa* var. *dolichostyla* individuals from the known local population	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Habitat fragmentation minimised by rehabilitation focussing on soil and vegetation species to extend fauna habitat and vegetation communities. Confirmation shall be success.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Visual Amenity	Final landforms integrate with the natural surroundings as far as practical.	All mine infrastructure (excluding the IWL, pit and any infrastructure retained in agreement with stakeholders) will be removed at closure.	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓
Final Land Use	Any known mineral resources with potential value to future generations is, where practically possible, preserved for potential Retain transport facilities considered of value to stakeholders, where practical.	Agreement by DMIRS on proposed future landuse.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Formal agreement on transfer of land ownership.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
		Formal agreement on management and maintenance of remaining infrastructure (roads, landing strip, etc.).	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Item	Objective	Completion Criteria Descriptions	Exploration Disturbance	Access Roads	Camp and Core cutting area	Pit	IWL	Waste Rock Landform	Plant and administration area	ROM Pads and Stockpiles	Borefield	Service Corridors	Water Services	Airstrips	Landfill and Disturbed Land
	future exploration or mining activity.	Inspections indicate vegetation and rehabilitated landforms blend into the surrounding landscape.				✓	✓	✓							
Water Quality	Ensure that the medium to long term water quality of local and regional surface and groundwater resources are not compromised.	No surface discharge of waters beyond the assimilative capacity of the local environment based on surrounding land systems.				✓	✓	✓	✓	✓					✓
Groundwater Regime	Mining not to have any long term detrimental impact on local or regional groundwater resources.	No contamination of groundwater resources beyond agreed levels.				✓	✓	✓	✓	✓				✓	✓
		No depletion of groundwater resources to the extent that has a detrimental environmental or social impact.				✓	✓	✓	✓	✓				✓	✓
Closure Planning	Cost effective implementation of RCP/MCP resulting in final relinquishment of Mining Leases / Tenements.	Government approval of MCP. Closure cost model. Decommissioning Plan. Relinquishment Plan.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Table 9-3: Draft Closure Task Register

Domain	Descriptions	Tasks	Research, Investigation, Trial and Progressive Rehabilitation Schedule
1	Exploration Disturbance	• Cut drill hole collars to a minimum of 40 cm below the surface. • Insert a permanent plug (concrete, conical plugs or other) into drill holes or cut collar. • Backfill the depression where the hole occurs to create a mound to facilitate water shedding away from the drill hole. • Remove any residual rubbish / scrap and dispose appropriately. • Infill sumps. • Reprofile, push down any windrows, bunds or miscellaneous stockpiles to form a free draining surface. • Spread topsoil over disturbed areas and rip on contour.	**Research, Investigation, Trial:** • None **Progressive Rehabilitation:** • 6 months after drilling unless DMIRS exception received
2	Roads	• Remove culverts, signage and traffic barriers. • Reprofile, push down any windrows, bunds or miscellaneous stockpiles to form a free draining surface. • Spread topsoil over disturbed areas and rip on contour. • All compacted surfaces to be ripped, culverts and concrete structures to be removed. • All concrete lined drainage channels and sumps to be broken up and removed. • Any potentially contaminated soils are to be identified and demarcated for remediation. • All haul routes that have been treated with saline dust suppression water need to be evaluated for potential removal and rehabilitation of road surface materials.	**Research, Investigation, Trial:** • None **Progressive Rehabilitation:** • Life of Mine closure
3	Camp and Core cutting area	• Liaise with management and local stakeholders (refer to Table 4-1) to determine requirements for any infrastructure to remain and be maintained post closure. • Decommission and removal of all un-required fixed and non-fixed infrastructure. • Break-up, remove and dispose of all concrete slabs and footings. • Re-contour land surfaces to fit in with the local surface drainage contours where practical. • Remove and appropriately dispose of all soils potentially impacted by hydrocarbons, where required. • Spread growth medium where required. • Incorporate vegetation into the applied topsoil material where possible. • Rip all compacted surfaces and apply seed, if required. • Disconnect and terminate services. • Collate and remove core samples for relocation or disposal. • Disassemble and remove small buildings. • Remove any residual rubbish / scrap and dispose appropriately. • Reshape area to form a free draining surface. • Spread topsoil over disturbed areas and rip on contour.	**Research, Investigation, Trial:** • Research into vegetation species to continue adjacent vegetation communities (prevention of habitat fragmentation) – update to be provided in next iteration of Mine Closure Plan **Progressive Rehabilitation:** • Life of Mine closure

Domain	Descriptions	Tasks	Research, Investigation, Trial and Progressive Rehabilitation Schedule
4	Pit	Final Pit shall be partially backfilled with waste rock with some section to natural ground level at angle of repose with 30 m berms. • Construct pit perimeter abandonment bund where required to prevent vehicular access to pit perimeter. • Complete in-pit waste rock backfill • Cover demolition debris with minimum 1.0 m depth of waste rock. • Contour rip compacted areas to minimum of 0.5 m depth at maximum spacing of 3 m to maximise infiltration. • Grade berms and top surfaces back-slope. • Construct drainage lines to safely shed excess runoff at ground level into pit. • Construct permanent drainage lines to promote downstream runoff compatible with environment.	**Research, Investigation, Trial:** • Cover material trial required to determine if mallee woodland or shrubland fauna habitat is achievable – when possible based on progressive rehabilitation • Final pit lake hydrogeological study required – 5 years prior to closure or when Life of Mine pit designs finalised • Research into vegetation species to continue adjacent vegetation communities (prevention of habitat fragmentation) – update to be provided in next iteration of Mine Closure Plan **Progressive Rehabilitation:** • Progressive rehabilitation of pit cover shall occur if possible – timing to be confirmed • Final rehabilitation to occur at Life of Mine closure
5	IWL	Final IWL shall be maximum 40 m in height and 120 ha and constructed as a water-shedding structure with regraded batter slopes at approximately 3H:1V and a domed surface. The domed surface will be developed upon approaching closure by manipulating placement of the filtered tailings. The final tailings surface will be capped with waste rock (similar to embankments) and integrated into adjacent WRD. • Final landform will be made self-draining (domed top surface via strategic placement of dry stack tailings) to avoid potential for surface water ponding. • Remove spigots, pipelines, floating decant system and other tailings distribution infrastructure. • All potentially contaminated soils are to be identified and demarcated for remediation. • Cut and seal underdrainage pipes. • Regrade embankment to 3H:1V • Place cover material and topsoil (source and depths to be confirmed via further test work and trials). • Install surface water controls (crest bund) and separation bunds on ramp. • Contour rip prior to seeding.	**Research, Investigation, Trial:** • Cover trial required to determine if mallee woodland or shrubland fauna habitat is achievable – when possible based on progressive rehabilitation • Cover trial to determine if additional surface water management controls required to minimise erosion – when possible based on progressive rehabilitation • Research into vegetation species to continue adjacent vegetation communities (prevention of habitat fragmentation) – update to be provided in next iteration of Mine Closure Plan • Seepage monitoring to determine any groundwater impacts – at commencement of operations • Tailings consolidation study – within two years of commencement of tailings deposition **Progressive Rehabilitation:** Life of Mine closure Progressive rehabilitation of embankment will occur if possible to trial cover

Domain	Descriptions	Tasks	Research, Investigation, Trial and Progressive Rehabilitation Schedule
6	Waste Rock Landform	Two landforms are proposed (Eastern WRL and the northern/eastern extension to the IWL) with a maximum of 44 m height above local ground level, maximum 30 m lifts and minimum 5 m benches. • Regrade embankment at a maximum of 20 degrees based on rehabilitation materials. • Place cover material and topsoil (source and depths to be confirmed via further test work and trials). • Install surface water controls (crest bund) and separation bunds on ramp. • Contour rip prior to seeding. • Regrade top of WRD for drainage controls. • Construction of toe bunds and spoon drains around perimeter to ensure surface water flow directed away from toe of dump and create silt traps.	**Research, Investigation, Trial:** • Cover material trial required to determine if mallee woodland or shrubland fauna habitat is achievable – when possible based on progressive rehabilitation • Surface hydrology studies for the final landforms and pit footprint will be required to confirm adequate controls – 5 years prior to closure • Research into vegetation species to continue adjacent vegetation communities (prevention of habitat fragmentation) – update to be provided in next iteration of Mine Closure Plan **Progressive Rehabilitation:** Progressive rehabilitation shall occur if possible
7	Plant and administration areas	• Dismantle and remove all power and communication lines. • Decontaminate, dismantle and demolish the plant and supporting infrastructure. • All potentially contaminated soils are to be identified and demarcated for remediation. • Concrete slabs and footings will be removed to a depth of 0.4 m below ground surface. This concrete will be broken up and disposed of in-situ by covering with benign waste rock or soil or burial in the landfill. • Where necessary remediation of contaminated soils. • All areas to be re-contoured to ensure free surface flow prior to ripping and seeding.	**Research, Investigation, Trial:** • Contaminated Site Assessments – during operations and finalised 5 years prior to closure • Research into vegetation species to continue adjacent vegetation communities (prevention of habitat fragmentation) – update to be provided in next iteration of Mine Closure Plan **Progressive Rehabilitation:** Life of Mine closure
8	ROM Pads and stockpiles	• Process all remaining ore stockpiles, clean the ROM pads, ore bins and crushing machinery. • Any remaining stockpiles to be transported to the pit. • Break up ROM pad foundations and transport to IWL (after TSF surface has consolidated). • Apply topsoil using specific topsoil stockpiles from within their sourced areas. • Scarify and re-contour disturbed areas and deep rip any traffic compacted areas and tracks prior to seeding.	**Research, Investigation, Trial:** • Research into vegetation species to continue adjacent vegetation communities (prevention of habitat fragmentation) – update to be provided in next iteration of Mine Closure Plan **Progressive Rehabilitation:** Life of Mine closure

Domain	Descriptions	Tasks	Research, Investigation, Trial and Progressive Rehabilitation Schedule

9	Borefields	• Determine whether the borefield and associated infrastructure will be retained for use by the Shire, landowners or ongoing exploration activities and the requirements for transferring ownership.
		• If the borefield is not to be handed over directly to the local landowner then:
		  ∗ All production bores are to be decommissioned with the removal of pumps, sealing-off and capping of the casing at least 300 mm below natural ground level. The ground surface above the casing is to be domed to accommodate any subsequent subsidence.
		  ∗ All pipelines, holding tanks and booster stations to be dismantled and removed.
		  ∗ The power source and any flow/detection equipment to be removed.
		  ∗ Monitoring bores are to be decommissioned prior to final lease relinquishment – the upper section of the bore casing sealed-off (mechanically restricted) at least 300 mm below ground level).
		• Return landscape to post land use state.
			Research, Investigation, Trial:
			• None
			Progressive Rehabilitation:
			Life of Mine closure

10	Service Corridors	• Ascertain final decommissioning responsibilities and liabilities with respective service providers. • Dismantle and remove all power and communication lines, including any transformer sub-stations. • Scarify all disturbed areas and deep rip any traffic compacted areas and tracks prior to rehabilitation. • Determine whether any access tracks will be retained. If access tracks are not to be retained, determine at which point during closure they will be rehabilitated.	**Research, Investigation, Trial:** • None **Progressive Rehabilitation:** Life of Mine closure
11	Water Services	• All pipelines, holding tanks and booster stations to be dismantled and removed. • Dismantle and remove all power, communication lines, telemetry and pumping equipment. • Decontaminate, dismantle and demolish the WWTP and supporting infrastructure. • All potentially contaminated soils are to be identified and demarcated for remediation. • Concrete slabs and footings will be removed to a depth of 0.4 m below ground surface. Reshape facilities by dozing in embankments to cover any sediment and ripped liner material. • Final facility surfaces need to be flattened, contoured and made safe. • Where appropriate sheet with regrowth material (or topsoil depending on availability). • Scarify and rehabilitate, seed where required.	**Research, Investigation, Trial:** • None **Progressive Rehabilitation:** Life of Mine closure

Domain	Descriptions	Tasks	Research, Investigation, Trial and Progressive Rehabilitation Schedule

12	Airstrips	• Determine whether the airstrip and associated infrastructure will be retained for use by the Shire or landowners and the requirements for transferring ownership.
		• Where facilities are to be taken over by other users these shall be in an operational status at the time of handover and include formal status certification.
		• Default position is to rehabilitate area which entails:
		  * Remove buildings, shade cloth/roofed areas, lighting fixtures, beacons, refuelling stations, fuel storage facilities, fencing and signage.
		  * Identify any contaminated soils and effectively remediate.
		  * Break up all sealed surfaces with the rubble transported for burial in a borrow pit or bury in-situ with topsoil material sourced elsewhere.
		  * All concrete or bitumen apron to be broken up and buried in-situ or in nearby borrow pits.
		  * Rip the underlying foundation material (road base or compacted calcrete/ferricrete) and contour surface so as not to restrict post closure surface flow.
		  * Deep rip and rehabilitate all surrounding disturbed land.
		  * Remove fence.
			Research, Investigation, Trial:
			• Rehabilitation trial to occur on old airstrip
			Progressive Rehabilitation:
			Life of Mine closure
			Progressive rehabilitation of old airstrip – timing to be confirmed

	Landfill and disturbed land	• Ensure landfill surface compacted and stable before reshaping. • Final landforms will be made self-draining to avoid potential for surface water ponding. • Active faces of the landfill will be covered with inert waste, re-contoured and deep ripped to remove compacted areas and seeded. • All signage, fences and general windblown rubbish around landfill will be removed. • Reprofile disturbed areas to re-instate any pre-mining surface flow patterns and deep rip along the contour. • Where possible sheet with any available regrowth material (topsoil or vegetation). • Rip and rehabilitate areas.	**Research, Investigation, Trial:** • None **Progressive Rehabilitation:** Life of Mine closure

9.3 Unplanned Closure

The unforeseen, earlier than expected, cessation of mining may be due to a number of reasons including market forces and initial overestimation of ore reserves. The closure process followed is similar to that for planned closure except for the following:

- IWL may require more dewatering than for planned closure prior to the cover being applied
- progressive rehabilitation of disturbed areas may not have occurred
- ore stockpiles that remain on the ROM pads may need to be removed back to the pit, as these represent a resource that may in future years have considerable value in future mining opportunities.

The mine will still likely contain potential ore and not be classified as sterile. In the 'un-planned closure' scenario the processing plant and mining operation may cease operations simultaneously, with the result that all closure related work will need to be done by a third party.

9.4 Care and Maintenance

A third closure planning scenario may occur when a mine goes into temporary shut down or 'Care and Maintenance' (C & M). The C & M period may come about for a number of reasons including the possible sale of the operation to a third party and may be months or years in duration where site activities are reduced to a minimum.

The C & M period requires:

- the development of a C&M plan
- an environmental investigation/site visit to determine the status and environmental risk of all components of the site
- on cessation of mining, removal of all mobile machinery/plant/equipment from underground to the surface where it is to be washed down and stored/parked up
- fence off all mine property with locked gates to ensure that only official mine vehicles are able to gain access
- processing the remaining ore stockpiles in some instances, cleaning the ROM pads, ore bins, conveyor system, crushing and processing plant. Flush and wash down all areas prior to lubricating machinery
- where possible return any excess stores, lubricants, fuels, chemicals and spares to suppliers
- flushing of all tailings disposal pipelines, storage tanks and bins
- reducing fuel storage levels to that required by the remaining skeleton crew. Skeleton crew also likely to need power and RO plant unless water is trucked in from Norseman
- establish an emergency response action plan, if monitoring indicates that there is a potentially serious environmental problem. If a catastrophic event does occur, it is essential that there is a plan in place to minimise injury and damage.

Regular monitoring and reporting to DMIRS and other government agencies carried out during operations will need to be continued through the C & M period.

10. Closure monitoring and maintenance

Rehabilitation and closure monitoring and maintenance programs will be initiated with the objective of ensuring the success of rehabilitation works, demonstrating achievement of completion criteria and identifying the need for maintenance works. Monitoring works will be undertaken on a regular basis post closure to assess the following:

- compliance with rehabilitation obligations
- physical stability of rehabilitated areas
- chemical stability of rehabilitated areas
- ecological function of rehabilitated areas
- impacts on final land use objectives
- the requirement for maintenance or remedial work.

The specific components of the monitoring program are described in the following subsections.

10.1 Monitoring Procedures

Monitoring of rehabilitation during operations and mine closure activities will be undertaken in compliance with the site procedures that will be developed as part of the site wide Environmental Management Plan.

10.2 Rehabilitation Earthworks Monitoring and Supervision

Supervision of all rehabilitation earthworks is integral to ensuring final landforms achieve their intended design criteria. Earthworks will be supervised by a suitably qualified environmental scientist or engineer who will ensure specifications, as detailed in rehabilitation procedures, are met. Rehabilitation will be supervised by an exploration geologist and/or field assistant. An audit will be undertaken following completion of rehabilitation earthworks to ensure compliance with rehabilitation obligations.

10.2.1 Progressive Rehabilitation Monitoring

A progressive rehabilitation monitoring program will be developed specifically for the Project to assess vegetation establishment and site stability.

Rehabilitation monitoring will comprise the establishment of monitoring sites at representative locations across rehabilitated and undisturbed (analogue) areas of the Project. These sites will be used to assess:

- changes over time
- vegetation establishment and regrowth
- erosion and landform stability
- fauna recolonisation
- weed populations.

Parameters to be measured will include species diversity, plant density, vegetation cover, litter/debris cover, erosion status and grazing impact. Permanent vegetation and stability monitoring transects will be established. The location of analogue and monitoring sites will be determined once the mine plan has been finalised to ensure an appropriate programme is implemented. It is currently expected that analogue sites will be located within vegetation communities and fauna habitats that are scheduled for clearing, particularly if heavily impacted. Monitoring transects will be established as needed throughout the LOM as progressive rehabilitation occurs (commencing one year after completion).

By comparing the progress of representative rehabilitation sites against analogue sites, it is possible to assess whether the rehabilitated site is progressing towards baseline levels recorded at analogue sites.

Annual monitoring over time will assist in ensuring that if progress towards indices of analogue sites and completion criteria is not occurring then the reason is identified and the need for remedial work recognised and carried out where necessary.

A rehabilitation maintenance program will be implemented to address any landform stability or other issues that arise through the monitoring program and to ensure that closure objectives and criteria are met.

10.3 Conservation Significant Species Monitoring

In addition to progressive rehabilitation monitoring, vegetation monitoring shall be undertaken to determine any indirect impacts from mining activity (for example dust, water table drawdown) on surrounding vegetation. Both proximate (within a few hundred metres) and distant analogues shall be established to allow commentary of indirect mining impacts on adjacent vegetation.

Monitoring will continue until completion of rehabilitation activities. Annual monitoring will summarise data collected during the year on *Banksia sphaerocarpa* var. *dolichostyla* and *Microcorys* sp. Mt Holland (D. Angus DA 2397) transects and additional data as follows:

- monitoring of incident reports impacting *Banksia sphaerocarpa* var. *dolichostyla* relating to damage, death, unauthorised clearing and fire
- monitoring of increases in herbivore species through feral control reports
- internal audit and inspection of areas of clearing
- monitoring of clearing through the clearing register, survey data and aerial photography.

Fauna monitoring shall occur and will focus on Malleefowl mound activity, population density and Chuditch population density. Results shall be compared to baseline fauna survey results. Investigations into the establishment of analogue fauna monitoring sites shall be undertaken and appropriate sites identified. Annual monitoring is expected and the scale and frequency shall be revised based on monitoring results. Monitoring shall be undertaken in accordance with the Environmental Protection Authority Statement of Environmental Principles, Factors and Objectives (EPA 2016a), Environmental Factor Guidelines – Terrestrial Fauna (EPA 2016b), Technical Guide – Terrestrial Fauna Surveys (EPA 2016c) and the Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA & DEC 2010).

10.4 General Site Inspections

General site wide inspections will be undertaken regularly during and following closure of the site. The site inspections will be undertaken for a period post closure at an appropriate frequency. It is expected that these inspections will be undertaken at least annually until the time of lease relinquishment.

The objectives of these inspections are to:

- identify any maintenance requirements such as remedial earthworks and the removal of sediments from diversion channels
- assess the presence of weeds or pest species and determine if control measures are required
- undertake general observations (including photo point monitoring) of the success of vegetation re-establishment
- undertake general observations (including photo point monitoring) of the presence of erosion and landform stability issues
- identify safety issues and ensure all warning signs and safety barriers are intact.

Additional inspections may also be undertaken following significant events such as substantial rainfall.

10.5 Water Monitoring

10.5.1 Groundwater Monitoring

It is proposed that the groundwater monitoring program prior to, during and following closure activities will be similar to that undertaken during operations with the use of the same sampling points and analysis parameters.

10.5.2 Surface Water Monitoring

During the operational phase surface water monitoring will focus on potential impacts of stormwater runoff from the access road and the IWL where surface runoff will be controlled by bunds and diversion channels.

Surface water sampling post closure will be opportunistic and dependent on actual storm events and surface runoff. The focus will be on the period during closure activities and the first wet season post closure.

11. Financial provisioning for closure

As part of its financial risk management, Covalent intends to always have sufficient liquidity to meet its closure obligations with regards to monitoring and maintenance, and by extension, the closure of the relevant disturbance areas at Mt Holland. Additionally, Covalent will account for Mine Rehabilitation Fund (MRF) contributions as an annual operating expense, separate to the closure provision, and contributions will not be used to offset any provisions.

Closure costs will be reviewed regularly to allow for:

- inflation
- additional site data collected as part of monitoring programs
- site experience with closure activities
- improvements in industry knowledge and practices
- modifications to the plan and work requirements
- changes to regulatory or financial reporting requirements.

Financial provisioning for the rehabilitation and closure of the Mt Holland disturbance areas will consider costs for:

- remedial earthworks
- rehabilitation of disturbance and access routes
- rehabilitation of the infrastructure
- post closure monitoring and maintenance
- project management.

Exploration disturbance will be rehabilitated progressively during operations and therefore does not carry a significant post-closure liability.

Rehabilitation of other areas is calculated using a unit rate per ha of disturbance and taking into consideration removal of infrastructure.

Covalent will ensure that closure cost provisions are regularly reviewed (every three years) to reflect the status of operations.

12. Management of information and data

To address the requirements of the mine closure planning guidelines (DMP/EPA 2015), Covalent will develop an operational information management framework, with systems for storage and quality assurance of environmental data as well as mine planning and operational documentation. The approach that will be adopted by Covalent is outlined in Table 12-1 below.

Table 12-1: Information and data management strategy

Requirement	Description of action
Establish	A systems audit will be undertaken to ascertain the types of information to be captured and stored. Following this audit, an electronic and hardcopy recording and filing system will be created. Electronic records allow ease of transfer into annual reporting documents and provide a backup to hardcopy records. Hardcopy records allow data to be recorded in the field, and allow a means of tracking data to electronic systems, establishing an auditable QA/QC process. The aim of this system will be to capture all data relevant to closure.
Assign responsible person	The project environmental officer (or other delegated person) will be assigned responsibility of the dataset. This person will ensure data is updated regularly. This person will be suitably qualified and knowledgeable regarding the requirements of environmental monitoring.
Record data	Monitoring will be undertaken on a regular basis, with all data collected transferred into the electronic database as soon as practicable. Once data transfer is complete, hardcopy monitoring records will be filed. Records will be categorised according to feature and monitoring activity (for example, 'IWL', 'groundwater quality' and 'revegetation').
Quality Assurance and Quality Control	After each monitoring round is completed, a quality assurance and quality control (QA/QC) check will take place. This will involve an employee of suitable qualifications and rank, who is not responsible for the database, checking that data has been transferred correctly from hardcopy to electronic form. This check will then be recorded as having taken place.
Training	Monitoring and recording of data will be explained to employees during the induction process. This will ensure on-site personnel are aware of the importance of the data collection process, and will provide a point of contact should personnel wish to report any environmental changes noted on site.
Miscellaneous	Non-regular events will also be recorded in the system. These will include, for example: seed type, provenance and volume applied to rehabilitation areas, names and volumes of reports submitted to DMIRS, decommissioning dates, instances of personnel leaving and entering employment at the site, etc.

Covalent will maintain a library of documents relevant to the closure and monitoring and maintenance of the Project, including but not limited to:

- this RCP and each of its revisions
- technical reports from baseline and closure studies
- annual environmental reports to regulators
- correspondence, minutes of meetings, and other records of engagement and consultation with regulators and other stakeholders with reference to closure of the Project
- site plans
- mapping/GIS data
- monitoring data and analytical reports.

As part of managing exploration activities, Covalent also maintains an exploration rehabilitation register. This includes:

- a record of all holes that have been drilled
- a record of all drill pads and sumps
- a record of all drill holes that have been rehabilitated
- a record of all sumps that have been backfilled
- a record of all tracks, drill pads and other disturbed areas that have been rehabilitated.

13. References

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