ENVIRONMENTAL REVIEW DOCUMENT
EARL GREY LITHIUM PROJECT

***Environmental Protection Act 1986* and *Environment Protection and Biodiversity Conservation Act 1999* Referral**

PREPARED BY:

KIDMAN RESOURCES LIMITED

KIDMAN RESOURCES

&

BLUEPRINT ENVIRONMENTAL STRATEGIES

Blueprint
Environmental Strategies

MAY 2017

Executive Summary

Proposal Overview

The Earl Grey Lithium Project (the Project) is located approximately 105 km south-southeast of Southern Cross, Western Australia (Figure E1). A large, economic pegmatite-hosted lithium deposit was discovered by Kidman Resources Limited (Kidman, the Proponent) in 2016. The deposit and proposed operation is situated at the abandoned Mt Holland Mine Site, which was operated between 1988 and 2001, and comprises a number of open pits, an underground mine, a processing plant, waste rock dumps, tailings storage facilities and other infrastructure that is largely unrehabilitated and currently a liability of the State of Western Australia.

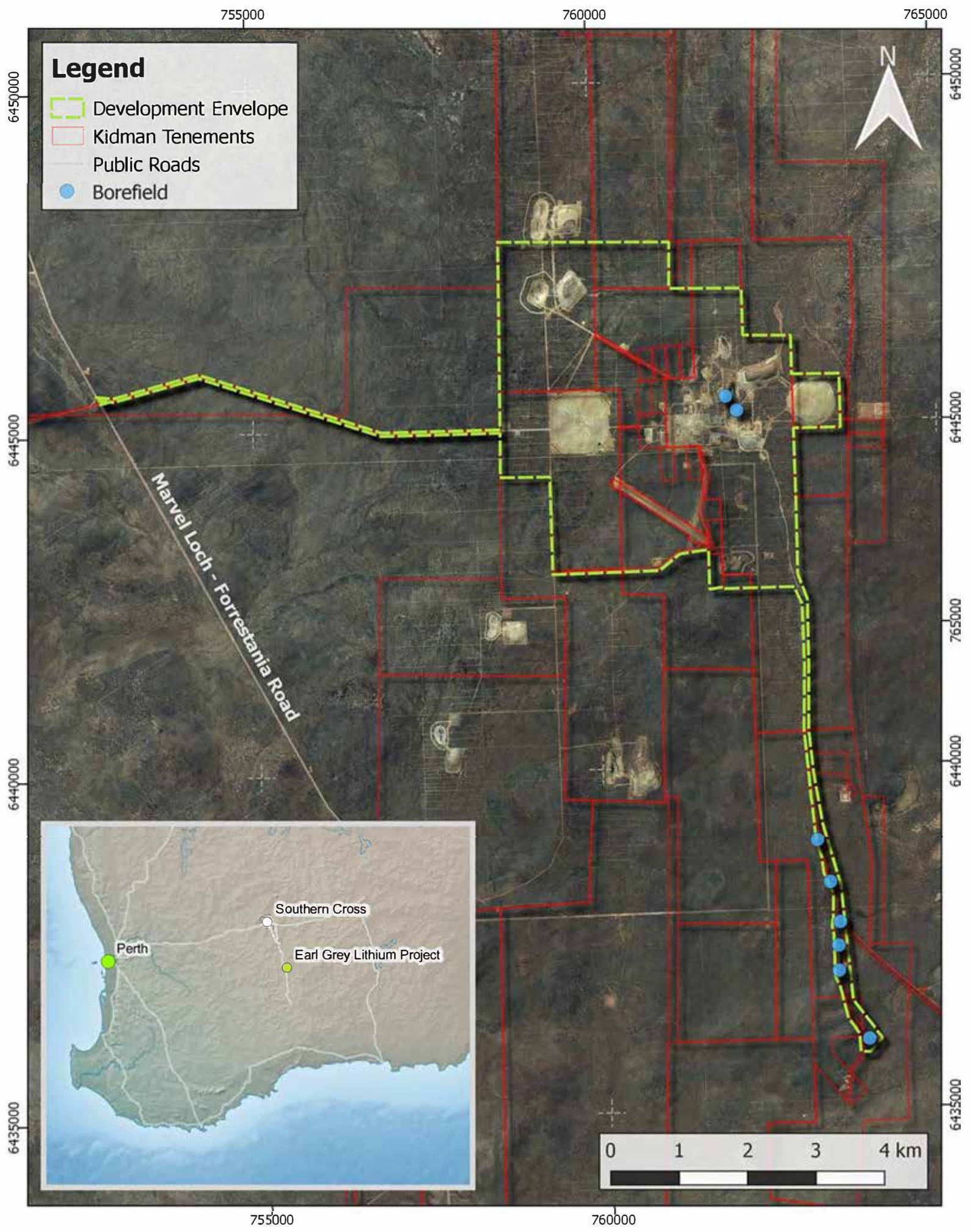
The Earl Grey Lithium Project will comprise open cut mining and processing of lithium ore, with transport of a lithium concentrate to an existing Western Australian port for export to overseas markets. Baseline studies completed in the Project area identified two key environmental factors that trigger referral to the Environmental Protection Authority, namely:

- Flora and Vegetation – Presence of threatened flora species *Banksia sphaerocarpa* var. *dolichostyla* within the development envelope.
- Terrestrial Fauna – Presence of *Leipoa ocellata* (Malleefowl) and *Dasyurus geoffroii* (Chuditch) within the Development Envelope.

This document has been prepared to support a Section 38 referral under the *Environmental Protection Act 1986*. It provides detailed information on the proposed operations and the management and mitigation measures that will be implemented to minimise impacts to conservation significant species, contribute to regional conservation programs and reduce the existing State rehabilitation liability associated with the abandoned Mt Holland Mine Site. A summary of the Proposal is provided in Table ES 1.

Table ES 1: Summary of the Proposal

Proposal Title	Earl Grey Lithium Project
Proponent Name	Kidman Resources Limited
Short Description	This Proposal is for the development of an open cut lithium mine within the abandoned Mt Holland Mine Site, located approximately 105 km south-southeast of Southern Cross, Western Australia. The Project will have a total footprint of 610 ha of which 245 ha are already disturbed. The Project life of mine is 30 to 40 years.
Key Factors	• Flora and Vegetation – Presence of threatened flora species *Banksia sphaerocarpa* var. *dolichostyla* within the development envelope. • Terrestrial Fauna – Presence of Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*) within the development envelope.



Scale: 80,000 Original Size: A4 Aerial Photo Date: 2014 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure E1** **Location Plan**	KIDMAN RESOURCES

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Key Characteristics of the Project

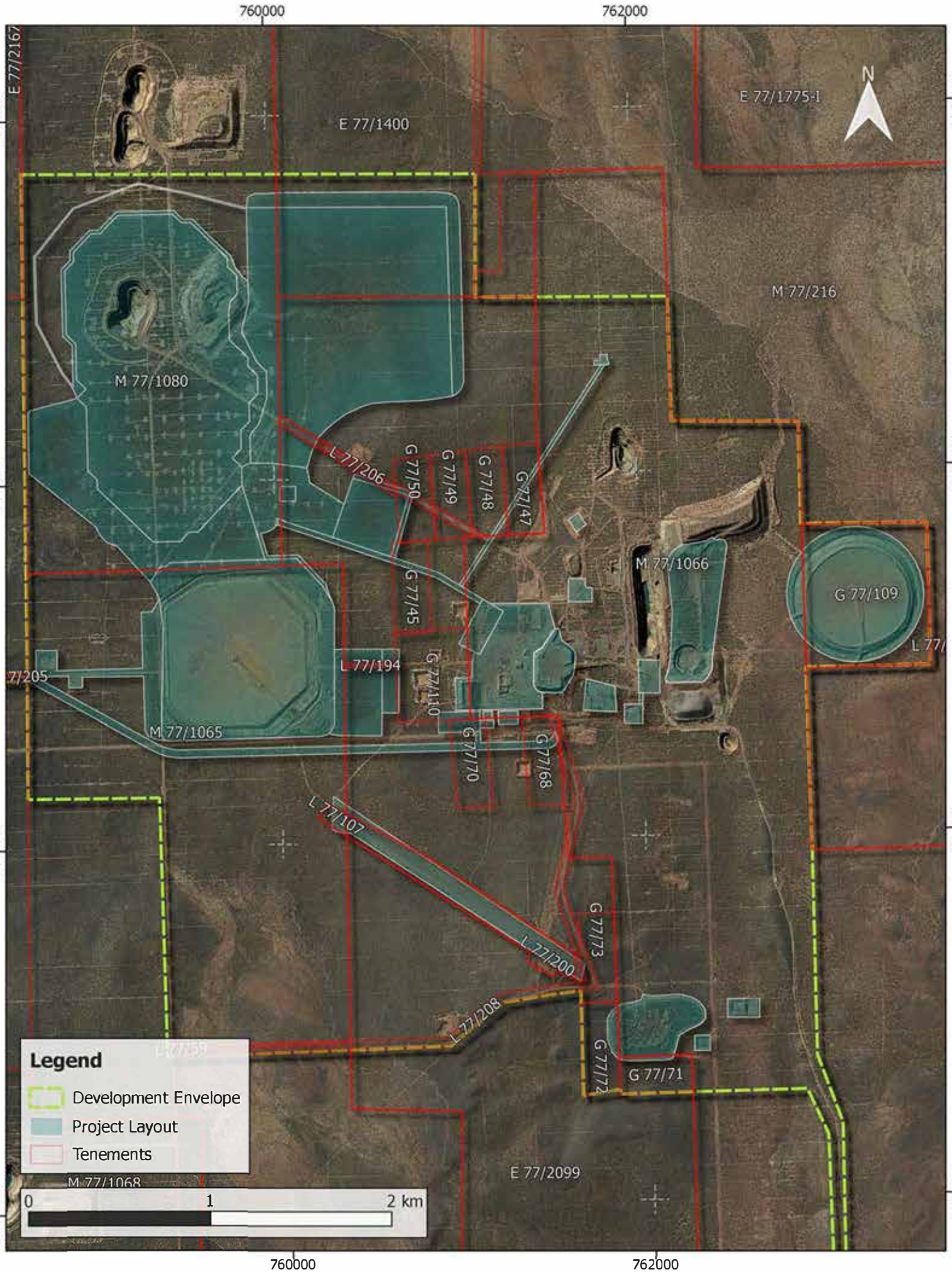
The key components of the Project will comprise:

- Progressive mining of the Earl Grey lithium deposit using conventional open cut drill and blast mining methods, over a potential 30 to 40 year life of mine (LOM), with transfer of ore to the run of mine (ROM) pad in preparation for processing.
- Processing of lithium ore (dominant lithium minerals being spodumene and petalite, which are both alumino silicates) at a rate of 3 million tonnes per annum, through a newly constructed gravity separation and flotation plant, largely constructed within the historic disturbance footprint.
- Production of a lithium concentrate that will be stored in a concentrate shed prior to being transported by road trains to an existing Western Australian export facility.
- Production of two chemically benign process waste streams, comprising:
  - A gravel sized reject which will be disposed of in waste rock dumps as well as being used for construction purposes (e.g. road base, fill, rehabilitation armouring).
  - A finer grained tailings stream that will be deposited into either the abandoned and unrehabilitated Tailings Storage Facility (TSF) 2 (hereby referred to as TSF Option A) or an expansion to the existing in-pit TSF 3 (hereby referred to as TSF Option B), both options reduce the project disturbance footprint and providing a rehabilitation solution to State liability landforms.
- Disposal of unmineralised waste rock to three locations as follows:
  - Stockpiling of waste rock over the abandoned and unrehabilitated TSF 1, thereby reducing the disturbance footprint and providing a rehabilitation solution to the State liability landform (hereby referred to as Waste Rock Dump 1 (WRD1).
  - Backfilling of the Earl Grey pit (infilling approximately 50% of the pit volume and covering approximately 50% of the surface area) as mining progresses from south to north, thereby reducing the disturbance footprint and the area of open pit remaining at closure (hereby referred to as WRD 2).
  - Construction of a new waste rock dump that has been designed to avoid threatened flora species (hereby referred to as WRD 3).
- Construction of a low-grade ore stockpile to the immediate southeast of the proposed pit for processing towards the end of the LOM.
- Refurbishment of the existing airstrip.
- Construction of other supporting infrastructure (e.g. accommodation village, power station, landfills, administration, workshops, roads, refurbishment of the borefield) predominantly within the historic footprint, thereby reducing new disturbance and providing a rehabilitation solution to a significant portion of the State rehabilitation liability.
- Utilisation of the existing road network.

In planning the proposed mining operations and layout, Kidman has prioritised two key environmental objectives:

1. *Minimising the Project footprint, to reduce the need for new clearing therefore minimising potential impacts on conservation significant flora and fauna.*
2. *Maximising the use of existing abandoned infrastructure and disturbed areas, such that the future operation can positively contribute to environmental values of the area by providing the means to rehabilitate State liabilities utilised by Kidman as part of the Earl Grey Lithium Project.*

The total footprint required for the Proposal will be 610 ha of which 245 ha will be located in previously disturbed areas. This will result in a net rehabilitation gain of approximately 45% of abandoned mine site disturbance within the development envelope. The proposed site layout is shown in Figure E 2. The key features of the project and the proposed physical extent of these features is provided in Table ES 2.



Scale: 31,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure E2** **Project Tenements**	KIDMAN RESOURCES

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Table ES 2: Location and Proposed Extent of Physical and Operational Elements

Physical Element	Operational Element	Location	Proposed Extent
Open Pit	Conventional drill and blast open cut mining of 100 million tonnes of lithium ore.	Located 1.7 km northwest of the abandoned Mt Holland plant site.	New Disturbance: 92.1 ha Existing Disturbance: 50.4 ha Total Footprint: 142.5 ha Depth: Ranging from 0 m to 295 m
Waste Rock Dump 1	36 million loose cubic metres of waste rock and gravel rejects from processing will be stockpiled on the abandoned TSF 1 and surrounds to form a permanent landform that will be progressively rehabilitated.	Located on the abandoned TSF 1 and surrounds, with the final footprint merging with Waste Rock Dump 2.	New Disturbance: 8.2 ha Existing Disturbance: 82.8 ha Total Footprint: 91.0 ha Maximum Height: 45 m Slope angle: 17 degrees
Waste Rock Dump 2	109 million loose cubic metres of waste rock and gravel rejects will be progressively backfilled in to the Earl Grey pit (infilling 50% of the pit volume) to form a permanent, raised landform.	Located within the Earl Grey pit (backfill).	New Disturbance: 33.5 ha Existing Disturbance: 4.5 ha Total Footprint: 38.0 ha Maximum Height: 45 m Slope angle: 17 degrees
Waste Rock Dump 3	52 million loose cubic metres of waste rock and gravel rejects from processing will be stockpiled to form new waste rock dump.	Located to the immediate east of the proposed Earl Grey Pit.	New Disturbance: 125.1 ha Existing Disturbance: 5.7 ha Total Footprint: 130.8 ha Maximum Height: 45 m Slope angle: 17 degrees
Processing Plant and Concentrate Storage Shed	Processing 3 million tonnes per annum via crushing and dense media (gravity) separation to produce 600,000 tonnes per annum lithium oxide concentrate.	Located adjacent to the historic abandoned Mt Holland plant site.	New Disturbance: 4.8 ha Existing Disturbance: 25.8 ha Total Footprint: 30.6 ha
Tailings Storage Facility and pipelines	Approximately 10 million tonnes of process fines will be deposited into the historic (abandoned) TSF 2 (TSF Option A) or the existing in-pit TSF 3 (TSF Option B) which will be expanded to form a paddock TSF.	Located 1.6 km east of the proposed processing plant, respectively.	New Disturbance: 2.6 ha Existing Disturbance: 41.4 ha Total Footprint: 44.0 ha
Power Supply	12 megawatt capacity diesel-powered generators.	Located adjacent to the processing plant.	New Disturbance: 0.0 ha Existing Disturbance: 0.8 ha Total Footprint: 0.8 ha
Borefield, dewatering and water supply Infrastructure	1.0 GL of water will be required to support mining, processing, dust suppression and domestic uses. Water will be sourced from the existing borefield and Bounty underground mine. Pit dewatering at rates less than 5 L/s will be required when mining reaches depths of approximately 58 m below surface.	The Bounty mine (water source) is located 800 m east of the processing plant area. The existing borefield is located 8 km south of the processing plant.	New Disturbance: 0.0 ha Existing Disturbance: 5.0 ha Total Footprint: 5.0 ha
Supporting Infrastructure	Other supporting infrastructure includes an accommodation village, waste water treatment facilities, landfills, water storage facilities, powerlines, pipelines, roads, explosives magazine, vegetation and topsoil stockpiles, coreyard, borrow pits, workshop and administration facilities.	Located predominantly in existing historic disturbance areas.	New Disturbance: 100.4 ha Existing Disturbance: 51.8 ha Total Footprint: 152.2 ha

Environmental Factors

The environmental setting of the Project can be summarised as follows:

- The Project is located in the Coolgardie Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion.
- The majority of the Project is situated on sandy, sandy clay or clay loam flats and gentle slopes supporting Eucalyptus mallee woodlands over Melaleuca shrublands.
- The threatened flora species, *Banksia sphaerocarpa* var. *dolichostyla*, has been recorded in the development envelope.
- Conservation significant fauna including the Chuditch and Malleefowl have been recorded in the development envelope.
- Locally, there are no distinct, recognisable natural landforms or significant drainage lines. Topography within the development envelope is generally subdued, with elevations ranging between 463 m RL Australian Height Datum (AHD) in the northwest and 390 m RL AHD in the southeast.
- There are no landforms, vegetation units or habitats that are considered unique or restricted.
- Saline to hypersaline groundwater occurs in low yielding fractured aquifers, about 60 to 70 m below the natural surface in the vicinity of the proposed pit, with a higher yielding caprock aquifer approximately 10 to 18 m below the natural surface in the vicinity of the existing borefield.
- Waste rock and tailings associated with the proposed mining operation is chemically benign, with adequate quantities of competent rock that can be used to armour landforms.
- There are no Native Title Claims or registered Aboriginal heritage sites in the development envelope.
- The nearest towns are Marvel Loch, located 80 km north of the Project, and Hyden, located approximately 100 km west of the Project.

The key environmental factors associated with the Project are identified as *Flora and Vegetation* and *Terrestrial Fauna*. Environmental impact assessment of these factors is summarised in Table ES 3. Other environmental factors that are not considered to be key factors are discussed in Section 8.5. These include:

- Terrestrial Environmental Quality.
- Landforms.
- Hydrological Processes.
- Inland Waters Environmental Quality.
- Air Quality.
- Human Health.

Table ES 3: Key Environmental Factors

Key Environmental Factors **Key Environmental Factor 1: Flora and Vegetation**	
EPA Objective	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Relevance of Factor to the Project	Flora surveys conducted in the development envelope recorded the threatened flora species *Banksia sphaerocarpa var. dolichostyla* and three priority (P) species*: Eutaxia lasiocalyx* (P2), *Acacia undosa* (P3) and *Hakea pendens (*P3).
Potential Impacts	• Clearing activities causing disturbance to conservation significant species. • Weed invasion resulting in competition for resources. • Altered fire regimes resulting in uncontrolled burning of vegetation and possibly conservation significant species. • Deterioration of vegetation from dust generation. • Deterioration of vegetation from saline water used in dust suppression. • Alteration of surface water flows resulting in impediment of water potentially resulting in ponding and associated vegetation death.
Mitigation	A Management Plan for the *Banksia sphaerocarpa var. dolichostyla* has been prepared and is provided in Appendix 1. A summary of the key management measures is provided below. The management measures are applicable to the maintenance and protection of flora and vegetation and associated biodiversity within the development envelope. ***Avoid*** • Design infrastructure to avoid disturbance to all known locations of *Banksia sphaerocarpa* var. *dolichostyla*. • Avoid accidental clearing of *Banksia sphaerocarpa* var. *dolichostyla* through: – Implementation of an internal clearing permit procedure. – Competition of further comprehensive pre-clearance flora surveys to validate known locations of *Banksia sphaerocarpa* var. *dolichostyla* and priority species. – Demarcation of populations that occur in close proximity to proposed clearing and construction activities. • Monitor the health of *Banksia sphaerocarpa var. dolichostyla* populations in the development envelope in accordance with the *Banksia sphaerocarpa var. dolichostyla* Management Plan. ***Minimise*** • Minimise disturbance to priority flora species where possible. • Minimise the amount of vegetation clearing required and habitat fragmentation through utilisation of existing disturbed areas and optimisation of the project layout. • Minimise the potential for clearing beyond the approved footprint through implementation of an internal clearing permit procedure. • Minimise the risk of introduction of invasive species through implementation of a vehicle hygiene procedure and weed control. • Minimise the potential for water ponding, through maintaining and not blocking natural drainages. • Minimise saline water overspray through use of dribble bars in roadway dust suppression and construction of earthen bunds on road sides. • Minimise increases in fire frequency through maintenance of fire breaks and implementation of fire management procedures. ***Rehabilitate*** • Restore vegetation units through progressive rehabilitation, in accordance with a Mine Closure Plan.

Key Environmental Factors	
	• Investigate methods for propagating *Banksia sphaerocarpa var. dolichostyla* as part of rehabilitation trials. • Maximise use of the Mt Holland abandoned infrastructure and disturbance areas, such that the future operation can positively contribute to environmental values of the area by providing the means to rehabilitate State liabilities.
Impact Assessment	• Following implementation of management measures, it is expected that no more than 365 ha of vegetation will be cleared over the 30 to 40 year LOM. • The Project avoids all known locations of threatened flora species *Banksia sphaerocarpa var. dolichostyla*. • Based on current survey information, the Project will result in the loss of one *Eutaxia lasiocalyx* population (P2), and two *Acacia undosa* populations (P3). The loss of these populations is considered to present a low risk to the conservation status of these species as the species are known to occur outside the development envelope (see Section 7.9.5). It is possible that these species as well as *Hakea pendens* (P3) and *Calamphoreus inflatus* (P4) occur in greater numbers in the development envelope, consequently, further comprehensive survey work is planned to ensure all priority species populations have been recorded. • There are no groundwater dependent ecosystems in the development envelope that will be affected by groundwater abstraction. Kidman will ensure that final infrastructure design does not result in impoundment of water that could result in vegetation death. • Following implementation of the above management measures, risks associated with fire, weeds and feral animals are considered low and may be improved by the presence of a long-term operation and associated resources to contribute to management of these risks. • The Project will result in a net rehabilitation gain of approximately 45% of abandoned mine site disturbance within the development envelope. This will ultimately improve the continuity of vegetation in the Project area.
Predicted Outcome	Through completion of comprehensive baseline studies, optimisation of the project footprint to utilise existing disturbed areas and implementation of stringent management measures, the Project is able to meet the EPA's objective to protect flora and vegetation so that biological diversity and ecological integrity are maintained.
Key Environmental Factor 2: Terrestrial Fauna	
EPA Objective	To maintain representation, diversity, viability and ecological function at the species, population and assemblage level.
Relevance of Factor to the Project	Fauna surveys within the development envelope and broader region identified the following conservation significant species: Malleefowl, Peregrine Falcon, Rainbow Bee-eater, Chuditch, Inland Western Rosella, Western Brush Wallaby and the Spotted Knob-tail Gecko. As the Chuditch and Malleefowl are listed as Vulnerable under the *Wildlife Conservation Act 1950*, further information is provided on the occurrence and management of these species. Proposed management measures are also applicable to the maintenance of other fauna populations. **Malleefowl –** five bird sightings, four active mounds and 17 inactive mounds were recorded over a board study area of which one bird sighting, one active mound and eight inactive mounds (including mound attempts) occurred in the development envelope. Malleefowl in the general area are likely to range over all habitats, favouring patches of shrubland on gravelly sands for mound construction. **Chuditch –** Eighteen individual Chuditch were trapped in the fauna 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.
Potential Impacts	• Clearing activities causing injury or death to fauna. • Vehicle strike causing injury or death to fauna. • Entrapment of fauna in dams and excavations. • Habitat loss and fragmentation. • Attraction of feral fauna and associated predation and competition for resources.

Key Environmental Factors	
	• Altered fire regimes resulting in uncontrolled burning of critical habitat.
Mitigation	Management Plans have been prepared for the Chuditch and Malleefowl and are provided in Appendix 2 and Appendix 3, respectively. A summary of impact mitigation measures are provided below. Proposed management measures are also applicable to the maintenance of other fauna populations and habitat. ***Avoid*** • Avoid clearing of fauna habitat where existing disturbed areas can be utilised. • Avoid unauthorised clearing though implementation of an internal clearing permit procedure. • Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules (e.g. keeping to designated tracks, limited vehicle movements between dusk and dawn, reduced speed limits). • Avoid accidental death and/or entrapment of fauna by installing egress points and/or fauna ladders in excavations and dams and/or regularly inspecting such facilities. • Avoid attraction of both feral and native species to the Project footprint by implementing domestic waste management procedures (e.g. fencing of landfills, regularly covering putrescible waste, secure lids on bins). • Avoid disturbance to active Malleefowl mounds: – Pre-clearance surveys will be completed prior to all clearing to record the presence/absence of Malleefowl and mounds in the area to be cleared. – Buffers (to be determined in consultation with DPaW) will be applied to active/recently active mounds to be flagged in the field as no-go zones. • All active mounds will be avoided and flagged with appropriately sized buffers determined in consultation with DPaW. Where mounds occur in essential areas (for instance within the proposed pit footprint), the following will apply: – Clearing will be delayed for a suitable period of time that allows monitoring of the mound, to inform the most appropriate timeframe for clearing; – Clearing will preferentially be undertaken outside of the breeding season; – If clearing is unavoidable and the mound contains eggs, they will be removed and incubated, with chicks released to suitable habitat close to the Project or to another location as advised by DPaW. • All Malleefowl mounds (active and inactive) will be recorded in a "Malleefowl Register" which will include date, observer, status of mound/Malleefowl and a GPS/location description. • A suitably qualified environmental professional (fauna spotter) will be present during all land clearing. The person will hold a permit to handle and move significant fauna under Regulation 15 of the WC Act, and have access to a care facility that can be used to rehabilitate injured fauna. ***Minimise*** • Minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas and undertaking clearing in a progressive manner. • Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock. • Minimise the impacts of feral fauna (fox and cat) on native species through implementation of broader Project feral animal baiting program. • Minimise injury and/or death of Chuditch during day time clearing by implementing a capture and release program by a suitably qualified and experienced environmental professional, in consultation with DPaW. ***Rehabilitate*** • Progressive rehabilitation will be undertaken in accordance with a Mine Closure Plan. • Completion criteria will incorporate fauna and habitat restoration objectives. • Kidman has maximised the use of the Mt Holland abandoned infrastructure and disturbed areas, such that the future operation can positively contribute to environmental values of the area by providing the means to rehabilitate State liabilities.

Key Environmental Factors	
Impact Assessment	• Following implementation of management measures, it is expected that no more than 365 ha of fauna habitat will be cleared over the 30 to 40 year LOM. • One active Malleefowl mound is located within the proposed pit footprint. Clearing of this mound will not be required for at least 18 months following commencement of operations. This provides Kidman with the opportunity to monitor the mound and determine the best method for protection of eggs, chicks and adults, should they still be present. • Impacts to Chuditch associated with clearing will be minimised (although not necessarily avoided) through a pre-clearing capture-and-release program that will be developed in consultation with DPaW and implemented on advice from DPaW. • Feral fox and cat control is considered one of the key factors that can assist in the maintenance of Chuditch, Malleefowl and other native fauna populations in the region. Therefore, a key corporate management commitment is to implement a broad scale investigation into the occurrence of feral species in the area as well as working with DPaW to contribute to regional feral animal control. • Following implementation of other management measures, risks associated with fire, feral animals, vehicle strikes and fauna entrapment are considered to be low and may be improved by the presence of a long-term operation and associated resources to contribute to management of these risks. • The Project will result in a net rehabilitation gain of approximately 45% of abandoned mine site disturbance within the development envelope. This will ultimately improve the continuity of habitat in the Project area.
Predicted Outcome	Through completion of comprehensive baseline studies, optimisation of the Project footprint to utilise existing disturbed areas and implementation of stringent management measures, the Project is able to meet the EPA's objective to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

Consultation

Key consultation that has occurred as part of Project planning is listed in Table ES 4.

Table ES 4: Summary of Consultation

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of Mines and Petroleum (DMP)	16/02/2017	Meeting	**DMP**: 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 DMP, focusing on proposed operations, environmental setting, baseline study results, presence of Chuditch, Malleefowl and threatened flora, opportunities for rehabilitation of abandoned mine site.	DMP commented on the potential positive outcomes associated with rehabilitation of historic disturbances. DMP suggested a pre-referral meeting be held with the Office of the Environmental Protection Authority to discuss conservation significant species.
Office of the Environmental Protection Authority (OEPA) and DMP	9/03/2017	Meeting	**OEPA**: Robert Hughes (Manager, Mining and Industrial South Branch) Helen Butterworth (Acting Principal Environmental Officer, Mining and Industrial South Branch). **DMP**: 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 OEPA 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. DMP reaffirmed that any Mining Proposal would be referred to DPaW and/or the OEPA for advice due to the presence of conservation significant species.
DPaW – Environmental Management Branch	9/03/2017	Phone Call	**Kidman**: Siobhan Pelliccia (Blueprint) to **DPaW:** Daniel Coffey.	Informed DPaW of meeting with the OEPA and DMP and requested a meeting to discuss the conservation significant species in the Project area.	DPaW communicated that although the Project was of interest, DPaW could not meet with proponents unless their project was located in DPaW managed land, or a formal request was made by DMP or the OEPA 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 OEPA) 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
Shire of Kondinin	28/03/2017	Meeting	**Shire:** John Read (CEO) and Mark Burges (Manager of Works) **Kidman:** Kevin Dockery (Project Manager)	Overview of the Project and in particular use of Shire roads and maintenance thereof. Opportunities for local employment and use of local services.	Shire road maintenance agreements to be implemented.
Shire of Yilgarn	29/03/2017	Meeting	**Shire:** Brian Jones (CEO) and Robert Bosenberg (Manager of Works) **Kidman:** Kevin Dockery	Overview of the Project and in particular use of Shire roads and maintenance thereof. Opportunities for local employment and use of local services.	Liaison with Shire of Yilgarn Regulatory Services was discussed in relation to Kidman ensuring compliance with current building codes and health regulations for buildings installed on site including construction of the accommodation village. Shire road maintenance agreements to be implemented.
DPAW – Western Shield Group	5/05/2017	Meeting	**DPAW**: 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.

Conclusions

The Earl Grey Lithium Project is a long-term operation that has been designed to minimise impacts to flora and fauna, which are considered the two key environmental factors applicable to the Project. Other factors, whilst not key factors, have been assessed and it is concluded that the project can be implemented such that the EPA objectives for these factors will be met.

Flora surveys within the development envelope have identified previously unrecorded populations of the threatened species, *Banksia sphaerocarpa var. dolichostyla.* All infrastructure has been strategically placed to avoid disturbance to this species.

Fauna surveys have identified a high density Chuditch population and active Malleefowl population both within and outside the development envelope. The information collected on both species represents an increase in knowledge of the abundance and recovery of these species in the Coolgardie IBRA region. Kidman has placed considerable emphasis on minimising of new clearing in order to limit the amount of habitat disturbance associated with the Project. This has resulted in a total new disturbance footprint of 365 ha. The remainder of the Project footprint is located on existing disturbed areas, of which 210 ha is part of the abandoned Mt Holland Mine Site. In combination with the implementation of stringent clearing controls, waste management procedures, feral animal control, bushfire control and a capture and release (for Chuditch), it is considered unlikely that the Project will impact the conservation status of these species.

Despite the relatively small footprint of the Project, Kidman is committed to contributing to efforts to improve the stability of regional Malleefowl and Chuditch populations. This will take the form of contributions (research, funding and/or other resources) to the regional Western Shield Program; the Department of Parks and Wildlife's lead animal conservation program.

Overall, the Project has the potential to provide a net environmental benefit to the region by providing a practical means of rehabilitating a significant portion of the State disturbance liability at the abandoned Mt Holland Mine Site, in combination with a commitment to contribute to regional conservation programs.

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Glossary

Abbreviation	Full Description
ABA	Acid Base Accounting
ACMC	Aboriginal Cultural Materials Committee
AER	Annual Environmental Report
ANC	Acid Neutralising Capacity
ANZECC	Australian and New Zealand Environment and Conservation Council
BOM	Bureau of Meteorology
CASA	Civil Aviation Safety Authority
DAA	Department of Aboriginal Affairs
DAFWA	Department of Agriculture and Food Western Australia
DER	Department of Environment Regulation
DFES	Department of Fire and Emergency Services
DMP	Department of Mines and Petroleum
DMS	Dense Media Separation
DoEE	Department of the Environment and Energy
DoH	Department of Health
DoW	Department of Water
DPaW	Department of Parks and Wildlife
EC	Electrical Conductivity
EIA	Environmental Impact Assessment
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
EPBC Act	*Environmental Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Area
ESP	Exchangeable sodium percentage
FTE	Full Time Equivalent
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Agency
LOM	Life of Mine
MCMPR	Ministerial Council on Mineral and Petroleum Resources
MCP	Mine Closure Plan
Mining Act	*Mining Act 1978*
MRF	Mining Rehabilitation Fund
MRWA	Main Roads Western Australia
NAF	Non-acid forming
NVS	Native Vegetation Solutions
OEPA	Office of the Environmental Protection Authority
PAF	Potentially acid forming
RIWI Act	*Rights in Water and Irrigation Act 1914*
ROM	Run of Mine
TSF	Tailings Storage Facility
WC Act	Wildlife Conservation Act 1950
WRD	Waste Rock Dump

1. INTRODUCTION

1.1 Background

The Earl Grey Lithium Project (the Project) is located approximately 105 km south-southeast of Southern Cross, Western Australia (Figure 1). A large, economic pegmatite-hosted lithium deposit was discovered by Kidman Resources Limited (Kidman, the Proponent) in 2016. The deposit and proposed operation is situated at the abandoned Mt Holland Mine Site, which was operated between 1988 and 2001, and comprises a number of open pits, an underground mine, a processing plant, waste rock dumps, tailings storage facilities and other infrastructure that is largely unrehabilitated and currently a liability of the State of Western Australia.

The Earl Grey Lithium Project will comprise open cut mining and processing of lithium ore, with transport of a lithium concentrate to an existing Western Australian port for export to overseas markets. Baseline studies completed in the Project area identified two key environmental factors that trigger referral to the Environmental Protection Authority, namely:

- Flora and Vegetation – Presence of threatened flora species *Banksia sphaerocarpa var. dolichostyla* within the development envelope.
- Terrestrial Fauna – Presence of *Leipoa ocellata* (Malleefowl) and *Dasyurus geoffroii* (Chuditch) within the Development Envelope.

This document has been prepared to support a Section 38 referral under the *Environmental Protection Act 1986*. It provides detailed information on the proposed operations and the management and mitigation measures that will be implemented to minimise impacts to conservation significant species, contribute to regional conservation programs and reduce the existing State rehabilitation liability associated with the abandoned Mt Holland Mine Site.

1.2 Proponent Details

The Project is owned by Kidman Resources Limited (Kidman). All tenements and tenement applications associated with the Project are held by either:

- Kidman Resource Limited.
- Montague Resources Australia Pty Ltd, a wholly owned subsidiary of Kidman.
- MH Gold Pty Ltd, a wholly owned subsidiary of Kidman.

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

Kidman Resources Limited
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E-mail: chris.williams@kidmanresources.com.au

1.3 Location and Tenure

The Project is located approximately 105 km south-southeast of Southern Cross in the Yilgarn Mineral Field of Western Australia (Figure 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. 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 (Table 1 and Figure 2). Two exploration licences are currently being transferred from Western Areas Limited to Kidman (Table 1). Three General Purpose Lease applications will be submitted over the Exploration Licences, where required, and other existing General Purpose Leases as part of a tenement amalgamation process.

Table 1: Project Tenement Summary

Tenement	Current Holder on Mineral Titles Online	Associated Infrastructure	Notes
M77/1080	Montague Resources Australia Pty Ltd	Earl Grey Pit WRD 1 and WRD 2	NA
M77/1065	Montague Resources Australia Pty Ltd	WRD 1, Contractors Yard, Topsoil and Vegetation Stockpiles, roads.	NA
M77/1066	Montague Resources Australia Pty Ltd	TSF Option A, TSF Option B, Processing Plant, Laydown, Landfill, Magazine Compound, Accommodation Village, Evaporation Ponds	NA
G77/70	MH Gold Pty Ltd	Administration	A General Purpose Lease application to be made over these tenements and associated proposed infrastructure.
G77/109	MH Gold Pty Ltd	TSF option A	
G77/110	MH Gold Pty Ltd	Processing Plant, ROM Pad	
G77/68	MH Gold Pty Ltd	Processing Plant	
E77/2099[1]	Western Areas Limited[1]	Administration, low grade stockpile, laydown area, roads, WRD 3.	
E77/1400[1]	Western Areas Limited[1]	WRD 3	General Purpose Lease application to be made over the portion of WRD3 proposed within this tenement.
G77/71	MH Gold Pty Ltd	Accommodation Village	A General Purpose Lease application to be submitted to amalgamate tenements.
G77/72	MH Gold Pty Ltd	Accommodation Village	
G77/73	MH Gold Pty Ltd	Access Road	
L77/107	MH Gold Pty Ltd	Airstrip	NA
L77/205	MH Gold Pty Ltd	Access Road	NA
L77/208	MH Gold Pty Ltd	Access Road	NA
L77/96	MH Gold Pty Ltd	Borefield	NA
L77/207	MH Gold Pty Ltd	Borefield, Road	NA

[1] Sale agreement executed

1.4 Project Timeframes

Indicative timeframes for the Project are summarised in Table 2.

Table 2: Indicative Project Timeframes

Activity	Timeframe (Calendar Year)	Description
Clearing	Q3 2017 – Q1 2018	Commence clearing of areas in accordance with necessity for initial phase of mine development.
Prestrip	Q4 2017 – Q1 2018	Commence pre-strip of areas required for initial phase of mine development.
Construction	Q4 2017	Commence construction of facilities, services and process plant
Mining	Q1 2018	Commence mining of starter pit
Commence processing	Q1 2018	Commission processing facility and increase throughput to nameplate capacity

1.5 Project History

1.5.1 Overview

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, including the existing Earl Grey pit, which is located within the new Earl Grey Resource.

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) 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 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 Kidman Resources or another party.

1.5.2 Existing Infrastructure

The Project is located in an existing mine site with extensive disturbances as shown in Figure 3. Key disturbances and infrastructure include:

- Three tailings storage facilities (TSF).
- Eight pits, including Bounty pit.
- Bounty underground mine.
- Seven waste rock dumps (WRD).
- Processing plant infrastructure.
- Run of mine ore storage pads (ROM).
- Airstrip.
- Accommodation village (remaining infrastructure includes concrete slabs, pipelines and miscellaneous disturbance).
- Landfill.
- Roads and tracks.
- Borefield.
- Coreyard.
- Water storage facilities.
- Borrow pits and other miscellaneous disturbances.

While some of the mine landforms have been rehabilitated, the majority of the site remains highly disturbed, representing a risk to both human health and safety and the environment. Key risks associated with the existing disturbances include:

- Mine voids remain open and accessible to the public.
- Tailings material within the TSFs are potentially acid forming (PAF) and contains elevated concentrations of metals and metalloids. None of the TSFs have been capped, allowing continued oxidation of tailings materials, potential acid generation, seepage into groundwater and potential contamination via wind blown dust and stormwater runoff.
- TSF1 has no freeboard, allowing stormwater to flow over the embankment. The embankments of TSF2 are also significantly eroded.
- Much of the remaining infrastructure is considered unsafe, particularly the historic processing plant area.

1.5.3 Existing Disturbance

For the purpose of this proposal, existing disturbance associated with the Project can be categorised as follows:

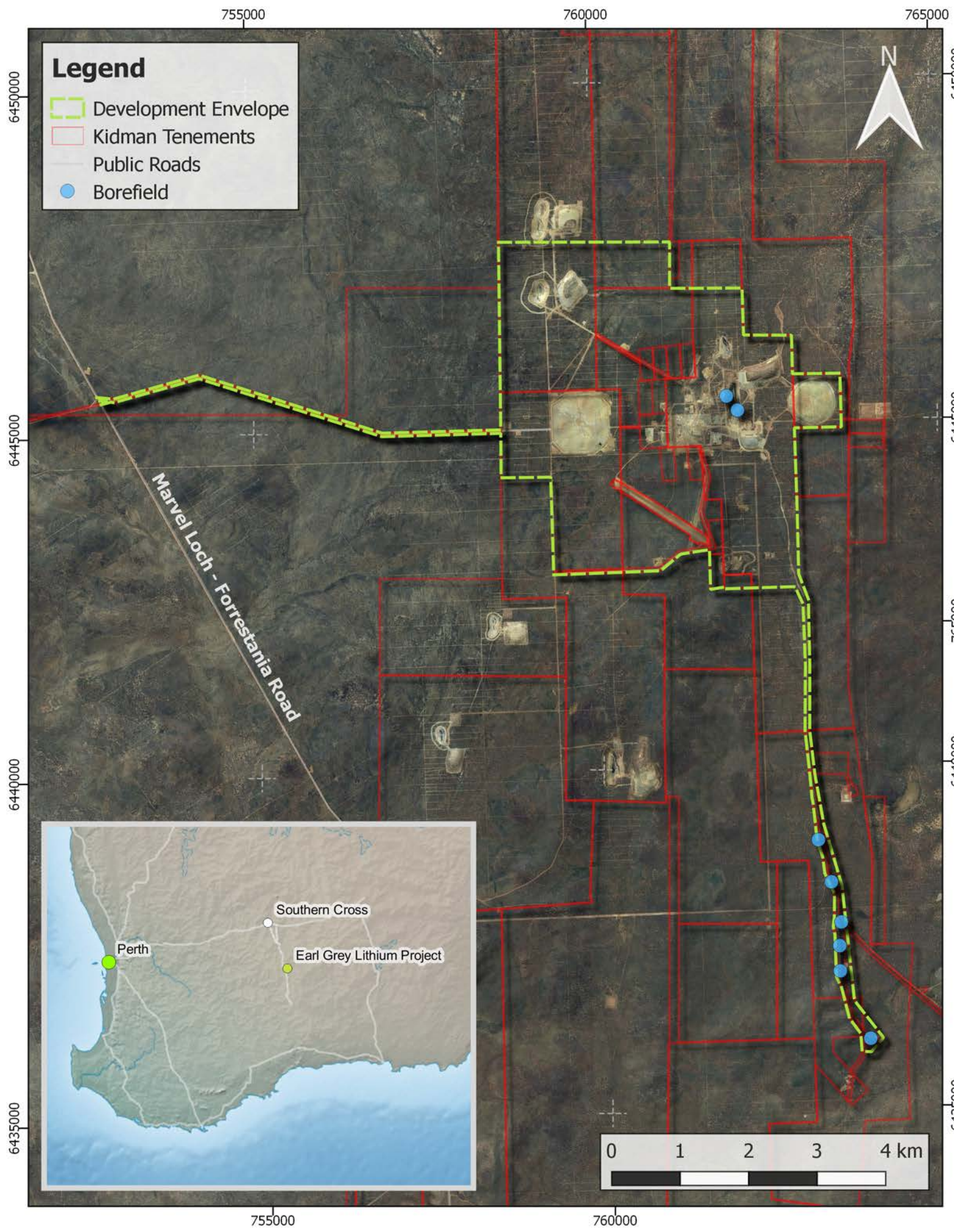
- State Liability Category 1 - Historic disturbance with no rehabilitation or vegetation regrowth.
- State Liability Category 2 - Historic disturbance with some rehabilitation earthworks completed with sparse regrowth of vegetation.
- Kidman Liability Category 1 – Historic disturbance that was not abandoned (i.e. there was no break in lease) (e.g. the airstrip).
- Kidman Liability Category 2 - New disturbance associated with exploration activities.

The existing road network is excluded entirely from the disturbance calculations. Areas associated with each category of disturbance are provided in Table 3.

Table 3: Existing Disturbance Areas

Disturbance Type	Description	Area (ha) within the Proposed Project Footprint
State Liability Category 1	Historic disturbance with no rehabilitation or vegetation regrowth.	Approximately 200 ha
State Liability Category 2	Historic disturbance with some rehabilitation earthworks completed with sparse regrowth of vegetation (limited to some regrowth on tracks and the existing Earl Grey WRD).	Approximately 10 ha
Kidman Liability Category 1	Historic disturbance that was not abandoned (e.g. the airstrip, southern borefield).	Approximately 25 ha
Kidman Liability Category 2	New disturbance associated with exploration activities (i.e. – Early Grey exploration drill pads and tracks).	Approximately 10 ha

Within the larger development envelope, total historic (abandoned) disturbance is approximately 445 ha. Therefore, utilisation of 200 ha of unrehabilitated disturbed areas, that will consequently become the rehabilitation liability of Kidman, represents a net rehabilitation gain of approximately 45% of this liability.



Scale: 80,000 **Original Size: A4** **Aerial Photo Date: 2014** **Grid: Australia MGA94 (50)**	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 1** **Location Plan**	KIDMAN RESOURCES

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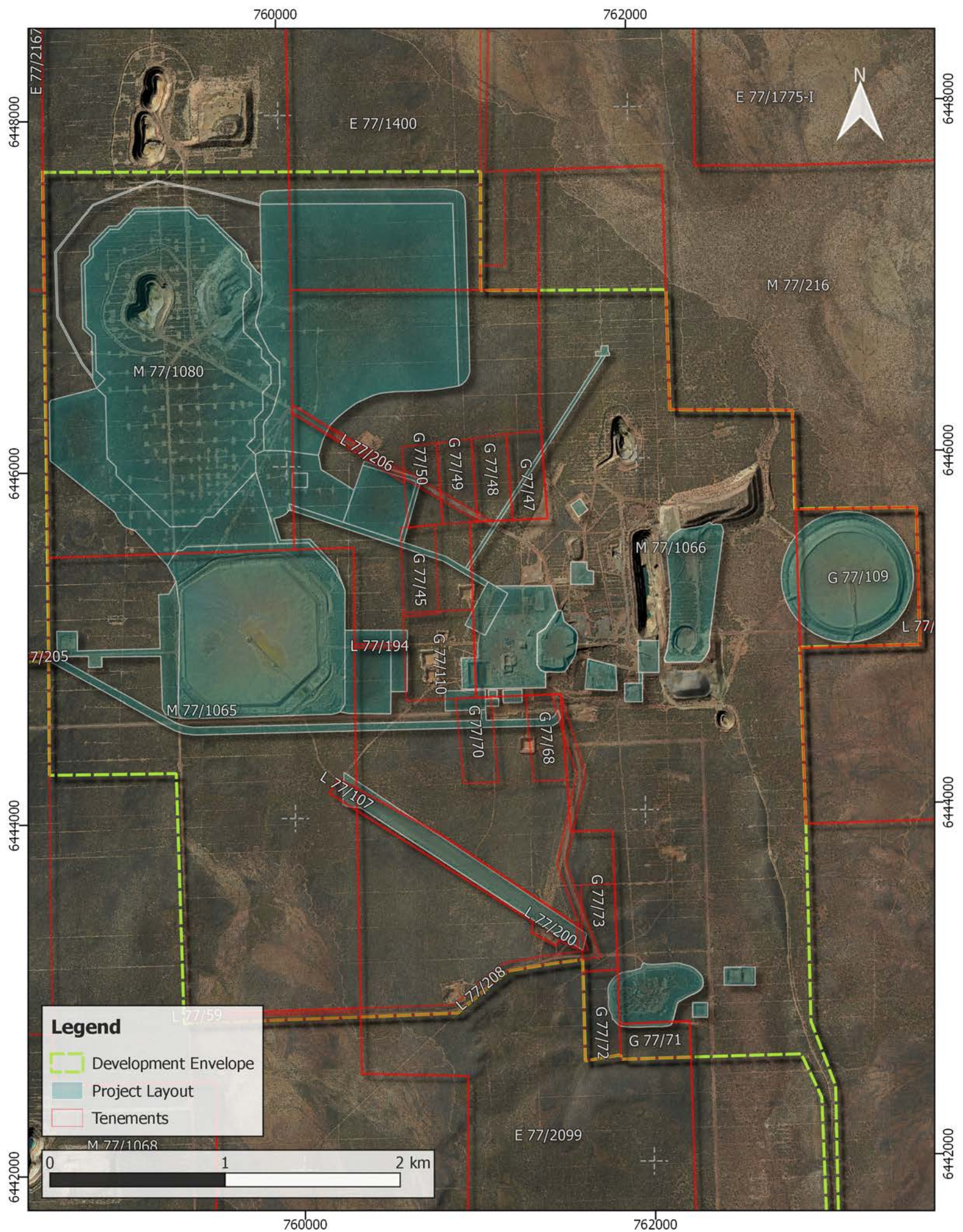

Scale: 31,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 2** **Project Tenements**	KIDMAN RESOURCES

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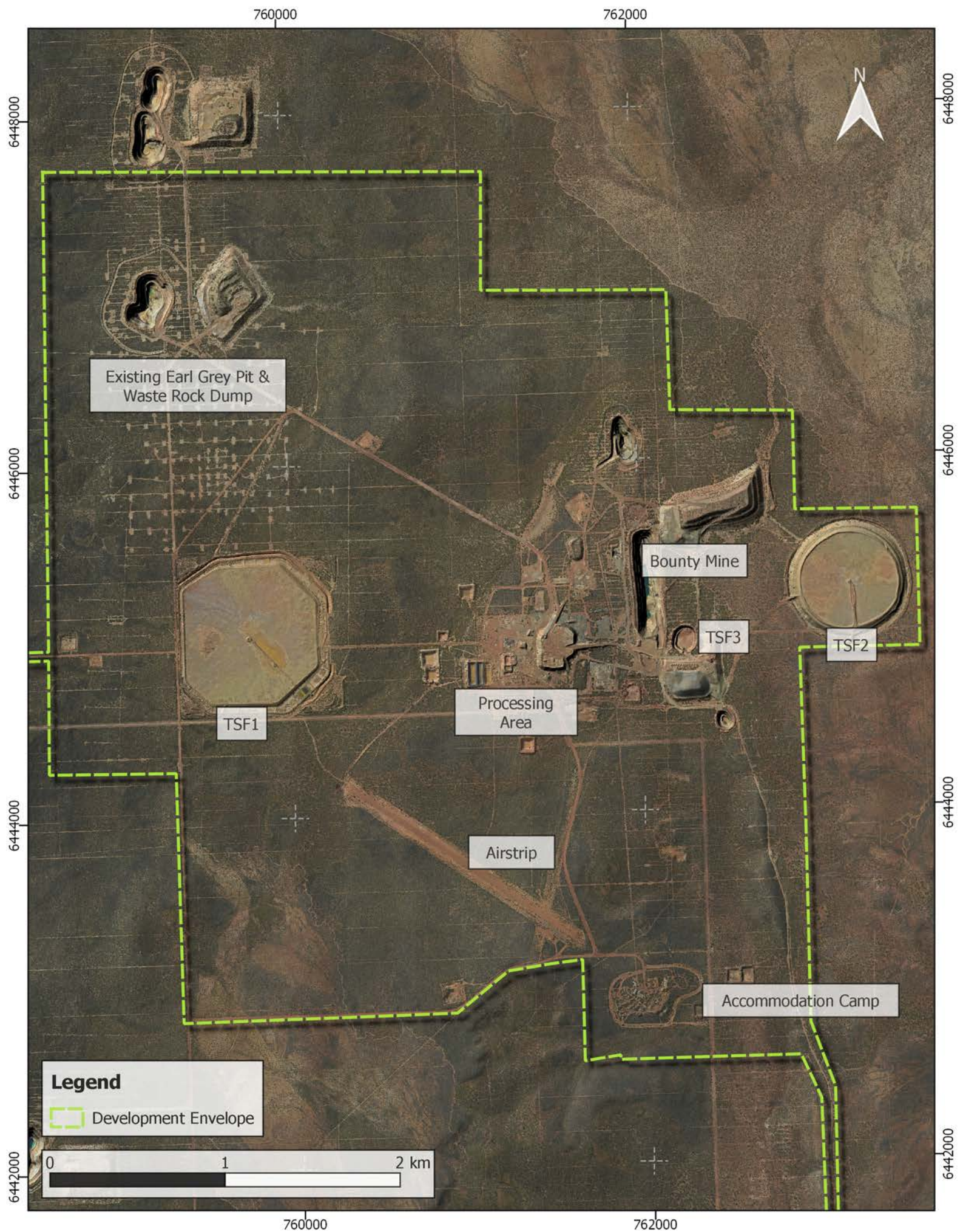

Scale: 31,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 3** **Existing Disturbance**	KIDMAN RESOURCES

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2. PROPOSAL DETAILS

2.1 Proposal Overview

Kidman proposes to develop the Earl Grey Lithium Project, within the existing, historic Mt Holland Mine Site. The current resource is 128 million tonnes (at 1.44 % lithium oxide) with a mining inventory of approximately 100 million tonnes. The ore is contained in a shallow dipping pegmatite unit that can be mined by standard open cut methods. A significant number of environmental studies have been undertaken within the Project area, under both historic and current ownership. The environmental setting is therefore well understood allowing Kidman to develop the Project in a way that identifies and minimises adverse environmental impacts while reducing the environmental risk associated with some of the historic infrastructure.

The key components of the Project will comprise:

- Progressive mining of the Earl Grey lithium deposit using conventional open cut drill and blast mining methods, over a potential 30 to 40 year life of mine (LOM), with transfer of ore to the run of mine (ROM) pad in preparation for processing.
- Processing of lithium ore (dominant lithium minerals being spodumene and petalite, which are both alumino silicates) at a rate of 3 million tonnes per annum, through a newly constructed gravity separation and flotation plant, largely constructed within the historic disturbance footprint.
- Production of a lithium concentrate that will be stored in a concentrate shed prior to being transported by road trains to an existing Western Australian export facility.
- Production of two chemically benign process waste streams, comprising:
  - A gravel sized reject which will be disposed of in waste rock dumps as well as being used for construction purposes (e.g. road base, fill, rehabilitation armouring).
  - A finer grained tailings stream that will be deposited into either the abandoned and unrehabilitated Tailings Storage Facility (TSF) 2 (hereby referred to as TSF Option A) or an expansion to the existing in-pit TSF 3 (hereby referred to as TSF Option B), both options reduce the project disturbance footprint and providing a rehabilitation solution to State liability landforms.
- Disposal of unmineralised waste rock to three locations as follows:
  - Stockpiling of waste rock over the abandoned and unrehabilitated TSF 1, thereby reducing the disturbance footprint and providing a rehabilitation solution to the State liability landform (hereby referred to as Waste Rock Dump 1 (WRD1).
  - Backfilling of the proposed Earl Grey pit (infilling approximately 50% of the pit volume and covering approximately 50% of the surface area) as mining progresses from south to north, thereby reducing the disturbance footprint and the area of open pit remaining at closure (hereby referred to as WRD 2).
  - Construction of a new waste rock dump that has been designed to avoid threatened flora species (hereby referred to as WRD 3).
- Construction of a low-grade ore stockpile to the immediate southeast of the proposed pit for processing towards the end of the LOM.
- Refurbishment of the existing airstrip.
- Construction of other supporting infrastructure (e.g. accommodation village, power station, landfills, administration, workshops, roads, refurbishment of the borefield) predominantly within the historic footprint, thereby reducing new disturbance and providing a rehabilitation solution to a significant portion of the State rehabilitation liability.
- Utilisation of the existing road network.

In planning the proposed mining operations and layout, Kidman has prioritised two key environmental objectives:

1. *Minimising the Project footprint, to reduce the need for new clearing therefore minimising potential impacts on conservation significant flora and fauna.*
2. *Maximising the use of existing abandoned infrastructure and disturbed areas, such that the future operation can positively contribute to environmental values of the area by providing the means to rehabilitate State liabilities utilised by Kidman as part of the Earl Grey Lithium Project.*

The total footprint required for the Proposal will be 610 ha of which 245 ha will be located within previously disturbed areas. This will result in a net rehabilitation gain of approximately 45% of abandoned mine site disturbance within the development envelope (see Section 1.5.3). The proposed site layout is shown in Figure 4. The key features of the project and the proposed physical extent of these features is provided in Table 4.

2.2 Key Characteristics

A summary of key characteristics for the Project are provided in Table 4.

Table 4: Key Characteristics Table

Physical Element	Operational Element	Location	Proposed Extent
Open Pit	Conventional drill and blast open cut mining of 100 million tonnes of lithium ore.	Located 1.7 km northwest of the abandoned Mt Holland plant site.	New Disturbance: 92.1 ha Existing Disturbance: 50.4 ha Total Footprint: 142.5 ha Depth: Ranging from 0 m to 295 m
Waste Rock Dump 1	36 million loose cubic metres of waste rock and gravel rejects from processing will be stockpiled on the abandoned TSF 1 and surrounds to form a permanent landform that will be progressively rehabilitated.	Located on the abandoned TSF 1 and surrounds, with the final footprint merging with Waste Rock Dump 2.	New Disturbance: 8.2 ha Existing Disturbance: 82.8 ha Total Footprint: 91.0 ha Maximum Height: 45 m Slope angle: 17 degrees
Waste Rock Dump 2	109 million loose cubic metres of waste rock and gravel rejects will be progressively backfilled in to the Earl Grey pit (infilling 50% of the pit volume) to form a permanent, raised landform.	Located within the Earl Grey pit (backfill).	New Disturbance: 33.5 ha Existing Disturbance: 4.5 ha Total Footprint: 38.0 ha Maximum Height: 45 m Slope angle: 17 degrees
Waste Rock Dump 3	52 million loose cubic metres of waste rock and gravel rejects from processing will be stockpiled to form new waste rock dump.	Located to the immediate east of the proposed Earl Grey Pit.	New Disturbance: 125.1 ha Existing Disturbance: 5.7 ha Total Footprint: 130.8 ha Maximum Height: 45 m Slope angle: 17 degrees
Processing Plant and Concentrate Storage Shed	Processing 3 million tonnes per annum via crushing and dense media (gravity) separation to produce 600,000 tonnes per annum lithium oxide concentrate.	Located adjacent to the historic abandoned Mt Holland plant site.	New Disturbance: 4.8 ha Existing Disturbance: 25.8 ha Total Footprint: 30.6 ha
Tailings Storage Facility and pipelines	Approximately 10 million tonnes of process fines will be deposited into the historic (abandoned) TSF 2 (TSF Option A) or the existing in-pit TSF 3 (TSF Option B) which will be expanded to form a paddock TSF.	Located 1.6 km east of the proposed processing plant, respectively.	New Disturbance: 2.6 ha Existing Disturbance: 41.4 ha Total Footprint: 44.0 ha
Power Supply	12 megawatt capacity diesel-powered generators.	Located adjacent to the processing plant.	New Disturbance: 0.0 ha Existing Disturbance: 0.8 ha Total Footprint: 0.8 ha
Borefield, dewatering and water	1.0 GL of water will be required to support mining, processing, dust suppression and domestic uses.	The Bounty mine (water source) is located 800 m east of the processing	New Disturbance: 0.0 ha Existing Disturbance: 5.0 ha Total Footprint: 5.0 ha

Physical Element	Operational Element	Location	Proposed Extent
supply Infrastructure	Water will be sourced from the existing borefield and Bounty underground mine. Pit dewatering at rates less than 5 L/s will be required when mining reaches depths of approximately 58 m below surface.	plant area. The existing borefield is located 8 km south of the processing plant.	
Supporting Infrastructure	Other supporting infrastructure includes an accommodation village, waste water treatment facilities, landfills, water storage facilities, powerlines, pipelines, roads, explosives magazine, vegetation and topsoil stockpiles, coreyard, borrow pits, workshop and administration facilities.	Located predominantly in existing historic disturbance areas.	New Disturbance: 100.4 ha Existing Disturbance: 51.8 ha Total Footprint: 152.2 ha

2.3 Proposed Land Disturbance

The total development envelope is approximately 1,984 ha, with a project footprint of 610 ha of which 245 ha will be situated on existing disturbed land, as summarised in Table 5. The total new land disturbance required for the proposal is 365 ha. Disturbance will be located wholly within tenure granted under the *Mining Act 1978*.

Table 5: Estimated Land Disturbance for Key Project Infrastructure

Project Component	Total Disturbance (ha)	Existing Disturbance (ha)	New Disturbance (ha)
Pit	142.5	50.4	92.1
WRD 1	91.0	82.8	8.2
WRD 2[1]	38.0	4.5	33.5
WRD3	130.8	5.7	125.1
TSF[2]	44.0	41.4	2.6
All Other Components	163.7	60.2	103.5
TOTAL	**610**	**245**	**365**

[1] Excluding pit area
[2] Assumes TSF Option A will be used.

Scale: 31,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 4** **Proposed Site Layout**	KIDMAN RESOURCES

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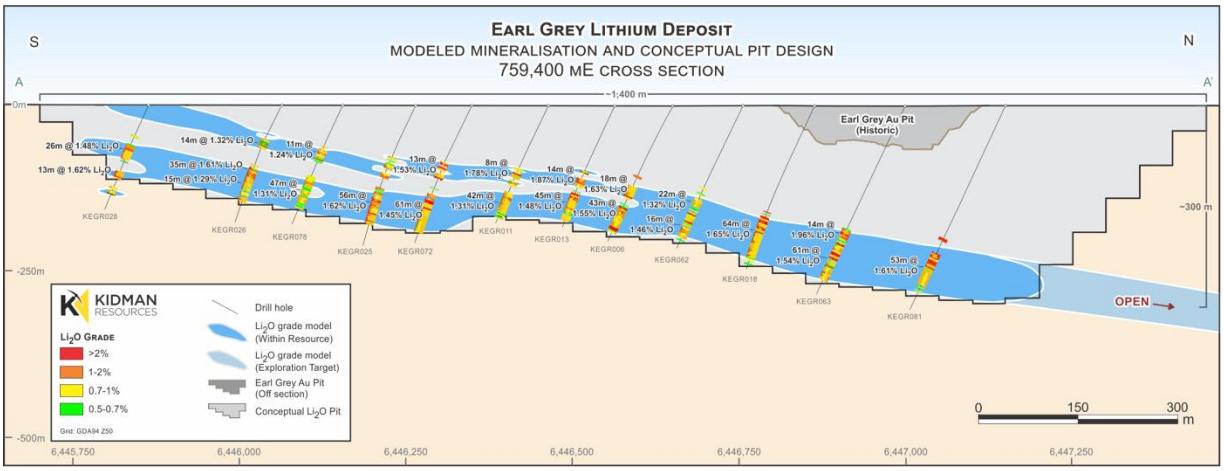
2.4 Mining

The Earl Grey deposit is proposed to be mined via conventional open cut methods. The pit will be developed in multiple stages over a 30 - 40 year period, with the first stage providing ore for years 1 to 6 (Figure 5). 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 in 5 m benches, with broken material excavated on 2.5 m flitches.

Ore will be transported to a ROM pad for transfer to the processing plant. Low grade ore will be transported to a separate stockpile located to the immediate south-east of the pit.

The pit will be approximately 1,800 m long by 950 m wide. Maximum pit floor depths will be approximately 185 m below existing ground level (270 mRL) in the south of the pit and 300 m (155 mRL) in the north. A long section of the proposed pit and Earl Grey orebody is shown in Figure 5.

Figure 5: Pit and Orebody Long Section



2.5 Waste Rock Management

The Earl Grey resource model includes waste rock volumes as well as economic mineralisation. Waste rock characteristics are also well understood (Section 7.14).

Mining of the Earl Grey lithium deposit will produce 200 million LCM of waste rock (inclusive of gravel rejects, as described below) over the 30 - 40 year life of mine. This will be managed using three waste rock landforms, as follows:

- Permanent waste rock dump covering the historic TSF1 (WRD1).
- Progressive backfilling of the pit to produce a permanent, raised waste rock landform (WRD2).
- A permanent waste rock dump to the immediate east of the pit (WRD3).

The location of these landforms is shown in Figure 6.

As discussed in detail under Section 7.14.1, and for the purpose of waste rock management, there are three types of waste to consider:

- Fresh waste rock, which is geochemically benign and resistant to erosion.
- Transitional waste rock, which is pH circum-neutral, slightly to moderately saline, low in soluble toxicants and of varying resistance to erosion.
- Oxide waste rock, which is low in soluble toxicants but highly saline, has a natural pH of 3.9 – 5.4 and is prone to be dispersive.

In addition to waste rock excavated from the pit, a coarse gravel reject material will also be produced during processing and will be managed as per fresh waste rock. This material is chemically benign and resistant to erosion. Further details on coarse gravel rejects is provided in Section 2.7.

As the development of the pit is staged through the varying types of waste to expose fresh ore so will the construction of the WRD1 be staged to encapsulate the oxide and transitional waste material with fresh, competent waste rock as the pit development progresses.

The sequential nature of the proposed mining allows for a staged approach to clearing, as is shown in Figure 6, such that only 33 % of the pit is cleared in the first six years. After approximately year six, the pit void will be sufficiently large to start accommodating progressive backfilling activities. All newly produced oxide waste will be preferentially disposed below ground level in the pit void, before being covered with transitional and fresh waste. Waste disposal at WRD1 will continue in parallel to progressive backfilling of the pit until the two waste rock landforms join and the design parameters are met (Table 6).

Construction of WRD3 will commence in approximately year nine. Based on the current pit design, waste disposal from year nine onwards will be split between progressive backfilling (WRD2) and WRD3 until approximately year 30, when progressive backfilling can no longer occur. At this point, all remaining waste material will be disposed at WRD3 and will be comprised predominately of fresh waste.

All dispersive oxide and transitional materials, in all waste rock landforms, will be completely encapsulated with fresh competent waste rock to minimise the potential for post closure erosion and sedimentation issues.

Design parameters for each landform are provided in Table 6, including allocation of the various waste rock types. The waste rock landforms have been designed and located in order to:

- Avoid detrimental geotechnical conditions.
- Minimise footprint and associated vegetation disturbance.
- Maximise use of existing disturbed areas.
- Avoid impacts on conservation significant flora and fauna.
- Avoid watercourses and areas of potential flooding.
- Avoid potential mineralised areas.
- Comply with Civil Aviation Safety Authority (CASA) airstrip regulations with respect to the Mt Holland airstrip runway approach.

Table 6: Waste Rock Landform Parameters

Parameter	WRD1	WRD2	WRD3
Total Volume (LCM)	36 million	109 million	52 million
Maximum Height (m)	45	45	45
Final Batter Angle (°)	17	17	17
Material Allocations (approximate)			
Oxide Waste (LCM)	2.5 million (7%)	7.6 million (7%)	3.6 million (7%)
Transitional Waste (LCM)	15.2 million (42%)	46.9 million (43%)	14.6 million (28%)
Fresh Waste (LCM)	10.8 million (30%)	43.4 million (40%)	25 million (48%)
Coarse Gravel Rejects (LCM)	7.5 million (21%)	16 million (10%)	9 million (17%)

Scale: 31,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 6** **Landform Development Over Time**	KIDMAN RESOURCES

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2.6 Processing

Processing of ore to produce a lithium oxide concentrate will occur in three stages as follows:

- **Crushing:** The processing circuit requires lithium ore to be crushed. This will be undertaken by feeding ore from the ROM in to a three-stage crushing circuit comprising of a primary jaw crusher, a dry triple deck sizing screen, secondary and tertiary crushers and fine ore storage bin at a design throughput of 3 Mtpa, producing 10 mm crushed ore that can be fed to the first stage of the Dense Media Separation (DMS) processing plant.
- **Dense media separation (DMS):** Crushed ore is conveyed to the DMS processing plant from the fine ore storage bin. The first stage of the DMS plant concentrates the lithium ore by separating the lithium bearing minerals (spodumene, petalite) from other minerals based on differences in density. No reagents are used in this process other than the addition of environmentally benign granular ferrosilicon (FiSi). This is undertaken to control the pulp density such that it is maintained between the density of the lithium bearing minerals and waste minerals. The lithium bearing material from the first stage is further reduced in size to a target 80% passing 2mm to ensure maximum liberation of the spodumene and/or petalite from the other minerals (typically quartz and albite). This material is then sent to a second stage of DMS. Waste minerals from both stages of DMS report to stockpile as a gravel product varying in size from 0.5mm to 10mm. Other finer fractions are sent to the thickening and tailings circuit. Spodumene sinks and is removed as the lithium concentrate product. Ferrosilicon is recovered for reuse via a magnetic recovery circuit.
- **Thickening and tailings disposal:** The tailings thickener receives dewatering and waste overflow streams from the DMS plant. The solids and liquids are combined with an environmentally benign and biodegradable flocculent and thickened prior to disposal in the TSF. Process water is used throughout the plant to wash and rinse screened material and for pulping (density separation). Process water is recycled within the processing facility via the tailings thickener. Additional process water is recovered from the TSF via a decant water return system. Raw water is used to top up the process water system as required.

The location of the processing plant is shown in Figure 4. This was selected with consideration to the proximity of the proposed pit, process water supply, power reticulation and availability of existing cleared areas. The overall process is consistent with other hard rock lithium projects within Australia.

The final lithium oxide (Li_2O) concentrate product will be stored in a purpose built storage facility immediately adjacent to the processing plant, prior to transport to an existing Western Australian port for export to overseas markets.

2.7 Lithium Oxide (Li_2O) Concentrate Product

The processing plant will produce lithium oxide concentrate as a final product. This will be transported by road to an existing Western Australian port for export to overseas markets.

The product has a range of applications including use in ceramics and medicine as well as a fluxing agent. More recently, global demand for lithium has significantly increased in line with the demand for automotive batteries, such as those used by Tesla for electric cars, and to a lesser degree, mobile phone batteries.

The product is environmentally benign and non-toxic, requiring no specific management measures other than containment (e.g. dust, runoff).

2.8 Tailings Management

Over the 30 - 40 year life of mine, approximately 10 Mt (7,500,000 m^3) of fine tailings and 70 Mt (33,000,000 m^3) of coarse tailings (gravel rejects) are expected to be produced. Gravel rejects will be managed as fresh waste rock or used as a construction material (e.g. road aggregate). Fine tailings require management within a dedicated tailings storage facility. There are two TSF options under consideration by Kidman:

- Refurbishment of the existing TSF 2, with a 10 m raise (TSF Option A).
- Development of a new TSF in the Bounty mine area, encompassing the existing TSF 3 (TSF Option B).

Both options make efficient use of existing disturbed landforms (Figure 4). The historic TSF 2 is located to the far east of the development envelope and covers approximately 35 ha. This facility is currently over 18 m high and contains tailings geochemically similar to those in TSF1 (i.e. potentially acid forming). TSF Option A requires refurbishment work to the existing facility (some buttressing of embankments) followed by a 10 m raise to accommodate new tailings for the life of mine.

The historic TSF 3 is an existing in-pit storage facility located near the historic Bounty pit. Refurbishment and use of TSF3 was approved by DMP and DER in 2014 as part of Convergent Minerals' (previous tenement holders prior to Kidman) Mining Proposal and Works Approval application as described in Section 1.5. TSF3 covers approximately 3 ha and has a remaining estimated capacity of 290,000 m^3. This will be used to deposit tailings for the first 1-2 years while construction of a larger facility is undertaken, encompassing the existing in-pit TSF3 and making use of surrounding waste rock dumps for dam embankments.

The tailings will be transferred via slurry pipeline from the processing plant to the selected TSF. Slurry densities are expected to range from 50-60% solids. The TSF will allow solids to settle out and excess water to be reclaimed and returned to the processing plant for reuse.

Tailings will be discharged to the selected TSF by sub-aerial deposition methods, using a combination of spigots at regularly spaced intervals along the embankment. The active beach will be regularly rotated around the TSF, promoting consolidation and controlling dust. A monitoring program will be established during operation of the TSF comprising data from piezometers and monitoring bores. As the tailings properties are expected to be environmentally benign (refer Section 7.14), and as the groundwater is saline to hypersaline, there is no requirement to construct a low permeability clay liner.

The selected TSF design will accommodate a 1 in 100 average exceedance probability (AEP) 72-hour rainfall event and still maintain adequate freeboard. Additionally, design and operation of the TSF will be undertaken in accordance with the following:

- Australian Committee on Large Dams (ANCOLD) guidelines.
- DMP Code of Practice: Tailings Storage Facilities in WA (2013).
- An approved operating manual that meets the requirements of The Guidelines on the Development of an Operating Manual for Tailings Storage (DME 1998)

2.9 Water Requirements

The Project requires 1.0 GL of water per annum. Water requirements, including use for processing, accommodation village and dust suppression around the mine site, will be met by the following:

- Pit dewatering (approximately 0.13 GL/annum from year 8 onwards).
- Groundwater abstraction from the existing borefield and/or Bounty underground (0.87 GL – 1.0 GL/annum).
- Water recycling within the various process water circuits.

2.9.1 Pit Dewatering

Dewatering volumes are expected to be very low, with inflow rates of approximately 3 to 4 L/s at depth. A dewatering system will be installed to remove all groundwater inflows from the pit. Water removed from the pit will predominantly be used in processing as well as dust suppression. During large storm events, any excess water will be pumped to the Bounty pit which has a capacity of 1.5 million cubic metres (allowing for 10 m freeboard).

2.9.2 Bounty Mine Water Supply

A licence to take water was granted by the Department of Water in May 2015 under Section 5C of the *Rights in Water and Irrigation Act 1914*. The licence, GWL180267, allows for the abstraction of up to 630,000 kL per annum from the historic Bounty pit and underground and expires in May 2025. Abstraction from this location will be

undertaken in accordance with the licence conditions. Details on the Bounty water supply hydrogeology are provided in Section 7.7.3.

2.9.3 Southern Borefield Water Supply

The Bounty mine water supply will be supplemented with water sourced from the existing southern borefield located approximately 8 km southeast of the accommodation village (Figure 1).

The southern borefield consists of seven production bores and a number of observation bores situated within the Mt Hope caprock aquifer. Water was abstracted from the borefield between 1988 and 2002 at a rate of up to 275,000 kL/annum, with peak abstraction rates of 3000 kL/day. Recoverable storage volumes of the aquifer have been estimated to be approximately 20,000,000 kL (URS 2002). Groundwater quality in the borefield is hypersaline, with total dissolved solids (TDS) concentrations varying between 73,000 mg/L and 87,000 mg/L. Further details on the borefield hydrogeology are provided in Section 7.7.2.

Kidman proposes to refurbish the existing southern borefield and will apply for a new groundwater licence under Section 5C of the *Rights in Water and Irrigation Act 1914*.

2.10 Support Facilities

Support facilities for the Project are summarised below. These will be situated on existing disturbed land wherever practicable, as shown in Figure 4.

2.10.1 Power Supply

Power will be produced on site using diesel generators for a combined, maximum power requirement of 12 MW. Any available power from the existing Western Power substation will be used primarily to reduce diesel generated power.

The diesel generators will be located in the processing plant area (Figure 4) and will have easy access for fuel transfers and power reticulation. Power will be generated at 11 kV and reticulated to a substation for stepping down to lower voltages for use across the site.

Prior to commissioning of the power plant, power will be supplied from the Western Power substation and temporarily from diesel powered generators.

2.10.2 Workshops

Three workshops will be located within the contractor's laydown area and a single workshop in the processing plant area for maintenance of plant, heavy and light vehicles.

2.10.3 Washdown Facility

Vehicle washdown facilities will be established in the processing plant area and contractor's laydown area. These will comprise both light and heavy vehicle washdown areas and a high pressure, low volume cleaning system to minimise water usage and waste water generation. Sediment and waste water will drain to a primary settlement sump. Oily water will overflow to an adjacent cell where oil will be separated from the water using a skimmer. The waste oil will be stored for off-site disposal by a licenced contractor while the water will be recycled or evaporated.

2.10.4 Miscellaneous Plant Buildings

A number of miscellaneous support buildings will be required. These include an administration office, first aid centre, laboratory, crib room, mine offices, plant offices, store rooms, and ablutions.

2.10.5 Accommodation Village

A 200 person accommodation village will be established to house the workforce. This will be located in the same area as the historic Mt Holland accommodation camp and will use existing disturbed land as far as practicable. A temporary accommodation camp will be established in the same location to house the construction workforce.

2.10.6 Water Treatment

Groundwater is saline to hypersaline and is unsuitable for human consumption. A reverse osmosis water treatment system is proposed to be established in the accommodation village area and will be used to reticulate potable water where required.

2.10.7 Waste Water Treatment

A waste water treatment plant (WWTP) will be established at the accommodation village. This will use biotechnological processes in accordance with Department of Health regulations for re-use via lawn and garden reticulation, with excess treated water being disposed of to the existing evaporation ponds located east of the accommodation village.

The design capacity of the accommodation WWTP is 40 m^3/day. The evaporation ponds will be fenced to restrict unauthorised access and fauna access. The WWTP and associated evaporation ponds will be operated in accordance with an Environmental Protection Act Licence.

Two small, self-contained, septic facilities will be established in the administration building, workshop and contractor areas, respectively. These will discharge low volumes of treated effluent to installed leach drains.

2.10.8 Fuel Storage

Diesel fuel will be stored in the processing plant area in 6 x 100 kL self bunded tanks providing a total storage of 600 kL. The facility will include lights, fuel management and level control systems, three fuel dispersing points, one being direct feed to the power plant, and oil/water recovery and separator unit.

2.10.9 Airstrip

The existing Mt Holland airstrip will be refurbished and used to fly some of the workforce in and out of the Project.

2.10.10 Communications

Communication systems will be established, comprising of the following:

- Internet and telephone network via point to point microwave signal over four new and two existing point to point towers back to Kalgoorlie.
- 3G mobile network via range extender installed on site.
- UHF and VHF radio communications across the site for operational use.

2.10.11 Explosives Storage Compounds

Mining requires use of explosives prior to excavation and haulage of ore and waste rock materials. Explosives will be stored within a licensed and secure compound. This will comprise:

- An Initiating and High Explosives storage compound complete with explosives magazines, and Ammonium Nitrate (AN) and Emulsion storage.
- A bulk product compound consisting of ISOtainer emulsion tanks and bagged AN stored as bulk products for down-hole delivery by a purpose built Mobile Processing Unit.

2.10.12 Laydown Areas

A number of laydown areas will be established for the Project, including contractor laydowns during the construction phase and permanent laydowns for the life of mine. Laydowns will be established on existing disturbed land as far as practicable (Figure 4). Laydown areas provide storage for large components (spares) for the processing plant and for the mining contractor's mobile equipment.

2.10.13 Landfill

It is expected that the operation will produce an average of 1,500 tonnes per annum of inert waste and 1,000 tonnes per annum of putrescible waste. Landfills will be managed in accordance with Environmental Protection (Rural Landfill) Regulations 2002.

As the existing landfill area contains a significant population of declared rare flora, Kidman proposes to construct and operate two new Class II facilities for inert and putrescible waste, respectively. Both landfills will be located between the processing plant and Bounty mine areas within an existing disturbed footprint (Figure 4).

Existing laydown areas will be utilised to aid in the separation of re-usable and recyclable materials. These areas will also be used for the temporary storage of recyclable wastes such as scrap metal and vehicle batteries prior to collection from site by a licenced contractor for disposal or recycling at a licenced facility.

2.10.14 Roads

Purpose built on-site roads will be constructed to provide safe and controlled passage for light and heavy traffic and or mobile earthmoving equipment. These will comprise existing roads as far as practicable, with some refurbishment. Use of Local Government Agency (LGA) roads will be by specific agreement with the respective LGA based on the purpose for which the road use is intended.

2.10.15 Topsoil and Vegetation Stockpiles

Topsoil and vegetation stripped from new disturbance areas will be stockpiled on the perimeter of the disturbance for later use in rehabilitation. Despite the long life of mine, topsoil viability will be preserved through appropriate handling and management, as well as through progressive rehabilitation activities.

2.11 Workforce

The site will accommodate a workforce consistent with providing the expertise and services required, including but not limited to positions relating to:

- Statutory management.
- Occupational health and safety.
- Environment.
- Administration.
- Technical services.
- Construction, mining, processing and maintenance.
- Haulage.
- Catering and janitorial.

Excluding external support services to the mine, the operational workforce is expected to consist of 160 positions. The majority of workers will be accommodated on site, with some local employment from Southern Cross on a drive-in-drive-out basis.

3. JUSTIFICATION, ALTERNATIVES AND OPTIMISATION

3.1 Justification

Development of the Project will help meet the strong global demand for lithium, which is predominantly used in battery manufacturing; a growing requirement of the renewable energy markets and electric motor vehicle industry (e.g. Tesla electric vehicles). This contributes to improving the environment by reducing dependence on fossil fuels.

The Project will be a significant source of direct and indirect employment, both during construction and in the operational phase. Indirect employment comprises flow-on employment effects from a project (essentially reflecting the demand for goods and services and the employment that must be generated to provide them). During construction, a workforce of approximately 100 personnel will be required over a 12 month period. When operations commence, an estimated 160 full-time equivalent (FTE) personnel will be employed directly with a further 16 FTE personnel required through indirect employment. Local employment and supporting local industry will assist regional towns like Kalgoorlie, Southern Cross, Esperance, Hyden and Norseman.

The Project will provide a revenue stream to the government through the payment of royalties and taxes. It has been estimated that the Western Australian government will receive more than $13 million in royalties and taxes each full year that the Project is in operation.

Implementation of the Project also provides the State of Western Australia with an opportunity to rehabilitate a proportion of the abandoned Mt Holland Mine Site. The current liability associated with the site is approximately $30 million. Implementation of the Project will result in utilisation and rehabilitation of State liability disturbances. The reduction in cost to the State resulting in utilisation and rehabilitation of disturbed areas is estimated to be in the order of $15 million.

3.2 Alternatives

A number of options and alternatives have been considered for the Project. These are summarised below:

Processing Options

Feasibility studies support a purpose-built processing plant capable of 3.0 Mtpa throughput constructed at the Project predominately within the existing disturbed plant footprint. Kidman also considered a short-term option to utilise the Poseidon Nickel Limited Lake Johnston processing facility located approximately 114 km southeast by road.

Mining Options

The ore reserve location cannot be changed and as such, the final pit footprint area is fixed. However, two different mining approaches were considered:

- Option 1: Open pit mining with progressive backfilling of the pit in combination with some external, permanent waste rock dumps.
- Option 2: Open pit mining with no progressive backfilling of the pit and all waste rock stored in external, permanent waste rock dumps.

Option 1 was considered a superior option due to its reduced impact on the environment by:

- Minimising the project footprint (and associated impacts on native vegetation and habitat)
- Minimising the area of open pit at closure.

Project Footprint

Due to a large area of the development envelope being a State liability, Kidman had two alternatives available in terms of designing the Project layout:

1. Establish infrastructure in previously undisturbed areas, thereby avoiding the current closure liability being transferred to Kidman.
2. Utilise existing State liability disturbance where possible and in doing so, take on the closure and rehabilitation liability associated with these areas.

Kidman has purposefully chosen to utilise a number of existing disturbed areas for the following reasons:

- Utilisation of existing disturbance reduces the need to clear more vegetation and consequently reduces potential impacts to flora, fauna and habitat.
- Utilisation of these areas provides a practical opportunity for Kidman to assist the State in the clean-up of abandoned mine landforms and infrastructure, thereby reducing the burden on the State by an estimated $15 million.
- Utilisation of these areas will result in an improvement in the health, safety and wellbeing of the environment, through appropriate rehabilitation of disturbances and infrastructure.

3.3 Optimisation of Land Use

The site layout has been optimised to use as much existing disturbed area as practicable. As such, the total area of new disturbance (365 ha) is significantly reduced from the total required footprint (610 ha). In addition to the benefits of maximising use of existing disturbed areas, 245 ha of historic disturbed areas used as part of the Project will be rehabilitated by Kidman upon closure. This includes disturbance areas that pose environmental risks such as the historic TSF 1, which is potentially acid forming.

The site layout has also been designed to minimise impacts to conservation significant species (notably through avoidance of threatened species *Banksia sphaerocarpa* var. *dolichostyla*, Chuditch and Malleefowl) and significant fauna habitat. Consequently, the preferred locations of certain infrastructure items have been purposefully reconfigured to minimise such impacts.

4. PRELIMINARY MINE CLOSURE AND REHABILITATION

4.1 Overview

A Mine Closure Plan (MCP) will be developed in accordance with the joint Department of Mining and Petroleum (DMP) and Environmental Protection Authority (EPA) Guidelines for Preparing Mine Closure Plans (2015). This will be submitted as part of the DMP Mining Approval process.

Specific details provided in the MCP will include the following key elements of mine closure:

- Closure specific obligations, commitments and legal requirements.
- Identification and management of key closure issues through completion of a formal risk assessment process and development of risk management measures.
- Stakeholder consultation including identification of stakeholders, future closure consultation, a stakeholder communication strategy and integration of consultation feedback into closure planning.
- Post-mining land use and closure objectives.
- Site specific and measurable completion criteria.
- Mine closure implementation plan, which includes planned and unplanned scenarios, general closure prescriptions for different disturbance types, specific closure tasks for each closure domain, a materials balance and a high level closure and rehabilitation schedule.
- Monitoring program to assess the effectiveness of closure actions.
- Description of the process and methodology undertaken to estimate the financial cost of closure for the Project.

As stated in Section 1.5, the abandoned Mt Holland Mine Site is a historic mine that was operated between 1988 and 2001 at which point 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. All disturbed areas associated with the mine site are currently a State liability. Kidman has chosen to maximise use of the existing disturbed areas as far as practical to minimise new disturbance and as an opportunity to rehabilitate some of the State liability. Areas disturbed under previous mining leases, and not to be disturbed by this proposal, will remain a State liability. Existing disturbance areas that are utilised as part of this proposal will therefore become the liability of Kidman, under the *Mining Act 1978* and the *Mining Rehabilitation Fund Act 2012*.

Accordingly, the MCP will include provisions for the areas covered under this proposal, notably:

- Earl Grey pit.
- WRD 1, 2 and 3.
- TSF option A and TSF Option B.
- Areas of the processing plant area utilised for processing and other infrastructure.
- The accommodation village.
- Airstrip.
- Supporting infrastructure (including waste water treatment facilities, landfills, water storage facilities, powerlines, pipelines, roads, explosives magazine, vegetation and topsoil stockpiles, coreyard, borrow pits, workshop and administration facilities).

Recommencement of mining at the Project provides beneficial outcomes for closure of historically disturbed areas. This is particularly relevant for areas that represent a potential risk to the environment or human health and safety such as the historic TSFs and processing plant. While the MCP will only detail areas where Kidman has a legal

obligation, should opportunities to rehabilitate other disturbances be identified that are mutually beneficial, Kidman will liaise directly with DMP to determine a program of works.

4.2 Post Mining Land Use

Mining and mineral exploration has been the principal land use in the 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 Project areas, where utilised by Kidman, as far as practicable to a natural ecosystem. While a return to a natural ecosystem is the ultimate end land use for the greater region, it is likely that further mining and mineral exploration by prospective companies will take place.

There are not considered to be any significant legacies or issues that will prevent the successful rehabilitation of the Project from meeting agreed post mining land uses. Given the long life of mine, details associated with the proposed final land use will be determined closer to the planned closure date within a revised MCP and in consultation with relevant stakeholders.

4.3 Closure Objectives and Completion Criteria

The objectives detailed in the MCP will aim to facilitate well-planned and effective mine rehabilitation, closure and decommissioning of the Project, while providing a process to:

- Enable all stakeholders to have 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 in Kidman accounts.
- 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 Kidman has met agreed closure criteria to the satisfaction of the relevant authority.

As discussed in Section 4.2, the primary aim at closure will be to return areas used by Kidman, as far as practicable, to the pre-mining land use of Vacant Crown Land that supports natural habitats and ecosystems and/or mineral exploration. 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.

Preliminary completion criteria for the Project are provided in Table 7 and have been developed to address the stated closure objectives. These completion criteria will be refined during development of the MCP and through future iterations of the MCP for the life of mine.

Table 7: Summary of Preliminary Closure Objectives

Aspect	Objectives
Safety	• Ensure access to completed mine workings is restricted. • 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	• Ensure that the long-term water quality of local and regional surface water and groundwater resources is not compromised.

Aspect	Objectives
	• Ensure soils are free of contamination. • Ensure no pollution will migrate into the surrounding environment upon closure (e.g. acidic/alkaline seepage).
Ecological Function	• To re-establish self-sustaining ecological communities on disturbed areas.
Visual Amenity	• Final landforms integrate with the natural surroundings as far as practical.
Final Land Use	• Rehabilitate disturbed areas to a state that enables sustainable post mining 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.
Regulatory Compliance	• Compliance with mine closure permitting and regulatory requirements. • Agreed closure indicators and criteria met and to the satisfaction of the relevant authority.

4.4 Management of Closure Issues

An assessment of potential closure risks for the Project will be detailed in the MCP.

Based on all available information, including historic and recent baseline studies and Project design, there are no significant closure issues that could inhibit the successful closure and rehabilitation of the Project. Key closure risks requiring consideration include:

- Management of dispersive waste rock materials and associated long term stability of waste rock landforms.
- Contaminated sites, specifically the identification of historically contaminated areas used under this Proposal that require investigation to inform rehabilitation criteria.
- Management and preservation of topsoil and other rehabilitation materials for use in progressive rehabilitation activities.
- Public safety, specifically, ensuring access to the Earl Grey pit is restricted and associated infrastructure removed.
- Materials balance, notably availability of growth medium for existing disturbed areas.

Management of these issues is described in the following subsections, with most aspects covered in the general closure prescriptions that will be applied to the Project. Specific management strategies are provided for the waste rock landforms, pit and TSF.

4.4.1 General Mine Closure Prescriptions

Closure and rehabilitation works generally involve a number of broad activities:

- Decommissioning of plant and infrastructure.
- Demolition of remaining infrastructure.
- Management of residual contamination that was not remediated during operations.
- Rehabilitation of disturbed areas, including earthworks and revegetation.

These activities are discussed below and will apply to closure of areas covered under this proposal.

Decommissioning

This phase will commence once mining and mineral processing operations cease and generally involves the following actions:

- Cleaning of all plant and equipment.

- The removal/draining of all liquids/solids/materials (i.e. clearing out of all stores, chemicals, fuels, lubricants and supplies). Any remaining chemicals and hydrocarbon inventories will be returned to the supplier or sold to a third party.
- The removal of all plant and equipment either for transfer to other sites, salvage (sale), or disposal.
- The dismantling of all salvageable infrastructure and removal to temporary salvage laydown areas.
- The demolition of all other infrastructure and removal to designated disposal sites.
- The remediation of all identified contamination sites.

Demolition

The following preliminary demolition tasks have been identified for the decommissioning phase:

- All plant and permanent structures will be dismantled or demolished and removed. Recoverable materials may be sold if a suitable market can be found at the time of decommissioning.
- All inert rubble and materials resulting from the demolition exercise will be disposed within an approved area (e.g. landfill). Liquid or hazardous wastes will be removed to appropriately licensed facilities off site.
- Where concrete foundations are not removed, these will be broken and covered with suitable material (e.g. waste rock, subsoil and topsoil).
- All surface pipelines, power cables/lines and security fences will be removed and materials will be sold or otherwise disposed in an approved area.
- Subsurface pipelines will remain if they cannot be economically salvaged, but will be appropriately drained, flushed and sealed (crimped or capped). Risers will be cut a minimum of 300 mm below the surface.
- All potentially contaminated soils are to be identified and demarcated for later remediation.

The Project facilities will only be provided to other users where formal agreement by the user to accept future liabilities is reached and where required, approval is obtained from the relevant Agencies.

Remediation

Potentially contaminated areas that remain at closure, following decommissioning and demolition, will be investigated and remediated in accordance with the *Contaminated Sites Act 2003*.

Rehabilitation

Rehabilitation is the return of disturbed land to a stable, productive and self-sustaining condition in consideration of beneficial uses of the land.

The general objective is to return, as far as practicable, all areas impacted by mining to a self-sustaining condition that is comparable to the surrounding vegetation. Rehabilitation of disturbed areas generally involves:

- Design of landforms to produce safe and stable slopes.
- Design of landforms to manage water, including construction of water management structures (e.g. crest bunds, toe drains).
- Armouring of final surfaces with competent cover material to increase surface stability.
- Replacement of available topsoil.
- Ripping to break soil compaction and increase water infiltration ability.
- Seeding/planting and fertilising as required.

Rehabilitation studies and trials will be undertaken during operations to determine the most effective methodologies for rehabilitating the different landforms used under the Project. As there are already a number of rehabilitated landforms present within the abandoned Mt Holland Mine Site, with varying degrees of rehabilitation success, these will be assessed to further refine rehabilitation designs of new landforms. Rehabilitation trials will also include propagation tests for *Banksia sphaerocarpa* var. *dolicholstyla* to aid in the species recovery.

4.4.2 Open Pit

The Earl Grey pit will be progressively backfilled and rehabilitated during operations as detailed in Section 2.5. Backfilling activities will result in a raised landform that covers approximately 50% of the entire pit footprint. The remaining 50% of the pit will remain open, with the pit waste rock landform (WRD2) benching down to the base of the pit as shown in Figure 6. An abandonment bund will be constructed around the open side of the pit, abutting against the pit waste rock landform (WRD2).

Following cessation of mining, groundwater levels will recover resulting in the formation of a permanent pit lake that will behave as a groundwater sink. It is anticipated that the water quality in the pit lake will be hypersaline, pH neutral with low concentrations of dissolved metals and nutrients.

4.4.3 Waste Rock Landforms

As detailed under Section 2.5, mining operations will produce approximately 200 million LCM of waste rock, of which 18 million LCM is oxide waste rock material and 99 million LCM is classified as transitional waste rock material. The oxide material is environmentally problematic due to its dispersive characteristics, salinity and naturally low pH, which is not favourable for vegetation growth. Management of environmentally problematic waste rock materials will be undertaken during operations. As detailed under Section 2.5, these wastes will be encapsulated using fresh, competent waste rock material (approximately 80 million LCM) including coarse gravel rejects, both of which are resistant to erosion.

The final waste rock landforms will be designed for long term stability and will be water retaining, with a top surface consisting of an inwardly draining concave profile or water embayments, subject to trials and further investigations. This will direct rainfall to the centre of the landform for storage and gradual release through infiltration and evapotranspiration processes. All waste rock landforms will have a crest bund to minimise runoff on the batters.

As part of rehabilitation earthworks, waste rock landform slopes will be battered down to a maximum gradient of 17°, covered with a material that is resistant to erosion (e.g. fresh waste rock and subsoil blend) and growth medium, before being ripped and seeded with an appropriate selection of local, native species. This will be refined during operations through rehabilitation trials and assessments.

The proposed WRD1 has significant benefits with respect to final closure and rehabilitation. As this landform will completely encapsulate the existing TSF1, the following benefits are expected:

- Reduction in oxidation rates of existing PAF tailings and subsequent release of acid mine drainage.
- Reduction in long term infiltration rates to the existing tailings thereby providing an overall reduction in seepage volumes.
- Prevention of contamination from wind blown tailings dust.
- Prevention of contamination resulting from stormwater runoff.
- Rehabilitation of an existing high risk landform.

4.4.4 Tailings Storage Facility

The selected TSF option will comprise an internally draining, store-and-release landform with the top surface draining towards the area used as the decant pond during operations. Following an adequate period of tailings consolidation and formation of a trafficable surface, Kidman will commence construction of the TSF cover. The cover will prevent the generation of airborne dust and will provide a growth medium for the establishment of native vegetation.

As detailed under Section 7.14, Project tailings are geochemically benign and do not require any specific management considerations. Due to potential evapoconcentration of salts within the tailings, the tailings cover may require a capillary break to prevent migration of salts towards the surface. This will likely comprise a layer of fresh, coarse waste rock material approximately 300mm thick. A layer of growth medium (200 – 300mm) will then be placed over the capillary break to provide a store-and-release cover suitable for revegetation of local species. The final cover design will be refined during the life of mine by undertaking rehabilitation trials and studies.

As both TSF options (TSF Option A and TSF Option B) currently under consideration by Kidman encompass existing tailings storage facilities, deposition of tailings from Earl Grey and subsequent encapsulation with a store and release cover will provide the following benefits:

- Reduction in oxidation rates of existing PAF tailings and subsequent release of acid mine drainage.
- Reduction in long term infiltration rates to the existing tailings thereby providing an overall reduction in seepage.
- Prevention of contamination from wind blown tailings dust.
- Prevention of contamination resulting from stormwater runoff from TSF2 (TSF Option A only).
- Removal of a pit void and associated risk to public safety (TSF Option B only).
- Rehabilitation of an existing high risk landform.

4.4.5 Other Project Infrastructure

Upon closure of the Project, and in the absence of any 3rd party transfer agreements (e.g. Shire), the majority of infrastructure including buildings, plant, pipelines, tanks and other structures will be decommissioned and removed from site for recycling or scrap. Any remaining structures will be demolished for burial in situ or in the pit.

As far as practicable, disturbed areas, including all historical disturbances used by Kidman, will be reprofiled to blend in with the surrounding ground levels and to reinstate natural drainage. These areas will then be ripped to reduce compaction and increase infiltration, before being seeded with local native vegetation species, as required.

Access will be prohibited by rehabilitating all access tracks to the site except for the main entrance. Access via this entrance will be prevented via locked gates. A combination of bunds, gates and signs will also be used to minimise unauthorised access.

4.4.6 Rehabilitation Materials Balance

Due to the large areas of historic disturbance at the abandoned Mt Holland Mine Site, ensuring adequate materials are available to complete rehabilitation works is an important part of mine closure planning. Based on observations to date, soils suitable for use as a growth medium are plentiful in the Project area. Numerous miscellaneous stockpiles of topsoil and subsoil material are located throughout the development envelope. 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 with additional material won from the surface excavation of the pit. Allowance has been made in the proposed footprint for storage of growth medium and vegetation.

A rehabilitation materials balance will be developed for the Project and detailed within the MCP.

5. STAKEHOLDER ENGAGEMENT

5.1 Key Stakeholders

Kidman has commenced an extensive consultation process with key stakeholders, including:

- State government.
- Federal government.
- Local government.
- Non-government organisations and interest groups.

A comprehensive list of key stakeholders is provided in Table 8.

Table 8: Key Stakeholders

Stakeholder Group	Stakeholder	Key Interests
State Government	Office of the Environmental Protection Authority (OEPA).	• Administration of the *Environmental Protection Act 1986* (EP Act). • Part IV (EP Act) Environmental Impact Assessments.
	Department of Mines and Petroleum (DMP).	• *Administration of the Mining Act 1978* (Mining Act). • Tenement conditions. • Mining proposals and programs of work. • Mining Rehabilitation Fund (MRF). • Closure and rehabilitation. • Safety.
	Department of Parks and Wildlife (DPaW).	• Administration of the *Wildlife Conservation Act 1950* (WC Act). • Flora, fauna and habitat conservation.
	Department of Aboriginal Affairs (DAA).	• Native title and indigenous requirements. • Heritage sites.
	Department of Fire and Emergency Services (DFES).	• Emergency services. • Fire breaks. • Fire reduction.
	Main Roads Western Australia (MRWA).	• Use of public roads.
Federal Government	Department of the Environment and Energy (DoEE).	• Administration of the *Environmental Protection and Biodiversity Conservation Act 1999* (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.

5.2 Stakeholder Engagement Process

Stakeholder engagement with State Departments and Local Government Authorities commenced in late 2016. Kidman has since developed and implemented an external stakeholder consultation strategy for ongoing social engagement and community investment.

The stakeholder consultation strategy has adopted the principles from the Ministerial Council on Mineral and Petroleum Resources (MCMPR) *Principles for Engagement with Communities and Stakeholders* (2005). This includes:

- Open and effective communication:
  - Two-way communication.
  - Clear, accurate and relevant information.
  - Timeliness.
- Transparency, requiring a process for communication and feedback.
- Collaboration, working cooperatively to seek mutually beneficial outcomes.
- Inclusiveness, with the aim of recognising, understanding and involving stakeholders early and throughout the process.
- Integrity, with engagement undertaken in a manner that fosters mutual respect and trust.

The outcomes of the consultation strategy are recorded in the Kidman Stakeholder Consultation Register. Consultation to date has comprised predominately of meetings and correspondence with a number of State and Federal Departments and Agencies, Local Government Authorities, Traditional Owners and non-government organisations and interest groups.

Kidman is committed to ongoing stakeholder identification, communication, engagement and consultation through the planning and approval phase, and through to construction, operational and closure phases of the Project.

5.3 Stakeholder Consultation

Ongoing stakeholder consultation has been underway since late 2016. Key engagement to date is summarised in Table 9.

Table 9: Summary of Key Stakeholder Consultation

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of Mines and Petroleum (DMP)	16/02/2017	Meeting	**DMP**: 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 DMP, focusing on proposed operations, environmental setting, baseline study results, presence of Chuditch, Malleefowl and threatened flora, opportunities for rehabilitation of abandoned mine site.	DMP commented on the potential positive outcomes associated with rehabilitation of historic disturbances. DMP suggested a pre-referral meeting be held with the Office of the Environmental Protection Authority to discuss conservation significant species.
Office of the Environmental Protection Authority (OEPA) and DMP	9/03/2017	Meeting	**OEPA**: Robert Hughes (Manager, Mining and Industrial South Branch) Helen Butterworth (Acting Principal Environmental Officer, Mining and Industrial South Branch). **DMP**: 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 OEPA 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. DMP reaffirmed that any Mining Proposal would be referred to DPaW and/or the OEPA for advice due to the presence of conservation significant species.
DPaW – Environmental Management Branch	9/03/2017	Phone Call	**Kidman**: Siobhan Pelliccia (Blueprint) to **DPaW:** Daniel Coffey.	Informed DPaW of meeting with the OEPA and DMP and requested a meeting to discuss the conservation significant species in the Project area.	DPaW communicated that although the Project was of interest, DPaW could not meet with proponents unless their project was located in DPaW managed land, or a formal request was made by DMP or the OEPA 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 OEPA) 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
Shire of Kondinin	28/03/2017	Meeting	**Shire:** John Read (CEO) and Mark Burges (Manager of Works) **Kidman:** Kevin Dockery (Project Manager)	Overview of the Project and in particular use of Shire roads and maintenance thereof. Opportunities for local employment and use of local services.	Shire road maintenance agreements to be implemented.
Shire of Yilgarn	29/03/2017	Meeting	**Shire:** Brian Jones (CEO) and Robert Bosenberg (Manager of Works) **Kidman:** Kevin Dockery	Overview of the Project and in particular use of Shire roads and maintenance thereof. Opportunities for local employment and use of local services.	Liaison with Shire of Yilgarn Regulatory Services was discussed in relation to Kidman ensuring compliance with current building codes and health regulations for buildings installed on site including construction of the accommodation village. Shire road maintenance agreements to be implemented.
DPAW – Western Shield Group	5/05/2017	Meeting	**DPAW**: 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.

6. STATUTORY FRAMEWORK

6.1 Summary

Mining operations in Western Australia trigger a number of statutory permitting and reporting obligations under both State and Commonwealth legislation that relate to environment and heritage. A summary of proposal activities and associated key regulatory approval requirements are listed in Table 10 with further detail provided in the following sub-sections.

Table 10: Key Legislation and Approvals

Proposed Activities	Type of Approval	Responsible Government Agency	Legislation
Impacts to Matters of National Significance	Referral of a Proposal. If "Controlled Action", approval type to be determined.	Department of the Environment and Energy	*Environment Protection and Biodiversity Conservation Act 1999*
Significant Impacts to the Environment	Section 38 Referral If assessment required, approval type to be determined.	Office of the Environmental Protection Authority	*Environmental Protection Act 1986*
Clearing of Native Vegetation	Native Vegetation Clearing Permit	Department of Mines and Petroleum	*Environmental Protection Act 1986*
Disturbance to Declared Rare Flora	Application for A Permit To Take Declared Rare Flora In A Non-Departmental Management Operation	Department of Parks and Wildlife	*Wildlife Conservation Act 1950* *Biodiversity Conservation Act 2016*
Prescribed Premises Activities (e.g. processing, disposal of waste, power generation, tailings disposal, sewerage disposal)	Works Approval and Licence	Department of Environment Regulation	*Environmental Protection Act 1986*
Mining and associated activities (e.g. processing, waste stockpiling, tailings storage)	Mining Proposal and Mine Closure Plan	Department of Mines and Petroleum with input from the Department of Parks and Wildlife	*Mining Act 19878*
Mine Dewatering Construction of bores Groundwater Abstraction	5C Licence application to take groundwater 26D Licence application to construct groundwater wells.	Department of Water	*Rights in Water and Irrigation Act 1914*

6.2 Commonwealth Legislation

6.2.1 Environment Protection and Biodiversity Conservation Act 1999

Commonwealth approval under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* is required if matters of national significance, as defined in the EPBC Act, are triggered. The Department of the Environment and Energy (DoEE) is responsible for administering the Act. Matters of national significance include presence of migratory birds, federally listed rare flora or fauna, Commonwealth land, nuclear actions and marine areas. A referral can be made by a Project proponent or any other person aware of the project.

Due to the presence of Chuditch (*Dasyurus geoffroii*) Malleefowl (*Leipoa ocellata*) and *Banksia sphaerocarpa var. dolichostyla* in the development envelope, which are protected species under the EPBC Act, referral of the Project was deemed necessary. This supporting document to the referral provides a detailed description of the species distribution, associated habitat, management and mitigation measures and residual impacts, to assist in DoEE's assessment.

Should the DoEE determine the Project to be a controlled action, Kidman proposes that the Project be assessed under the Native Vegetation Clearing Permit (NVCP) process, which is an accredited process under the Bilateral Agreement between the Commonwealth of Australia and the State of Western Australia. The NVCP process is considered an appropriate process for this Project for the following reasons:

- Environmental issues associated with the Project relate to terrestrial flora, fauna and habitat, which are the key focus areas of a NVCP assessment.
- There are no other significant environmental or social issues associated with the Project.
- The NVCP includes a 20 day public review and submissions period and a 20 day public appeals period.

A referral under the EPBC Act is scheduled for May 2017.

6.2.2 Native Title Act

The *Native Title Act 1993* provides a national system for the recognition and protection of native title and for its co-existence with the national land management system. There are currently no native title claims associated with the development envelope.

6.3 Western Australian Legislation

6.3.1 Environmental Protection Act 1986

Part IV – Environmental Impact Assessment

Part IV of the *Environmental Protection Act 1986* (EP Act) provides for the referral and environmental impact assessment of proposals that are likely, if implemented, to have a significant impact on the environment. In 2016, new administrative procedures were released that establish the practices of environmental impact assessment under Part IV Divisions 1 and 2 of the Act.

There are five stages set out in the administrative procedures:

- Stage 1: Referral of a proposal:
- Stage 2: EPA to decide whether or not to assess a referred proposal, comprising:
  - Decision not to assess - Where the EPA determines that the likely effect of the proposal on the environment is not so significant as to warrant assessment. The EPA may also provide advice and make recommendations on environmental aspects of the proposal.

  - Decision to assess based on information provided in the referral. This may occur when adequate detail is provided in the referral to allow the EPA to complete their assessment.
  - Decision to assess as an Environmental Review (without public review period).
  - Decision to assess as an Environmental Review (with public review period).
- Stage 3: Assessment of Proposals.
- Stage 4: EPA report on the assessment of a proposal.
- Stage 5: Decision on a proposal and implementation of proposals.

Due to the presence of Chuditch (*Dasyurus geoffroii*) Malleefowl (*Leipoa ocellata*) and *Banksia sphaerocarpa* var. *dolichostyla* in the development envelope, which are conservation significant species under the *Wildlife Conservation Act 1950*, referral of the Project to the EPA was deemed necessary. This supporting document to the referral provides detailed information about the Project and its impacts to assist the EPA in their assessment.

Part V – Native Vegetation Clearing Permit

Part V (Section 51) of the EP Act specifies that clearing of native vegetation in Western Australia requires a permit. The clearing provisions of this Act are described in the *Environmental Protection Amendment Act 2003* (Western Australia) and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*.

All clearing associated with the Project will require a clearing permit, unless the Project is assessed and approved through Part IV of the Act.

The NVCP process requires assessment of the 10 clearing principles, which comprise:

- Biodiversity Significance:
  - Native vegetation should not be cleared if it comprises a high level of biological diversity.
  - Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.
  - Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.
  - Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.
  - Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.
  - Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- Land Degradation:
  - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- Conservation Estate:
  - Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area
- Ground and Surface Water Quality
  - Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.
  - Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence of flooding.

As previously stated, the NVCP process is an accredited process under the Bilateral Agreement between the Commonwealth and the State of Western Australia.

Part V – Prescribed Premises, Works Approval and Licences

Part V (Section 52) of the Act establishes a range of statutory instruments to permit the assessment and management of environmental outcomes arising from emissions from industry by the Department of Environment Regulation (DER). A works approval authorises work to be undertaken on Prescribed Premises which is likely to cause, increase, alter or result in a discharge of waste, emission of noise, odour or electromagnetic radiation to the environment. The works approval process involves the assessment of the environmental performance of proposed works and the acceptability of potential emissions from those proposed works. Prescribed Premise categories are defined in Schedule 1 of the *Environmental Protection Regulations 1987* and include processing or beneficiation of metals or non-metallic ore, mine dewatering, waste water disposal, solid waste landfill and power generation. Operations that trigger a Prescribed Premises category require a Works Approval and Environmental Licence for construction and operation.

The Project will trigger a works approval and licence for processing, waste disposal to landfills, sewage disposal, dewatering and power generation.

6.3.2 Wildlife Conservation Act

In December 2016, several parts of the new *Biodiversity Conservation Act 2016* were proclaimed. The *Biodiversity Conservation Act 2016* is ultimately intended to replace the *Wildlife Conservation Act 1950*. At the time of compiling this report, the *Biodiversity Conservation Act 2016* does not fully replace the *Wildlife Conservation Act 1950*. Flora, threatened species listings and controls over the taking and keeping of native species, are still covered under the *Wildlife Conservation Act 1950*. Where reference is made to the *Wildlife Conservation Act 1950*, this also includes the *Biodiversity Conservation Act 2016*.

Flora within Western Australia that is considered to be under threat may be classed as either threatened flora or priority flora. Where flora has been gazetted as threatened flora under the *Wildlife Conservation Act 1950*, it is an offence "to take" such flora without the written consent of the Minister. The *Wildlife Conservation Act 1950* states that "to take" flora includes to gather, pluck, cut, pull up, destroy, dig up, remove or injure the flora or to cause or permit the same to be done by any means. This applies to *Banksia sphaerocarpa var. dolichostyla,* which occurs in the development envelope and is registered as threatened under the Act.

The Act also lists fauna species under a set of Schedules, as follows:

- Schedule 1: Fauna that is rare or likely to become extinct (critically endangered fauna)
- Schedule 2: Fauna that is rare or likely to become extinct (endangered fauna)
- Schedule 3: Fauna that is rare or likely to become extinct (vulnerable fauna)
- Schedule 4: Fauna presumed to be extinct
- Schedule 5: Migratory birds protected under an international agreement
- Schedule 6: Fauna that is of special conservation need (conservation dependent fauna)
- Schedule 7: Other specially protected fauna

Of note, the Chuditch and Malleefowl, which were recorded in the development envelope, are listed under Schedule 3 (Vulnerable fauna) under the Act (see Section 7.10.4).

6.3.3 Mining Act 1978

Before commencement of any mining operation, the proponent is required, under the provisions of the *Mining Act 1978*, to submit a Mining Proposal to the DMP. The Mining Proposal sets out the proposed operation, environmental conditions, impacts and management measures. The Mining Proposal must also be accompanied by a Mine Closure Plan.

Where the Mining Proposal includes environmental aspects that do not fall under the jurisdiction of DMP (for example, threatened flora, fauna or conservation reserves), DMP can refer the Mining Proposal on to the Department of Parks and Wildlife for review and comment.

Following assessment of the Mining Proposal by DMP, a number of conditions will be imposed on the relevant tenements. All environmental commitments made in a Mining Proposal become legally binding obligations once the Mining Proposal is imposed as a tenement condition.

A Mining Proposal submitted by Convergent Minerals Limited was approved by DMP in 2015 and included reuse of the processing plant, TSF3, accommodation village, landfill and other supporting infrastructure. The Mining Proposal was never implemented. This proposal presents a significantly different operation to the 2015 Mining Proposal and will therefore require submission of a new Mining Proposal and Mine Closure Plan to DMP. The Mining Proposal will be prepared in accordance with the 2016 DMP guidelines.

6.3.4 Rights in Water and Irrigation Act 1914

Groundwater Licences are required to construct groundwater wells and abstract groundwater for dewatering and water supply purposes. These are issued by the Department of Water under the provisions of the *Rights in Water and Irrigation Act* 1914 and are subject to conditions which may stipulate maximum annual abstraction volumes, monitoring requirements and reporting requirements.

A groundwater licence was approved for the Project in 2015 for an annual water entitlement of 630,000 kL. The Project will require an amendment to this groundwater licence to increase the annual water entitlement to 1.0 GL to meet the Project water demands.

6.3.5 Aboriginal Heritage Act

The *Aboriginal Heritage Act 1972* makes provision for "the preservation on behalf of the community of places and objects customarily used by or traditional to the original inhabitants of Australia or their descendants, or associated therewith, and for other purposes incidental thereto". The heritage values of any given area are usually assessed in consultation with the Traditional Owners associated with that area. The outcome of surveys may require the submission of an application to the Aboriginal Cultural Materials Committee (ACMC) under Section 18 of the Act. The ACMC determines whether disturbance of a particular site is permissible but no approvals can be issued until the outcome of any related process under Part IV of the EP Act is known.

There no registered Aboriginal heritage sites in the Project area (see Section 7.15.2).

7. EXISTING ENVIRONMENT

7.1 Studies and Investigations

A significant number of baseline studies have been undertaken in the Project area since the 1990s and the environmental setting is well understood. Studies undertaken specifically for the Earl Grey Lithium Project are listed in Table 11.

Table 11: Studies and Investigations

Factor	Description	Consultant
Soils	Physical and chemical analysis of soils representative of those likely to be disturbed	MBS Environmental
Waste Rock and Tailings	Physical and chemical analysis of waste types representative of those likely to be mined	MBS Environmental
Flora and Vegetation	Flora and vegetation assessment	Mattiske Consulting, Native Vegetation Solutions, Goldfields Landcare Services
Fauna and Habitat	Detailed fauna and habitat assessment Regional habitat and camera trap assessment	Western Wildlife
Groundwater	Hydrogeological assessment – dewatering, water supply and water balance	Groundwater Resource Management
Surface Water	Desktop hydrology characterisation supported by high resolution aerial imagery and digital elevation model	Blueprint Environmental Strategies
Invertebrate Fauna	Desktop assessment due to low likelihood of suitable habitat	Bennelongia Environmental Consultants
Heritage	Desktop review of existing reports and database search	Blueprint Environmental Strategies
Waste Rock Balance	Study to determine waste rock management requirements and pit backfilling options.	Mining Plus

7.2 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.

7.3 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.

7.4 Geology

7.4.1 Regional Geology

The Project is located in the Mt Holland Gold Field, which covers southern sections of the Archaean Southern Cross – Forrestania Greenstone Belt (Figure 7). 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.

7.4.2 Local Geology

The Earl Grey pegmatite was emplaced into the mafic and ultramafic lithologies of the Mid-Eastern ultramafic belt in the central Forrestania greenstone belt.

The Mid-Eastern ultramafic belt is overlain to the west by a porphyroblastic garnet-actinolite schist, presumed to be a deformed basal unit of the upper sedimentary succession. The contact between the upper and lower successions appears to be at least partly structural, and has historically been interpreted as a major regional shear zone.

The weathering zone around the Earl Grey pegmatite is around 30-40m deep, with few instances of outcrop or subcrop in the area. The area is mostly covered by a thin (up to 5m) veneer of laterite which is underlain by a 10-15m deep elluvial zone of pallid grey to mottled clay material. The regolith becomes increasingly iron-rich toward the base of the weathering profile, with ferric induration common.

The Earl Grey pegmatite consists of a relatively simple 25-90 m thick flat-lying body flanked by several narrower and less continuous hangingwall and footwall apophyses up to 25 m thick. The pegmatites show an overall west-southwest strike and a 5-15º dip, however the attitude of the bodies varies locally along strike and down-dip. Both the main pegmatite body and its apophyses have several apparent reversals in the dip-direction along strike, likely indicating the bodies have been gently folded post-emplacement.

The main pegmatite body is bound to the west by an apparent north-south striking shear which defines the boundary between the ultramafic and sedimentary belts. The timing of movement along the shear in relation to pegmatite emplacement is currently unclear, and several narrow 1-6m pegmatite sills have been observed to cross-cut the metasedimentary biotite-garnet schist where intersected 3 km down-dip of the surface expression. The eastern margin of the pegmatite is currently undefined, and the main body appears to split into several narrower, weakly mineralised bodies. The relationship of eastern Earl Grey pegmatite zone with the Bounty North pegmatite, located approximately 1.7 km directly to the east, is unclear. The pegmatite remains open at depth but is truncated to the south by the east-west trending Binneringie dolerite dyke.

There is a clear thickening of the main pegmatite body as it approaches the western shear contact, where it averages 70 m in width and has a maximum known thickness of 90 m. The pegmatite thins to around 50 m in average thickness through the central zone before splitting into several bodies that average 25m thickness in the eastern extent of the deposit.

Faulting within the pegmatite has been observed in diamond drill core, however no major offsets have been definitively observed.

A cross-section of the Earl Grey deposit is shown in Figure 8.

Figure 7: Regional Geology

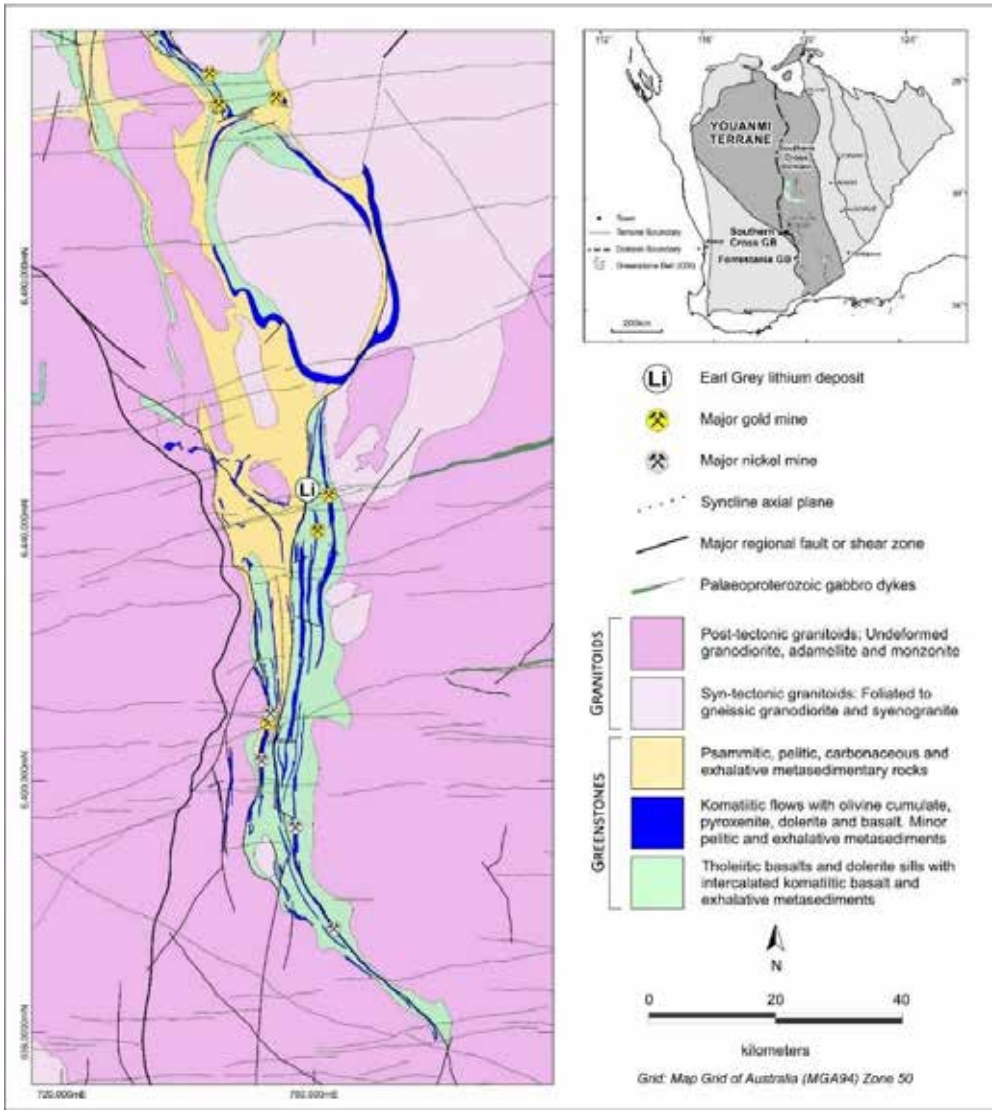
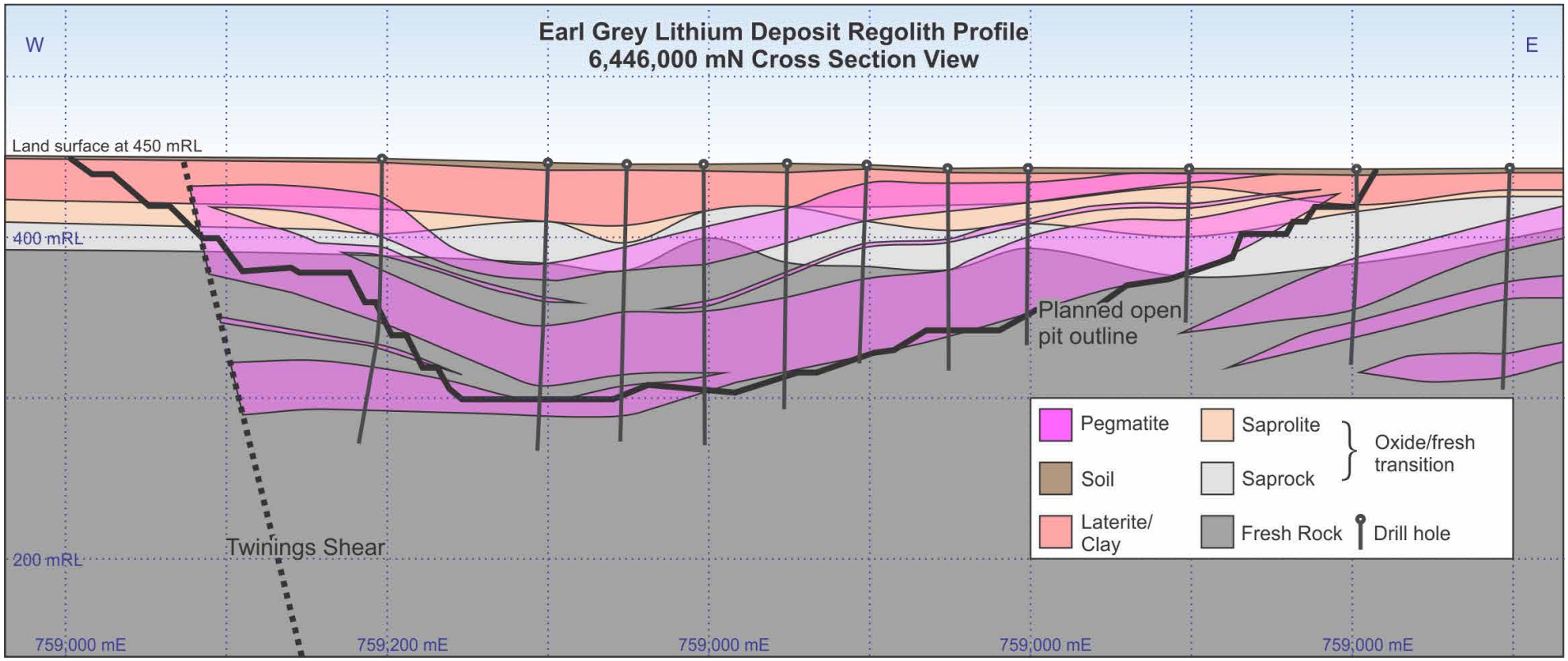


Figure 8: Long-Section of the Earl Grey Deposit



7.5 Soils

A soil assessment was undertaken by MBS Environmental in 2017 (see Appendix 4). The assessment included the collection and analysis of different soil types (depths, locations) within the Earl Grey Lithium Project areas. 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.

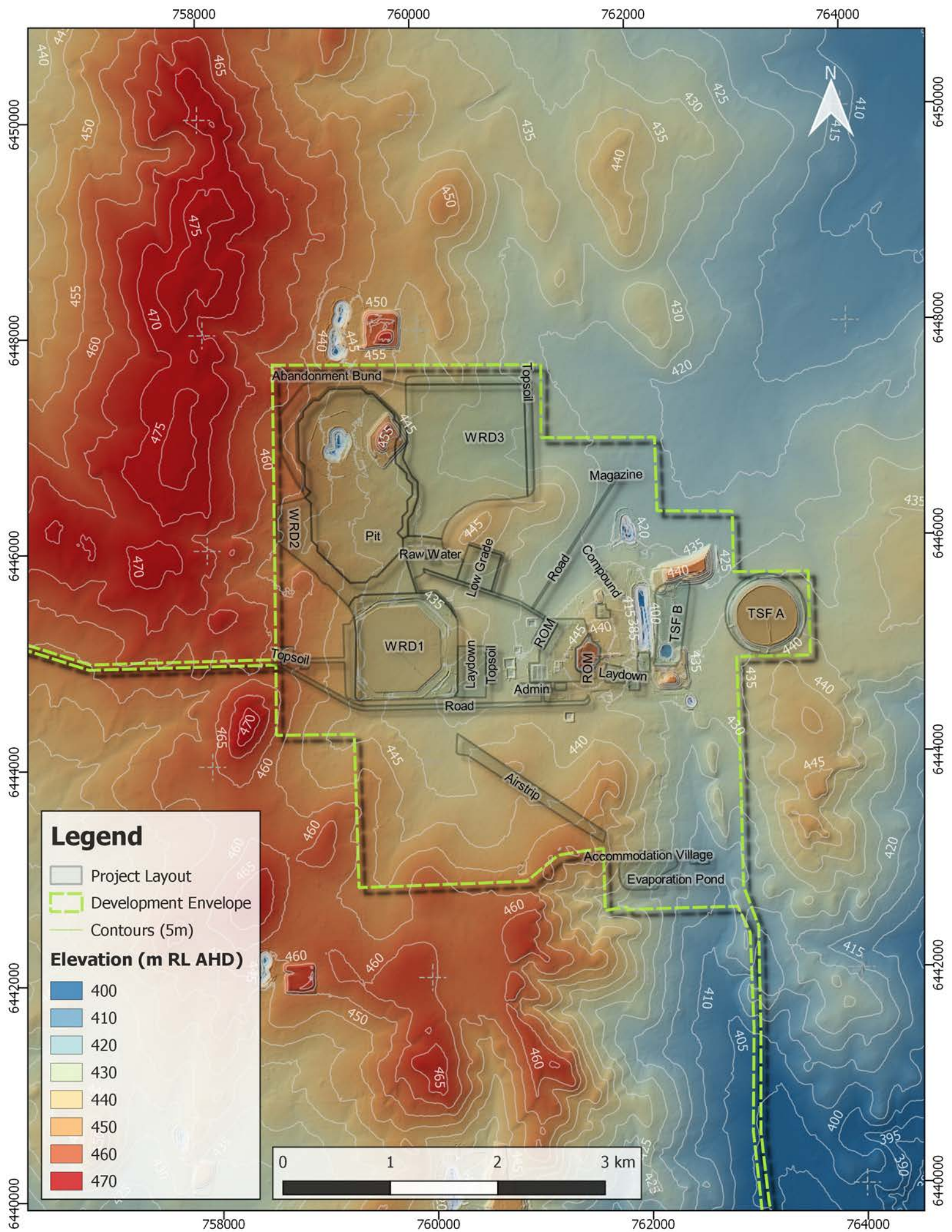
The gravelly subsoil material from the duplex sandy gravel soil type is not considered a highly valued rehabilitation material by virtue of very high acidity and a lack of coarse gravel, however it could be used as a gravelly construction material (e.g. road base or construction of the ROM pad and bunds).

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 2017a).

7.6 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 2017a).

Locally, there are no distinct, recognisable natural landforms in the Project area or surrounds. Topography within the development envelope 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 development envelope 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 development envelope 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. Topography, elevations and landforms are shown in Figure 9.



Scale: 50,000 Original Size: A4 Imagery Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 9** **Topography, Elevations & Landforms**	KIDMAN RESOURCES

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7.7 Hydrogeology

7.7.1 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. Typically the limited exposure of granite indicates there is limited recharge potential and consequently the supply is not considered sustainable as a project supply. No fresh water supplies have been identified near the Project area.

7.7.2 Earl Grey Hydrogeological Setting

An initial hydrogeological investigation was undertaken by Groundwater Resource Management in early 2017 and further investigations are underway. The initial investigation was focussed around the proposed Earl Grey pit footprint using 14 reverse circulation drill holes that extend to the base of the Earl Grey deposit. Test work included airlift yield and recovery testing, permeability estimation as well as groundwater sampling and laboratory analysis. The aim of the initial investigation was to identify the likely range of dewatering volumes during mining as well as the pit groundwater quality. The investigation found that:

- The water table is relatively deep, ranging from 58 to 70m below ground level.
- Low permeability conditions are generally present across the proposed pit footprint.
- Airlift yields were very low, ranging from 0.2 to 4.0 L/s, with two holes found to be dry.
- The northern half of the pit has higher yields than the southern half.
- Permeability estimates ranged between 6 x 10^{-3} and 0.02 metres/day.

Groundwater quality was found to have the following attributes:

- Circum-neutral to slightly acidic, with pH values varying between 6.1 and 6.8.
- Saline to hypersaline, with total dissolved solids (TDS) varying between approximately 17,000 mg/L and 120,000 mg/L.
- Relatively consistent with respect to major ion composition, with sodium and chloride as the dominant ions. Bicarbonate, calcium and magnesium are also present in elevated concentrations and the water is therefore classified as very hard.

- Slightly elevated concentrations of some metals and metalloids including arsenic, cadmium and copper. All values were well below livestock drinking water guidelines (ANZECC 2000) and are not of environmental significance.

7.7.3 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).

7.7.4 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).

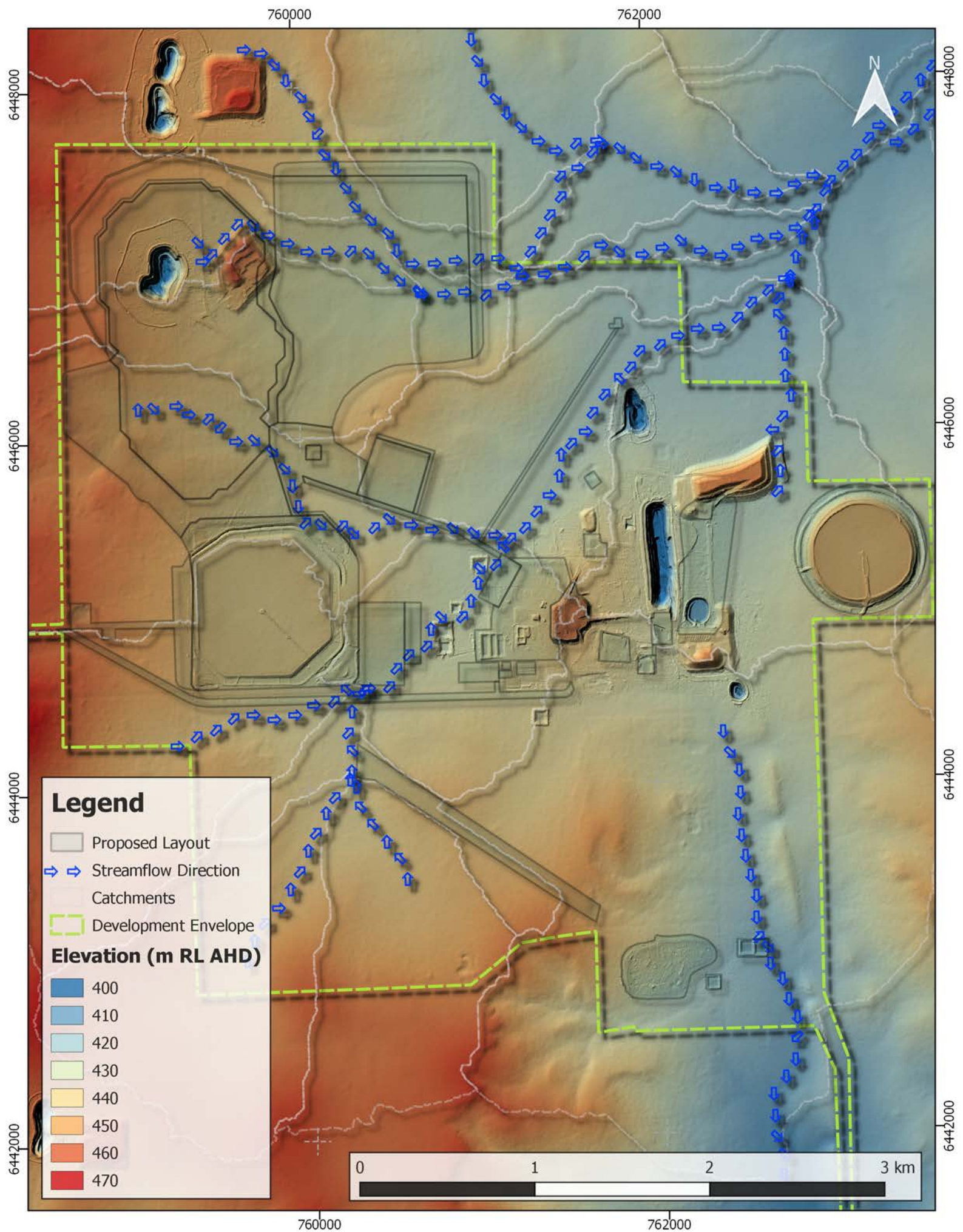
The caprock aquifer is highly anisotropic, with permeability being controlled by the scale and extent of fracturing, weathering and alteration. Test pumping data suggests that aquifer conditions range from semi-unconfined with delayed yield to semi-confined with leakage effects, subject to local conditions. 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).

7.8 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 km^2 within the 58,000 km^2 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. Local catchments and drainage directions are shown in Figure 10.



Scale: 31,000 Original Size: A4 Imagery Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 10** **Local Hydrology**	KIDMAN RESOURCES

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7.9 Flora and Vegetation

7.9.1 Studies

Several assessments of flora and vegetation in the vicinity of the development envelope have been completed. The most recent surveys are listed in Table 12. The study areas are presented in Figure 11 and include:

- Areas within the development envelope, including the Earl Grey prospect, Irish Breakfast prospect and targeted searches of proposed infrastructure areas.
- Areas outside of the development envelope, including the Van Uden prospect and Prince of Wales prospect.

Table 12: Flora and Vegetation Studies

Reference	Description
Native Vegetation Solutions (2014).	• Native Vegetation Solutions (NVS) conducted targeted searches for *Banksia sphaerocarpa* var. *dolichostyla* around existing infrastructure areas (including roads, the historic camp, landfill and airstrip) of the Project.
Native Vegetation Solutions (2016).	• In September 2016, Native Vegetation Solutions conducted targeted searches for *Banksia sphaerocarpa var. dolichostyla* within proposed exploration areas of the Earl Grey deposit.
Mattiske Consulting Pty Ltd (2017).	• The assessment of the flora and vegetation of the Earl Grey, Irish Breakfast and Prince of Wales prospects 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. All vegetation survey quadrats measured 20 m x 20 m in size.
Blueprint Environmental Strategies (2017).	• In April 2017, Goldfields Landcare Services conducted targeted searches for *Banksia sphaerocarpa* var. *dolichostyla* within proposed landform and infrastructure areas of the Project.

The flora and vegetation assessment completed by Mattiske (2017) is provided in Appendix 5. The results of targeted threatened flora searches are summarised in a report prepared by Blueprint Environmental Strategies (2017), provided as Appendix 6. The results, where relevant to this proposal, are discussed in the following sections.

7.9.2 Flora

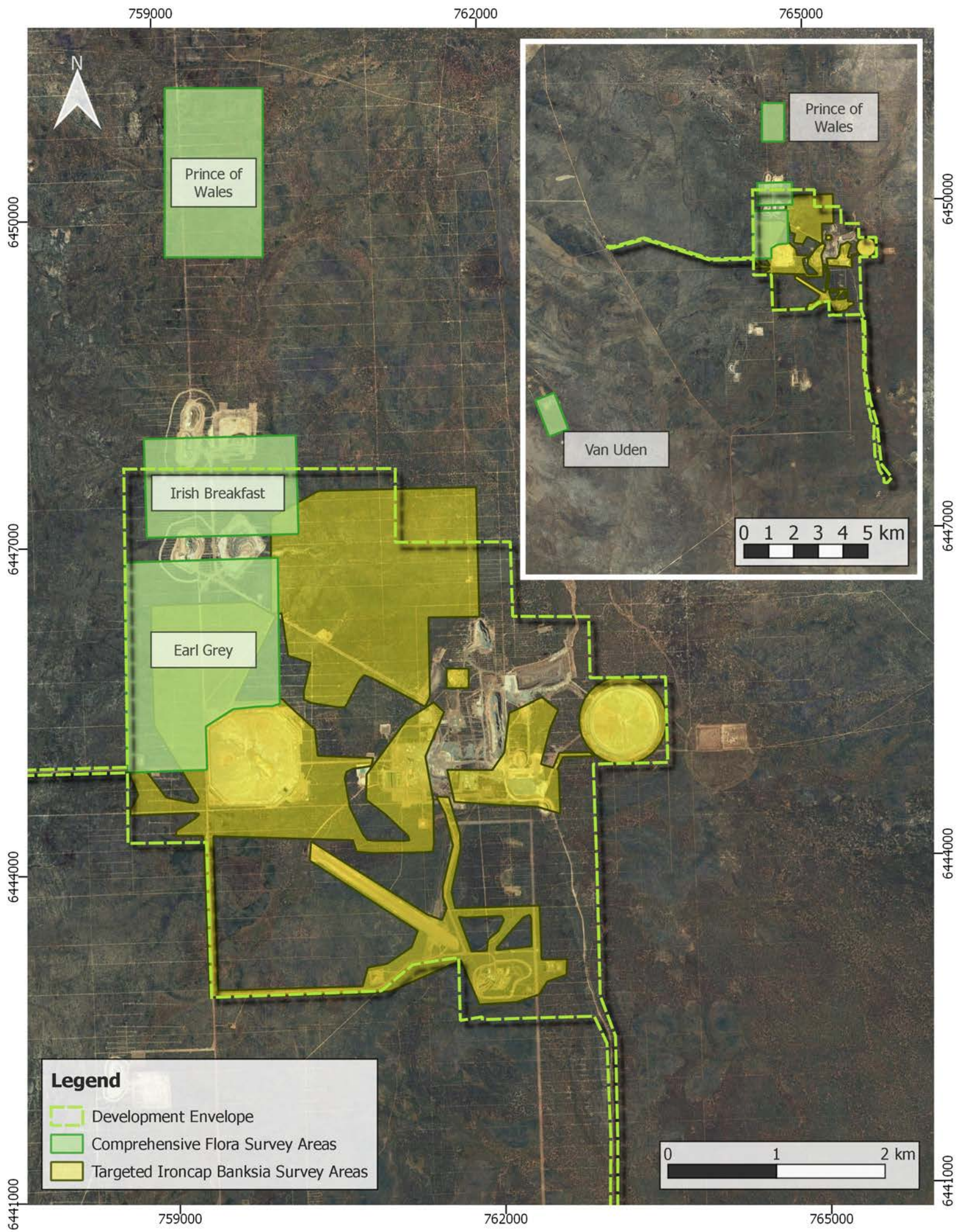
A total of 720 plant taxa were identified in the desktop assessment as having the potential to occur within the study area. These 720 taxa are representative of 62 families and 205 genera. The most commonly represented families were the Myrtaceae (158 taxa), Fabaceae (119 taxa), Proteaceae (69 taxa), Orchidaceae (32 taxa) and Asteraceae (30 taxa). The most commonly represented genera were Acacia and Eucalyptus (both 65 taxa), Melaleuca (39 taxa), and Grevillea (25 taxa).

A total of 184 vascular plant taxa which are representative of 86 genera and 35 families were recorded by Mattiske (2017). The majority of taxa recorded were representative of the Myrtaceae (46 taxa), Fabaceae (30 taxa), and Proteaceae (19 taxa) families. Species which were classified as strictly annual represented 9.9 % of all taxa recorded.

7.9.3 Vegetation Communities

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

Thirteen vegetation communities were defined by Mattiske (2017) in the 2016 survey. Of these, eight communities were identified in the development envelope, as listed in Table 13. Vegetation communities were not mapped in the following areas: WRD3, TSF Option B, the contractor's laydown, administration block and a section of the processing plant area. These areas were searched for threatened flora species, *Banksia sphaerocarpa* var. *dolichostyla* and comprehensive vegetation mapping will be completed in June to August 2017.



Scale: 50,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 11** **Flora Survey Areas**	KIDMAN RESOURCES

Table 13: Vegetation Communities in the Earl Grey Deposit Area

Code	Description
Woodlands	
W2	*Eucalyptus salubris, Eucalyptus flocktoniae subsp. flocktoniae low woodland over Melaleuca pauperiflora subsp. fastigiata, Melaleuca halmaturorum, Daviesia argillacea mid open shrubland over Microcybe ambigua low sparse heathland on pale orange clayey sand flats.*
Mallee Woodlands	
MW5	*Eucalyptus burracoppinensis*, *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Callitris canescens* low open mallee woodland over *Banksia purdieana*, *Beaufortia orbifolia*, *Allocasuarina spinosissima* mid open shrubland over *Gompholobium hendersonii*, *Goodenia pinifolia* low isolated shrubs on yellow-brown clay loam on flats.
MW6	*Eucalyptus burracoppinensis*, *Eucalyptus eremophila* mid open mallee woodland over *Thryptomene kochii, Melaleuca laxiflora, Acacia acuminata* mid open shrubland over *Drummondita hassellii, Microcybe ambigua* low sparse heathland on grey-brown to orange-brown clay to clay sand, often with scattered ironstone pebbles on flats.
MW7	*Eucalyptus capillosa* subsp. *polyclada, Eucalyptus eremophila* mid open mallee woodland over *Allocasuarina acutivalvis* subsp. *acutivalvis*, *Hakea subsulcata, Melaleuca hamata* mid-tall sparse shrubland over *Hibbertia exasperata, Phebalium megaphyllum* low sparse shrubland on orange-brown to brown clay to loamy clay, with occasional ironstone pebbles, on flats and slopes.
MW8	*Eucalyptus eremophila* mid 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.
MW9	*Eucalyptus rigidula*, *Eucalyptus capillosa* subsp. *capillosa* mid mallee woodland over *Melaleuca acuminata* subsp. *acuminata*, *Melaleuca hamata, Melaleuca laxiflora* mid open shrubland over *Grevillea acuaria*, *Cryptandra minutifolia* subsp. *brevistyla, Dodonaea bursariifolia* low sparse heathland on brown to red-brown clay loam soils on flats and lower slopes.
MW10	*Eucalyptus rigidula, Eucalyptus eremophila, Eucalyptus flocktoniae* subsp. *flocktoniae* mid mallee woodland over *Melaleuca laxiflora, Melaleuca lateriflora, Melaleuca hamata* mid open shrubland over *Daviesia argillacea, Acacia hystrix* subsp. *hystrix*, *Grevillea acuaria* low sparse heathland on yellow to pale orange-brown clay sands with occasional scattered ironstone pebbles on flats.
MW11	*Eucalyptus eremophila, Eucalyptus incrassata, Eucalyptus prolixa* mid mallee woodland over *Melaleuca halmaturorum, Melaleuca lateriflora, Melaleuca hamata* mid sparse shrubland over *Daviesia scoparia*, *Acacia mackeyana* low sparse heathland on grey-brown to orange-brown clay and clay sands on flats and slopes.

The dominant vegetation communities (MW6, MW10 and MW11) accounted for 55% of all the survey quadrats. *Eucalyptus eremophil*a was a common species in all three communities, with *Eucalyptus burracoppinensis* forming a dominant component of community MW6, *Eucalyptus flocktoniae subsp. flocktoniae* in community MW10 and *Eucalyptus incrassate* and *Eucalyptus prolixa* being co-dominant in community MW11.

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.

None of the vegetation communities defined within the study area are classified as unique or restricted in the region. There is a considerable degree of disturbance in the development envelope, in terms of pits, waste dumps, access tracks and drill tracks, particularly form past mining and exploration activities.

The development envelope is situated wholly within the buffer of the 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. Whilst the above listed community types are not necessarily the only vegetation types which would be associated with the Ironcap Hills Vegetation Complexes, the absence of any of the listed communities, and associated landforms, together with the peripheral location of the Project with respect to the PEC buffer, would support the proposition that the Project area is not of consequence in relation to the Ironcap Hills PEC.

7.9.4 Groundwater Dependent Ecosystems

Groundwater in the vicinity of the Earl Grey deposit is approximately 60 to 70 m below surface, whilst groundwater associated with the borefield occurs at approximately 10 m below surface. All water in the Project area is saline to hypersaline and is unlikely to support groundwater dependent ecosystems.

7.9.5 Conservation Significant Species

A number of conservation significant taxa have been recorded in the development envelope (Mattiske 2017, Blueprint 2017). The species are listed in Table 14 and shown in Figure 12.

Table 14: Conservation Significant Flora Species Recorded in the Development Envelope

Species	Conservation Status		Records in 2014-2017 Surveys
	WC Act/DPaW Priority List	EPBC Act	
Banksia sphaerocarpa var. *dolichostyla*	Threatened	Vulnerable	521 records from within the development envelope. All infrastructure has been located to avoid this species.
Eutaxia lasiocalyx	Priority 2	NA	Recorded in the Earl Grey survey area and within the proposed disturbance areas.
Acacia undosa	Priority 3	NA	Recorded in the Earl Grey and Irish Breakfast survey areas with two populations within proposed disturbance areas.
Hakea pendens	Priority 3	NA	Recorded in the Earl Grey survey area, however outside of proposed disturbance areas.
Calamphoreus inflatus	Priority 4	NA	Recorded from the Prince of Wales survey which is outside the development envelope.

Banksia sphaerocarpa* var. *dolichostyla is an easily identified shrub 2 to 4 metres 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. There are 85 record of species on DPaWs NatureMap database (DPaW 2017). Surveys between 2014 and 2018 have recorded 521 plants in the development envelope.

Eutaxia lasiocalyx grows in the Avon Wheatbelt P1 and Southern Cross IBRA subregions. It is a low, spreading, multi-stemmed shrub which grows to 15 cm high. It flowers in November with yellow flowers. It grows on red sandy loam and laterite and quartz gravel on gentle lower slopes (DPaW 2017). *Eutaxia lasiocalyx* is known from five records at the State Herbarium and is geographically restricted to the area near Lake Barber and Mt Holland to the south of Southern Cross (Florabase, DPaW 2017). One new populations were recorded by Mattiske (2017).

Acacia undosa is known from the Avon Wheatbelt P1, Southern Cross and Western Mallee IBRA subregions. It is a dense, spreading shrub 30 cm to 1.5 m tall. It flowers yellow from July to September and grows on sandy clay loam and clayey sand on undulating plains and in low-lying areas (DPaW 2017). Three new populations were recorded by Mattiske (2017). *Acacia undosa* is known from 21 records at the State Herbarium and is geographically spread over the eastern Wheatbelt from Tammin to Bruce Rock, Lake Grace, Newdegate, Lake Magenta Nature Reserve to near Mt Holland (Florabase, DPaW 2017). Large areas in the eastern Wheatbelt have been cleared and developed for agriculture so the eastern populations are less disturbed.

Hakea pendens occurs in the Eremaean or South-west Botanical Provinces and the Coolgardie, Avon Wheatbelt and Mallee IBRA subregions. It is a shrub 2 to 3 m high and 2.5 to 3.1 m wide. In September it flowers in white to pink. *Hakea pendens* grows on stony loam and ironstone ridges (DPaW 2017). *Hakea pendens* is known from 23 records at the State Herbarium and is geographically spread over the eastern Wheatbelt from Yellowdine, Hyden, Forrestania, Marvel Loch, Parker Range, Mt Caudan to near Mt Holland (Florabase, DPaW 2017). Large areas in the eastern Wheatbelt have been cleared and developed for agriculture so the eastern populations are less disturbed. One new populations were recorded by Mattiske (2017).

Calamphoreus inflatus is known from the Eremaean and South-West botanical provinces and Southern Cross and Western Mallee IBRA subregions. It is an erect, spreading shrub growing from 40 cm to 1.6 m high and to 2 m across. It flowers blue-purple to green from October to December or February to March. It prefers clay loam with ironstone gravel soils on flats and disturbed sites (DPaW 2017). *Calamphoreus inflatus* is known from 26 records at the State Herbarium and is geographically spread over the eastern Wheatbelt from Hyden, Forrestania, Marvel Loch, Lake King to near Mt Holland (Florabase, DPaW 2017). Large areas in the eastern Wheatbelt have been cleared and developed for agriculture so the eastern populations are less disturbed. Three new populations were recorded by Mattiske (2017).

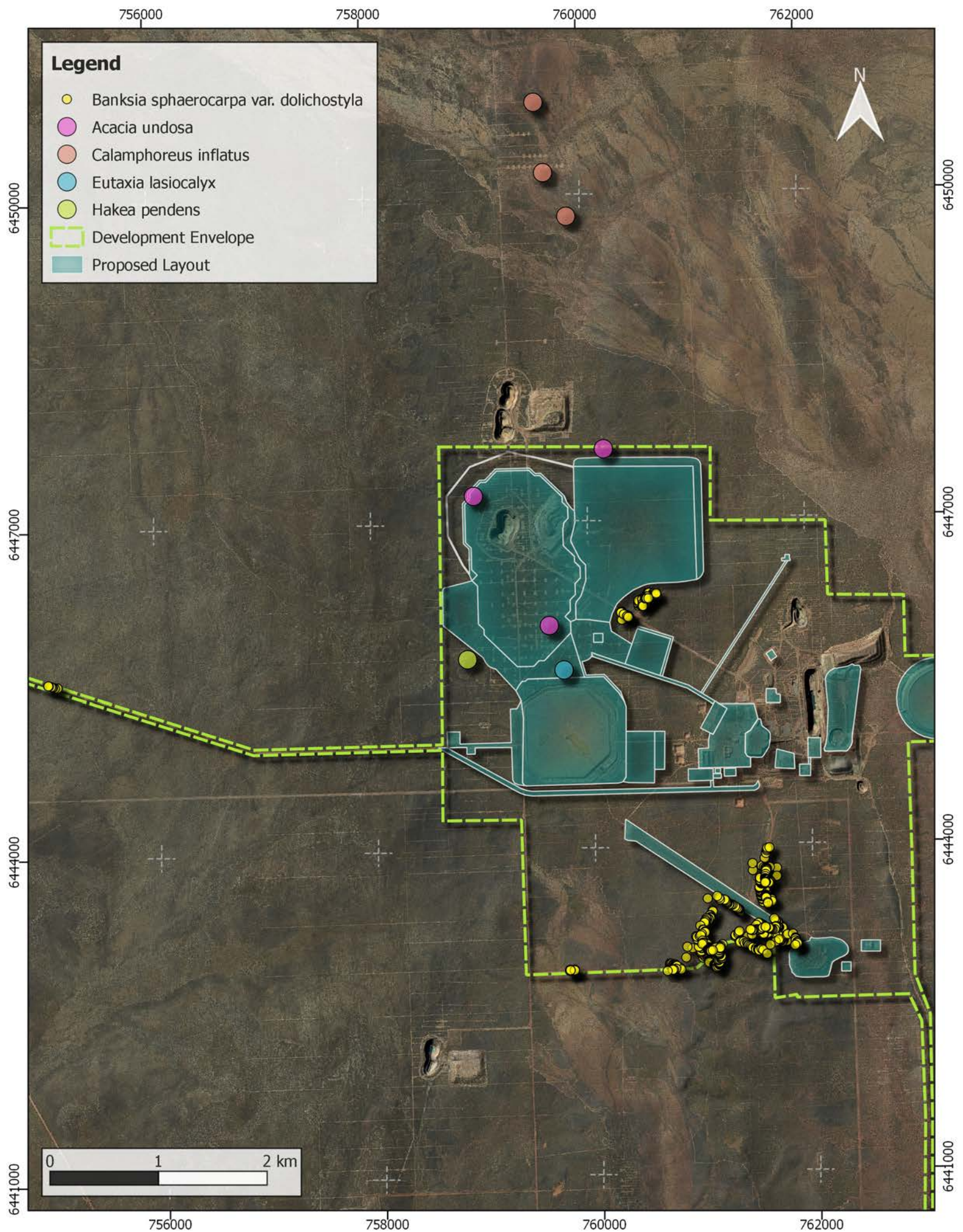
7.9.6 Range Extensions

Two taxa recorded by Mattiske (2017) represent an extension to their currently known distribution. These taxa were *Hakea invaginata* and *Centrolepis strigosa* subsp. *Rupestris*. The recording of *Hakea invaginata* represents an approximately 150 km south-eastern extension to its currently known range. The recording of *Centrolepis strigosa* subsp. *rupestris* represents an approximately 200 km southern extension to its currently known range. Neither taxa are considered to be of conservation significance.

7.9.7 Introduced Species

One introduced (exotic) plant taxon was recorded in the development envelope by Mattiske (2017). The introduced taxon recorded was *Centaurium tenuiflorum. This taxon is listed as Permitted (s11) pursuant to the Biosecurity and Agriculture Management Act 2007* according to the 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 2017).



Scale: 50,000 Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 12** **Locations of Conservation Significant Flora**	KIDMAN RESOURCES

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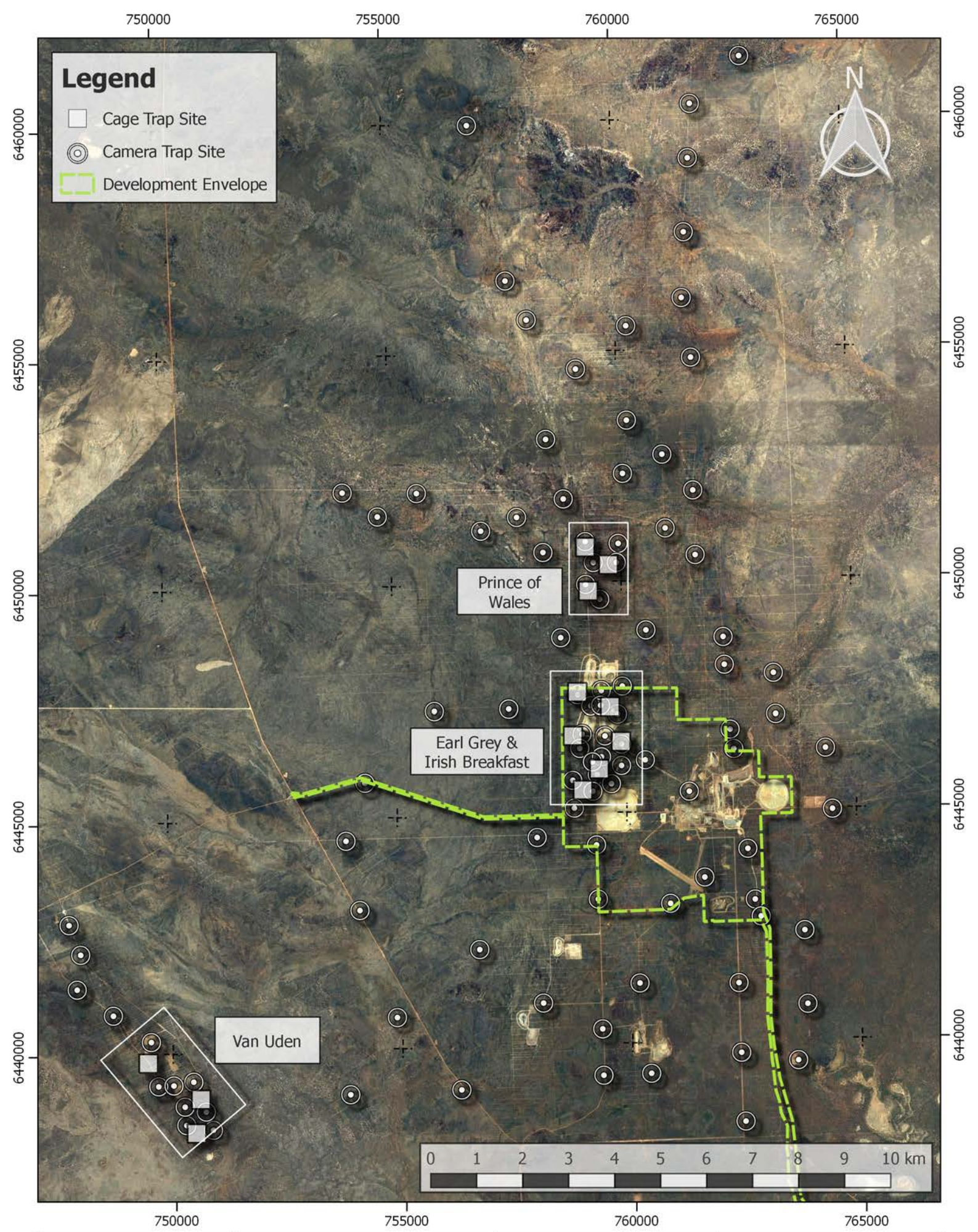
7.10 Terrestrial Fauna and Habitat

7.10.1 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 15. The surveys covered a broad study area, with more concerted trapping in the development envelope as well as regional trapping and habitat assessment. A summary of the survey methods and findings are described below and the full report is provided in Appendix 7.

Table 15: Fauna and Habitat Surveys

Date	Survey Type and Extent	Survey Details
10 – 15 Oct 2016	Reconnaissance survey with targeted searches for Malleefowl and Chuditch in the Earl Grey study area (Figure 13)	• Literature review and database searches. • Opportunistic records taken. • Habitats recorded and mapped. • **Chuditch**: 12 baited camera traps established for 5 nights totaling 60 trap nights at Earl Grey (Figure 13). • **Malleefowl**: 269 km of transects completed by 4 personnel at 10 m spacing (Figure 14).
21 Nov – 4 Dec 2016	Detailed survey (trapping and targeted searches), encompassing four study areas, including Early Grey and Irish Breakfast which occur within the development envelope (Figure 13). Prince of Wales and Van Uden study areas fall outside the development envelope, however provide further regional context to the fauna and habitat assessment.	• Trapping – 12 sites established (Figure 13) 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 totaling 189 trap nights (Figure 13). • **Malleefowl**: Irish Breakfast: 138 km of transects completed by 6 personnel at 10 m spacing. Prince of Wales: 176 km of transects completed by 6 personnel at 10 m spacing (Figure 14). Van Uden: Opportunistic only.
15 Jan – 25 Feb 2017	Regional Chuditch survey	• **Chuditch**: 44 baited camera traps deployed for 13 to 24 nights resulting in 794 trap nights (Figure 13). • Vegetation and habitat descriptions taken at camera trap locations. • **Malleefowl**: Opportunistic only.



Scale: 120,000 Original Size: A4 Aerial Photo Date: 2014 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 13** **Locations of Study Areas, Trap Sites & Camera Traps**	KIDMAN RESOURCES

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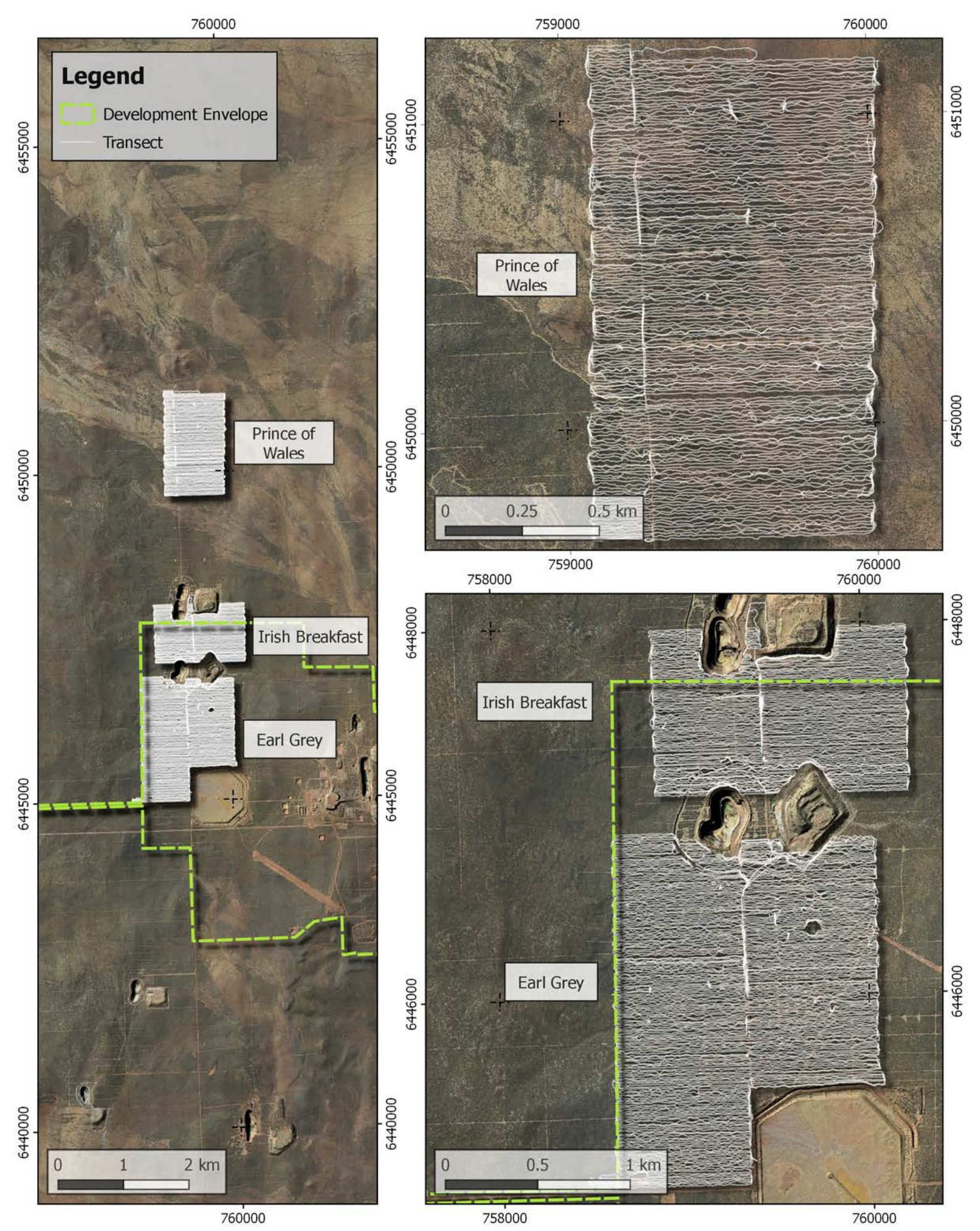

Scale: 85, 18, 30k Original Size: A4 Aerial Photo Date: 2017 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 14** **Malleefowl Transects**	KIDMAN RESOURCES

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7.10.2 Habitat

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

- **Mallee woodland** – Mallee woodland is a very common habitat, both within the project area and in the bioregion. The 'mallee woodland' habitat describes a structural type, and within 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.
- **Open woodland** – Open woodland is less common in this mallee-dominated region. Open woodlands occur patchily, and in the project area is characterised by a canopy of Salmon Gum (*Eucalyptus salmonophloia*) sometimes with Merrit (*Eucalyptus flocktoniae*) over a sparse shrub understorey. This habitat occurs on red to brown clay-loams, sometimes with ironstone pebbles. This habitat was identified in the broader study area.
- **Shrublands** – Shrublands are common but patchy in occurrence in the Project area, as well as in broader regional study area. It occurs on gravelly sands and varies in composition, but is usually dominated by species of *Acacia*, *Allocasuarina*, *Hakea* and/or *Melaleuca*. This habitat lacks large trees, but 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.

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 Project area. Historically cleared areas, waste dumps and open pits are present in the study area, and are only likely to support a small complement of native fauna. Significant parts of the regional study areas were recently burnt at the time of survey.

7.10.3 Fauna Assemblage

The broader study area assessed by Western Wildlife is likely to support a relatively intact faunal assemblage, with only regionally extinct species likely to be missing from the area. The faunal assemblage is diverse as it contains elements from both the Eremaen (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 Project area and regional areas covered in the survey.

7.10.4 Conservation Significant Fauna

Thirteen vertebrate fauna of conservation significance have the potential to occur in the project area and surrounds. These species are listed in Table 16.

Table 16: 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.
Woma *Aspidites ramsayi*	Priority 1	NA	Likely to be locally extinct.
Spotted Knob-tail Gecko *Nephrurus stellatus*	NA	NA	May occur. Recorded outside of the development envelope.
Birds			
Malleefowl *Leipoa ocellata*	Vulnerable WC Act	Vulnerable	Known to occur; 5 bird sightings, 4 active mounds and 16 inactive mounds were recorded over a board 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 WC 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.
Peregrine Falcon *Falco peregrinus*	Schedule 7 WC 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 WC 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 particular significance.
Fork-tailed Swift *Apus pacificus*	Schedule 5 WC 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 geoffroii*	Vulnerable WC 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 WC Act	Endangered	Although there is a historical record from 10 km south, this species is considered to have a low likelihood of inhabiting the project area, 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 16, the Malleefowl, Peregrine Falcon, Rainbow Bee-eater, Chuditch, Inland Western Rosella, Western Brush Wallaby and the Spotted Knob-tail Gecko were recorded by Western Wildlife within the development envelope and/or regional surrounds. Each of these species is discussed in the following sub-sections.

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 (see Figure 15). Factors that may have positively influenced Chuditch numbers in the region include low numbers of feral predators and the presence of long-unburnt habitats to provide shelter and denning sites. Individuals are likely to have a core home range of 2,125 ha (males) or 189 ha (females), though they are likely to range even more widely and the core home-ranges are likely to overlap. 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.

Malleefowl – The Malleefowl was sighted and active mounds were recorded in the fauna surveys. Specifically: 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 (see Figure 16). The distribution of surveyed mounds reflects the survey effort; Earl Grey, Irish Breakfast and Prince of Wales were intensively searched via 10 m transects so it is considered the inventory of mounds within these areas is near-complete. The remaining areas were sampled opportunistically, so it is likely that some mounds remain unrecorded. Malleefowl in the study areas are likely to range over all habitats, favouring 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.

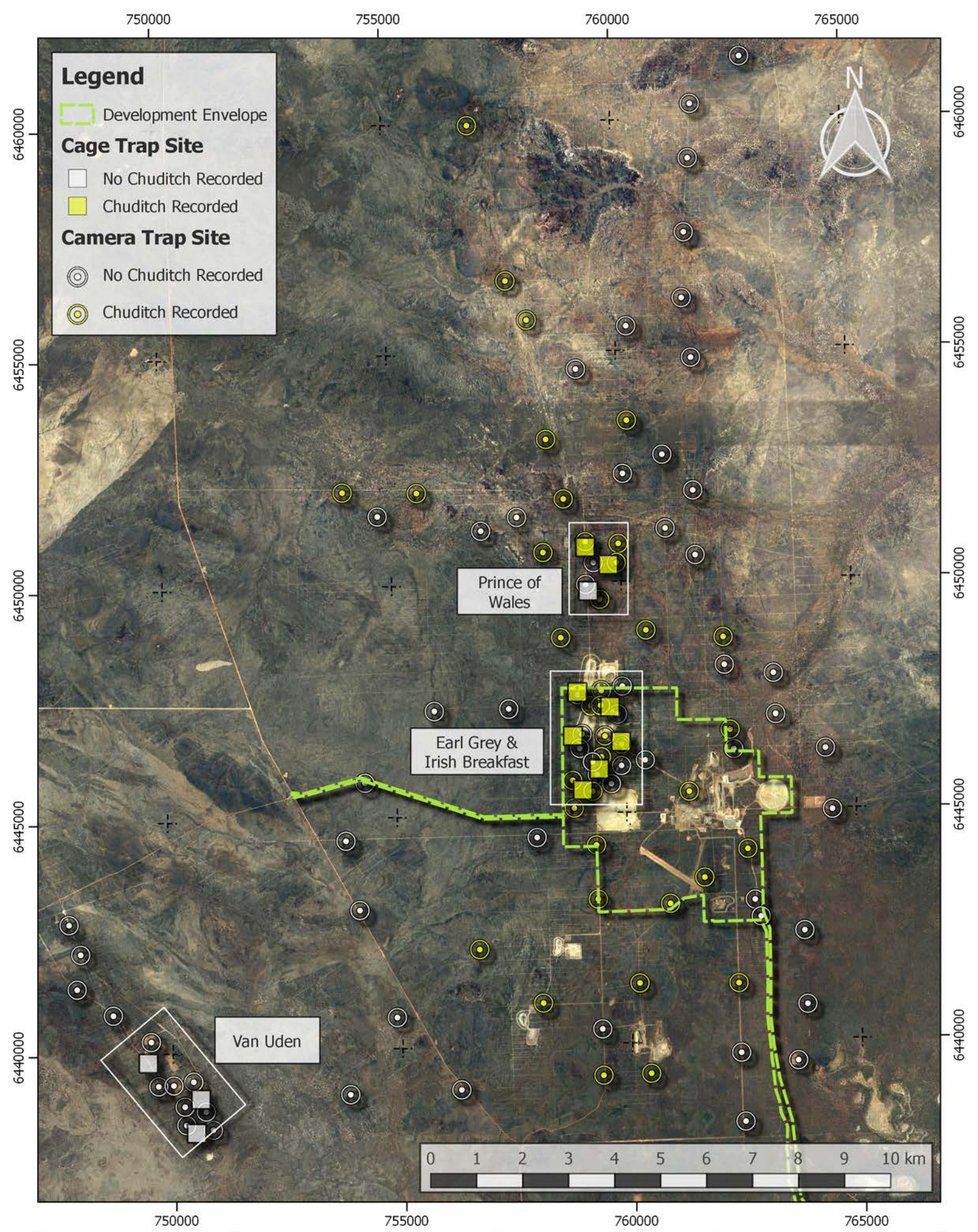
Peregrine Falcon – is a widespread bird of prey that globally has a very large range and a very large population that appears to be secure, as in Western Australia, though this species may experience reductions at a local level due to human disturbance at nesting sites. The species is likely to forage 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).

Spotted Knob-tail Gecko – has a very restricted range occurring between Mt Holland and Bungalbin Hill. This species may also occur in shrublands on sandy soils, it favours mallee woodlands with hummock grass in sandplain habitats, and has been recorded nearby in Jilbadji Nature Reserve. This species was recorded once in the greater regional area (west of the Project), in sandplain shrubland habitat. The Spotted Knobtail Gecko may occur in shrubland habitats in the Project area, but is likely to be absent from areas of heavier soils in mallee or open eucalypt woodlands (Western Wildlife 2017).



Scale: 120,000 Original Size: A4 Aerial Photo Date: 2014 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 15** **Chuditch Survey Results**	KIDMAN RESOURCES

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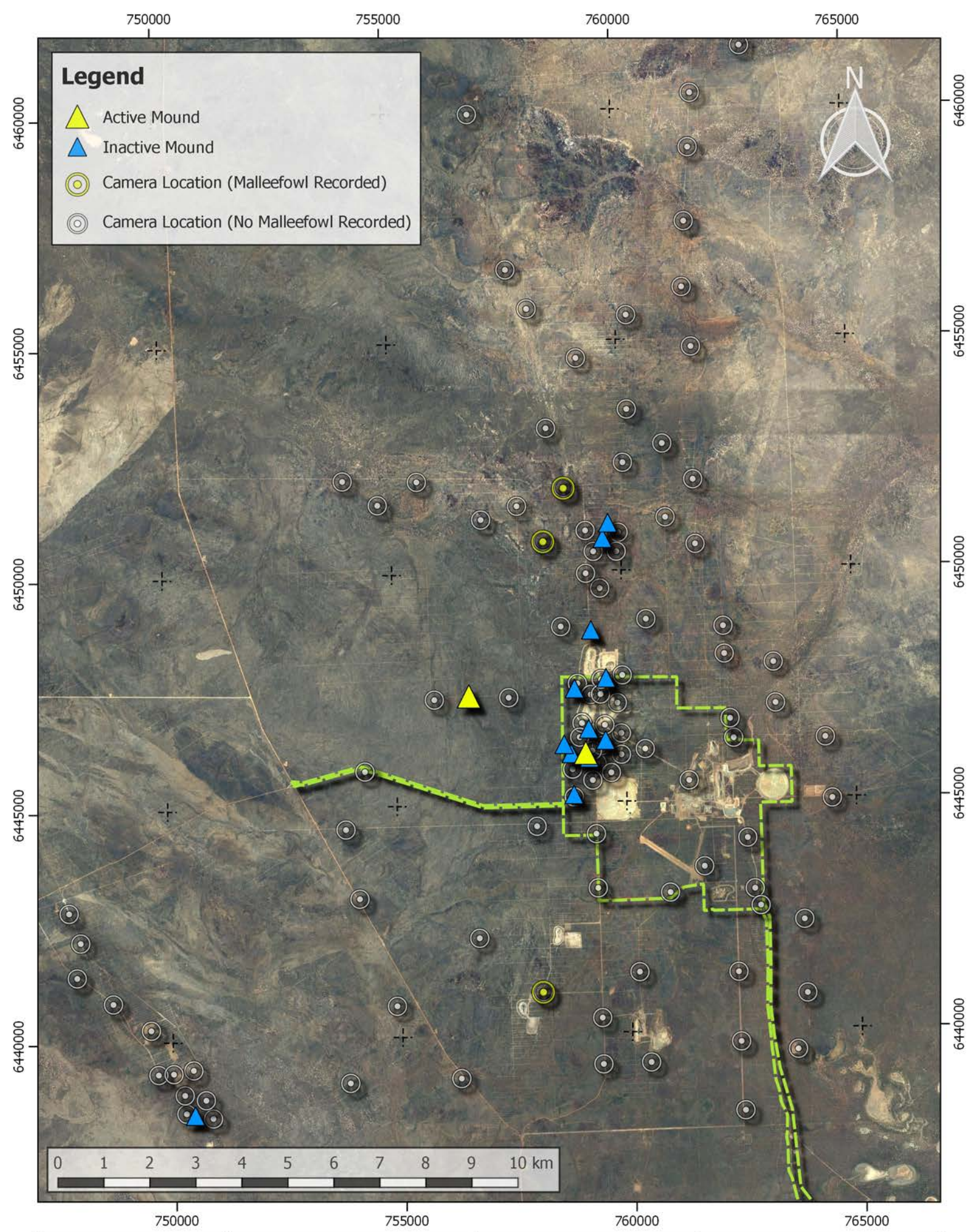

Scale: 120,000 Original Size: A4 Aerial Photo Date: 2014 Grid: Australia MGA94 (50)	**Kidman Resources Limited** **Earl Grey Lithium Project**	**Figure 16** **Malleefowl Survey Results**	KIDMAN RESOURCES

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7.11 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).

The limited distribution of SREs makes them vulnerable to extinction from both environmental changes and human impacts to even small areas such as an aquifer or banded ironstone formation ridges. Conservation of SREs is often hampered by poor taxonomic knowledge.

Habitats of the project area were described by Western Wildlife (2017). They were determined to be widespread and common, extending well beyond the development envelope. No restricted habitats considered likely to harbour SREs were identified such as banded ironstone formation ridges, wetlands, salt lakes or rocky outcrops that are often associated with SREs. Furthermore, as the project has a relatively small footprint (365 ha), it is considered unlikely that the project will impact SREs, should they occur in the area.

7.12 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.

7.13 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 7.7) 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.

7.14 Waste Material Characterisation

Waste characterisation work was undertaken by MBS Environmental (2017b) (Appendix 8). This included a geochemical assessment of 64 waste rock samples from 12 drill holes taken across the Earl Grey ore body, as summarised in Table 17. Geochemical assessment methodologies included the following:

- Acid base accounting to determine the potential for acid mine drainage (AMD).
- Elemental composition to determine the presence of any environmentally problematic concentrations of metals and metalloids.
- Water leachable characterisation to identify potentially problematic seepage.
- Dilute acid leachable characterisation to determine seepage characteristics under acidic conditions.
- Exchangeable cations to determine waste rock sodicity and effective cation exchange capacity.
- Mineralogical assessment using X-ray diffraction analysis to confirm Project mineralogy.

All 64 samples were analysed and screened for total sulfur and Acid Neutralising Capacity (ANC). Full acid base accounting (ABA) was conducted if the initially determined total sulfur was more than 0.2%. A selection of 21 samples were also analysed for elemental composition, 13 samples for water and acid leachable parameters and 5 samples for minerology composition. A selection of 10 clay rich weathered oxide samples (representing subsoils/overburden), were analysed for parameters including pH, Electrical Conductivity (EC) and Cation Exchange Capacity (CEC). Particle Size Distribution testing was undertaken on 6 samples and Emerson Class testing was undertaken on 9 samples respectively.

Table 17: Waste Rock Samples

Weathering Zone	Lithology Type	No. of Samples
Oxide (Clay)	Weathered Mafic	7
Oxide (Clay)	Weathered Pegmatite	4
Transitional	Transitional Mafic	5
Transitional	Transitional Pegmatite	4
Fresh	Fresh Mafic	24
Ore	Pegmatite Ore	15
Fresh	Contact Zone	5
Total number of samples		**64**

7.14.1 Types of Waste

There are four types of waste associated with mining and processing:

- Fresh waste rock (overburden).
- Oxide waste rock (overburden).
- Transitional waste rock (overburden).
- Tailings, comprising coarse gravel reject and fine tailings.

These are discussed below.

Fresh Waste Rock

Geochemical assessment of 24 fresh mafic waste rock samples and five fresh rock contact zone samples indicated that:

- Only one of the 29 samples of mafic/contact zone fresh analysed contained more than the 0.3% total sulfur content considered capable of potentially generating AMD in a semi-arid environment. All fresh rock waste samples were classified by acid base accounting procedures as non acid forming (NAF). Fresh rock mafic waste had very low average total sulfur concentrations (0.07% equal to an acid production potential of 2 kg H_2SO_4/t) versus a moderate average acid neutralising capacity (ANC) (31 kg H_2SO_4/t).

- All mafic and contact zone waste rocks showed significant enrichment in lithium and beryllium consistent with the geology of the orebody formation. Arsenic (maximum 333 mg/kg) and chromium (maximum 1,101 mg/kg) were the most commonly enriched elements other than those in mafic/contact zone samples, with both elements being enriched in three samples. Although other selected samples were also enriched in antimony, rubidium, tin, tantalum and cadmium (one sample) from these lithologies, the levels of enrichment were marginal and average overall concentrations of environmentally significant metals and metalloids were low.
- Water leachates were alkaline and with low salinity and indicated very low to less than detectable concentrations of most metals and metalloids, which is consistent with the insoluble nature of the expected mineral forms. All results were well below ANZECC 2000 livestock drinking and Department of Health (DoH) 2014 non-potable groundwater water use guidelines, with the exception of aluminium for which results were inconsistent and more likely to be a result very fine particulate material. Any seepage or runoff from these materials is predicted to be alkaline, low to brackish salinity with very low concentrations of metals and metalloids and low levels of soluble alkalinity.
- Any contact with acidic materials (e.g. contact with acidic pore water from acidic subsoils and oxide waste) was simulated by leaching with a weak acid (acetic acid). Under the acidic conditions of this test, the primary elements released were iron, aluminium, silicon, calcium and magnesium, which are all considered a slight dissolution of available acid neutralising species.
- Arsenic was more soluble for fresh mafic and contact zone samples under acid conditions than for water leachates, however all samples (maximum 0.53 mg/L arsenic in the 1:20 extract) remained approximately one tenth of the ANZECC 2000 livestock drinking water guideline of 5 mg/L. Concentrations of all other environmentally significant metals and metalloids remained low to very low, even under acidic conditions and also below ANZECC 2000 livestock drinking water guidelines.

Oxide Waste Rock

Geochemical assessment of 7 weathered oxide mafic and 4 weathered oxide pegmatite samples indicated the following:

- Only one highly weathered clay rich mafic oxide sample had sufficient sulfur to warrant full acid base (ABA) accounting analysis and was technically classed as PAF (low capacity) according to standard ABA classification. However, this classification is considered an artefact of the presence of acid insoluble sulfates, which leads to overestimation of oxidisable sulfur content. This sample along, with other oxide waste samples, should be considered as subsoil/oxide waste with a naturally low pH.
- The pH and salinity of transitional and oxide waste material was strongly correlated with depth. All samples less than approximately 30 m deep (i.e. the most weathered samples) had low pH values in the range of 3.9 to 5.4, and were highly to extremely saline (EC > 780 µS/cm). Transitional samples at deeper depths were circum-neutral and only slightly saline (approximately 200 to 300 µS/cm in a 1:5 water extract). Both observations suggest a shift at approximately this depth (30 m) from highly weathered acidic kaolinite based clays to less weathered illite 'layer' clays.
- All oxide samples were sodium and magnesium dominant with high exchangeable sodium percentage (ESP) values between 16 and 62%, indicating all samples of clay-rich oxide waste from the Project are highly sodic and prone to be dispersive. Emerson Class results indicated 4 of the 9 oxide samples were spontaneously dispersive, however the samples which were not spontaneously dispersive all had EC values in the 1:5 water extract of greater than 1,500 µS/cm. Gradual leaching of excess salt from these higher salinity samples in the field if under exposed conditions is expected to result in these materials becoming increasingly dispersive, based on the ESP and clay contents.
- The levels of exchangeable aluminium indicate this is a major source of the acidity in weathered oxides from the Project. The levels of aluminium (as well as salinity) would make these materials hostile for any use in rehabilitation as a growth medium.

Transitional Waste Rock

Geochemical assessment of 9 transitional mafic/pegmatite samples indicated that:

- All transitional waste rock samples were classified as NAF.
- Overall the concentrations of environmentally significant metals and metalloids were lower than for fresh waste rock material. Similar to the fresh waste rock samples, transitional waste rocks showed significant enrichment in lithium and beryllium but these were absent in more highly weathered oxide clays. Antimony, tin and tantalum were also enriched in a sample of transitional pegmatite, which is again consistent with the largely unweathered orebody.
- Arsenic was the most soluble environmentally significant metalloid in water leachates with a maximum of 1.0 mg/L soluble in transitional pegmatite in a 1:5 water extract. This remains significantly below the ANZECC 2000 livestock drinking water guideline of 5 mg/L and is not considered a risk to the surrounding environment – particularly given the hypersaline nature of the groundwater.
- The pH and salinity of transitional and oxide waste material was strongly correlated with depth. Transitional waste samples at deeper depths (> 30m) were circum-neutral and only slightly saline (approximately 200 to 300 µS/cm in a 1:5 water extract).
- Due to the lower salinity and neutral pH values, the transitional waste rock material is considered appropriate for use as a growth medium in rehabilitation and can be used to encapsulate the environmentally problematic oxide material, in combination with competent fresh waste rock material and/or gravel rejects.

Tailings

A prediction of tailings composition was made based on the average ore composition and typical flotation recoveries for spodumene (Project target mineral). These results indicated that:

- All samples of pegmatite ore contained extremely low levels of total sulfur (average 0.02% and maximum 0.12%) which resulted in all ore samples being classified as NAF.
- As expected for a pegmatite orebody, all ore samples showed significant geochemical enrichment in lithium, beryllium, rubidium, tantalum and tin. Ore samples were otherwise very low in significant enrichment with only arsenic in one ore sample recording a value considered enriched versus an average soil abundance of 25 mg/kg.
- Water leachate results for ore samples (which should closely match those of process tailings), were alkaline, low salinity and indicated very low to less than detectable concentrations of most metals and metalloids. All results were well below ANZECC 2000 livestock drinking water and DoH 2014 non-potable groundwater water use guidelines, with the exception of aluminium for which overall results were inconsistent and more likely to be a result of very fine particulate material. Arsenic, despite enrichment in one sample, had very low solubility in water extracts (lower than for corresponding concentrations in mafic waste rock).
- Spodumene was the only lithium bearing mineral positively identified in mineralogy analysis of a single ore sample – potentially present petalite was not detected in this sample. Cookeite (a likely alteration product of spodumene) was identified as the principal lithium mineral in transitional pegmatite.
- Tailings concentrations for most elements were calculated to be approximately 1.3 times the concentration present in the ore after allowing for removal of the spodumene and quartz by gravity separation/flotation. Enriched elements in the calculated tailings consisted of beryllium (168 mg/kg), rubidium (3,198 mg/kg), tin (62 mg/kg) and tantalum (70 mg/kg). As the process of gravity separation and flotation of spodumene from crushed ore will not chemically alter mineral phases present, these elements are expected to remain low in solubility as assessed on the ore samples themselves.

7.15 Social Environment

7.15.1 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 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 Native Title claims.

7.15.2 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 sites in the Project area.

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. 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.

8. ENVIRONMENTAL PRINCIPLES AND FACTORS

8.1 EPA Principles of Environmental Protection

There are five principles which guide the overall application of the *Environmental Protection Act 1986* (EP Act). The EPA has also adopted two additional principles to help guide policy development and environmental impact assessment. Kidman has considered these principles during planning and feasibility studies for development of the Project. These considerations are summarised in Table 18.

Table 18: Principles of Environmental Management

Principle	Consideration
1. Precautionary Principle. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by: • careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and • an assessment of the risk-weighted consequences of various options.	A thorough understanding of the Project's environmental setting has been attained through review of historic documentation and studies, as well completion of project-specific baseline studies (described in Section 7). This has contributed significantly to the scientific understanding of the area and has allowed Kidman to design the Project in a way that identifies, prevents and minimises adverse environmental impacts. Stringent management measures have been devised around clearing, waste disposal, feral animal control, weed control and fire management, to further avoid or minimise the potential for significant environmental impacts, specifically in relation to conservation significant species. Overall there is a high level of certainty relating to the Project and its potential impacts on the environment.
2. The principle of intergenerational equity. The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.	The Project presents the Western Australian economy with the opportunity to diversify its mineral exports and increase its resilience in an evolving market. Development of the Project will help meet the strong global demand for lithium, which is predominantly used in battery manufacturing; a growing requirement of the renewable energy markets and electric motor vehicle industry (e.g. Tesla electric cars). This contributes to improving the environment by reducing dependence on fossil fuels. In undertaking the proposal, Kidman will implement suitable environmental management measures to minimise the overall impact of the Project, ensuring that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations. In undertaking the proposal, Kidman will contribute to an improved environment through rehabilitation of State liability disturbance utilised in the Project, that currently poses a risk to the health and amenity of the area.
3. Principles relating to improved valuation, pricing and incentive mechanisms. • Environmental factors should be included in the valuation of assets and services. • The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.	The following valuations, pricing and incentive measures are of relevance to the Project: • Environmental management, including qualified site personnel, consultants, ongoing studies and equipment will be incorporated into the Project Feasibility costs. • Kidman has sought to use of existing disturbance associated with the abandoned mine site, thereby reducing the financial burden on the State of Western Australia.

Principle	Consideration
• The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste. • Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems.	• In applying for a works approval and licence under Part V of the Environmental Protection Act 1986, Kidman will pay fees associated with estimated emissions to the environment, consistent with the polluter pays principle. • Kidman will seek opportunities for continuous improvement over the life of mine. Improving efficiencies across the Project will reduce ongoing costs as well as the overall impact on the environment, for example: • Minimising clearing which presents a cost saving associated with earthworks as well as a reduced environmental impact; • Reducing waste to the landfill through implementation of a recycling scheme. • Progressive rehabilitation to assist in restoring natural ecosystems, whilst reducing the costs associated with the Mining Rehabilitation Fund. • Small gains in energy efficiency can result in large, overall reductions in fuel consumption, costs and greenhouse gas emissions.
4. The principle of the conservation of biological diversity and ecological integrity. Conservation of biological diversity and ecological integrity should be a fundamental consideration.	This principle has been a fundamental consideration in the design and proposed management of the Project. Kidman has undertaken comprehensive survey work that extends outside of the development envelope in order to better understand the distribution of conservation significant species. Kidman has taken a conservative approach to design of the project by limiting the extent of habitat clearing through utilisation of existing disturbed areas. Additionally, all infrastructure has been located to avoid *Banksia sphaerocarpa* var. *dolichostyla*. Proposed management measures aim to ensure that biological diversity and integrity of the area is maintained.
5. The principle of waste minimisation. All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	Waste minimisation principles have been considered as part of design and feasibility studies. There are 4 key types of waste associated with the project, comprising mine waste (waste rock/overburden and tailings), waste requiring landfill disposal (putrescible and inert), wastewater and hydrocarbon waste. Waste minimisation and management measures include: **Mining Waste** • Mine waste volumes have been minimised by Kidman through optimisation of the resource definition. This reduces operational costs and the area needed to store and manage these waste types. • Mine sequencing has been undertaken to allow encapsulation of dispersive waste rock materials using fresh, competent waste rock. • Waste landforms will be conservatively designed to minimise erosion and the exposure of dispersive materials. A number of existing waste rock dumps have been historically rehabilitated at Mt Holland with varying success. These will be assessed to identify aspects that have contributed to successful or failed rehabilitation, with the findings incorporated into final landform design. **Waste for Landfill** • Waste recycling programs will be established to reduce the volume requiring landfill disposal. • Use of packaged products will be minimised as far as practicable, or will be bought in bulk.

Principle	Consideration
	• Unused products will be returned to the supplier where practicable, instead of going to landfill. **Wastewater** Water use and disposal will be minimised by: • Internally recycling process water. • Returning water from the TSF for recycling in the processing plant. • Using dewatering water in dust suppression, processing, or storage for later re-use. **Hydrocarbon Waste** • Servicing and maintenance of vehicles, plant and equipment will preferentially occur within designated service and workshop areas with designated washdown facilities. This will contain any hydrocarbon waste for appropriate disposal. • Wash down bays will use high pressure, low volume washing systems to minimise the volume of oily water requiring treatment and/or disposal. • Storage of hydrocarbons will occur in suitably sized bunded facilities.
6. Best practice. When designing proposals and implementing environmental mitigation and management actions, the contemporary best practice measures available at the time of implementation should be applied.	Kidman is committed to developing the Project in a way that reduces environmental impacts as far as practicable and will endeavour to implement best practice measures during the approvals process through to closure. Examples of best practice are evident in the management measures and conservation efforts that are described in this document.
7. Continuous improvement. The implementation of environmental practices should aim for continuous improvement in environmental performance.	Kidman will implement an annual environmental performance review as part of a Project Environmental Management System to identify areas for improvement. Such areas will be assigned performance targets and timelines for implementation and completion.

8.2 Identification and Assessment of Environmental Factors

With consideration to all available information, including the Project design and both new and historic baseline environmental data, the following are identified as being key environmental factors to the proposal:

- Flora and Vegetation – due to the presence of threatened flora species *Banksia sphaerocarpa var. dolichostyla* within the development envelope.
- Terrestrial Fauna – due to the presence of Malleefowl (*Leipoa ocellata*) and Chuditch (*Dasyurus geoffroii*) within the Development Envelope.

Information regarding the environmental factors listed above, including a description of the potential impact and preliminary management and mitigation actions, is provided in the following sub sections.

Other environmental factors that are not considered to be key factors are discussed in Table 19 and include:

- Terrestrial Environmental Quality.
- Landforms.
- Hydrological Processes.

- Inland Waters Environmental Quality.
- Air Quality.
- Human Health.

8.3 Flora and Vegetation

8.3.1 EPA Objective

The EPA objective for Flora and Vegetation is *to protect flora and vegetation so that biological diversity and ecological integrity are maintained*.

In the context of this objective, ecological integrity is the composition, structure, function and processes of ecosystems, and the natural range of variation of these elements.

8.3.2 Policy and Guidance

Guidance and policy relevant to this factor includes:

Laws and Regulations

- *Environmental Protection Act 1986* (WA).
- *Agricultural and Related Resources Protection Act 1976* (WA).
- *Biosecurity and Agriculture Management Act 2007* (WA).
- *Bush Fires Act 1954* (WA).
- *Wildlife Conservation Act 1950* (WA).
- *Biodiversity Conservation Act 2016* (WA).
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

Guidelines

- Environmental Factor Guideline: Flora and vegetation (EPA 2016).
- Technical Guidance - Flora and vegetation surveys for environmental impact assessment (EPA 2016).
- Position Statement No. 2: Protection of native vegetation in Western Australia (EPA 2000).
- Guidance Statement 55: Implementing best practice in proposals submitted to the environment impact assessment process (EPA 2003).

8.3.3 Receiving Environment

Flora surveys conducted in the development envelope recorded the threatened flora species *Banksia sphaerocarpa* var. *dolichostyla* and three priority (P) species*: Eutaxia lasiocalyx (P2), Acacia undosa (P3)* and *Hakea pendens (P3)* (refer to Section 7.9.5 and Figure 12).

None of the vegetation communities defined within the study area are classified as unique or restricted in the region. There is a considerable degree of existing disturbance in the development envelope associated with the abandoned Mt Holland Mine Site.

8.3.4 Potential Impacts

The following aspects of the project have been identified as having the potential to impact flora and vegetation, including *Banksia sphaerocarpa* var. *dolichostyla* and priority species:

- Clearing – Mining, exploration and survey may result in unintentional clearing of individual plants or populations during clearing or off-road activities.
- Weed Invasion – Mining activities may increase risk of weed invasion through clearing, new roads and tracks, additional vehicles and lack of vehicle hygiene procedures increasing competition for resources.
- Changed Fire Regimes – Mining activities can cause accidental fires, though the risk is low, unplanned fires can also be caused by road accidents, lightning or arson. Large, unplanned bushfires are undesirable as they substantially change flora and vegetation on a large scale.
- Changed Hydrogeology – The Project will require groundwater abstraction, which can result in degradation of flora and vegetation where species ae dependent on groundwater.
- Changed Hydrology – Operations can result in modified hydrology (e.g. creek diversions or impoundment of flows) resulting in deterioration of plant health through either inundation or reduced water supply.
- Habitat Fragmentation – Fragmentation of individuals and populations from land clearing reduces potential for gene flow. Fragmentation potentially exacerbates other threats like fire, weed invasion and herbivory by feral species by providing access into habitats that were previously dense and difficult to traverse.
- Increased Feral Fauna – Increased human activity can lead to an increase in feral herbivores which thrive in modified landscapes with additional water sources, food from rubbish tips and increased access along tracks and roads. Feral fauna, particularly herbivores such as goats, camels and rabbits, have the potential to negatively impact flora and vegetation, with competition and land degradation by rabbits, unmanaged goats and feral pigs.
- Generation of dust – Earth moving activities (e.g. clearing, loading), vehicle movements on unsealed roads and processing activities have the potential to generate dust which can result in impacts to the health of flora and vegetation through clogging of stomata.
- Dust suppression using hypersaline water – Use of hypersaline water in dust suppression on roads and other surfaces has the potential to impact flora and vegetation if it is not contained and flows to surrounding vegetation.
- Spillages – Spillages of tailings and hypersaline water from pipelines can result in large scale vegetation death without the correct controls in place.

8.3.5 Mitigation Measures

A Management Plan for the *Banksia sphaerocarpa* var. *dolichostyla* has been prepared and is provided in Appendix 1. A summary of the key management measures are provided below. The management measures are applicable to the maintenance and protection of flora and vegetation and associated biodiversity within the development envelope.

Avoid

- Design infrastructure to avoid disturbance to all known locations of *Banksia sphaerocarpa* var. *dolichostyla*.
- Avoid accidental clearing of *Banksia sphaerocarpa* var. *dolichostyla* through:
  - Implementation of an internal clearing permit procedure.
  - Competition of further comprehensive pre-clearance flora surveys to validate known locations of *Banksia sphaerocarpa* var. *dolichostyla* and priority species.
  - Demarcation of populations that occur in close proximity to proposed clearing and construction activities.
- Monitor the health of *Banksia sphaerocarpa var. dolichostyla* populations in the development envelope in accordance with the *Banksia sphaerocarpa var. dolichostyla* Management Plan.

Minimise

- Minimise disturbance to priority flora species where possible.
- Minimise the amount of vegetation clearing required and habitat fragmentation through utilisation of existing disturbed areas and optimisation of the project layout.
- Minimise the potential for clearing beyond the approved footprint through implementation of an internal clearing permit procedure.
- Minimise the risk of introduction of invasive species through implementation of a vehicle hygiene procedure and weed control.
- Minimise the potential for water ponding, through maintaining and not blocking natural drainages.
- Minimise saline water overspray through use of dribble bars in roadway dust suppression and construction of earthen bunds on road sides.
- Minimise increases in fire frequency through maintenance of fire breaks and implementation of fire management procedures.

Rehabilitate

- Restore vegetation units through progressive rehabilitation, in accordance with a Mine Closure Plan.
- Investigate methods for propagating *Banksia sphaerocarpa* var. *dolichostyla* as part of rehabilitation trials.
- Maximise use of the Mt Holland abandoned infrastructure and disturbance areas, such that the future operation can positively contribute to environmental values of the area by providing the means to rehabilitate State liabilities.

8.3.6 Impact Assessment

Based on current survey information, all infrastructure has been located to avoid *Banksia sphaerocarpa* var. *dolichostyla*. The Project will result in the loss of one *Eutaxia lasiocalyx* population (P2), and two *Acacia undosa* populations (P3). The loss of these populations is considered to present a low risk to the conservation status of these species as the species are known to occur outside the development envelope (see Section 7.9.5). It is possible that these species as well as *Hakea pendens* (P3) and *Calamphoreus inflatus* (P4) occur in greater numbers in the development envelope, consequently, further comprehensive survey work is planned to ensure all priority species populations have been recorded.

There are no groundwater dependent ecosystems in the development envelope that will be affected by groundwater abstraction. Kidman will ensure that final infrastructure design does not result in impoundment of water that could result in vegetation death.

Following implementation of management measures, the following impacts are considered to present a low risk to flora and vegetation:

- Increased fire: the presence of a long-term operation may result in an overall reduction in large scale wildfires through firebreak maintenance, early detection and response to fires.
- Increase in introduced plant species: Mitigated through stringent vehicle hygiene procedures and managed through weed control programs.
- Increase in feral animal population: Implementation of the project presents an opportunity for a long-term feral animal control program to be implemented in the region.

The Project offers a rehabilitation gain of approximately 45% through utilisation of State liability disturbance areas that will be rehabilitated by Kidman at closure or progressively during operations, thereby ultimately improving the continuity of vegetation in the Project area.

8.3.7 Predicted Outcome

Through completion of comprehensive baseline studies, optimisation of the project footprint to utilise existing disturbed areas and implementation of stringent management measures, the project is able to meet the EPA's objective to protect flora and vegetation so that biological diversity and ecological integrity are maintained.

8.4 Terrestrial Fauna

8.4.1 EPA Objective

The EPA objective for Terrestrial Fauna is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.*

In the context of this objective, ecological integrity is the composition, structure, function and processes of ecosystems, and the natural range of variation of these elements.

8.4.2 Policy and Guidance

Guidance and policy relevant to this factor include:

Laws and Regulations

- *Environmental Protection Act 1978* (WA).
- *Wildlife Conservation Act 1950* (WA).
- *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth).

Guidelines

- Environmental Factor Guideline: Terrestrial fauna (EPA 2016).
- Technical Guidance – Terrestrial fauna surveys; EPA (2016)
- Technical Guidance – Sampling of short range endemic invertebrate fauna (EPA 2016).
- Matters of National Environmental Significance. Significant impact guidelines 1.1 - *Environment Protection and Biodiversity Conservation Act 1999* (DEWHA 2009).

8.4.3 Receiving Environment

Fauna surveys completed in the development envelop and broader region identified the following conservation significant species: Malleefowl, Peregrine Falcon, Rainbow Bee-eater, Chuditch, Inland Western Rosella, Western Brush Wallaby and the Spotted Knob-tail Gecko (refer to Section 7.10).

None of the habitats identified in the development envelope are considered to be restricted or unique in the region. Uncommon habitat types, such as granite outcrops, salt lakes or freshwater wetlands, are absent from the project area. There is a considerable degree of existing disturbance in the development envelope associated with the abandoned Mt Holland Mine Site.

8.4.4 Potential Impacts

The following aspects of the project have been identified as having the potential to impact fauna and habitat, including conservation significant species:

- Clearing activities causing injury or death – Clearing of vegetation with heavy vehicles may cause direct mortality or injury of fauna species.

- Vehicle strike causing injury or death – Species maybe at risk of direct mortality or injury by project vehicles, particularly nocturnal species (e.g. Chuditch).
- Entrapment – Fauna may become trapped in containers, uncapped drill holes, trenches, excavations or water storage structures. Steep sided or slippery structures may prevent escape and result in direct mortality.
- Habitat Loss – Conservation significant species (including Chditch and Malleefowl) are likely to occur throughout the project area in all habitats, though they may be temporarily absent in areas that have been recently and extensively burnt. All breeding or foraging habitat in the area is considered 'critical habitat' for Chuditch and Malleefowl, and clearing is regarded as a current threat to this species.
- Habitat Fragmentation – Fragmentation of fauna habitat from land clearing reduces the ability of individuals to move freely for dispersed or temporary resources and reduces gene flow. Habitat fragmentation potentially exacerbates other threats, like predation by feral species, by providing access into habitats that were previously dense and difficult to traverse. These impacts are already present in the area due to roads and existing exploration tracks. Fauna are better able to persist in a modified landscape when vegetation patches are large and there are more links between patches.
- Increased Disturbance to Fauna and Fauna Habitats – The project has the potential to create a range of disturbance to fauna; noise, movement and light from heavy machinery, the workshop, road lighting, and the presence of people or vehicles. Fauna, including Malleefowl and Chuditch may avoid disturbance or experience increased stress, expending energy in avoidance behaviours. The project has potential for habitat degradation adjacent to operations with increased feral predators or weed proliferation.
- Increased Feral Fauna – Increased human activity can lead to an increase in feral predators which thrive in modified landscapes with additional water sources, food from rubbish tips and increased access along tracks and roads. Feral fauna, particularly predators such as foxes, cats and wild dogs, have the potential to negatively impact native fauna (including the Malleefowl and Chuditch), with predation by feral cats and foxes both recognised as key threatening processes.
- Changed Fire Regimes – Mining activities can cause accidental fires, though the risk is low, unplanned fires can also be caused by road accidents, lightning or arson. Large, unplanned bushfires are undesirable as they substantially change fauna habitats on a large scale. Fauna can be negatively impacted by fire with direct mortality experienced as well as a reduction required habitat such the loss of leaf-litter essential for building mounds.

8.4.5 Mitigation Measures

Management Plans have been prepared for the Chuditch and Malleefowl and are provided in Appendix 2 and Appendix 3, respectively. A summary of impact mitigation measures are provided below. Proposed management measures are also applicable to the maintenance of other fauna populations and habitat.

Avoid

- Avoid clearing of fauna habitat where existing disturbed areas can be utilised.
- Avoid unauthorised clearing though implementation of an internal clearing permit procedure.
- Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules (e.g. keeping to designated tracks, limited vehicle movements between dusk and dawn, reduced speed limits).
- Avoid accidental death and/or entrapment of fauna by installing egress points and/or fauna ladders in excavations and dams and/or regularly inspecting such facilities.
- Avoid attraction of both feral and native species to the Project footprint by implementing domestic waste management procedures (e.g. fencing of landfills, regularly covering putrescible waste, secure lids on bins).
- Avoid disturbance to active Malleefowl mounds:

  - Pre-clearance surveys will be completed prior to all clearing to record the presence/absence of Malleefowl and mounds in the area to be cleared.
  - Buffers (to be determined in consultation with DPaW) will be applied to active/recently active mounds to be flagged in the field as no-go zones.
- All active mounds will be avoided and flagged with appropriately sized buffers determined in consultation with DPaW. Where mounds occur in essential areas (for instance within the proposed pit footprint), the following will apply:
  - Clearing will be delayed for a suitable period of time that allows monitoring of the mound, to inform the most appropriate timeframe for clearing;
  - Clearing will preferentially be undertaken outside of the breeding season;
  - If clearing is unavoidable and the mound contains eggs, they will be removed and incubated, with chicks released to suitable habitat close to the Project or to another location as advised by DPaW.
- All Malleefowl mounds (active and inactive) will be recorded in a "Malleefowl Register" which will include date, observer, status of mound/Malleefowl and a GPS/location description.
- A suitably qualified environmental professional (fauna spotter) will be present during all land clearing. The person will hold a permit to handle and move significant fauna under Regulation 15 of the WC Act, and have access to a care facility that can be used to rehabilitate injured fauna.

Minimise

- Minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas and undertaking clearing in a progressive manner.
- Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock.
- Minimise the impacts of feral fauna (fox and cat) on native species through implementation of broader Project feral animal baiting program.
- Minimise injury and/or death of Chuditch during day time clearing by implementing a capture and release program by a suitably qualified and experienced environmental professional, in consultation with DPaW.

Rehabilitate

- Progressive rehabilitation will be undertaken in accordance with a Mine Closure Plan.
- Completion criteria will incorporate fauna and habitat restoration objectives.
- Kidman has maximised the use of the Mt Holland abandoned infrastructure and disturbed areas, such that the future operation can positively contribute to environmental values of the area by providing the means to rehabilitate State liabilities.

8.4.6 Impact Assessment

Following implementation of management measures, it is expected that no more than 365 ha of fauna habitat will be cleared over the 30 to 40 year LOM.

One active Malleefowl mound is located within the proposed pit footprint. Clearing of this mound will not be required for at least 18 months following commencement of operations. This provides Kidman with the opportunity to monitor the mound and determine the best method for protection of eggs, chicks and adults, should they still be present.

Impacts to Chuditch associated with clearing will be minimised (although not necessarily avoided) through a pre-clearing capture-and-release program that will be developed in consultation with DPaW and implemented on advice from DPaW.

Feral fox and cat control is considered one of the key factors that can assist in the maintenance of Chuditch and Malleefowl populations in the region. On this basis, a key corporate management commitment (discussed in Section

10) is to implement a broad scale investigation into the occurrence of feral species in the area as well as working with DPaW to contribute to regional feral animal control.

Following implementation of other management measures, the following impacts are considered to present a low risk to fauna and habitat:

- Increased fire: The presence of a long-term operation may result in an overall reduction in large scale wildfires through firebreak maintenance, early detection and response to fires.
- Increase in feral animal population: Implementation of the Project presents an opportunity for a long-term feral animal control program to be implemented in the region.
- Entrapment of fauna: Although possible, implementation of management measures will reduce the likelihood of fauna entrapment resulting in death or injury. It is unlikely that entrapment will affect the conservation status of species in the area.
- Vehicle strike: Although possible, implementation of management measures will reduce the likelihood of vehicle strikes resulting in death or injury to fauna. At low frequencies, although undesirable, it is unlikely that vehicle strikes will affect the conservation status of species in the area.

The Project offers a rehabilitation gain of approximately 45% of historic disturbance in the development envelope, through utilisation of State liability disturbance areas that will be rehabilitated by Kidman at closure or progressively during operations, thereby ultimately improving the continuity of habitat in the Project area.

8.4.7 Predicted Outcome

Through completion of comprehensive baseline studies, optimisation of the project footprint to utilise existing disturbed areas and implementation of stringent management measures, the Project is able to meet the EPA's objective to protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

8.5 Other Environmental Factors

Other environmental factors considered less likely to be impacted by the Project include:

- Terrestrial Environmental Quality.
- Landforms.
- Hydrological Processes.
- Inland Waters Environmental Quality.
- Air Quality.
- Human Health.

Information regarding each of these factors including a description of the potential environmental impact and preliminary management and mitigation actions is provided in Table 19. Guidance and policy documents that have been taken into consideration during the assessment of other factors have also been included in this table.

Table 19: Assessment of Other Factors

Guidance and Policy	Receiving Environment	Potential Impacts	Preliminary Mitigation and Management Actions	Predicted Outcome
Terrestrial Environmental Quality **EPA Objective: To maintain the quality of land and soils so that environmental values are protected.**				
• Environmental Factor Guideline – Terrestrial Environmental Quality (EPA 2016). • *Environmental Protection Act 1986* (Part V – Works Approvals and Licensing). • Guidance Statement No. 6: Rehabilitation of Terrestrial Ecosystems. Guidance for the Assessment of Environmental Factors (EPA 2006). • *Contaminated Sites Act 2003.*	• Three types of receiving environment: – Subdued relief, comprising Eucalyptus woodlands, shrublands of Allocasuarina and Acacia, and mixed heath of Melaleuca and Acacia. All partially disturbed from historic exploration activities. – Highly disturbed, cleared areas from historic mining activities. Geochemically benign. – Highly disturbed, potentially contaminated areas from historic mining activities (e.g. TSF, processing plant). • 2 main soil types: – Duplex sandy gravels. – Yellow/brown loamy duplex. • All Project (ore, wastes) materials are non-acid forming. There are no acid sulfate soils. • Oxide waste is naturally acidic, saline to extremely saline and dispersive. • Transitional waste is circum-neutral and slightly saline.	• Contamination of soils through spillage of reagents, chemicals, hydrocarbons, tailings or metalliferous, acidic or saline water. • Erosion of waste rock landforms and/or TSF and associated sedimentation. • Discharge of inadequately treated sewage effluent causing contamination of the environment. • Poorly designed and operated landfill causing contamination of the environment.	• Tailings are geochemically benign and do not require specific management measures other than those discussed under Section 2.7. • Oxide wastes are dispersive and unsuitable for use in rehabilitation and will be encapsulated using fresh waste rock material and/or coarse gravel rejects. • Waste rock landforms will be designed for long term stability: – Maximum batter angles of 16°. – Store-and-release, concave surface profiles. – Crest bunds. – Encapsulation of dispersive materials with fresh, competent waste rock. – Revegetation with local native species. • All hydrocarbon and chemical storages will be designed and constructed in accordance with Australian Standards AS1940 and AS1692. • Pipes transferring saline water or tailings will be located within bunds, fitted with leak detection systems and routinely inspected. • Chemicals and hydrocarbons will be stored and used within bunded areas. • Hydrocarbon wastes will be segregated from other wastes and collected for offsite disposal by a licensed contractor. • Spill kits will be located at strategic locations throughout the Project area and employees trained in their use. • Disturbance will be minimised through careful design of site layout and mine scheduling.	The potential for significant, gross impacts on terrestrial environmental quality are limited. The Project's waste products are non-acid forming and while oxide waste material is dispersive and unsuitable for use in rehabilitation, this can be adequately managed by returning the material to the pit void as part of progressive backfilling and through encapsulation with the abundant fresh waste rock material. Kidman considers that the potential impacts on terrestrial environmental quality can be adequately managed such that the EPA objective will be met with no significant residual impacts post closure.

Guidance and Policy	Receiving Environment	Potential Impacts	Preliminary Mitigation and Management Actions	Predicted Outcome
			Disturbed areas will be rehabilitated as they become available. • Topsoil will be stripped and stockpiled for later use in rehabilitation activities. • Topsoil stockpiles will be seeded if required to minimise erosion and develop a self-sustaining seedbank. • Water storages potentially storing saline or poor quality water will be lined to prevent or minimise seepage. They will be operated with adequate freeboard to store inflows associated with 1 in 100 year, 72 hour rainfall event. • Landfill and waste water treatment plants will be operated in accordance with an Environmental Licence.	
Landforms **EPA Objective: To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.**				
• Environmental Factor Guideline – Landforms (EPA 2016). • Environmental Assessment Guideline for Environmental Principles, Factors and Objectives, (EAG 8). (EPA 2015). • Guidance on the EPA Landforms Factor. Environmental Protection Bulletin Number 23 (EPA 2015).	• The Project area is generally flat to gently undulating, other than existing man-made landforms associated with the historic mining operation. • Existing landforms used under the Proposal are either unrehabilitated or poorly rehabilitated. • No landforms within Project tenements are listed on the Western Australian Geoheritage Sites database. • Baseline studies have not identified any uncommon landforms within Project tenements that could be considered important at a local, regional or national level. • No presence of banded iron formations, dunes or dune fields, ridgelines, or caves or cave systems.	• Permanent changes to the landscape through development of an open pit and construction of waste rock landforms and TSF. • Post-mining constructed landforms are inconsistent with the surroundings. • Medium term changes to the landscape for construction and operation of Project elements. Such impacts are for the life of the Project only. • Concentration of stormwater flows through landscape modification and increased erosion within disturbed areas.	• Development of a MCP in accordance with joint DMP and EPA Guidelines for Preparing Mine Closure Plans (2015). • Constructed landforms will be rehabilitated to blend in with the surrounding landscape as far as practicable. • Project design minimises new disturbance whilst maximising use of existing disturbance. • Existing disturbance and landforms used under the proposal will be rehabilitated in accordance with a MCP. • Disturbed areas will be progressively rehabilitated as they become available.	The main outcome will be the creation of permanent, rehabilitated waste rock landforms and TSF. The Mt Holland area already contains numerous comparable landforms, however most have been inadequately rehabilitated due to poor planning, implementation and survey control. Final landform designs for the Project will be developed as part of the MCP, resulting in post closure landforms that are safe, stable and blend in with the surrounding landscape. On this basis, Kidman considers that the EPA objective for this factor will be met.

Guidance and Policy	Receiving Environment	Potential Impacts	Preliminary Mitigation and Management Actions	Predicted Outcome
Hydrological Processes **EPA Objective: To maintain the hydrological regimes of groundwater and surface water so that environmental values are protected.**				
• Environmental Factor Guideline – Hydrological Processes (EPA 2016). • Position Statement 4 – Environmental Protection of Wetlands (EPA 2004). • Department of Water. 2013. Western Australia Water in Mining Guideline. Water licensing delivery report series. Report No. 12. Perth, Western Australia. • *Environmental Protection Act 1986* (Part V – Works Approvals and Licensing). • *Rights In Water and Irrigation Act 1914.*	**Surface Water** • Located in upper headwaters of the DoW Lake Eva sub-catchment of the Avon/Yilgarn Basin. • Natural drainage within the Mt Holland Mine Site has been significantly altered due to the construction of roads, ditches, bunds and other landforms. • Drainage generally occurs as sheetflow across most of the area. • Many existing constructed landforms across Mt Holland, with no significant impacts to local hydrology. • No groundwater dependent ecosystems. • No pools or wetlands. • No other beneficial groundwater users in the region. **Groundwater** • Low yielding aquifer in Earl Grey deposit area with saline to hypersaline groundwater encountered from 58 to 70 m below ground level. • Project water supplies comprise existing borefields located in the Bounty mine area and south of the accommodation village. • Existing borefield in Bounty mine area with current groundwater licence and allocation of 630,000 kL. • Existing, high yielding southern borefield in caprock aquifer with water table approximately 10 - 18 m below ground level.	• Impacts to aquifer water quality as a result of mine activities. • Formation of a cone of depression in the watertable in immediate vicinity of the pit and borefields as a result of abstraction and mine dewatering. • Localised reduction in surface water volumes. • Ponding of water in Project areas. • Flooding of the Project area and associated project elements.	• A detailed hydrological review and on-going monitoring will be conducted to ensure sustainable groundwater abstraction. • Kidman will seek approval from DoW for Project groundwater abstraction for the purposes of mining, dust suppression and ore processing. • All groundwater abstraction will be conducted in accordance with the *Rights in Irrigation and Water Act 1914*. • No requirement for discharge to the environment. • Water requirements reduced through internal recycling (e.g. return water from TSF) and optimisation of the processing system. • Project design has incorporated surface water diversion measures to minimise risk of flooding or ponding of Project areas. • Project design will consider flood levels and make adequate provision to minimise risk of flooding Project areas. • Existing drainages will be remediated in areas utilised by Kidman. • Culverts or floodways will be installed where necessary to maintain natural drainage. • The MCP will seek to reinstate natural drainage as far as practicable upon closure. • Existing, proven borefields. The hydrogeology of these borefields is well understood from the 10+ years of operation associated with historic mining activities. • Groundwater monitoring bores will be installed/refurbished in accordance with a site wide groundwater management plan to monitor groundwater levels and quality.	The Project will result in drawdown of the aquifer (Earl Grey, Bounty Mine water supply and southern borefield). As groundwater quality is saline to hypersaline and as there are no other beneficial water users in the area, Kidman considers the potential impacts to be minimal. Natural drainage is restricted within the Mt Holland area due to existing roads, bunds and other landforms. This will be improved through implementation of the Project, particularly at closure through reinstatement of natural drainage lines, as far as practicable, resulting in a net improvement to the local hydrology. Kidman considers that the potential impacts of the Project to hydrological processes can be adequately managed such that the EPA objective for this factor will be met and that residual impacts are therefore acceptable.

Guidance and Policy	Receiving Environment	Potential Impacts	Preliminary Mitigation and Management Actions	Predicted Outcome
Inland Waters Environmental Quality **EPA Objective: To maintain the quality of groundwater and surface water so that environmental values are protected.**				
• Environmental Factor Guideline – Inland Waters Environmental Quality (2016). • Position Statement 4 – Environmental Protection of Wetlands (EPA 2004). • Department of Water – Water quality monitoring program design: A guideline for field sampling for surface water quality monitoring programs. • *Rights In Water and Irrigation Act 1914.* • Western Australia Water in Mining Guideline. Water licensing delivery report series. Report No. 12. Perth, Western Australia (Department of Water 2013).	**Surface Water** • Located in the upper headwaters of the Lake Eva sub-catchment of the Avon/Yilgarn Basin. • No permanent surface water features in proximity to the Project. • All other drainage occurs as sheetwash. • Stormwater runoff from the two existing paddock TSFs (TSF1 and TSF2) is expected to be poor quality. • Other drainage is expected to be high in suspended solids due to concentration of flows from constructed landforms (e.g. roads, ditches), but otherwise good quality. **Groundwater** • Low yielding aquifer in Earl Grey deposit area with saline to hypersaline groundwater. • Relatively deep watertable in the Earl Grey deposit area (58 to 70 m below ground level). • Project water supplies comprise existing borefields located in the Bounty mine area and south of the accommodation village. • Southern borefield is in a high yielding caprock aquifer with a water table approximately 10 - 18 m below ground level. • All water sources are saline to hypersaline. • No other beneficial groundwater users or receptors/	• Contamination of drainage lines from metalliferous or saline water, tailings or hydrocarbon spills. • Contamination of groundwater due to seepage from mine waste landforms (TSF, WRDs). • Contamination of underlying groundwater due to mixing with waters formed in a pit lake after closure. • Increased sediment entering drainage lines during construction or following periods of high rainfall.	• Project design has considered existing hydrology and the proposed site layout has been designed to minimise impacts on the hydrological regime. • Diversion bunds will be constructed to separate clean and potentially contaminated water around the processing plant area. • Potentially contaminated water will be captured and either re-used, transferred to the TSF or to a lined evaporation pond. • Pipes transferring poor quality water (e.g. saline water or tailings) will be located within bunds, fitted with leak detection systems and routinely inspected. • Chemicals and hydrocarbons will be stored and used within bunded areas. • Hydrocarbon transfer operations will occur within bunded areas. • Spill kits will be located at strategic locations throughout the project area and employees trained in their use. • Water storages potentially storing saline or poor quality water will be lined to prevent or minimise seepage. • Sediment control measures will be implemented during construction and operations. • Routine groundwater monitoring. • Opportunistic surface water monitoring.	There are no permanent surface water features in the Project area. Existing areas where elevated sedimentation and erosion rates occur, due to concentrated stormwater flows, will be improved where used by Kidman resulting in a net improvement to surface water quality. This is particularly relevant at closure where Kidman will reinstate natural drainage patterns as far as practicable in areas used under this proposal. Local groundwater is saline to hypersaline and relatively deep, particularly in the Earl Grey deposit area and Bounty mine water supply area. There is limited potential to significantly impact groundwater quality with the geochemically benign Project waste products. The proposed use and encapsulation of existing tailings storage facilities is expected to significantly reduce the contamination of surface water and groundwater. All potential impacts to inland waters environmental quality can be adequately managed using standard

Guidance and Policy	Receiving Environment	Potential Impacts	Preliminary Mitigation and Management Actions	Predicted Outcome
	• Overall groundwater quality across Project water supplies contains slightly elevated concentrations of metals, well below livestock drinking water guidelines (ANZECC 2000).			practices. On this basis, Kidman considers that the potential impacts of the Project to inland waters environmental quality can be adequately managed such that the EPA objective for this factor will be met and that residual impacts are therefore acceptable.
Air Quality **EPA Objective: To maintain air quality and minimise emissions so that environmental values are protected.**				
• Environmental Factor Guideline – Air Quality (EPA 2016). • A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and Other Related Activities (DEC 2011). • Environmental Protection Bulletin No .24: Greenhouse Gas Emissions and Consideration of Projected Climate Change Impacts in the EIA Process (EPA 2015). • National Environmental Protection (Ambient Air Quality) Measure (2003).	The Mt Holland Project is remote and the nearest receptor, Marvel Loch, is located approximately 70km to the north. As there are no other industries in the area, existing air quality is expected to be good, although bush fires are common in the region and can significantly degrade the quality of local and regional airsheds.	• Generation of dust via: – Land clearing during construction. – Open pit blasting. – Material handling within the open pit. – Crushing processes. – Erosion of the TSF surface. – Erosion from topsoil, waste rock and ore stockpiles. – Vehicle movement on unsealed roads within the project area. – Power generation and vehicle exhaust. • Generation of greenhouse gas emissions via engine exhaust emissions from construction	• Dust suppression measures will be implemented using water sprays and other means, as necessary. • Site roads will be properly formed and compacted with appropriate drainage. • The accommodation village has adequate separation from mining elements and activities to minimise adverse impacts. • Vehicle traffic will be confined to defined roads and tracks. • Disturbed areas will be rehabilitated progressively as they become available. • The moisture content of the TSF will be managed such that the potential for dust generation is minimised. • Energy efficiency and greenhouse gas emissions will be considered as part of equipment selection and purchase. • Vehicles and power generation equipment will be maintained to minimise emissions. • The nearest town (Marvel Loch) is 70 km away and beyond the range of any impacts of the Project. • The processing plant crushing circuit will include a dust collector that will draw dust from the ore transfer points in the process stream.	As there are no nearby sensitive receptors and as Project emissions can be adequately managed through standard practices, Kidman considers that the EPA objective for this factor will be met.

Guidance and Policy	Receiving Environment	Potential Impacts	Preliminary Mitigation and Management Actions	Predicted Outcome
			• Euro V standard vehicles and equipment (post 2009) or appropriate quality diesel fuel will be used to minimise NOx and particulate emissions.	
Human Health **EPA Objective: To protect human health from significant harm.**				
• Environmental Factor Guideline – Human Health (EPA 2016). • *Environmental Protection Act 1986* (Part V – Works Approvals and Licensing). • A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites Remediation and Other Related Activities (DEC 2011). • EPA Guidance Statement No. 3, Separation Distances between Industrial and Sensitive Land Uses (EPA 2005). • National Environment Protection Measure for Ambient Air Quality 1994 as Amended 2003 (NEPC 2003).	The Mt Holland Project is remote and the nearest receptor, Marvel Loch, is located approximately 70km to the north. Project products, including all waste products, are non radioactive. Some of the existing disturbed areas, notably the TSFs and processing plant area may represent a risk to human health.	The Project area is remote and is not visited by people other than mine workers. Potential impacts on employee health relevant to the EP Act include: • Noise. • Air quality (particulates). • Chemical exposure.	• Project design has considered exposure to noise and dust emissions. The accommodation village has adequate separation to minimise adverse impacts. • Compliance with occupational hygiene requirements for noise, dust and chemicals in operational areas. • Rehabilitation of historically disturbed areas utilised by Kidman, including high risk areas such as TSF1 and the processing plant area.	Human health aspects can be adequately managed through standard operational practices as well as under the EP Act (Part V – Works Approvals and Licensing). The Project will result in a positive outcome with regards to reducing the long term risk to human health associated with potentially contaminated areas such as TSF1 and the processing plant area. On this basis, Kidman considers that the EPA objective for this factor will be achieved.

9. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

Commonwealth approval under the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* is required if matters of national significance, as defined in the EPBC Act, are triggered. The DoEE is responsible for administering the Act. Matters of national significance include presence of migratory birds, federally listed rare flora or fauna, Commonwealth land, nuclear actions and marine areas. A referral can be made by a Project proponent or any other person aware of the project.

Following comprehensive flora and fauna searches of the Project area, in combination with an EBPC Act Matters Search, the following Matters of National Significance were recorded in the development envelope:

- Chuditch (Dasyurus geoffroii).
- Malleefowl (Leipoa ocellata).
- *Banksia sphaerocarpa* var. *dolichostyla*.

A summary of impacts associated with each of these species is provided below.

Chuditch

Eighteen individual Chuditch were trapped in Project surveys (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. The population extends well beyond the Project footprint and is likely to extend further to the east, south and north of the survey area (refer to Section 7.10).

Following implementation of management measures (described in Section 8.4), it is expected that no more than 365 ha of fauna habitat will be cleared over the 30 to 40 year life of mine. Impacts to Chuditch associated with clearing will be minimised (although not necessarily avoided entirely) through a pre-clearing capture-and-release program that will be developed in consultation with DPaW and implemented on advice from DPaW.

A Chuditch Management Plan has been prepared and will be further refined in consultation with relevant government agencies. It incorporates management of impacts associated with clearing, feral animals, domestic waste, vehicles movements, fire, noise, light and dust.

Overall, the Project is considered to pose a relatively low risk to Chuditch and offers environmental gains associated with rehabilitation of historic disturbance, contribution of knowledge on the species through implementation of monitoring programs, and opportunities to enhance conservation efforts through feral animal monitoring and control, which is considered one of the greatest risks to the species.

Malleefowl

Five bird sightings, four active mounds and 17 inactive mounds were recorded over a board study area of which one bird sighting, one active mound and eight inactive mounds (including mound attempts) occurred in the development envelope. Malleefowl in the general area are likely to range over all habitats, favouring patches of shrubland on gravelly sands for mound construction (refer to Section 7.10).

One active Malleefowl mound is located within the proposed pit footprint. Clearing of this mound will not be required for at least 18 months following commencement of operations. This provides Kidman with the opportunity to monitor the mound and determine the best method for protection of eggs, chicks and adults, should they still be present. Over a 30 – 40 year life of mine, there is also potential for new mounds to be constructed in proposed clearing areas. Consequently, all proposed clearing areas will be subject to pre-clearance searches during the life of mine.

Feral fox and cat control is considered one of the key factors that can assist in the maintenance of Malleefowl populations in the region. On this basis, a key corporate management commitment (discussed in Section 10) is to implement a broad scale investigation into the occurrence of feral species in the area as well as working with DPaW to contribute to regional feral animal control.

A Malleefowl Management Plan has been prepared and will be further refined in consultation with relevant government agencies. It incorporates management of impacts associated with clearing, feral animals, domestic waste, vehicles movements, fire, noise, light and dust.

Overall, the Project is considered to pose a relatively low risk to Malleefowl and offers environmental gains associated with rehabilitation of historic disturbance, contribution of knowledge on the species through implementation of monitoring programs, and opportunities to enhance conservation efforts through feral animal monitoring and control, which is considered one of the greatest risks to the species.

Banksia sphaerocarpa var. dolichostyla

Flora surveys of the Project area recorded 521 *Banksia sphaerocarpa* var. *dolichostyla* taxa. None of these records occur within the project footprint as the project has been deliberately designed to avoid any clearing of *Banksia sphaerocarpa* var. *dolichostyla* taxa.

A *Banksia sphaerocarpa* var. *dolichostyla* Management Plan has been prepared and will be further refined in consultation with relevant government agencies. It incorporates management of impacts associated with clearing (including accidental and unauthorized clearing), weeds, spillages (e.g. saline water and tailings), fire and dust.

Overall, the Project is considered to pose a relatively low risk to *Banksia sphaerocarpa* var. *dolichostyla* as no species will be directly impacted by the proposed action. Additionally, implementation of the Project offers potential environmental gains associated with this species including improved knowledge of the species, response and assistance with fire control and rehabilitation of historic mining disturbances that are now the liability of the State of Western Australia.

No other species protected under the EPBC Act have been recorded or are expected to occur in the development envelope. There are no other Matters of National Significance triggered by the proposed action.

This supporting document to the referral provides a detailed description of the species distribution, associated habitat, management and mitigation measures and residual impacts, to assist in DoEE's assessment.

Should the DoEE determine the Project to be a controlled action, Kidman proposes that the Project be assessed under the Native Vegetation Clearing Permit (NVCP) process, which is an accredited process under the Bilateral Agreement between the Commonwealth of Australia and the State of Western Australia. The NVCP process is considered an appropriate process for this Project for the following reasons:

- Environmental issues associated with the Project relate to terrestrial flora, fauna and habitat, which are the key focus areas of a NVCP assessment.
- There are no other significant environmental or social issues associated with the Project.
- The NVCP includes a 20 day public review and submissions period and a 20 day public appeals period.

A referral under the EPBC Act is scheduled for May 2017.

10. OFFSETS

Based on the small footprint, low risk operation and proposed management measures to further reduce and contribute to maintenance of environmental values, formal offsets are not considered necessary.

As a responsible corporate citizen, this proposal has committed to the following measures that demonstrate Kidman's commitment to ecological sustainable development and offer a net environmental gain through implementation of the Project:

- **Rehabilitation of State Liability Disturbance**: Kidman's approach to optimising use of the existing disturbed footprint results in a loss of only 365 ha of vegetation over the 30 to 40 year LOM, whilst providing rehabilitation of 210 ha of disturbance (including two tailings storage facilities) that is a liability of the State of Western Australia. The work associated with closing and rehabilitating State liability disturbance that Kidman is utilising is estimated to represent approximately $15 million.
- **Research and Control of Feral Fauna Populations**: Kidman is committed to ensuring operations do not contribute to increased numbers in feral animal populations. In order to determine if additional control measures (e.g. baiting) are required to maintain low feral animal populations, Kidman proposes to conduct a baseline study in to the existing feral fauna populations (focussing on the fox and cat population) in the broader area. This information is intended to provide a baseline for comparison of feral animal numbers over the LOM, with subsequent monitoring proposed on a biennial basis for the first six years of operations.
- **Monitoring of Chuditch and Malleefowl**: Although the impacts to Chuditch and Malleefowl habitat are relatively small over the LOM, Kidman proposes to implement a broader regional camera monitoring program to assist in gathering information on the distribution and density of the species populations. The methodology will be developed in consultation with DPaW and all data gathered will be provided to DPaW and DoEE.
- **Contribution to the Western Shield Program**: In addition to the conservation initiatives described above, Kidman is committed to providing a financial contribution to the Western Shield Program, DPaW's lead animal conservation program.

11. CONCLUSIONS AND HOLISTIC IMPACT ASSESSMENT

The Project is located in a remote brownfields mine site that was abandoned in 2001 and remains largely unrehabilitated. Existing infrastructure includes several areas that are considered to represent a risk to human health and safety and the environment. Implementation of the Project will have three key environmental benefits:

- The first benefit is the Project's contribution to a more sustainable energy market with an increased demand in lithium ion batteries. This has a significant role in satisfying the principle of intergenerational equity, particularly with the 30 to 40 year life of mine.
- The second key benefit is the rehabilitation of a significant area of abandoned mine disturbance, including areas that represent a risk to human health and safety and the environment.
- The third is a voluntary commitment to conservation programs including feral animal control and threatened species monitoring. This information can be used to guide management practices both at a local and regional scale and will contribute to the overall knowledge of species in the areas.

A thorough understanding of the surrounding environment has been attained through review of historic documentation and studies, as well as through completion of baseline studies undertaken specifically for the Project. This has contributed significantly to the scientific understanding of the area and has allowed Kidman to design the Project in a way that identifies, prevents and minimises adverse environmental impacts. Kidman has also engaged key stakeholders through an extensive stakeholder consultation program.

Overall, the Project has the potential to provide a net environmental benefit to the region by providing a practical means of rehabilitating a significant portion of the State disturbance liability, in combination with a commitment to contribute to regional conservation programs.

12. REFERENCES

ANZECC 2000. *National Water Quality Management Strategy, Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand.

ANZMEC / MCA (2000). *Strategic Framework for Mine Closure*. Australian and New Zealand Minerals and Energy Council & Minerals Council of Australia.

Beard J.S. (1972) *Vegetation survey of Western Australia. The Vegetation of the Hyden Area, Western Australia. Map and explanatory memoir. 1:250,000 series*. Vegmap Publications, Sydney.

Beard, J.S. (1990) *Plant Life of Western Australia*. Kangaroo Press, Kenthurst NSW.

Bureau of Meteorology (2016) *Climate Data Online*, Bureau of Meteorology, Commonwealth of Australia http://www.bom.gov.au/climate/averages/

Blueprint Environmental Strategies (2017). *Targeted Surveys for Threatened Flora Species Banksia sphaerocarpa var. dolichostyla – Summary Report.* Unpublished report prepared for Kidman Resources Limited.

Department of Agriculture and Food Western Australia (2017). *Western Australian Organism List*. https://www.agric.wa.gov.au/bam/western-australian-organism-list-waol

Department of Mines and Petroleum and Environmental Protection Agency (2015). *Guidelines for Preparing Mine Closure Plans*.

Department of Parks and Wildlife (2017). *Western Australian Flora Statistics*. Accessed 9th February 2017 http://florabase.dpaw.wa.gov.au/statistics/

Environmental Protection Authority (2016a). *Statement of Environmental Principles, Factors and Objectives*. EPA, Western Australia.

Environmental Protection Authority (2016b). *Environmental Factor Guideline – Terrestrial Fauna*. EPA, Western Australia.

Environmental Protection Authority PA (2016c). *Technical Guidance – Terrestrial Fauna Surveys*. EPA, Western Australia.

Environmental Protection Authority and Department of Environment Conservation (2010). *Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. (eds B.M. Hyder, J. Dell and M.A. Cowan). Perth, Western Australia.

Groundwater Resource Management (2014). *Blue Vein Hydrogeological Desktop Study Mount Holland Project*. Unpublished Report prepared for Convergent Minerals Limited.

Groundwater Resource Management (2017). *Mount Holland: - February 2017 Airlift Testing Summary Results.* Unpublished Report prepared for Kidman Resources Limited.

Harvey, M. S. (2002). *Short-range endemism amongst the Australian fauna: some examples from non-marine environments*. Invertebrate Systematics. 16 (4): 555

Mattiske Consulting (2017). *Flora and Vegetation of the Earl Grey, Irish Breakfast and Prince of Wales Prospects*. Unpublished report to Kidman Resources Limited.

MBS Environmental (2017a). *Earl Grey Lithium Deposit Soil and Landform Assessment*. Unpublished report prepared for Kidman Resources Limited.

MBS Environmental (2017b). *Earl Grey Lithium Deposit Waste Rock Characterisation*. Unpublished report prepared for Kidman Resources Limited.

Native Vegetation Solutions (2014). *Targeted Threatened Flora Search 2014- Convergent Minerals Ltd, Mount Holland Gold Projec*t, Unpublished memorandum prepared for Convergent Minerals Ltd, 8th October 2014.

Native Vegetation Solutions (2016). *Threatened Flora Targeted Survey For Kidman Resources Ltd- Mt Holland Gold Project, Earl Grey Prospect.* Unpublished report to Kidman Resources Limited.

URS (2002). Bounty Gold Mine Borefield Aquifer Review July 2001 to June 2002.

Western Wildlife (2017). *Mt Holland Project: Earl Grey, Irish Breakfast, Prince of Wales, Van Uden Level 2 Vertebrate Fauna Survey and Targeted Chuditch Survey 2016 – 2017*. Unpublished Report for Kidman Resources Limited.

Western Heritage Research Pty Ltd (2005). *A Report of an Ethnographic Survey of mining Tenements at the Mounty Mine, Near Forrestania*. Unpublished Report prepared for Montague Resources NL.

APPENDICES

All appendices provided separately

APPENDIX 1: *BANKSIA SPHAEROCARPA VAR. DOLICHOSTYLA* MANAGEMENT PLAN

APPENDIX 2: CHUDITCH MANAGEMENT PLAN

APPENDIX 3: MALLEEFOWL MANAGEMENT PLAN

APPENDIX 4: SOIL ASSESSMENT

APPENDIX 5: FLORA AND VEGETATION ASSESSMENT

APPENDIX 6: SUMMARY OF TARGETED THREATENED FLORA SEARCHES

APPENDIX 7: FAUNA AND HABITAT ASSESSMENT

APPENDIX 8: WASTE AND TAILINGS CHARACTERISATION