


# Chuditch (*Dasyurus geoffroii*) Management Plan Earl Grey Lithium Project



**Version No. 1**

**May 2017**

## DOCUMENT CONTROL

Version	Date	Authorisation	Signature
1.0	15 May 2107	Siobhan Pelliccia	

## EXECUTIVE SUMMARY

This Chuditch Management Plan is submitted to support environmental referrals under the *Environmental Protection Act 1986* and *Environment Protection and Biodiversity Conservation Act 1999* for the Earl Grey Lithium Project which will be developed by Kidman Resources Limited (Kidman). Table 1 presents the purpose of the Chuditch Management Plans in the context of Western Australian Environmental Protection Authority (EPA) objectives.

**Table 1: Purpose of the Chuditch Management Plan**

Item	Description
Title of proposal	Earl Grey Lithium Project
Proponent name	Kidman Resources Limited
Ministerial Statement number	Not applicable
Purpose of the Management Plan	This Management Plan is submitted to support referrals under the <i>Environmental Protection Act 1986</i> and the <i>Environment Protection and Biodiversity Conservation Act 1999</i> . The purpose of this Chuditch Management Plan is to provide a framework to ensure that impacts on the Chuditch attributable to the Earl Grey Lithium Project are minimised and impacts do not conflict with the EPA objective for terrestrial fauna.
Key environmental factor	Terrestrial Fauna - Chuditch ( <i>Dasyurus geoffroii</i> )
Objective	Terrestrial Fauna: To maintain the representation, diversity, viability and ecological function at the species, population and community levels.

This Chuditch Management Plan is designed to be adaptive and will be updated over the life of the project (approximately 30 to 40 years) with increased knowledge about Chuditch in the Great Western Woodlands, and the effectiveness of implemented management measures. Prior to commencement of mining Kidman will update this plan in consultation with all relevant government departments as required. As such this plan remains a working document. Table 2 presents the environmental criteria to measure achievement of environmental objectives through implementation of this Management Plan.

**Table 2: Environmental Objectives and Targets**

Objectives	Targets
Minimise the potential for clearing activities to cause injury or death to terrestrial fauna, including the Chuditch.	Minimal deaths due to direct interaction with equipment and machinery.
Minimise the potential of vehicle strike causing injury or death to terrestrial fauna, including the Chuditch.	Minimal death attributable to light vehicle strike, use of unauthorised tracks or off-road driving.
Minimise entrapment leading to injury or death of terrestrial fauna, including the Chuditch.	Minimal death due to entrapment in drill holes, containers, bins, open excavations, trenches, landfill or water holding facilities.
Minimise requirements for clearing which results in habitat loss and fragmentation	No unauthorised clearing/ clearing outside approved clearing areas. Progressive rehabilitation undertaken.
Minimise pollution from light and noise	Compliance with industry requirements for noise and light emissions. Light emissions limited to project.
Minimise increases to predator abundance (cat, dog, fox)	Waste and water sources not available to feral predators. Predator control program implemented. No increase in predator abundance.
No increase in fire frequency or intensity	No fires attributed to mining and associated activities.

The key provisions of the plan to protect terrestrial fauna, including the Chuditch, are considered to be:

- Monitoring of the Chuditch population in a manner deemed best practice following consultation with DPaW, potentially through camera and cage trapping.
- Implementation of an internal clearing permit procedure.
- A capture and release program may be implemented during land clearing. This will be confirmed following consultation with DPaW on the most effective harm mitigation practice.
- Management of waste facilities (landfills) to reduce attraction of fauna to the Project.
- Display and enforcement of speed limits on Project roads.
- Implementation of strict traffic management rules to reduce the incidence of vehicle strikes.
- Feral animal control for the project and coordination with regional programs.
- Staff training and awareness including an induction and Toolbox sessions.
- Progressive rehabilitation, including rehabilitation of some abandoned disturbed areas.

A summary of the location of the complete environmental management provisions of the Chuditch Management Plan are provided in Table 3.

**Table 3: Key Provisions of the Chuditch Management Plan**

Key Provision	Location in Chuditch MP
Rationale for choosing management based provisions.	Section 1.4
Comprehensive list of management actions.	Section 2.2, Table 5
Comprehensive summary of management targets.	Section 2, Table 5

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## APPENDICES

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# 1. Context, Scope and Rationale

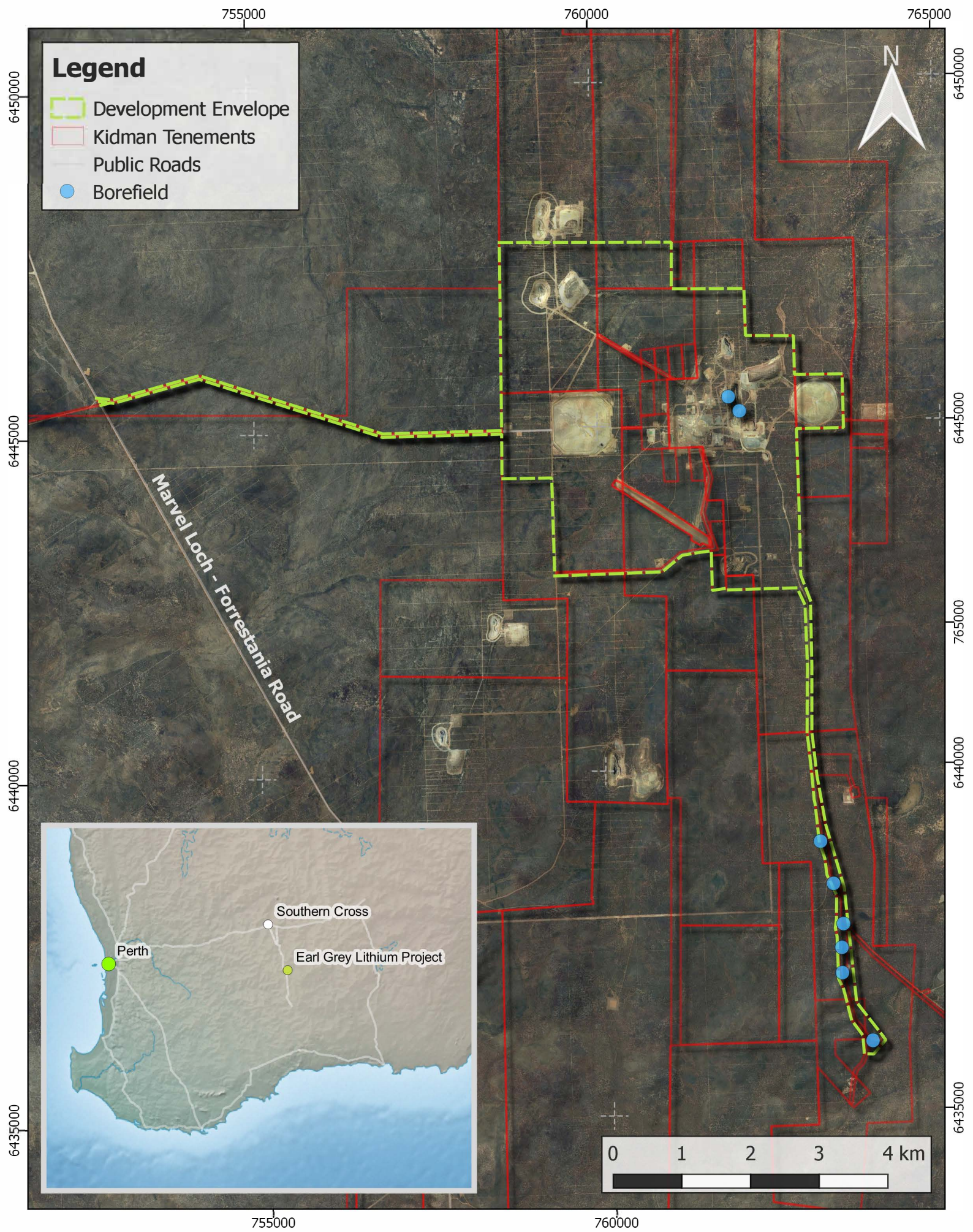
This section includes a summary of the proposed Project and its key features. Information is also provided on the Chuditch including survey findings, biology and distribution, assumptions and uncertainties, management approach that will be taken and the rationale for the approach.

## 1.1 Proposal

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 un-rehabilitated and currently a liability of the State of Western Australia. Construction of the Project is scheduled to commence in Quarter 3 2017, with mining scheduled for Quarter 1 2018. The Project is located on tenure granted under the *Mining Act 1978*. The development envelope and conceptual Project footprint is shown in Figure 2.

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).
- Processing of lithium ore at a rate of 3 million tonnes per annum, through a newly constructed gravity separation and floatation 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 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), thereby reducing the project footprint and providing a rehabilitation solution to the State liability landform.
- Disposal of unmineralised waste rock to three locations:
  - Stockpiling of waste rock over the abandoned and unrehabilitated Tailings Storage Facility 1 (TSF 1), thereby reducing the disturbance footprint and providing a rehabilitation solution to the State liability landform (hereby referred to as Waste Rock Dump (WRD) 1).
  - Backfilling of the Earl Grey pit as mining progresses from south to north (hereby referred to as WRD 2), thereby reducing the disturbance footprint and the area of open pit remaining at closure.
  - 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 end of 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.

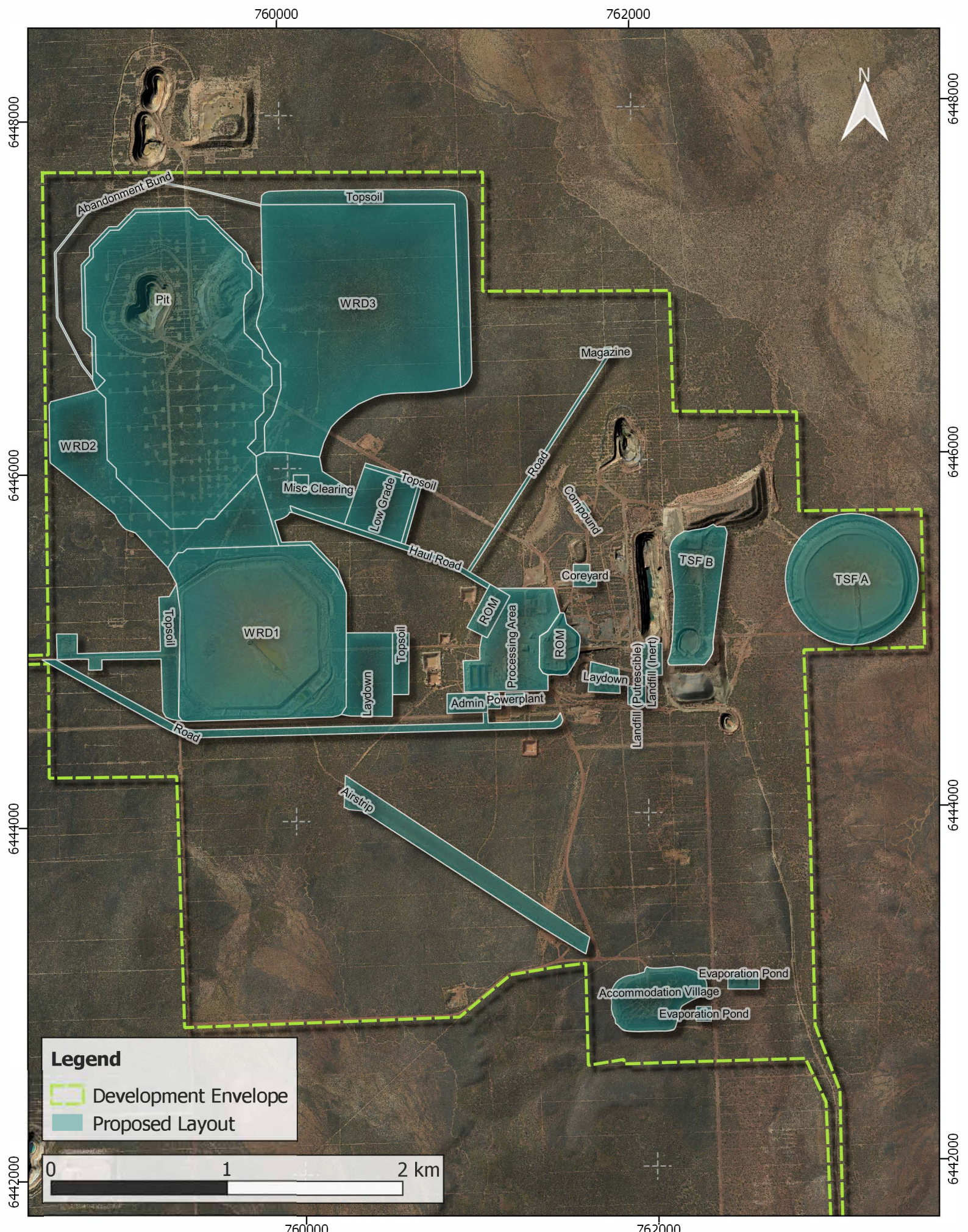


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**Kidman Resources Limited  
 Earl Grey Lithium Project**

**Figure 1**  
**Location Plan**

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**Figure 2**  
**Proposed Site Layout**

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## 1.2 Key Environmental Factor: Terrestrial Fauna (Chuditch)

The EPA's objective for protection of terrestrial fauna is to maintain representation, diversity, viability and ecological function at the species, population and assemblage level.

Fauna surveys of the Project area have shown the Chuditch (*Leipoa ocellata*) to be present. The Chuditch is a species of conservation significance, listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* and Schedule 3 Vulnerable (fauna that is rare or is likely to become extinct) under the *Wildlife Conservation Act 1950*.

The following aspects of the Project have been identified as having the potential to impact terrestrial fauna, including the Chuditch:

- Clearing activities causing injury or death – Clearing of vegetation with heavy vehicles may cause direct mortality or injury of Chuditch.
- Vehicle strike causing injury or death – Species may be at risk of direct mortality or injury by project vehicles.
- Entrapment – Chuditch may become trapped in containers, uncapped drill holes, trenches, excavations or water storage structures.
- Habitat Loss - Chuditch are likely to occur throughout the Project areas in all habitats, though they may be temporarily absent in areas that have been recently and extensively burnt. All Chuditch breeding or foraging habitat in the area is considered 'critical habitat' for this species, and clearing, including the creation of new gaps in an otherwise homogenous habitat area, is regarded as a current threat to this species.
- Habitat Fragmentation – Fragmentation of fauna habitat from land clearing reduces the ability of individual Chuditch 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 Chuditch; noise, dust, movement and light from heavy machinery, lighting and the presence of people or vehicles. Chuditch may avoid disturbance or experience increased stress, expending energy in avoidance behaviours.
- 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 the 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. The Chuditch is negatively impacted by fire with direct mortality experienced as well as a reduction in habitat.

## 1.3 Condition Requirements

No specific conditions relating to Chuditch currently apply to the Project. This Management Plan is submitted with the environmental referrals in order to satisfy the Environmental Protection Authority (EPA) and the Department of the Environment and Energy (DoEE) that Kidman has taken into consideration the environmental objectives set for terrestrial fauna, specifically the Chuditch, and are committed to implementing the Project in a manner that meets these objectives.

## 1.4 Rationale and Approach

### 1.4.1 Survey and Results

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 4. The surveys covered areas both within and outside of the development envelope and comprised identification of fauna habitats, trapping for terrestrial fauna, bird surveys, bat echolocation survey, spotlighting and targeted searches for evidence of conservation significant species.

**Table 4: Details of Fauna Surveys Completed in the Project Area and Surrounds**

Date	Survey Type	Survey Details
10 – 15 Oct 2016	Reconnaissance survey with targeted searches for Chuditch in the Earl Grey area (Figure 3)	<ul style="list-style-type: none"> <li>Literature review and database searches.</li> <li>Opportunistic records taken.</li> <li>Habitats of the Earl Grey study area recorded and mapped.</li> <li>Deployment of 12 baited camera traps established for 5 nights totaling 60 trap nights at Earl Grey (Figure 3).</li> </ul>
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 envelop (Figure 3). Prince of Wales and Van Uden study areas fall outside the development envelop, however provide further regional context to the fauna and habitat assessment.	<ul style="list-style-type: none"> <li>Trapping – 12 sites established (Figure 3) comprising: <ul style="list-style-type: none"> <li>10 pitfall traps, 10 baited funnel traps, 10 baited Elliott traps and 2 baited cage traps for 8 nights.</li> <li>Each site had 80 pitfall trap-nights, 80 funnel trap-nights, 80 Elliott trap-nights and 16 cage trap-nights.</li> <li>The survey had 960 trap-nights for pitfalls, funnels and Elliott traps, and 192 trap-nights for cages.</li> </ul> </li> <li>Birds: 7 x 20 minute surveys undertaken at each trapping site.</li> <li>Bats: SM2 ultrasonic bat detectors deployed for 1 night at each trapping site and the camp.</li> <li>Spotlighting: 2 nights, 6 people in 3 teams using road-spotting and head-torching.</li> <li>Opportunistic records taken.</li> <li>Habitats recorded and mapped.</li> <li>Deployment of 45 baited camera traps for 4 or 5 trap nights totaling 189 trap nights (Figure 3).</li> </ul>
15 Jan – 25 Feb 2017	Regional camera trapping.	<ul style="list-style-type: none"> <li>Deployment of 44 baited camera traps deployed for 13 to 24 nights resulting in 794 trap nights (Figure 3).</li> <li>Vegetation and habitat descriptions taken at camera trap locations.</li> </ul>

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### Legend

- Cage Trap Site
- ⊙ Camera Trap Site
- ▭ Development Envelope



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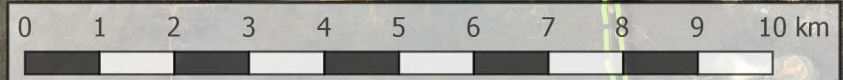
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Prince of Whales

Earl Grey & Irish Breakfast

Van Uden



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**Kidman Resources Limited**  
**Earl Grey Lithium Project**

**Figure 3**  
**Locations of Study Areas,**  
**Trap Sites & Camera**  
**Traps**

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Chuditch were recorded in all three surveys, with results summarised as follows:

- Camera traps recorded Chuditch on 44 of 101 cameras.
- Camera trap success rate was 44 %.
- Camera traps recorded Chuditch in all habitats, with greater camera trap success in unburnt habitat, and in areas of mallee woodland.
- Cage traps captured a total of 18 individual Chuditch, comprising 10 adults and 8 dispersing young.
- Cage trap success was 16 % with 31 captures from 192 cage trap-nights.
- The Chuditch was recorded in a range of habitats across the study areas, including mallee woodlands, open woodlands and shrublands.

Within the development envelope:

- Sixteen individual Chuditch were captured in cage traps.
- Of the 44 camera traps that recorded Chuditch, 14 were located in the development envelope.

The distribution of Chuditch records collected in the three surveys area are shown on Chuditch Distribution

## 1.4.2 Chuditch Biology and Behaviour

The Chuditch is the largest carnivorous marsupial in Western Australia, adult males weigh about 1.3 kg and females 0.9 kg. They are brown with white spots, have large rounded ears, a pointed muzzle, large dark eyes and a non-hopping gait. Chuditch are primarily nocturnal, but can be active during the day for breeding or if weather restricts nocturnal foraging. They are opportunistic feeders, foraging primarily on the ground and at night, but can climb trees to feed or flee. They eat insects, large invertebrates, mammals, birds, lizards, frogs, carrion, vegetation including fruits and flowers and scavenge for food scraps around campsites and roadkill. They are solitary animals with large home ranges of 15 km<sup>2</sup> (males) 3-4 km<sup>2</sup> (females) and smaller core areas defined by den locations of 4 km<sup>2</sup> (males) and 0.9 km<sup>2</sup> (females)(DEC 2008, Van Dyck & Strahan 2008).

## 1.4.3 Chuditch Distribution

At European settlement the Chuditch ranged across approximately 70 percent of the continent in every mainland State and Territory. Following a drastic decline and contraction of range has occurred since European settlement free-ranging populations are now restricted to Western Australia, covering around 5% of their former range. Remaining populations occur in Jarrah (*Eucalyptus marginata*) forests and woodlands in southwestern Western Australia, woodlands, mallee shrublands and heaths along the south coast to the Ravensthorpe area and drier woodland and mallee shrubland in the Wheatbelt and Goldfield Regions. The primary causes of Chuditch distribution contraction were habitat removal, the spread of introduced predators and active persecution by humans (DEC 2008; Van Dyck & Strahan 2008).


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
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### Legend


 Development Envelope


#### Cage Trap Site

 No Chuditch Recorded

 Chuditch Recorded

#### Camera Trap Site

 No Chuditch Recorded

 Chuditch Recorded



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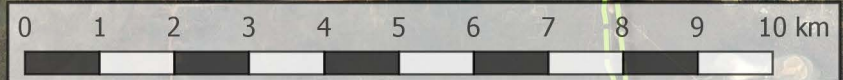
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Prince of Whales

Earl Grey & Irish Breakfast

Van Uden



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Aerial Photo Date: 2014  
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**Kidman Resources Limited**  
**Earl Grey Lithium Project**

**Figure 4**  
**Chuditch Survey Results**

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### 1.4.4 Key Assumptions and Uncertainties

Key assumptions:

- The Project area and greater regional area have been adequately surveyed for terrestrial fauna, with three surveys undertaken comprising a detailed fauna survey, and targeted regional Chuditch surveys completed.
- Fauna surveys were completed in compliance with EPA and DoEE requirements (EPA 2002, EPA 2004, EPA & DEC 2010, EPA 2016a, DoEE 2011).
- The surveys provide sufficient information to confirm Chuditch presence, and suggest a healthy population exists within and outside the Project.
- The density of the Chuditch population surveyed indicates a combination of favourable factors; dense unburnt habitat providing abundant food sources, breeding sites and protection from feral predators, in association with low numbers of feral predators; foxes, cats and wild dogs which may be attributed to feral animal control programs in the area.
- The lack of Chuditch in some areas surveyed indicate the species is variable in time and space. Its absence may be a response to fire which reduces habitat provisions of food sources and shelter from predators.
- The population is likely to extend further to the east, south and north of the survey area. It is assumed that by utilising areas of existing disturbance and minimising clearing, as well as progressively rehabilitating the pit, and rehabilitating existing liabilities, the impacts of the Project to the Chuditch will be minimised.

Key uncertainties:

- The Chuditch is highly mobile and has been recorded in all habitats, making it difficult to exclude any areas from being potential habitat.
- Chuditch may utilise many shelters within a core range, so the location of shelters and breeding sites within the project area are unknown.
- The extent to which Chuditch are utilising the existing disturbed area for den sites is unknown.
- The extent of the Chuditch population beyond the areas surveyed in baseline assessments, and in the greater regional area is generally unknown.

### 1.4.5 Management Approach

The management approach taken in this Management Plan is risk-based and developed around the mitigation hierarchy of avoid, minimise, rehabilitate and off-set to ensure impacts to the Chuditch have been avoided or reduced to as low as reasonably practicable.

Management actions detailed in this Management Plan have been specifically designed to ensure the Project meets its environmental objectives for the key environmental factor. Risks and management actions were identified and prioritised using information gained from baseline surveys and other regional and local information within the public domain including the Chuditch (*Dasyurus geoffroi*) National Recovery Plan (DEC 2012) ensuring the approach aligns with any regional and national framework.

### 1.4.6 Rationale for Choice of Provisions

The management approach is informed by results of baseline surveys and the Project parameters. The Project will have a small footprint over a long life of mine with priority use of existing disturbed areas and progressive rehabilitation, including rehabilitation of existing State liabilities.

Management and mitigation measures have been designed for the long term 40 year life of mine, and as such, may require adaptive solutions in subsequent revisions.

## 2. Chuditch Management Plan Provisions

This section identifies the provisions that Kidman proposes to implement to ensure protection of terrestrial fauna, with a focus on the Chuditch. It states the management objective, identifies management actions that will be implemented to mitigate and manage potential risks to terrestrial fauna including the Chuditch, and management targets that will be used to measure the efficacy and performance of management actions. A monitoring framework for tracking performance against management targets is included in Section 3.

This Management Plan utilises management-based provisions because Chuditch, as an ecological factor, is difficult to objectively measure and report on. This section details management-based actions, targets, a monitoring framework and reporting requirements to ensure the protection of the Chuditch from the risks associated with the Project.

### 2.1 Objective

The objective of this Management Plan is to ensure the Project is managed to maintain the local Chuditch population, its diversity, variability and ecological function at the species, population and community level, in compliance with the EPA objective for terrestrial fauna (EPA 2016).

### 2.2 Management Actions

Management objectives have been identified to address potential impacts detailed in Section 1.2. To meet the management objectives, a series of project specific, risk-based management actions have been developed and prioritised based on risk to minimise potential impacts to terrestrial fauna, including the Chuditch. The management actions focus on proposal activities that have the highest likelihood of causing adverse impact to the Chuditch. These management actions were specifically developed to meet the EPA's objective for terrestrial fauna by Kidman for the Earl Grey Lithium Project.

Management objectives, targets, actions and reporting are listed in Table 5. Risk assessment tables are provided as Appendix 1. The risk rating remains Medium for two management objectives related to clearing:

- Clearing activities causing injury or death – a best practice program, which may be trapping and release during all land clearing will be developed in consultation with DPaW to minimise disruption to this species.
- Habitat loss and fragmentation – although the project is small and land clearing requirements are low, all Chuditch breeding or foraging habitat is considered critical habitat for this species, and clearing is regarded as a current threat to this species.

Although some impacts may be experienced through clearing, the Project offers an opportunity to rehabilitate historic disturbed areas that are currently a State liability, resulting in a net gain of habitat to Chuditch in the long term.

### 2.3 Management Targets

Measurable management targets have been developed to ensure management actions are effective. If management targets are met, then impacts on the local terrestrial fauna population, including the Chuditch population, will be minimised and the EPA's environmental objective for terrestrial fauna will be achieved.

As discussed in Section 2.2, land clearing activities have the potential to impact on a limited amount of critical habitat for the Chuditch. This impact is anticipated to be minimised by limiting the amount of clearing and implementing progressive rehabilitation.

Management objectives, targets, actions and reporting are listed in Table 5. Monitoring is described in Section 3.

**Table 5: Objectives, Targets, Actions, Timeframe and Reporting**

Management Objective	Management Targets	Management Actions	Timeframe/Phase	Records and Reports
Minimise the potential for clearing activities to cause injury or death to terrestrial fauna, including the Chuditch.	Minimal Chuditch deaths due to direct interaction with equipment and machinery.	<ul style="list-style-type: none"> <li>Avoid unauthorised clearing through implementation of an internal clearing permit procedure.</li> <li>Minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas and undertaking clearing in a progressive manner.</li> <li>Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock.</li> <li>Subject to consultation and agreement with DPaW, a capture and release program will be implemented during land clearing by a suitably qualified and experienced environmental professional.</li> <li>A 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 <i>Wildlife Conservation Act 1950</i>, have suitable equipment to administer emergency care to injured and or displaced fauna and have access to a care facility that can used to rehabilitate injured fauna.</li> </ul>	All phases	<p>Internal audits and inspections of areas to be cleared before and after clearing.</p> <p>Incident reporting of Chuditch death and over-clearing.</p> <p>Clearing register.</p> <p>Annual Environmental Report</p> <p>Chuditch register of all capture and releases, sightings and interactions.</p> <p>Reporting on all capture programs developed in consultation with DPaW.</p>
Minimise the potential of vehicle strike causing injury or death to terrestrial fauna, including the Chuditch.	Minimal Chuditch death attributable to mining vehicle strike.	<ul style="list-style-type: none"> <li>Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules (e.g. keeping to designated tracks, limited driving between dusk and dawn, driving to road and weather conditions, reduced speed limits, Chuditch signage).</li> <li>All sightings and interactions with the Chuditch to be reported to the Environmental Department.</li> <li>Environmental personnel to identify and link with local wildlife carers/vets for injured Chuditch.</li> <li>Staff training and awareness to provide information on the Chuditch (e.g. how to identify species, conservation status, the importance of minimising impacts on the species, adherence to speed limits, reporting to Environmental Department).</li> </ul>	All phases	<p>Incident reports of speeding, unauthorised driving and Chuditch deaths.</p> <p>Internal audits and inspections of vehicle speeds.</p> <p>Annual Chuditch monitoring report (to be confirmed following consultation with DPaW).</p>



Management Objective	Management Targets	Management Actions	Timeframe/Phase	Records and Reports
Minimise entrapment leading to injury or death of terrestrial fauna, including the Chuditch.	Minimal Chuditch death due to entrapment in drill holes, containers, bins, open excavations, trenches, landfill or water holding facilities.	<ul style="list-style-type: none"> <li>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.</li> <li>Open holes, including drill holes, to be covered or capped during construction or rehabilitated when they are no longer required.</li> <li>Domestic waste facilities will be fenced and putrescible wastes will be regularly covered.</li> <li>Containers to have doors closed securely when not in use.</li> </ul>	All phases	<p>Incident reports for entrapped fauna.</p> <p>Internal audits and inspections of site high risk areas for potential for entrapment and death.</p> <p>Monitoring report (following consultation with DPaW).</p>
Minimise requirements for clearing which results in habitat loss and fragmentation	No clearing outside approved clearing areas. Progressive rehabilitation undertaken.	<ul style="list-style-type: none"> <li>Avoid clearing of fauna habitat and minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas.</li> <li>Internal clearing permit procedure to be developed and implemented (to include flagging of clearing areas by surveyors, supervision of clearing by a suitably qualified environmental professional, reporting of over-clearing).</li> <li>Progressive land clearing with the amount of active disturbance minimised.</li> <li>Progressive rehabilitation in accordance with a Mine Closure Plan.</li> <li>Completion criteria will incorporate fauna and habitat restoration objectives.</li> <li>Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock.</li> <li>Where possible, direct placement of topsoil and vegetation will be respread over rehabilitated areas. The site layout will be compact, reducing fragmentation, and allowing fauna to move through the landscape on all sides of the project.</li> </ul>	Planning Construction Operation	<p>Clearing Register.</p> <p>Internal clearing permits.</p> <p>Survey data.</p> <p>Annual Environmental Report.</p> <p>Incident reports for over-clearing.</p> <p>Monitoring report (following consultation with DPaW).</p>
Minimise pollution from light and noise.	Minimal disruptions to fauna from noise and light emissions.	<ul style="list-style-type: none"> <li>Project travel between dusk and dawn will be limited to essential travel.</li> <li>Lights will be strategically placed and designed to shine towards plant operations and minimise light spill to the surrounding environment.</li> <li>Equipment design will specify compliance with Australian Standard noise limits.</li> </ul>	All phases	<p>Incident reports for light spill and noise violations.</p> <p>Monitoring report (following consultation with DPaW).</p>

Management Objective	Management Targets	Management Actions	Timeframe/Phase	Records and Reports
Minimise increases to feral predator abundance (cat, dog, fox) and herbivorous competitors.	Waste and water sources not available to feral predators. Predator control program implemented. Minimal increase in predator abundance.	<ul style="list-style-type: none"> <li>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, borrow pits designed to avoid ponding water).</li> <li>Kidman will undertake pest animal control on site in cooperation with regional control programs where appropriate.</li> <li>Kidman will undertake monitoring of feral predator abundance to determine control program effectiveness.</li> <li>Kidman will consider contributing to the Western Shield program as a sponsor, as an offset or to provide predator control services.</li> <li>Staff training and awareness to include information on feral species (e.g. impact on the Chuditch, no feeding of feral species and all sightings of feral species to be reported).</li> </ul>	All phases	<p>Opportunistic observations. Incident reports of Chuditch predation.</p> <p>Internal audits and inspections.</p> <p>Annual Environmental Report.</p> <p>Predator control to include monitoring of predator species.</p> <p>Monitoring report (following consultation with DPaW).</p>
No increase in fire frequency or intensity.	No fires attributed to mining and associated activities.	<ul style="list-style-type: none"> <li>Avoid increases in fire frequency through maintenance of fire breaks and implementation of fire management procedures (e.g. Hot Work Permit system, fire-fighting training, Emergency Response Plan).</li> <li>Firefighting equipment will be located on site, in machinery and vehicles.</li> <li>Lightning protection equipment will be installed as part of project design where necessary.</li> <li>Vehicles will not be permitted to leave access tracks or cleared areas.</li> <li>Kidman will work with DPaW and DFES to undertake prescribed burns.</li> <li>Kidman will contribute to fire management in the region.</li> <li>Staff training and awareness to include information on the prevention and management of fires.</li> </ul>	All phases	<p>Aerial photography. Incident reports.</p>

### 3. Monitoring

The following monitoring will be undertaken for the Chuditch Management Plan:

- Monitoring of the local Chuditch population in a way considered best practice, following consultation with DPaW, potentially through annual survey using camera traps and cage and traps.
- Monitoring of the existing feral fauna populations (focussing on the fox and cat population). This information is intended to provide a baseline for comparison of feral animal numbers over the life of mine. Best practice techniques developed following consultation with DPaW. The information will also guide any feral control programs implemented in the Project area.
- Monitoring of incident reports for Chuditch predation, vehicle strike, speeding and night driving, over-clearing, light and noise disturbance and fire.
- Monitoring of clearing through the clearing register, survey data and aerial photography.
- Monitoring of rehabilitation progress criteria defined in the Mine Closure Plan.

Where there is evidence of management targets not being met, or a trigger value being breached – for instance a Chuditch being killed, management measures will be reviewed to ensure further deaths do not occur.

## 4. Reporting

The Chuditch Management Plan sets out the reporting requirements relating to the implementation of the plan. Reporting includes:

- Preparation of an Annual Environmental Report (AER) to be submitted to the appropriate regulatory authorities. The AER will include monitoring results and trends as compared to trigger and threshold criteria.
- Provision of data (annually) from monitoring programs to DPaW and DoEE, as well as the National Chuditch Monitoring Database.
- In the event that the management target is exceeded (or not met), the relevant authority will be notified within 7 days of identification of the exceedance, including threshold contingency actions which have been implemented due the exceedance of threshold criteria.

## 5. Adaptive Management and Review of the management Plan

This Management Plan has defined the issue (Section 1.2), outlined management and mitigation measures to address the issue (Section 2), and introduced monitoring and evaluation of these measures (Section 3).

The management approach for the Chuditch at the Project will be adaptive. The Chuditch Management Plan will be formally reviewed annually by a suitably qualified experienced person. In addition to annual review, the Chuditch Management Plan will be reviewed if:

- New information is learned from monitoring, or monitoring indicates that management targets are not being achieved.
- New information becomes available about the Chuditch, for instance a change in conservation status.
- There is a change in the project description, for instance an increase in the size of the disturbance.

## 6. Stakeholder Consultation

Stakeholder consultation that is relevant to this management plan is summarised in Table 6.

**Table 6: Stakeholder Consultation**

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of Mines and Petroleum (DMP)	16/02/2017	Meeting	<b>DMP:</b> Ian Mitchell (Team Leader – Operations, Environment), Richard Smetana (Environmental Officer). <b>Kidman:</b> 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, Chuditch 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	<b>OEPA:</b> Robert Hughes (Manager, Mining and Industrial South Branch) Helen Butterworth (Acting Principal Environmental Officer, Mining and Industrial South Branch). <b>DMP:</b> Ian Mitchell <b>Kidman:</b> 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, Chuditch 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	<b>Kidman:</b> Siobhan Pelliccia (Blueprint) to <b>DPaW:</b> 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.

Stakeholder	Date	Type of Consultation	Persons Involved	Summary of Communication	Comments Received
Department of the Environment and Energy (DoEE)	20/03/2017	Meeting in Canberra	<p><b>DoEE:</b> 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).</p> <p><b>Kidman:</b> Chris Williams, Michael Green (Exploration Manager), Siobhan Pelliccia, James Cumming</p>	Summary of project presented to DoEE (as described above for the OEPA) with a focus on matters of national significance, including the Chuditch, Chuditch and <i>Banksia sphaerocarpa var. dolichostyla</i>	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.
DPAW – Western Shield Group	5/05/2017	Meeting	<p><b>DPAW:</b> Ashley Millar</p> <p><b>Kidman:</b> Chris Williams, Siobhan Pelliccia, Jill Woodhouse (Environmental Advisor) and Jenny Wilcox (Western Wildlife – Lead Zoologist)</p>	Overview of Project presented with focus on findings of fauna survey, in particular, occurrence of Chuditch 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	17/05/2017	Letters	<p><b>Conservation Council of WA:</b> Piers Verstegen (Director)</p> <p><b>National Chuditch Recovery Team:</b> Tim Burnard (National Coordinator)</p> <p><b>Wilderness Society:</b> Peter Robertson (State Coordinator)</p>	Introduction to Kidman and the Project. Recognition of stakeholder status. Invitation to meet to discuss the Project.	No comments received at time of submission.

## 7. References

DEC (2012) *Chuditch (Dasyurus geoffroii) Recovery Plan. Wildlife Management Program No. 54*. DEC. Perth, Western Australia.

DoEE (2011) *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act*. DoEE. Canberra, ACT.

EPA and DEC (2010) *Technical Guide - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (eds B.M. Hyder, J. Dell and M.A Cowan). EPA & DEC. Perth, Western Australia.

EPA (2002) *Terrestrial Biological Surveys as an Element of Biodiversity Protection. Position Statement No. 3*. March 2002. EPA. Perth, Western Australia.

EPA (2004) *Guidance for the assessment of environmental factors. Guidance Statement No. 56. June 2004*. EPA. Perth, Western Australia.

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Van Dyck, S and Strahan, R. (2008) *The Mammals of Australia*. New Holland Publishers. Frenchs Forest, New South Wales.

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



## **APPENDICES**

## **APPENDIX 1: RISK ASSESSMENT TABLES**

**Table A1-1: Risk Consequence and Likelihood Definitions**

Consequence Ranking			Likelihood Ranking		
1	Insignificant	No detectable impact on population: <i>Insignificant amount of poor quality habitat cleared; Individual mortality due to roadkill</i>	A	Almost Certain	The incident is expected to occur most of the time/every time.
2	Minor	Short-term or local impact to population: <i>Removal of a small area of habitat for a short period of time; A small number of Chuditch fatalities, for instance a number of recently hatched chicks.</i>	B	Likely	The incident will probably occur in most circumstances/ regularly/ weekly.
3	Moderate	Long-term detrimental, but recoverable, impact on population: <i>Removal of a large area of habitat that will be rehabilitated as suitable habitat in the future; Death of a number of individuals that make up a local population.</i>	C	Moderate	The incident should occur at some time/ quarterly.
4	Major	Long-term detrimental impact on the population, which may not be recoverable, and the population is threatened with extinction: <i>Removal of habitat to the threshold required to maintain a viable population, without rehabilitation; Death of a large number of Chuditch which make up the regional population.</i>	D	Unlikely	The incident could occur at some time in the life of the project.
5	Catastrophic	Non-recoverable population decline leading to extinction: <i>Excessive removal of habitat beyond the threshold required to maintain a viable population; Death of all Chuditch.</i>	E	Rare	The incident may occur only in exceptional circumstances and may never happen.

**Table A1-2: Risk Assessment Categories**

		Consequences				
		1	2	3	4	5
Likelihood		INSIGNIFICANT	MINOR	MODERATE	MAJOR	CATASTROPHIC
A	ALMOST CERTAIN	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>	<u>H</u>
B	LIKELY	<u>M</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>
C	MODERATE	<u>L</u>	<u>M</u>	<u>H</u>	<u>H</u>	<u>H</u>
D	UNLIKELY	<u>L</u>	<u>M</u>	<u>M</u>	<u>H</u>	<u>H</u>
E	RARE	<u>L</u>	<u>M</u>	<u>M</u>	<u>M</u>	<u>H</u>

**Table A1-3: Management Plan Risk Assessment**

Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/ Phase
Minimise the potential for clearing activities to cause injury or death to Chuditch	<b>HIGH 3A</b>	<ul style="list-style-type: none"> <li>Avoid unauthorised clearing through implementation of an internal clearing permit procedure.</li> <li>Minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas and undertaking clearing in a progressive manner.</li> <li>Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock.</li> <li>Subject to consultation and agreement with DPaW, a capture and release program will be implemented during land clearing by a suitably qualified and experienced environmental professional.</li> <li>A 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 <i>Wildlife Conservation Act 1950</i>, have suitable equipment to administer emergency care to injured and or displaced fauna and have access to a care facility that can be used to rehabilitate injured fauna.</li> </ul>	<b>MEDIUM 2D</b>	All phases
Minimise the potential of vehicle strike causing injury or death to Chuditch	<b>MEDIUM 2B</b>	<ul style="list-style-type: none"> <li>Avoid accidental disturbance to fauna and habitat by enforcing strict traffic management rules (e.g. keeping to designated tracks, limited driving between dusk and dawn, driving to road and weather conditions, reduced speed limits, Chuditch signage).</li> <li>All sightings and interactions with the Chuditch to be reported to the Environmental Department.</li> <li>Environmental personnel to identify and link with local wildlife carers/vets for injured Chuditch.</li> <li>Staff training and awareness to provide information on the Chuditch (e.g. how to identify species, conservation status, the importance of minimising impacts on the species, adherence to speed limits, reporting to Environmental Department).</li> </ul>	<b>LOW 1D</b>	All phases
Minimise entrapment leading to injury or death of Chuditch	<b>MEDIUM 2B</b>	<ul style="list-style-type: none"> <li>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.</li> <li>Open holes, including drill holes, to be covered or capped during construction or rehabilitated when they are no longer required.</li> <li>Domestic waste facilities will be fenced and putrescible wastes will be regularly covered.</li> <li>Containers to have doors closed securely when not in use.</li> </ul>	<b>LOW 1C</b>	All phases
Minimise requirements for clearing which results in habitat loss and fragmentation	<b>HIGH 4A</b>	<ul style="list-style-type: none"> <li>Avoid clearing of fauna habitat and minimise disturbance to fauna and habitat by locating infrastructure, where possible, in existing disturbed areas.</li> <li>Internal clearing permit procedure to be developed and implemented (to include flagging of clearing areas by surveyors, supervision of clearing by a suitably qualified environmental professional, reporting of over-clearing).</li> <li>Progressive land clearing with the amount of active disturbance minimised.</li> <li>Progressive rehabilitation in accordance with a Mine Closure Plan.</li> <li>Completion criteria will incorporate fauna and habitat restoration objectives.</li> <li>Minimise disturbance to fauna and habitat through backfilling of the pit with waste rock.</li> <li>Where possible, direct placement of topsoil and vegetation will be respread over rehabilitated areas. The site layout will be compact, reducing fragmentation, and allowing fauna to move through the landscape on all sides of the project.</li> </ul>	<b>MEDIUM 2C</b>	Planning Construction Operation

Management Objective	Inherent Risk	Management Actions	Residual Risk	Timeframe/Phase
Minimise pollution from light and noise	<b>MEDIUM</b> 1A	<ul style="list-style-type: none"> <li>Project travel between dusk and dawn will be limited to essential travel.</li> <li>Lights will be strategically placed and designed to shine towards plant operations and minimise light spill to the surrounding environment.</li> <li>Equipment design will specify compliance with Australian Standard noise limits.</li> </ul>	<b>LOW</b> 1C	All phases
Minimise increases to feral predator abundance (cat, dog, fox) and herbivorous competitors	<b>HIGH</b> 3B	<ul style="list-style-type: none"> <li>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, borrow pits designed to avoid ponding water).</li> <li>Kidman will undertake pest animal control on site in cooperation with regional control programs where appropriate.</li> <li>Kidman will undertake monitoring of feral predator abundance to determine control program effectiveness.</li> <li>Kidman will consider contributing to the Western Shield program as a sponsor, as an offset or to provide predator control services.</li> <li>Staff training and awareness to include information on feral species (e.g. impact on the Chuditch, no feeding of feral species and all sightings of feral species to be reported).</li> </ul>	<b>LOW</b> 1D	All phases
No increase in fire frequency or intensity	<b>MEDIUM</b> 2B	<ul style="list-style-type: none"> <li>Avoid increases in fire frequency through maintenance of fire breaks and implementation of fire management procedures (e.g. Hot Work Permit system, fire-fighting training, Emergency Response Plan).</li> <li>Firefighting equipment will be located on site, in machinery and vehicles.</li> <li>Lightning protection equipment will be installed as part of project design where necessary.</li> <li>Vehicles will not be permitted to leave access tracks or cleared areas.</li> <li>Kidman will work with DPaW and DFES to undertake prescribed burns.</li> <li>Kidman will contribute to fire management in the region.</li> <li>Staff training and awareness to include information on the prevention and management of fires.</li> </ul>	<b>LOW</b> 1D	All phases