Memorandum

25 June 2019

To	Covalent Lithium Pty Ltd		
Copy to			
From	Erin Lynch (via Drew Farrar)	Tel	+61 8 6222 8316
Subject	Covalent Lithium Refinery Environmental Approvals Threatened Species Assessment	Job no.	6138272

1 Introduction

1.1 Background

Covalent Lithium Pty Ltd (Covalent) is proposing to construct a Lithium Refinery (the project), located at 15 Mason Road in the Kwinana Industrial Area (KIA). The project is designed to produce 45,500 tonnes per annum (tpa) of battery-grade Lithium hydroxide monohydrate $LiOH.H_2O$, which is the equivalent of 40,000 tpa Lithium carbonate (Li_2CO_3).

Covalent has commissioned GHD Pty Ltd (GHD) to provide environmental approval support for the project. The refinery will be constructed on the northern hardstand portion of the site. The southern portion of the site is vegetated and is classified under the *Contaminated Sites Act 2003* (WA) as remediated for restricted use. GHD is currently undertaking studies to address key environmental issues including waste management, water supply, wastewater discharges, air and noise emissions, surface water management, and existing groundwater contamination. In addition, GHD will be preparing the approval documentation under Part V of the *Environment Protection Act 1986* (EP Act).

1.2 Purpose of this memorandum

Covalent engaged GHD to undertake an assessment of flora and vegetation of the whole lease area including fringing trees to identify the presences or potential likelihood of threatened flora and fauna species occurring. The survey included a targeted Black Cockatoos assessment. The outcome of this assessment will form the basis of the pre-referral document to the Environmental Protection Authority and Department of Water and Environmental Regulation under Part IV of the EP Act.

1.3 Survey area

The survey area is located at 15 Mason Road, Kwinana and is approximately 76 hectares (ha) in size. The refinery is proposed to be built on an existing hardstand, which is approximately 29 ha. The hardstand covers the northern portion of the lease boundary. The remaining area consists of a mixture of native vegetation and planted trees.

The survey area is shown in Figure 1, attached.

GHD Pty Ltd ABN 39 008 488 373
Level 10 999 Hay Street Perth WA 6000 Australia
T + 61 8 6222 8222 **F** + 61 8 6222 8555 **E** permail@ghd.com **W** www.ghd.com

1.4 Scope of works

The scope of works involved a threatened species assessment, including a desktop assessment of the local area and field assessment. The following actions were completed to fulfil the scope:

- A desktop assessment of the survey area prior to the field survey to identify biological features and constraints, which may be in, or near the survey area
- Field assessment to verify/ground truth the desktop assessment findings
- Describe the flora and vegetation on-site, including mapping of broad vegetation/habitat types and vegetation condition
- A flora and fauna likelihood of occurrence assessment based on the vegetation units and fauna habitat present within the survey area
- Targeted Black Cockatoo assessment to characterise the presence of roosting, breeding and foraging habitat
- A consolidated memorandum (this document).

1.5 Limitations and assumptions

This memorandum has been prepared by GHD for Covalent and may only be used and relied on by Covalent Lithium Pty Ltd for the purpose agreed between GHD and Covalent. GHD otherwise disclaims responsibility to any person other than Covalent arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

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2 Methodology

2.1 Desktop assessment

Prior to the commencement of the field survey, a desktop assessment was undertaken to identify relevant environmental information pertaining to the survey area. This included a review of:

- The Department of the Environment and Energy (DotEE) Protected Matters Search Tool (PMST) to identify communities and species listed under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) potentially occurring within 10 km of the survey area (DotEE 2019) (attached)

- The Department of Biodiversity Conservation and Attractions (DBCA) NatureMap database for flora and fauna species previously recorded within 10 km of the survey area (DBCA 2019) (attached)
- Desktop review of existing datasets and reports

2.2 Field survey

GHD ecologist Erin Lynch undertook a habitat assessment of the vegetation with the survey area on the 22 May 2019 to determine potential usage by threatened species, including a targeted Black Cockatoo survey. The Black Cockatoo survey was conducted in accordance with the EPBC Act referral guidelines for three threatened black cockatoo species: Carnaby's Cockatoo *Calyptorhynchus latirostris* (Endangered), Baudin's Cockatoo *Calyptorhynchus baudinii* (Endangered) and Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* (Vulnerable) (Department of Sustainability, Environment, Water, Population and Community (DSEWPaC 2012).

The assessment included the identification, description and recording of:

- Potential and actual breeding habitat (relevant tree species with a Diameter at Breast Height (DBH) greater than 500 mm)
- Existing tree hollows (including size and) and any evidence of use by Black Cockatoos
- Potential night roosting habitat and foraging evidence
- Suitable foraging habitat.

In addition, an inventory of flora and fauna species observed during the field survey was compiled.

2.3 Desktop Assessment

2.3.1 Conservation significant flora

Searches of the EPBC Act PMST and Naturemap databases identified the presence or potential presence of four threatened flora taxa listed under the EPBC Act and *Biodiversity Conservation Act 2016* (BC Act) within a 10 km buffer of the survey area.

2.3.2 Conservation significant fauna

Searches of the EPBC Act PMST and Naturemap databases identified the presence or potential presence of 16 threatened fauna (not including exclusively marine species) listed under the EPBC Act and/or BC Act within a 10 km buffer of the survey area. Of these, only two fauna species are considered likely to occur within the survey area, Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo.

The survey area is located within the known distribution for the Carnaby's Cockatoo and Forest Red-tailed Black Cockatoo. A review of available data revealed no documented breeding records from the vicinity of the survey area (i.e. within 10 km). The closest known breeding site is in Karnup, approximately 21 km south-east from the survey area. The survey area does not fall within the documented breeding range for the Carnaby's Cockatoo (DSEWPaC 2012). There is currently no defined breeding range for the Forest Red-tailed Black Cockatoo.

A review of available data identified the closest known roost sites to be approximately 10 km east, 15 km north-east and 7 km south-east of the survey area.

2.4 Survey results

2.4.1 Flora and vegetation

The survey area consists of two broad vegetation types, *Eucalyptus* woodland and *Acacia* shrubland. The strip of vegetation along the northern and eastern boundary consists of a *Eucalyptus* woodland dominated by a mixture of *Eucalyptus gomphocephala*, *E. decipiens* and *E.* cornuta over scattered *Callitris preissii*, *Melaleuca lanceolata* and *M. huegelii* over sparse native and introduced/weed shrubs including *Acacia saligna*, *A. cyclops* and **Schinus terebinthifolius* over weedy grasses and herbs. The southern half of the survey area consists of an *Acacia* shrubland, consisting of a mid-shrub layer dominated by *Acacia rostellifera*, *A. saligna* and *Spyridium globulosum* with scattered patches of *Melaleuca huegelii* over a predominantly bare under-storey dominated by **Asparagus asparagoides*.

Plate 1 *Eucalyptus* woodland

Plate 2 *Acacia* shrubland

The condition of the vegetation remaining within the survey area is considered to be Degraded to Completely Degraded. The entire survey area has a long history of clearing and associated disturbances. The vegetation present appears to represent a mixture of remnant natives, natural regrowth and planted trees and shrubs. The survey area is heavily weed infested and evidence of foxes and rabbits was observed throughout the site.

No flora of conservation significance was recorded from the survey area. The survey area has been historically cleared and is highly modified, and considered unlikely to support conservation significant species based on the available habitat present.

A list of flora species observed during the field survey is provided in Table 1 (attached). Mapping of the vegetation types and condition are provided on Figure 2 and Figure 3 (attached).

2.4.2 Fauna

Two broad fauna habitat types are present within the survey area which correspond with the vegetation types described in section 2.4.1 (Figure 2). Although the vegetation within the survey area is in degraded condition, the woodland and shrublands do provide shelter and opportunistic food resources for some bird species. The sandy soils, fallen branches/dead trees and leaf litter provides suitable habitat for reptiles such as skinks, snakes and geckos.

No threatened fauna species or evidence of their presence was recorded within the survey area during the survey. Based on suitable habitat present, two threatened fauna species were identified as likely to occur within the survey area;

- Carnaby's Cockatoo (*Calyptorhynchus latirostris*) - Endangered

- Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*) – Vulnerable

2.4.3 Targeted Black Cockatoo Assessment

The Black Cockatoo tree survey identified 88 potential breeding trees of suitable DBH (>500 mm) from within the survey area (Figure 3). Trees of this size are considered to have a nesting potential now, or will develop hollows within 100 years. All tree species recorded consisted of Tuart (*Eucalyptus gomphocephala*) and none of the 88 trees recorded contained hollows visible from the on-ground assessment. Therefore the survey area does not currently contain suitable breeding habitat for Black Cockatoos.

During the survey, no black cockatoo species were directly seen feeding or observed flying over the survey area. Additionally, there was no evidence of foraging observed. The *Eucalyptus* woodland consists of suitable foraging species (*Eucalyptus gomphocephala* and other planted Eucalypt species) of which there is approximately 5.45 ha. However this vegetation type is considered to have low foraging value due to the lack of proteaceous species and native eucalypt species such as Marri (*Corymbia calophylla*) and Jarrah (*Eucalyptus marginata*) and distance from known breeding and roosting habitat.

The eucalyptus trees (including both native and introduced/planted) recorded in the survey area are of a sufficient size to provide roosting habitat for black cockatoos. However no evidence of roosting was observed during the survey.

Mapping of the potential Black Cockatoo breeding trees and suitable foraging habitat is provided in Figure 3 (attached).

2.5 References

Department of Biodiversity, Conservation and Attractions (DBCA) 2018, *NatureMap: Mapping Western Australia's biodiversity*, DBCA, retrieved May 2019, from http://NatureMap.dpaw.wa.gov.au/default.aspx

Department of the Environment and Energy (DotEE) 2017, Revised draft referral guideline for three threatened black cockatoo species Carnaby's Black Cockatoo, Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo, Commonwealth of Australia, Canberra.

Department of the Environment and Energy (DotEE) 2018a, *Environmental Protection and Biodiversity Conservation Act 1999 Protected Matters Search Tool Results*, retrieved August 2018, from http://www.environment.gov.au/epbc/pmst/index.html

Department of Sustainability, Environment, Water, Population and Community (DSEWPaC) 2012, EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species: Carnaby's Black Cockatoo, Baudin's Black Cockatoo and Forest Red-tailed Black Cockatoo, Commonwealth of Australia, Canberra

Peck A, Barrett G and Williams M 2018, The 2018 Great Cocky Count: a community-based survey for Carnaby's Black-Cockatoo (*Calyptorhynchus latirostris*), Baudin's Black-Cockatoo (*Calyptorhynchus baudinii*) and Forest Red-tailed Black-Cockatoo (*Calyptorhynchus banksii naso*). BirdLife Australia, Floreat, Western Australia.

Western Australia Planning Commission 2011, Mapping of Carnaby's Cockatoo potential feeding vegetation and known breeding and roosting sites, Western Australian Planning Commission, Perth

Regards

PP 

Erin Lynch
Ecologist

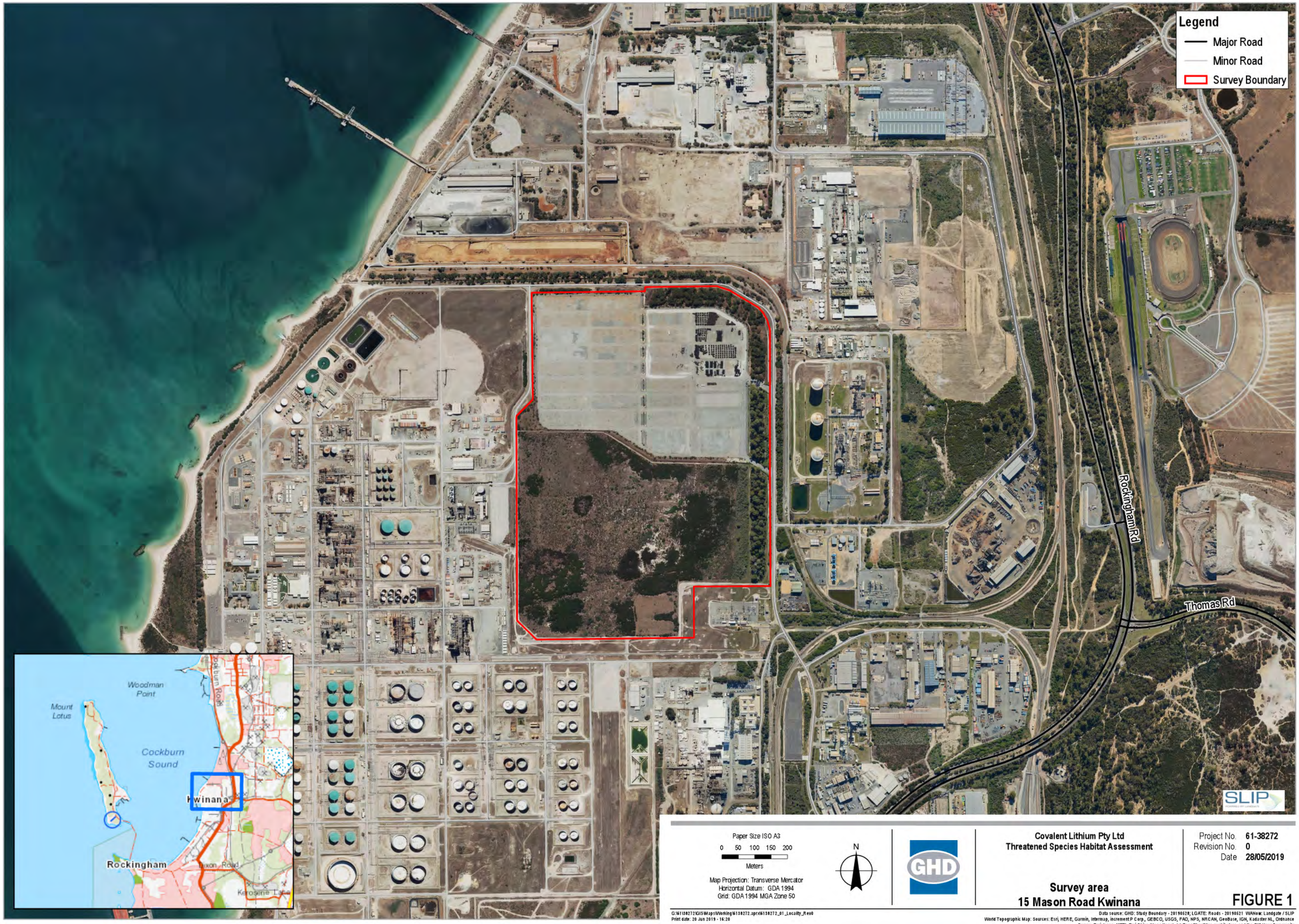
Table 1 Flora species recorded within the survey area

Family	Species
Anacardiaceae	**Schinus terebinthifolius*
Apocynaceae	**Gomphocarpus fruticosus* (DP)
Asparagaceae	**Asparagus asparagoides* (DP)
Asphodelaceae	**Asphodelus fistulosus*
Asphodelaceae	**Trachyandra divaricata*
Asteraceae	**Hypochaeris glabra*
Chenopodiaceae	*Rhagodia baccata*
Cupressaceae	*Callitris preissii*
Euphorbiaceae	**Euphorbia terracina*
Euphorbiaceae	*Ricinus communis*
Fabaceae	*Acacia cyclops*
Fabaceae	*Acacia rostellifera*
Fabaceae	*Acacia saligna*
Hemerocallidaceae	*Dianella revoluta*
Myrtaceae	*Eucalyptus gomphocephala*
Myrtaceae	*Eucalyptus decipiens*
Myrtaceae	**Eucalyptus cornuta*
Myrtaceae	**Eucalyptus sp.* (Planted)
Myrtaceae	*Melaleuca huegelii*
Myrtaceae	*Melaleuca lanceolata*
Oxalidaceae	**Oxalis pes-caprae*
Poaceae	**Avena barbata*
Poaceae	**Ehrharta calycina*
Poaceae	**Lagurus ovatus*
Poaceae	**Eragrostis curvula*
Poaceae	**Cynodon dactylon*
Poaceae	**Hyparrhenia hirta*
Ranunculaceae	*Clematis linearifolia*
Rhamnaceae	*Spyridium globulosum*
Solanaceae	**Solanum nigrum*
Xanthorrhoeaceae	*Xanthorrhoea preissii*

*Introduced/weed species

Table 2 Fauna species recorded during the field survey

Family	Species	Common Name
Birds		
Acanthizidae	*Sericornis frontalis*	White-browed Scrubwren
Campephagidae	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike
Corvidae	*Corvus coronoides*	Australian Raven
Dicruridae	*Rhipidura leucophrys*	Willie Wagtail
Dicruridae	*Rhipidura fuliginosa*	Grey Fantail
Hiruninidae	*Hirundo neoxena*	Welcome Swallow
Meliphagidae	*Lichenostomus virescens*	Singing Honeyeater
Pachycephalidae	*Pachycephala rufiventris*	Rufous Whistler
Zosteropidae	*Zosterops lateralis*	Silvereye
Mammals		
Canidae	*Vulpes vulpes*	Fox (Introduced)
Leporidae	*Oryctolagus cuniculus*	Rabbit (Introduced)
Reptiles		
Scincidae	*Menetia greyii*	



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Meters

Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 50

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Covalent Lithium Pty Ltd
Threatened Species Habitat Assessment

Survey area
15 Mason Road Kwinana

Project No. **61-38272**
Revision No. **0**
Date **28/05/2019**

FIGURE 1

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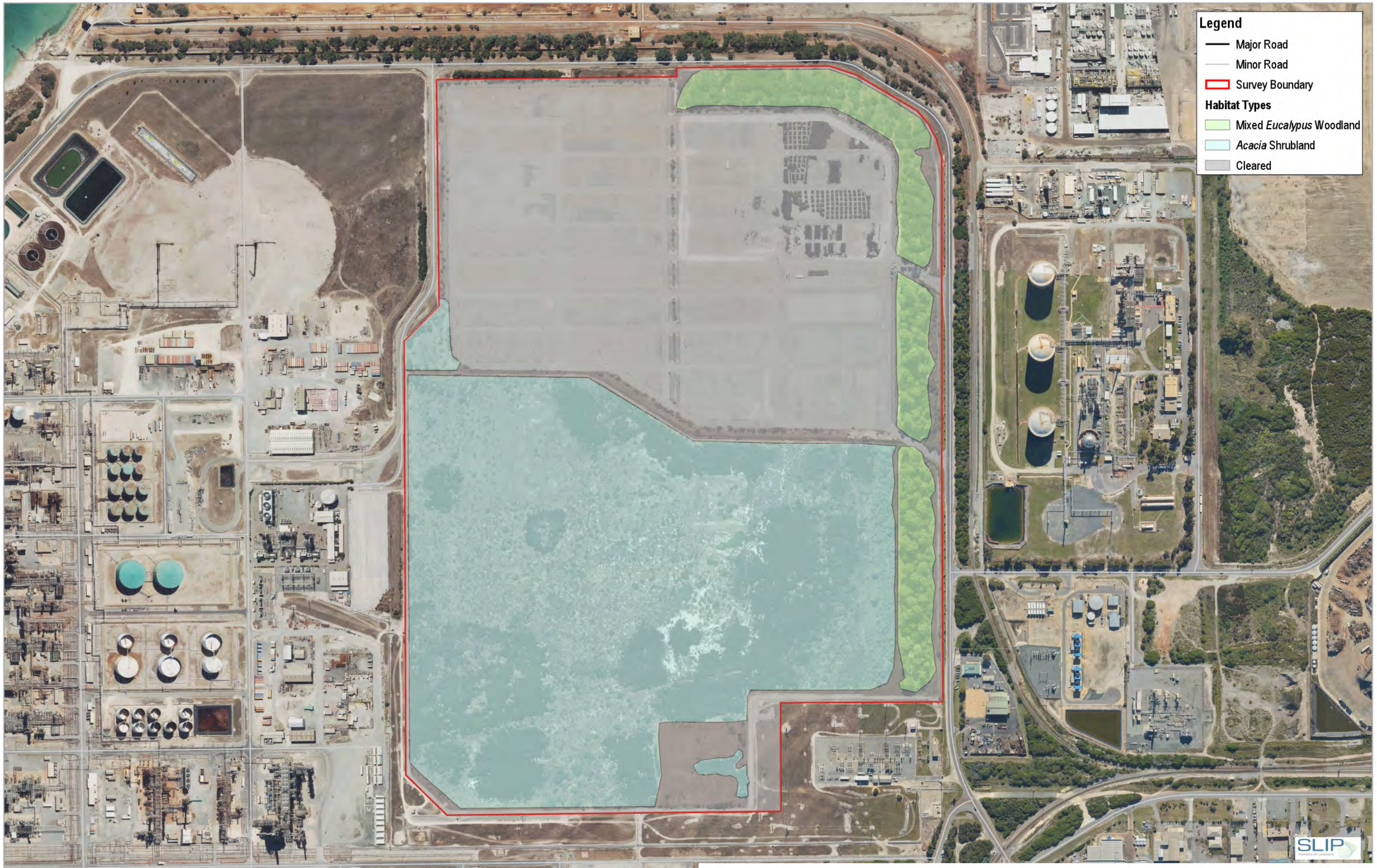

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Covalent Lithium Pty Ltd
Threatened Species Habitat Assessment

Project No. **61-38272**
Revision No. **0**
Date **20/06/2019**

Vegetation / Habitat Types

FIGURE 2

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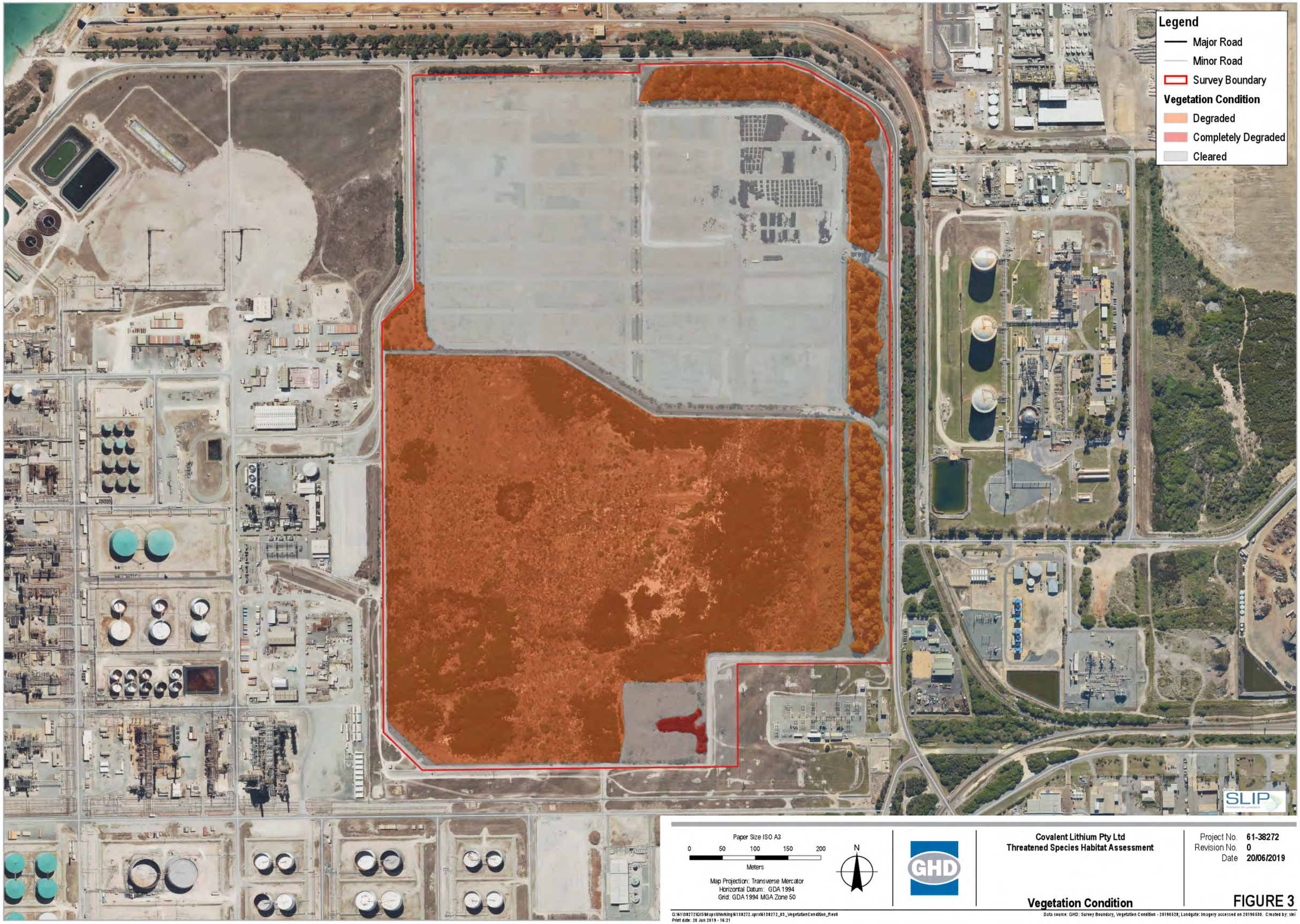

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Project No. **61-38272**
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Date **20/06/2019**

Vegetation Condition

FIGURE 3

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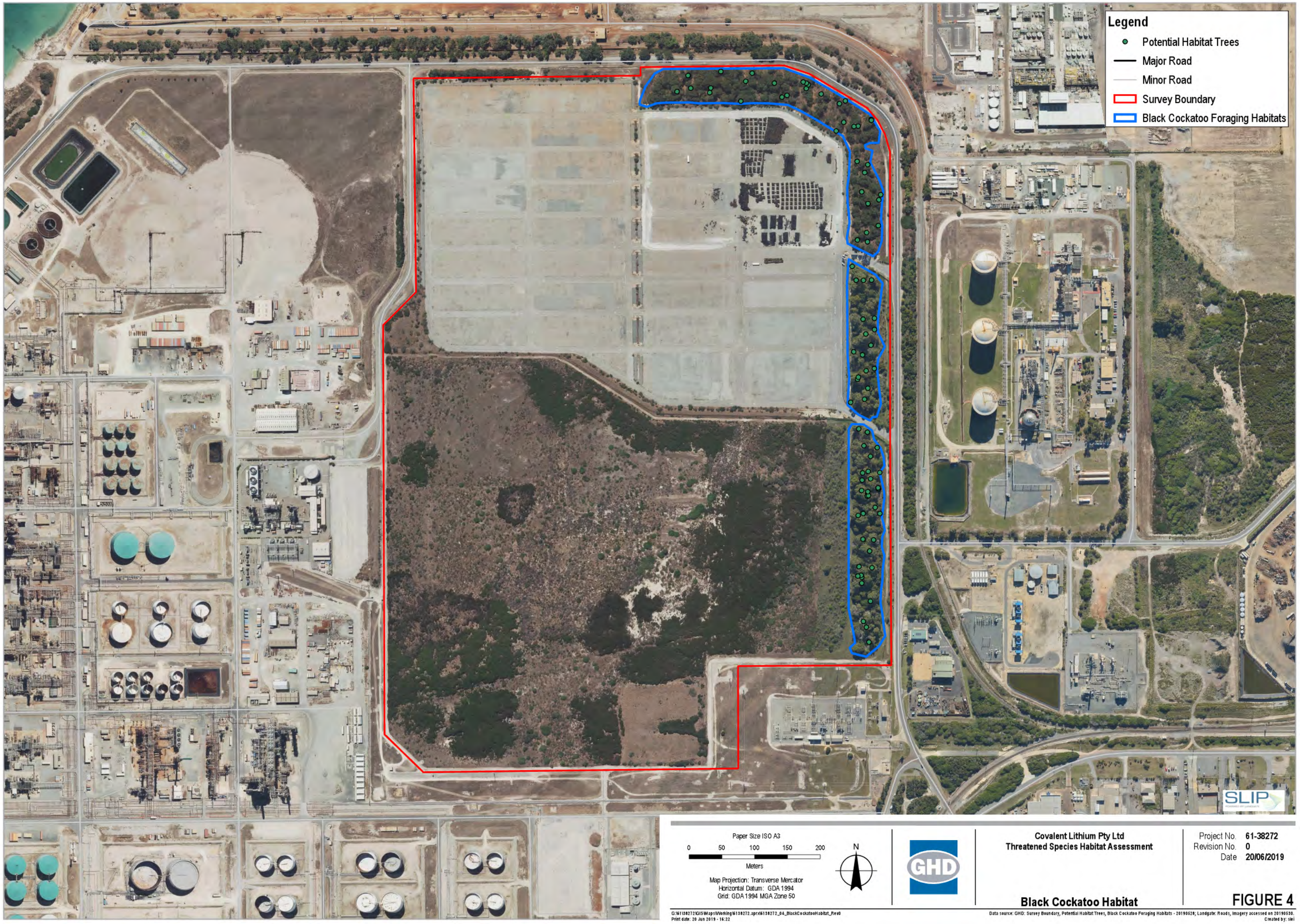

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Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 50

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Project No. **61-38272**
Revision No. **0**
Date **20/06/2019**

Black Cockatoo Habitat

FIGURE 4

G:\61\38272\GIS\Maps\Working\61\38272.aprx\61\38272_04_BlackCockatooHabitat_Rev0
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Data source: GHD: Survey Boundary, Potential Habitat Trees, Black Cockatoo Foraging Habitats - 20190628; Landgate: Roads, Imagery accessed on 20190530.
Created by: slei