APPENDIX J: TARGETED NIGHT PARROT SURVEY – LAKE LEFROY (PHOENIX ENVIRONMENTAL SCIENCES)

Memo

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From: Volker Framenau

CC:

Date: 10 January 2018

Subject: Targeted Night Parrot (*Pezoporus occidentalis*) Survey at Lake Lefroy

1 INTRODUCTION

St Ives Gold Mining Company's (SIGMC) St Ives operations at Lake Lefroy, approximately 50 km south of the City of Kalgoorlie-Boulder entail mining beneath the surface of the lake, land-based operations and dewatering discharge to the lake. The lake is a hypersaline ephemeral playa covering approximately 55,400 ha. To ensure the St Ives operations will continue beyond 2018, the B2018 Project (the Project) has been initiated. This project will seek to expand outside the existing MS 879 approved footprint, covering a broad area encompassing terrestrial and lake-based operations (B2018 Development Envelope).

Following confirmed sightings of the Night Parrot (*Pezoporus occidentalis*) (EPBC Act – Endangered; WC Act – Critically Endangered) at a salt lake in Western Australia in March 2017 (Hamilton *et al.* 2017a; Jackett *et al.* 2017), the Department of Biodiversity, Conservation and Attractions (DBCA) updated its survey guidelines for the species in the State (DPaW 2017). Suitable habitat for the Night Parrot was identified in the B2018 Development Envelope at Lake Lefroy and therefore an Environmental Scoping Document for the Project issued by the Environmental Protection Authority in October 2017 required targeted surveys to be undertaken for the species. Phoenix Environmental Sciences Pty Ltd (Phoenix) was commissioned by Talis Consultants (Talis) on behalf of SIGMC to conduct a targeted survey for Night Parrots at Lake Lefroy.

2 BACKGROUND

The Night Parrot is considered the rarest bird in Australia. The species was thought to be extinct until a single road-killed specimen was collected in Queensland in October 1990 (Boles *et al.* 1994). Since then, additional specimens have been recorded in Queensland (McDougall *et al.* 2009) and further sightings were confirmed in the Pilbara, Goldfields and East Murchison regions of WA (DBCA 2017; Hamilton *et al.* 2017a; Hamilton *et al.* 2017b; Jackett *et al.* 2017). A recent feather of the species was also reported recently from near Lake Eyre in South Australia (Young *et al.* 2017).

Little is known about the biology of this cryptic species. Most sightings or recordings occur at night, near water and it is assumed that birds come to drink prior to feeding at night. The nest is located in tunnelled dense vegetation and can contain three to six eggs (Garnett *et al.* 2011; Hamilton *et al.* 2017a).

The survey guidelines (DPaW 2017) define the broad habitat requirements of the species in Western as including areas of old-growth spinifex (*Triodia*) for roosting and nesting, together with foraging habitats that are likely to include various native grasses and herbs, and may or may not contain shrubs or low trees. Roosting and nesting sites are in clumps of dense vegetation, primarily patches of old and large spinifex (often >50 years unburnt), especially ring-forming hummocks. These may be in expanses or isolated patches, and may be associated with other vegetation types, such as dense chenopod shrubs (DPaW 2017; Hamilton *et al.* 2017b). These habitats are often naturally fragmented and therefore well-protected from fire. Collapsed spinifex hummocks (<40–50 cm high) are not likely to provide adequate shelter (DPaW 2017).

Foraging habitat preferences of Night Parrots are not well understood. Favoured sites are likely to vary across the range of the species, and by season. Based on observations in Queensland, areas rich in herbs including forbs, grasses and grass-like plants, are believed to be important in WA. *Triodia*, *Sclerolaena* and other succulent chenopods are likely to be important (DPaW 2017). Foraging habitat is likely to be more important if it is adjacent to or within about 10 km of patches of *Triodia* deemed suitable as roosting habitat (DPaW 2017). Where Triodia is absent, samphire near salt lakes appear to provide sufficient foraging habitat for the species (Young *et al.* 2017).

Alteration of fire regime, predation by introduced species and over grazing by cattle are the main threats to the species, resulting in poor habitat quality and direct mortality of individuals (DBCA 2017). Murphy *et al* (2017) observed that in Queensland persistence of the species correlated with the absence of foxes and the low prevalence of cats, both of which were common in the study area (Phoenix 2017d). Murphy *et al* (2017) also analysed archival aerial imagery and determined that fire was "not a feature of their study area, resulting in the long-term, stable availability of patchy *Triodia* habitats separated by natural no-fuel areas." Murphy *et al* (2017) determined that their study area had a long history of moderate grazing concentrated on alluvial habitats and concluded that Night Parrots and cattle had coexisted on Brighton Downs for at least 11 years.

The map of historical records in WA indicates the species can potentially occur across a wide range of common habitat (Davis & Metcalf 2008).

3 METHODS

Survey methods were consistent with the most recent edition of DBCA's survey guidelines for the Night Parrot (DPaW 2017).

Sites with potential Night Parrot habitat, i.e. open bushland with old-growth spinifex (*Triodia* spp.) (DPaW 2017), were identified based on detailed flora and vegetation and terrestrial fauna surveys for the B2018 Project at Lake Lefroy (Phoenix 2017a, b, c, e). Within the B2018 Development Envelope, these sites were generally situated near the south-eastern edge of Lake Lefroy (Table 1; Figure 1; Appendix 1).

Survey methods consisted of passive acoustic surveys with SongMeter SM2 recording devices at eight sites spread evenly throughout the B2018 Development Envelope in potential habitat for the species (Table 1; Figure 1; Appendix 1). SongMeters were installed to record for at least seven nights continuously each night. Potential roosting and nesting sites for Night Parrots were targeted. Field work was carried out by Tim Sachse, a highly experienced vertebrate zoologist. The recorded data were analysed by Mr. Bob Bullen, Bat Call WA.

Table 1 Survey locations and effort for Night Parrot survey in the B2018 Development Envelope

Site	Latitude (GDA94)	Longitude (GDA94)	Installed	Collected	No. of nights
01	-31.322309	121.732848	17 July 2017	25 July 2017	8
02	-31.332062	121.717263	25 July 2017	1 August 2017	7
03	-31.309768	121.766151	17 July 2017	25 July 2017	8
04	-31.357670	121.729771	25 July 2017	1 August 2017	7
05	-31.371126	121.749918	17 July 2017	25 July 2017	8
06	-31.420142	121.793840	25 July 2017	1 August 2017	7
07	-31.474468	121.756468	25 July 2017	1 August 2017	7
08	-31.485439	121.688652	17 July 2017	25 July 2017	8

4 RESULTS

All survey sites were dominated by Spinifex (*Triodia* spp.) in open eucalypt woodland; ring-forming Spinifex was only recorded at site 04 (Appendix 1). Dense shrubby vegetation was not present at any of the sites with expanses of Spinifex.

No evidence of Night Parrot calls was recorded on the SongMeter devices.

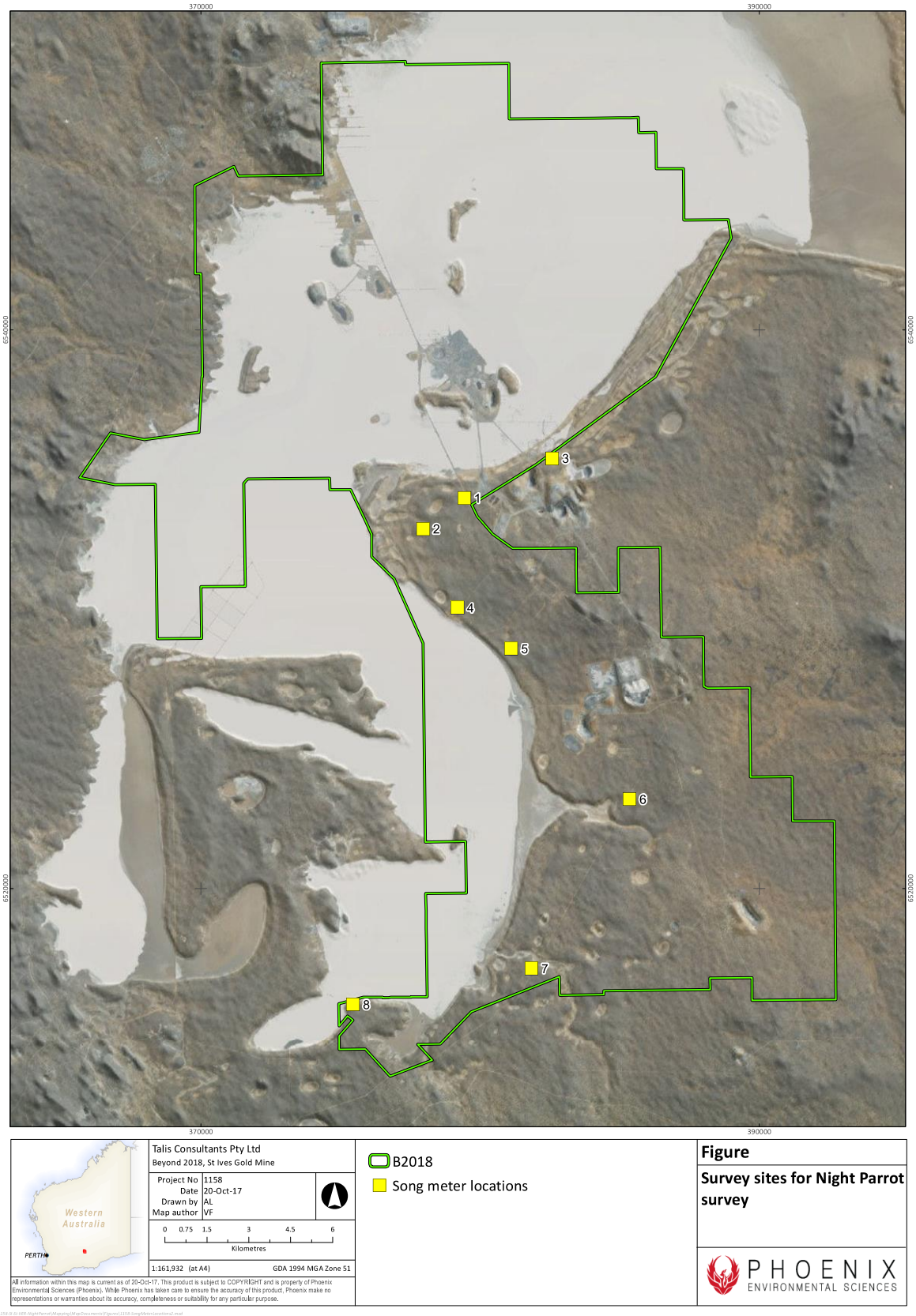

Figure 1 **Survey sites of Night Parrot Survey**

5 DISCUSSION

The B2018 Development Envelope is located in the Coolgardie IBRA region, subregion COO3 "Eastern Goldfields" (Cowan 2001). Based on previous records of Night Parrots, this subregion is only of 'moderate priority' for Night Parrot surveys (DPaW 2017). This is consistent with the survey not providing any evidence of the species.

Based on extensive surveys of flora and vegetation (Phoenix 2017a, b, c) and a Level 1 terrestrial fauna assessment (Phoenix 2017e), only a few sites of moderate likelihood for Night Parrot to roost and nest could be identified (Figure 1; Table 1; Appendix 1). Spinifex was present at these sites in considerable expanses; however, clumps were generally of comparatively low density, small and low in height (< 40 cm). Only at site 04 some apparently older, ring-forming plants were present (; Appendix 1). The upper layers of vegetation were generally open, with little evidence of dense shrub layers for birds to hide. Overall, the Spinifex grasslands around Lake Lefroy do not seem to be of high quality for roosting and breeding of Night Parrot.

When considering the likelihood of Night Parrots to occur at Lake Lefroy, it is important to consider that no available survey technique can irrefutably demonstrate that the species is absent from a site (DPaW 2017). Where habitat is suitable, even if the species was not confirmed to be being present, it might still frequent the area at other times. In such cases, an impact assessments should indicate the likelihood of occurrence based on the quality of the habitat at the site, focus on the risk of a project to the species on the assumption that it is present, and assess any threatening processes that may occur as a result (e.g. reduction of the extent or quality of habitat, increase in numbers of feral predators, increase (or decrease) in grazing pressure, or changed fire regime) (DPaW 2017).

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Appendix 1: Survey site descriptions

Site: **01**

Coordinates (WGS84): -31.322309, 121.732848. **Altitude:** 303.8 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: sand

Soil colour: red-orange

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: Open Mallee *Eucalyptus* woodland (to 12 m) over *Triodia* sp. grassland (to 0.5 m)

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Site: **02**

Coordinates (WGS84): -31.332062, 121.717263. **Altitude:** 288.0 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: clay-loam

Soil colour: orange-red

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: Open *Eucalyptus* mallee woodland (t0 15 m) over *Triodia* sp. (up to approx. 30 cm height)

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Site: **03**

Coordinates (WGS84): -31.309768, 121.766151. **Altitude:** 270.2 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: clay-loam

Soil colour: red orange

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: open Eucalyptus woodland (to 12 m) over Triodia sp. grasses (up to 30–40 cm height)

Memo

Site: **04**

Coordinates (WGS84): -31.357670, 121.729771. **Altitude:** 297.7 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: clay-loam

Soil colour: orange

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: scattered *Eucalyptus* (to 12 m) over mixed (*Acacia, Allocasuarina* and *Eremophila*) shrubs (to 8 m) over old-growth, ring-forming *Triodia* spp. (to 50 cm)

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Site: **05**

Coordinates (WGS84): -31.371126, 121.749918. **Altitude:** 300.7 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: sand

Soil colour: orange red

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: open *Eucalyptus* (to 15 **m) woodland over old but** low *Triodia* spp. (up to 30 cm high)

Memo

Site: **06**

Coordinates (WGS84): -31.420142, 121.793840. **Altitude:** 304.2 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: loamy clay

Soil colour: orange red

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: open *Eucalyptus* spp. woodland (up to 12 m) over *Triodia* spp. grassland (up to 30 cm height)

Memo

Site: **07**

Coordinates (WGS84): -31.474468, 121.756160. **Altitude:** 297.5 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: loamy clay

Soil colour: orange

Rock type: none

Fire history: > 5 years

Disturbance: none evident

Habitat description: open *Eucalyptus* spp. woodland (up to 12 m) with scattered mixed shrubs (to 3 m) over *Triodia* spp. grassland (up to 30 cm height)

Memo

Site: **08**

Coordinates (WGS84): -31.485439, 121.688652. **Altitude:** 300.1 m

Habitat type: Mature spinifex in open woodland on plain

Topography: plain

Slope: negligible

Soil: **loamy clay**

Soil colour: **orange red**

Rock type: none

Fire history: **> 5 years**

Disturbance: **none evident**

Habitat description: open *Eucalyptus* woodland (to 12 m) with scattered mixed shrubs over old *Triodia* spp. stands (ca. 40 cm high); behind ridge next to salt lake.