

LEE ROAD DEVIATION AND LOT 9005 LIME PIT, NULLAKI

TARGETED THREATENED FLORA SURVEY

Prepared for: Graeme Robertson
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The logo for PGV Environmental is located at the bottom of the page. It features the letters 'PGV' in a large, bold, white sans-serif font. Below 'PGV', the word 'ENVIRONMENTAL' is written in a smaller, white, all-caps sans-serif font. The background of the bottom half of the page is a vibrant orange with a subtle, curved white line that sweeps across the width of the page, creating a sense of movement and depth.

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1 INTRODUCTION

1.1 Background

Mr Graeme Robertson is planning to mine limestone off a section of his property on Lot 9005 rock Cliff Circle, Nullaki. The mining proposal will require a section of Lee Road to be re-aligned from the eastern boundary of Lot 9005 through Reserve 17464 and connecting with the current Lee Road cul-de-sac head.

The lime pit site and road deviation both contain native vegetation. Flora and vegetation surveys have been carried out on the sites previously but not at a time or in enough detail to record conservation significant flora species.

PGF Environmental was commissioned by Graeme Robertson to undertake a targeted flora survey of the Lee Road deviation and Lime Pit site on Lot 9005.

The location of the targeted flora survey areas is shown in Figures 1 and 2. The Lee Road deviation is approximately 750m long and 20m wide. The Lime Pit site is approximately 8ha in area.

1.2 Objective

The targeted Threatened flora survey will search and record any Threatened flora species that occur in the Lee Road deviation and Lot 9005 Lime Pit survey areas.

The definition of Threatened flora is “flora that has been declared to be ‘likely to become extinct or is rare, or otherwise in need of special protection’, pursuant to section 23F(2) of the Wildlife Conservation Act” (DPaW, 2017).

2 PREVIOUS SURVEYS

2.1 Lee Road Deviation

A Level 1 Flora and Vegetation Survey of the proposed Lee Road deviation was undertaken by Bio Diverse Solutions in 2017.

The Level 1 survey included a search of NatureMap and the EPBC Act Protected Matters Search Tool as well as a review of previous surveys in the area to compile a list of Threatened and Priority species that could potentially occur on the site.

The database search identified 9 Threatened (Declared Rare) and 15 Priority flora species have been recorded within 10km of the survey area. Based on the habitat present on the site Bio Diverse Solutions considered that three of the Threatened flora species and six of the Priority species could potentially occur on the site. The three potential Threatened flora species were *Conostylis misera*, *Chordifex abortivus* and *Drakaea micrantha*.

Following the database review, Bio Diverse Solutions undertook a survey of the site on 22 March 2017. A flora list was compiled as well as a description and map of vegetation communities.

Three vegetation communities were recorded on the site by Bio Diverse Solutions as follows:

- Bullich – Agonis Woodland
- Open Heath
- Sedgeland

The main vegetation community on the site was the Open Heath community. The Bullich – Agonis Woodland occurred at the eastern end and a thin section of the proposed road reserve in the central part. The Sedgeland was restricted to the western end of the site.

The condition of the vegetation on the site was rated by Bio Diverse Solutions as mostly Pristine.

Bio Diverse Solutions recorded 75 plant species, of which 63 were native. Bio Diverse Solutions considered that the Priority 4 species *Banksia sessilis* var. *cordata* occurred on the site, however stated that flowers were required for a positive identification.

No Threatened flora species were recorded in the March survey, however Bio Diverse Solutions noted that *Drakaea micrantha* is a geophyte that requires a spring survey to detect leaves or flowers.

2.2 Lot 9005 Rock Cliff Circle Lime Pit Site

Bio Diverse Solutions undertook a vegetation communities survey of the whole of Lot 9005 Rock Cliff Circle in 2016. Lot 9005 is 770ha in size and has a long frontage to the Southern Ocean.

As part of the survey a database search of flora species likely to occur within 5km of the site was undertaken using NatureMap and the WA Herbarium records. The database search identified one Threatened and 27 Priority species having previously been recorded within 5km. Bio Diverse Solutions did not provide an analysis in their report of which of the species identified could potentially occur on

the site. The one Threatened flora species identified in the database search was the Grand Spider Orchid *Caladenia huegelii*.

A one day flora and vegetation survey was undertaken on 6 April 2016 in which vegetation communities were mapped and flora species were recorded. Threatened species were not specifically targeted during the survey.

Ten vegetation types were recorded on the whole of Lot 9005. One vegetation type, Coastal Scrub, was mapped on the Lime Pit site. The condition of the vegetation on the Lime Pit site was rated by Bio Diverse Solutions as Pristine.

A total of 112 species were recorded by Bio Diverse Solutions during the survey, including 103 native species. Two Priority species, *Banksia sessilis* var. *cordata* and *Billardiera drummondii* were recorded. No Threatened (Declared Rare) flora species were recorded.

3 METHODOLOGY

3.1 Database Searches

To supplement the database searches of Bio Diverse Solutions PGV Environmental undertook an EPBC Act Protected Matters Search Tool (PMST) and NatureMap search to identify any Threatened species that might occur within 5km of the survey areas. As both sites are within 400m of each other only one database search was required.

The PMST identified seven Threatened plant species listed under the Commonwealth EPBC Act that could occur within 5km of the survey areas. All seven species are also listed as Threatened under the Western Australian *Wildlife Conservation Act 1950*. The Threatened species are:

- *Calectasia cyanea* (Blue Tinsel Lily)
- *Chordifex abortivus* (Manypeaks Rush)
- *Conostylis misera* (Grass Conostylis)
- *Drakaea micrantha* (Dwarf Hammer Orchid)
- *Isopogon uncinatus* (Hook-leaf Isopogon)
- *Kennedia glabrata* (Northcliffe Kennedia)
- *Verticordia apecta* (Hay River Featherflower)

Naturemap did not record any Threatened species within 5km and only recorded *Kennedia glabrata* within 10km.

The record of *Caladenia huegelii* identified in the Bio Diverse Solutions database search for Lot 9005 is likely an historical error of identification. *Caladenia huegelii* only occurs on the Swan Coastal Plain between Perth and Capel, not on the South Coast.

Table 1 lists the seven Threatened species identified in the PMST database search together with their flowering time, preferred habitat and likelihood of occurring on site.

Table 1: List of Threatened Species Potentially Occurring Within 5km of the Sites.

Species	Flowering	Habitat	Likelihood on Lee Road Site	Likelihood on Lime Pit Site
<i>Calectasia cyanea</i>	June-Oct	White, grey or yellow sand, gravel	Possible	Possible
<i>Chordifex abortivus</i>	Sept-Oct	Sand. Low rises and undulating areas	Possible	Possible
<i>Conostylis misera</i>	Oct-Nov	White or grey sand, sandy loam. Winter-wet flat	Possible	Unlikely
<i>Drakaea micrantha</i>	Sept-Oct	White-grey sand	Possible	Possible
<i>Isopogon uncinatus</i>	Oct-Nov	Loam or sand on granite, peaty sand. Swampy depressions	Unlikely	Unlikely
<i>Kennedia glabrata</i>	Aug-Nov	Sandy soil pockets. Granite outcrops	No	No
<i>Verticordia apecta</i>	Nov	Sandy clay with loam and broken granite. Slopes	No	No

3.2 Targeted Survey

The targeted Threatened species survey was undertaken by Dr Paul van der Moezel, an experienced botanist with PGV Environmental, on 13 October 2018. The weather was partly cloudy with a maximum of 18°C. Slight rain fell for 15 minutes during the middle of the day.

Prior to the Lee Road deviation survey centre line co-ordinates were provided at 50m spacings on a recent aerial photograph.

The survey methodology for the Lee Road site included walking parallel lines, where possible, 10m apart at a slow walking pace at right angles to the direction of the proposed road. The width of the survey area was 40m either side of the centre line.

The Lime Pit survey site was walked on as tight a grid as possible given the very dense and hard to penetrate understorey over much of the site, particularly in the valleys and lower slopes.

Any individuals or populations of Threatened flora found were to be recorded with a hand-held GPS and the number of individual plants counted or estimated.

4 RESULTS

4.1 Lee Road Deviation

PGV Environmental found the vegetation type and condition description of the Lee Road deviation made by Bio Diverse Solutions (2017) area to be accurate.

The Open Heath vegetation, which was the dominant vegetation type on the site (Plate 1), provided good access and visibility for all Threatened flora species, including the very small Dwarf Hammer Orchid (*Drakaea micrantha*).

Plate 1: Open Heath Vegetation



A very small patch of *Lepidosperma gladiatum* Sedgeland at the western end was dense but contained numerous kangaroo tracks on which to walk and observe (Plate 2).

Plate 2: *Lepidosperma gladiatum* Sedgeland



The Bullich-Agonis Woodland at the eastern end and along parts of the northern boundary of the survey area had very dense *Lepidosperma effusum* in the wetter soil types and was very difficult to walk through. The *Lepidosperma* plants were so dense that the probability that any Threatened flora species that grow in wetland environments would occur is considered highly unlikely.

Plate 3. Bullich-Agonis Woodland



No Threatened flora species were recorded during the survey.

Many additional species were recorded that were not listed on the provisional list of 75 species recorded in March 2017 by Bio Diverse Solutions. Among them were six orchid species, as follows:

- *Caladenia falcata*
- *Caladenia flava*
- *Caladenia latifolia*
- *Thelymitra macrophylla*
- *Pyrorchis nigricans*
- *Diuris corymbosa*

The number and type of orchid species observed to be flowering during the mid-October survey indicates that if *Drakaea micrantha* had occurred on the site it would have been able to be identified from flowering material as well as its distinctive basal leaf.

4.2 Lime Pit Location 9005

The vegetation in the Lime Pit site contained two distinct vegetation types that Bio Diverse Solutions grouped within the Coastal Scrub vegetation community.

The main vegetation type on the mid and upper slopes was a Closed Low Heath with dominant species being *Hibbertia cuneiformis*, *Jacksonia horrida*, *Hakea oleifolia*, *Olearia axillaris*, *Leucopogon* sp. up to 1m high. The shrub cover was very dense with very little ground cover observable. Where the shrub density was a little more open the ground contained a dense cover of *Desmocladus flexuosus*. No bare ground was observed.

The lower slopes and valleys contained dense clumps of Peppermint (*Agonis flexuosa*) over dense *Lepidosperma gladiatum* Sedgeland.

Plate 4 shows the mix of dense Heath and Peppermint vegetation on the site.

Plate 4: Vegetation on the Lime Pit Site



The dense vegetation made surveying along parallel transects impossible. Instead, as much ground as possible was walked in a grid pattern through the dense vegetation with greater coverage on the slightly less dense upper slopes and ridges.

No Threatened flora species were recorded during the survey.

Many additional species were recorded that were not included on the provisional list of 112 species recorded 112 in April 2016 by Bio Diverse Solutions. Among the new species recorded included three orchid species as follows:

- *Caladenia applanata* subsp. *applanata*
- *Caladenia latifolia*
- *Thelymitra* sp.

The coastal limestone landform is not considered the preferred habitat of any of the Threatened flora species identified in the database searches. The dense vegetation is also not conducive to the Dwarf Hammer Orchid occurring on the site.

5 CONCLUSIONS

A targeted Threatened flora survey of the Lee Road deviation and Lot 9005 Lime Pit survey areas was undertaken by PGV Environmental on 13 October 2018.

The database search and review of previous surveys for the areas resulted in seven species having potential to occur within 5km of the sites. Of those, three were assessed as possibly occurring on the site, two unlikely and two not likely to occur.

No Threatened flora species were recorded in the survey.

The timing of the survey and survey conditions were considered appropriate. Access was difficult through the Lime Pit site, however the near-coastal limestone landform and dense vegetation cover meant that the possibility of the Threatened flora identified in the database search occurring on the site was highly unlikely.

6 REFERENCES

Bio Diverse Solutions (2016). *Lot 9005 Rock Cliff Circle, Denmark. Vegetation Communities Survey*. Prepared for Graeme Robertson.

Bio Diverse Solutions (2017). *Proposed Lee Road Alignment, Youngs Siding WA 6330. Level 1 Flora and Vegetation Survey Report*. Prepared for Graeme Robertson.

DPaW (Department of Parks and Wildlife (2017). *Conservation Codes for Western Australian Flora and Fauna*. 23 May 2017.

FIGURES



0 10 20 30 40 50m

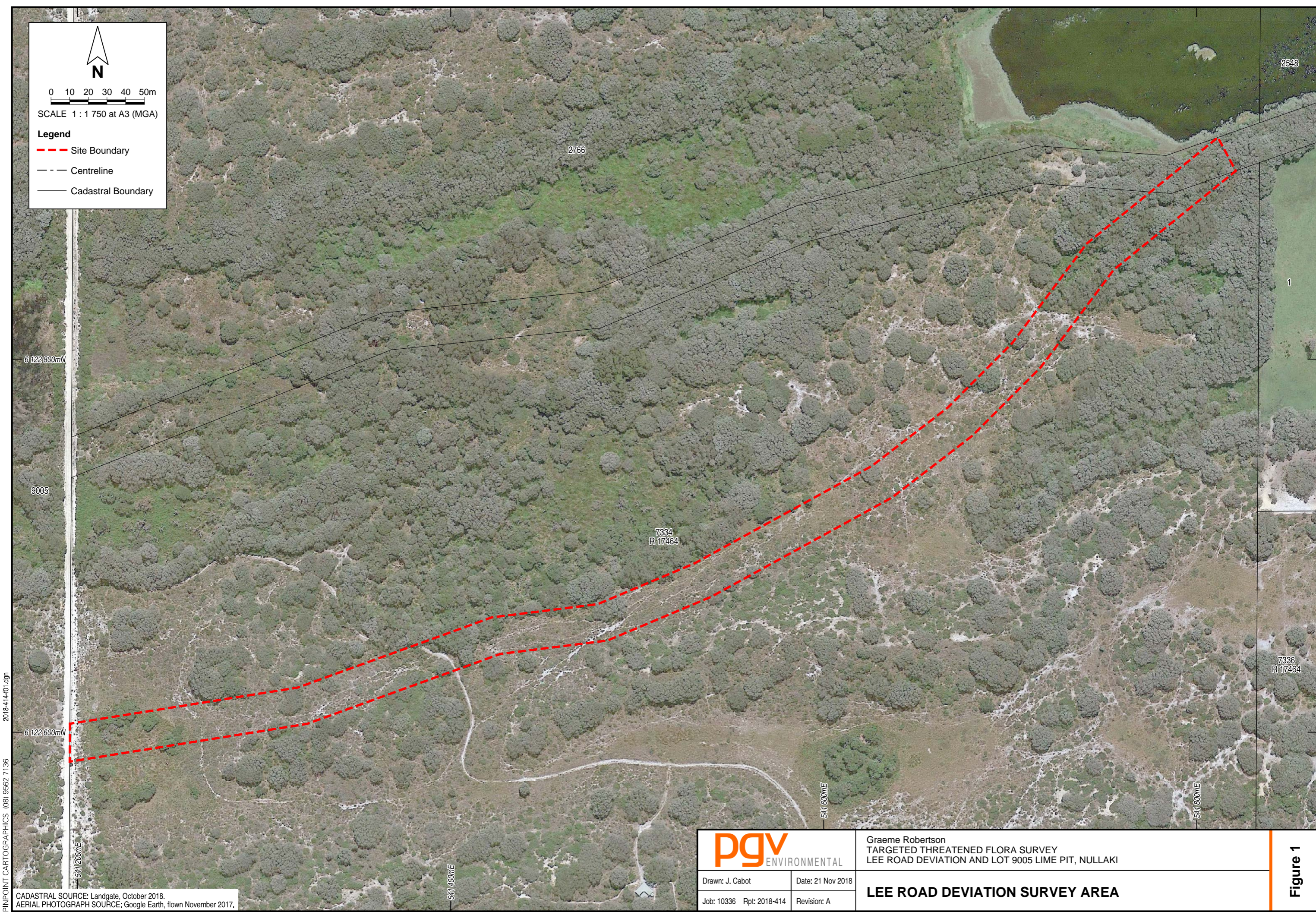
SCALE 1 : 1 750 at A3 (MGA)

Legend

--- Site Boundary

- - - Centreline

— Cadastral Boundary



6 122 600mN

9005

6 122 600mN

2766

7334
R 17464

2548

1

7336
R 17464

641 200mE

641 400mE

641 600mE

641 800mE

PINPOINT CARTOGRAPHICS (08) 9562 7136
2018-414-101.dgn

CADASTRAL SOURCE: Landgate, October 2018.
AERIAL PHOTOGRAPH SOURCE: Google Earth, flown November 2017.



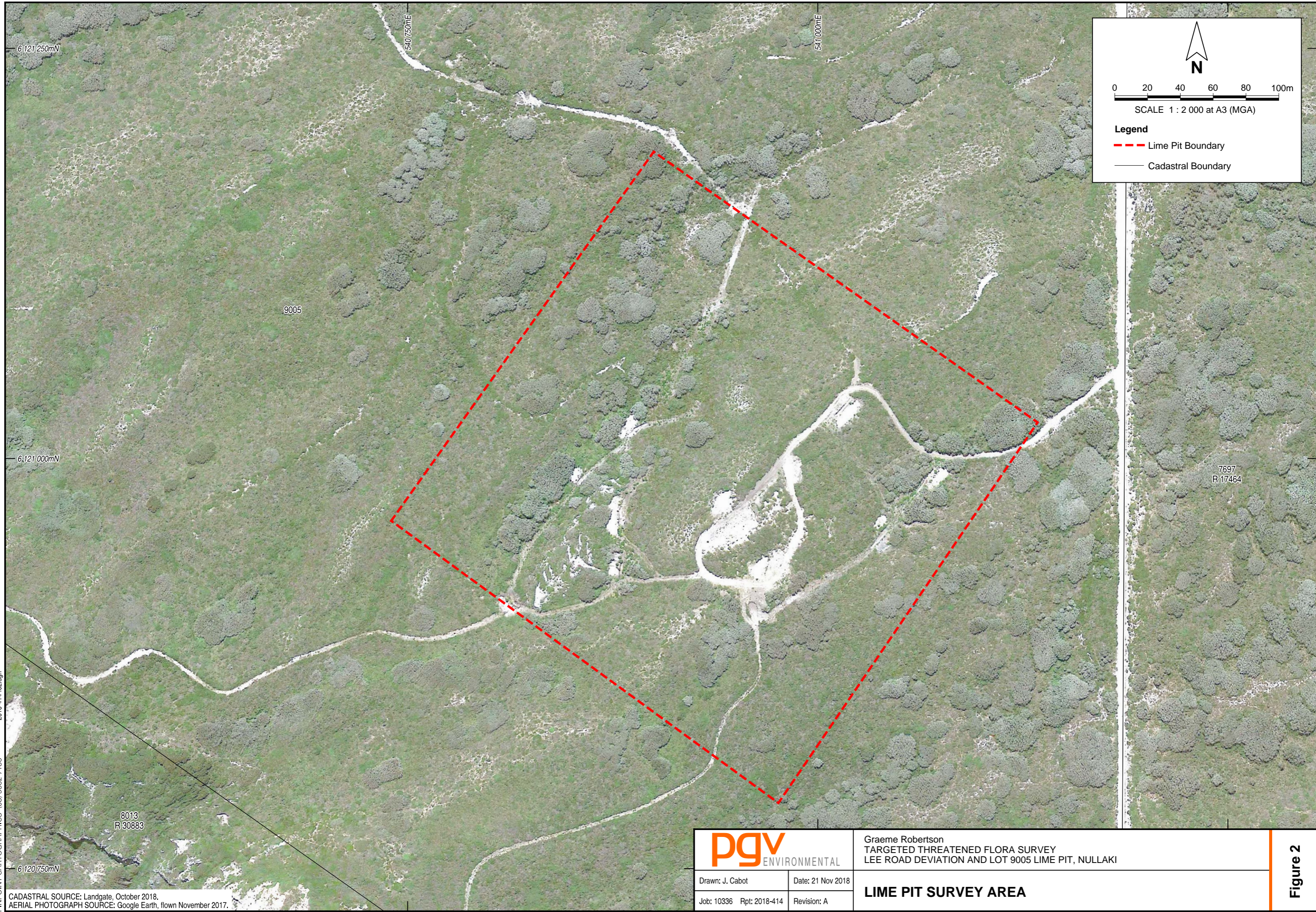
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Drawn: J. Cabot Date: 21 Nov 2018

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LEE ROAD DEVIATION SURVEY AREA

Figure 1



N

0 20 40 60 80 100m

SCALE 1 : 2 000 at A3 (MGA)

Legend

- - - Lime Pit Boundary
- Cadastral Boundary

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PINPOINT CARTOGRAPHICS (08) 9562 7136

CADASTRAL SOURCE: Landgate, October 2018.
AERIAL PHOTOGRAPH SOURCE: Google Earth, flown November 2017.

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LIME PIT SURVEY AREA

Figure 2