



DUST MANAGEMENT PLAN

LOT 103 BOYANUP ROAD WEST, STRATHAM

September 2023

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Limitations

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This report has been prepared based upon data and other information provided by the Client and other individuals and organisations, most of which are referred to in the report, which Accendo has not independently verified or checked beyond the agreed scope of work. Accendo does not accept liability in connection with such unverified information.

The conclusions and recommendations in this report are based on assumptions made by Accendo described in this report where and as they are required. Accendo disclaims liability arising from any of the assumptions being incorrect.

The report is based on site specific conditions encountered and information received at the time of preparation of this report or the time that site investigations were undertaken. Accendo disclaims responsibility for any changes that may have occurred after this time.

The preparation of this report has been undertaken and performed in a professional manner, in consideration of the scope of services and in accordance with environmental consulting practices. No other warranty is made.

CONTENTS

1	INTRODUCTION.....	1
1.1	BACKGROUND	1
1.2	PURPOSE AND SCOPE	1
2	EXISTING ENVIRONMENT.....	2
2.1	LAND USE	2
2.2	SENSITIVE RECEPTORS	2
2.3	TOPOGRAPHY AND SOILS	2
2.4	CLIMATE	3
3	EXTRACTION ACTIVITIES.....	4
3.1	OPERATIONAL WORKS.....	4
3.1.1	Truck Movements.....	4
3.1.2	Sand Extraction	5
3.1.3	Final Contours.....	5
3.1.4	Equipment	5
3.1.5	Water Usage	6
4	POTENTIAL IMPACTS	7
4.1	DUST SOURCES.....	7
4.2	RISK ASSESSMENT.....	7
4.3	MANAGEMENT MEASURES	9
	REFERENCES	13
	FIGURES	15
	APPENDIX A – SITE CONTOUR SURVEY	16
	APPENDIX B – COMPLAINTS REGISTER.....	17

TABLES

Table 1.	Residential dwellings within 1,500 m of subject site	2
Table 2.	Equipment	5
Table 3.	Dust management measures.....	10

FIGURES

Figure 1. Regional Location of the Subject Site

Figure 2. Extent of the Subject Site

Figure 3. Sensitive Receptors

Figure 4. Transport route

1 INTRODUCTION

1.1 Background

Leeuwin Civil Pty Ltd (the applicant) is proposing to extract sand from a 7.4 ha area within Lot 103 Boyanup Road West, Stratham (herein referred to as the subject site) (refer to **Figure 1** and **Figure 2**).

This application is made for a five-year period however, the exact life of the project is difficult to estimate as it will be dependent on supply and demand trends.

The available volume of sand (*insitu* volume of approximately 400,000 m³) is to be extracted, commencing to the north of the subject site and moving in a southerly direction (refer to **Figure 2**).

The slope of the final contours of the quarry will be an undulating surface at approximately 12.6 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal.

1.2 Purpose and Scope

This Dust Management Plan (DMP) has been prepared to fulfil the relevant requirements provided within the Shire of Capel's *Local Planning Scheme No. 8* and *Local Planning Policy No. 6.2 Extractive Industries*. It is intended to provide the Shire of Capel, the public and relevant government agencies with an understanding of the proposal and the environmental strategies and commitments proposed to address dust emissions associated with the proposed land use. This document has been prepared to support and should be read in conjunction with, the *Extractive Industry Operations Plan* prepared by Accendo Australia (2023) for sand extraction within the subject site.

Recognised industry standard practices for dust control are well-established within Western Australia. The utilisation of these standard practices is proposed at the subject site to suppress dust and reduce potential impacts associated with dust emissions.

Management of these activities are an effective means to prevent adverse effects of dust. The purpose of this DMP is to review the risks and control measures to appropriately manage dust and mitigate its impact.

The scope of the DMP is to cover the following:

- Legislative and regulatory compliance;
- Existing environment;
- Risk assessment of potential dust sources and air quality impacts;
- Mitigation and measurement measures; and
- Roles and responsibilities in relation to dust management.

2 EXISTING ENVIRONMENT

2.1 Land Use

The subject site is zoned “Rural” under the Shire of Capel’s *Local Planning Scheme No. 8*. The subject site is located within the “Special Control Area – Basic raw materials” under the *Local Planning Scheme No. 8*. The proposed extractive industry is a permitted land use within this zone subject to development approval from the Shire of Capel.

Land use abutting the boundaries of the subject site is Rural based to the north, east and south. Properties to the west of the subject site on the other side of Bussell Highway are zoned ‘Special Rural’.

The subject site is currently used for the grazing of cattle.

2.2 Sensitive Receptors

The Environmental Protection Authority (EPA) *Guidance for the Assessment of Environmental Factors* (June 2005) provides generic separation distances to assist in the determination of suitable buffers where industry may have the potential to affect the amenity of a sensitive land use. In particular, for extractive industries, a buffer distance of 300 m to 500 m is recommended from sensitive land uses.

The closest residential dwellings to the subject site are provided below and shown in **Figure 3**.

Table 1. Residential dwellings within 1,000 m of the subject site.

Resident No.	Distance to subject site (m)
1	140 m
2	648 m
3	779 m
4	786 m
5	880 m
6	936 m
7	987 m

The closest residential dwelling to the subject site is located 140 m from the southern boundary. This residence is periodically inhabited throughout the year and the majority of the work in the south of the subject site will be undertaken during the absence of the residents. The applicant has undertaken extensive consultation with Resident No. 1 to ensure that all concerns and potential impacts are adequately addressed.

All other residences do not have a direct line of sight to the extraction area and are buffered by existing vegetation.

2.3 Topography and Soils

The current topography of the subject site can be described as sloping with the elevation ranging from 13 m Australian Height Datum (AHD) in the west to 30 m AHD in the south eastern corner of the subject site (refer to **Appendix A**).

The subject site is located on the Perth Coastal Zone consisting of coastal sand dunes and calcarenite within the Spearwood system. The Spearwood systems consists of “*Sand dunes and plains with yellow deep sands, pale deep sands and yellow/brown shallow sands*” (Tille 2006).

The subject site is located within the Spearwood S1b phase consisting of 'dune ridges with deep siliceous yellow brown sands or pale sands with yellow-brown subsoil and slopes up to 15%' (Natural Resource Information (NRInfo) (DPIRD 2023).

2.4 Climate

The climate of the locality is classified as Mediterranean with warm to hot summers and cool wet winters.

The closest weather recording station is Bunbury (Station 9965). Temperatures are highest on average in February, at approximately 30°C. July has the lowest average temperature of the year of 7.3°C.

Rainfall for the area is approximately 730 mm per annum with approximately 90% of the rain falling during the winter months, April to October inclusive.

During the summer months the dominant wind in the mornings is from the south-east at 10-14 knots, swinging to the south-west at 20-25 knots in the afternoon. During winter, the winds are most commonly 10-14 knots with no dominant prevailing direction. During storms winds from the west and north-west can reach 40 knots (BoM 2020).

Rainfall intensity has been calculated using the Bureau of Meteorology (BoM) Intensity-Frequency-Duration (IFD) data system which yields the two hour 1 in 10 (10%) annual exceedance probability storm event for the subject site as 40.2 mm/hr.

3 EXTRACTION ACTIVITIES

The gravel quarry will cover an area of approximately 7.4 ha, with a current maximum elevation ranging from 13 m AHD to 30 m AHD. It will be excavated to a maximum depth of approximately 12.6 m AHD commencing in the north east and moving initially in a southerly direction in stages less than 2 ha in size (refer to **Figure 2**). The proposal does not include any crushing or screening of material.

It is estimated that the total volume of sand to be removed will be approximately 400,000 m³ with a maximum of approximately 200,000 m³ excavated each year, depending on supply and demand.

The planned end use of the quarry is to restore a natural soil profile and return the area to pasture, ensuring that there is no net loss of agricultural land.

3.1 Operational Works

Using a loader, the topsoil (where available) will be stripped and placed in stockpiles. Overburden, if present, will be removed using a dump truck and stockpiled to the perimeter of the proposed pit area.

Typical operating hours for quarries will be adopted for the subject site which involves 0700 am to 1800 pm each Monday to Friday and Saturdays 0700 am to 1300 pm, with no activities to occur on Sundays or public holidays. The site will be worked by 2 - 3 persons, depending on market demand.

3.1.1 Truck Movements

Access from the property will be via Boyanup Road West (a RAV -4 classified road), travelling west to Bussell Highway (refer to **Figure 4**). The road intersection will be asphalt, with sealing up to the length of a vehicle followed by a gravel access track. Signage will be erected on both the West and East extents of the road access advising of trucks entering.

It is proposed to extract a maximum of approximately 200,000 m³ or bank cubic metres (BCM) per year. The average daily extraction rate:

$$\begin{aligned} &= 200,000 \text{ BCM} / 52 \text{ weeks} / 5 \text{ working days per week} \\ &= 769 \text{ BCM per day.} \end{aligned}$$

It is estimated that approximately 70% of the haulage is proposed to be undertaken from October to May (8 months). Therefore, the average daily extraction rate (main season):

$$\begin{aligned} &= 200,000 \text{ BCM} \times 70\% / 32 \text{ weeks} / 5 \text{ working days} \\ &= 875 \text{ BCM per day.} \end{aligned}$$

The average daily extraction rate (LCM):

$$\begin{aligned} &= 875 \text{ BCM} \times 1.15 \\ &= 1006 \text{ LCM} \end{aligned}$$

It is proposed to utilise 22 tonne semi-trailers with a capacity of approximately 39.6 LCM of gravel. Accordingly, the average daily truck movements during the main season are as follows:

$$\begin{aligned} &= 1006 \text{ LCM} / 39.6 \text{ LCM truck capacity} \\ &= 25 \text{ truck movements per day} \times 2 \text{ (to and from)} \\ &= 50 \text{ trips per day} \times 2 \text{ (peak fluctuations)} \\ &= 100 \text{ trips per day maximum.} \end{aligned}$$

Given the highly variable nature of the campaigns, these calculations are estimates only, there may be periods in which these daily truck numbers are exceeded.

3.1.2 Sand Extraction

The sand will be excavated by a bulldozer to a stockpile or loaded directly to waiting trucks for transport. A summary of the proposed sand extraction activities is provided below:

- Prior to excavation commencing the site will be ground surveyed, the excavation footprint marked out and a 1 m contour plan developed.
- The topsoil and overburden (if present) will be stripped and stockpiled using a loader.
- An excavator or front-end loader will be used to dig the sand and transport it to a stockpile.
- The sand will then be picked up by a loader and loaded to trucks for transport.
- Excavation will commence in the north of the quarry and then move in a southerly direction. The face and walls of the pit will act as noise barriers.
- Upon completion of each section of quarry, the section will be reformed and back filled, where subgrade material is available, to achieve the proposed final contours.
- At the end of excavation, the floor of the quarry will be deep ripped, covered by overburden and topsoil, and rehabilitated to a constructed soil.

3.1.3 Final Contours

The slope of the final contours of the quarry will be an undulating surface at approximately 12.6 m AHD which is consistent with the adjoining land.

Slopes of the batters at the end of excavation will be retained at 1:4 vertical to horizontal which will enable the landform to be integrated with the surrounding landscape. This batter can be readily traversed by livestock, vehicles and machinery and is considered appropriate for the site's topographical relief.

3.1.4 Equipment

All operational equipment will work on the quarry floor to provide maximum sound and visual screening. All equipment and infrastructure will be fully portable to facilitate movement throughout the site required for staged quarrying operations. The site will be secured by locked gates when it is not being actively worked. The boundary fencing will be maintained to prevent inadvertent and unauthorised entry.

Equipment and facilities that may be used onsite are provided in the Table below.

Table 2. Equipment.

Equipment	Description
Site office and/or containers	May be required for the management and security of small items.
Toilet	A portable toilet may be required on site.
Water tanker	Used for dust suppression on the access roads and working floors when required.
Loader (938/330)	Loaders will be used for the movement of sand and loading road trucks.
Excavator (325/330)	An excavator may be used for the removal of sand material.
Anaconda Radial Stockpiler	Used for stockpiling sand.
Fuel storage	No fuel will be stored onsite.

Equipment	Description
Light vehicles	Access to and around the site.
Tip truck	Removal of sand from site.

3.1.5 Water Usage

Water is only required for dust suppression within the quarry and the access road. Water will be sourced from an offsite source and tankered to the site for dust suppression purposes, as required.

4 POTENTIAL IMPACTS

4.1 Dust Sources

The proposed extraction activities will involve the disturbance of large quantities of soil and earthen material. Specifically, this may include the following activities:

- Earthworks during extraction activities;
- Topsoil stripping;
- Loading and transportation of material;
- Vehicle movement within the site; and
- Wind erosion of exposed surfaces.

These activities have the potential to generate dust that, if not adequately controlled, can cause nuisance and safety risks. In-pit operations tend to generate less dust than surrounding activities due to the reduced airflow within the pit. The removal and replacement of topsoil material has the highest risk associated with dust generation due to the large volumes of material involved and generally lower levels of soil moisture.

4.2 Risk Assessment

In accordance with the DWER’s “A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities”, a risk assessment for dust emissions has been prepared (DWER 2021).

For a site that is generating uncontaminated dust, such as extractive industry sites, the site classification chart in Appendix 1 of the DWER guideline can be used for assessing the site risk. Appendix 1 also details the provisions and contingency arrangements for dust management which apply to each site classification score.

The site classification assessment is provided below.

Part A. Nature of site

Item	Score Options				Score
1. Nuisance potential of soil when disturbed	Very low - 1	Low – 2 <i>Material is of course composition</i>	Medium - 4	High - 6	2
2. Topography and protection provided by undisturbed vegetation	Sheltered and screened - 1	Medium screening – 6 <i>Screening provided by stabilised bunds and roadside vegetation</i>	Little screening – 12	Exposed and wind prone - 18	6

3. Area of site disturbed by the works	Less than 1ha - 1	Between 1 and 5ha – 3 <i>Excavation will occur in stages less than 2 ha.</i>	Between 5 and 10ha – 6	More than 10ha - 9	3
4. Type of work being done	Roads and trenches - 1	Roads, drains and medium deep sewers - 3	Roads, drains, sewers and partial earthworks - 6	Bulk earthworks – 9 <i>Sand extraction</i>	9
Total score for Part A					20

Part B. Proximity of site to other land uses

Item	Score Options				Score
1.Distance of other land uses from site	More than 1km - 1	Between 1km and 500m – 6	Between 100m and 500m - 12	Less than 100m - 18	12
2. Affect of prevailing wind direction (easterly) on other land uses	Not affected - 1	Isolated land uses affected by one wind direction – 6	Dense land uses affected by one wind direction – 9	Dense/sensitive land uses highly affected by prevailing winds - 12	6
Total score for Part A					18

Site Classification Score (A x B) = 360

Classification 2 (score between 200 and 399, considered **Low risk**). The provisions, contingency arrangements and monitoring requirements as specified by the DWER (2011) associated with a Clasificaiton 2 proposal are provided below.

Provisions:

The developer shall supply a contingency plan to the local government, which shall detail the activities should dust impacts occur.

Contingency arrangements:

Include an allowance for water-cart operation, wind fencing and surface stabilisation during the construction period for the purposes of dust suppression.

All areas of disturbed land should be stabilised to ensure that the disturbed area exposed at any time is kept to a practical minimum.

Monitoring requirements:

Complaints management system in place.

Notice to be erected at the site providing contact details of the person to be contacted.

4.3 Management Measures

While the potential impacts to amenity from dust emissions are considered low, standard dust suppression measures will be implemented during operation activities, as provided within **Table 3**.

Table 3. Dust management measures.

Legislation and Key Standards		
<p><i>Environmental Protection Act 1986 (EP Act)</i></p> <p><i>A guideline for managing the impacts of dust and associated contaminants from land development sites, contaminated sites remediation and other related activities (DEC 2011)</i></p>		
Objectives		
<ul style="list-style-type: none"> • Minimise dust lift during all activities. • No adverse dust impacts to sensitive receptors from the quarry operations. 		
Targets		
<ul style="list-style-type: none"> • No visible dust beyond the property boundary. • No dust complaints. 		
Management Actions		
Description	Responsibility	Timing
Notice to be erected at the site, providing contact details of the person to be contacted regarding the works. This person will also be available outside of operational hours to address any complaints.	Site Manager	Prior to extraction
Induction for all employees will include information on: <ul style="list-style-type: none"> • Potential sources of dust • Dust Management Plan • Speed limits onsite and staying on designated roads • Reporting procedure for dust issues 	Site Manager	Prior to extraction
Topsoil stripping shall <u>not</u> occur during the following conditions: <ul style="list-style-type: none"> • Winds in excess of 30 km/hr; 	Site Manager	Topsoil stripping and bund construction

Areas of land cleared and the period of time they remain cleared are to be kept to a minimum.	Site Manager	At all times
Water trucks are to water down unsealed roads during operation to reduce dust lift.	Site Manager	As required
Stockpiles, where possible, will be limited to the anticipated cubic volume/vehicle movement for cartage on the following operating day.	Machine Operator	At all times
Temporary stockpiles and exposed areas will be watered and stabilised as required. Stabilisation techniques that will be considered depending on environmental conditions will include hydro-mulching.	Site Manager	As required
Transport of dust-prone material will be via covered trucks or dampened prior to transport to prevent dust lift during transport.	Drivers	During soil transport activities
Water trucks are to be available at all times during quarry activities to water the site on observation of dust lift.	Site Manager	As required
Vehicle speeds will be restricted to no more than 10km/hr on the site to minimize dust lift off.	Drivers	At all times
Wind fencing and soil stabilisation equipment will be available for commissioning if required.	Site Manager	As required
Maintain a complaints register (refer to Appendix B). A Complaints Register will be established for the site to record the following information: <ul style="list-style-type: none"> • Date, time, location and nature of the exceedance. • Identify the cause (or likely cause) of the exceedance and responsible parties. • Identify the activities that were occurring at the time of the non-compliance. • Determine the activities that were most likely contributing to the non-compliance. • Describe what action has been taken to date. • Describe the proposed measures to address the exceedance. 	Site Manager	As required

Monitoring			
Description	Parameter	Responsibility	Frequency
Visual monitoring of dust will be ongoing throughout the day during operations. All monitoring is to be maintained on a logging sheet for reference and proof of compliance.	Dust lift and signs of dust deposition near property boundary. Evidence of no visible dust crossing the site boundary will be used as the monitoring criteria for compliance.	Site Manager	Continuous
Contingency and Corrective Actions			
Incident or Consequence	Corrective Action	Responsibility	
Observation of excessive dust lift onsite	Report and investigate as incident.	Site Manager	
	Halt work within proximity of the area until cause of dust is addressed.	Site Manager	
	Increase dust mitigation measures (e.g. additional watering of exposed areas).	Site Manager	
Complaint received	Report and investigate as incident. To determine the validity of the complaint, the wind direction, wind speed and activities being undertaken on site at the time of the complaint will be established.	Site Manager	
	If required, halt work until cause of dust is addressed.	Site Manager	
	If the complaint is verified as being due to a site source, remedial action will be undertaken within 2 hours. The Shire of Capel will be advised of all complaints as soon as they are received. If a complaint cannot be resolved within the 2 hour response period, it may be necessary to cease operations.	Site Manger	
	Review dust management procedures and adjust if deemed necessary.	Site Manager	

REFERENCES

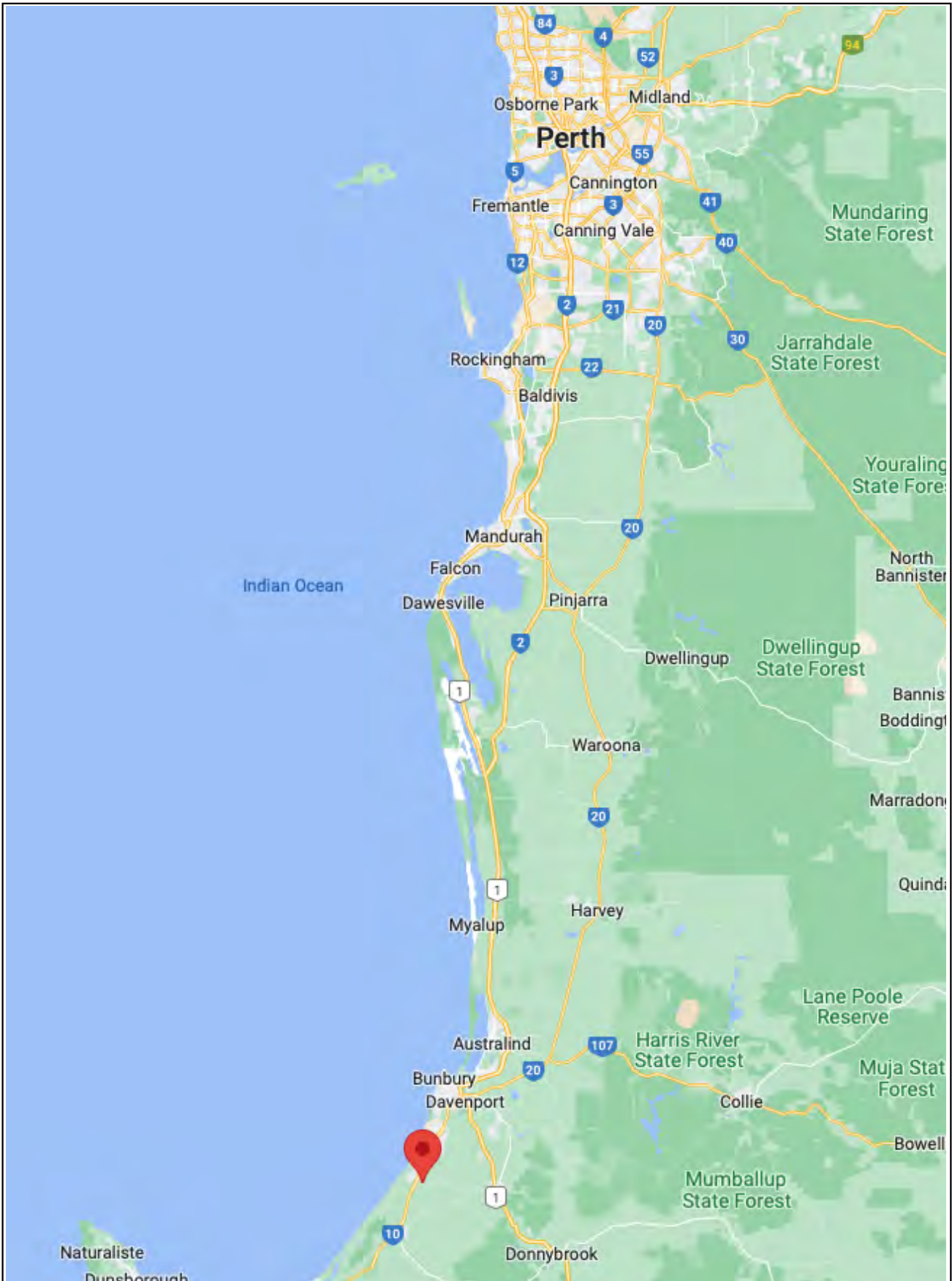
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FIGURES



PROJECT Lot 103 Boyanup Rd W, Stratham

DRAWING TITLE Figure 1 – Site Locality

CLIENT Leeuwin Civil Pty Ltd



Project Number 2311

Designed PN
Drawn PN

Date
Local Authority
Sheet 1 of 1

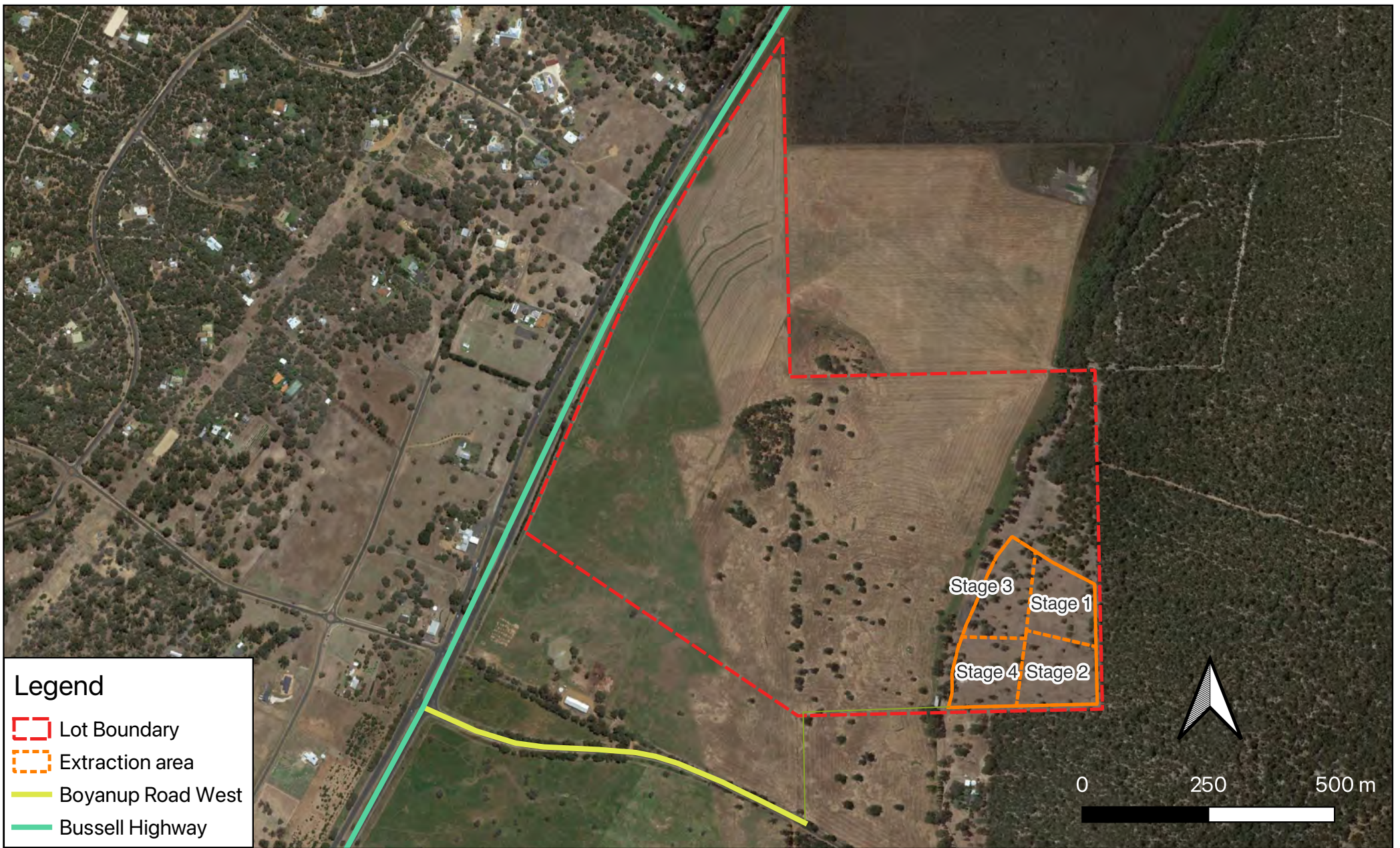
Drawing Number Figure 1

Checked
Approved

26/09/2023
Shire of Capel

Revision A

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Legend

- Lot Boundary
- Extraction area
- Boyanup Road West
- Bussell Highway

PROJECT 103 Boyanup Road West, Stratham

DRAWING TITLE Figure 2 - Site Extent

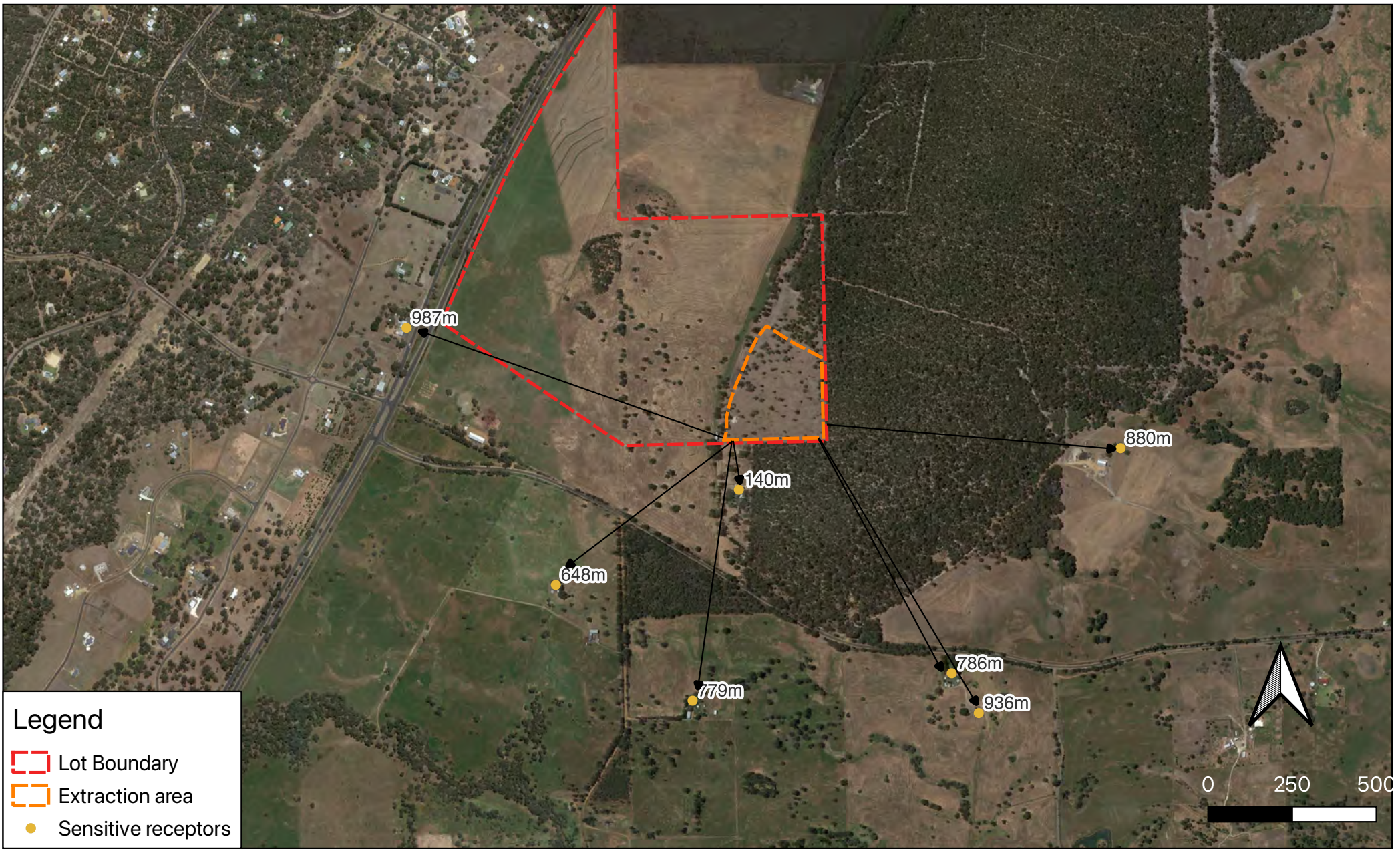
CLIENT Leeuwin Civil Pty Ltd

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AUSTRALIA

PO Box 5178
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Western Australia 6280
Mobile 0418 950 852

Project Number	2311	Designed	PN
Drawing Number	Figure 2	Drawn	PN
Revision	A	Checked	
Date	20/09/2023	Approved	
Sheet 1 of 1		Local Authority	Shire of Capel

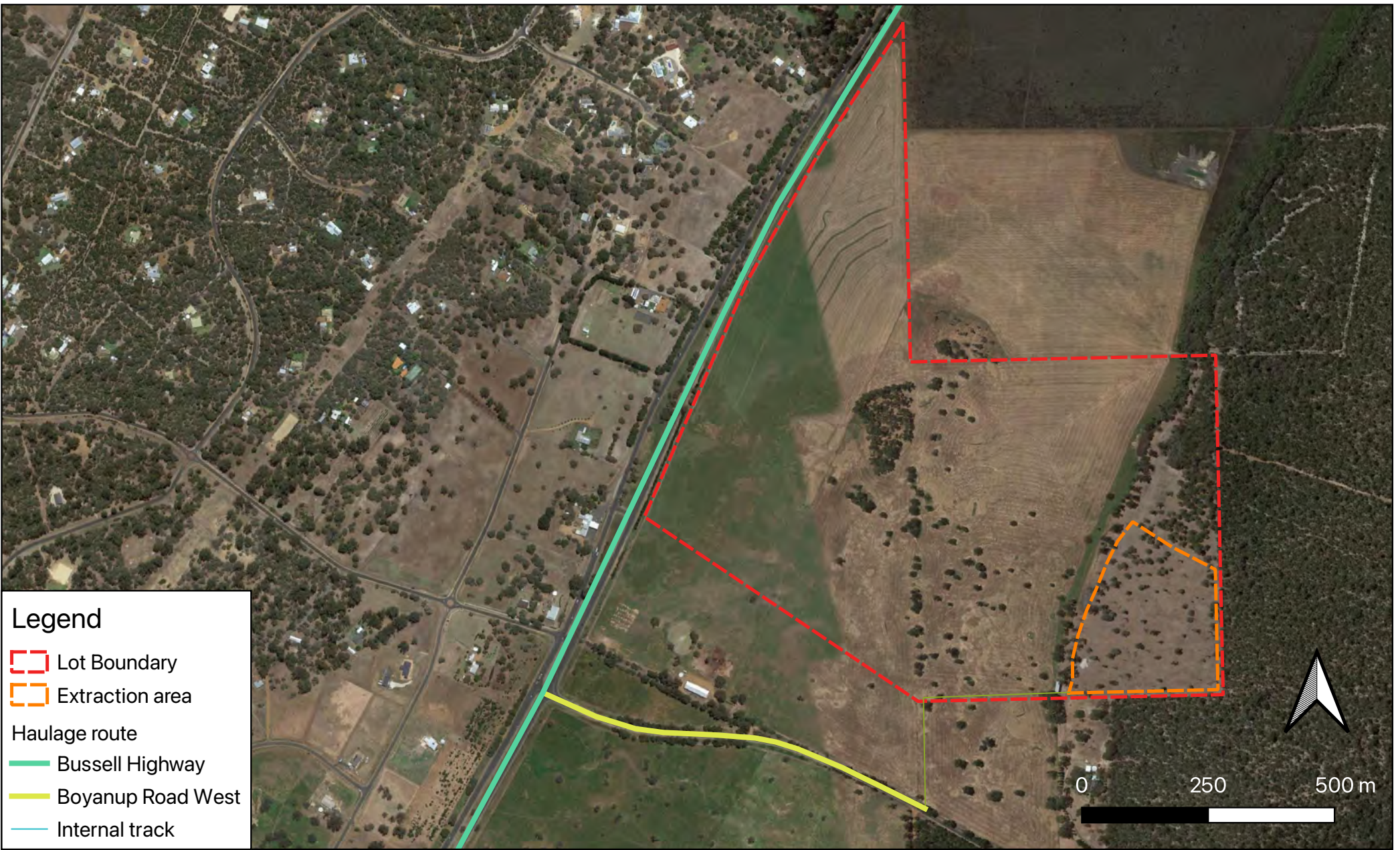
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Legend

- Lot Boundary
- Extraction area
- Sensitive receptors

PROJECT	103 Boyanup Road West, Stratham	 PO Box 5178 West Busselton Western Australia 6280 Mobile 0418 950 852	Project Number	2311	Designed	PN
DRAWING TITLE	Figure 3 - Sensitive Receptors		Drawing Number	Figure 3	Drawn	PN
CLIENT	Leeuwin Civil Pty Ltd	Revision	A	Checked		
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		Sheet 1 of 1		Local Authority	Shire of Capel	



Legend

- Lot Boundary
- Extraction area
- Haulage route
- Bussell Highway
- Boyanup Road West
- Internal track

PROJECT 103 Boyanup Road West, Stratham

DRAWING TITLE Figure 4 - Haulage Route

CLIENT Leeuwin Civil

accendo
AUSTRALIA

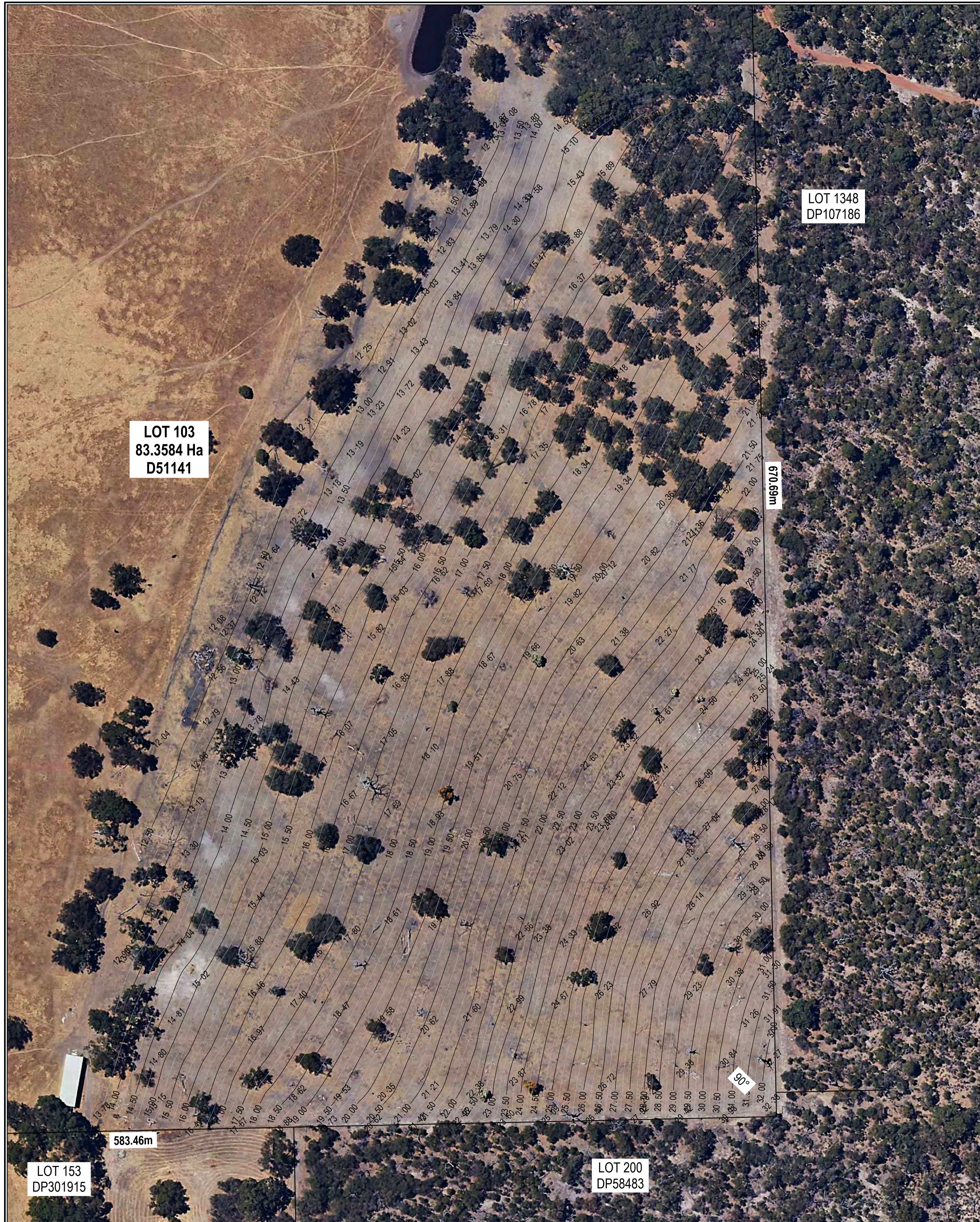
PO Box 5178
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Western Australia 6280
Mobile 0418 950 852

Project Number 2311
Drawing Number Figure 4
Revision A
Date 21/06/2023
Sheet 1 of 1

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Approved
Local Authority Shire of Capel

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APPENDIX A – SITE CONTOUR SURVEY



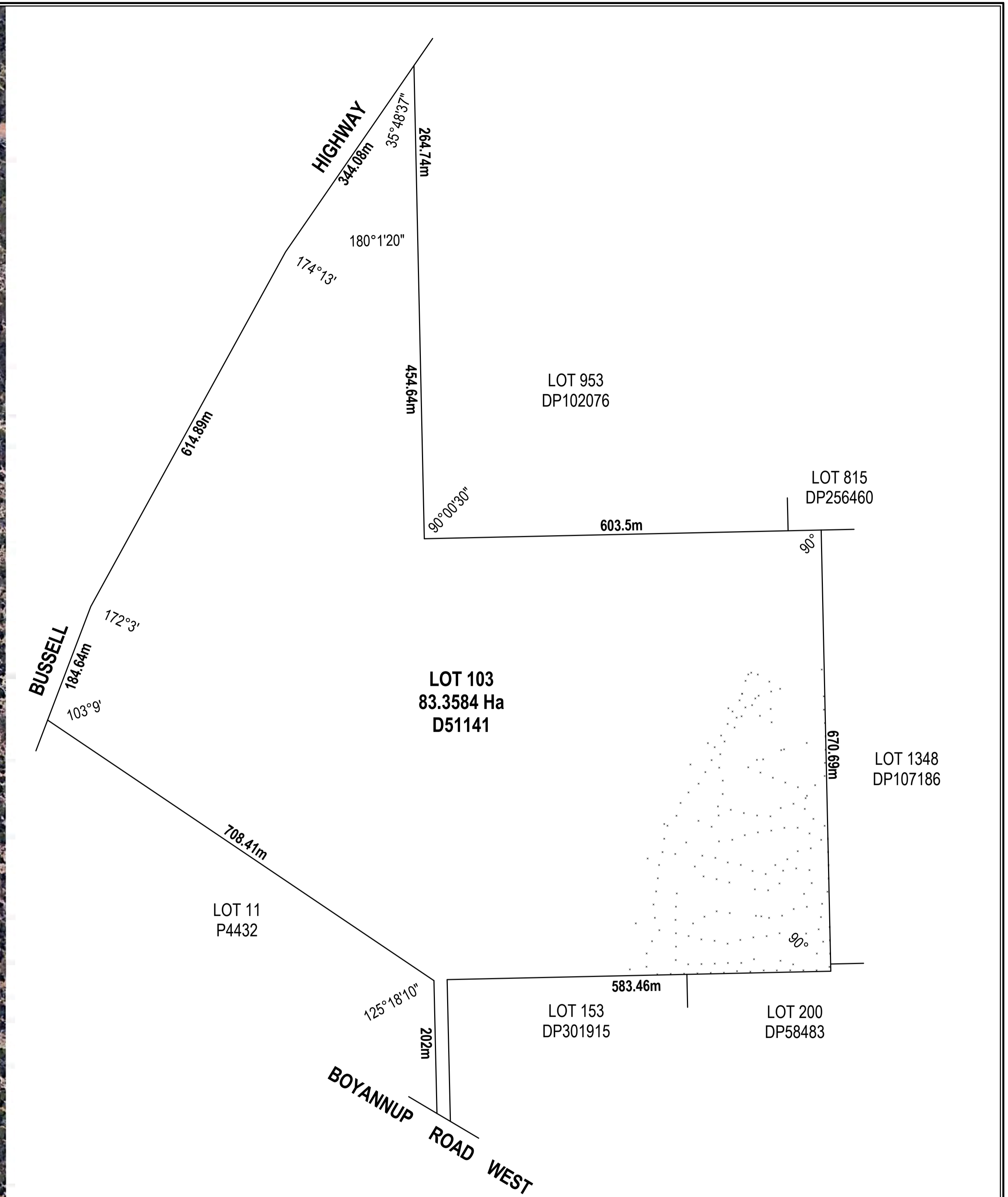
LOT 103
83.3584 Ha
D51141

LOT 1348
DP107186

583.46m

LOT 153
DP301915

LOT 200
DP58483



LOCALITY DIAGRAM (NOT TO SCALE)

LEGEND

27.13 EXISTING SURFACE HEIGHT
BOUNDARY

- NOTES:**
- Limited boundary marks found. Boundary resurvey recommended if building on or close to boundary.
 - Datum is AHD established from VRS / GPS.
 - Above ground services located by survey. Underground services plotted from plans supplied by the relevant authorities. No liability is accepted for errors in underground service locations. All services to be located on site prior to any work being done.
 - No boundary marks found unless otherwise noted.
 - Contour interval is 0.25m.
 - PDF to be used in conjunction with DWG file supplied. Some point heights may have been omitted for clarity; see DWG file.

Rev.	DESCRIPTION	DATE	DRAWN	CHECKED
A	INITIAL ISSUE	30/8/23	TJ	MR

Scale: 1:1000
0 10 20 30 40 50

Surveyor: MR
Survey date: 18/7/2023
Precal/Cad: N/A

FEATURE AND CONTOUR SURVEY
LOT 103 ON DIAGRAM 51141,
BOYANUP ROAD, STRATHAM

Client: **LEEUWIN CIVIL**

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APPENDIX B – COMPLAINTS REGISTER

Complaints Register

Ref. No.	Date	Name & Address of Complainant	Time/Date of Complaint	Detail of Complaint	Summary of Actions Taken	Shire Notified	Person Responsible