PUBLIC HEARING ON BEHALF OF THE MINISTER

NORTHERN TERRITORY PLANNING SCHEME

AGENDA ITEM: 1 **MEETING DATE**: 16/06/2026 **FILE**: PA2026/0137

APPLICATION:	Subdivision to create 26 lots (25 new lots and the balance parcel) in 3 stages
APPLICANT:	Brad Cunnington of Cunnington Rosse Town Planning and Consulting
LAND OWNER:	Daly River Pastoral Pty Ltd (ACN 119 823 371) as trustee for The Browne North West Trust
LOCATION:	N.T. Portion 7860 (745) Edith Farms Rd, Edith NT (**Bookmark A**)
ZONE:	Unzoned
AREA:	3437ha

1. PROPOSAL

The application is seeking consent to develop N.T. Portion 7860 (745) Edith Farms Rd, Edith NT for the purpose of a subdivision to create 26 lots (25 new lots and the balance parcel) in 3 stages

A copy of the application is at **Bookmark B**.

2. REASON FOR APPLICATION

An application is required for planning permission because pursuant to section 44 of the *Planning Act 1999* 'subdivision' requires consent.

3. BACKGROUND

The application has been assessed by Development Assessment Services (DAS) against the Northern Territory Planning Scheme 2020 (NTPS2020) which applies to the land. The detailed Technical Assessment is provided at **Bookmark C.**

The proposed development is located on unzoned land and the proposed subdivision is Impact Assessable under Clause 1.8(1)(c)(ii) of the NTPS2020, therefore, pursuant to sub-clause 4 of Clause 1.10 (Exercise of Discretion by the Consent Authority), the following needs to be considered:

(a) any relevant requirements, including the purpose of the requirements, as set out in Parts 5 or 6;
- 6.3.2 (Lot Size and Configuration for Subdivision in Zones RL, R and H, and Unzoned Land)
- 6.3.3 (Site Characteristics for Subdivision for Lots of 1ha or Greater in Zones RR, RL, R and H, and Unzoned Land)
- 6.3.4 Infrastructure for Subdivision in Zones RL, R and Unzoned Land

(b) any Overlays and associated requirements in Part 3 that apply to the land;
- CNV - Clearing of Native Vegetation

(c) the guidance provided by the relevant zone purpose and outcomes in Part 4, or Schedule 4.1 Specific Use Zones; and
- Not applicable – application is located on land that is unzoned

(d) any component of the Strategic Framework relevant to the land as set out in Part 2.
- Katherine Land Use Plan – not technically applicable

The requirements, overlays, and the components of the NTPS2020 have been considered by DAS, and the application was found to comply with all relevant requirements. Please see the technical assessment for further details.

4. PUBLIC EXHIBITION

The application was placed on public exhibition for a period of two weeks between 01 May 2026 and 15 May 2026 and one public submission was received. A copy of the submission can be found at **Bookmark D**.

5. PUBLIC SUBMISSIONS

Barbara Tootell
- Concerns that there is not enough water supply and that sediment is appearing more frequently in the water supply.
- Waterflows will be changed as a result of the subdivision.
- Increase of traffic on the roads will require more maintenance and upgrades on both Edith Farms Road and Beasley Road.

6. SERVICE AUTHORITY COMMENTS

The proposal was circulated to the following service authorities for comment:
- Katherine Town Council
- Development Coordination, Land Resource Division-DLPE
- Power Networks Network Engineering - Power & Water Registry
- Water Services Land Development - Power and Water Corp.
- Survey - Dept. Lands, Planning and Environment

The following services authorities provided comments which can be found at **Bookmark E**, and are summarised below:

Katherine Town Council – Bookmark E1
- Does not object to the application
- Notes that:
    - Council do not own or maintain any registered assets of infrastructure in the subdivision area.
    - Council have reviewed the driveway and stormwater plans.

Development Coordination, Land Resource Division-DLPE – Bookmark E2

Flora and Fauna Division:
- Does not object to the application
- Note that no targeted surveys are required
- Provides information on the Ghost Bat species and Victorian River Squat Snail
- Supports the recommendations made in the Land Suitability Assessment
- Recommends that:
    - Works in riparian areas are minimised
    - Rock outcrops are incorporated wholly within individual lots where possible
    - The use of barbed wire is restricted
    - Future clearing is in accordance with relevant requirements

Water Resources Division:
- Does not object to the application
- Provides information relating to water supply in the region and the drilling of bores and water quality for portability.

Land Resources Division:
- Does not object to the application
- Has conducted a site inspection of the location in 2019
- Agrees there is at least one hectare of unconstrained land per a lot
- Recommends an ESCP Type 2.
- Provides information about land clearing
- Provides information about weeds

Environment Heritage Division:
- Does not object to the application
- Recommends an 'Unexpected Finds Protocol' be developed and that an archaeological survey is undertake.
- Provides further information relating to heritage requirements

Environmental Regulation Division:
- Does not object to the application
- Indicates that the development does not appear to trigger the licensing requirements of an Environment Protection Approval (EPA)
- Provides information about environmental issues that may need to be considered.

Power Networks Network Engineering - Power & Water Registry – Bookmark E3
- Does not object to the application
- Notes that there is no reticulated power supply and recommends a cautionary note should be placed on the titles
- Provides information about power requirements relevant to the subdivision

Water Services Land Development - Power and Water Corp. – Bookmark E4
- Do not object to the application
- Note that there is no reticulated water supply

7. ISSUES FOR CONSIDERATION
- The application is for a subdivision, and the Minister is the consent authority.
- A public submission has been received under Section 49(1) of the *Planning Act 1999*.
- Section 50(1) of the *Planning Act 1999* provides that 'if a natural person or body corporate makes a submission in accordance with section 49(1) or (2), the consent authority may invite the person or a representative of the body to appear before it and give evidence in relation to the development application'.
- Section 50(3) of the *Planning Act 1999* provides that 'If the Minister is the consent authority in relation to the land or development to which a submission relates, the Minister may appoint a person or body to receive information from the relevant person or representative mentioned in subsection (1) or (2)'.
- Barbara Tootell who is the only submitter for the this application was invited to appear before the consent authority to give evidence in relation the development application.

8. RECOMMENDATION

As per your delegation under Section 50(3) of the *Planning Act 1999* you conduct a public hearing on behalf of the Minister and receive information from persons or authorities which made submissions in accordance with Section 49(1) of the *Planning Act 1999* to the development of N.T. Portion 7860 (745) Edith Farms Rd, Edith NT.

Daniel Herlihy

AUTHORISED: **DANIEL HERLIHY**
SENIOR PLANNER
DEVELOPMENT ASSESSMENT SERVICES

Map created Mon Jun 15 10:52:54 ACST 2026

Map Center: 131° 59' 53" E, 14° 19' 3" S

Legend

- General Lines
- Town Planning Zones
  - A - Agriculture
  - CV - Caravan Park
  - CB - Central Business
  - C - Commercial
  - CL - Community Living
  - CP - Community Purpose
  - CN - Conservation
  - DV - Development
  - RR - Rural Residential
  - GI - General Industry
  - HT - Heritage
  - HR - High Density Residential
  - H - Horticulture
  - LI - Light Industry
  - M - Main Road
  - MR - Medium Density Residential
  - LMR - Low-Medium Density Residential
  - CA - No Planning Scheme Controls
  - OR - Organised Recreation
  - PM - Proposed Main Road
  - PS - Public Open Space
  - RW - Railway
  - RD - Restricted Development
  - R - Rural
  - RL - Rural Living
  - SC - Service Commercial
  - LR - Low Density Residential
  - S - Specific Use
  - TC - Tourist Commercial
  - U - Utilities
  - WM - Water Management
  - FD - Future Development
  - RJ - Residential Jabiru
  - PSJ - Public Open Space Jabiru
  - ORJ - Organised Recreation Jabiru
  - CJ - Commercial Jabiru
  - SCJ - Service Commercial Jabiru
  - TCJ - Tourist Commercial Jabiru
  - CPJ - Community Purpose Jabiru
  - FDJ - Future Development Jabiru
  - IJ - Industrial Jabiru
  - MJ - Main Road Jabiru
  - UJ - Utilities Jabiru
- Road Labels
- Road Centrelines
  - Highway
  - Other Road
- Parcel Numbers
  - Cadastre
  - Coastline

Created by DAHER

Bottom Left: 131° 56' 56", -14° 20' 38"
Top Right: 132° 02' 49", -14° 17' 27"
Approximate Scale: 1:73,000
Datum: GDA 1994
Data for information purposes only
- accuracy not guaranteed
N.T. Land Information System

Land owner/s authorisation to lodge a development application

The Planning Act 1999

Before you fill in the form

Signatures from ALL landowners registered on the land title must be provided.

The authorisation must be dated within six months of the submission of the application.

Fields marked with an asterisk (*) are required.

Fields marked with a carat (^) are required if applicable.

Applicant

In accordance with Section 46(3)(aa)(i) of the *Planning Act 1999*, a development application is to contain the name and contact details of the **applicant** AND **any person on whose behalf the application is made.**

Name of Applicant/Consultant or Acting agent	Brad Cunnington, Cunnington Rosse Town Planning and Consulting		
Address	PO Box 36004 Winnellie NT 0821		
Phone	0427796140	**Email**	brad@crtpc.com.au

Persons on whose behalf the application is made:

Person/s on whose behalf the application is made:	Anthony Browne		
Address	11 Marne Street, VAUCLUSE NSW 2030		
Phone	0429654007	**Email**	a.j.browne@icloud.com

The applicant is hereby authorised to lodge a development application over the subject land described as:

***Lot/NT portion**	07860
***Location/town/hundred**	NT Portion
***Street address**	745 Edith Farms Road, Edith

The application is for the purpose of:

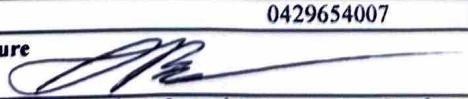
***Proposed development** *Brief description of proposed development*	Subdivision to create 26 lots

Landowner/s signature

In accordance with Section 46(3)(aa)(ii) of the *Planning Act 1999*, a development application is to contain the **name and contact details of the owner of the land** to which the application relates.

Written authorisation from each:

- **Individual owner**: Each person listed on the title must provide written authorisation for the application.
- **Companies**: For each company listed on the title, written authorisation must be obtained from the **director** or **authorised representative** of the company. This authorisation confirms that the company is giving consent for the application and that the person signing on behalf of the company has the legal authority to do so.

***Full name**	Anthony James Browne		
^Company name	Daly River Pastoral Pty Ltd as trustee for the Browne North West Trust		
^Title *(e.g. director/authorised representative)*	Director		
Phone	0429654007	**Email**	a.j.browne@icloud.com
***Signature**			
***Date**	29-MARCH-2026		

Landowner signature

*Full name	DIANE AMANTE BROWNE
^Company name	DALY RIVER PASTORAL ATF BROWNE NORTHWEST TRUST
^Title (e.g. director/authorised representative)	DIRECTOR
Phone 0408 434 162	Email browneagroup@icloud.com
*Signature	D Browne
*Date	29/03/2026

Any Persons with an interest in the land (as applicable)

In accordance with section 46(3)(aa)(iii) and (iv) of the *Planning Act 1999*, a development application is to contain the name and contact details of **any person who entered into an agreement** with the applicant and/or landowner, **to acquire an estate or interest in the land to which the application relates**; and **any person with an interest** prescribed by regulation.

^Full name	
^Company name	
^Title (e.g. director/authorised representative)	
^Signature	
Phone	Email
^Full name	
^Company name	
^Title (e.g. director/authorised representative)	
^Signature	
Phone	Email

Privacy Note

The Department of Lands, Planning and Environment, on behalf of the Minister, is authorised under the *Planning Act 1999* to collect the information on this form, or otherwise provided by you, to consider a proposal to grant a Development Permit or to amend a planning scheme. Failure to provide the information in full may result in delays in processing of the application.

Some of the personal information provided by you on this application may be publicly available, as part of a public exhibition process. The information is also regularly provided to other Northern Territory Government agencies, the Australian Valuation Office, local governments and Commonwealth Government Departments and agencies, as required by law.

Collection of personal information on this form is done in accordance with the privacy legislation within the Northern Territory *Information Act 2002*. For more information, please refer to the Northern Territory Government's privacy statement located at https://nt.gov.au/copyright-disclaimer-and-privacy
Any personal information provided can be subsequently accessed by you on request.

NORTHERN TERRITORY GOVERNMENT

CUNNINGTON ROSSE
Town Planning & Consulting

Statement of Effect

SUBDIVISION TO CREATE 26 LOTS IN 3 STAGES

NT PORTION 7860 (745 EDITH FARMS ROAD, EDITH)

17 April 2026

Contact

Name	Brad Cunnington
Position	Director
Email	brad@crtpc.com.au

Important Note

This report has been prepared for the sole purpose of making a development application and this report is strictly limited to the purpose, and facts and circumstances stated within. It is not to be utilsed for any other purpose, use, matter or application.

While every effort has been made to ensure accuracy, Cunnington Rosse Town Planning and Consulting does not accept any responsibility in relation to any financial or business decisions made by parties other than those for whom the original report was prepared for and/or provided to.

If a party other than the Client uses or relies upon facts, circumstances and/or content of this Report without consent of Cunnington Rosse Town Planning and Consulting, Cunnington Rosse Town Planning and Consulting disclaims all risk and the other party assumes such risk and releases and indemnifies and agrees to keep indemnified Cunnington Rosse Town Planning and Consulting from any loss, damage, claim or liability arising directly or indirectly from the use of or reliance on this report.

Document Control

Author	Brad Cunnington
Version	1.1
Date	17 April 2026

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Attachment A: Subdivision Layout Plans

Attachment B: Subdivision Boundary Slope Plans

Attachment C: Preliminary Stormwater Management Plan and Report

Attachment D: Land Suitability Assessments

Attachment E: Site and Soil Evaluation

Attachment F: Land Capability Assessments

Attachment G: Erosion and Sediment Control Plan

Attachment H: Title Documents

Attachment I: Survey Plan LTO22020/020

1.0 Introduction and Background

Cunnington Rosse Town Planning and Consulting have been engaged by Daly River Pastoral Pty Ltd as trustee for the Browne North West Trust to prepare and lodge a development application for the subdivision of NT Portion to create 26 lots in 3 stages. The proposed subdivision comprises the third stage of the Sunrise Estate development, a series of rural / rural lifestyle lots in the locality of Edith, approximately 30 kilometres north-west of Katherine. The proposed lots all front Edith Farms or Beasley Roads, with the proposed lifestyle lots having a minimum land area of 8.01 hectares. The remnant area is proposed to be retained across three parcels, with lot areas of 1,981.89, 809.11 and 440.81 hectares.

The Sunrise Estates development commenced in 2012 with the first lots adjacent the northern side of Edith Farms Road titled in 2014. Stage 2 included lots adjacent the southern side of Edith Farms Road, with titles issued in 2020. Stage 3, subject of this application, extends the estate further west adjacent the southern side of Edith Farms Road and along Beasley Road. Lots are not serviced and the resultant larger lot sizes ensure sufficient space for dwellings and outbuildings, on-site wastewater treatment systems, bores and auxiliary power supply.

The subdivision of land requires a development permit pursuant to **Section 44(b)** of the *Northern Territory Planning Act 1999* (the Act), and an application for development for the purpose of *subdivision* is considered at the level of *Impact Assessable.* This report details the nature of the subject land and locality, the proposed development, considers the proposal against the relevant provisions of the Planning Scheme (including the Strategic Framework), and the relevant components of **Section 46(3)** of the Act. This report (and application) is to be read together with the plans, reports and background information contained in **Attachments A** through **I**.

2.0 Site and Locality

Site Details	
Location	NT Portion 7860
Title Reference and Land Tenure	CUFT 855 512 Estate in Fee Simple
Area Under Title	34 square kilometres 37 hectares
Easements Identified on Title	None Identified
Landowner	Daly River Pastoral Pty Ltd as trustee for the Browne North West Trust
Planning Scheme Context	
Planning Scheme	Northern Territory Planning Scheme 2020
Zone	• Unzoned
Applicable Land Use Definitions	Subdivision (NTPA **Section 5**)
Strategic Framework	• Katherine Land Use Plan
Overlays	• CNV – Clearing of Native Vegetation
Subdivision Requirements	• Clause 6.3.2 – Lot Size and Configuration for Subdivision in Zones RL, R and H, and Unzoned Land • Clause 6.3.3 – Site Characteristics for Subdivision for Lots of 1ha or Greater in Zones RR, RL, R and H, and Unzoned Land • Infrastructure for Subdivision in Zones RL, R and Unzoned Land

Table 1: *Site details and Planning Assessment Context*

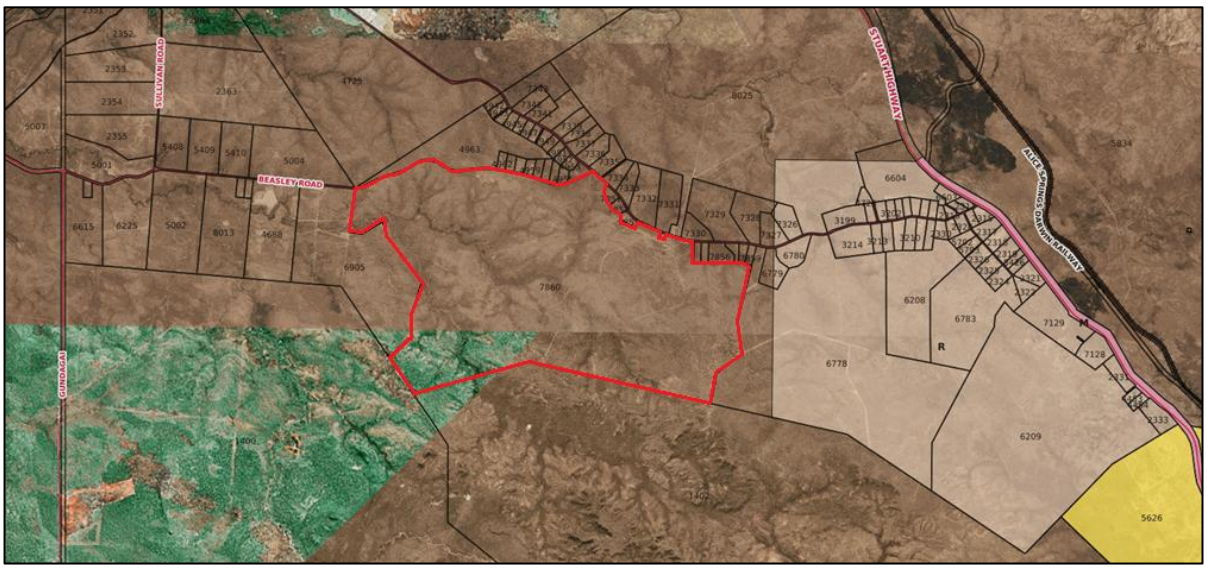

Figure 1: *Subject land (red border) – NT Portion 7860*

The subject land comprises a large 3,437 hectare parcel adjacent the southern side of Edith Farms and Beasley Roads, in the locality of Edith. NT Portion 7860 has a combined frontage to Edith Farms Road of approximately 1.6 kilometres, and an uninterrupted frontage to Beasley Road of approximately 6.07 kilometres. The site is predominantly covered with native vegetation, with a number of informal vehicle tracks, a small number of isolated gravel extraction sites (including a single area close to the Beasley Road frontage), and a single dwelling and associated outbuildings in the north-eastern part of the site. The site is largely undeveloped, and has historically been used for pastoral purposes.

The land area broadly slopes from east to west, with the site elevation ranging between 110 and 170 metres AHD. Both Beasley and Edith Farms Roads generally follow the existing ridgelines. Records show 4 existing (RN030538; RN029234; RN025641; and RN024953) and 2 historic (RN009486; and RN022551) bores within the subject land. Existing land unit mapping shows the land as predominantly plains with gentle slopes and well-drained soils (3a, 3b, 3c and 3d), with vegetation dominated by low woodlands of *Eucalyptus tectifica* and *E. foelscheana*. In the southern portion of the site, a drainage system runs east to west and is subject to seasonal inundation. The nearest major drainage system to the subdivision is Bondi Creek, a third-order stream and tributary of the Fergusson River, located approximately 1.5 kilometres to the south of Beasley Road.

2.1 Locality

The surrounding locality predominantly comprises a mix of rural lifestyle and pastoral land uses. Smaller lots fronting Edith Farms and Beasley Roads are generally utilised in a manner consistent with rural lifestyle activities, including home based business, small agricultural activities and other rural and associated activities. Larger parcels, including the subject land, are generally utilised for low-density grazing and other pastoral activities, or are unused (other than for natural or environmental purposes). Rural lifestyle lots fronting Edith Farms and Beasley Roads are generally consistent with the minimum 8 hectare size limit, with lots along the northern side of Edith Farms Road, and further west along Beasley Road towards the Fergusson River being generally larger.

Lots immediately north of Beasley Road and south of Edith Farms Road are more consistent with the 20 acre / 8 hectare rural lifestyle lot sizes. The Stuart Highway commences approximately 5.5 kilometres east of the site. The Edith Farms Volunteer Bushfire Brigade is located at 755 Edith Farms Road, surrounded on 3 sides by the subject land.

3.0 Proposed Development

The proposed development comprises the subdivision of land to create 26 lots from the existing NT Portion 7860. 23 lots are proposed as rural lifestyle lots, consistent with the minimum 8 hectare lot size, whilst the remnant portion will be retained across three proposed lots, with the dividing boundaries between the three larger lots aligned with the existing internal fencelines. The proposed lots are laid out as follows:

- **Lots 2, 3, 4** and **6** consisting of rural lifestyle lots adjacent the southern side of Edith Farms Road, between existing Portions 7853 and 7854. The lots have areas between 8.01 and 8.03 hectares. Proposed lot 4 adjoins the western and southern boundary of the Volunteer Bushfire Brigade lot at Portion 6090;

- **Lots 7-11, 13** and **15-25** consisting of rural lifestyle lots adjacent the southern side of Beasley Road, with proposed lot 7 fronting the intersection of Beasley and Edith Farms Road. Lot sizes are between 8.01 and 20.15 hectares, with proposed lot 24 being larger to ensure an adequate provision of land suitable for development ('unconstrained' land). The historic gravel extraction area across lots 21, 22 and 23 will be remediated as part of the proposed subdivision works;

- **Lots 12** and **14** being battleaxe lots with an access (axe-handle) between lots 11 and 13 (lot 12) and between lots 13 and 15 (lot 14). The battleaxe lots are larger (17.28 and 13.81 hectares respectively) with axe handles between 218.78 and 240.90 metres long and 20 metres wide, and enable subdivision access to suitable ('unconstrained') land setback from Beasley Road; and

- **Lots 1, 5** and **26** comprising the remaining areas with proposed lot sizes of 1,981.89, 809.11 and 440.81 hectares respectively. Lots 1, 5 and 26 will retain frontage to Edith Farms Road, and lot 1 will also retain the unused (by lots 7-25) frontage to Beasley Road, between the western edge of lot 25 and the existing western boundary of NT Portion 7860.

Access to the proposed lots will be via the existing Edith Farms and Beasley Road frontages, with individual access in accordance with the requirements of the Northern Territory Department of Logistics and Infrastructure and/or Katherine Town Council. As well as the gravel pit rehabilitation works, construction works comprise the clearing and establishment of 10 metre wide firebreaks along new subdivision boundaries (unless already installed such as the existing fencelines dividing lots 1, 5 and 26), and the installation of access driveways fronting each new allotment. Access driveways are expected to consist of concrete invert crossovers in accordance with DLI's standard drawings.

The subdivision will be undertaken in 3 stages, with the first stage (stage 3A) consisting of lots 1-6 and 26; the second stage (3B) lots 7-14 and the third stage (3C) lots 15-25.

The proposed subdivision is shown in the subdivision layout plans in **Attachment A,** together with the subdivision slope plans (**Attachment B**), Stormwater Management Plan (**Attachment C**), Land Suitability Assessments (**Attachment D**), Site and Soil Evaluation (**Attachment E**), Stage 2 Land Capability Assessment (2019) and addendum to address current subdivision (**Attachment F**) and the Erosion and Sediment Control Plan (**Attachment G**).

4.0 Northern Territory Planning Scheme

4.1 Nature of Development

Section 5(1a) of the Northern Territory Planning Act defines *subdivision* as follows:

> *(1) Subject to subsections (2), (3) and (4), in this Act, subdivision means the division of land into parts available for separate occupation or use, by means of:*
>
> *a) Sale, transfer or partition.*

The proposal comprises the division of land into parts (being individual allotments) for separate occupation by means of sale or transfer. The proposed subdivision is not a form of exempt subdivision under subsections (2), (3) or (4), thus is consistent with the definition of *subdivision* in **Section 5(1)(a).** Pursuant to **Section 44(b),** a development permit is required *if the proposed development is the subdivision or consolidation of land.*

4.2 Assessment Category

Subdivision (where it is not for consolidation or for the creation of a unit title scheme) is an *Impact Assessable* form of development pursuant to **Clause 1.8(1)(c)** of the Planning Scheme. In accordance with **Clause 1.10(4)**, when considering an application for a use or development identified as Impact Assessable the consent authority must consider all of the following:

a) any relevant requirements, including the purpose of the requirements, as set out in Parts 5 or 6;

b) any Overlays and associated requirements in Part 3 that apply to the land;

c) the guidance provided by the relevant zone purpose and outcomes in Part 4; and

d) any component of the Strategic Framework relevant to the land as set out in Part 2.

In accordance with **Clause 1.10(5)**, the consent authority may consent to a proposed use or development that is not in accordance with a requirement set out in Parts 3, 5 or 6 only if it is satisfied that the variation is appropriate having regard to:

a) *the purpose and administration clauses of the requirement; and*

b) *the considerations listed under Clause 1.10(3) or 1.10(4).*

Variations proposed in this application are addressed in response to the applicable scheme sections.

4.3 Strategic Framework

Part 2 of the Planning Scheme contains the Strategic Framework, consisting of strategic planning policies and strategic land use plans. Consideration of the Strategic Framework is required in an application for development identified as *Impact Assessable.* The Strategic Framework policy applicable to the Katherine Region is the *Katherine Land Use Plan.* Evident in **Figure 2,** the Land Use Plan does not extend over the subject land.

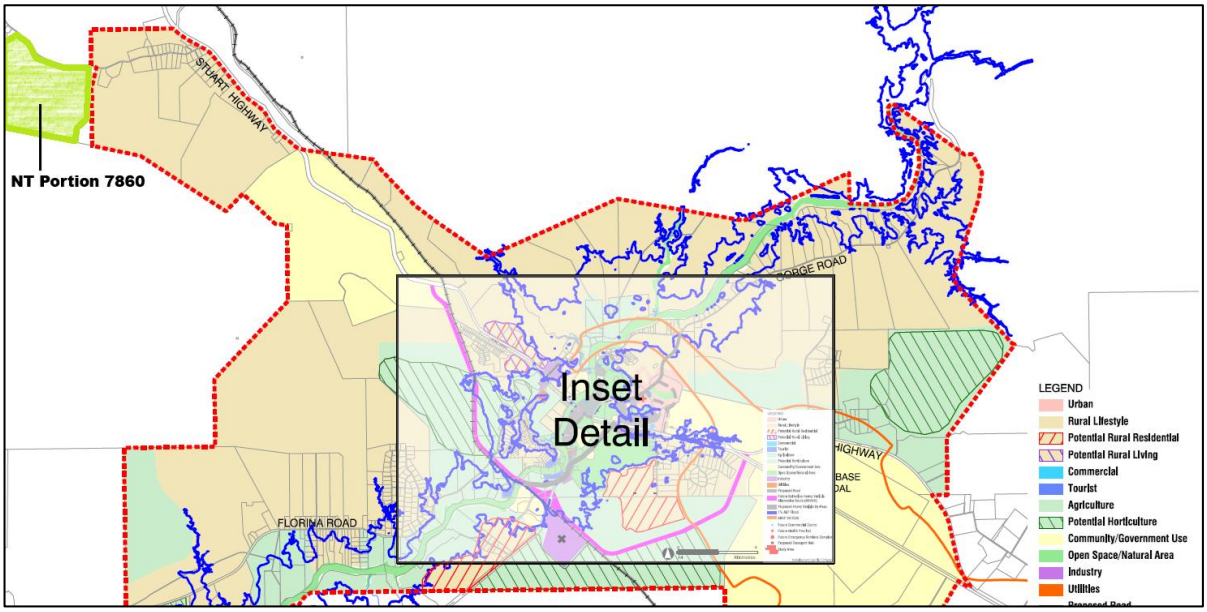

Figure 2 *Subject land showing within excerpt from Figure 1: Land Use Structure within the Katherine Land Use Plan*

Notwithstanding the Land Use Plan doesn't extend over the subject land, it is useful to consider the Objectives applicable to *Rural Lifestyle* areas within **Clause 2.1.2** of the Land Use Plan. *Rural Lifestyle* is consistent with the identified land use areas within land encapsulated by the Land Use Plan to the east of the subject land, and is consistent with the intended lot size and development outcomes for the proposed subdivision. **Clause 2.1.2** provides the following objectives.

Objectives in identification of opportunities for Rural Lifestyle Lots

- *To preserve land with high and medium capability for agriculture for those activities within the context of competing rural living and rural residential use.*
- *To preserve and enhance the natural resources, biodiversity and heritage values of a locality.*

The limited size of the subject land relative to larger pastoral holdings, and the marginal nature of the land for horticulture and agriculture use (refer caution notice in **Attachment H**) mean the proposed subdivision will not undermine the desired preservation of land with high and medium capability for agriculture. Ensuring resultant lots comply with the minimum 8 hectare requirement is consistent with the Zone Purpose in **Clause 4.21** (for Zone R, which is subject to the same 8 hectare minimum) to ensure subdivision results in *large lots to provide separation between potentially incompatible uses*. **Sections 2.1.5** and **2.1.6** of the Land Suitability Assessment in **Attachment D** confirm:

- There are no mapped sites of conservation significance within the site, it is highly unlikely that the subdivision will impact the nearest sites of conservation significance, no sinkholes were identified during desktop or field surveys, and the land is not within a Priority Environmental Management Area; and

- No threatened or restricted ranges species have been recorded within the project area, and the land is not known to contain habitat for restricted range species.

There are no known heritage items within or in close proximity of the subject land, and the limited extent of development and clearing works is such that the risk of encountering items is low.

Key Rural Lifestyle Objectives

- *To maintain or enhance the amenity of established localities.*

- *To minimise potential risks from natural hazards including flooding and sink holes.*

- *To require detailed land capability assessment of the site to accommodate the intended future uses and to identify infrastructure required to minimise any potential detrimental impacts on natural resources, particularly groundwater.*

The proposed lots are consistent with the size and nature of rural lifestyle lots within the locality, resulting in large, extremely low-density rural lots reliant on the existing public road network in an area that has reasonable access to groundwater. The size, number and layout of the proposed lots is unlikely to unreasonably impact the amenity of surrounding areas given the consistent lot sizes proposed, and the land capability investigations in **Attachments D, E** and **F** demonstrate the suitability of the land for the intended purpose, notwithstanding the required approach to on-site wastewater disposal and erosion and sediment control.

4.4 Overlays

4.4.1 Clause 3.2 – Clearing of Native Vegetation

Clause 3.2 applies to land in Zone RR, and confirms that the clearing of native vegetation of more than one hectare in aggregate of land requires consent. The proposed subdivision will allow the clearing of up to 1 hectare of land on each resultant lot without triggering Overlay **Clause 3.2.** Despite this, the subdivision does not

mandate the clearing of 1 hectare native vegetation per lot, and the extent and location of any future clearing on the proposed lots will be a matter for future landowners.

This application does not seek approval for the *clearing of native vegetation,* and any future clearing areas cannot be defined at this stage. Accordingly, further consideration of Overlay **Clause 3.2** is not required at this stage.

4.5 Zoning

NT Portion 07860 is not Zoned by the Northern Territory Planning Scheme 2020, thus is *unzoned* land. Accordingly, there are no applicable Zone Purpose or Outcome requirements.

4.6 Subdivision Development Requirements

4.6.1 Clause 6.3.2 – Lot Size and Configuration for Subdivision in Zones RL, R and H, and Unzoned Land

Purpose

Ensure subdivisions of rural and unzoned land:

(a) have lots that are of a size and configuration suited for the intended purpose;

(b) have lots that are of a size consistent with the topographical constraints of the land (that may dictate that lots are of an area in excess of the specified minimum); and

(c) do not impose unsustainable demands on groundwater or unreasonably degrade the environment.

Administration

1. *The consent authority may **consent** to a subdivision that is not in accordance with sub-clauses 5-10 if it is satisfied that:*
    a. *the subdivision does not result in an increased lot yield; and*
    b. *the lot size and/or configuration achieves at least one of the following:*
        i. *an existing boundary encroachment by a building is remedied;*
        ii. *the lots created are more regular in shape;*
        iii. ***access** is provided to a lot that previously had no **access** or an unsuitable **access**;*
        iv. *the subdivision will better meet the overall outcomes for the zone and the relevant components of the strategic framework applicable to the locality;*

v. *the arrangement of lots results in a significant protection of areas of environmental value; or*

vi. *provides opportunity for a future local road network; and*

c. *the consent authority is satisfied that the lots created will be consistent with the purpose of this requirement and the zone purpose and outcomes.*

2. *The consent authority may **consent** to a subdivision on Unzoned Land that is not in accordance with the table to this clause only if it is satisfied that the lots created will be consistent with the purpose of this requirement.*

3. *Despite sub-clause 1, the consent authority must not **consent** to a subdivision in Zone RL in Alice Springs and adjacent zoned areas that is not in accordance with the table to this clause.*

4. *The unconstrained nature of the land is to be demonstrated by a land suitability assessment addressing the NT Land Suitability Guidelines, in accordance with clause 6.3.3.*

Requirements

5. *Land is to be subdivided in accordance with the table to this clause.*

The table to **Clause 6.3.2** requires the subdivision of unzoned land does not result in lots below 8 hectares. The proposed subdivision has been designed to ensure compliance with this requirement, with lots between 8.01 and 1,978.69 hectares. Accordingly, the subdivision complies with subclause 5.

6. *Lots have a depth to width ratio not exceeding 4:1.*

The depth to width ratio of the irregular shaped lots including lots 1, 5, 7 and 26 are not readily determined, however these lots are either large lots encapsulating the remnant areas (lots 1, 5 and 26) or respond to the existing road layout (lot 7). All lots ensure adequate dimensions to enable future development and provide adequate separation to adjacent lots. The highest depth to width ratio for all other lots is lot 8, with a width of 160.75 metres and maximum depth of 507.5 metres, resulting in a depth to width ratio of 3.16:1, well below the maximum of 4:1.

7. *Incorporate as far as practicable, drainage lines and drainage floors wholly within a single lot.*

Where possible, drainage lines are contained within single parcels, with the majority of drainage lines contained within proposed lot 1. Where boundary crossing of drainage lines is unavoidable, usually as a result of the drainage line commencing a short distance below the road reserve ridge line adjacent otherwise suitable land, boundary crossings are limited to lower order drainage paths, and the boundary crossing is as close to 90 degrees as practicable. Minor drainage line crossings occur at the rear boundary of lot 24, the lot 23/24 side boundary, lot 10 rear boundary, lot 8 rear boundary, lot 7/8 shared boundary and lot 6 rear boundary.

8. *Allow for 70m separation between bores, both proposed and existing.*

The existing and indicative bore locations shown in **Attachment E** (**Figures 4.1, 4.2** and **4.3**) and **Attachment F** (**Figure 2**) confirm the ability for bores to achieve a minimum separation of 70 metres.

9. *Lot boundaries are to be:*

    a. *at right angles to any watercourse;*

The proposed lots avoid watercourse (rivers, creeks and streams) crossings, however minor drainage line crossings occur at the rear boundary of lot 24, the lot 23/24 side boundary, lot 10 rear boundary, lot 8 rear boundary, lot 7/8 shared boundary and lot 6 rear boundary. These crossings are as close to right angles as practicable noting the need to ensure boundaries are appropriately oriented relative to the adjacent road, to the land contours and the drainage lines.

    b. *sufficiently up slope to be outside of seepage zones where following drainage lines; and*

Proposed lots and boundary lines are generally limited to the upland parts of Portion 07860 to ensure lot boundaries are well above drainage floors and associated seepage lines. Boundaries have been laid out to minimise crossing of drainage lines and ensure crossing occurs at right angles or as close as possible thereto.

    c. *at right angles to contours or along contours where slope is between 2.0% and 5.0% and follow ridge lines, spurs or contours where slope is above 5.0%.*

The heat map in **Attachment B** demonstrates the boundary layout relative to slope. Evident in the mapping the majority of boundary lengths occur across slopes of 0-2%, with boundaries in some areas between 2-5%. The subdivision layout avoids boundaries across land with a slope in excess of 5%. Where boundaries extend into areas between 2 and 5%, boundary orientation runs along or directly across the contours where possible, noting that the varied alignment of the existing contours, and the need to retain some uniformity in the lot boundary layout, prevents a direct alignment or crossing of contours in the following areas:

- Western boundary of lot 4;
- Rear boundary of lot 12;
- Lot 14/15 shared boundary; and
- Rear boundaries of lots 21, 22 and 23.

These boundaries are located across the contours (rather than along or at right angles) to ensure appropriate lot and boundary orientation relative to adjacent roads, drainage lines, land areas suitable for development and steeper terrain.

The approach detailed in the erosion and sediment control plan in **Attachment G,** noting that firebreaks are to be cleared and grubbed, with existing topsoil retained and respread for natural revegetation, will ensure erosion risk is mitigated to an acceptable extent. Firebreaks will be graded to fill in localised hollows and depressions, and to encourage sheet flow conditions across the tracks. All debris and windrows will be removed to avoid channelisation of flows along the firebreaks, and diversion Banks will be installed where required in accordance with the DENR Technical Notes. In addition to the proposed rural lifestyle lots, the remnant portions will retain the existing cleared fencelines as boundary lines, with any existing firebreak remediation undertaken as required, to ensure alteration of the existing landforms is minimised.

10. *Minimise the number of watercourse crossings.*

Minor drainage line crossings occur at the rear boundary of lot 24, the lot 23/24 side boundary, lot 10 rear boundary, lot 8 rear boundary, lot 7/8 shared boundary and lot 6 rear boundary. Boundary crossing of drainage lines is usually a result of the drainage line commencing a short distance below the road reserve ridge line adjacent otherwise suitable land, and are limited to lower order drainage paths with the boundary crossing as close to 90 degrees as practicable.

Table to Clause 6.3.2: Lot Size and Configuration for Subdivision in Zones RL, R and H, and Unzoned Land	
Zone	**Minimum Lot Size and Requirements**
RL	2ha with a minimum of 1ha of unconstrained land
R	8ha with a minimum of 1ha of unconstrained land or 40ha in Alice Springs and Tennant Creek municipalities, with a minimum of 1ha of unconstrained land
H	25ha all unconstrained land
Unzoned Land	8ha

4.6.2 Clause 6.3.3 – Site Characteristics for Subdivision for Lots of 1ha or Greater in Zones RR, RL, R and H, and Unzoned Land

Purpose

Ensure subdivision of land in Zones RR, RL, R and H, and unzoned land, responds to the physical characteristics of the land.

Administration

1. *The consent authority must not **consent** to a subdivision that does not include 1ha of land per lot in Zones RL, R and Unzoned Land, and 25ha in Zone H, identified as unconstrained in relation to:*

    (a) Storm tide flooding;

    (b) Riverine flooding;

    (c) Localised stormwater flooding;

    in accordance with the land suitability assessment and stormwater management plan.

2. *The consent authority must not **consent** to a subdivision unless the relevant government agencies, local government council and service authorities provide formal comment to the consent authority in relation to the land suitability assessment and stormwater management plan and the possibility of storm tide flooding, riverine flooding and localised stormwater flooding of the identified 1ha of land.*

3. *The consent authority may **consent** to an application that is not in accordance with sub-clauses 4-7 if the application includes preliminary land assessment and stormwater management plans prepared by the applicant and approved by the relevant government agency and or service authority, demonstrating that 1ha of land per lot and all internal roads are unconstrained by localised stormwater flooding and by those issues addressed in the NT Land Suitability Guidelines.*

Requirements

4. *Each lot is to have unconstrained access from a public road to the identified unconstrained land.*

The subdivision plans in **Attachment A** demonstrate the unconstrained land identified in the Land Suitability Assessments in **Attachment D** directly adjoins the road frontage for all lots.

5. *An application to subdivide rural or unzoned land should include the following documents prepared by suitably qualified professionals:*

    (a) a land suitability assessment addressing the NT Land Suitability Guidelines; and

The land Suitability Assessments in **Attachment D** demonstrate the land identified as suitable for development within each lot as follows:

- **Land Suitability Class S1 (Highly Suitable)** in relation to soil salinity, acid sulphate soils and riverine flooding; and

- **Land Suitability Class S2 (Moderately Suitable)** and **Land Suitability Class S3 (Marginally Suitable)** in relation to drainage, or **Land Suitability Class S2** in its entirety with engineering; and

- **Land Suitability Class S3 (Marginally Suitable)** in relation to on-site wastewater management and erosion risk, or **Land Suitability Class S2** with engineering.

The land suitability classes above are described as follows:

- **S1:** Land having no significant limitations to sustained application for a given land use or only minor limitations. Nil to minor negative economic, environmental, health and/or social outcomes;

- **S2:** Land having limitations which in aggregate are moderately severe for sustained application of a given land use. Appreciable inferior to S1 land. Potential negative economic, environmental health and/or social outcomes if not adequately managed; and

- **S3:** Land having limitations which in aggregate are sever for sustained application of a given use. Moderate to high risk of negative economic, environmental, health and/or social outcomes if not adequately managed.

The required engineering inputs referred to above are detailed in **section 2.3.1** of the assessment, noting that the solutions outlined are relatively common and straightforward, specifically:

- **Gravel >50%** - this is a constraint for wastewater management, and therefore the area affected is relatively small. The limitation can be addressed through the site-and-soil evaluation report and the selection of a specific waste management system, such as the addition of sand filters;

- **Shallow soils** – this is a constraint for wastewater management, and therefore the area affected is relatively small. The limitation can be addressed through the site-and-soil evaluation report and the selection of a specific waste management system, such as an above-ground or mounded system;

- **Rocky outcrop** – this is a constraint for wastewater management, and therefore the area affected is relatively small. The limitation can be addressed through the site-and-soil evaluation report and the selection of a specific waste management system; and

- **Erosion risk** – erosion risk is considered to be marginally constrained when slopes are > 0.75% and not suitable for development when slopes are > 5%. Most of the land assessed (i.e. north of project area) has slopes of 1 – 3%. This is particularly a risk during land clearing. By the development of an erosion sediment control plan (ESCP) and avoiding slopes > 5%, the risks from erosion are manageable.

The findings in the 2018 Land Suitability Assessment in **Attachment B** are consistent with the stage 3 assessment, and demonstrate the unconstrained areas with land suitability classes consistent, if not slightly more suitable, with the above applicable to the lots in the stage 3 area.

The Assessment also notes the historic gravel extraction over the unconstrained areas of lots 21, 22 and 23, resulting in extensive areas of bare earth, some erosion, the creation of artificial water pits and extracted material stockpiles.

Whilst this area is considered suitable for development, remediation will be required to adequately address erosion risk, wastewater management issues and drainage. The assessment notes that development of this area would have a positive effect on the environment if these issues are addressed. The proposed remediation works are addressed in the Erosion and Sediment Control Plan in **Attachment G.**

(b) *a stormwater management plan including but not limited to; the potential impact on neighbouring land, external roads, internal roads and the 1ha of land identified as unconstrained, the upstream and downstream flows and any proposed mitigation measures.*

The stormwater management plan in **Attachment C** confirms the intended stormwater management approach to match existing drainage conditions, with natural sheet flow maintained and the avoidance of concentrated inter-allotment drainage. Clearing will be limited to firebreaks, with subdivision boundaries designed to minimise any ongoing drainage and erosion risks per the erosion and sediment control plan in **Attachment G.** Natural sheet flow conditions will be maintained, with no concentrated inter-allotment drainage. The majority of lot boundaries are located away from drainage lines and associated buffers, with any required crossings at right angles to minimise interference. Boundaries respond to landforms by locating along or directly across contours, with diversion banks provided where this is not possible. Other the installation of driveway crossovers fronting each proposed lot, no new drainage infrastructure is proposed.

The stormwater management plan notes that the Subdivision results in minimal alteration to land use, clearing or existing hydrological flow regimes, and that pre-development peak flow rates in existing drains and creeks will remain unaltered thus no stormwater attenuation is required. Furthermore, the proposed subdivision results in minimal alteration to land use, clearing or existing hydrological flow regimes, thus impacts on stormwater quality within existing drains and creeks will be negligible and no specific long-term stormwater quality treatment measures are warranted. Stormwater quality will be managed through construction by implementing a certified erosion and sediment control plan.

6. *The subdivision design must address the constraints as identified in the land suitability assessment and stormwater management plan in relation to the location of internal roads, lot boundaries and the identified 1ha of unconstrained land.*

The subdivision design reflects the suitable land identified in the land suitability assessment, ensuring each lot has a minimum 1 hectare unconstrained land. No new roads are proposed, and lot boundaries have been sited to respond to drainage lines and the existing contours to minimise landform alteration and erosion risk. The required engineering outcomes to ensure land suitability class of S2 or higher affect small areas within each lot for the establishment of onsite wastewater disposal, or can be addressed through the implementation of an erosion and sediment control plan prior to and during construction. These measures are relatively common and are not onerous.

7. *An application to subdivide land on the maps "Priority Environmental Management Areas – Litchfield" and "Priority Environmental Management Areas – Katherine" as an area potentially of environmental significance should, on the advice of the relevant government agency, be accompanied by and the*

*consent authority shall have regard to an evaluation by a suitably qualified professional of the environmental significance of the **native vegetation** and land form (e.g. lagoons, wetlands, rugged terrain and drainage systems).*

The subject land is outside of the Katherine Priority Environmental Management Areas study area.

8. *An application described in sub-clause 7 must demonstrate that the proposed subdivision design does not adversely affect the environmental values as identified in the evaluation.*

Not applicable.

9. *Subdivision design of rural and unzoned land should:*

    (a) *Retain and protect significant natural and cultural features;*

There are no mapped or known significant natural or cultural features within the rural lifestyle subdivision area, and none identified during field studies.

    (b) *Minimise the number of lots in, or exclude from subdivision, areas of high conservation significance and riparian zones;*

No sites of conservation significance are mapped in the project area, and the Land Suitability Assessment (**section 2.1.5**) confirms that the proposed subdivision is unlikely to affect the nearest areas of conservation significance or priority environmental management. Riparian drainage systems are mapped in the central portion of the remnant land areas within land unit 7e. The proposed rural lifestyle lots are situated well above these areas, and the alignment of the remnant area boundaries with the existing fence lines minimises the number of lots across these areas.

    (c) *Minimise alteration or disturbance to natural drainage systems including drainage areas, recognisable watercourses, lagoons and permanent and semi-permanent springs; and*

No lagoons, springs, creeks or rivers are located or have been identified within the rural lifestyle subdivision areas. Where possible, drainage lines are contained within single parcels, with the majority of drainage lines contained within proposed lot 1. Where boundary crossing of drainage lines is unavoidable, crossings are limited to lower order drainage paths, and the boundary crossing is as close to 90 degrees as practicable.

    (d) *Minimise erosion hazard, sedimentation and pollution of watercourses.*

Boundary layouts respond to existing land contours and avoid steeper areas to minimise erosion risk and resultant sedimentation. Earthworks are limited to remediation of the historic quarry across lots 21, 22 and 23, and the driveway crossovers and firebreaks, and will be undertaken in accordance with the measures identified in the erosion and sediment control plan in **Attachment G** to ensure erosion hazards are appropriately minimised.

4.6.3 Clause 6.3.4 – Infrastructure for Subdivision in Zones RL, R and Unzoned Land

Purpose

Ensure that subdivision of land in Zones RL, R and unzoned land, is integrated with infrastructure, community services and facilities and will not unreasonably affect the environment.

Administration

1. *The consent authority may **consent** to a subdivision that is not in accordance with sub-clauses 2-7, only if it is satisfied the subdivision is consistent with the purpose of this clause.*

Requirements

2. *Minimise disturbance through earthworks associated with the provision of infrastructure.*

Earthworks are limited to the quarry remediation, installation of driveway crossovers and stabilisation of firebreaks. No new roads or reticulated infrastructure is proposed.

3. *Provide for connection to reticulated services where practical.*

Consistent with existing lots along Edith Farms and Beasley Roads, reticulated services are not currently available and will not be provided to the proposed lots. Ensuring rural lifestyle lots exceed the minimum 8 hectare lot size (the lowest rural lifestyle density in the Planning Scheme) ensures sufficient space for on-site wastewater treatment (refer below), bores and solar installations if required.

4. *Where no reticulated sewerage is available, a site and soil evaluation report must be completed by an appropriately qualified site-and-soil evaluator demonstrating that onsite wastewater management systems can be installed on each lot in accordance with the requirements of the Code of Practice for Wastewater Management.*

The Site and Soil Evaluation in **Attachment E** confirms the soil types and site conditions to determine the ability and subsequent requirements for on-site effluent disposal. The report notes identified limitations in relation to soil depth, high seasonal rainfall, dispersive soils and cobbles / boulders applicable to the subject land, and as such recommends the most suitable land application system being a mound system, relying on imported fill to construct land application systems and overcome the above limitations. The report confirms the required mound dimensions of 26.42 by 8.43 by 1.07 metres high, and the associated mapping indicates that the mound systems can be accommodated within the proposed lots while maintaining the required buffer distances from infrastructure and drainage areas.

The areas within lots 2-6 and 26 fronting Edith Farms Road were assessed as part of the stage 2 Land Suitability and Capability Assessments in 2018. The Addendum to the 2018 (updated in 2019) Land Capability Assessment (both documents in **Attachment F**) adds the proposed additional subdivision areas (lots 2-6) and updates the

2018 report to ensure consistency with the updated NT Health Guidelines. The 2018 Land Capability Assessment evaluated the project area for the purpose of installing wastewater management systems in nine lots and was accompanied by a Land Suitability Assessment of the same area informed by both desktop and field-based research, and soil laboratory testing. The additional scope of work in the addendum covers the proposed lots, all located within the project area previously assessed in the 2018 Land Capability Assessment and accompanying Land Suitability Assessment. The addendum confirms the conclusions of the original 2018 Land Capability Assessment are applicable to the six lots proposed in this area, and correctly describe wastewater management options in line with current guidelines.

Accordingly, the findings in **Attachments E** and **F** confirm that onsite wastewater management systems can be installed on each lot in accordance with the Code of Practice.

5. *Where no reticulated water is available, development is to demonstrate that an adequate supply of groundwater is available for domestic purposes, except where the land is:*

    a. *Located within Zone RL or R in the Top End Region; and*

    b. *Within a 'restricted water extraction area' as declared by the Minister responsible for the administration of the Water Act 1992.*

The subject land is not located in Zones R or RL, and is not within a restricted water extraction area. A review of the available aquifers indicates Fractured and Karstic Rock aquifer within the Tindall Limestone geo form (150 metres below ground level). Further consultation with Water Resources, Department of Lands, Planning and Environment, confirmed that the subject land is located outside the Katherine Water Allocation Plan area, but within the Daly Roper Beetaloo Water Control District, and that aquifers may be encountered in the Jinduckin Formation and Tindall Limestone units. The Tindall Limestone will likely be encountered between 50 and 150 metres below ground level, with depth increasing to the south-west of the property.

Water Resources advised that Tindall Limestone is generally considered a better aquifer (in terms of yields and water quality), and that nearby bore yields along Edith Farms and Beasley Road range from 0.02 – 10 L/s. Both the Jinduckin Formation and Tindall Limestone are considered fractured rock aquifers, meaning yields will vary with location and depth drilled, with higher yields typically encountered in larger fractures and karstic (cavernous) features. Finally, Water Resources advised that the subject land lies within an identified gamma log area, meaning there is a requirement to gamma log the drillhole prior to final bore construction in order to separate better quality water encountered in the Tindall Limestone, from generally poorer quality water in the overlying Jinduckin Formation.

Based on the advice from Water Resources and the bore yields in the immediate areas, it is expected that there will be an adequate supply of groundwater for domestic purposes.

6. *Roads should:*

    c. *be designed to:*

        i. *interconnect with the existing road network;*

        ii. *provide for connections to potential future subdivisions of adjoining lands;*

        iii. *provide a clear hierarchy of roads; and*

        iv. *minimise individual lot **access** to major roads;*

    d. *respond to the physical characteristics of the land by:*

        i. *following ridge lines or contours where possible; and*

        ii. *where crossing watercourses be positioned at right angles to the watercourse and minimise the number of crossing points;*

    e. *be sealed where lot sizes are 2ha or less;*

    f. *be located above the 1.0% AEP flood line or any seepage line, whichever is the higher;*

    g. *be designed with discharge drains placed to minimise erosion and associated engineering and maintenance costs;*

No new roads are proposed.

    h. *provide direct **access** to lots and avoid battle-axe strips, however, where justified, battle-axe strips should be:*

        i. *not less than 10m wide; and*

        ii. *less than 250m in length.*

Two battleaxe lots are proposed to take advantage of suitable land extending further into the subject site from Beasley Road. Lots 12 and 14 have battleaxe strips of 218.78 and 240.9 metres respectively, with both strips 20 metres wide, exceeding the minimum dimensions in subclause 6(h). A splayed frontage is proposed to Edith Farms Road from lot (one of the larger remnant parcels), however given the size and shape of lot 5, the lack of reticulated power services and the width of the connection to Edith Farms Road, the layout of this parcel is not considered a true battleaxe lot.

7. *Where a road crosses a tidal arm in a rural subdivision it is expected to have a minimum elevation of RL 8m AHD and be designed to enable a discharge of at least a 5.0% AEP flood event.*

No new roads are proposed and the subject land is not subject to tidal inundation.

5.0 Section 46(3)(b) – Interim Development Control Order

Title details in **Attachment I** confirm there are no Interim Development Control Orders currently applicable to the proposed subdivision.

6.0 Section 46(3)(c) – Referral to the NT EPA

Section 48 of the Environmental Protection Act 2019 (EPA Act) requires a project be referred to the NT Environmental Protection Authority (NT EPA) for assessment if it has the potential to have a significant impact on the environment or meets a referral trigger. Noting the findings in **Attachment D,** the limited extent of land clearing proposed, and the low-intensity nature of the anticipated future uses on the proposed lots, the proposed subdivision is not likely to have a significant impact on the environment nor meet a referral trigger.

7.0 Section 46(3)(d) – Merits of Proposed Development

The proposed subdivision will provide additional rural lifestyle land in a manner consistent with existing lots in the surrounding area and without reducing or otherwise compromising the availability of viable agricultural or horticultural land.

8.0 Section 46(3)(e) – Subject Land, Suitability of Development and Effect on Other Land

The nature of the subject land and surrounding locality (**section 2**), and the suitability of the subject land to accommodate the proposed development (**section 4** and **Attachments C, D, E** and **F**) have been addressed in this report and associated attachments. In summary, the land is considered suitable to accommodate rural lifestyle lots at the extremely low densities proposed.

9.0 Section 46(3)(f) – Public Facilities and Open Space

The provision of public facilities and open space are not directly applicable to an application for rural lifestyle lots on unzoned land. Public facilities and open space are available in Katherine, approximately 35 kilometres (drive) from the subject land.

10.0 Section 46(3)(g) – Public Utilities and Infrastructure

The subject land fronts both Beasley and Edith Farms Roads, with access to the proposed lots proved therefrom. The existing road network is not expected to exceed the capacity or design parameters of the existing public road network, including the existing intersections between Edith Farms and Beasley Roads, and Edith Farms Road and the Stuart Highway.

There are no reticulated power, water or sewer services in the surrounding area, and future use of the proposed lots will be reliant on bore water, onsite wastewater treatment and alternative power source. This approach is consistent with existing lots in the area, and there is sufficient groundwater to service the proposed lots. The analysis in **Attachments F** confirm the proposed lots can accommodate onsite wastewater treatment and disposal.

11.0 Section 46(3)(h) – Impact on Amenity

The proposed subdivision will result in minimal clearing and landform alteration, consisting of the installation of firebreaks and driveway crossovers. Future use and development will increase the number of lots both in the area and fronting Edith Farms and Beasley Roads, however the proposed lot sizes and resultant densities are consistent with existing rural lifestyle lots, and ensure adequate separation between existing and future land uses. Accordingly, the potential impact on amenity as a result of the proposed subdivision is negligible.

12.0 Section 46(3)(j) – Benefit/Detriment to Public Interest

Section 51 of the Act requires the consent authority to consider whether the proposal is in the public interest with specific consideration given to (where relevant) how the application addresses community safety through crime prevention principles in design, water safety, and access for persons with disabilities.

In response to these matters:

- No adverse impacts are expected to occur in relation to public safety, including the use of existing public roads and installation of access driveways in accordance with the Northern Territory Subdivision Development Guidelines;

- There is sufficient groundwater to service the proposed lots and anticipated use, and the limited extent of physical works, anticipated future land use and limits on future vegetation clearing are such that adverse impacts on downstream waterways aren't likely to occur; and

- The subdivision is consistent with the design requirements and community expectations for accessibility within rural areas.

13.0 Section 46(3)(ja) – Restricted Water Extraction Area

The subject land is not located within a Restricted Water Extraction Area.

14.0 Section 46(3)(k) – Compliance with the Building Act

The existing structures will be entirely contained within proposed lot 26 (one of the larger remnant parcels), however the subject land is not within a building control area. Accordingly, the proposed subdivision will not affect compliance with the requirements of the Northern Territory Building Act.

15.0 Section 46(3)(l) – Development of Scheme Land

The application does not comprise the subdivision of land under a unit titles scheme. Accordingly, Section **46(3)(l)** is not applicable.

16.0 Conclusion

This report accompanies an application for Development Permit for the subdivision of NT Portion 7860 to create 26 lots, comprising 23 rural lifestyle lots and three remnant parcels. The proposed lots are consistent with the lot size and configuration requirements in the Northern Territory Planning Scheme for the subdivision of unzoned land. Extensive investigations have been undertaken to determine the land suitability and capability, and the subdivision design responds to these findings, as well as the identified landforms, soil types and drainage areas. This report and the accompanying documentation demonstrate the proposed subdivision suitably complies with the requirements of the Northern Territory Planning Scheme, and where variations are proposed, is consistent with the qualitative requirements and objectives. The proposed subdivision ensures each lot includes at least 1 hectare of unconstrained land, and will result in lots consistent with land capability and surrounding development.

Brad Cunnington

Cunnington Rosse Town Planning and Consulting

17 April 2026

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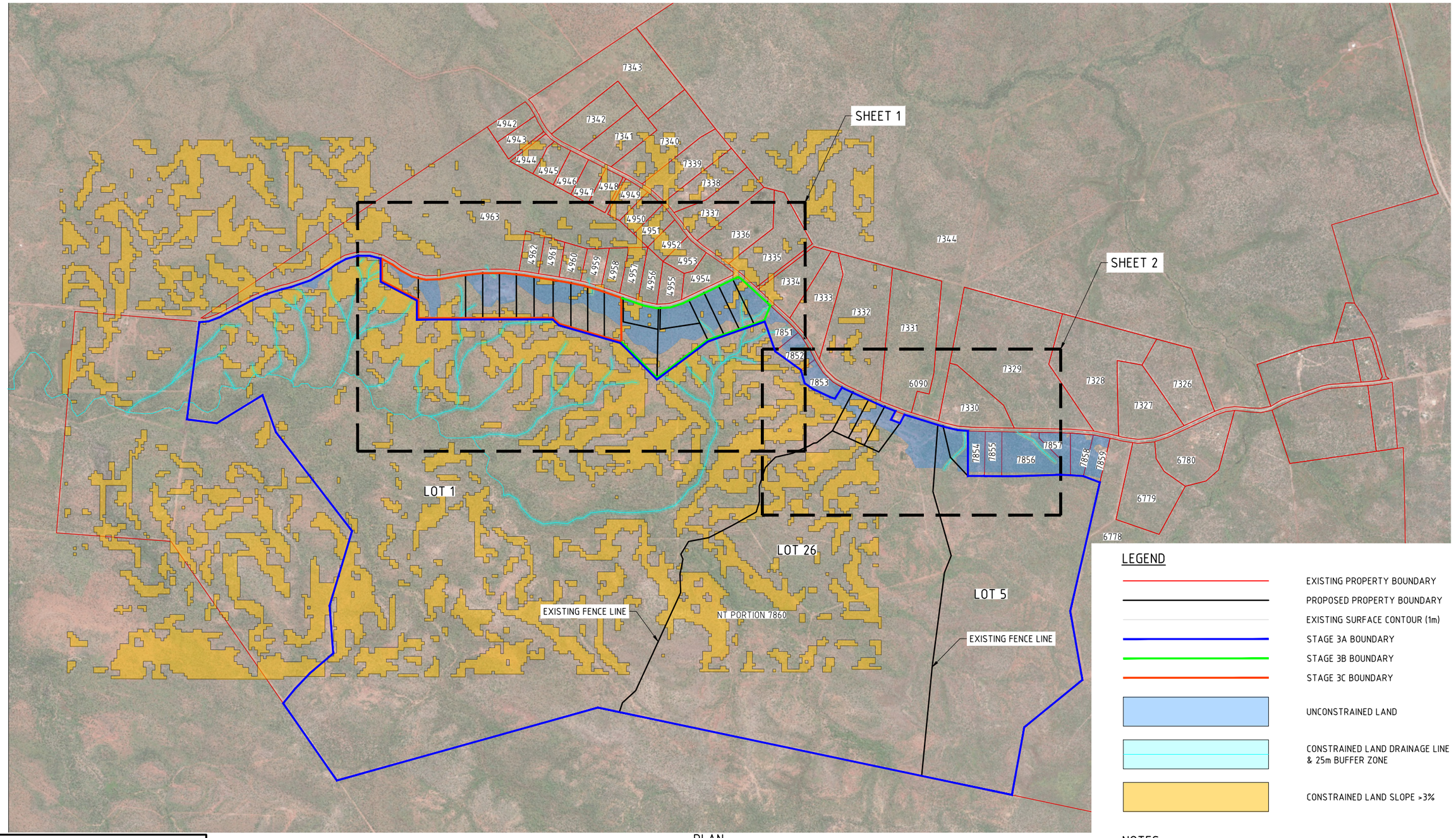

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- EXISTING SURFACE CONTOUR (1m)
- STAGE 3A BOUNDARY
- STAGE 3B BOUNDARY
- STAGE 3C BOUNDARY
- UNCONSTRAINED LAND
- CONSTRAINED LAND DRAINAGE LINE & 25m BUFFER ZONE
- CONSTRAINED LAND SLOPE >3%

NOTES

1. REFER LAND SUITABILITY ASSESSMENT REPORT FOR FURTHER DETAILS ON CONSTRAINED LAND

200 0 200 400 600 800 1000m

0 1:20000-A1 1:40000-A3

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site

No guarantee is given that all existing services are shown

PLAN
STAGES 3A, 3B & 3C

No	DATE	INITIAL	AMENDMENT
0	07/04/26	PB	ISSUED FOR DEVELOPMENT APPLICATION

CLIENT
DALY RIVER PASTORAL

byrne
ABN 78 124 388 192
P.O.Box 36789, WINNELLIE, NT 0821
Ph. 08 89472476 Fax: 08 89475098

APPROVED	
PB	
DRAWN	CHECKED
SS	PB
DESIGNED	CHECKED
SS	PB

TITLE
KATHERINE
NT PORTION 7860, EDITH FARMS ROAD, EDITH
SUNRISE ESTATES SUBDIVISION STAGE 3
GENERAL ARRANGEMENT PLAN

SCALE	PROJECT No	DRAWING No	AMDT
AS SHOWN	NT25091	C001	0

PLOTTED ON: 7/Apr/2026 8:14 AM
USER: SCOTT SCHAMBURG
FILE LOCATION: C:\12dsw\data\BYRNE-TMS\NT25091 - ACT Group_Edith Farms Rd Sub Stage 3_1824\04 CADD\4.2 DWG\S1-NT25091-LAYOUT.dwg

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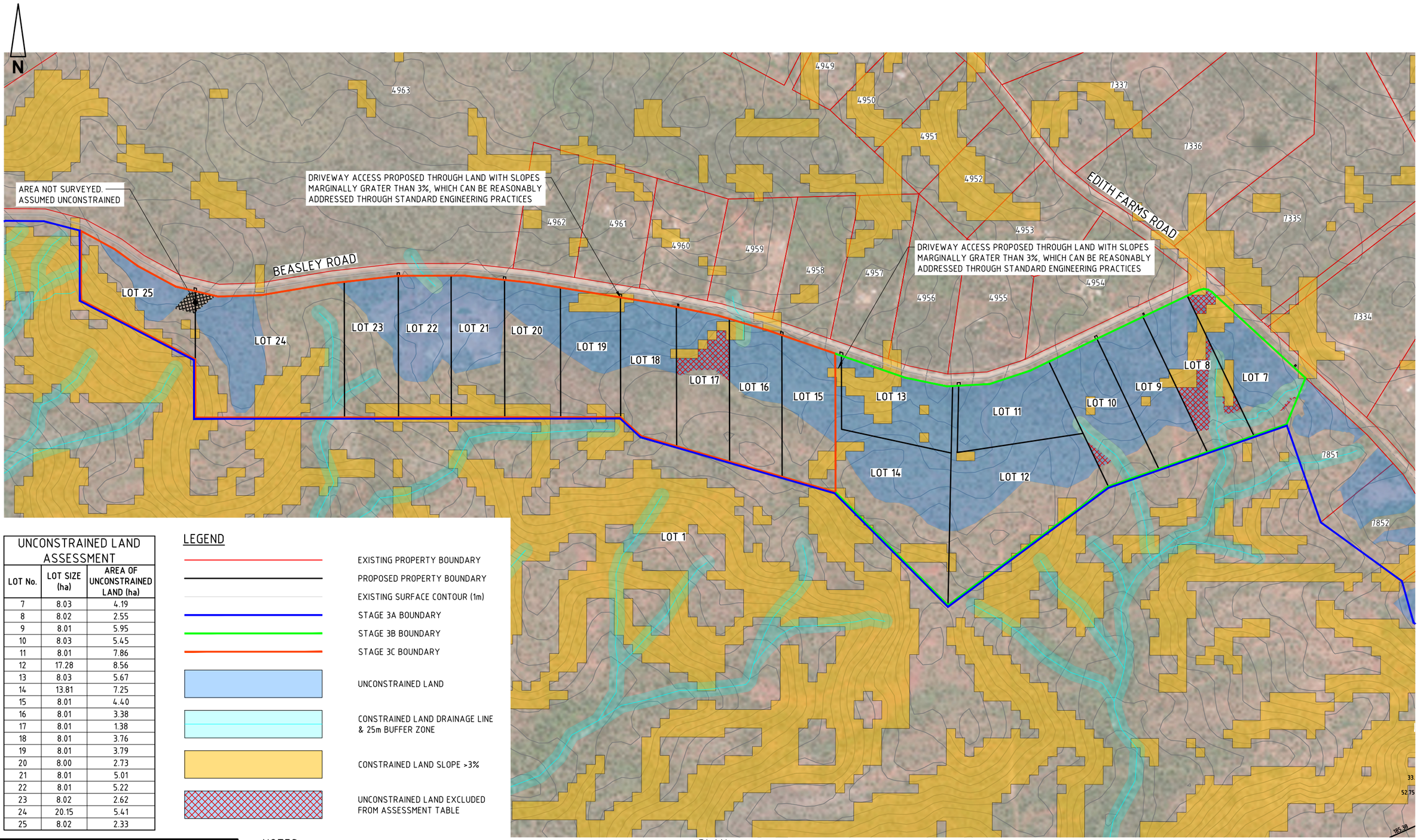

UNCONSTRAINED LAND ASSESSMENT		
LOT No.	LOT SIZE (ha)	AREA OF UNCONSTRAINED LAND (ha)
7	8.03	4.19
8	8.02	2.55
9	8.01	5.95
10	8.03	5.45
11	8.01	7.86
12	17.28	8.56
13	8.03	5.67
14	13.81	7.25
15	8.01	4.40
16	8.01	3.38
17	8.01	1.38
18	8.01	3.76
19	8.01	3.79
20	8.00	2.73
21	8.01	5.01
22	8.01	5.22
23	8.02	2.62
24	20.15	5.41
25	8.02	2.33

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- EXISTING SURFACE CONTOUR (1m)
- STAGE 3A BOUNDARY
- STAGE 3B BOUNDARY
- STAGE 3C BOUNDARY
- UNCONSTRAINED LAND
- CONSTRAINED LAND DRAINAGE LINE & 25m BUFFER ZONE
- CONSTRAINED LAND SLOPE >3%
- UNCONSTRAINED LAND EXCLUDED FROM ASSESSMENT TABLE

WARNING

BEWARE OF UNDERGROUND SERVICES

The locations of underground services are approximate only and their exact position should be proven on site

No guarantee is given that all existing services are shown

NOTES

1. REFER LAND SUITABILITY ASSESSMENT REPORT FOR FURTHER DETAILS ON CONSTRAINED LAND

PLAN
STAGE 3B & 3C

60 0 60 120 180 240 300m
0 1:6000-A1 1:12000-A3

No	DATE	INITIAL	AMENDMENT
0	07/04/26	PB	ISSUED FOR DEVELOPMENT APPLICATION

CLIENT: DALY RIVER PASTORAL

byrne
ABN 78 124 388 192
P.O.Box 36789, WINNELLIE, NT 0821
Ph. 08 89472476 Fax: 08 89475098

APPROVED	
PB	
DRAWN	CHECKED
SS	PB
DESIGNED	CHECKED
SS	PB

TITLE: **KATHERINE**
NT PORTION 7860, EDITH FARMS ROAD, EDITH
SUNRISE ESTATES SUBDIVISION STAGE 3
LAYOUT PLAN - SHEET 1 OF 2

SCALE	PROJECT No	DRAWING No	AMDT
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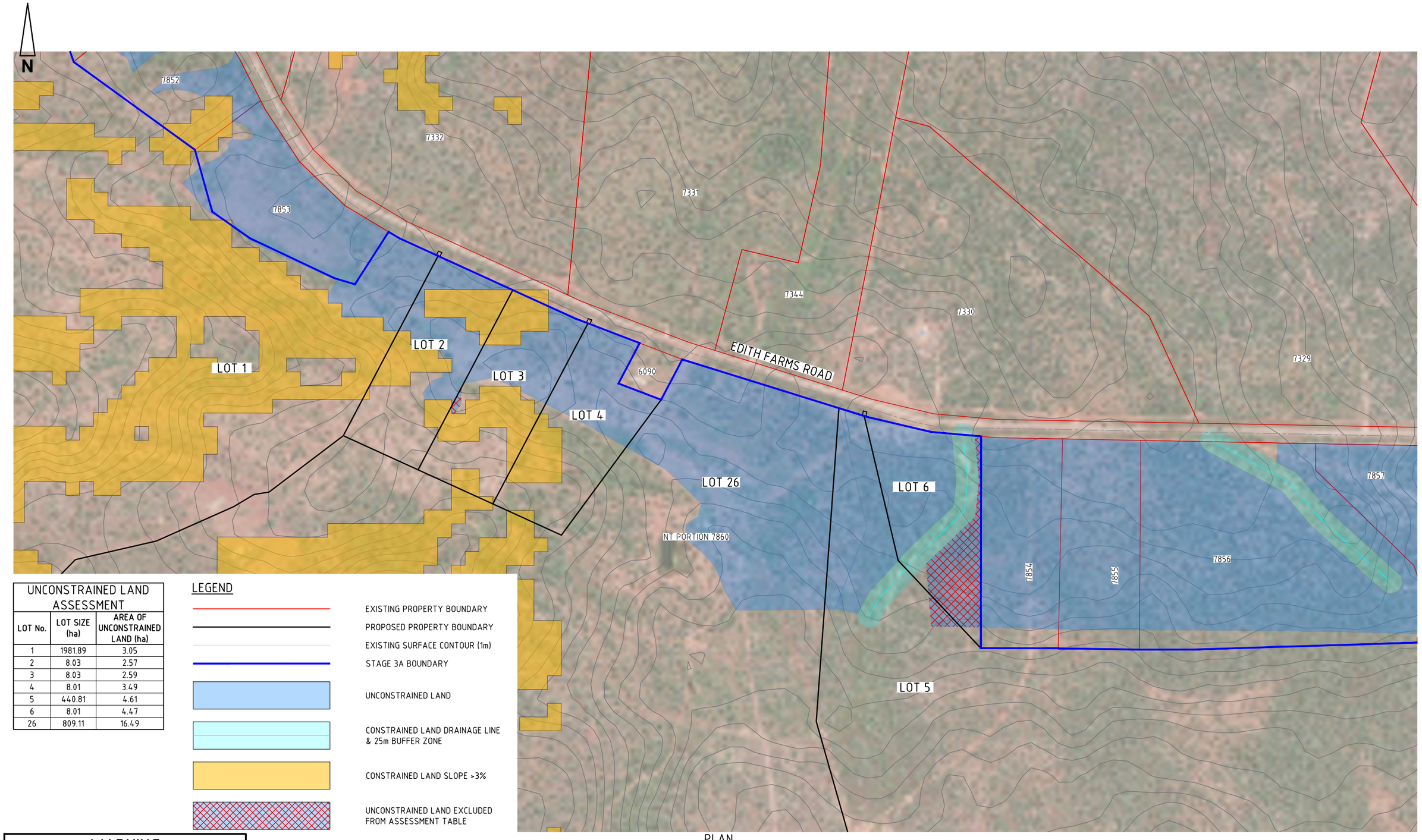

PLAN
STAGE 3A

UNCONSTRAINED LAND ASSESSMENT		
LOT No.	LOT SIZE (ha)	AREA OF UNCONSTRAINED LAND (ha)
1	1981.89	3.05
2	8.03	2.57
3	8.03	2.59
4	8.01	3.49
5	440.81	4.61
6	8.01	4.47
26	809.11	16.49

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- EXISTING SURFACE CONTOUR (1m)
- STAGE 3A BOUNDARY
- UNCONSTRAINED LAND
- CONSTRAINED LAND DRAINAGE LINE & 25m BUFFER ZONE
- CONSTRAINED LAND SLOPE >3%
- UNCONSTRAINED LAND EXCLUDED FROM ASSESSMENT TABLE

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NOTES

1. REFER LAND SUITABILITY ASSESSMENT REPORT FOR FURTHER DETAILS ON CONSTRAINED LAND

40 0 40 80 120 160 200m
0 1:4000 - A1 1:8000 - A3

No	DATE	INITIAL	AMENDMENT
0	07/04/26	PB	ISSUED FOR DEVELOPMENT APPLICATION

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DRAWN	CHECKED
SS	PB
DESIGNED	CHECKED
SS	PB

TITLE
KATHERINE
NT PORTION 7860, EDITH FARMS ROAD, EDITH
SUNRISE ESTATES SUBDIVISION STAGE 3
LAYOUT PLAN - SHEET 2 OF 2

SCALE	PROJECT No	DRAWING No	AMDT
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LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- STAGE 3A BOUNDARY
- STAGE 3B BOUNDARY
- STAGE 3C BOUNDARY

SHEET 1

SHEET 2

LOT 1
1981.89 ha

LOT 26
809.11 ha

LOT 5
440.81 ha

NT PORTION 7860

REFER TO EXISTING LTO PLAN LTO2020/20 FOR EXISTING BOUNDARY DIMENSIONS WHERE THEY REMAIN UNALTERED. (TYP).

PROPOSED BOUNDARIES FOLLOWS EXISTING FENCE LINE. (DIMENSIONS APPROXIMATE) (TYP).

4942 4943 4944 4945 4946 4947 4948 4949 4950 4951 4952 4953 4954 4955 4956 4957 4958 4959 4960 4961 4962 4963

7343 7342 7341 7340 7339 7338 7337 7336 7335 7334 7333 7332 7331 7344

7851 7852 7853 6090 445.99 7329 7330 7328 7327 7326 7854 7855 7856 7857 7858 7859 6780 6779 6778

200.00 141.84 114.76 152.45 162.23 185.83 211.82 557.25 56.10 689.44 687.87 188.89 981.25 1128.96 1112.14 177.22 101.33 224.70 3189.50 951.50

PLAN
STAGES 3A, 3B & 3C

200 0 200 400 600 800 1000m
0 1:20000-A1 1:40000-A3

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0	07/04/26	PB	ISSUED FOR DEVELOPMENT APPLICATION

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SS	PB
DESIGNED	CHECKED
SS	PB

TITLE
KATHERINE
NT PORTION 7860, EDITH FARMS ROAD, EDITH
SUNRISE ESTATES SUBDIVISION STAGE 3
SUBDIVISION PLAN - GENERAL ARRANGEMENT

SCALE	PROJECT No	DRAWING No	AMDT
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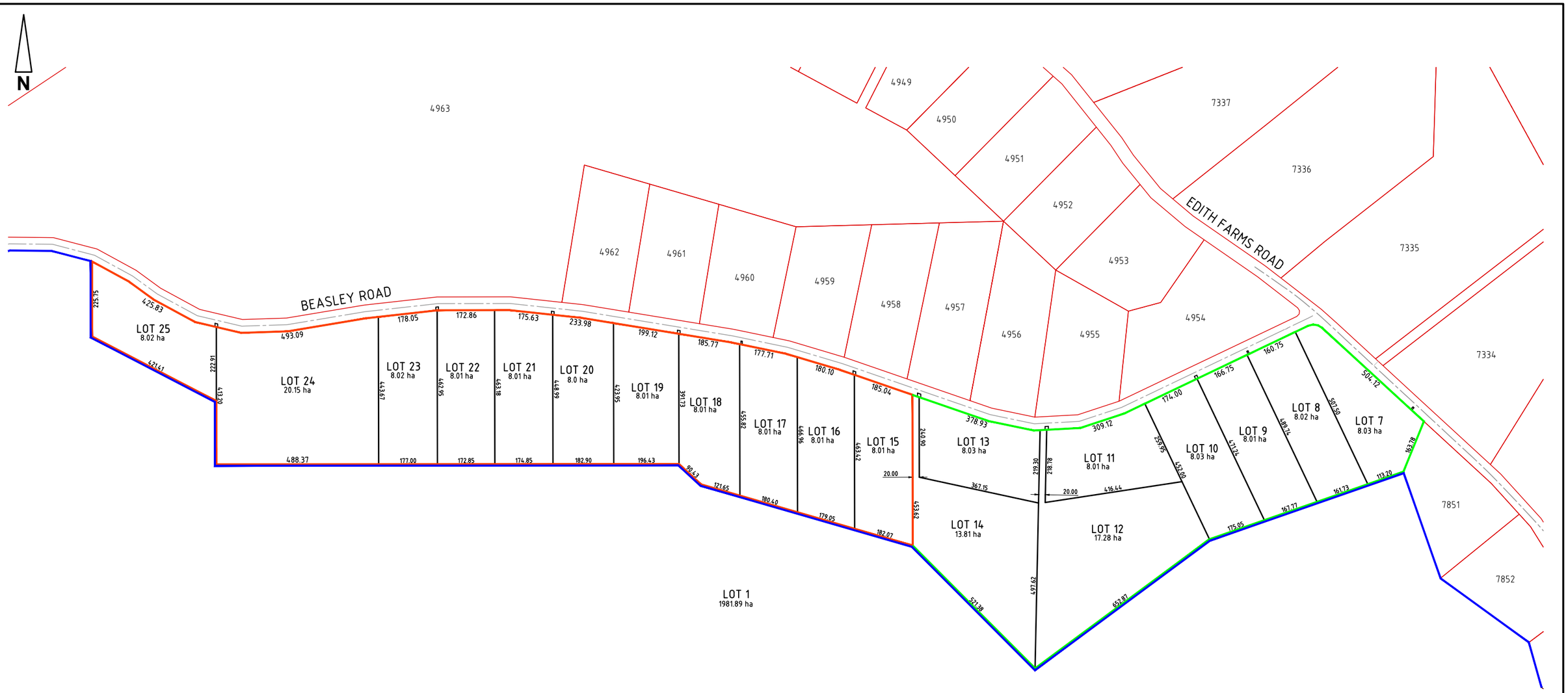

LEGEND

- EXISTING PROPERTY BOUNDARY
- PROPOSED PROPERTY BOUNDARY
- STAGE 3A BOUNDARY
- STAGE 3B BOUNDARY
- STAGE 3C BOUNDARY

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PLAN
STAGE 3B & 3C

60 0 60 120 180 240 300m
0 1:6000-A1 1:12000-A3

No	DATE	INITIAL	AMENDMENT
0	07/04/26	PB	ISSUED FOR DEVELOPMENT APPLICATION

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APPROVED	
PB	
DRAWN	CHECKED
SS	PB
DESIGNED	CHECKED
SS	PB

TITLE
KATHERINE
NT PORTION 7860, EDITH FARMS ROAD, EDITH
SUNRISE ESTATES SUBDIVISION STAGE 3
SUBDIVISION PLAN - SHEET 1 OF 2

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7852

7332

7331

7853

7344

7330

7329

EDITH FARMS ROAD

LOT 1
1981.89 ha

LOT 2
8.03 ha

LOT 3
8.03 ha

LOT 4
8.01 ha

6090

LOT 26
809.11 ha

NT PORTION 7860

LOT 6
8.01 ha

LOT 5
440.81 ha

7857

7856

7854

7855

120.69
180.28
180.48
121.50
100.08
100.09
359.76
149.95
111.40
445.99
445.73
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368.86
180.30
180.30
165.23
204.50
33.05
52.75
185.38
182.01
148.00
325.64
464.63
689.44
264.34

LEGEND

EXISTING PROPERTY BOUNDARY

PROPOSED PROPERTY BOUNDARY

STAGE 3A BOUNDARY

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PLAN
STAGE 3A

40 0 40 80 120 160 200m

0 1:4000 - A1 1:8000 - A3

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0	07/04/26	PB	ISSUED FOR DEVELOPMENT APPLICATION

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DRAWN	CHECKED
SS	PB
DESIGNED	CHECKED
SS	PB

TITLE
KATHERINE
NT PORTION 7860, EDITH FARMS ROAD, EDITH
SUNRISE ESTATES SUBDIVISION STAGE 3
SUBDIVISION PLAN - SHEET 2 OF 2

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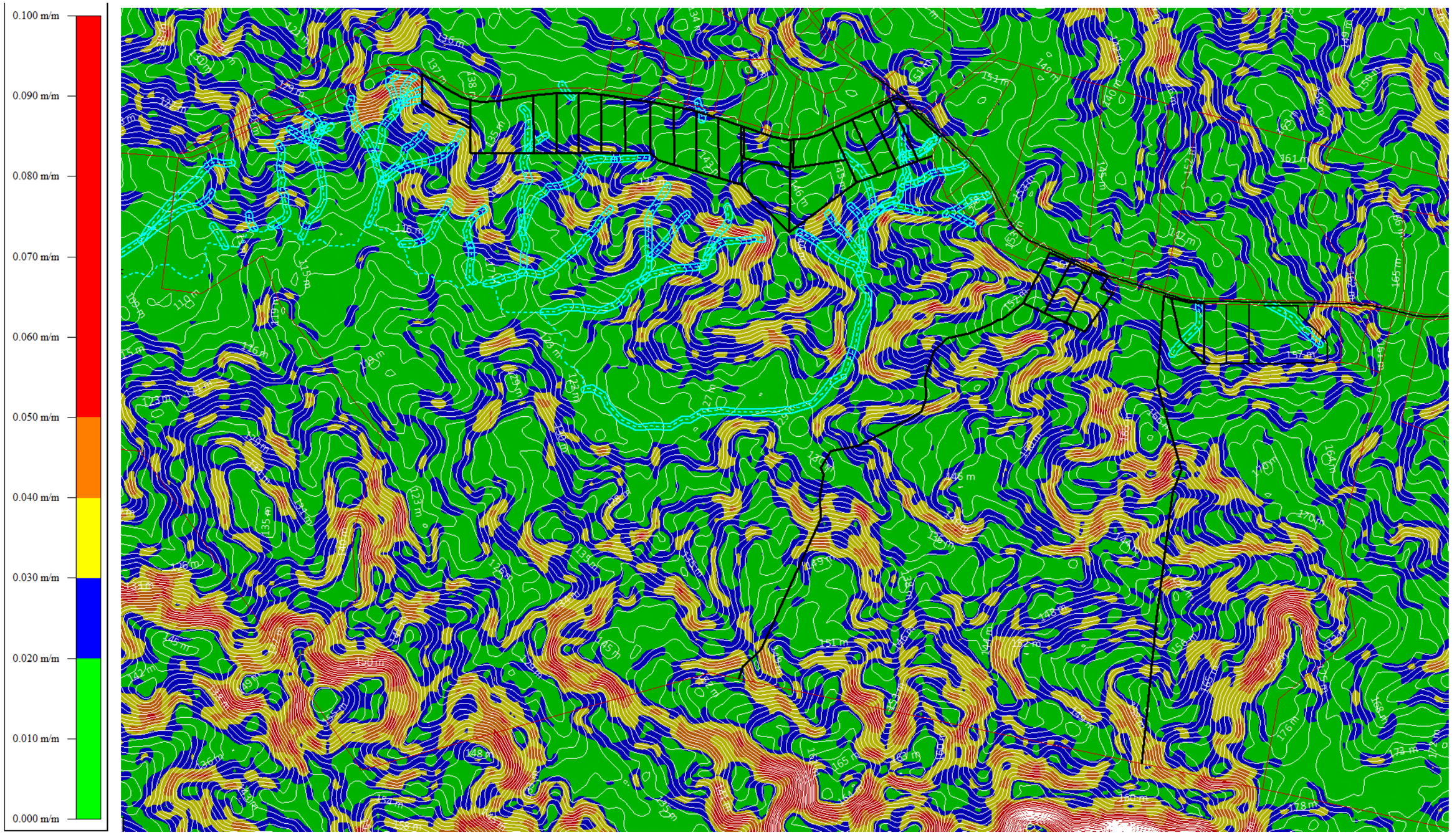
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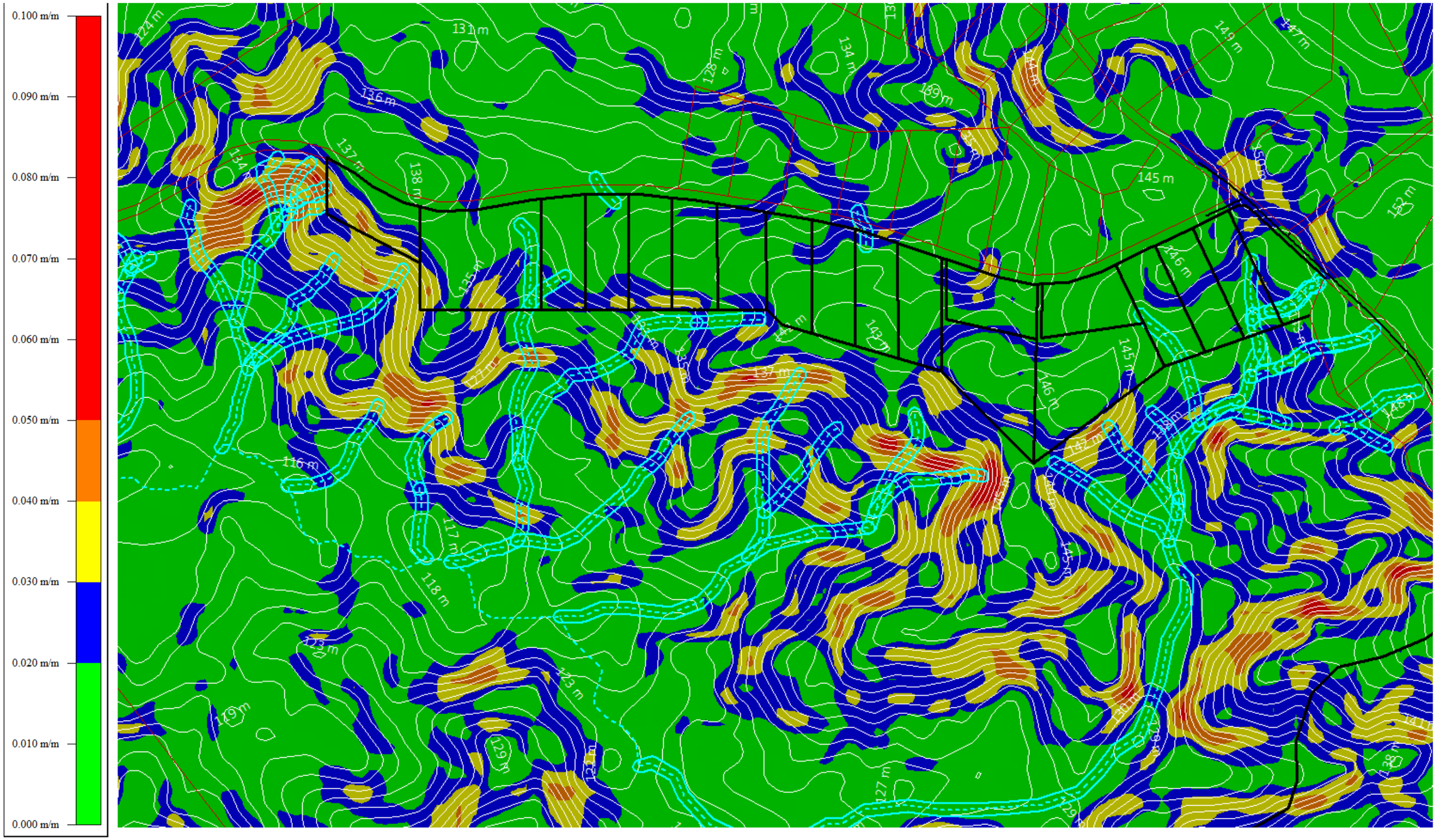
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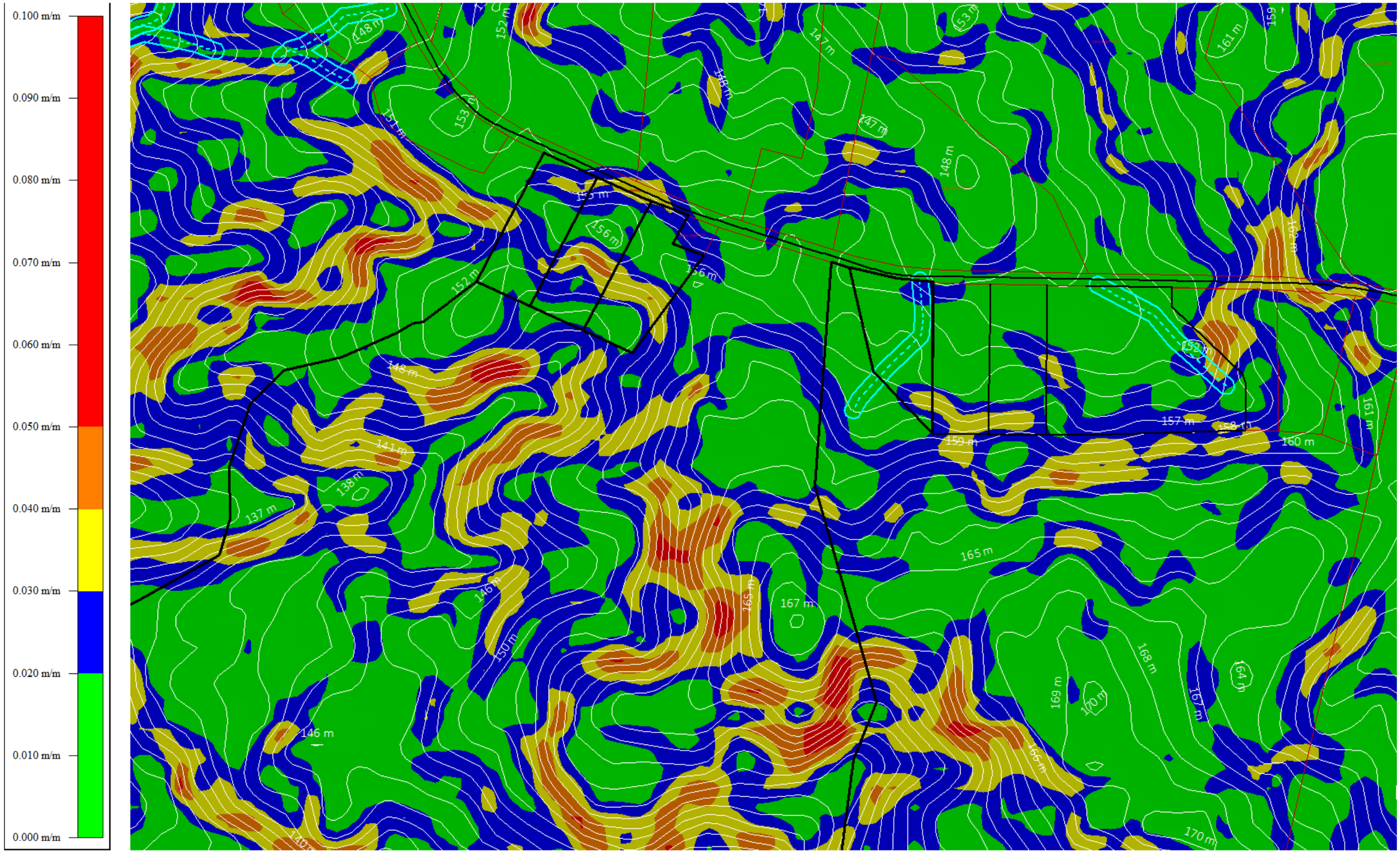
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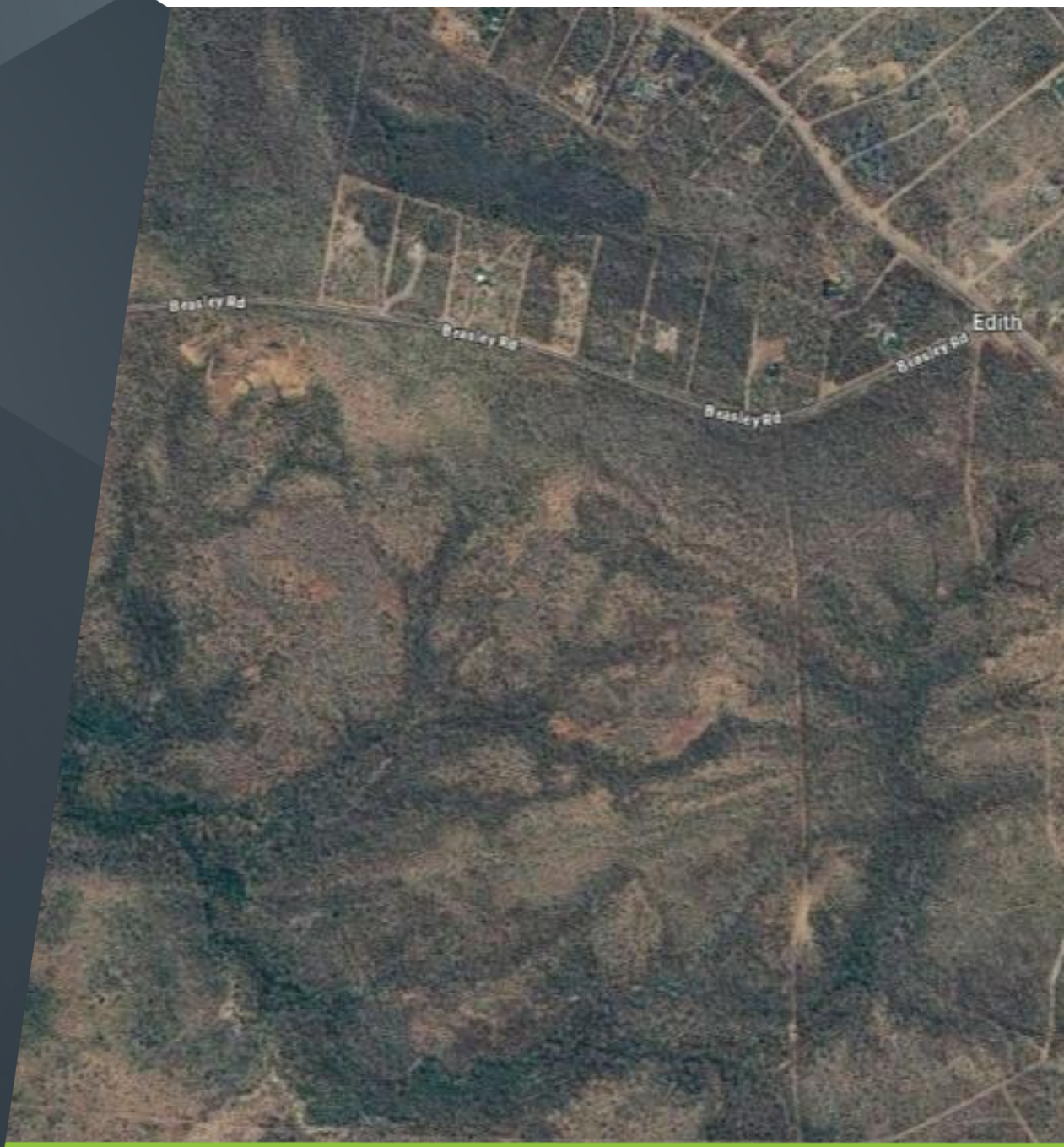
167 m
150 m
168 m
169 m
170 m
167 m
164 m
146 m
166 m
170 m

Sunrise Estates Subdivision – Stage 3
NT Portion 7860, Edith Farms Road, Edith

Stormwater Management Plan

Daly River Pastoral

8 April 2026



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Document Control

Document: Sunrise Estates - Stage 3 - Stormwater Management Plan

Reference: NT25091-REP-001_D

Date: 8 April 2026

Prepared by Patrick Chin

Reviewed by Paul Brandis

Rev	Revision Date	Description	Authorised (Position)	Signature
A	15/01/2026	Issued For Information	Paul Brandis Director	
B	19/01/2026	Issued For Information	Paul Brandis Director	
C	05/02/2026	Issued For Information	Paul Brandis Director	
D	08/04/2026	Issued for information	Paul Brandis Director	

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1 Introduction

Daly River Pastoral (the Developer) is proposing to subdivide Section 7860, 745 Edith Farms Road, Edith NT (the Site) into 26 large Rural Lots of minimum 8ha (the Subdivision). The Site is currently unzoned.

Byrne has been engaged by the Developer to prepare this Stormwater Management Plan to comply with the requirements of Section 7.1 of the *Northern Territory Subdivision Development Guidelines (NTSDG).*

1.1 CPEng Certification

This Stormwater Management Plan (SMP) has been prepared and certified by Paul Brandis (CPEng) and complies with the *Northern Territory Subdivision Development Guidelines (NTSDG)*.

2 Background Information

2.1 About the Site

The Site (Figure 1) is approximately 3437ha and is unincorporated unzoned land. The Site is currently leased for pastoral use and is predominantly natural bushland with a small dwelling and a small quarry.

The Site is bounded by Beasley Road to the North, and Edith Farms Road to the North-East which includes several smaller lots (approx. 8ha) previously developed as part of Sunrise Estates – Stage 2.
Other boundaries abut similar large private rural/pastoral properties.

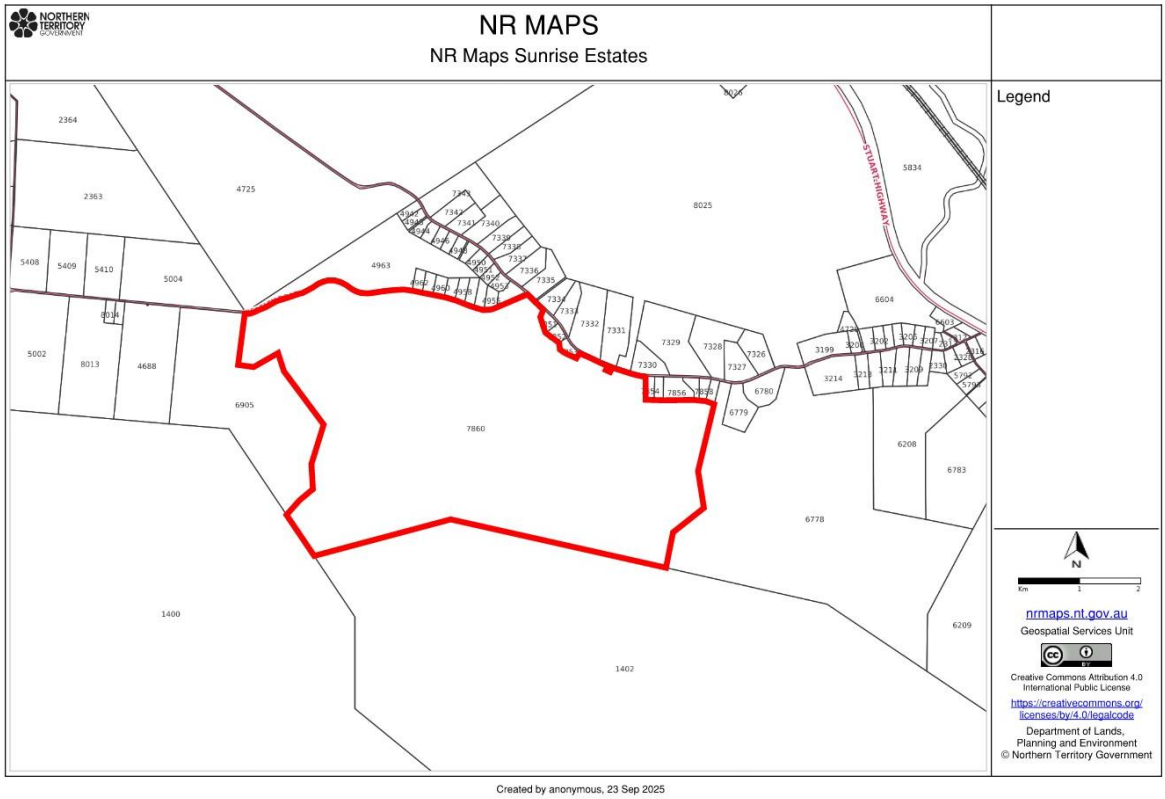

Figure 1. Site Locality (Source: NR Maps)

2.2 About the Subdivision

Subdivision Plans are provided in Drawings NT25091-C001 to NT25091-C103 Revision C (Attachment A). The Site is proposed to be subdivided into 26 Lots, which are typically in the order of 8.01 ha except for:

- NT Portion 6777 Balance Lot – 589.72 ha
- Lot 1 – 1981.89 ha
- Lot 5 – 440.81 ha
- Lot 12 – 17.28 ha
- Lot 14 – 13.81 ha
- Lot 24 – 20.15 ha

2.3 Development Works

The development works (the Works) required to facilitate the Subdivision is generally limited to:

- Clearing and establishment of 10m wide firebreaks along new Subdivision boundaries; and
- Installation of access driveways fronting each new allotment, typically comprising concrete invert crossovers as per DLI Standard Drawing CS-3005.

Minimal alteration in land use or clearing is expected to result from the proposed Subdivision, with only minor clearing required for the establishment of firebreaks.

Lots 21, 22 and 23 include an existing gravel pit, which has historically been cleared. It is proposed that this be rehabilitated as part of the Works with some minor reshaping and revegetation.

2.4 Topography

Byrne Consultants obtained topography information from the following sources:

- 1m smoothed contour data, derived from Elevation and Depth - Foundation Spatial Data (ELVIS)
- 1 : 2,500 Topo Maps (NR Maps)

ELCIS Data has been processed in Global Mapper to generate contours and watersheds (Figure 2).

Site elevation ranges from approx. 110m to 170m AHD. The Site broadly slopes from east to west, with Beasley Road and Edith Farms Road generally following ridgelines.

3 Existing Site Conditions

Existing site topography, catchments and stormwater flow paths are shown in Figure 2 , with the proposed subdivision boundaries shown in bold.

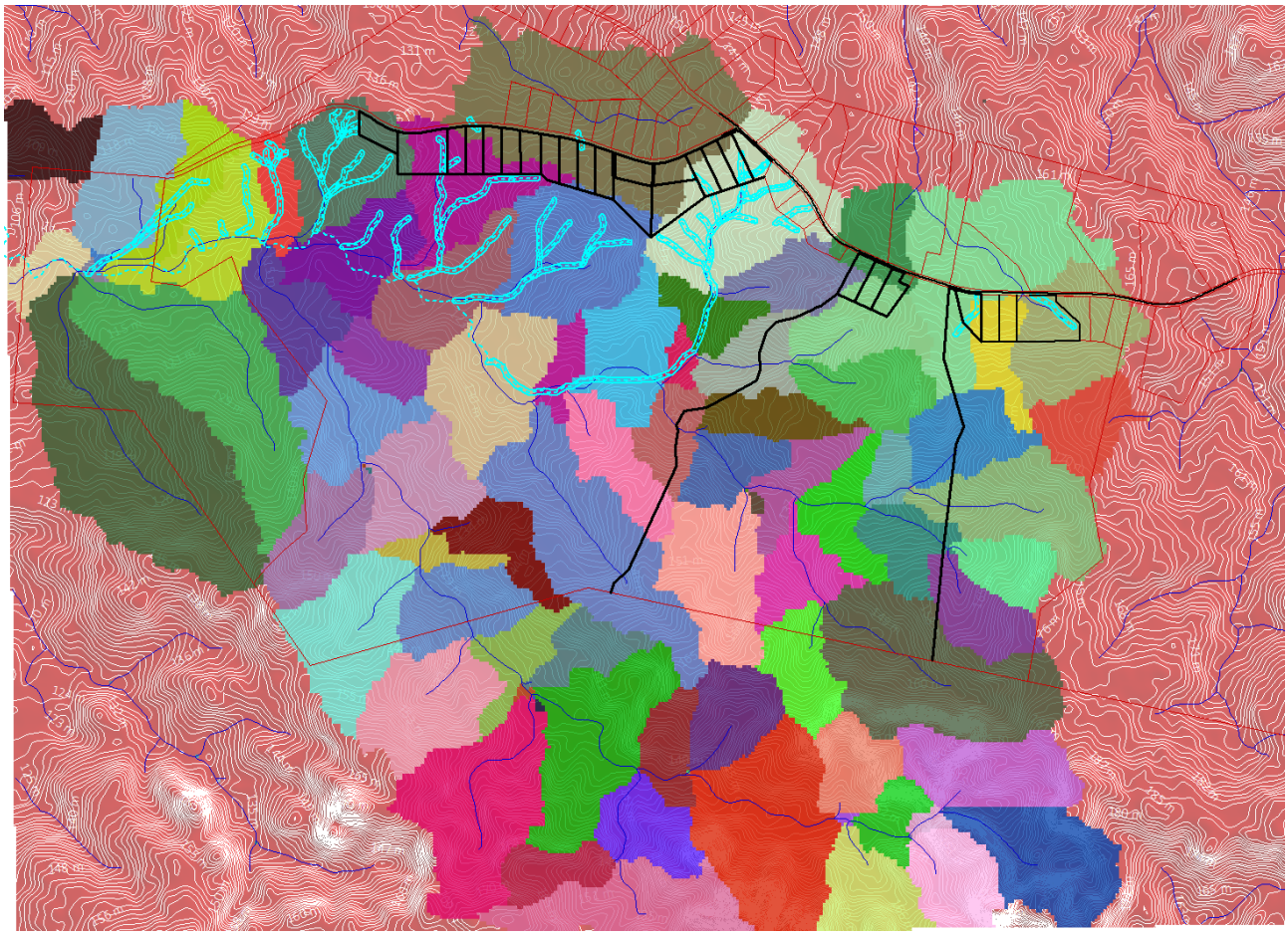

Figure 2. Stormwater Catchment Network

The Site broadly slopes from east to west, with Beasley Road and Edith Farms Road generally following ridgelines.

Beasley Road and Edith Farms Road are both typical rural cross-sections, with table drains and floodways facilitating natural flow patterns through adjoining rural properties.

The Site has numerous minor ephemeral drainage lines, which mostly converge into the upper reaches of Bondi Creek, a tributary of the Fergusson River (Figure 3).

There are no riverine flooding risks which constrain the proposed Subdivision, as identified in the *Land Suitability Assessment – Beasley Road – Sunrise Estates Pty Ltd* (Ecoz, 2025).

The Site is also greater than 200km from the nearest coastline, so is not at any risk of storm surge.

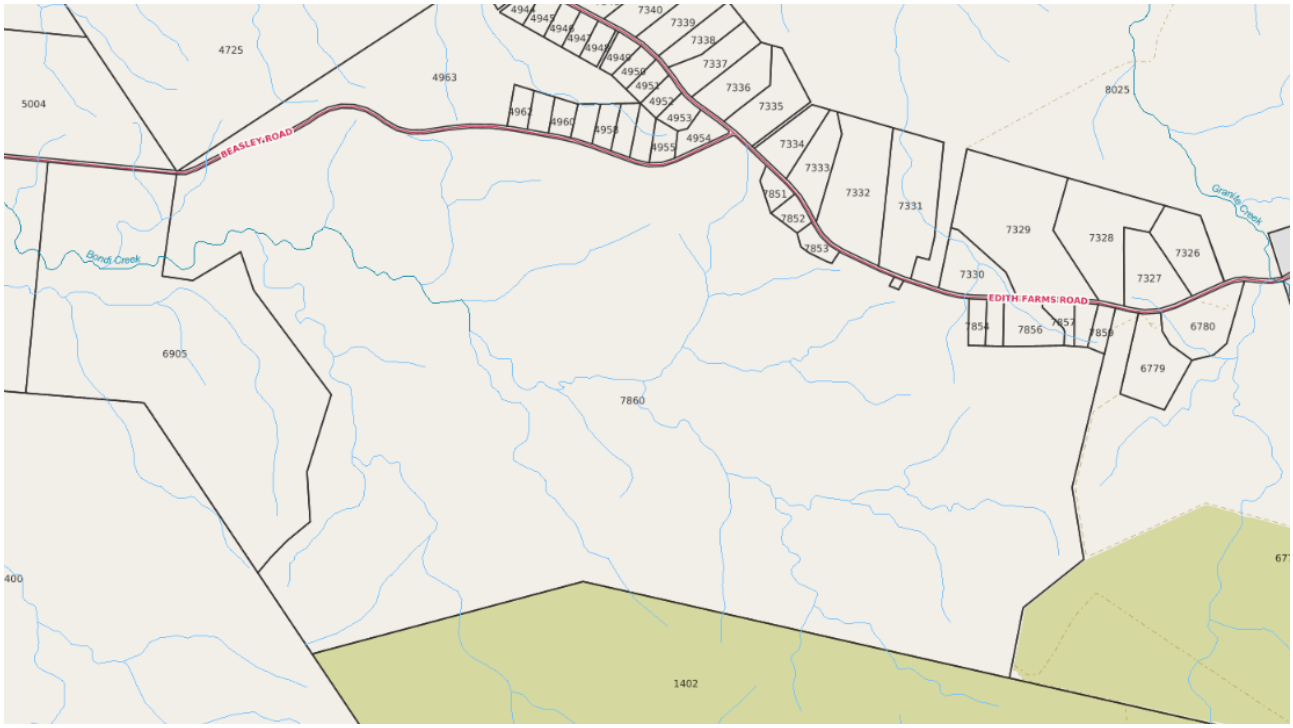

Figure 3. Nearby River Systems (Source: NR Maps)

4 Proposed Stormwater Management Approach

4.1 Overview

Stormwater management for the new subdivision will generally match existing conditions.

Natural sheet flow conditions will be maintained, with no concentrated inter-allotment drainage.

New allotments are generally to remain uncleared other than what is necessary for the establishment of 10m wide firebreaks along new Subdivision boundaries.

As part of the planning process, Subdivision boundaries and associated firebreaks have been set out to minimise ongoing drainage and erosion issues, so far as reasonably practicable (Refer *NT25091-REP-002 Erosion and Sediment Control Plan* for further details). This includes:

- Locating boundaries outside of drainage lines, including 25m riparian vegetation buffers and seepage zones. Where this is not possible, they have been set out to cross drainage lines at right angles to minimise interference.
- Locating boundaries along contours to minimise longitudinal gradients and mitigate long stretches of flow accumulation along firebreaks. Where this is not possible, diversion banks will be provided in accordance with the Erosion and Sediment Control Plan (ESCP).

The existing gravel pit in Lots 21, 22 and 23 will be reshaped and revegetated to restore natural sheet flow conditions so far as reasonably practicable.

No new drainage infrastructure is proposed, other the installation of access driveways fronting each new allotment, typically comprising concrete invert crossovers as per DLI Standard Drawing CS-3005.

4.2 Peak Flow Rates

The Subdivision results in minimal alteration to land use, clearing or existing hydrological flow regimes. Pre-development peak flow rates in existing drains and creeks will remain unaltered. No stormwater attenuation is required.

4.3 Stormwater Quality

The Subdivision results in minimal alteration to land use, clearing or existing hydrological flow regimes. Impacts on stormwater quality within existing drains and creeks will be negligible. No specific long-term stormwater quality treatment measures are warranted.

Stormwater quality will be managed through construction by implementing a Certified ESCP.

5 Closing

This Stormwater Management Plan supports the proposed Subdivision of Section 7860, 745 Edith Farms Road, Edith NT (the Site) into 26 large Rural Lots of minimum 8ha.

It complies with the NT Subdivision Development Guidelines, has been certified by a CPEng, and is deemed to satisfy the requirements of the NT Planning Scheme 2020.

Please contact me if you wish to discuss this report further.

Yours sincerely,

Paul Brandis

Principal Engineer (CPESC No. 9681)
BEng(Civil), MIEAust, CPEng, NER, RPEQ, DipPM, CPESC, GAICD

Attachments

Attachment A – Subdivision Plans (NT25091-C001 to C003, and NT25091-C101 to C103)

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Gold Coast

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Robina QLD 4226
07 5628 2794

Sunshine Coast

30 Chancellor Village Boulevard
Sippy Downs QLD 4556
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Land Suitability Assessment
Beasley Road
Sunrise Estates Pty Ltd

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Document ID	251590
Author(s)	Maria Consuelo Reyes Campos & Simon Aylott

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2	Willem Westra van Holthe and Brad Cunnington	Simon Aylott	Simon Aylott	24/9/2025
3	Willem Westra van Holthe and Brad Cunnington	Simon Aylott	Simon Aylott	28/11/2025

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GPO Box 381, Darwin NT 0800

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Appendices

APPENDIX A **SAMPLE SITES DETAILS**

APPENDIX B **SURVEY SITE LAND, VEGETATION AND SOIL DESCRIPTIONS**

APPENDIX C **SOIL SALINITY RESULTS**

APPENDIX D **DRAINAGE CLASSIFICATION ASSESSMENT**

APPENDIX E **ON-SITE WASTEWATER MANAGEMENT**

APPENDIX F **SUBDIVISION LAYOUT**

ACRONYMS

DLI	Department of Logistics and Infrastructure
DLPE	Department of Lands, Planning and the Environment
ha	Hectare
ESCP	Erosion and Sediment Control Plan
LSA	Land Suitability Assessment
mbgl	Metres below ground level
NT	Northern Territory
NTPS	Northern Territory Planning Scheme
PEM	Priority Environmental Management
SOCS	Site of Conservation Significance

Acknowledgements

Thank you to Lindsay Robinson for his assistance with soil auger drilling and subsequent site photographs.

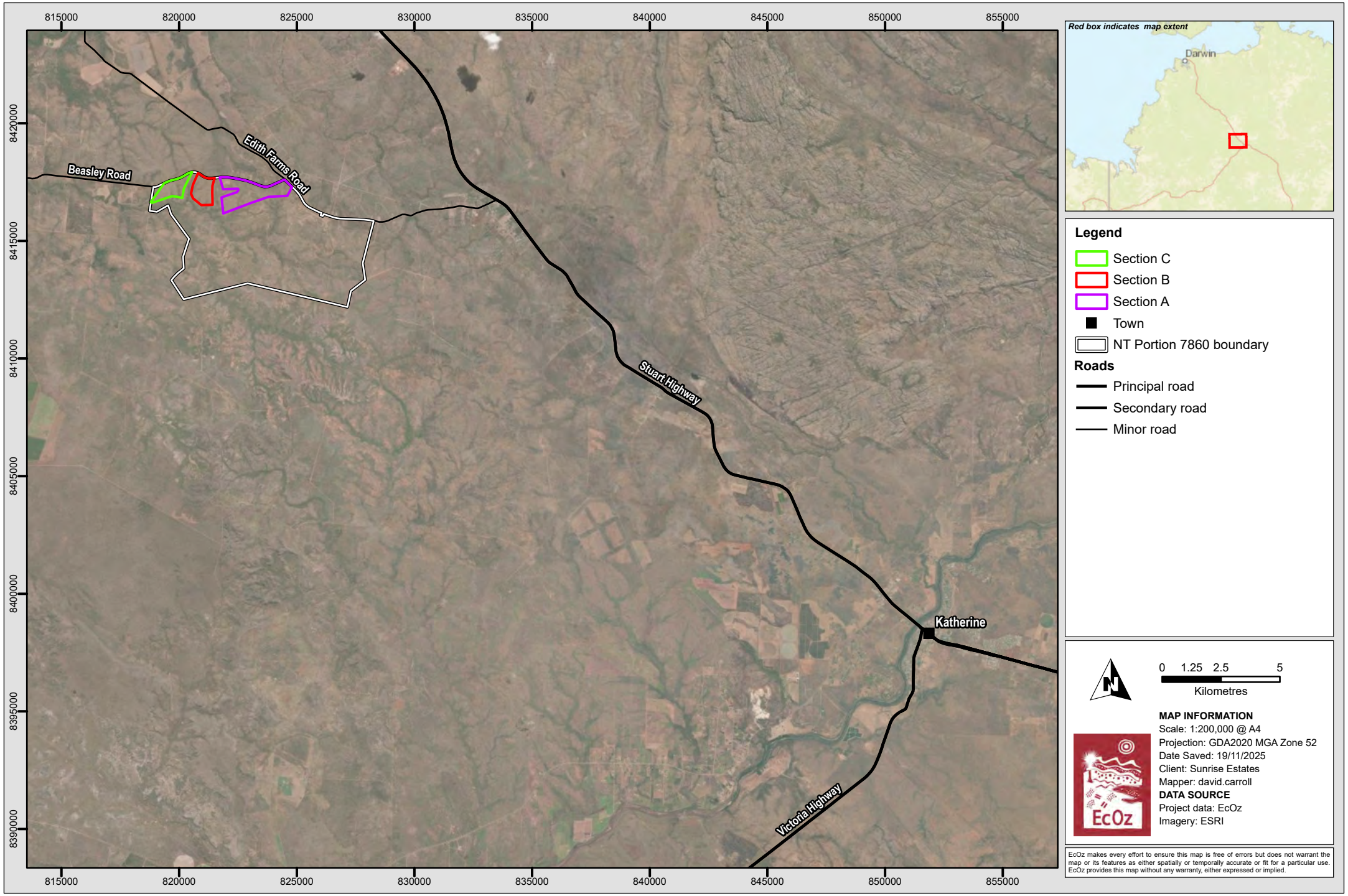
1 INTRODUCTION

EcOz Environmental Consultants (EcOz) was engaged by Sunrise Estates (the Client) to undertake a Land Suitability Assessment (LSA) within NT Portion 7860, 745 Edith Farms Rd, Edith. The property is a 3,437 ha area located approximately 40 km north of Katherine and is classified as Unzoned Land for planning. The Client proposes to subdivide NT Portion 7860 into a number of lots, all within three Sections along Beasley Road (Figure 1-1). These three Sections are herein referred to collectively as the 'project area':

- Section A – 236 ha
- Section B – 96 ha
- Section C – 91 ha.

According to the Clause 6.3 of the Northern Territory Planning Scheme (NTPS), a subdivision of unzoned land is to be assessed through a Land Suitability Assessment (LSA), which is required to determine the suitability of the land for subdivision and wastewater management. An LSA involves both desktop and field-based assessment of the property and determination of the potential constraints relevant to subdivision.

It should be noted that apart from the three Sections described above, final subdivision boundaries were not known at the time of this assessment. The aim of this LSA report is to assess the suitability of the project area for subdivision, with a particular focus on the land within the northern part of the project area, that is adjacent to Beasley Road and will allow for access to any proposed lots. Because of this focus, as well as the large area involved, the southern portion was not visited during the field survey. Instead, a drone survey of the entire project area was conducted prior to the field survey to support the desktop review.



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Layout: Figure 1-1. Location map

Figure 1-1. Map showing location of the project area

1.1 Development details

The project area is currently leased for pastoral production. The proposed subdivision seeks to subdivide Section C as one lot (with the option of amalgamating Section C and Section B), and to subdivide Section A into an undetermined number of lots, all fronting onto, and accessed via, Beasley Road.[1] The remaining land within NT Portion 7860 is proposed to continue under pastoral production. The NTPS allows the subdivision of unzoned land with a minimum lot size of 8 ha, of which a minimum of 1 ha must be considered suitable for development.

Surrounding land use in the area consists mainly of pastoral production. The adjacent land on the northern side of Beasley Road has been subdivided into a number of 8 ha residential lots. Previously, a subdivision was approved to create 9 large lots (mostly 8 ha) along Edith Farms Road, the closest being adjacent to Section A. The local Northern Territory (NT) Volunteer Bushfire Brigade compound is located on the southern side of Edith Farms Road approximately 1.7 km from the project area.

1.2 Land suitability classes

An LSA requires assessment of the environmental conditions of the property in order to give the site an overall ranking for suitability of rezoning and development. The findings are assessed against suitability classes defined in the NT Land Suitability Guidelines (NTG 2020) and presented in Table 1-1.

Table 1-1. Land suitability classes as per the NT Land Suitability Guidelines (NTG 2020)

Suitability Classes	Description
Class S1 Highly suitable	Land having no significant limitations to sustained application for a given land use or only minor limitations. Nil to minor negative economic, environmental, health and/or social outcomes.
Class S2 Moderately suitable	Land having limitations which in aggregate are moderately severe for sustained application of a given land use. Appreciable inferior to S1 land. Potential negative economic, environmental health and/or social outcomes if not adequately managed.
Class S3 Marginally suitable	Land having limitations which in aggregate are sever for sustained application of a given use. Moderate to high risk of negative economic, environmental, health and/or social outcomes if not adequately managed.
Class S4 Not suitable	Land having limitations which may be insurmountable. Limitations are so sever as to preclude successful to sustained use of the land. Very high risk of negative economic, environmental and/or social outcomes if not managed.
Class S5 Not suitable	Land having limitations which appear so severe as to preclude any possibilities of successful sustained use of the land in the given matter. Almost certain risk of significant negative economic, environmental and/or social outcomes.

[1] After the initial draft of this report was issued, the project area was expanded slightly, due to challenges in land suitability. An additional area of land between Sections A & B was added, as well as a focus on land at the southern portion of Section A. The final subdivision plans, along with relevant data have been included in Appendix F.

2 LAND SUITABILITY ASSESSMENT

The assessment of the project area involved a desktop review, which included a search of zoning, land units, areas of environmental significance, and threatened flora and fauna. A drone survey was also conducted as part of this review. A site inspection was undertaken to ground-truth the findings of the desktop review and identify any further environmental parameters that are relevant to the proposed subdivision.

2.1 Desktop review

A desktop review of aerial photography and online land information databases was undertaken to identify potential environmental constraints to be further investigated during the site inspection. Satellite imagery was used to assess the current land use and any development on the property and surrounding areas.

The online government resource 'NR Maps' and government publications were used to source the following data:

- Cadastral boundaries
- Land units (1:50,000)
- Location of areas of environmental significance – e.g. Sites of Conservation Significance and Conservation (CN) zoned land
- Location of waterways, areas of seasonal inundation, and seasonally-waterlogged soils
- Location of bores
- Contours (1 m).

An assessment of environmental constraints identified through analysis of data listed above was undertaken in accordance with requirements of relevant Northern Territory Government documents, including:

- NT Planning Scheme 2020
- Katherine Land Use Plan 2014
- The NT Land Clearing Guidelines 2024
- NT Land Suitability Guidelines 2020.

2.1.1 Drone survey

To support the desktop review, a drone survey was conducted of the project area on 3 April 2025. A Mavic 3 Enterprise drone with a 20MP camera equipped with a wide-angle lens, was flown over the project area at a height of 120 m. Photographs were processed into an ortho-mosaic map, which was used to identify constraints such as rocky outcrops and erosion gullies, and to examine patterns in vegetation.

2.1.2 Existing land unit descriptions

Existing land units of the project area were mapped at a scale of 1:50,000 by Aldrick & Robinson (1970). The environmental attributes of these land units are summarised in Table 2-1, and the location and extent of each unit in relation to the project area is illustrated in Figure 2-1.

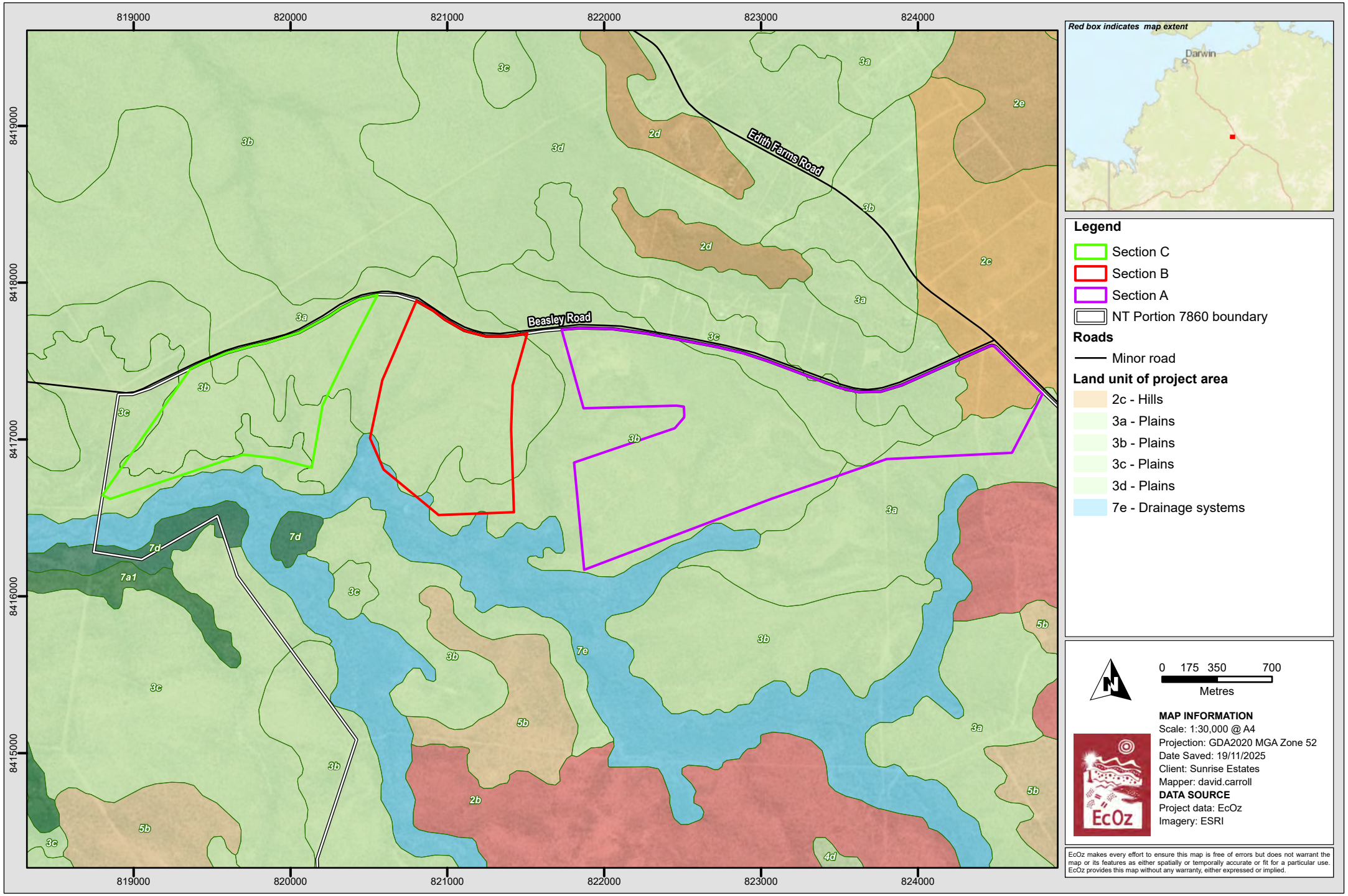
The land is mapped as predominantly plains with gentle slopes and well-drained soils (3a, 3b, 3c and 3d), dominated by low woodlands of *Eucalyptus tectifica* and *E. foelscheana*. Land unit 2c, on the corner of Beasley Road and Edith Farms Road, contains slopes up to 15% and shallow, rocky soils (although field surveys found this area to be dominated by <3% slopes – see Figure 2-15). To the south of the project area, a drainage system (7e) runs east to west and is subject to seasonal inundation.

Limitations of these land units for development are described by Aldrick & Robinson (1970) and detailed in Table 2-1. Land units 3a and 3b are both limited by severe rocky outcrops and small pockets of shallow soils, with limitations more pronounced in 3a. Shallow soils are also a limitation within land units 2c, and potentially 3c. Soils are well drained in all land units except 7e (Aldrick & Robinson 1970).

Areas of imperfectly-drained soils are indicated by the presence of the small tree species *Grevillea heliosperma* and *Petalostigma pubescens*. Presence of the small tree species *Hakea arborescens* in the vegetation indicates areas of shallow soils overtopping limestone.

Table 2-1. Description of the existing land units within the zones (Aldrick & Robinson 1970)

Land unit	Landform description	Vegetation description	Drainage	Soil	Limitations
Hills					
2c	Hills - hilly terrain; slopes 5-15%; rocky and boulder-strewn	Eucalyptus dichromophloia low open woodland to mid-high open woodland (Eucalyptus umbrawarrensis and Lancewood in lower rainfall areas) with Spinifex and annual Sorghum grass layer	Well drained soils; very rapid run-off.	Soils generally shallow or skeletal; Rudosols	Shallow rocky soils; very erodible
Plains					
3a	Plains - undulating and dissected terrain; slopes to 2%; frequent linear outcrops of intermixed limestone and sandstone.	*Eucalyptus tectifica* and *Eucalyptus foelscheana;* Low woodland; frequently well-developed understorey of *Hakea arborescens* and *Cochlospermum fraseri* and mixed annual Sorghum and perennial grass layer	Well drained soils; moderately rapid run-off	Tippera – small pockets of very shallow Loamy Red Earths; minor Elliott (Florina) - Loamy Yellow Earths; Kandosols	Severe rock outcrop; shallow soils in small pockets; steeper slopes are highly erodible if cleared; severely restricted accessibility
3b	Plains – gently undulating with dissected terrain; slopes less than 2%; scattered limestone pavement or rock outcrop.	*Eucalyptus tectifica* and *Eucalyptus foelscheana*; Low woodland; frequently well-developed understorey of *Hakea arborescens* and *Cochlospermum fraseri* and mixed annual Sorghum and perennial grass layer	Well drained soils; slow runoff.	Tippera - shallow Loamy Red Earths; minor Elliott (Florina) - Loamy Yellow Earths; Kandosols	Severe rock outcrop; restricted accessibility.
3c	Plains - Flat to gently sloping; slopes less than 2%; scattered limestone pavement or outcrop; indistinct drainage floors	*Eucalyptus foelscheana* low woodland with few shrubs and mainly perennial *Sehima* tall grass layer	Well drained soils; slow run-off	Tippera - Loamy Red Earths, deep with minor outcrop or shallow with small amounts of surface stone or grave; Kandosol	Minor rock; sometimes shallow soils; erodible on slopes over 1% if cleared
3d	Plains - flat to gently sloping; slopes less than 2%; indistinct drainage floors	Uniform *Eucalyptus tectifica* and *Eucalyptus foelscheana* low woodland with perennial *Sehima* and *Themeda* grass layer	Well drained soils; slow runoff.	Tippera - deep Loamy Red Earths; minor small inclusions of Elliott (Florina) – Loamy Yellow Earths; Kandosols	Minor rock; sometimes shallow soils; erodible on slopes over 1% if cleared.
Drainage systems					
7e	Riparian forest thickets	Drainage systems - major creeks and severely gullied tributaries; includes permanent and ephemeral waters.	Poorly-drained alluvial soils; Tenosols	Subject to regular wet season flooding	Severe risk of erosion, particularly gullying; subject to regular wet season flooding; highly unstable environment



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Layout: Figure 2-2. Map of existing land units

Figure 2-1. Map of existing land units

2.1.3 Riverine flood mapping

According to the NT Land Suitability Guidelines (DIPL 2020), land constrained by the risk of riverine flooding is defined as land situated below the 1% Annual Exceedance Probability (AEP) flood level. The project area is located well above 100 m elevation and is not in proximity to the Katherine River. It is therefore entirely outside the 1% AEP flood zone (DEPWS 2006).

The nearest major drainage system to the subdivision is Bondi Creek, a third-order stream, located approximately 1.5 km to the south of Beasley Road. Bondi Creek is a tributary of the Fergusson River.

2.1.4 Acid sulfate soils

Acid sulfate soils are typically restricted to coastal marine environments. As the project area is located in the Katherine region, approximately 300 km from the NT coastline, the presence of acid sulfate soils is not expected (low probability of occurrence). The project area does not fall within mapped Acid Sulfate Soil Risk mapping accessed via NR Maps.

2.1.5 Areas of conservation significance

No Sites of Conservation Significance (SOCS) are mapped within the project area. The closest recorded SOCS are the Yinberrie Hills, located approximately 2 km north of the proposed subdivision area, and the Western Arnhem Plateau, approximately 11 km to the east. It is highly unlikely that the proposed subdivision will impact either of these SOCS. The project area does not fall within the Priority Environmental Management (PEM) area for Katherine, which borders the eastern edge of Portion 7860. The subdivision is unlikely to affect the values of this area, particularly given that the area of interest lies more than 4 km to the north-west.

Sinkholes are common in the karst topography of the Katherine region, with 283 sinkhole locations identified between 1999 and 2002 (DEPWS 2018). These features contribute to groundwater recharge and provide unique habitats for biodiversity, including bats. No large sinkholes have been recorded within the project area, and no incidental sinkholes were observed during field survey. However, it is noted that not all areas within the project area were covered on foot and smaller sinkholes may not be visible using drone footage.

2.1.6 Potential threatened species

A search of NT Portion 7860 and surrounds within the NT and Commonwealth threatened species databases and the NT Flora and Fauna Atlas did not record the presence of any threatened species or restricted ranges species within the project area. A number of threatened species have been recorded in the Katherine region. Targeted surveys for threatened species and associated habitat within the project area have not been undertaken. The project area is not know to contain habitat for restricted range species.

Assuming lots are used for the establishment of houses and associated rural land use and that lots remain largely vegetated, the proposed subdivision is not expected to a have a significant impact on threatened species.

2.2 Field assessment

A field assessment was undertaken by two EcOz Environmental Consultants from the 11 – 13 June 2025, using an All-Terrain Vehicle (ATV) and on foot. An 18V battery-powered mechanical auger was initially used which was later changed to a Tracked Mini Loader with auger for the majority of test sites (Figure 2-2). A total of 14 sites were assessed at the area of investigation as per Appendix A. Most of the soil test sites were within Section A.

Figure 2-2. Photograph of Tracked Mini Loader with auger

The northern portion of the project area was surveyed with reference to the existing land unit descriptions to determine appropriate on-ground location of land unit boundaries. Meanders were conducted within Section B and C to verify features such as erosion gullies and rocky outcrop that were identified in drone imagery. Corrected land unit boundaries were made within Section C using drone imagery and the extent of rocky outcrop noted in the field meander. A total of 14 survey sites were completed as follows:

- Section A soil sites (ASS) 3, 4, 5, 6, 7, 8, 9, 10
- Section B soil sites (BSS) 1, 2, 12, 13
- Section C soil sites (CSS) 14, 15.

The soil sites were located across the northern boundary of the project area, to focus on the environmental attributes adjacent to Beasley Road (the most favourable location for subdivision). The more remote southern areas were not accessible using the Tracked Mini Loader due to time, safety risks from uneven ground, and potential damage to vegetation.

Vegetation structure and flora species composition of the three dominant species within each stratum (NVIS level V), were recorded within a 20 m x 20 m quadrat at each site, according to methods outlined in the NT *Guidelines and Field Methodology for Vegetation Survey and Mapping* (Brocklehurst et al. 2007). Landform, slope and soil characteristics were recorded according to methods and descriptions outlined in the *Australian Soil and Land Survey Field Handbook* (NCST 2024). Weed infestations and incidences of erosion were recorded as observations, but targeted surveys were not undertaken for these aspects of the Property. Environmental attributes recorded at each site are presented in Appendix B.

After discussions with a town planner and engineers, the Client asked to include more areas in the LSA that had not been visited during the site visit. These areas were: the eastern edge of Section B, the area between Sections A and B, two areas of land at the southern edge of Section A and the gravel pit within Section A. It is considered that enough information is known of these areas from proximate assessed areas within the same land units to infer the land attributes with confidence.

2.2.1 Ground truthed land units

Survey sites were located within each mapped land unit area to determine the accuracy of land unit descriptions. Two long meanders to observe rocky outcropping extent and erosion were undertaken in

Sections B and C. Drone imagery and slope data were used to supplement the ground survey. Survey sites and the corresponding corrected land units attributed to the project area include:

- Land unit 3a: Survey sites BSS1, 2, 12 & 13; CSS14 & 15
- Land unit 3b: Survey sites ASS3 & 4
- Land unit 3c: Survey sites ASS5, 6 & 7
- Land unit 3d: Survey site ASS8 & 9
- Land unit 2c: Survey site ASS10
- Land unit 7e: no survey sites.

The field assessment found that the land units attributed to the project area at the scale of 1:50,000 were broadly correct. It was found that land unit boundary 3a in Section C was incorrect and this boundary was therefore extended based on the presence of extensive rocky outcrop visible in drone imagery and verified through the field meander. Because land units 3a and 3b within the Tagoman land system have similar attributes, differentiation was based on the presence of more extensive rocky outcrop. No other changes to land unit boundaries were made. The area of each land unit per Section is displayed below in Table 2-2.

Table 2-2. Table of ground truthed land units per Section

Section	Land units present within zones	Comments
A (~236 ha)	• 3a (17 ha) • **3b (152 ha)** • 3c (32 ha) • 3d (19 ha) • 2c (16 ha)	Dominant land unit: 3b. The western half of the section is classified as land unit 3b. Along Beasley Road, land units 3b, 3c, 3d, and 2c occupy approximately equal areas. Land unit 3a is present only in the south-eastern corner of the section.
B (~96 ha)	• **3a (81 ha)** • 3b (13 ha) • 7e (1 ha)	Dominant land unit: 3a. Almost all road frontage and the majority of the section fall within land unit 3a, except for land unit 3b in the south-eastern corner and minor occurrences of land unit 7e along the southern boundary.
C (~91 ha)	• **3a (41 ha)** • **3b (36 ha)** • 3c (13 ha)	Dominant land units: 3a and 3b. Land unit 3a is predominant along Beasley Road, while 3b dominates the central and western portions of Zone A. Land unit 3c is present along the western and southern boundaries.

2.2.2 Soil assessment

Methodology

Soils were assessed at 14 sampling sites through the excavation of soil test pits to a depth of 1 m or refusal, using a motorised auger. Two sites (ASS3 & ASS4) were only assessed to a depth of 0.6 m. Soils were described based on surface characteristics (i.e. presence of surface gravels/rock outcrops or inundation), and sub-surface soil horizons (coarse fragments, moisture content, texture, colour, presence of mottling and depth). This information, in combination with vegetation indicators, provides insight into soil drainage and absorption capacity (see Appendix A).

Full site assessments were not undertaken in four sites (BSS1, 2, 12 & 13) because all four soil test pits reached refusal at or below 0.4 mbgl. Despite this, all four sites are still included in this assessment. All four area within Section B.

More detail of soil assessment methodology is included below in Table 2-3.

Table 2-3. Soil assessment methodology

Activity	Comment
Soil sampling	Excavation of soils via mechanical and motorised auger to a depth of 0.6 mbgl, 1.0 mbgl or refusal. A total of 14 sample sites were excavated; however, soil samples were collected for only nine sites. The sites where soil conditions were considered not suitable (<0.6 mbgl and/or rocky soils) were excluded from the sampling collection procedures. A summary of the sample collection is detailed in Appendix A. Soil samples were collected at a rate of one sample per horizon per sampling area.
Soil description and observations	All soil field observations and descriptions were recorded on a dedicated field data sheet in accordance with the *Australian soil and land survey field handbook* (NCST 2024). Soil profile descriptions included horizon designation, excavation depth, Munsell colour, soil texture class, coarse fragments, and gravel content. Gravel content was estimated by sieving soil samples using a 1 mm sieve, based on the proportion of the sample retained. It is noted that coarse sand was included as part of the gravel content. This information, in combination with vegetation and site indicators, provides insight into soil erosion risk, drainage, on-site wastewater management.

Soil profile description

The most common soil types encountered at the site sections are:

- Section A: dark reddish-brown clay loam, with gravel portion approximately 80% abundance with clay inclusions. It is noted that some samples were moist at the time of processing and samples with high clay content did not pass through the sieve. This could lead to a higher apparent gravel content percentage.
- Section B: brown silty clays and loamy sands. No gravel content or soil samples were collected in this zone.
- Section C: red silty clay with gavel portion at approximately 60% abundance.

Refer to Appendix B for detailed soil descriptions and field observations.

Soil salinity

Soil salinity laboratory results for the samples collected indicate that all soil sites were non-saline, with values less than 2 dS/m. Salinity description results are detailed in Appendix C.

Rocky outcrops

Patches of rocky outcrops made of limestone and sandstone are common within land units 3a and 3b and are generally indicative of shallow soils. Drone imagery was used to identify dense patches of rocks within the project area, with a focus on the northern portion of the study area, confirmed through meanders through these land units during the field visit. Mapping (Figure 2-16, Figure 2-17) shows the location of many of these rocky areas but is not exhaustive.

Erosion risk

Areas of erosion risk are most likely in areas with certain soil types, steep gradients, in association with drainage lines, and where vegetative cover has been removed.

Along the northern portion of Beasley Road, particularly within land units 3b, 3c and 3d of Section A, the land is generally flat (< 2 %). The mid and lower areas of Section B and the south-west portion of Section A (see Figure 2-15 and Figure 2-16) contain ravines and erosion gullies with slopes >5%. The presence of gullies and

ravines suggests that areas with > 2% slope carry a high erosion risk when combined with soil type and high rainfall of the region.

To calculate slope, SRTM-derived smoothed 1 second Digital Elevation Data was downloaded from Geoscience Australia and converted into vector geometry using QGIS for categorisation and mapping.

Figure 2-3. Photograph of erosion gully in land unit 3a

Drainage

A desktop analysis using 1m contour data[2] identified a that rainfall run-off broadly flows from the east to the south and south-west across the project area, emptying into Bondi Creek. However, water also runs west along the north of the project area in Section A, and crosses the road at several points (see Figure 2-14; Figure 2-15). The highest point within the project area is at the eastern side of Section A (elevation ~148m); however, in the centre of Section A, a ridge line (elevation 142m – 145m) also directs run-off north and north-west.

The field assessment identified all but one sampling sites within Section A as well-drained, with one – ASS3 – assessed as imperfectly drained. The assessment of ASS3 was based on soil colour (dark yellowish brown), presence of indicator species *Petalostigma pubescens*, and contour data (1 m) which show the area north and immediately west of the quarry is seasonally wetter than other assessment sites – see Appendix B. Land unit 7e forms part of a drainage system and is considered poorly drained.

Refer to Appendix D for drainage classification assessment details.

[2] 1m contour data derived from Geoscience Australia 1 second DEM (2011), available through ELVIS (https://elevation.fsdf.org.au/). The data was processed in QGIS using the raster contour extraction tool.

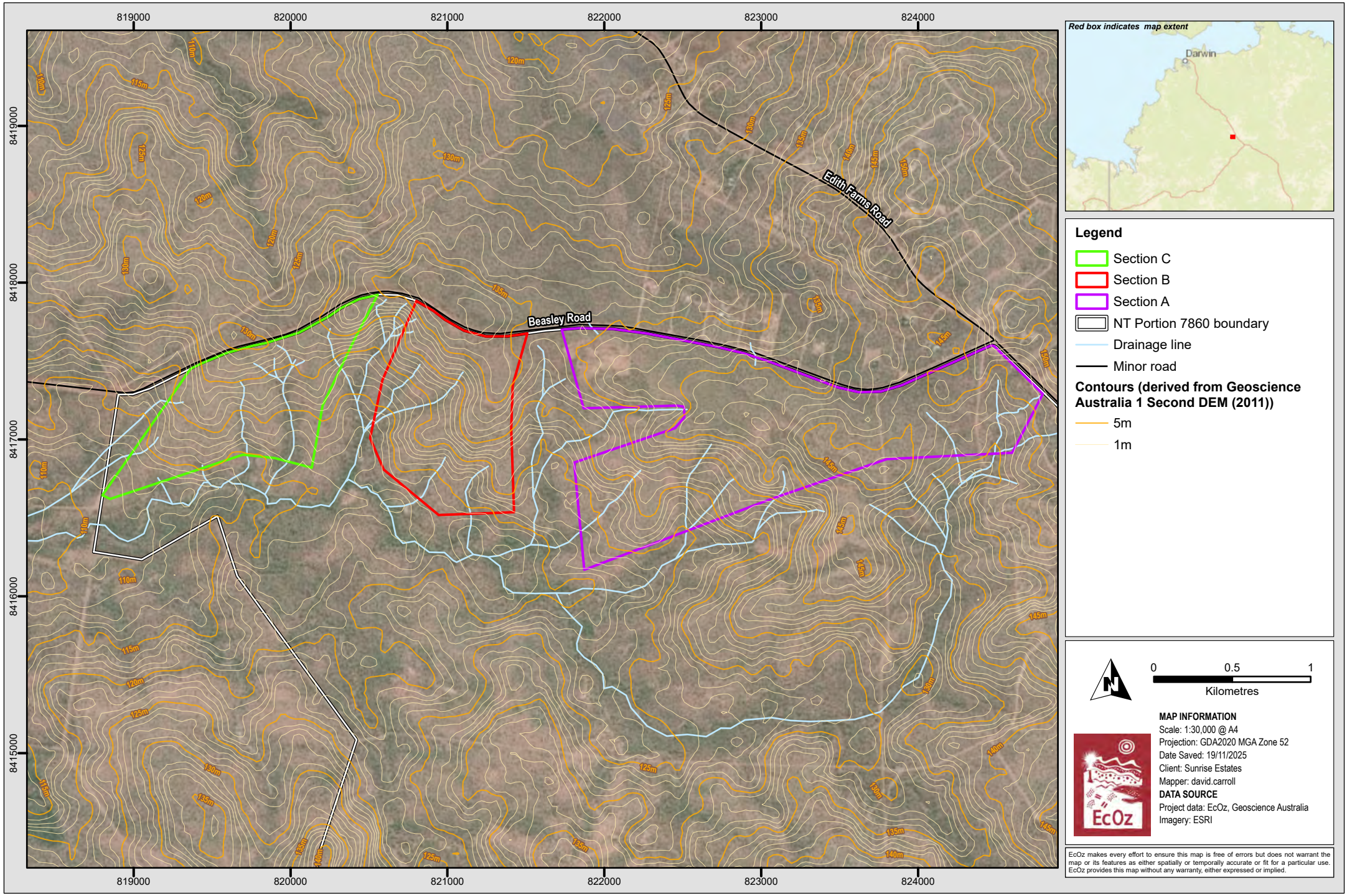
On-site Wastewater Management

The below information provides insight for estimating risk categories as outlined in Table 2 of the NT Land Suitability Guidelines.

- Clay content
- Soil depth
- Gravel content[3]
- Slopes
- Drainage.

Results indicated that all soil assessment sites are classified S3 – marginally suitable, which is within the High-risk category for on-site wastewater management due to >15% clay at depth and >50% sub-surface gravel. More detail of these results is provided in Section 2.3 also in Appendix E.

[3] This is listed in Table 2 of the Land Suitability Guidelines (NTG 2020) as 'surface gravel'; however, the author was advised by the DLPE Land Assessment Branch to assess this as 'sub-surface gravel' content instead (Jason Hill, Director Land Assessment Branch, pers. Coms. 6 July 2025)



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Layout: Figure 2-1. Map of contours and drainage lines

Figure 2-4. Map of drainage and contours

2.3 Land suitability assessment

Table 2-4 describes the suitability classes of the mapped assessment areas in the project area. Due to time constraints, the assessment area only relates to areas within Sections A, B and C where land attributes could be confidently evaluated. The southern portion of the project area was not ground-truthed and therefore has not been included in the formal assessment area. However, land constraints of slope >3% and drainage outside of the assessment area were assessed using satellite and drone imagery. It is likely that more suitable land exists within Section A outside of the assessed areas, and possibly also in Sections B and C.

The assessment areas are shown on Figure 2-14, Figure 2-15, Figure 2-16 and Figure 2-17 and are labelled 'landunit – area of unconstrained land'.

The results of the desktop review and field survey – including the laboratory soil sampling data – were used to evaluate potential constraints within the northern portion of the project area and assign a Suitability Class according to the requirements of the land suitability criteria defined in NT Land Suitability Guidelines (Table 1-1).

Based on the findings, the major potential limiting factors within the assessment areas (i.e. those areas within the project area that were field verified) are related to shallow soils, slopes >0.75% (mostly <2%) and sub-surface gravel content >50%. Ephemeral drainage lines have also been included in all mapping (buffered by 25 m as required by the Land Clearing Guidelines, 2024). These limitations result in an initial assessment for the entire project area of Suitability Class **S3 – marginally suitable** for erosion and wastewater management. However, with additional engineering inputs, the Suitability Class can be effectively modified to **S2 – moderately suitable**. See Table 2-4 below and Section 3 for more detail.

Other constraints noted outside of the project area, particularly in the central and western portions of the project area, are rocky outcrops and steep slopes >5%. Contour data at a 1 m scale shows average slopes of 2-3% across much of Section C and B, as well as in the south-western and eastern portions of Section A. Within these sloped areas, there are steep ravines and gullies of up to 10% slope, which may present severe constraints to any future development. Land unit 7e was not assessed and is assumed to be unsuitable for development because it is part of a drainage system. None of the above areas are within the project area.

Table 2-4. Land suitability classes of assessment areas

Land Suitability Category	Unsuitable Land Definition	Site Assessment	Suitability Class*
Drainage	Areas that are wet or saturated either at, above or close to the land surface for a period of weeks to months (per year) as a result of rainfall, landscape function and/or position or soil hydrology factors.	Land units 3a: Moderately well drained	S2
		Land unit 3b: Moderately well drained. The western portion of Section A (from ASS03 to western boundary of land unit) was identified as imperfectly drained. To the east, ASS04 was assessed as well drained, showing no signs of waterlogging or drainage issues.	S3 current
			S2 with engineering
		Land unit 3c: Well drained Water drains north across Beasley Road ~100 m north-west of ASS6.	S2
		Land unit 3d: Well drained Some water seepage may occur in a south-west direction along Beasley Road, within the project area, before draining across Beasley Road.	

		Land unit 2c: Well drained	
On-site Wastewater Management	Soils that have one or more of: • Slopes greater than 10% • Imperfectly to very poorly drained • Contain minimal clay (20%) at depth • Shallow soils (<0.5m) • Extensive exposed rock (>10%) • Greater than 50% gravel in sub-soil	Land unit 3a: High (soils <0.6 m in Section B; sub-soil gravel portion <50% in Section C)	S3 current
		Land unit 3b: High (the western edge of this land unit is imperfectly drained, around ASS3. Gravel portion of sub-soil is >50% in ASS3 and ASS4.)	
		Land unit 3c: High (>50% gravel content in sub-soil)	S2 with engineering
		Land unit 3d: High (>50% gravel content in sub-soil)	
		Land unit 2c: High (>50% gravel content in sub-soil)	
Erosion Risk	Soil landscapes that have a moderate to very high erosion risk	Land unit 3a: slopes 1 – 2.5% Land unit 3b: slopes 1 – 1.5% Land unit 3c: slopes 1 – 1.5% Land unit 3d: slopes: 1.5 – 2.5% Land unit 2c: slopes 2.5%, sandy Rudosols. Within land units 3b, 3c and 2c the majority of land is <2%. Some smaller areas have up to 3% slope. Land with <3% slope is considered manageable with engineering and is assessed S2. Smaller areas of up to 4% slope also occur and should be avoided where possible. These are assessed as constrained (S3). Apart from a localised area near ASS7, no slopes >5% exist in the assessed areas. These higher slopes are an erosion risk and are discussed in Section 2.2.2.	S3 current S2 with engineering
Soil Salinity	Soil salinity >4dS/m ECe	Non-saline	S1
Acid Sulphate Soils	Soils with greater than 0.02% oxidisable sulphur is present	No acid sulphate soil risk exists at the site (outside of marine risk area)	S1
Riverine Flooding	Land below the 1% AEP flood level	Outside of riverine flood level	S1

*the assessment refers to areas within each land unit that have been assessed, not the entire land unit.

2.3.1 Additional assessment information

This section provides more detail about several additional areas that were identified for potential subdivision after field work was completed.

Section B - east

The eastern edge of Section B was not formally assessed during the site visit; however, soil and vegetation assessments were undertaken within this land unit ~300 m to the west at a similar elevation and are therefore considered relevant. Photographs taken of the area (Figure 2-5) post-site visit provide additional evidence that the vegetation is analogous with those assessment sites. Therefore the constraints of this land unit are shallow

soils and rocky outcrops and erosion. Slopes greater than 5% occur in the northern 500 m of this area and should be avoided due to erosion risks.

Between Sections A and B

This area is a wide drainage area straddling two land units – 3a and 3b. The closest assessment sites - BSS12 (3a) and ASS3 (3b) - are both within 500 m. Land unit 3a is considered a higher risk for constraints (see Table 2-1) and therefore contours were used to delineate an area of land within land unit 3b that is suitable for development, with an additional buffer around the mapped drainage line as a pre-caution – see Figure 2-8 and Figure 2-9.

Gravel Pit

This is a relatively flat ~8 ha area at the north-west corner of Section A that has been disturbed through historic surface extraction (gravel mining), resulting in extensive areas of bare earth, some erosion, the creation of artificial water pits and a few stockpiles of materials, as well as some scattered regrowth of *Acacia* spp (see Figure 2-10, Figure 2-11, Figure 2-12 and Figure 2-13). This area is considered suitable for development provided extensive remediation occurs that will adequately address erosion risk, wastewater management issues and drainage. Development of this area would have a positive effect on the environment if it addressed these issues and led to improved rehabilitation.

Figure 2-5. Map showing location of photo sites within Sections A and B

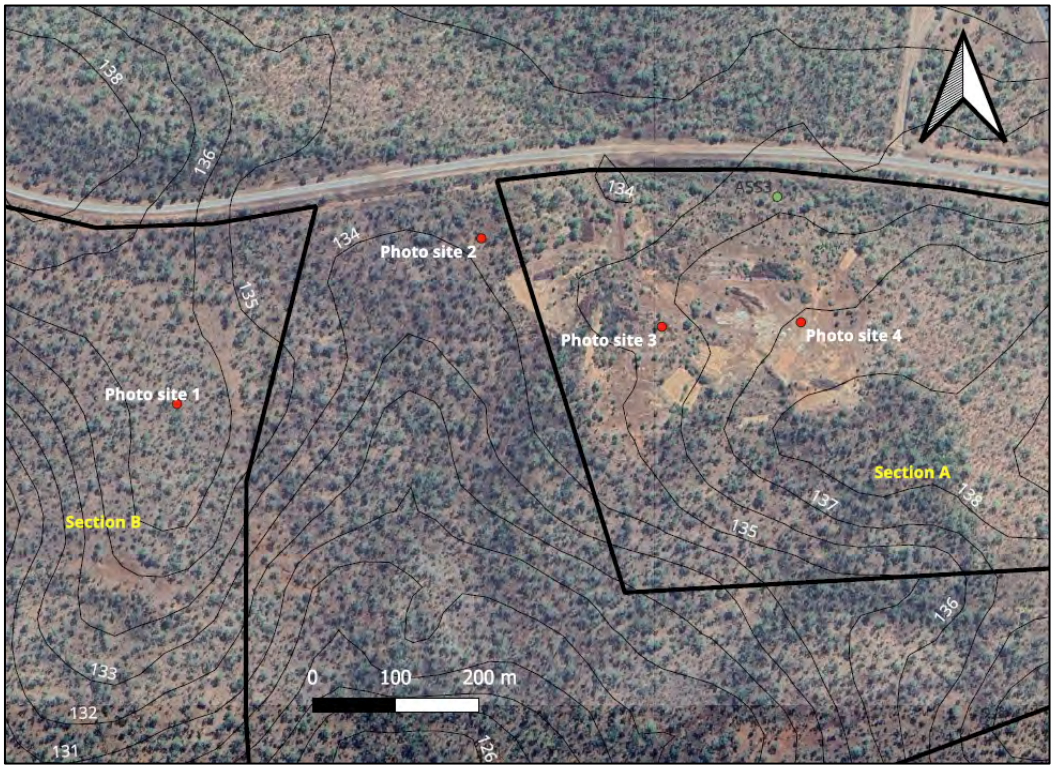


Figure 2-6. Photo site 1 facing east

Figure 2-7. Photo site 1 soil surface

Figure 2-8. Photo site 2 facing south

Figure 2-9. Photo site 2 soil surface

Figure 2-10. Photo site 3 facing north

Figure 2-11. Photo site 3 soil surface

Figure 2-12. Photo site 4 (gravel mine) facing east

Figure 2-13. Photo site 4 soil surface

Engineering inputs

This report identifies land constraints of the project area and suggests engineering solutions but does not assess the likely success of these engineering solutions to address limitations. However, the solutions outlined here are relatively common and straightforward. They are:

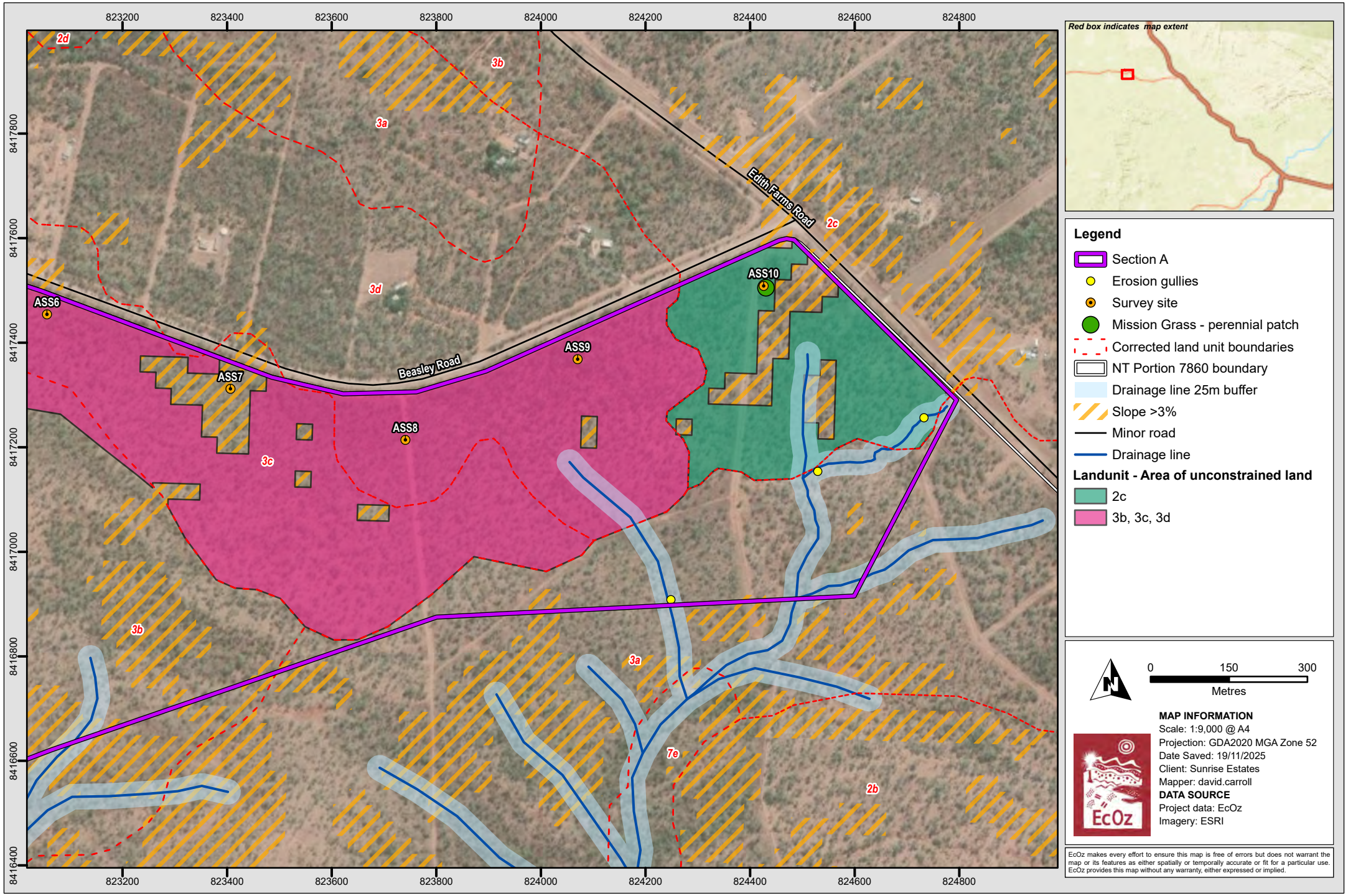
- **Gravel >50%** - this is a constraint for wastewater management, and therefore the area affected is relatively small. The limitation can be addressed through the site-and-soil evaluation report and the selection of a specific waste management system, such as addition of sand filters.
- **Shallow soils** – this is a constraint for wastewater management, and therefore the area affected is relatively small. The limitation can be addressed through the site-and-soil evaluation report and the selection of a specific waste management system, such as an above-ground or mounded system.
- **Rocky outcrop** – this is a constraint for wastewater management, and therefore the area affected is relatively small. The limitation can be addressed through the site-and-soil evaluation report and the selection of a specific waste management system.
- **Erosion risk** – erosion risk is considered to be marginally constrained when slopes are > 0.75% and not suitable for development when slopes are > 5%. Most of the land assessed (i.e. north of project area) has slopes of 1 – 3%. This is particularly a risk during land clearing. By the development of an erosion sediment control plan (ESCP) and avoiding slopes > 5%, the risks from erosion are manageable.

2.4 Limitations

Not all of land assessed was able to be visited during the site visit. The focus has been on the most northern 100-150 m of the project area, which was then extrapolated to areas of contiguous land further south. Satellite and drone imagery of vegetation and soil colour, contours and land unit data has been used to provide the evidence to extend the assessment findings into homologous areas. It is possible that areas further south within the project area that have not been included in this assessment may be suitable for development but require further investigation.

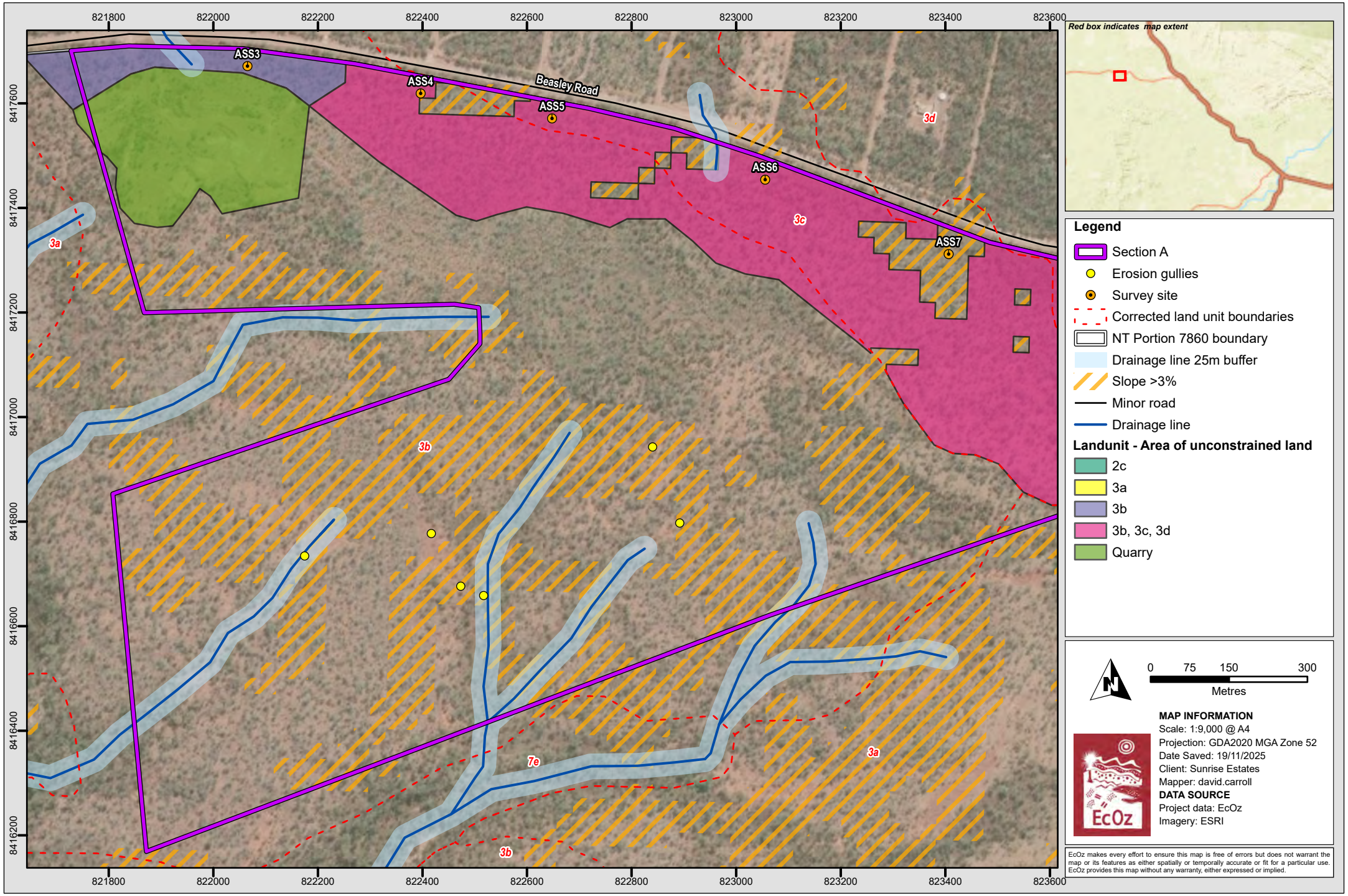
Slopes have been calculated using SRTM-derived smoothed 1 second Digital Elevation Data and are approximations due to low resolution. Drone derived DEM provide a finer scale of slope, particularly in areas where there are gullies and ravines which are especially at risk of erosion.

Drainage lines are sometimes broad and indistinct. Every attempt has been made to delineate these clearly, applying buffers as mandated by the NT *Land Clearing Guidelines* (DEPWS 2024). However, because of the large area, some have been estimated using drone imagery. It is recommended that drainage boundaries are verified during wastewater system installation.



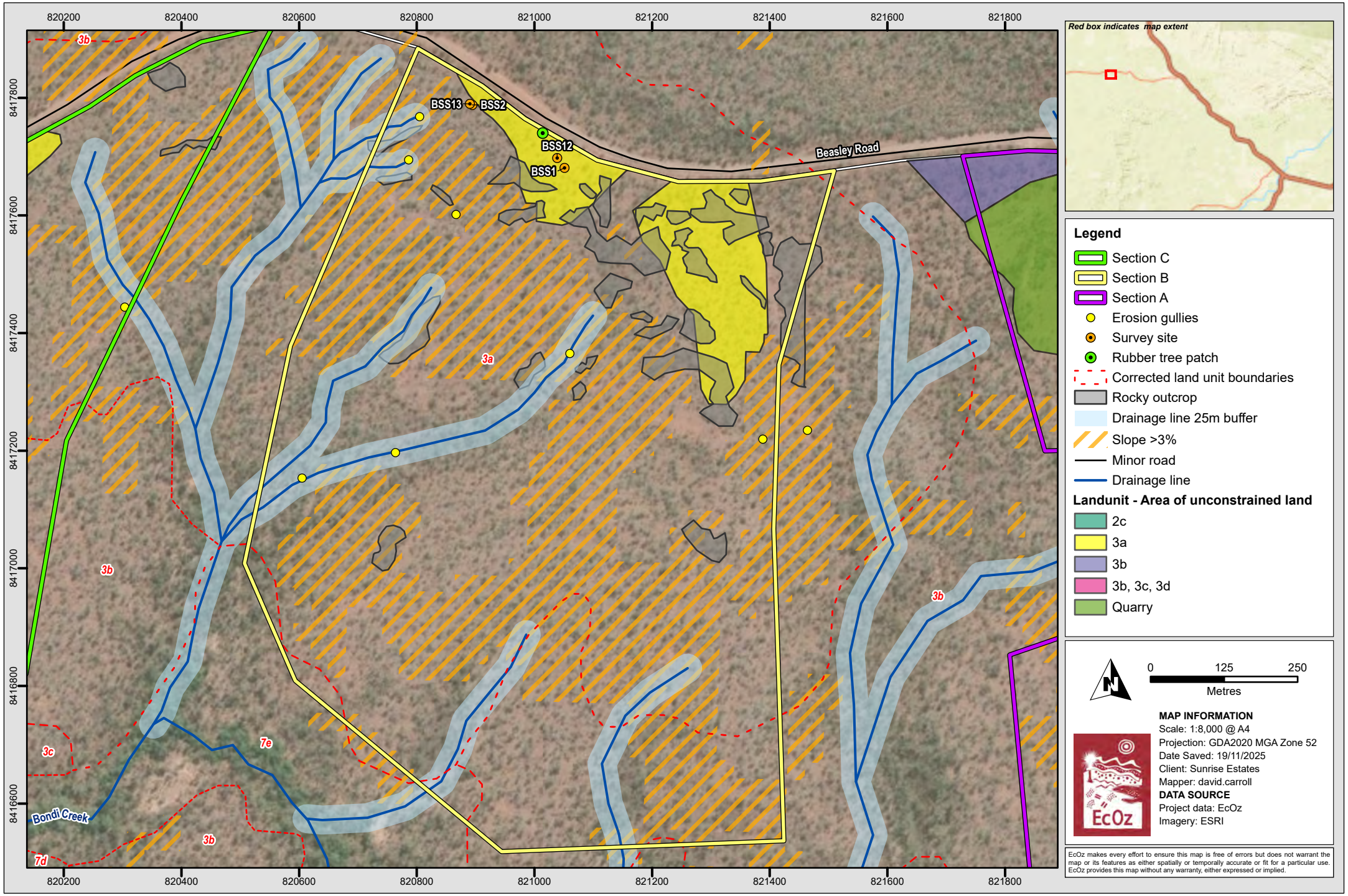
Path: Z:\01 EcOz_Documents\05 EcOz M-Files GIS\2025\EZ25072 - Sunrise Estates - Beasley Road LSA\1. Project Files\2. Report Maps\EZ25072 - Beasley Road LSA\EZ25072 - Beasley Road LSA.aprx
Layout: Figure 2-3. Map of suitable and constrained land in Section A - east

Figure 2-14. Map of land assessment - Section A (eastern portion)



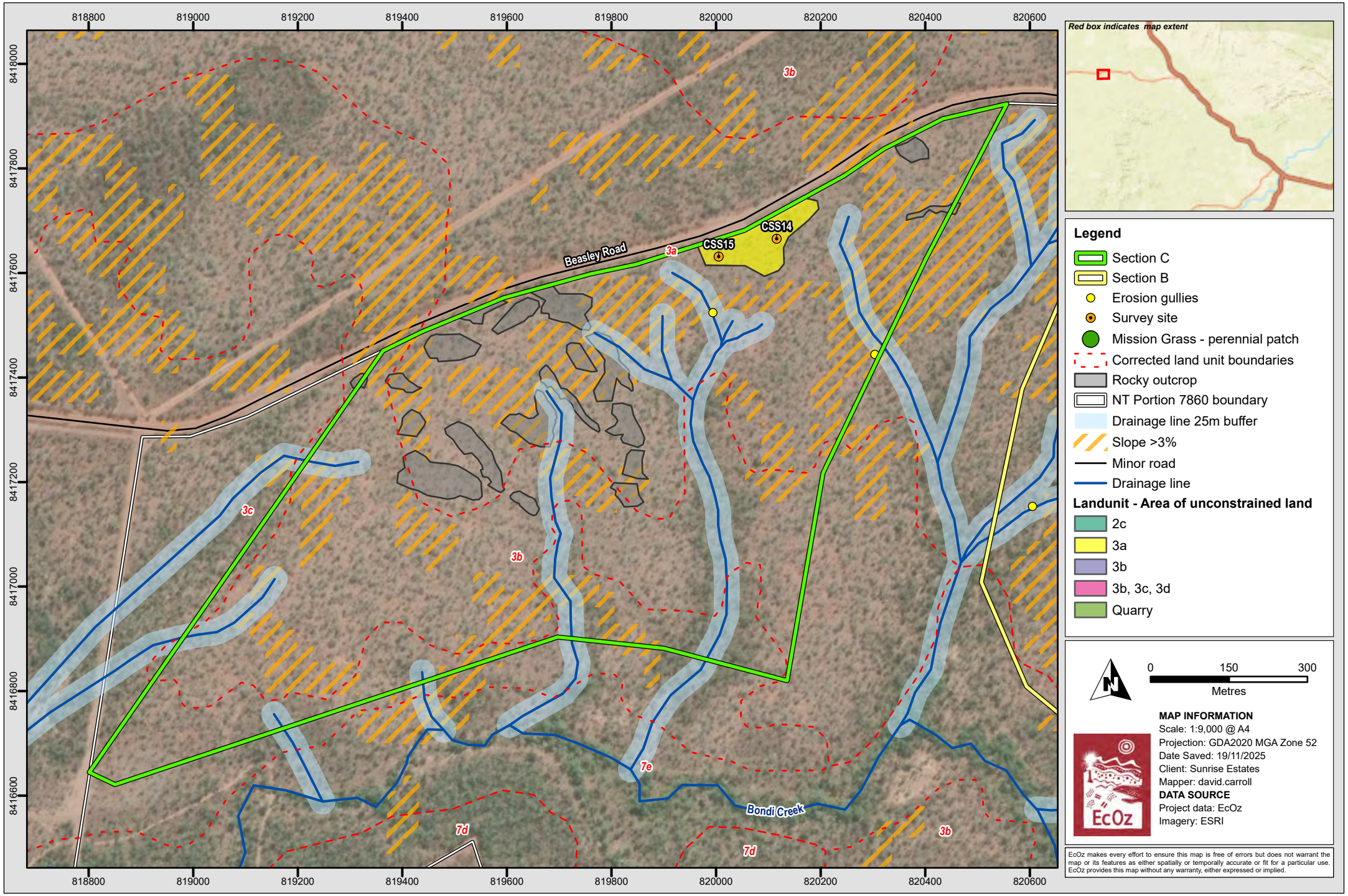
Path: Z:\01 EcOz_Documents\05 EcOz M-Files GIS\2025\EZ25072 - Sunrise Estates - Beasley Road LSA\1. Project Files\2. Report Maps\EZ25072 - Beasley Road LSA\EZ25072 - Beasley Road LSA.aprx
Layout: Figure 2-4. Map of suitable and constrained land in Section A - west

Figure 2-15. Map of land assessment - Section A (western portion)



Path: Z:\01 EcOz_Documents\05 EcOz M-Files GIS\2025\EZ25072 - Sunrise Estates - Beasley Road LSA\1. Project Files\2. Report Maps\EZ25072 - Beasley Road LSA\EZ25072 - Beasley Road LSA.aprx
Layout: Figure 2-5. Map of suitable and constrained land in Section B

Figure 2-16. Map of land assessment - Section B



Path: Z:\01 EcOz_Documents\05 EcOz M-Files GIS\2025\EZ25072 - Sunrise Estates - Beasley Road LSA\1. Project Files\2. Report Maps\EZ25072 - Beasley Road LSA\EZ25072 - Beasley Road LSA.aprx
Layout: Figure 2-6. Map of suitable and constrained land in Section C

Figure 2-17. Map of land assessment - Section C

3 CONCLUSIONS & RECOMMENDATIONS

An assessment of the land suitability of NT Portion 7860 for the purposes of subdivision indicates that all land verified through a field visit (i.e. the assessment areas) has moderate constraints to development (S3), but due to the nature of these constraints, they are inherently manageable through additional engineering inputs.

The major constraints identified in the project area are slopes greater than 0.75% and sub-soil gravel content >50%, which are relevant to erosion and wastewater management risks. Rocky outcrops and shallow soils were also recorded in some areas, particularly within Section B. All constraints can be managed effectively through development of an ESCP (for erosion) and septic system design (for wastewater management). The gravel pit in Section A (~8 ha) will require remediation to address erosion, drainage and wastewater management constraints.

The desktop and field assessments confirmed that existing land unit mapping is generally accurate, although one boundary was amended. The ground-truthed land units have been mapped and provided a basis for the assessment of land suitability. A 25 m vegetation buffer has been placed around all drainage lines according to the *NT Land Clearing Guidelines* (DEPWS 2024). While care has been taken to accurately delineate these drainage lines accurately, minor differences between datasets creates a margin of error. It is recommended that they are confirmed during survey work, particularly during the wet season.

It is generally recommended that lot boundaries do not cross drainage areas or areas of steep slopes (>5%), as establishment of fence lines and fire breaks can cause disturbance and result in altered hydrology and risk of erosion. Fence lines should allow for water to pass through and should be constructed to avoid collecting and concentrating water flow.

Land clearing required for the subdivision, including housing allotments, should avoid the drainage areas and buffer zones as mapped in Figure 2-14 to Figure 2-17. Large trees should also be preserved wherever possible. Minimising unnecessary clearing will reduce environmental impacts of the subdivision and avoid erosion and sedimentation issues.

Weed management should be implemented in accordance with the Weeds Management Act and guidelines provided by the NT Weeds Branch (see WMB 2021). An online search of the NT weeds dataset (DEPWS 2018) found patches of three Class B weeds - Gamba Grass (*Andropogon gayanus*), Sicklepod (*Senna obtusifolia*) and Mission Grass (*Cenchrus* sp.) - recorded along Beasley Road. During the field visit, large infestations of Hyptis (*Mesosphaerum suaveolens*) were observed across the northern part of the project area, particularly within Section A. A small patch of Mission Grass (*Cenchrus sp*.) was recorded within land unit 2c and a patch of Rubber Bush (*Calotropis procera*) was recorded in land unit 3a.

Weed controls should be implemented prior to further development, and clearing minimised to avoid spread of existing weeds. Vehicle hygiene should be implemented during subdivision development (i.e. only bring clean vehicle onto site, avoid driving through weed infested areas, stick to marked tracks where possible), to avoid spreading existing weeds and introducing new species.

4 REFERENCES

Aldrick JM, and Robinson CS, 1970, *Report on the Land Units of the Katherine-Douglas Area, NT*, Land Conservation Section.

Brocklehurst, P, Lewis, D, Napier, D and Lynch, D 2007, *Northern Territory Guidelines and Field Methodology for Vegetation and Survey Mapping, Technical Report No. 02/2007D*, Department of Natural Resources, Environment and the Arts, Palmerston, Northern Territory.

Department of Lands Planning and the Environment (DLPE) 2015, *Northern Territory Planning Scheme*, Northern Territory Government Darwin.

Department of Environment, Parks, and Water Security (DEPWS) 2024. *Land Clearing Guidelines*. Darwin, Northern Territory.

NT Planning Commission 2014, *Katherine Land Use Plan*, Darwin, Australia

Northern Territory Government (2020) *Northern Territory Land Suitability Guidelines*. Darwin Australia.

The National Committee on Soil and Terrain (NCST) 2024, *Australian Soil and Land Survey Field Handbook,* CSIRO Publishing, Collingwood, Victoria.

Weed Management Branch (WMB) 2021, *Northern Territory Weed Management Handbook,* Northern Territory Government, Palmerston.

APPENDIX A SAMPLE SITES DETAILS

Section	Sample site ID	Coordinates (Y,X)	Number of samples collected	Methodology used	Comment
B	BSS01	-14.294175, 131.975583	No samples collected	Mechanical hand auger used; limited to 0.6 mbgl	Refusal at 0.15 mbgl
B	BSS02	-14.293227, 131.97412	No samples collected	Mechanical hand auger used; limited to 0.6 mbgl	Refusal at 0.30 mbgl
A	ASS03	-14.2941429, 131.9849754	2 (ASS03_0.0-0.3, ASS03_0.3-0.6)	Mechanical hand auger used; limited to 0.6 mbgl.	One sample per horizon collected
A	ASS04	-14.2945759, 131.9880484	2 (ASS04_0.0-0.3, ASS04_0.3-0.6)	Mechanical hand auger used; limited to 0.6 mbgl.	One sample per horizon collected
A	ASS05	-14.2949789, 131.9903804	3 (ASS05_0.0-0.3, ASS05_0.3-0.6, ASS05_0.6-1.0)	Motorised auger used; limited to 1.0 mbgl	One sample per horizon collected
A	ASS06	-14.2959889, 131.9941684	2 (ASS06_0.0-0.4, ASS06_0.4-0.9)	Motorised auger used; limited to 1.0 mbgl.	One sample per horizon collected
A	ASS07	-14.297234, 132.997434	2 (ASS07_0.0-0.15, ASS07_0.15-1.00)	Motorised auger used; limited to 1.0 mbgl.	One sample per horizon collected
A	ASS08	-14.2980769, 132.0005434	3 (ASS08_0.0-0.1, ASS05_0.1-0.4, ASS05_0.4-1.0)	Motorised auger used; limited to 1.0 mbgl.	One sample per horizon collected
A	ASS09	-14,296645, 132.003575	3 (ASS09_0.0-0.1, ASS09_0.1-0.4, ASS09_0.4-1.0)	Motorised auger used; limited to 1.0 mbgl.	One sample per horizon collected
A	ASS10	-14.295338, 132.006852	2 (ASS10_0.0-0.1, ASS09_0.1-0.5).	Motorised auger used; limited to 1.0 mbgl.	One sample per horizon collected
B	BSS12	-14.294025, 131.975466	No samples collected	Mechanical hand auger used; limited to 0.6 mbgl	Refusal at 0.40 mbgl
B	BSS13	-14.29321, 131.974081	No samples collected	Mechanical hand auger used; limited to 0.6 mbgl	Refusal at 0.40 mbgl
C	CSS14	-14.294424, 131.966924	1 (CSS14_0.0-0.7)	Motorised auger used; limited to 1.0 mbgl	One sample per horizon collected
C	CSS15	-14.294744, 131.965901	No samples collected	Motorised auger used; limited to 1.0 mbgl	Depth verification auger pit

APPENDIX B SURVEY SITE LAND, VEGETATION AND SOIL DESCRIPTIONS

Reference Site	BSS01	
Coordinates (Y,X)	-14.294175, 131.975583	
Vegetation Type	*A full site assessment was not undertaken*	
Corrected land unit	3a	
Ground cover	Vegetation Leaf litter Bare soil Rock Gravel	
Other site notes	Large flat area, with potential scalding because limited vegetation in ground, mid or upper layers. Rubber Bush patch present. Minimal rocky outcrops. Soil was very rocky and impenetrable with 18V mechanical auger.	

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: Height range: Average height:	Cover: Height range: Average height:	Cover: Height range: Average height:
Species		
Eucalyptus tectifica	*Hakea arborescens*	-
-	-	-
-	-	-

Soil			
Slope	1.5%		
Aspect	Southeast		
Drainage Potential	N/A		
Gravel cover	N/A		
Rock cover	N/A		

Gravel portion	N/A

Soil Profile				
Horizon	**Depth range (m)**	**Soil Description**	**Soil type**	**Comment**
B1	0-0.15	Sandy LOAM with gravel and cobble inclusions	Kandosol	Hard setting with crust on top, A horizon not present. No samples were collected

Reference Site	BSS02
Coordinates (Y,X)	-14.293227, 131.97412
Vegetation Type	*A full site assessment was not undertaken*
Corrected land unit	3a
Ground cover	Vegetation Leaf litter Bare soil Rock Gravel
Other site notes	Impenetrable layer of hard clay at 0.7m. *Hakea arborescens* dominant in the mid-layer.

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: Height range: Average height:	Cover: Height range: Average height:	Cover: Height range: Average height:
Species		
Eucalyptus tectifica	*Hakea arborescens*	-
-	-	-
-	-	-

Soil	
Slope	3.0%
Aspect	Southwest
Drainage Potential	N/A
Gravel cover	N/A
Rock cover	N/A

Gravel portion	Not recorded

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
B1	0-0.30	Sandy LOAM with gravel and cobble inclusions	Kandasol	Hard setting with crust on top, A horizon not present. No samples were collected

Reference Site	ASS03
Coordinates (Y,X)	-14.294143, 131.984975
Vegetation Type	*Corymbia foelscheana*, *Eucalyptus tectifica* mid high open woodland over *Petalostigma pubescens mid-layer* and *ground cover of Themeda triandra, Sehima nervosum and mixed Sorghum* spp.
Corrected land unit	3b
Ground cover	Vegetation 70% Leaf litter 15% Bare soil 10% Rock 0% Gravel 5%
Other site notes	Quarry located 50 m toward the south. Termite mounds and *Hyptis* sparse throughout

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 7% Height range: 5-8 m Average height: 6 m	Cover: 40% Height range: 1-5 m Average height: 3 m	Cover: 40%
Species		
Corymbia foelscheana (5%)	*Petalostigma pubescens (20%)*	*Themeda triandra (10%)*
Eucalyptus tectifica (2%)	*Terminalia ferdinandiana (5%)*	*Sehima nervosum (10%)*
-	*Acacia holosericea (5%)*	*Mixed sorghum (30%)*
-	*Terminalia pterocarya (10%)*	-

Soil	
Slope	1%
Aspect	North
Drainage Potential	Imperfectly drained
Gravel cover	5%

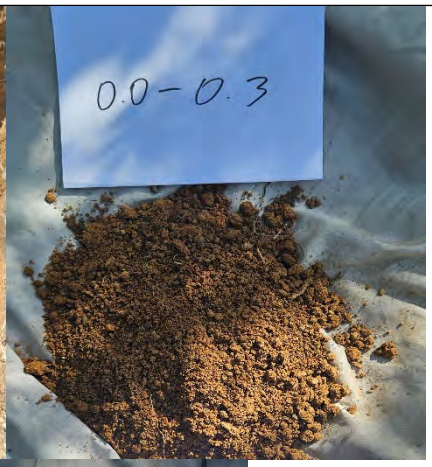
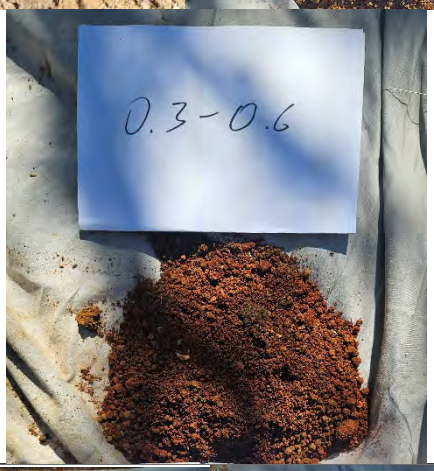
<table>
<tr><td>Rock cover</td><td>0%</td><td colspan="2">  </td></tr>
<tr><td colspan="2">Gravel portion</td><td> 
</td><td> 
</td></tr>
</table>

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00-0.30	Dark yellowish brown (10YR4/4) silty CLAY, coarse fragments 3 – 30 mm with an average size of 7 mm (90% abundance)	Kandasol	Imperfectly drained. Sample ASS03_0.00-0.30
B1	0.30–0.60	Reddish brown (5YR5/5), CLAY, coarse fragments 3 – 30 mm with an average size of 10 mm (95% abundance)	Kandasol	Imperfectly drained. Sample ASS03_0.30-0.60. Termination depth at 0.60 (mechanical limitation, hand auger)

Reference Site	ASS04
Coordinates	-14.294576, 131.988048
Vegetation Type	*Corymbia foelscheana*, mid high open woodland over *Terminalia pterocarya* with *Aristida* sp. dominated ground layer.
Corrected land unit	3b
Ground cover	Vegetation 40% Leaf litter 45% Bare soil 10% Rock 0% Gravel 5%
Other site notes	Termite mound and *Hyptis* sparse throughout

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 10% Height range: 8-10 m Average height: 9 m	Cover: 52% Height range: 2–7 m Average height: 4.5 m	Cover: 90%
Species		
Corymbia foelscheana (10%)	*Terminalia pterocarya (30%)*	*Aristida sp. (75%)*
-	*Hakea arborescens (5%)*	*Mixed sorghum (10%)*
-	*Petalostigma pubescens (10%)*	*Chrysopogon latifolius (5%)*
-	*Grevillea mimosoides (2%)*	-

Soil	
Slope	1-2%
Aspect	South
Drainage Potential	Well drained
Gravel cover	5%
Rock cover	0%

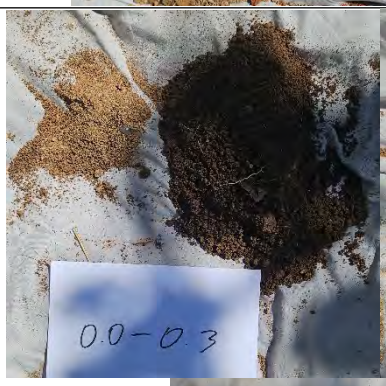
		  
Gravel portion		 

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00-0.30	Yellowish red (5YR4/6) clay LOAM, coarse fragments 5 mm (80% abundance)	Kandasol	Sample ASS04_0.00-0.30
B1	0.30–0.60	Dark red (10YR3/6), clay LOAM, coarse fragments 5 – 10 mm (80% abundance)	Kandasol	Sample ASS04_0.30-0.60. Termination depth at 0.60 (mechanical limitation, hand auger)

Reference Site	ASS05
Coordinates (Y,X)	-14.294979, 131.99038
Vegetation Type	*Corymbia foelscheana* mid high woodland with *Corymbia foelscheana* over a mid-layer of *Terminalia pterocarya* and *Aristida sp.* ground cover.
Corrected land unit	3c
Ground cover	Vegetation 30% Leaf litter 40% Bare soil 20% Rock 0% Gravel 10%
Other site notes	Hyptis (*Mesosphaerum suaveolens*) found throughout site. Termite mounds present.

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 20% Height range: 4 -8 m Average height: 6.5 m	Cover: 40% Height range: 2 - 6 Average height: 4 m	Cover: 10%
Species		
Eucalyptus tectifica (5%)	*Petalostigma pubescens (10%)*	*Aristida sp. (30%)*
Corymbia foelscheana (15%)	*Terminalia Ferdinandiana (5%)*	*Mixed sorghum (10%)*
-	*Terminalia pterocarya (20%)*	-
-	*E. chlorostachys (5%)*	-

Soil	
Slope	1-2%
Aspect	South
Drainage Potential	Well drained
Gravel cover	10%
Rock cover	0%

		
Gravel portion		  

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00-0.30	Brown (7.5YR4/3) clay LOAM, coarse fragments 3 – 5 mm (80% abundance)	Kandasol	Sample ASS05_0.00-0.30
B1	0.30–0.60	Dark red (25YR3/6) clay LOAM, brown and red mottled, coarse fragments 3 – 5 mm with clay inclusions (80% abundance)	Kandasol	Sample ASS05_0.30-0.60
B2	0.60–1.00	Dark red (10R3/6) sandy LOAM, coarse fragments 3 - 5 mm with clay inclusions (80% abundance)	Kandasol	Sample ASS05_0.60 – 1.00

Reference Site	ASS06
Coordinates	-14.295989, 131.994168
Vegetation Type	*Eucalyptus tectifica, Corymbia foelscheana* mid high woodland over *Terminalia ferdinandiana* with a ground layer of *Chrysopogon fallax*
Corrected land unit	3c
Ground cover	Vegetation 35% Leaf litter 50% Bare soil 10% Rock 0% Gravel 5%
Other site notes	Termite mounds, Hyptis (*Mesosphaerum suaveolens*), 3 small hollows visible in *E. tintinans*

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 35% Height range: 4 – 8 m Average height: 6.5 m	Cover: 37% Height range: 3 – 6 m Average height: 4.5 m	Cover: 80%
Species		
Eucalyptus tectifica (20%)	*Terminalia ferdinandiana (30%)*	*Chrysopogon fallax (50%)*
Corymbia foelscheana (20%)	*Cochlospermum fraseri (5%)*	-
E. tintinnans (5%)	*Hakea arborescens (2%)*	-

Soil	
Slope	1%
Aspect	Southwest
Drainage Potential	Well drained
Gravel cover	5%
Rock cover	0%

Gravel portion	

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00-0.10	Very dusky red (2.5YR2.5/2) clay LOAM, coarse fragment 3 – 4 mm with clay inclusions (90% abundance)	Kandasol	Sample ASS06_0.00-0.10
B1	0.10–0.40	Yellowish red (5YR4/6) clay LOAM, coarse fragments 3 – 4 mm with clay inclusions (95% abundance)	Kandasol	Sample ASS06_0.10-0.40
B2	0.40–0.60	Dark red (10YR3/6) clay LOAM, coarse fragments 4 mm with clay inclusions (90% abundance)	Kandasol	Sample ASS06_0.40 – 0.60

Reference Site	ASS07
Coordinates	-14.297234, 131.997434
Vegetation Type	*Eucalyptus tectifica* mid high woodland with *C. foelscheana* over *T. pterocarya* and *B. megaphyllus* with a *C. fallax* ground layer.
Corrected land unit	3c
Ground cover	Vegetation 45% Leaf litter 30% Bare soil 20% Rock 0% Gravel 5%
Other site notes	Few termite mounds, Hyptis weed present

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 25% Height range: 4 – 8 m Average height: 5.5 m	Cover: 20% Height range: 1 – 6 m Average height: 3 m	Cover: 65%
Species		
Corymbia foelscheana (5%)	*Terminalia pterocarya (5%)*	*Themeda triandra (10%)*
Eucalyptus tectifica (20%)	*Brachychiton megaphyllus (5%)*	*Themeda sp (5%)*
-	*C. foelscheana (5%)*	*Chrysopogon fallax (40%)*
-	*E. tetrodonta (5%)*	Mixed *Sorghum (10%)*

Soil	
Slope	1%
Aspect	Southwest
Drainage Potential	Well drained
Gravel cover	5%
Rock cover	0%

		
Gravel portion		 

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00-0.15	Dark reddish brown (2.5YR3/4) clay LOAM, coarse fragments 3 mm (90% abundance) with clay inclusions	Kandasol	Sample ASS07_0.00-0.15
B1	0.15–1.00	Dusky red (10YR3/4) clay LOAM, coarse fragments 3 - 5 mm (95% abundance) with clay inclusions	Kandasol	Sample ASS07_0.15-1.00

Reference Site	ASS08
Coordinates	-14.298077, 132.000543
Vegetation Type	*Eucalyptus tectifica* mid high woodland with *Corymbia foelscheana* and *Erythrophleum chlorostachys* mid storey over *Themeda triandra* and *Sehima nervosum* ground layer.
Corrected land unit	3d
Ground cover	Vegetation 65% Leaf litter 10% Bare soil 20% Rock 0% Gravel 5%
Other site notes	Hyptis (*Mesosphaerum suaveolens*) sparse throughout whole area, dense near Beasley Road, evidence of fire (fire scar 1m) approximately 1 year old

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 25% Height range: 6-10 m Average height: 8.5 m	Cover: 20% Height range: 2 - 6 Average height: 4	Cover: 60%
Species		
Eucalyptus tectifica (15%)	*Eucalyptus tectifica (15%)*	*Themeda triandra (10%)*
Corymbia foelscheana (10%)	*Ficus aculeata (5%)*	*Sehima nervosum (50%)*

Soil	
Slope	2-3
Aspect	South
Drainage Potential	Well drained
Gravel cover	5%
Rock cover	0%

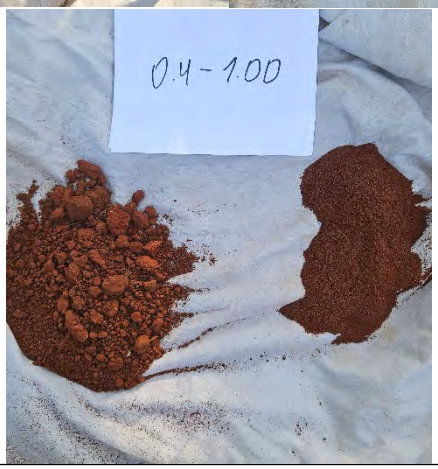
		
Gravel portion		  

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00-0.10	Dark reddish brown (5YR3/4) clay LOAM, coarse fragment 3 mm (90% abundance) with clay inclusions	Kandasol	Sample ASS08_0.0-0.10
B1	0.10–0.40	Dark reddish brown (2.5YR3/4) clay LOAM, coarse fragments 3 mm (90% abundance) with clay inclusions	Kandasol	Sample ASS08_0.10-0.40
B2	0.40–1.00	Dark red (2.5YR3/6) sandy clay LOAM, coarse fragments 3 – 5 mm (80% inclusions) with clay inclusions	Kandasol	Sample ASS08_0.40-1.00

Reference Site	ASS09
Coordinates	-14.296645, 132.003575
Vegetation Type	*Corymbia foelscheana* mid high open woodland with *Erythrophleum chlorostachys* over *E. chlorostachys with dense Hyptis grassland.*
Corrected land unit	3d
Ground cover	Vegetation 45% Leaf litter 45% Bare soil 15% Rock 0% Gravel 5%
Other site notes	Occasional termite mounds, Hyptis (*Mesosphaerum suaveolens*) dense throughout. Evidence of past fires (fire scars) approximately 2 years old.

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 35% Height range: 8 – 12 m Average height: 9.5 m	Cover: 40% Height range: 2 – 6 m Average height: 4 m	Cover: 90%
Species		
Eucalyptus tectifica (15%)	*Erythrophleum chlorostachys (30%)*	*Hyptis (90%)*
Corymbia foelscheana (20%)	*Cochlospermum fraseri (5%)*	-
-	*Brachychiton megaphyllus (2%)*	-
-	*Gardenia megasperma (5%)*	-

Soil	
Slope	1-2% ondulating
Aspect	Southeast
Drainage Potential	Well drained
Gravel cover	5%
Rock cover	0%

		
Gravel portion		  

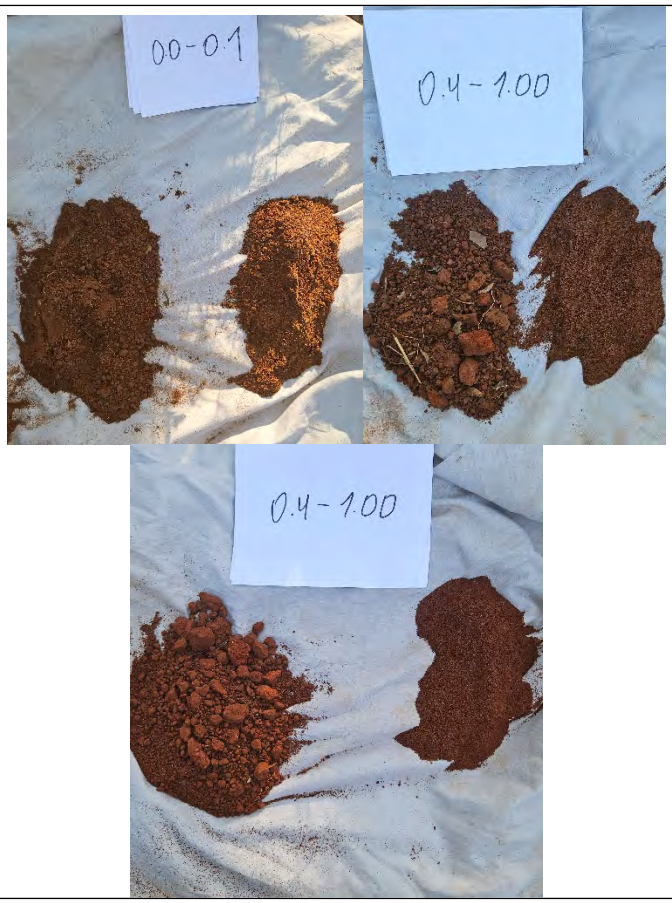
Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00 – 0.10	Yellowish red (5YR4/6/) clayey SAND, coarse fragments 5 mm (60% abundance)	Kandasol	Sample ASS09_0.0-0.10
B1	0.10 – 0.40	Red (2.5YR4/6) clayey SAND, coarse fragments 5-10 mm (50% abundance) with clay inclusions	Kandasol	Sample ASS09_0.10-0.40

B2	0.40 – 1.00	Dark red (2.5YR3/6) clayey SAND, coarse fragments 5-10 mm (60% abundance)	Kandasol	Sample ASS09_0.40-1.00

Reference Site	ASS10
Coordinates	-14.295338, 132.006852
Vegetation Type	*Eucalyptus tectifica* mid high open woodland over *Eucalyptus tectifica* and *Erythrophleum chlorostachys* mid high open shrubland over *Heteropogon contortus* tussock grassland
Corrected land unit	2c
Ground cover	Vegetation 95% Leaf litter 5% Bare soil 0% Rock 0% Gravel 0%
Other site notes	Dense *Hyptis* (*Mesosphaerum suaveolens*) throughout, small patch of Mission Grass – perennial (*Cenchrus polystachios*)

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 30% Height range: 6 – 10 m Average height: 8 m	Cover: 5% Height range: 2-4 m Average height: 3 m	Cover: 90% Height range: 0 – 1.5 m Average height: 0.7 m
Species		
Eucalyptus tectifica (20%)	*Erythrophleum chlorostachys (5%)*	Mixed Sorghum (90%)
Erythrophleum chlorostachys (10%)		

Soil	
Slope	2-3%
Aspect	Southeast
Drainage Potential	Well drained
Gravel cover	0%
Rock cover	0%

Gravel portion	

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00 – 0.10	Dark reddish brown (5YR3/3/) clayey SAND, coarse fragments 3 – 5 mm (50% abundance)	Rudosol	Sample ASS10_0.0-0.10
B1	0.10 – 0.50	Reddish brown (5YR 4/4) clayey SAND, coarse fragments 3-10 mm (60% abundance)	Rudosol	Sample ASS10_0.10-0.50
B2	0.50 – 1.00	Red (2.5YR4/6) clayey SAND, coarse fragments 5-10 mm (60% abundance) with clay inclusions	Rudosol	Sample ASS09_0.50-1.00

Reference Site	BSS12
Coordinates	-14.294025, 131.975466
Vegetation Type	*A full site assessment was not undertaken*
Corrected land unit	3a
Ground cover	Vegetation Leaf litter Bare soil Rock Gravel
Other site notes	Site at same location as BSS1

Vegetation		
Upper Stratum **% cover -** 35 **Height range (m) –** 7-14 **Average height (m) -** 10	**Mid Stratum** **% cover -** 5 **Height range (m) –** 0.5-7 **Average height (m) -** 3	**Ground Stratum** **% cover -** 20 **Height range (m) –** 0-0.5 **Average height (m) –** 0.2
-	-	-
-	-	-
-	-	-

Soil	
Slope	3%*
Aspect	Southeast
Drainage Potential	N/A
Gravel cover	N/A
Rock cover	N/A

		
Gravel portion*		Not recorded

*Estimated with aerial imagery

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0-0.4	Silty CLAY	Kandasol	Hard setting with crust on top, A horizon not present. No samples were collected

Reference Site	BSS13
Coordinates	-14.293227, 131.97412
Vegetation Type	*A full site assessment was not undertaken*
Corrected land unit	3a
Ground cover	Vegetation Leaf litter Bare soil Rock Gravel
Other site notes	Site at same location as BSS2

Vegetation		
Upper Stratum **% cover -** 30 **Height range (m) –** 12-18 **Average height (m) -** 16	**Mid Stratum** **% cover -** 10 **Height range (m) –** 1-7 **Average height (m) -** 3	**Ground Stratum** **% cover -** 60 **Height range (m) –** 0-1 **Average height (m) –** 0.8
-	-	-
-	-	-
-	-	-

Soil	
Slope	1.5%*
Aspect	Southwest
Drainage Potential	N/A
Gravel cover	N/A
Rock cover	N/A

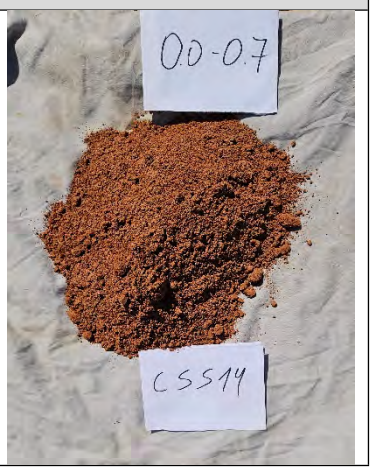
Gravel portion	Not recorded

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0-0.40	Silty clay LOAM	Kandasol	Hard setting with crust on top, A horizon not present. No samples were collected

Reference Site	CSS14
Coordinates	-14.294423, 131.966924
Vegetation Type	*Eucalyptus tectifica* low open woodland over *Hakea arborescens* and *Erythrophleum chlorostachys* with a *Melhania oblongifolia* and mixed *Sorghum* ground layer.
Corrected land unit	3a
Ground cover	Vegetation 15% Leaf litter 30% Bare soil 15% Rock 10% Gravel 30%
Other site notes	No weeds or fire scars observed

Vegetation		
Upper Stratum	**Mid Stratum**	**Ground Stratum**
Cover: 12% Height range: 6- 10 m Average height: 7 m	Cover: 34% Height range: 2 - 6 m Average height: 5 m	Cover: 20%
Species		
Eucalyptus tectifica (5%)	*Hakea arborescens (20%)*	*Melhania oblongifolia (10%)*
Corymbia foelscheana (5%)	*Ficus aculeata (2%)*	*Mixed sorghum (10%)*
Eucalyptus confertiflora (2%)	*Cochlospermum fraseri (5%)*	-
-	*Vachellia pachyphloia (2%)*	-
-	*Erythrophleum chlorostachys (5%)*	-

Soil	
Slope	0.5 – 1.5%
Aspect	South
Drainage Potential	Moderately well drained
Gravel cover	30
Rock cover	10



Gravel portion	

Soil Profile				
Horizon	**Depth range (m)**	**Soil description**	**Soil type**	**Comments**
A1	0.00 – 0.70	Red (2.5YR4/8) silty CLAY, coarse fragments 5-13 mm (60% abundance)	Kandasol	Top layer with cobbles and some rocks found while digging. Sample CSS14_0.0-0.7

APPENDIX C SOIL SALINITY RESULTS

Sample Site ID*	Laboratory result (EC 1:5)	Electrical conductivity of the saturation extract (ECe)	Salinity classification
Zone A			
ASS03_0.0-0.3	22 µS/cm	0.13 – 0.22 dS/m	Non-saline
ASS03_0.3-0.6	5 µS/cm	0.03 – 0.05 dS/m	Non-saline
ASS04_0.0-0.3	5 µS/cm	0.03 – 0.05 dS/m	Non-saline
ASS04_0.3-0.6	7 µS/cm	0.04 – 0.07 dS/m	Non-saline
ASS05_0.0-0.3	5 µS/cm	0.03 – 0.05 dS/m	Non-saline
ASS05_0.3-0.6	8 µS/cm	0.04 – 0.08 dS/m	Non-saline
ASS06_0.0-0.1	7 µS/cm	0.04 – 0.07 dS/m	Non-saline
ASS06_0.1-0.4	5 µS/cm	0.03 – 0.05 dS/m	Non-saline
ASS06_0.4-0.9	6 µS/cm	0.03 – 0.06 dS/m	Non-saline
ASS07_0.0-0.15	14 µS/cm	0.08 – 0.14 dS/m	Non-saline
ASS07_0.15-1.0	15 µS/cm	0.09 – 0.15 dS/m	Non-saline
ASS08_0.0-0.1	8 µS/cm	0.04 – 0.08 dS/m	Non-saline
ASS08_0.1-0.4	12 µS/cm	0.07 – 0.12 dS/m	Non-saline
ASS08_0.4-1.0	11 µS/cm	0.06 – 0.11 dS/m	Non-saline
ASS09_0.0-0.1	7 µS/cm	0.04 – 0.07 dS/m	Non-saline
ASS09_0.1_0.4	8 µS/cm	0.04 – 0.08 dS/m	Non-saline
ASS09_0.4-1.0	13 µS/cm	0.07 – 0.13 dS/m	Non-saline
ASS10_0.0-0.1	9 µS/cm	0.05 – 0.09 dS/m	Non-saline
ASS10_0.1-0.5	5 µS/cm	0.03 – 0.05 dS/m	Non-saline
Zone C			
CSS14_0.0-0.7	65 µS/cm	0.39 – 0.65 dS/m	Non-saline

APPENDIX D DRAINAGE CLASSIFICATION ASSESSMENT

Sample ID	Land unit	Soil depth (depth of excavation)*	Soil texture	Clay content	Landscape position	Drainage classification
ASS03	3b	0.6 mbgl	Silty CLAY	40-60%	Mid-slope	Imperfectly drained
ASS04	3b	0.6 mbgl	Clay LOAM	30-40%	Mid-slope	Well drained
ASS05	3c	1.0 mbgl	Clay LOAM, sandy LOAM with clay inclusions	20-50%	Mid-slope	Well drained
ASS06	3c	0.6 mbgl	Clay LOAM with clay inclusions	30-50%	Mid-slope	Well drained
ASS07	3c	1.0 mbgl	Clay LOAM with clay inclusions	30-50%	Mid-slope	Well drained
ASS08	3d	1.0 mbgl	Clay LOAM, sandy clay LOAM with clay inclusions	20-50%	Mid-slope	Well drained
ASS09	3d	1.0 mbgl	Loamy SAND with clay inclusions	0-20%	Mid-slope	Well drained
ASS10	2c	1.0 mbgl	Loamy SAND with clay inclusions	0-20%	Mid-slope	Well drained
CSS14	3a	0.7 mbgl	Silty CLAY	40-60%	Mid-slope	Moderately well drained

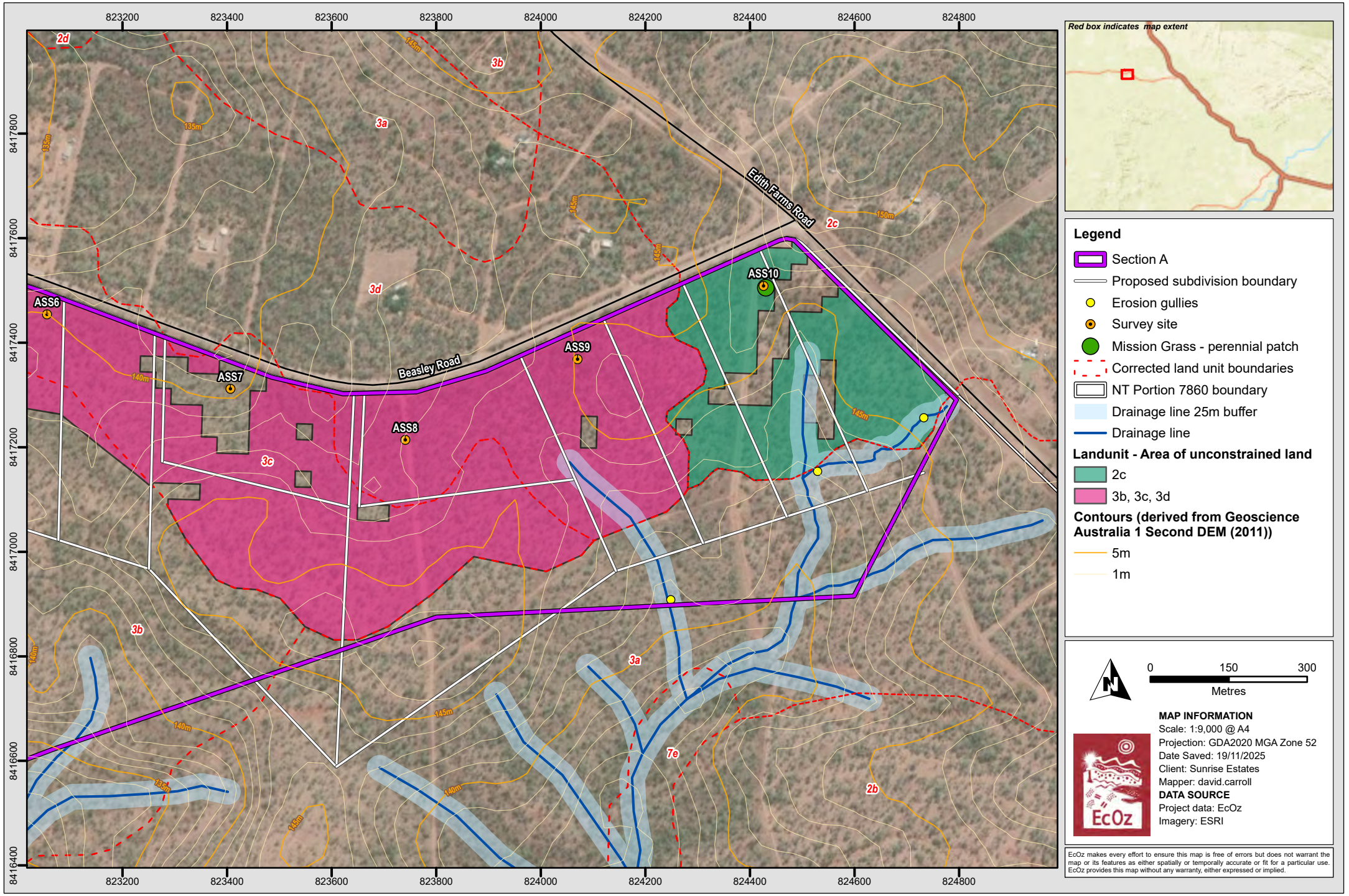
** none of the abovementioned sites were drilled to refusal*

APPENDIX E ON-SITE WASTEWATER MANAGEMENT

Sample ID	Slopes	Drainage	Clay content	Soil depth	Rock exposure	Sub-soil gravel content	Risk category
Section A							
ASS03	1%	Imperfectly drained	40-60%	0.6 mbgl	0%	90-95%	High
ASS04	1.5%	Well drained	30-40%	0.6 mbgl	0%	80%	Medium
ASS05	1.5%	Well drained	20-50%	1.0 mbgl	0%	80%	Low
ASS06	1%	Well drained	30-50%	0.6 mbgl	0%	90-95%	Medium
ASS07	1%	Well drained	30-50%	1.0 mbgl	0%	90-95%	Low
ASS08	2.5%	Well drained	20-50%	1.0 mbgl	0%	80-90%	Low
ASS09	1.5%	Well drained	0-20%	1.0 mbgl	0%	50-60%	Medium
ASS10	2.5%	Well drained	0-20%	1.0 mbgl	0%	50-60%	Medium
Section B							
BSS01	1.5%*	Well drained	-	0.15 mbgl	-	-	High
BSS02	2.5%*	Well drained	-	0.30 mbgl	-	-	High
BSS12	1.5%*	Well drained	-	0.40 mbgl	-	-	High
BSS13	2.5%*	Well drained	-	0.40 mbgl	-	-	High
Section C							
CSS14	1%	Moderately well drained	40-60%	0.7 mbgl	10%	60%	Medium
CSS15	*1.5**	*Moderately well drained*	-	*0.6 mbgl*	-	-	*N/A*

**Estimated with aerial imagery.*

APPENDIX F SUBDIVISION LAYOUT



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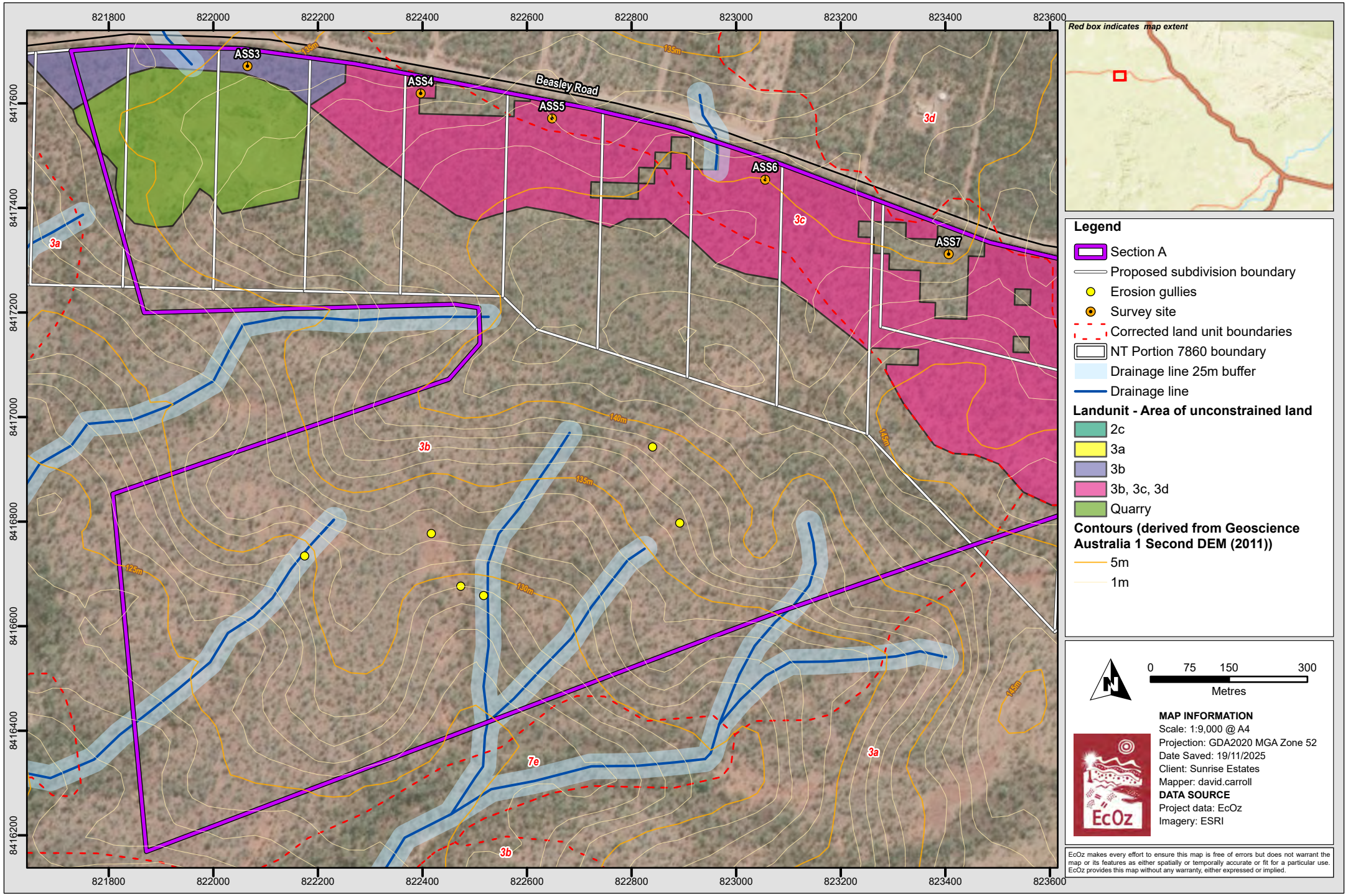
Layout: Map of suitable and constrained land in Section A - east

Map of suitable and constrained land in Section A - east



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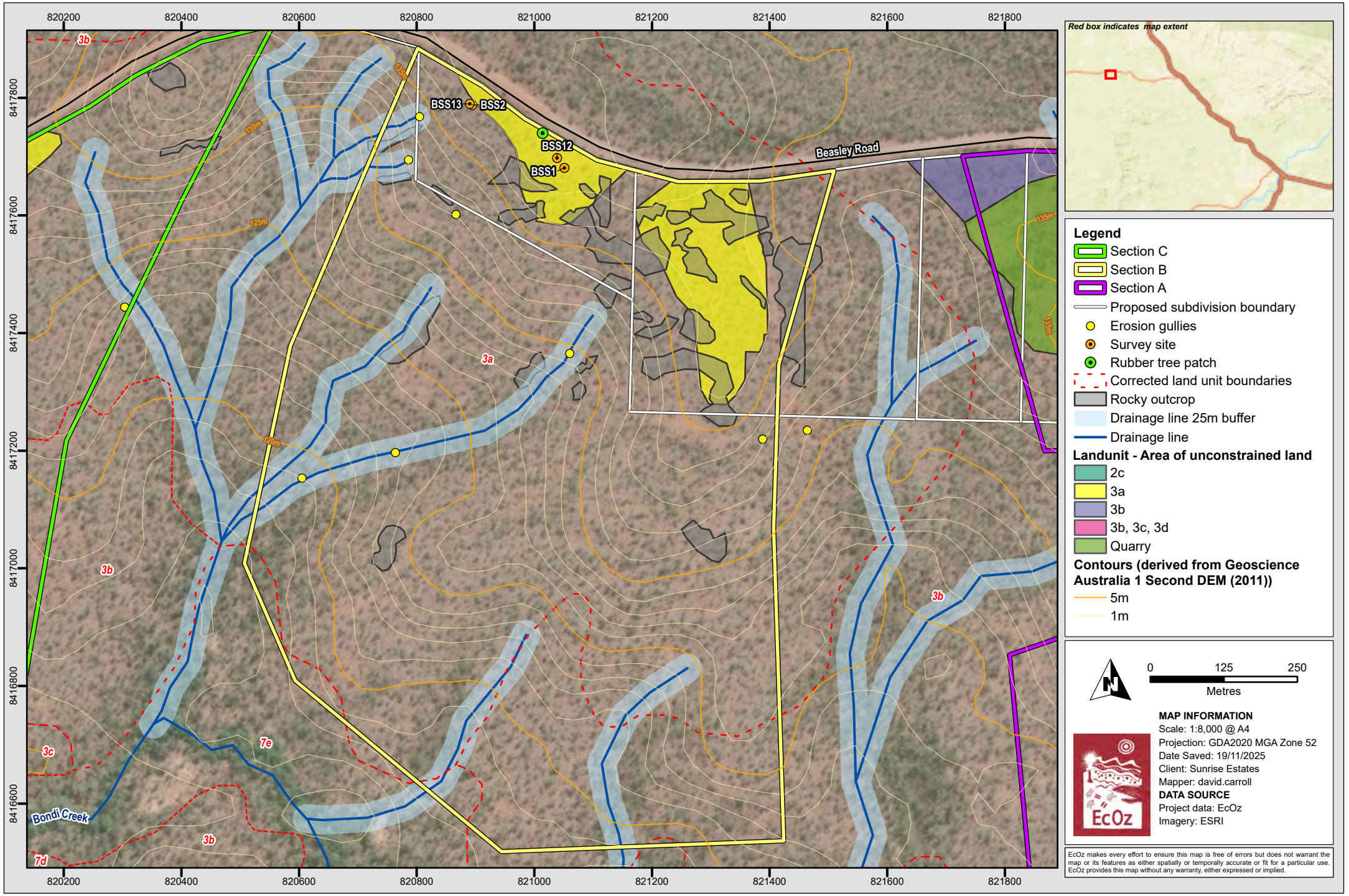
Layout: Map of suitable and constrained land in Section A - west

Map of suitable and constrained land in Section A - west



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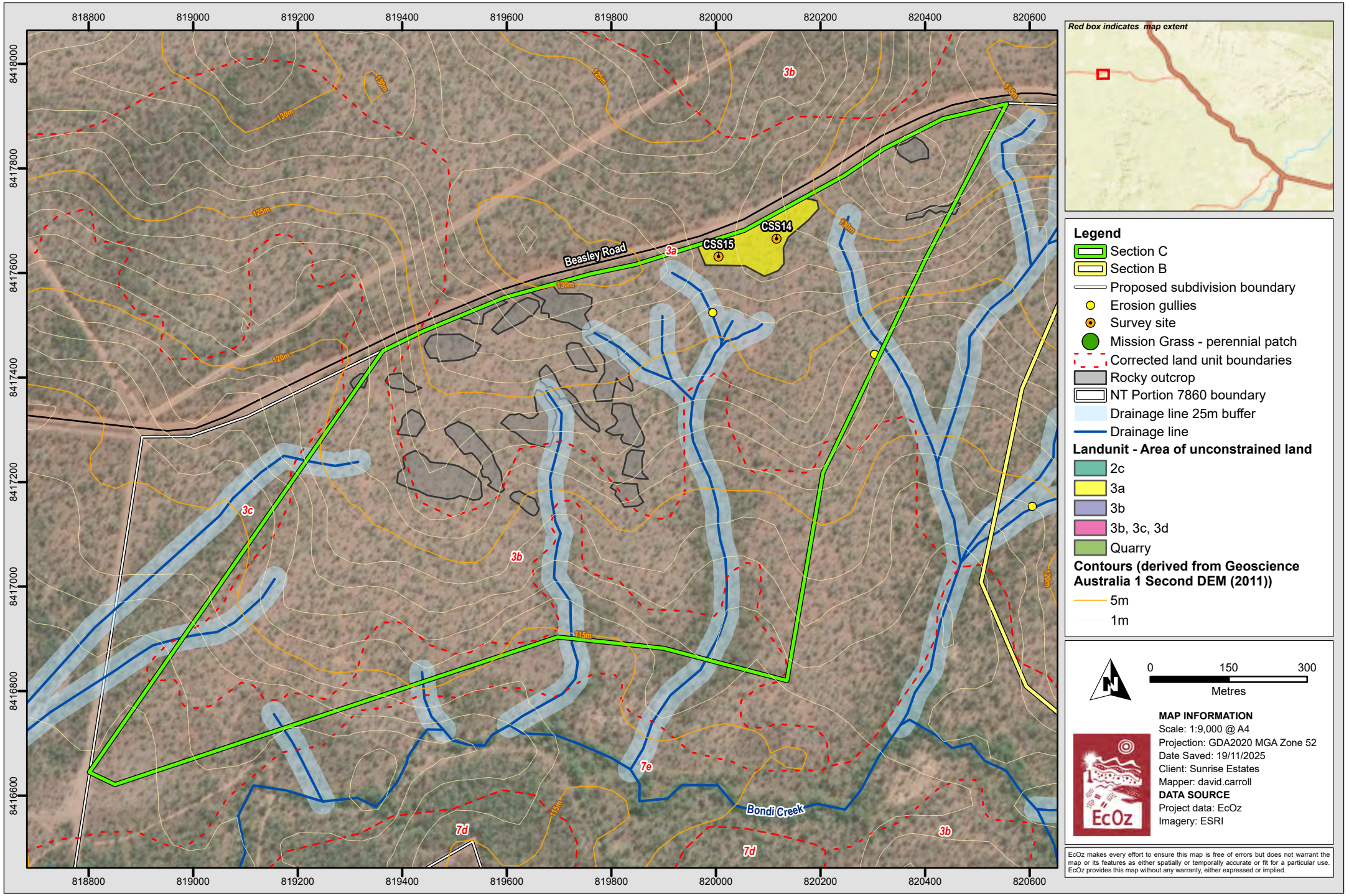
Layout: Map of suitable and constrained land in Section B

Map of suitable and constrained land in Section B



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Layout: Map of suitable and constrained land in Section C

Map of suitable and constrained land in Section C

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RELIANCE, USES and LIMITATIONS

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Appendices

APPENDIX A SURVEY SITE LAND, VEGETATION AND SOIL DESCRIPTIONS

1 INTRODUCTION

This report outlines the findings of an investigation into the land suitability of 745 Edith Farms Road (NT Portion 6777), 'the property' for the purposes of subdividing seventeen 8 ha lots. The remaining portion (3388 ha) of the property is proposed to continue under pastoral production. The existing lot is approximately 3524 ha in size and is accessed via Edith Farms Road, located 40km north of Katherine, along the Stuart Highway (Figure 1).

An assessment of the suitability of the property for subdivision is required under Clause 11.4 (Subdivision of Rural and Unzoned Land) of the *Northern Territory Planning Scheme*. A land suitability assessment (LSA) involves both desktop and field based assessment of the property and determination of the potential constraints relevant to subdivision.

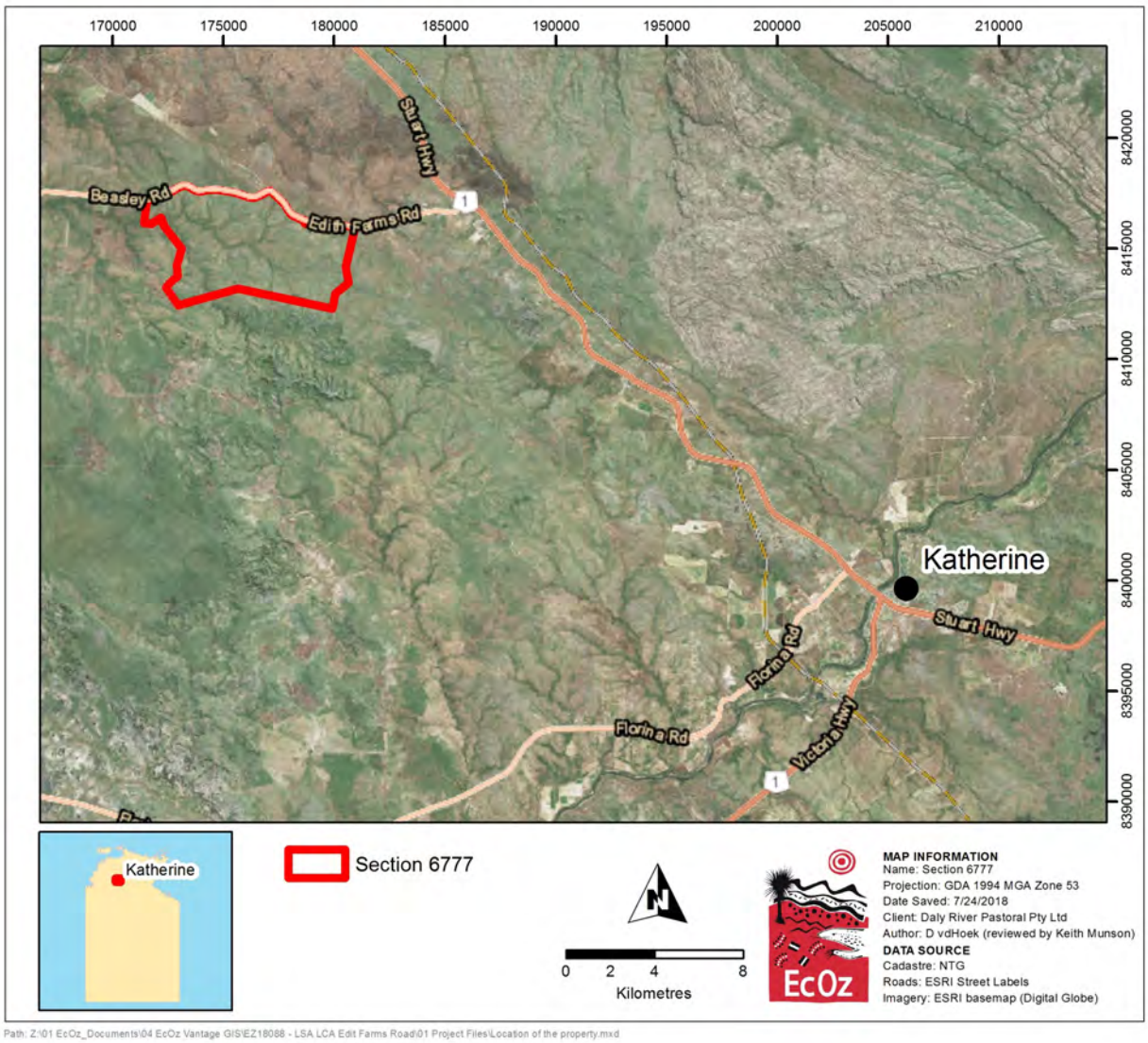


Figure 1. Location of the Property

1.1 Development details

The property is currently leased for pastoral production and unzoned. The proposed subdivision seeks to subdivide seventeen 8 ha blocks, with all blocks fronting onto and accessed via Edith Farms Road. The remaining lot is proposed to continue under pastoral production and is here in referred to as the ('remaining pastoral lot'). The Northern Territory Planning Scheme allows the subdivision of unzoned land with a minimum lot size of 8 ha, of which a minimum of 1ha must be found suitable for development.

Surrounding land use consists mainly of pastoral production. The adjacent land on the northern side of Edith Farms Road has been subdivided into large rural blocks, suitable for small scale cattle production. The local NT Volunteer Bushfire Brigade compound is located on the southern side of Edith Farms Road and has been previously subdivided from NT Portion 6777 ('the property'). The proposed subdivision lots are located either side of the NT Volunteer Bushfire Brigade compound, with eight lots located on the western side and nine lots on the eastern side. The 'remaining pastoral lot' also divides the two sets of lots and supports existing infrastructure including a dwelling, cattle yards and a dam. The 'remaining pastoral lot' fronts onto Edith Farms Road and is adjacent to a stock route on the northern side of the road, allowing the movement of cattle between Section 7344 and Section 6777 (Figure 2).

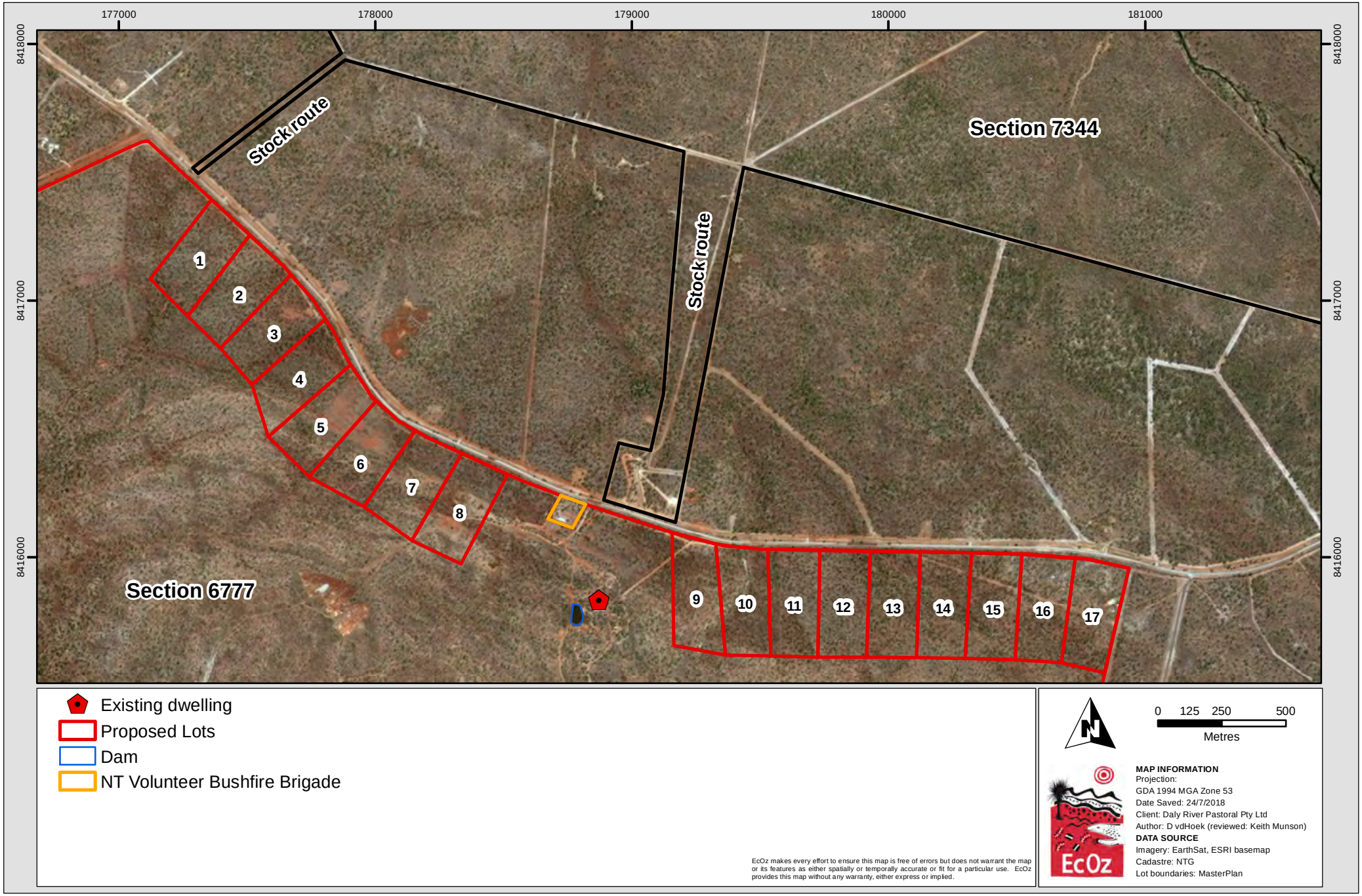


Figure 2. Map of proposed lots and existing infrastructure within the subdivision area

2 LAND SUITABILITY ASSESSMENT

A Land Suitability Assessment (LSA) requires assessment of the environmental conditions of the property in order to give the site an overall ranking for suitability of rezoning and development (see Table 1)

Table 1. Adapted land suitability classes based on FAO (DLPE 2013)

Suitability Classes	Description
Class S1 Highly suitable	Land having no significant limitations to sustained application for a given land use or only minor limitations. Nil to minor negative economic, environmental, health and/or social outcomes.
Class S2 Moderately suitable	Land having limitations which in aggregate are moderately severe for sustained application of a given land use. Appreciable inferior to S1 land. Potential negative economic, environmental health and/or social outcomes if not adequately managed.
Class S3 Marginally suitable	Land having limitations which in aggregate are severe for sustained application of a given use. Moderate to high risk of negative economic, environmental, health and/or social outcomes if not adequately managed.
Class S4 Not suitable	Land having limitations which may be insurmountable. Limitations are so severe as to preclude successful to sustained use of the land. Very high risk of negative economic, environmental and/or social outcomes if not managed.
Class S5 Not suitable	Land having limitations which appear so severe as to preclude any possibilities of successful sustained use of the land in the given matter. Almost certain risk of significant negative economic, environmental and/or social outcomes.

The assessment of the property involved a desktop review, which included a search of zoning, land units, areas of environmental significance and threatened flora and fauna. A site inspection was undertaken to ground truth the findings of the desktop review and identify any further environmental parameters that are relevant to the proposed subdivision.

2.1 Desktop review

The desktop review utilised aerial photography and online land information databases to identify potential environmental constraints. Google Earth imagery was used to assess current land use and the extent of development within the property and surrounding area.

The online government resource 'NR Maps', and associated metadata, was used to access the following:

- Cadastral boundaries
- 1:50,000 land units of the Katherine-Douglas Area
- Location of sites of conservation significance

An assessment of environmental constraints identified through analysis of data listed above was undertaken in accordance with requirements of relevant Northern Territory Government documents including:

- *NT Planning Scheme*
- *NT Land Suitability Guidelines 2013*
- *Katherine Land Use Plan 2014*

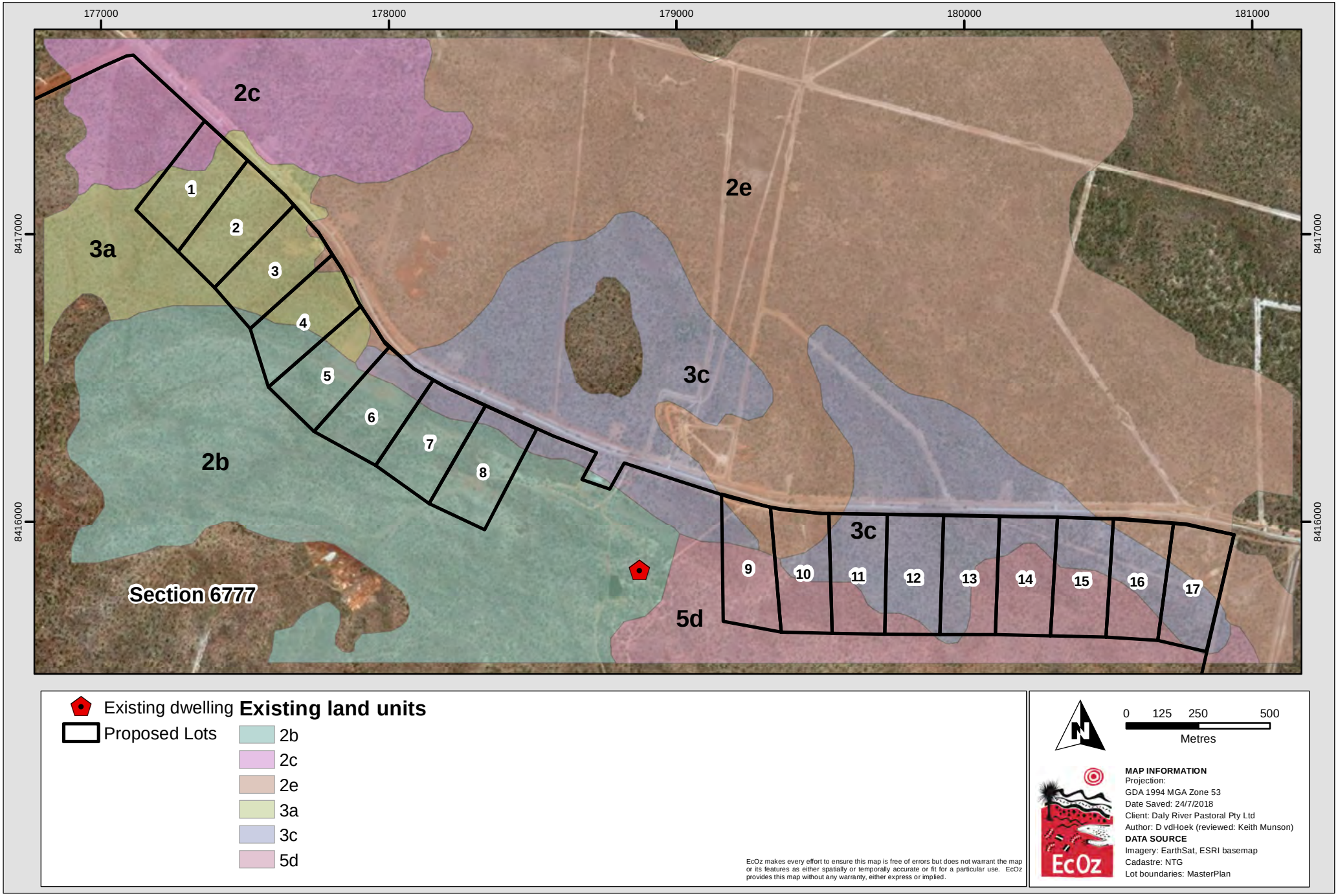
2.1.1 Existing land unit descriptions

Six land units, as mapped by Aldrick and Robinson (1970) occur along the northern edge of the property, proposed for subdivision (see Table 2). Land units range from plateau side slope to low hills in land units 2b, 2c and 2e, through to gently sloping plains in land units 3a, 3c, and 5d. Side slopes and hills (2b, 2c and 2e) may be constrained due to slopes greater than 10% and rock outcropping may also be present. Severe limestone outcropping is also present in land unit 3a. Soils are well drained on hills (2b, 2c and 2e) and through much of the plains (3a and 3c). Soils are imperfectly drained in land unit 5d. Areas of imperfectly drained soils are indicated by the presence of *Grevillea heliosperma* and *Petalostigma pubescens*.

Existing land units show that proposed lots 1 to 4 are within land unit 3a and likely to contain limestone outcropping. Land unit 2b (plateau side slopes) occur along the southern portion of lots 4 to 8. Gently sloping plains (3c) are present along the northern edge of lots 5 to 16 and the southern portion of lot 17. Impeded drainage within land unit 5d occurs in the southern portion of lots 9 to 16 (see Figure 3).

Table 2. Description of the existing land units within the area of subdivision (Aldrick & Robinson 1970)

Land unit	Land form description	Vegetation description	Drainage	Soil	Limitations
2b	Side slopes to Plateaux – Rugged terrain; slopes 15 – 40%; rocky crests and boulder strewn slopes	*Eucalyptus dichromophloia;* Low open woodland to mid-high open woodland (*Eucalyptus umbrawarrensis* and Lancewood in lower rainfall areas) with Spinifex and annual Sorghum grass layer	Well drained soils; very rapid run-off	Rudosols	Shallow rocky soils; usually inaccessible
2c	Hills – Hilly terrain; slopes 5 – 15%; rocky and boulder strewn	*Eucalyptus dichromophloia* low open woodland to mid-high open woodland *(Eucalyptus umbrawarrensis* and Lancewood in lower rainfall areas) with Spinifex and annual *Sorghum* grass layer	Well drained soils; very rapid run-off	Rudosols	Shallow rocky soils; very erodible
2e	Low hills - Gently undulating crests and upper slopes to 5%; frequent outcrop of sandstone or laterite	Low woodland or tall shrubland on shallow gravelly soils and open forest on rocky sandy soils with mainly Spinifex and annual Sorghum grass layer	Well drained soils; rapid run-off	Tenosols	Shallow rocky soils; erodible
3a	Plains - Gentle slopes or undulating and dissected terrain; slopes to 2%; severe limestone and sandstone pavement and outcrop	*Eucalyptus tectifica* and *Eucalyptus foelscheana;* Low woodland; frequently well developed understorey of *Hakea arborescens* and *Cochlospermum fraseri* and mixed annual Sorghum and perennial grass layer	Well drained soils; moderately rapid run-off	Kandosols	Severe rock outcrop; shallow soils; steeper slopes are highly erodible if cleared; severely restricted accessibility
3c	Plains - Flat to gently sloping; slopes less than 2%; scattered limestone pavement or outcrop; indistinct drainage floors	*Eucalyptus foelscheana* low woodland with few shrubs and mainly perennial *Sehima* tall grass layer	Well drained soils; slow run-off	Kandosols	Minor rock; sometimes shallow soils; erodible on slopes over 1% if cleared
5d	Plains - Undulating terrain; slopes generally less than 3%	Open woodland with a wide range of species with a scattered shrub layer of *Grevillia heliosperma* and *Petalostigma* and predominately annual *Sorghum* grass layer	Imperfectly drained soils; slow to moderately rapid run-off	Kandosols	Impeded drainage; Un-trafficable in the wet season; very erodible if disturbed



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ18088 - LSA LCA Edit Farms Road\01 Project Files\Figure 3. Map of existing land units.mxd

Figure 3. Map of existing land units

2.1.2 Riverine flood mapping

The property is not located nearby to any riverine flood areas. The nearest major drainage system to the subdivision is Bondi Creek located approximate 1 km to the south and flowing a distance of approximately 14km into the Fergusson River. Granite Creek is located 1.5 km to the east of the proposed subdivision and flow a distance of approximately 14 km into the Edith River.

2.1.3 Acid sulphate soils

Acid sulphate soils are restricted to marine coastal areas. As the Property is located in the Katherine region, approximately 300km from the NT coastline, acid sulphate soils do not occur.

2.1.4 Areas of conservation significance

No Sites of Conservation Significance (SOCS) are mapped as occurring on the property. The closest recorded SOCS is the Yinberry Hills located approximately 2 km to the north of the proposed subdivision area. It is highly unlikely that the proposed subdivision will result in impacts to the Yinberry Hills SOCS.

2.1.5 Potential threatened species

A search of the Property and surrounds within the NT and Commonwealth threatened species databases and the NRM infonet database does not record the presence of any threatened species within the property. A number of threatened species have been recorded in the Katherine region. Targeted surveys for threatened species and associated habitat have not been undertaken. Assuming lots are used for the establishment of houses and associated rural land use and that lots remain largely vegetated, the proposed subdivision is not expected to a have a significant impact on threatened species.

2.2 Field assessment

A field assessment of the Property was undertaken by two EcOz Environmental consultants from the 4th to the 6th of July 2018, to ground truth the land units and investigate the suitability of land for subdivision. The property was traversed with the use of an All-Terrain Vehicle and on foot.

The entire site was surveyed with reference to the existing land unit descriptions to determine appropriate on-ground location of land unit boundaries. Corrected land unit boundaries were then recorded using a hand held GPS unit for later upload to an ArcGIS mapping program. At total of 10 survey sites (SS1 – SS8, VS9 and SS10) where located across the Property to assess the accuracy of existing land unit descriptions within each corrected land unit area. Vegetation structure and flora species composition of the three dominant species within each stratum (NVIS level V), were recorded within a 20 m x 20 m quadrat at each site, according to methods outlined in the NT Guidelines and field Methodology for vegetation Survey and Mapping (Brocklehurst, et.al 2007). Landform, slope and soil characteristics where recorded according to methods and descriptions outlined in the Australian Soil and Land Survey Field Handbook (NCST 2009). Additional detailed soil data was also collected at SS1 – SS8 and SS10, to determine the developmental suitability of these areas and ground truth the accuracy of existing land unit descriptions (Figure 4 and Figure 5). Weeds, erosion and threatened species were recorded as observations, but targeted surveys were not undertaken for these aspects of the Property. Environmental attributes recorded at each site are presented in Appendix A.

2.2.1 Ground truthed land units

The field assessment has identified that four of the current land unit types attributed to the property are correct. Survey sites have been located within each land unit area to determine the accuracy of land unit descriptions. Survey sites and the corresponding corrected land units attributed to the Property include:

- Land unit 2b: Survey site SS10
- Land unit 2e: Survey sites SS1 and SS5
- Land unit 3c: Survey sites SS2, SS3, SS4, SS6, SS7 and SS8
- Land unit 3a: Survey site VS9

It was also found that the current 1:50,000 scale land unit boundaries were incorrect in a number of places across the property. Corrected land unit boundary lines surveyed on ground, have been used to update the land unit boundaries shown in Figure 4 and Figure 5. Corrections to land unit boundaries have reclassified land units 5d – imperfectly drained soils, to land unit 3c – well drained soils. This decision was made based on a lack of vegetation species which indicates soils and drainage characteristic of 5d. Areas mapped as 5d were broadly indistinguishable from areas of 3c and were therefore combined. Changes to land unit boundaries also reclassified the northern edge of land unit 3a – severe limestone pavement, to land unit 3c. This is in response to the northern edge of land unit 3a being found to contain deep soils and free of areas of limestone pavement (lots 1 – 4). This area was found to be broadly indistinguishable from 3c and was therefore mapped as an extension of the area of 3c located to the east (lots 5 – 8).

2.2.2 Soil assessment

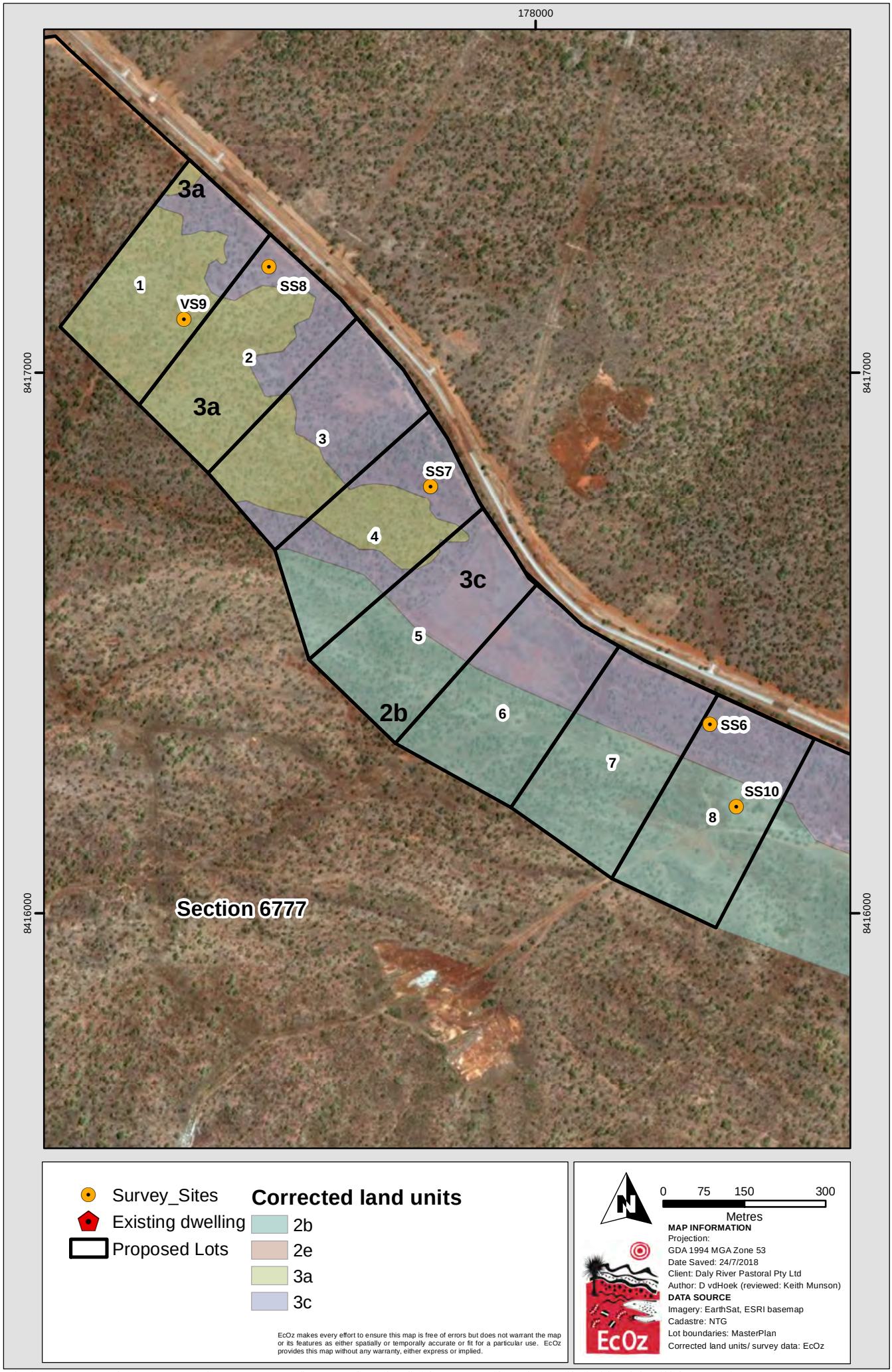
Soils were assessed onsite through the excavation of soil test pits to a depth of 1.5 m or refusal, using a motorised auger. Soils were described based on surface characteristics (i.e. presence of surface gravels/rock outcrops or inundation), and subsurface soil horizons (coarse fragments, moisture content, texture, colour, presence of mottling and depth). This information, in combination with vegetation indicators, provides insight into soil drainage and absorption capacity (see Appendix A).

Soil test pits were dug at sites SS1, SS2, SS3, SS4, SS5, SS6, SS7, SS8 and SS10. A test pit was not dug at site VS9 as this site was located within land unit 3a and heavily constrained with limestone pavement. Two soil samples were taken within corrected land unit 2e (SS1 and SS5). Site SS1 recorded a gravelly sand with a high portion of course fragments (55%) in the top A1 horizon (0-50 mm) and grading into a sandy clay in the B (25% course fragments) and C horizons (45% course fragments). Soil recorded at SS5 was sandy clay loam in the A1 horizon with minimal course fragments (5%). The course fragments increased in the sandy clay B horizon (20%) and gravelly sand C horizon (30%). The majority of soil samples were taken within corrected land unit 3c (SS2, SS3, SS4, SS6, SS7 and SS8). These soil samples were all very similar, containing minimal course fragments in the subsurface horizons (<25%). A number of soil samples within 3c had a high gravel portion (>25%) in the A1 horizon. Soil textures ranged from silty or sandy clay loam in the A, B and C horizons. One soil test pit was dug within corrected land unit 2b and recorded a gravelly sand with 55% course fragments in the A1 horizon, grading to sandy clay in B1 (55% course fragments) and the B2 horizon (45% course fragments). All soils found within the three corrected land unit areas were found suitable for development and are considered well drained and suited to the disposal of onsite wastewater.

2.2.3 Rock outcrops and sinkholes

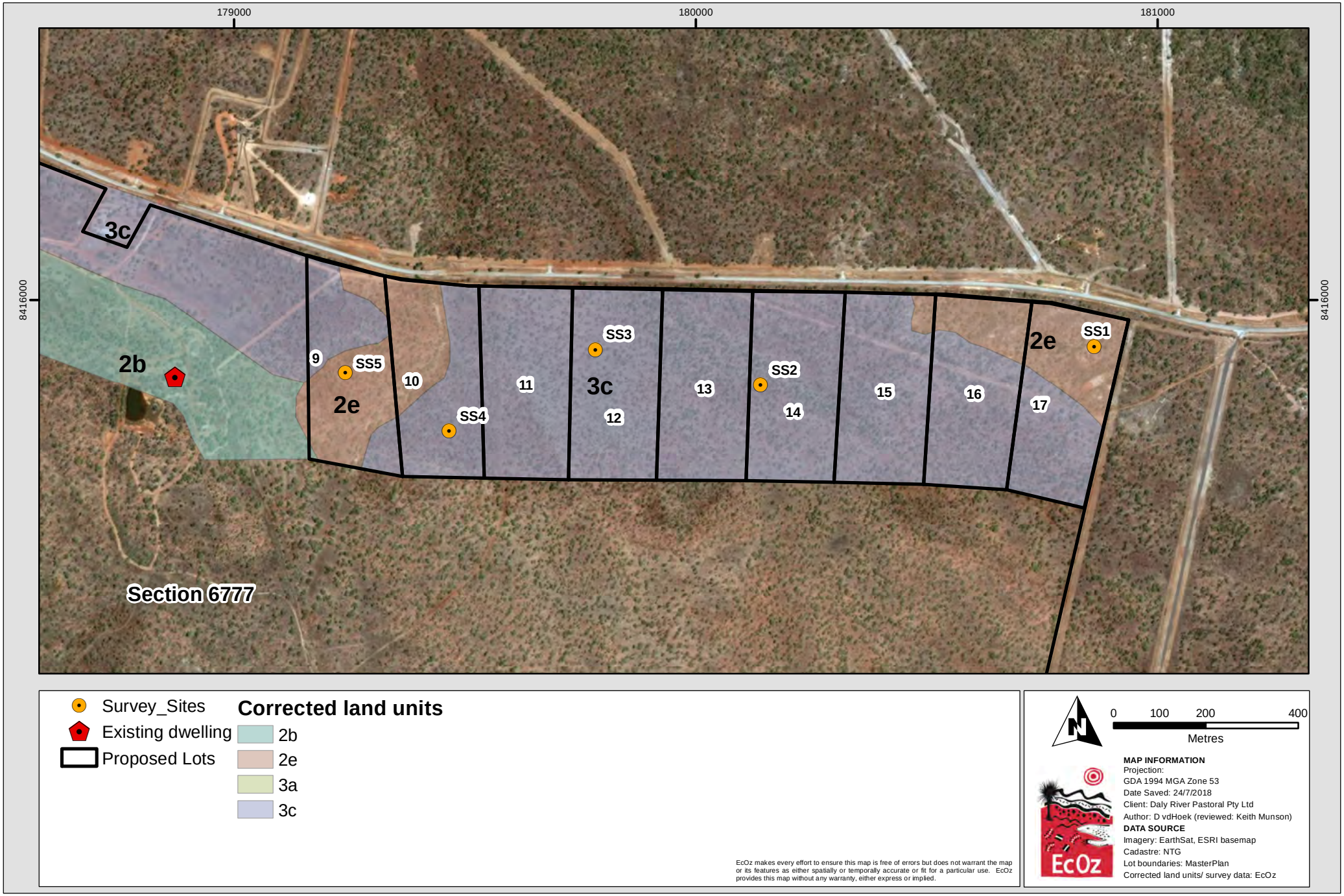
Areas of limestone pavement were identified and the boundaries mapped within corrected land unit area 3a. Vegetation (*Hakea arborescens*) was used to indicate areas of shallow soils overtopping limestone and these areas were also mapped as limestone (see Figure 6).

Sandstone and laterite outcropping were identified and the boundaries mapped within corrected land unit area 2e within lots 15, 16 and 17 (see Figure 7).



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ18088 - LSA LCA Edit Farms Road\01 Project Files\Figure 4. Survey sites and corrected land unit boundaries within lots 1 - 8.mxd

Figure 4. Survey sites and corrected land unit boundaries within lots 1 - 8



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ18088 - LSA LCA Edit Farms Road\01 Project Files\Figure 5. Survey sites and corrected land unit boundaries within lots 9 - 17.mxd

Figure 5. Survey sites and corrected land unit boundaries within lots 9 - 17

2.3 Potential land constraints

The site assessment and review of land unit information indicates that the most significant potential land constraints for subdivision are severe limestone pavement in land unit 3a, rock outcrops in land unit 2e and slopes greater than 10% in land unit 2b. A number of ephemeral drainage lines are also located within the proposed subdivision area. A 25 m wide vegetation buffer has been applied to drainage lines as required by the Land Clearing Guidelines (NRESTAS 2010). Areas of rock outcrop, steep slopes and drainage line buffers are not suitable for development and are considered constrained areas (see Figure 6 and Figure 7).

2.4 Suitability class

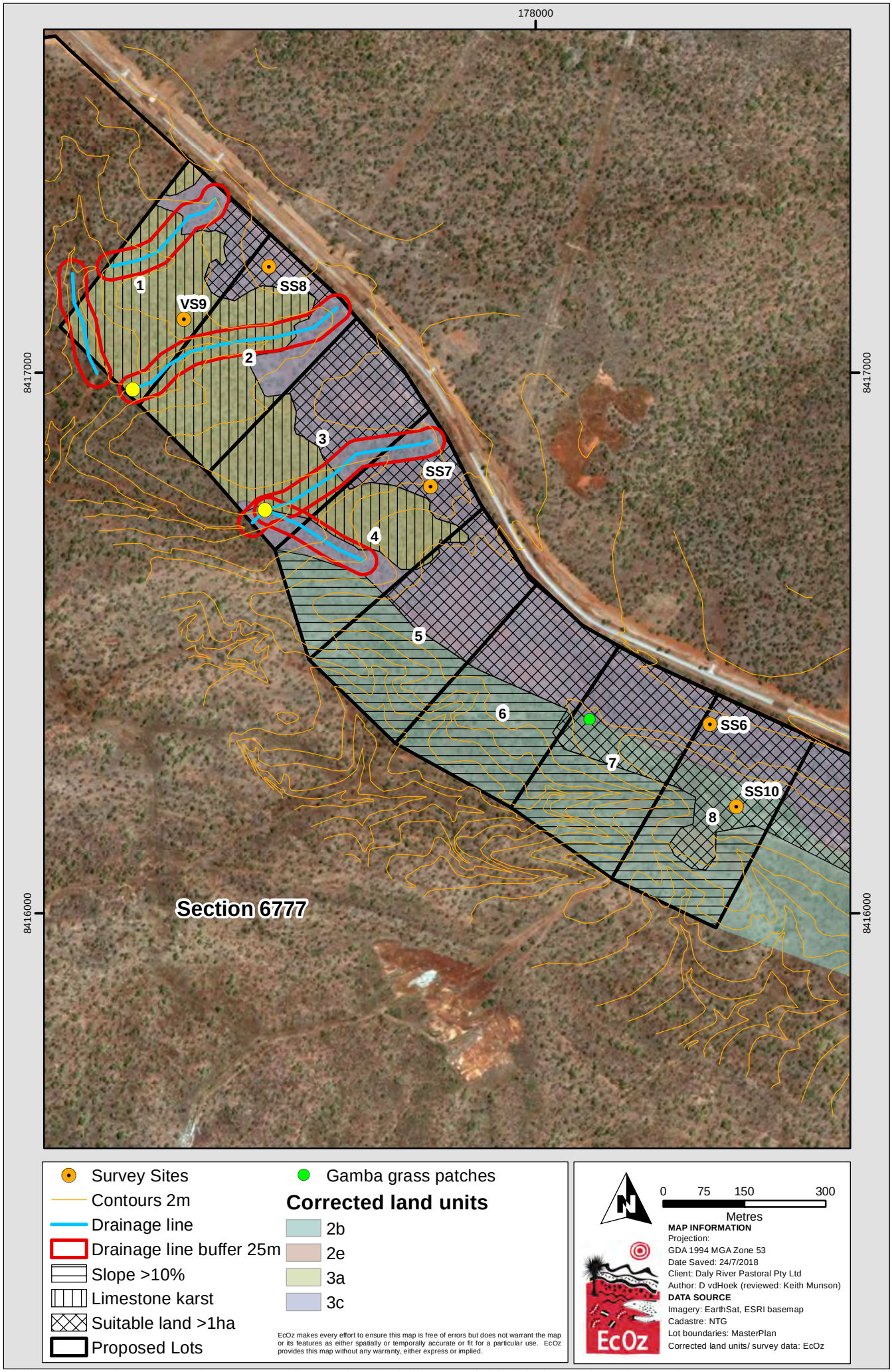
Based on the findings of both the desktop review and site investigation, potential constraints have been assessed in accordance with the LSA Guidelines (Table 3). The main potential limiting factors within Section 6777 are related to rock outcrops, steep slopes and ephemeral drainage lines. As such these align closely with area considered constrained or unconstrained. The area of unconstrained suitable land has been calculated for each proposed lot, based on the ground-truthed land units to ensure that at least 1 ha of unconstrained land is available (Table 4). Maps outlining areas with greater than 1 ha of continuous land, suitable for development are shown in Figure 6 and Figure 7.

Table 3. Land suitability classes

Land Suitability Category	Constrained Land Definition	Property Assessment	Suitability Class
Drainage	Areas that are wet or saturated either at, above or close to the land surface for a period of weeks to months (per year) as a result of rainfall, landscape function and/or position or soil hydrology factors.	Land units 2b, 2e, 3c and 3a Well drained – vegetation and soils indicate no sign of waterlogging or drainage issues	S2
On-site Wastewater Management	Soils that have one or more of: • Slopes greater than 10% • Imperfectly to very poorly drained • Contain minimal clay (20%) at depth • Shallow soils (<0.5m) • Extensive exposed rock (>10%) • Greater than 25% gravel	Land unit 3c	S1
		Land unit 2b and 2e Greater than 25% coarse fragments (excluding areas of rock outcrop and slopes >10%)	S2
		Land unit 3a Extensive limestone outcrop and shallow soils	S3
Erosion Risk	Soil landscapes that have a moderate to very high erosion risk	Land units 2b, 2e, 3a and 3c are prone to erosion if disturbed. Erosion observed in 3a. erosion and sediment controls may be required	S2
Soil Salinity	Soil salinity >4dS/m ECe	Soil tested and not found to be saline	S1
Acid Sulphate Soils	Soils with greater than 0.02% oxidisable sulphur is present	No acid sulphate soil risk exists at the site (outside of marine risk area)	S1
Storm Tide Flooding	Coastal areas below Primary Storm Tide inundation extent	Outside of coastal area so no risk of storm surge	S1
Riverine Flooding	Land below the 1% AEP flood level	Outside of riverine flood level	S1

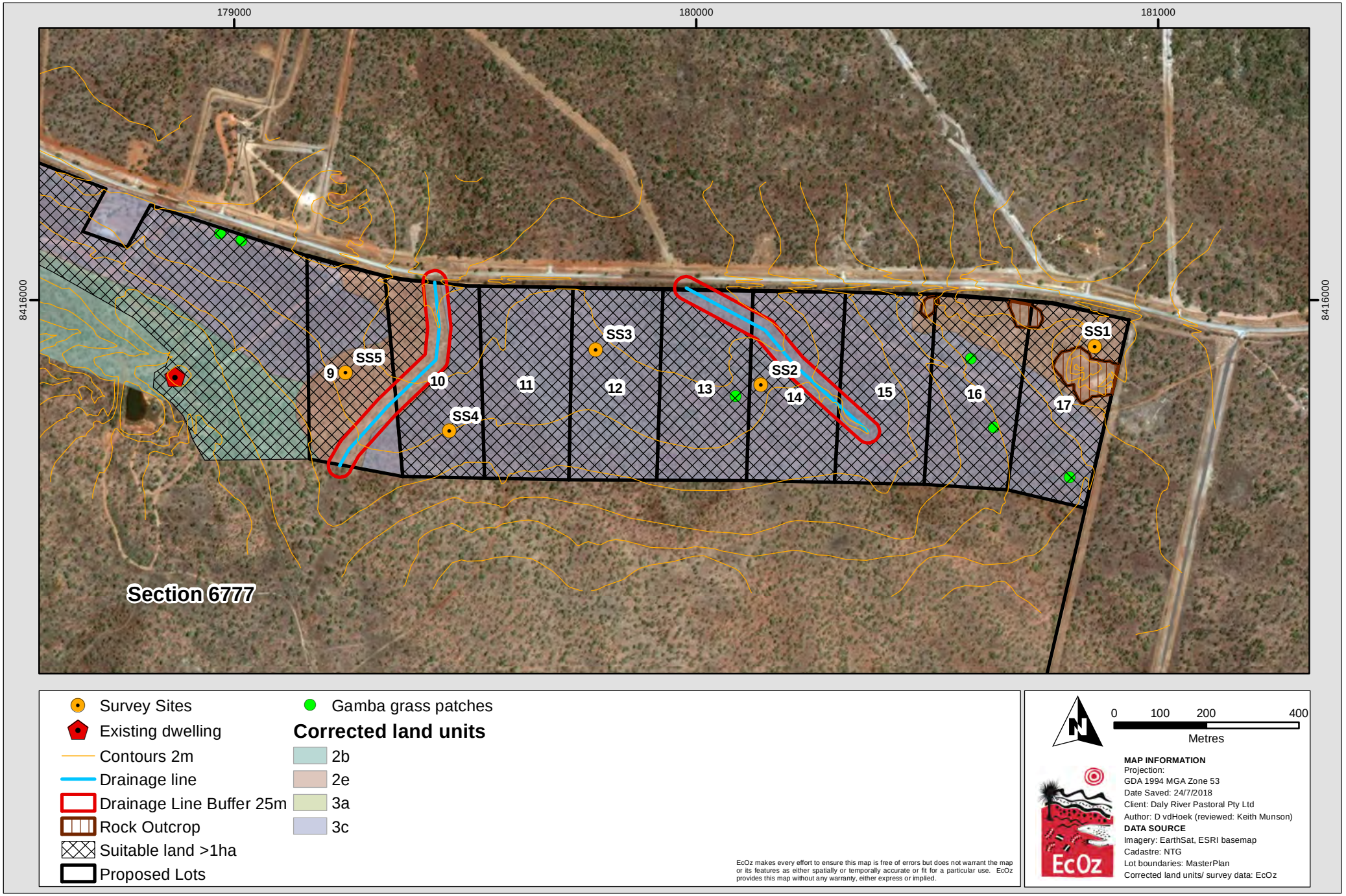
Table 4. Area of unconstrained land per lot

Lot	Total Area (ha)	Suitable land (ha) (>1 ha continuous)	Constrained Area (ha)
1	8	1.04	6.96
2	8	1.08	6.92
3	8	3.81	4.19
4	8	1.62	6.38
5	8	3.98	4.02
6	8	3.45	4.55
7	8	4.22	3.78
8	8	4.68	3.32
9	8	6.31	1.69
10	8	6.54	1.46
11	8	8	0
12	8	8	0
13	8	7.08	0.92
14	8	4.27	3.73
15	8	7.39	0.61
16	8	7.75	0.25
17	8	6.89	1.11



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ18088 - LSA LCA Edit Farms Road\01 Project Files\Figure 6. Map of suitable land and constrained areas in lots 1 - 8.mxd

Figure 6. Map of suitable land and constrained areas in lots 1 - 8



Path: Z:\01 EcOz_Documents\04 EcOz Vantage GIS\EZ18088 - LSA LCA Edit Farms Road\01 Project Files\Figure 7. Map of suitable land and constrained areas in lots 9 - 17.mxd

Figure 7. Map of suitable land and constrained areas in lots 9 - 17

3 CONTROL PROVISONS

In order to minimise the environmental impacts resulting from the subdivision of Section 6777, the following control provisions are recommended.

3.1 Drainage systems

A number of landscape drainage systems have been identified within the Property, including drainage lines in land unit 2e, 3a and land unit 3c. Any land clearing on the Property should be undertaken with adequate management measures, such as erosion and sediment controls, in order to minimise potential erosion and sediment transfer. A minimum 25 m vegetation buffer as required in the Land Clearing Guidelines (NRESTAS 2010) and section 10.2 of the NT Planning Scheme, should be adhered to in order to minimise potential impacts on drainage lines in the Property. Any fence lines established through the drainage lines should aim to minimise disturbance and avoid impeding water flow paths. Fire breaks should be maintained in a manner that minimises disturbance to vegetation and groundcover (see Section 3.6).

3.2 Land use

The proposed lots are being developed primarily for rural development. Given that the lots are only 8ha in size, it is recommended that no more than 1 ha of land is cleared to establish a rural dwelling and associated infrastructure. Under section 10.2.5 of the NT Planning Scheme the clearing of more than 1 ha of unzoned land requires consent.

3.3 Wastewater management

The proposed lots will require the disposal of onsite wastewater. Septic systems have potential to contaminate groundwater and surface water if not appropriately sited and maintained. Setback requirements from buildings, water courses, lot boundaries, bores etc. apply to wastewater management systems in accordance with the *NT Code of Practice for Small Onsite Sewage and Sullage Treatment Systems* (Territory Health Services, 1996). All onsite wastewater management systems must be located on areas found suitable for development (see Figure 6 and Figure 7).

A Land Capability Assessment (LCA) has been undertaken for the proposed subdivision and provides further details on the design requirements for the soil type and site conditions found to be suitable within each lot.

3.4 Erosion

The establishment of lot boundaries, fire breaks and fence lines should avoid creating concentrated flow which could result in erosion. Slashing of fire breaks along boundary fence lines will maintain ground cover and minimise erosion potential. A number of land units have been identified as having highly erodible soils if cleared of native vegetation, including land units 2e, 3a, 3c. Two erosion gullies were observed in areas of limestone outcropping in land unit 3a (see Figure 6). A number of land clearing operational techniques are outlined within the NT Land Clearing Guidelines (NRETAS 2010), to minimise the risk of soil erosion, including, timing of clearing operations, minimising soil disturbance and the management of post clearing debris. The clearing of land on steep slopes may require additional erosion and sediment control measures which are most accurately determined with the development of a site specific Erosion and Sediment Control Plan (ESCP).

3.5 Weed management

Isolated patches of Gamba grass, a highly invasive Class B weed (growth and spread to be controlled), were observed during the field assessment. The location of Gamba grass patches were recorded and are mapped in Figure 6 and Figure 7. The NT *Weeds Management Act* requires landholders to control weeds on their property. It is recommended that targeted weed management be undertaken throughout the property, with care taken to maintain a grass cover to reduce the risk of erosion along drainage lines. Care should also be taken during land clearing for the development of the proposed subdivision, to prevent the spread of weeds throughout the Property. Advice on weed management is available in the NT Weed Management Handbook and individual weed management plans, all available from http://www.lrm.nt.gov.au/weeds (WMB 2014).

3.6 Fire management

The NT Planning scheme requires a fire break up to 5 m wide along the boundary of a lot having an area 8ha or less. The NT *Bushfires Act* also requires a continuous 4 m wide firebreaks around all external lot boundaries, although they can deviate around wet or rocky areas and large trees. Firebreaks are required to be either graded or slashed to a maximum height of 50 mm, with all slashed material removed. In order to reduce impacts on drainage areas and minimise erosion risk, it is recommended that lot boundaries are slashed (rather than graded) to prevent erosion within the development and significant trees are avoided.

4 CONCLUSIONS & RECOMMENDATIONS

An assessment of the land suitability of Section 6777 for the purposes of subdivision indicates that there is sufficient suitable area to accommodate the proposed subdivision design. The 17 proposed lots have been located and each has at least 1 ha of unconstrained land (well-drained, free of rock outcropping and <10% slope), as required under the NT Planning Scheme. Sufficient land was also found suitable within the remaining pastoral lot.

The desktop and field assessments confirmed that existing land unit mapping is generally accurate, although some boundaries were amended. The ground-truthed land units have been mapped and provided a basis for the assessment of land suitability. Constrained/unconstrained land was also calculated based on the updated maps and areas that contain rock outcropping or support slopes greater than 10% have been considered constrained, due to limitations for onsite wastewater management. A 25 m vegetation buffer has been placed around drainage lines and these areas are also considered constrained to development.

It is generally recommended that lot boundaries do not cross drainage areas or areas of steep slope (>10%), as establishment of fence lines and fire breaks can cause disturbance and result in altered hydrology and risk of erosion. The proposed boundaries of lots 1, 2, 3, 4, 9, 10, 13, 14 and 15 cross areas mapped as drainage lines. It is recommended that the boundaries within these drainage areas are not cleared, but rather slashed, to avoid disturbing the ground surface and minimising erosion. Fence lines should allow for water to pass through and should be constructed to avoid collecting and concentrating water flow. Proposed boundaries are also located on areas of steep land (>10% slope) in lots 5, 6, 7, and 8. It is also recommended that these boundaries also be slashed to minimise any soil disturbance and concentration of surface flows. An erosion and sediment control plan may be required to provide further guidance on this.

Land clearing required for the subdivision, including housing allotments, should avoid the drainage areas and buffer zones as mapped in Figure 6 and Figure 7. Large trees should also be preserved wherever possible. Minimising unnecessary clearing will reduce environmental impacts of the subdivision and avoid erosion and sedimentation issues.

Weed management should be implemented in accordance with the *Weeds Management Act* and guidelines provided by the NT Weeds Branch (see WMB 2014). Some isolated patches of Gamba grass (Class B) were identified on the property during the site inspection. Weed controls should be implemented prior to further development, and clearing minimised to avoid spread of existing weeds. Vehicle hygiene should be implemented during subdivision development (i.e. only bring clean vehicle onto site, avoid driving through weed infested areas, stick to marked tracks where possible), to avoid spreading existing weeds and introducing new species.

5 REFERENCES

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APPENDIX A SURVEY SITE LAND, VEGETATION AND SOIL DESCRIPTIONS

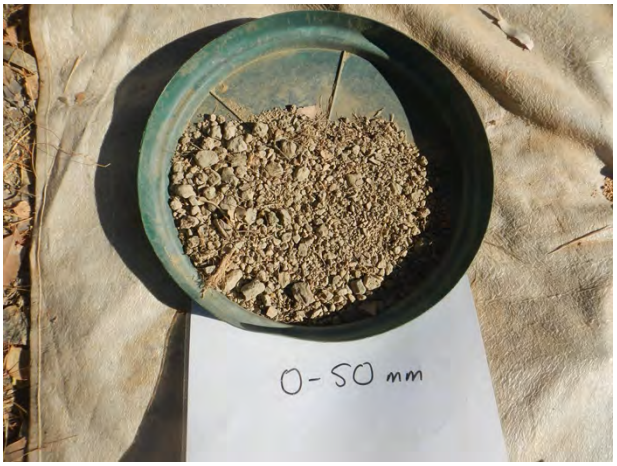
Reference Site	**SS1**
Vegetation Type	*Corymbia foelscheana*, *Eucalyptus tectifica* mid high open woodland over *Erythrophleum chlorostachys* and *Croton arnhemicus* mid high sparse shrubland over *Eriachne sp.* open tussock grassland
Corrected land unit	**2e**
Ground cover	Vegetation 20% Leaf litter 20% Bare soil 5% Rock 0% Gravel 55%
Other site notes	

GDA 1994 MGA Zone 53
180862E, 8415899N

Vegetation		
Upper Stratum **% cover -** 35 **Height range (m) –** 7-14 **Average height (m) -** 10	**Mid Stratum** **% cover -** 5 **Height range (m) –** 0.5-7 **Average height (m) -** 3	**Ground Stratum** **% cover -** 20 **Height range (m) –** 0-0.5 **Average height (m) –** 0.2
Corymbia foelscheana	*Erythrophleum chlorostachys*	*Eriachne sp.*
Eucalyptus tectifica	*Croton arnhemicus*	*Schizachyrium fragile*
Erythrophleum chlorostachys	-	*Petalostigma quadriloculare*

Soil	
Slope (%)	2
Aspect	North-North-West
Drainage Potential	Moderately well drained
Gravel cover (%)	55
Rock cover (%)	0

Soil profile

Gravel portion	  

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.5	10YR 4/2 Dark greyish brown	Gravelly sand	No	3-40mm 55% Mode = 3mm	Tenosols
B2	0.05-0.7	7.5YR 5/6 Strong brown	Sandy clay	Yes	3-40mm 25% Mode = 3mm	Tenosols
C	0.7-1.0	7.5YR 6/4 Light brown	Sandy clay	No	3-40mm 45% Mode = 3mm	Tenosols

Reference Site	**SS2**
Vegetation Type	*Eucalyptus tectifica* and *Eucalyptus bigalerita* mid high woodland over *Corymbia foelscheana* and *Eucalyptus tectifica* mid high open shrubland over *Heteropogon contortus* tussock grassland
Corrected land unit	**3c**
Ground cover	Vegetation 50% Leaf litter 40% Bare soil 10% Rock 0% Gravel 0%
Other site notes	Alluvial flat

GDA 1994 MGA Zone 53
180140E, 8415816N

Vegetation		
Upper Stratum **% cover -** 25 **Height range (m) –** 10-14 **Average height (m) -** 12	**Mid Stratum** **% cover -** 12 **Height range (m) –** 1-7 **Average height (m) -** 4	**Ground Stratum** **% cover -** 50 **Height range (m) –** 0-1 **Average height (m) –** 0.5
Eucalyptus tectifica	*Corymbia foelscheana*	*Heteropogon contortus*
Eucalyptus bigalerita	*Eucalyptus tectifica*	*Themeda triandra*
Corymbia foelscheana	-	-

Soil	
Slope (%)	1
Aspect	North
Drainage Potential	Rapidly drained
Gravel cover (%)	0
Rock cover (%)	0

Soil profile

Gravel portion	  

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.1	7.5YR 3/4 Dark brown	Sandy clay loam	No	3-5mm 5% Mode = 3mm	kandosol
B1	0.01-0.35	5YR 3/4 Dark reddish brown	Silty clay loam	No	3-30mm 10% Mode = 3mm	kandosol
B2	0.35-1.0	2.5YR 3/6 Dark red	Sandy clay	No	3-10mm 10% Mode = 3mm	kandosol

Reference Site	**SS3**
Vegetation Type	*Eucalyptus tectifica* mid high open woodland over *Eucalyptus tectifica* and *Corymbia foelscheana* mid high sparse shrubland over *Chrysopogon fallax* tussock grassland
Corrected land unit	**3c**
Ground cover	Vegetation 70% Leaf litter 20% Bare soil 8% Rock 2% Gravel 0%
Other site notes	Impenetrable layer of hard clay at 0.7m.

GDA 1994 MGA Zone 53
179782E, 8415894N

Vegetation

Upper Stratum **% cover -** 8 **Height range (m) –** 8-12 **Average height (m) -** 10	**Mid Stratum** **% cover -** 4 **Height range (m) –** 0.5-5 **Average height (m) -** 3	**Ground Stratum** **% cover -** 70 **Height range (m) –** 0-0.5 **Average height (m) –** 0.3
Eucalyptus tectifica	*Eucalyptus tectifica*	*Chrysopogon fallax*
-	*Corymbia foelscheana*	*Themeda triandra*
-	-	-

Soil

Slope (%)	1
Aspect	North
Drainage Potential	Moderate to rapidly drained
Gravel cover (%)	0
Rock cover (%)	2

Soil profile

Gravel portion	  

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.05	5YR 3/4 Dark reddish brown	Sandy clay	No	3-70mm 20% Mode = 4mm	kandosol
B1	0.05-0.2	5YR 3/4 Dark reddish brown	Silty clay loam	No	3-40mm 15% Mode = 3mm	kandosol
B2	0.2-0.7	2.5YR 3/6 Dark red	Clay loam	No	3-40mm 15% Mode = 3mm	kandosol

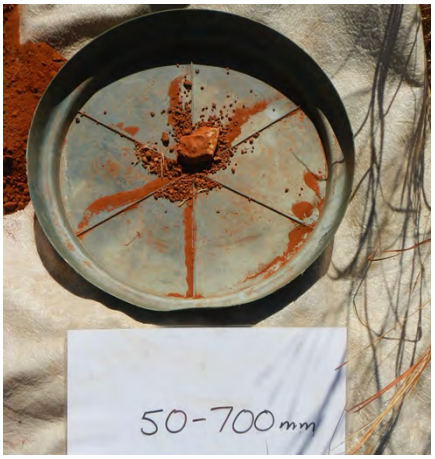
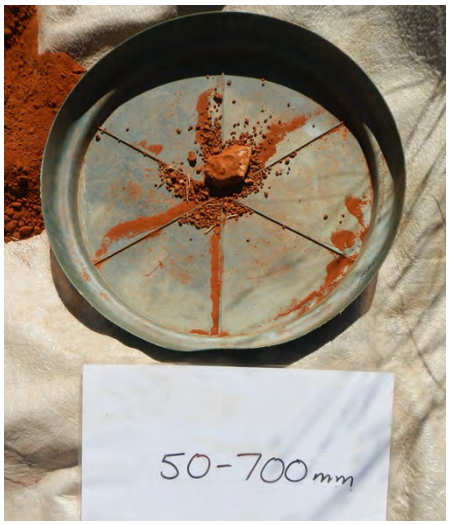
Reference Site	**SS4**
Vegetation Type	*Corymbia confertiflora, Eucalyptus tectifica* mid high woodland over *Corymbia confertiflora* mid high open shrubland over *Heteropogon contortus* tussock grassland
Corrected land unit	**3c**
Ground cover	Vegetation 60% Leaf litter 20% Bare soil 20% Rock 0% Gravel 0%
Other site notes	

GDA 1994 MGA Zone 53
179466E, 8415717N

Vegetation		
Upper Stratum **% cover -** 30 **Height range (m) –** 12-18 **Average height (m) -** 16	**Mid Stratum** **% cover -** 10 **Height range (m) –** 1-7 **Average height (m) -** 3	**Ground Stratum** **% cover -** 60 **Height range (m) –** 0-1 **Average height (m) –** 0.8
Corymbia confertiflora	*Corymbia confertiflora*	*Heteropogon contortus*
Eucalyptus tectifica	-	*Themeda triandra*
-	-	-

Soil	
Slope (%)	1
Aspect	North
Drainage Potential	Rapidly drained
Gravel cover (%)	0
Rock cover (%)	0

Soil profile

Gravel portion	  

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.05	2.5YR 2.5/4 Dark reddish brown	Silty clay loam	No	2-5mm 1% Mode = 2mm	kandosol
B2	0.05-0.7	2.5YR 3/6 Dark red	Silty clay loam	No	2-100mm 1% Mode = 3mm	kandosol
Laterite bedrock	0.7+	-	-	-	-	-

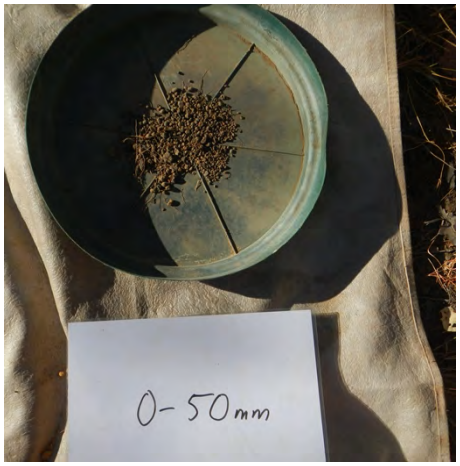
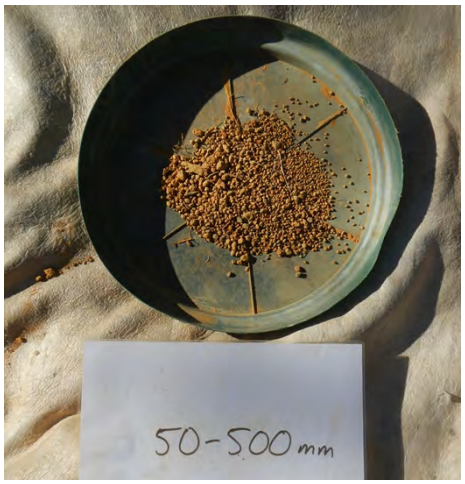
Reference Site	**SS5**
Vegetation Type	*Corymbia foelscheana*, *Eucalyptus tectifica* mid high woodland over *Terminalia ferdinandiana* and *Corymbia foelscheana* mid high open shrubland over *Heteropogon contortus* tussock grassland
Corrected land unit	**2e**
Ground cover	Vegetation 50% Leaf litter 40% Bare soil 10% Rock 0% Gravel 0%
Other site notes	

GDA 1994 MGA Zone 53
179235E, 8415840N

Vegetation		
Upper Stratum **% cover -** 25 **Height range (m) –** 10-16 **Average height (m) -** 14	**Mid Stratum** **% cover -** 10 **Height range (m) –** 1-7 **Average height (m) -** 3	**Ground Stratum** **% cover -** 50 **Height range (m) –** 0-1 **Average height (m) –** 0.6
Corymbia foelscheana	*Terminalia ferdinandiana*	*Heteropogon contortus*
Eucalyptus tectifica	*Corymbia foelscheana*	-
-	-	-

Soil	
Slope (%)	1
Aspect	South-East
Drainage Potential	Moderately to rapidly drained
Gravel cover (%)	0
Rock cover (%)	0

Soil profile

Gravel portion	  

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.05	10YR 3/2 Very dark greyish brown	Sandy clay loam	No	3-20mm 5% Mode = 3mm	Tenosols
B2	0.05-0.5	10YR 5/3 Brown	Sandy clay	No	3-20mm 20% Mode = 3mm	Tenosols
C	0.5-0.7	5YR 4/6 Yellowish red	Gravelly sand	No	3-40mm 30% Mode = 3mm	Tenosols
Laterite bedrock	0.7+	-	-	-	-	-

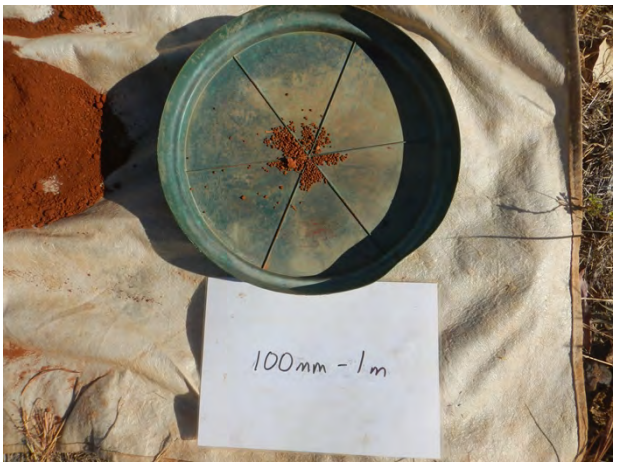
Reference Site	**SS6**
Vegetation Type	*Corymbia foelscheana*, *Eucalyptus tectifica* mid high open woodland over *Corymbia foelscheana* and *Acacia holosericea* low sparse shrubland over *Chrysopogon fallax* tussock grassland
Corrected land unit	**3c**
Ground cover	Vegetation 50% Leaf litter 35% Bare soil 12% Rock 3% Gravel 0%
Other site notes	

GDA 1994 MGA Zone 53
178322E, 8416350N

Vegetation		
Upper Stratum **% cover -** 6 **Height range (m) –** 10-20 **Average height (m) -** 16	**Mid Stratum** **% cover -** 2 **Height range (m) –** 1-5 **Average height (m) -** 2	**Ground Stratum** **% cover -** 50 **Height range (m) –** 0-1 **Average height (m) –** 0.2
Corymbia foelscheana	*Corymbia foelscheana*	*Chrysopogon fallax*
Eucalyptus tectifica	*Acacia holosericea*	*Themeda triandra*
Corymbia grandifolia	*Planchonia careya*	*Heteropogon contortus*

Soil	
Slope (%)	3
Aspect	North
Drainage Potential	Moderately to rapidly drained
Gravel cover (%)	0
Rock cover (%)	3

Soil profile

Gravel portion	 

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.1	2.5YR 3/4 Dark reddish brown	Sandy clay	No	3-50mm 40% Mode = 3mm	kandosol
B2	0.1-1	2.5YR 2.5/4 Dark reddish brown	Clay loam	No	3-25mm 1% Mode = 3mm	kandosol

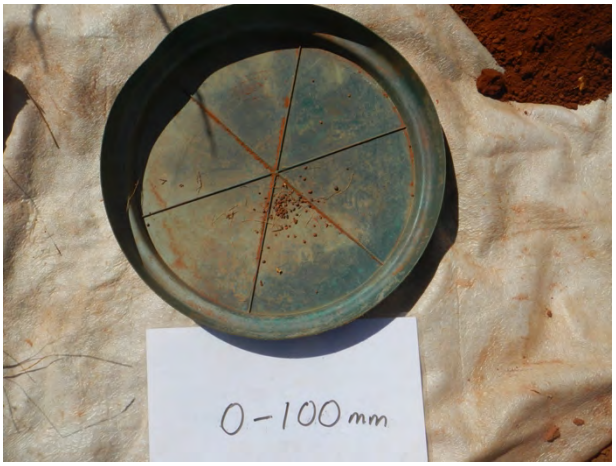
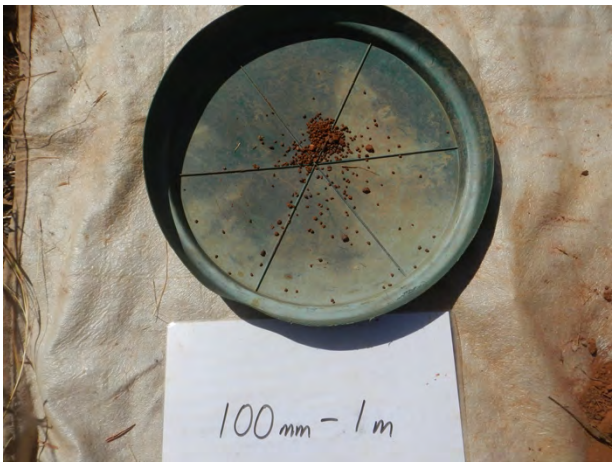
Reference Site	**SS7**
Vegetation Type	*Eucalyptus tectifica and Corymbia foelscheana* mid high woodland over *Corymbia foelscheana* and *Cochlospermum fraseri* mid high sparse shrubland over *Heteropogon contortus* tussock grassland
Corrected land unit	**3c**
Ground cover	Vegetation 70% Leaf litter 20% Bare soil 0% Rock 10% Gravel 0%
Other site notes	Ground impenetrable from 1m.

GDA 1994 MGA Zone 53
177806E, 8416790N

Vegetation		
Upper Stratum **% cover -** 12 **Height range (m) –** 10-16 **Average height (m) -** 14	**Mid Stratum** **% cover -** 3 **Height range (m) –** 1-7 **Average height (m) -** 5	**Ground Stratum** **% cover -** 70 **Height range (m) –** 0-1 **Average height (m) –** 0.8
Eucalyptus tectifica	*Corymbia foelscheana*	*Heteropogon contortus*
Corymbia foelscheana	*Cochlospermum fraseri*	*Chrysopogon fallax*
-	*Acacia holosericea*	-

Soil	
Slope (%)	2
Aspect	North-West
Drainage Potential	Rapidly drained
Gravel cover (%)	0
Rock cover (%)	10

Soil profile

Gravel portion	 

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.1	5YR 3/4 Dark reddish brown	Clay loam	No	3mm only <1%	kandosol
B2	0.1-1	2.5YR 2.5/4 Dark reddish brown	Silty clay loam	No	3-5mm 1% Mode = 3mm	kandosol

Reference Site	**SS8**
Vegetation Type	*Eucalyptus tectifica, Corymbia foelscheana* mid high open woodland over *Corymbia foelscheana* and *Erythrophleum chlorostachys* mid high sparse shrubland over *Themeda triandra* tussock grassland
Corrected land unit	**3c**
Ground cover	Vegetation 55% Leaf litter 35% Bare soil 10% Rock 0% Gravel 0%
Other site notes	Ground impenetrable from 1m.

GDA 1994 MGA Zone 53
177507E, 8417196N

Vegetation		
Upper Stratum **% cover -** 10 **Height range (m) –** 10-16 **Average height (m) -** 14	**Mid Stratum** **% cover -** 5 **Height range (m) –** 1-7 **Average height (m) -** 4	**Ground Stratum** **% cover -** 55 **Height range (m) –** 0-1 **Average height (m) –** 0.7
Eucalyptus tectifica	*Corymbia foelscheana*	*Themeda triandra*
Corymbia foelscheana	*Erythrophleum chlorostachys*	*Chrysopogon fallax*
Corymbia grandifolia	-	*Heteropogon contortus*

Soil

Slope (%)	<1
Aspect	North
Drainage Potential	Moderately to rapidly drained
Gravel cover (%)	0
Rock cover (%)	0

Soil profile

Gravel portion	 

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.1	5YR 3/4 Dark reddish brown	Sandy clay	No	3-60mm 40% Mode = 3mm	kandosol
B2	0.1-1	2.5YR 2.5/4 Dark reddish brown	Clay loam	No	3-20mm 2% Mode = 3mm	kandosol

Reference Site	**VS9**	 GDA 1994 MGA Zone 53 177350E, 8417099N
Vegetation Type	*Corymbia foelscheana*, *Eucalyptus tectifica* mid high open woodland over *Hakea arborescens* and *Vachellia pachyphloia* mid high open shrubland over *Sehima nervosum* tussock grassland	
Corrected land unit	**3a**	
Ground cover	Vegetation 40% Leaf litter 37% Bare soil 3% Rock 15% Gravel 5%	
Other site notes	Limestone pavement	

Vegetation		
Upper Stratum **% cover -** 8 **Height range (m) –** 10-16 **Average height (m) -** 14	**Mid Stratum** **% cover -** 12 **Height range (m) –** 1-8 **Average height (m) -** 4	**Ground Stratum** **% cover -** 40 **Height range (m) –** 0-1 **Average height (m) –** 0.5
Corymbia foelscheana	*Hakea arborescens*	*Sehima nervosum*
Eucalyptus tectifica	*Vachellia pachyphloia*	*Heteropogon contortus*
Corymbia grandifolia	*Gardenia megasperma*	*Themeda triandra*

Soil		
Slope (%)	3	- Soil profile
Aspect	South	
Drainage Potential	Rapidly drained	
Gravel cover (%)	5	
Rock cover (%)	15	
Gravel portion		-

Reference Site	**SS10**
Vegetation Type	*Eucalyptus tectifica* mid high open woodland over *Eucalyptus tectifica* and *Erythrophleum chlorostachys* mid high open shrubland over *Heteropogon contortus* tussock grassland
Corrected land unit	**2b**
Ground cover	Vegetation 20% Leaf litter 30% Bare soil 40% Rock 10% Gravel 0%
Other site notes	

GDA 1994 MGA Zone 53
178371E, 8416198N

Vegetation

Upper Stratum **% cover -** 5 **Height range (m) –** 10-16 **Average height (m) -** 14	**Mid Stratum** **% cover -** 15 **Height range (m) –** 1-7 **Average height (m) -** 4	**Ground Stratum** **% cover -** 20 **Height range (m) –** 0-1 **Average height (m) –** 0.5
Eucalyptus tectifica	*Eucalyptus tectifica*	*Heteropogon contortus*
-	*Erythrophleum chlorostachys*	-
-	*Acacia holosericea*	-

Soil

Slope (%)	2
Aspect	South
Drainage Potential	Moderately well drained
Gravel cover (%)	0
Rock cover (%)	10

Soil profile

Gravel portion	  

Soil Profile						
Horizon	**Depth range (m)**	**Colour**	**Texture**	**Mottles**	**Course fragments size and %**	**Soil type**
A1	0-0.04	10YR 4/6 Dark yellowish brown	Gravelly sand	No	3-70mm 55% Mode = 3mm	Rudosols
B1	0.04-0.08	5YR 4/6 Yellowish red	Sandy clay	Yes	3-40mm 55% Mode = 3mm	Rudosols
B2	0.8-1	5YR 4/6 Yellowish red	Sandy clay	Yes	3-70mm 45% Mode = 3mm	Rudosols