Public Notice Details

Planning Application Details

Application No	DA2500095

Property Details

Property Location	570 Huntingdon Tier Road Bagdad

Application Information

Application Type	Discretionary Development Application
Development Category	Outbuilding
Advertising Commencement Date	15/10/25
Advertising Closing Period If the Council Offices are closed during normal office hours within the above period, the period for making representations is extended.	30/10/25

Enquiries regarding this Application can be made via to Southern Midlands Council on (03) 6254 5050 or by emailing planningenquires@southernmidlands.tas.gov.au. Please quote the development application number when making your enquiry.

Representations on this application may be made to the General Manager in writing either by

Post: PO Box 21, Oatlands Tas 7120
Email: mail@southernmidlands.tas.gov.au
Fax: 03 6254 5014

All representations must include the authors full name, contact number and postal address and be received by the advertising closing date.

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SOUTHERN MIDLANDS COUNCIL

APPLICATION FOR PLANNING PERMIT

DEVELOPMENT / USE

Use this form to apply for a permit in accordance with section 57 and 58 of the *Land Use Planning and Approvals Act 1993*

Proposed use/development:
(Provide details of proposed works and use).

New Shed

Location of Development:
(If the development includes more than one site, or is over another property include address of both Properties).

570 Huntingdon Tier Road, Bagdad

Certificate of Title/s Volume Number/Lot Number:

163955/3

Land Owners Name:

Cheryllyn Heather Thompson and Troy Anthony Thompson

Full Name/s or Full Business/Company Name

Applicant's Name:

Sheds N Homes Hobart, Sarah Harriss

Full Name/s or Full Business/ Company Name (ABN if registered business or company name)

Contact details:

Postal address for correspondence:
57 Cove Hill Road, Bridgewater

Telephone or Mobile:
0408406307

Email address:
hobart@shedsnhomes.com.au

(Please note it is your responsibility to provide your correct email address and to check your email for communications from the Council.)

Details
Tax Invoice for application fees to be in the name of:
(if different from applicant)

Full Name/s or Full Business or Company Name and ABN if registered business or company name

Print email address	*ABN*

What is the estimated value of all the new work proposed

$ 40,000

Address all correspondence to: The General Manager, PO Box 21, Oatlands, Tasmania 7120
Oatlands Office: 71 High Street, Oatlands 7120 Phone (03) 62545000
Kempton Office: 85 Main Street, Kempton 7030 Phone (03) 62545050
Email Address: mail@southernmidlands.tas.gov.au Web: www.southernmidlands.tas.gov.au
ABN 68 653 459 589

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SOUTHERN MIDLANDS COUNCIL

For Commercial Planning Permit Applications Only

Signage:

Is any signage proposed?	Yes		No	

If yes, attach details: size, location and art work

Business Details:

Existing hours of operation

Hours	am	to	pm
Weekdays			
Sat			
Sun			

Proposed hours of new operation

Hours	am	to	pm
Weekdays			
Sat			
Sun			

Number of existing employees: _____

Number of proposed new employees: _____

Traffic Movements:

Number of commercial vehicles serving the site at present		Approximate number of commercial vehicles servicing the site in the future	

Number of Car Parking Spaces:

How many car spaces are currently provided		How many new car spaces are proposed	

Is the development to be staged: Please tick ✓answer

Yes ☐ No ☐

Please attach any additional information that may be required by Part 6.1 *Application Requirements* of the Tasmanian Planning Scheme – Southern Midlands.

Signed Declaration

I/we as owner of the land or person with consent of the owner hereby declare that:

1. I/we have read the Certificate of Title and Schedule of Easements for the land and I/we are satisfied that this application is not prevented by any restrictions, easements or covenants.
2. I/we provide permission by or on behalf of the applicant for Council officers to enter the site to assess the application.
3. The information given in this application is true and accurate. I/we understand that the information and materials provided with this application may be made available to the public. I/we understand that the Council may make such copies of the information and materials as, in its opinion, are necessary to facilitate a thorough consideration of the application.
4. I/we have secured the necessary permission from the copyright owner to communicate and reproduce the plans submitted with the application for assessment. I/we indemnify the Southern Midlands Council for any claim or action taken against it regarding a breach of copyright in respect of any of the information or material provided.
5. I/we declare that, in accordance with Section 52(1) of the Land Use Planning and Approvals Act 1993, that I have notified the owner of the intention to make this application. Where the subject property is owned or controlled by Council or the Crown, their consent is attached and the application form signed by the Minister of the Crown responsible and/or the General Manager of the Council.

Applicant Signature (If not the Title Owner)	Applicant Name (*please print*)	Date
	Sarah Harriss	30/07/2025

Land Owner(s) Signature	Land Owners *Name (please print)*	Date
	F. THOMPSON	30/7/25

Address all correspondence to: The General Manager, PO Box 21, Oatlands, Tasmania 7120
Oatlands Office: 71 High Street, Oatlands 7120 Phone (03) 62545000
Kempton Office: 85 Main Street, Kempton 7030 Phone (03) 62545050
Email Address: mail@southernmidlands.tas.gov.au Web: www.southernmidlands.tas.gov.au
ABN 68 653 459 589

SOUTHERN MIDLANDS COUNCIL

Land Owner(s) Signature	Land Owners *Name (please print)*	Date
CT	Cheryllyn Thompson	30/7/25

PRIVACY STATEMENT

The Southern Midlands Council abides by the Personal Information Protection Act 2004 and views the protection of your privacy as an integral part of its commitment towards complete accountability and integrity in all its activities and programs.

Collection of Personal Information: The personal information being collected from you for the purposes of the Personal Information Protection Act, 2004 and will be used solely by Council in accordance with its Privacy Policy. Council is collecting this information from you in order to process your application.

Disclosure of Personal Information: Council will take all necessary measures to prevent unauthorised access to or disclosure of your personal information. External organisations to whom this personal information will be disclosed as required under the Building Act 2000. This information will not be disclosed to any other external agencies unless required or authorised by law.

Correction of Personal Information: If you wish to alter any personal information you have supplied to Council please telephone the Southern Midlands Council on (03) 62545050. Please contact the Council's Privacy Officer on (03) 6254 5000 if you have any other enquires concerning Council's privacy procedures.

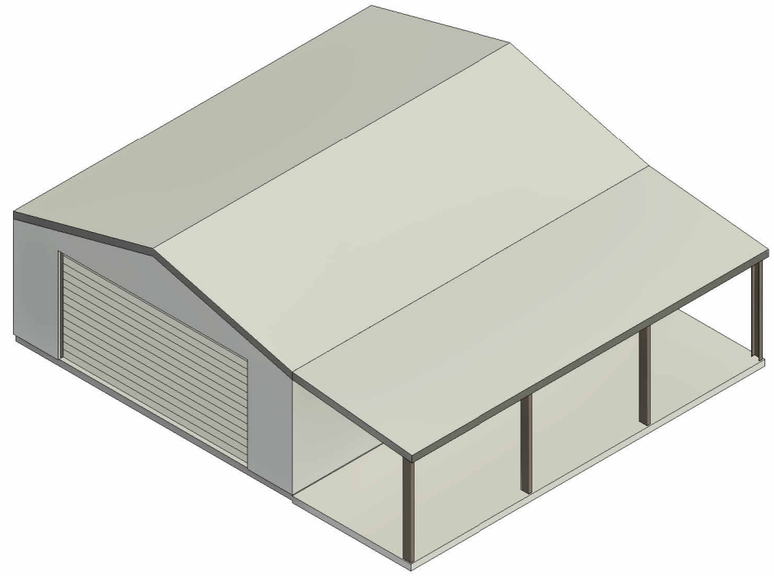
CONSTRUCTION NEW FARM SHED

CLASS 10A

SNH25-029

CONTENTS

CLIENT	Cheryllyn Heather Thompson & Troy Anthony Thompson
PROPERTY ADDRESS	570 Huntingdon Tier Road, Bagdad
PROPERTY TITLE REFERENCE	163955/3
PROPERTY IDENTIFICATION NUMBER	3247834
LOCAL AUTHORITY	Southern Midlands
PLANNING ZONE	Tasmanian Planning Scheme
OVERLAYS	Lowlandslip Hazard Band, Priority Vegitation, Bushfire Prone
BUSHFIRE ATTACK LEVEL	NA
CORROSION ENVIRONMENT	TBC
SOIL CLASSIFICATION	NA
WIND CLASSIFICATION	N3
PROPERTY LOT SIZE	22000m2
PROPOSED FOOTPRINT	90m2



DIMENSION NOTE:
Use written diemtnions only. Do no scale from drawings. All figured dimensions are to be used as a guide only. It is imperative that all dimensions, setouts and levels be confirmed onsite by the builder, Surveyor or Sub Contractor prior to the commencement of work, manufacture or installaion; and the Builder, Sub Contractor and/or manufacturer ensures a full set of plans are on hand and reference has been made to the general notes

SHEDS n HOMES
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57 Cove Hill Road
Bridgewater TAS 7030
(03) 6263 6545
hobart@shedsnhomes.com.au

BLST Pty Ltd
ABN 52 660 422 159

CLIENT NAME: Cheryllyn Heather Thompson & Troy Anthony Thompson			DRAWING TITLE: COVER PAGE	
PROJECT ADDRESS: 570 Huntingdon Tier Road, Bagdad	DATE: DATE	SCALE:		DRAWN BY: SH
PROJECT: NEW FARM SHED	REVISION No:	SHEET SIZE: A3	JOB No: SNH25-029	SHEET No: A1.0

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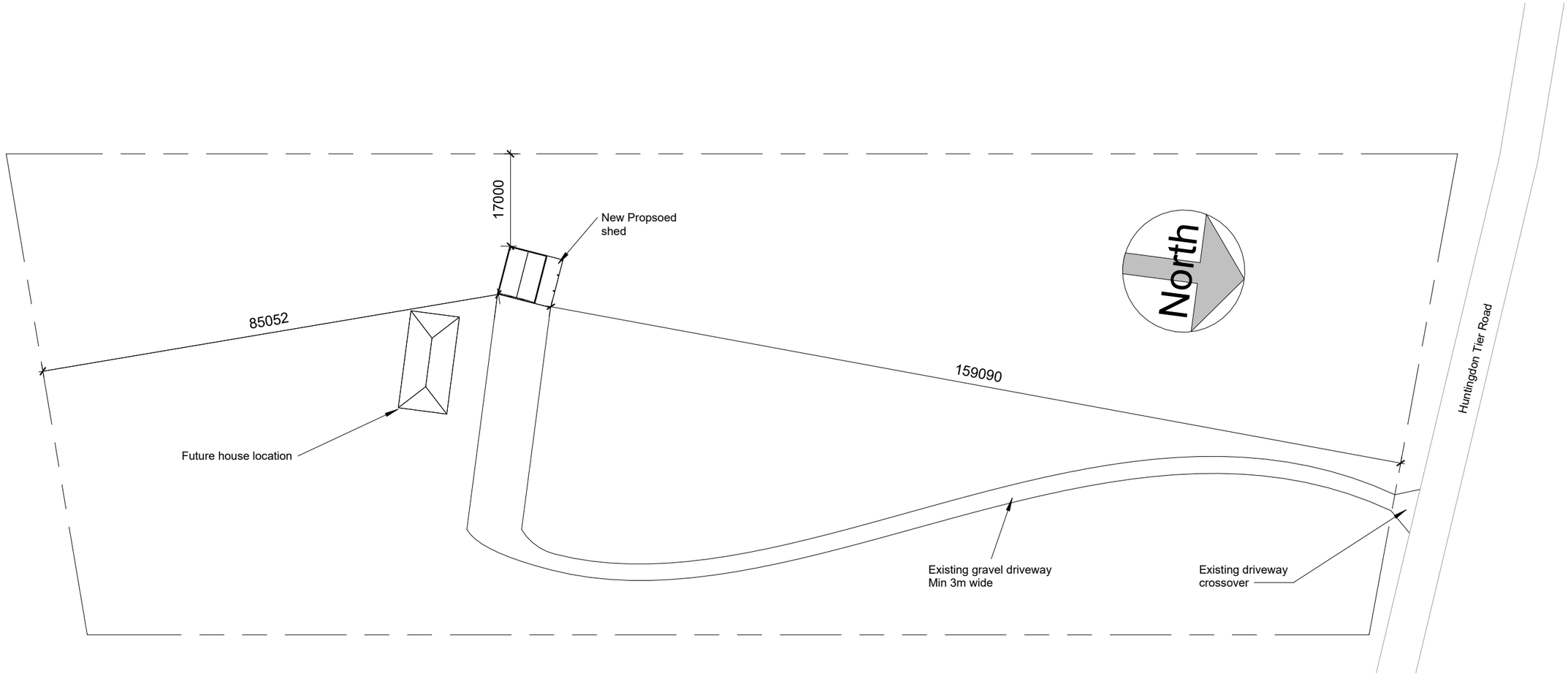

1 SITEPLAN

1 : 750

DIMENSION NOTE:
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BLST Pty Ltd
ABN 52 660 422 159

CLIENT NAME: Cherylln Heather Thompson & Troy Anthony Thompson		DRAWING TITLE: Siteplan		
PROJECT ADDRESS: 570 Huntington Tier Road, Bagdad	DATE: 30/07/2025	SCALE: 1 : 750		DRAWN BY: BH
PROJECT: New Farm Shed	REVISION No: 1	SHEET SIZE: A3	JOB No: SNH25-029	SHEET No: C2.0

1

16/07/25

Client

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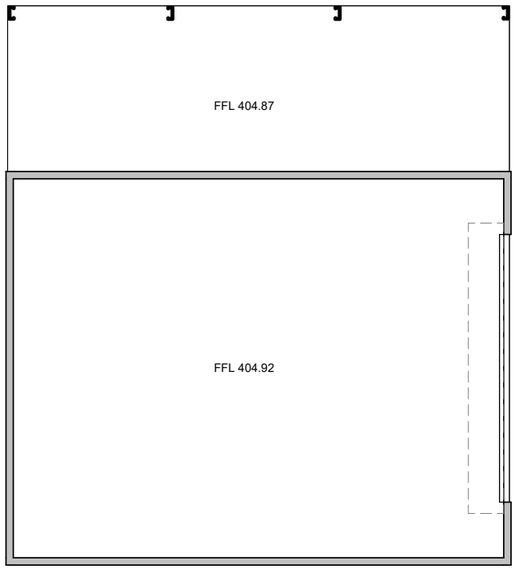

Ground Floorplan 1:100

DIMENSION NOTE:
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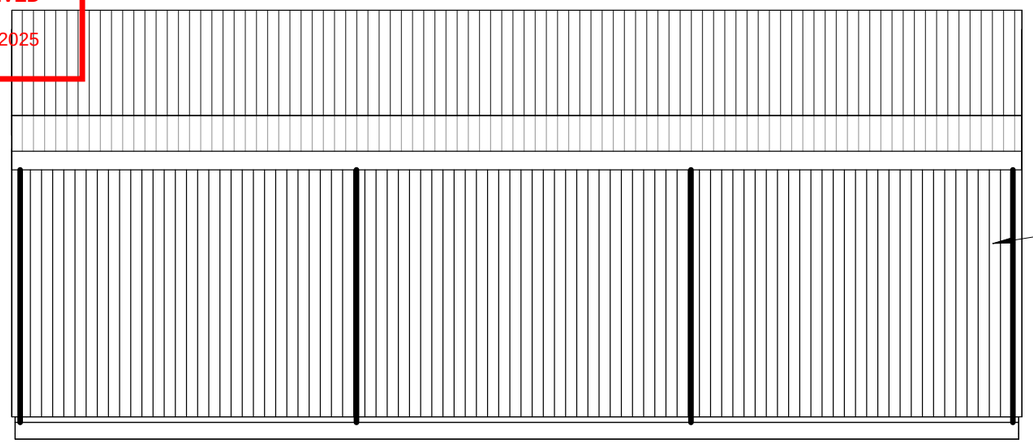
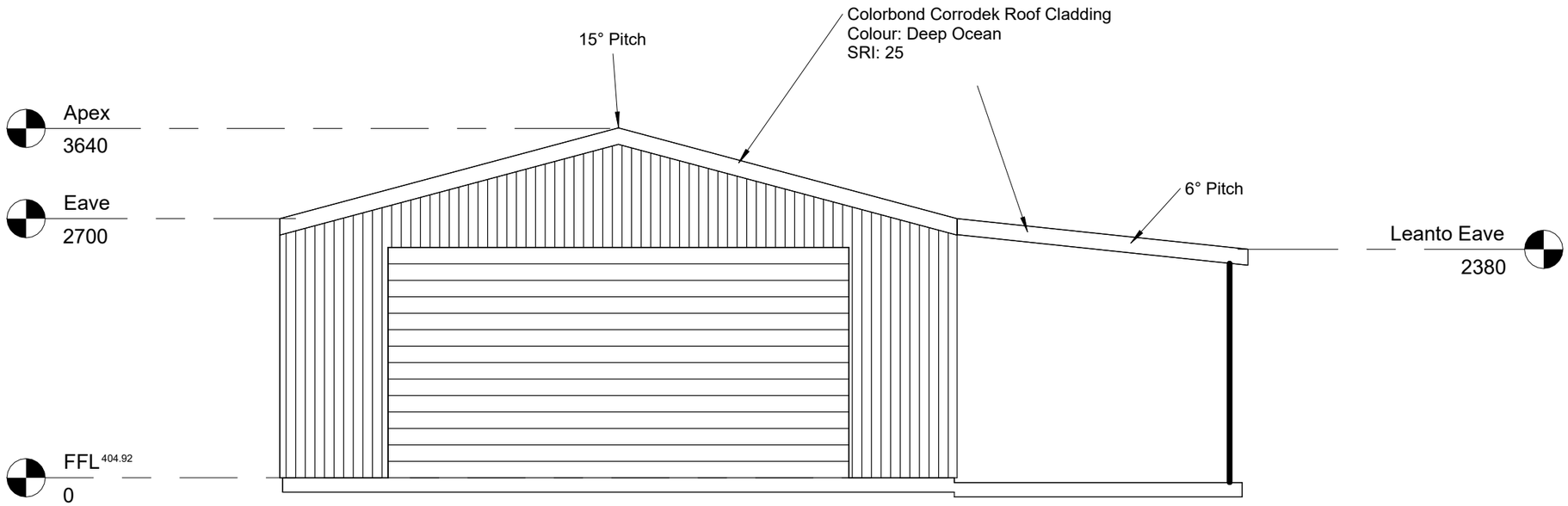
(03) 6263 6545
hobart@shedsnhomes.com.au

BLST Pty Ltd
ABN 52 660 422 159

CLIENT NAME: Cheryllyn Heather Thompson & Troy Anthony Thompson		DRAWING TITLE: FLOORPLAN		
PROJECT ADDRESS: 570 Huntingdon Tier Road, Bagdad	DATE: 30/07/2025	SCALE: 1 : 100		DRAWN BY: BH
PROJECT: NEW FARM SHED	REVISION No:	SHEET SIZE: A3	JOB No: SNH25-029	SHEET No: A3.0



1 North
1 : 50



2 East
1 : 50

DIMENSION NOTE:
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Bridgewater TAS 7030
(03) 6263 6545
hobart@shedsnhomes.com.au
BLST Pty Ltd
ABN 52 660 422 159

CLIENT NAME: Cheryllyn Heather Thompson & Troy Anthony Thompson		DRAWING TITLE: ELEVATIONS		
PROJECT ADDRESS: 570 Huntingdon Tier Road, Bagdad	DATE: 30/07/2025	SCALE: 1 : 50		DRAWN BY: SH
PROJECT: NEW FARM SHED	REVISION No:	SHEET SIZE: A3	JOB No: SNH25-029	SHEET No: A4.0

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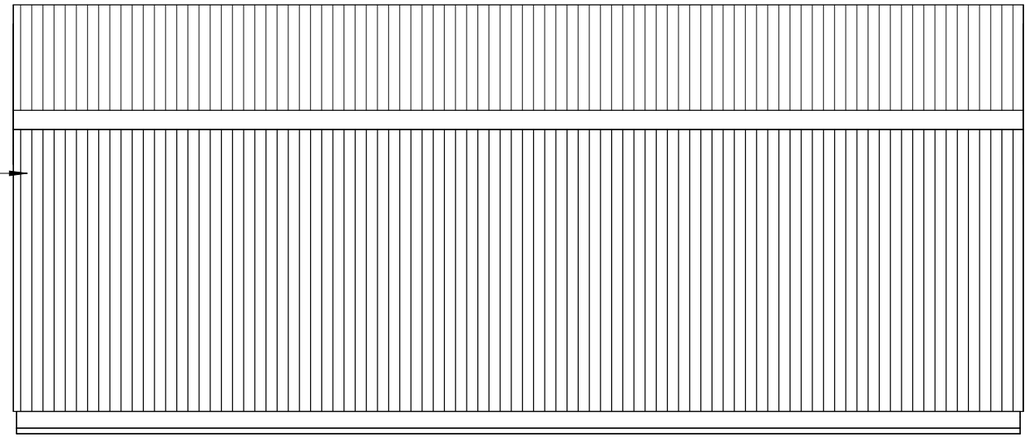
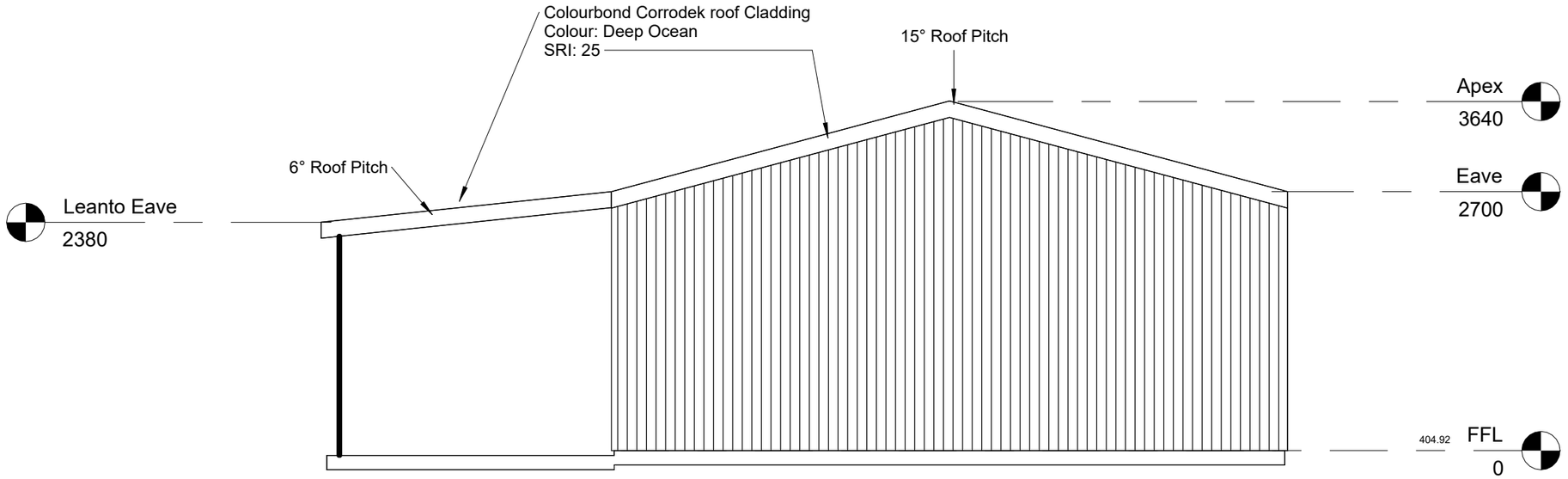
Colorbond Trimclad wall cladding
Colour: Pale Eucalypt
SRI: 44



1 South
1 : 50



2 West
1 : 50

DIMENSION NOTE:
Use written diemtnions only. Do no scale from drawings. All figured dimensions are to be used as a guide only. It is imperative that all dimensions, setouts and levels be confirmed onsite by the builder, Surveyor or Sub Contractor prior to the commencement of work, manufacture or installaion; and the Builder, Sub Contractor and/or manufacturer ensures a full set of plans are on hand and reference has been made to the general notes

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hobart@shedsnhomes.com.au

BLST Pty Ltd
ABN 52 660 422 159

CLIENT NAME: Cheryllyn Heather Thompson & Troy Anthony Thompson			DRAWING TITLE: ELEVATIONS	
PROJECT ADDRESS: 570 Huntingdon Tier Road, Bagdad	DATE: 30/07/2025	SCALE: 1 : 50		DRAWN BY: SH
PROJECT: NEW FARM SHED	REVISION No:	SHEET SIZE: A3	JOB No: SNH25-029	SHEET No: A4.1

BLST Pty Ltd
57 Cove Hill Road, Bridgewater 7030
EMAIL: hobart@shedsnhomes.com.au

06 October 2025

Planning

Southern Midlands Council

DEVELOPMENT APPLICATION – DA2500095 – FARM SHED at 570 Huntingdon Tier Road, Bagdad

Dear planning team,

Please see below responses regarding your Request for Further information dated 13 August 2025.

1. **Floorplan and Elevations**

   Please see attached sheet for this information.

2. **Amend Site Plan**

   The site plan has been updated to include the location of the future dwelling and vehicle access.

3. **Natural Assets Code (Provided direct to council by client)**

   A Natural Values Report has been completed and is attached for your review. The findings of the report indicate there is no threatened flora on the site and recommended minimising the extent of “clearance and conversion” and/or “disturbance” to native vegetation.

4. **Bagdad Potential Dispersive Soils Specific area Plan (provided direct to council by client)**

   A soil report has been prepared by Enviro-Tech and is attached for your review. Specifically, this report recommends the following in relation to the dispersive soils encountered on site and stormwater management:

- Avoid stormwater absorption trenches; instead, distribute stormwater along contour-parallel swale drains. Vegetate these swales to help prevent erosion and boost evapotranspiration.
- *All surface water collected on paved surfaces should be directed to designated swale drains. If impervious gravel surfaces are used, water from these areas can be distributed over the site using shallow swale drains. Testing indicates that the dispersive soil is as shallow as 0.4 m, so the swales should be constructed shallowly with appropriate mounding. Alternatively, if deeper swales are excavated, they must be lined.*
- *It is essential to ensure that water does not enter beneath buildings and pavements. Water intrusion can cause significant damage to structural components due to the potential development of tunnel erosion.*

We hope the information provided satisfies the RFI, and we look forward to hearing from you soon.

Yours sincerely,

Sarah Harriss

BLST Pty Ltd

enviro•tech
CONSULTANTS
Geotechnical & Environmental Services

GEOTECHNICAL SITE INVESTIGATION FOR FOUNDATIONS WASTEWATER, DISPERSIVE SOIL AND LANDSLIDE MANAGEMENT

570 HUNTINGDON TIER ROAD - BAGDAD

PROPOSED DWELLING AND SHED

Client: Troy and Cheryllyn Thompson

Certificate of Title: 163955/3

Investigation Date: 26/08/2025

Refer to this Report As

Enviro-Tech Consultants Pty. Ltd. 2025. Geotechnical Site Investigation for Foundations and Wastewater Report for a Proposed Dwelling and Shed, 570 Huntingdon Tier Road - Bagdad. Unpublished report for Troy and Cheryllyn Thompson by Enviro-Tech Consultants Pty. Ltd., 26/08/2025.

Report Distribution

This report has been prepared by Enviro-Tech Consultants Pty. Ltd. (Envirotech) for the use by parties involved in the proposed development of the property named above.

Permission is hereby given by Envirotech and the client, for this report to be copied and distributed to interested parties, but only if it is reproduced in colour, and only distributed in full. No responsibility is otherwise taken for the contents.

Limitations of this report

Advice herein is general, and advice provided in the associated report must be read in conjunction with this report:

Enviro-Tech Consultants Pty. Ltd. 2025. Landslip Hazard Assessment Report for a Proposed Dwelling And Shed, 570 Huntingdon Tier Road - Bagdad. Unpublished report for Sheds n Homes by Enviro-Tech Consultants Pty. Ltd., 26/08/2025.

In some cases, variations in actual Site conditions may exist between subsurface investigation boreholes. This report only applies to the tested parts of the Site at the Site of testing, and if not specifically stated otherwise, results should not be interpreted beyond the tested areas.

The Site investigation is based on the observed and tested soil conditions relevant to the inspection date and provided design plans (building footprints presented in Attachment A). Any site works which has been conducted which is not in line with the Site plans will not be assessed. Subsurface conditions may change laterally and vertically between test Sites, so discrepancies may occur between what is described in the reports and what is exposed by subsequent excavations. No responsibility is therefore accepted for any difference in what is reported, and actual Site and soil conditions for parts of the investigation Site which were not assessed at the time of inspection.

This report has been prepared based on provided plans detailed herein. Should there be any significant changes to these plans, then this report should not be used without further consultation which may include drilling new investigation holes to cover the revised building footprint. This report should not be applied to any project other than indicated herein.

No responsibility is accepted for subsequent works carried out which deviate from the Site plans provided or activities onsite or through climate variability including but not limited to placement of fill, uncontrolled earthworks, altered drainage conditions or changes in groundwater levels.

Footing exposure classification is presented on a layer-by-layer basis. In practice, some layers may be removed during excavation or replaced as part of site cuts and fills, while others may be incorporated within the building envelope. The information should therefore be regarded as guidance only, and the designer must assess the actual founding conditions and make the final determination of concrete strength, curing and cover requirements.

At the time of construction, if conditions exist which differ from those described in this report, it is recommended that the base of all footing excavations be inspected to ensure that the founding medium meets that requirement referenced herein or stipulated by an engineer before any footings are poured.

Investigation Summary

Site Classification

In accordance with AS2870 – 2011 and after thorough consideration of the known details pertaining to the proposed building and associated works (hereafter referred to as the Site), the geology, soil conditions, soil properties, and drainage characteristics of the Site have been classified as follows:

CLASS P based on the following problematic ground conditions identified at the Site:

- Loose soil was identified at the Site at depths of up to 0.5 m in BH03
- Class 1 dispersive soils are present at the Site with CLASS P foundation conditions requiring specialised management measures to mitigate erosion hazards.

Notwithstanding the problematic soil conditions observed/proposed at the Site, the soil would be classified as Class S.

Foundations

It is recommended that concentrated loads including but not limited to slab edge or internal beam or strip footings supported directly on piers or pads which are founded in the Distinctly Weathered SANDSTONE Bedrock at 0.4 to 1.3 m depth or greater with an allowable bearing capacity of 400 kPa.

Wind Load Classification

The AS 4055-2021 Wind loads for Housing classification is summarised.

Region:	A
Terrain category:	TC2.5
Shielding Classification:	PS
Topographic Classification:	T2
Wind Classification:	N3
Design Wind Gust Speed ($V_{h,u}$) m/s	50

I recommend that during construction, I and/or the design engineer are notified of any major variation in the foundation conditions as predicted in this report.

Kris Taylor, BSc (hons)

Environmental & Engineering Geologist

Director

Site Investigation

The Site investigation is summarised in Table 1.

Table 1 Summary of Site Investigation

Client	**Troy and Cheryllyn Thompson**
Project Address	570 Huntingdon Tier Road - Bagdad
Council	Southern Midlands
Planning Scheme	Tasmanian Planning Scheme
Inundation, Erosion or Landslip Overlays	Low Landslip Hazard Code
Proposed	Dwelling and shed
Investigation	Fieldwork was carried out by an Engineering Geologist on the 26/8/2025
Site Topography	The building site has a moderate slope of approximately 14% (8°) to the northeast
Site Drainage	The site receives overland flow runoff directly from the southwest.
Soil Profiling	A total of 5 boreholes were investigated at the Site.
Investigation Depths	The target excavation depth was estimated at 2.3 m. Borehole logs and photos are presented in Appendix B & C.
Soil moisture and groundwater	All recovered soil at the site ranged from dry to moist. Groundwater was not encountered.
Geology	According to 1:25,000 Mineral Resources Tasmania geological mapping (accessed through The LIST), the geology comprises of: Permian - Triassic Thickly-bedded medium-course-grained quartz sandstone and minor usually black shale layers, the sandstone to shale ratio normally exceeds 10:1.

Soil Profiles

The geology of the site has been documented and described according to Australian Standard AS1726 for Geotechnical Site Investigations, which includes the Unified Soil Classification System (USCS). Soil layers, and where applicable, bedrock layers, are summarized in Table 2.

Table 2 Soil Summary Table

#	Layer	Details	USCS	BH01	BH02	BH03	BH04	BH05
1	Silty SAND	SOIL & COBBLES/BOULDERS: Silty SAND trace gravel, trace clay, black, well sorted, fine grained sand; 25% SANDSTONE cobbles/boulders, MD-D	SM			0-0.4		
2	SAND	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch; angular gravel; 25% SANDSTONE cobbles/boulders, VL-MD	SM	0-0.2 DS@0.1	0-0.2	0.4-0.5	0-0.2	0-0.2
3	Silty SAND	SOIL & COBBLES/BOULDERS: Silty SAND, yellowish brown, well sorted, fine to medium grained sand, trace roots, trace clay, 5 % roots and charcoal; 25% SANDSTONE cobbles/boulders, L-D	SM	0.2-0.7 DS@0.5		0.5-0.8	0.2-0.5	0.2-0.4
4	CLAY	CLAY with sand, grey, mottled yellowish brown, high plasticity, fine grained sand, VSt	CH			0.8-1.3 DS@1.0	0.5-1.3	0.4-0.8
5	Clayey SAND	SOIL & COBBLES/BOULDERS: Clayey SAND, yellowish brown, well sorted, fine grained sand, with gravel, trace roots, trace silt, 5 % roots and charcoal; angular gravel; 25% SANDSTONE cobbles/boulders, VL	SC		0.2-0.4 DS@0.2			0.8-1.1 DS@0.9
6	SANDSTONE	Distinctly Weathered SANDSTONE Bedrock, EL (rock strenght inferred from BH02,0.4)		0.7-0.9 REF	0.4-0.5 PL@0.4 REF	1.3-1.5 REF	1.3-1.5	1.1-1.2 REF

Consistency[1] **VS** Very soft; **S** Soft; **F** Firm; **St** Stiff; **Vst** Very Stiff; **H** Hard. Consistency values are based on soil strengths AT THE TIME OF TESTING and is subject to variability based on field moisture condition
Density[2] **VL** Very loose; **L** Loose; **MD** Medium dense; **D** Dense; **VD** Very Dense
Rock Strength **EL** Extremely Low; **VL** Very Low; **L** Low; M Medium; **H** High; **VH** Very High; **EH** Extremely High
PL Point load test (lump)
DS Disturbed sample
PV Pocket vane shear test
FV Downhole field vane shear test
U50 Undisturbed 48mm diameter core sample collected for laboratory testing.
REF Borehole refusal
INF DCP has continued through this layer and the geology has been inferred.

[1] Soil consistencies are derived from a combination of field index, DCP and shear vane readings.
[2] Soil density descriptions presented in engineering logs are derived from the DCP testing.

Tasmanian Planning Scheme (TPS)

SOU-S3.0 Bagdad Potential Dispersive Soils Specific Area Plan

Purpose

The purpose of the Bagdad Potential Dispersive Soils Specific Area Plan is:

SOU-S3.1.1 To minimise and/or mitigate adverse impacts from development on land that contains potentially dispersive soils.

SOU-S3.4 Definition of Terms

dispersive soil: means soil or sediment with an Exchangeable Sodium Percentage greater than 6% or which demonstrates dispersive behaviour when in contact with fresh water.

dispersive soil management plan: means a report prepared in accordance with Hardie, M (2009): Dispersive Soils and their Management: Technical Reference Manual and DPIW (2009), Dispersive Soils and their Management – Guidelines for Landowners, Planners and Engineers, by a suitably qualified person, that details:

(a) the dispersive potential of soils in the vicinity of the proposed development;

(b) the potential for the development to cause or contribute to gully or tunnel erosion;

(c) an analysis of the level of risk to the development and the level of risk to users of the development; and

(d) proposed management measures to reduce risk to an acceptable level where necessary.

SOU-S3.7 Development Standards for Buildings and Works

Objective

That buildings and works with the potential to disturb dispersive soil are appropriately located or managed to minimise the potential to cause erosion and ensure risk to property and the environment is reduced to an acceptable level.

Acceptable Solutions

Acceptable Solutions	Proposal
Buildings and works must be for:	
(a) works not involving the release of concentrated water or the disturbance of soils;	Works will involve the disturbance of soils
(b) additions or alterations to an existing building, or the construction of a non-habitable building, provided the development area is no more than 100m^2; or	No applicable
(c) forestry operations in accordance with a certified Forest Practices Plan.	No applicable

Performance Criteria

Performance Criteria	Proposal
Buildings and works must be designed, sited and constructed to minimise the risks associated with dispersive soil to property and the environment, having regard to:	
(a) the dispersive potential of soils in the vicinity of proposed buildings, driveways, services and the development area generally;	The shallow bedrock is of advantage at the Site, at this provides the opportunity to intercept dispersive soil layers in cuts.
(b) the potential of the development to affect or be affected by erosion, including gully and tunnel erosion;	Where soil surfaces are disturbed, they should ideally be paved or treated with gypsum and covered with a loam soil.
(c) the dispersive potential of soils in the vicinity of water drainage lines, infiltration areas/trenches, water storages, ponds, dams and disposal areas;	Some areas of the Site do not have dispersive soils. The proposed wastewater absorption area does have dispersive soil and it must be ensured gypsum treatment is applied. Stormwater absorption trenches are not recommended and stormwater must be distributed across contour parallel swale drains. These may be vegetated to reduce erosion and evaporation potential.
(d) the level of risk and potential consequences for property and the environment from potential erosion, including gully and tunnel erosion;	Risk at the site can be fully managed given the recommendations presented herein.
(e) management measures that would reduce risk to an acceptable level; and	Management measures are recommended, and an acceptable level can be achieved.
(f) the advice contained in a dispersive soil management plan.	See the following section for management advice.

Landslip Overlay Overview C15

The proposed building and works fall within the LIST Landslip Hazard Overlay (low hazard band) as presented in Appendix A. Landslide hazard reporting requirements are presented in Table 3.

Table 3 Landslip Hazard Reporting Requirements Framework

Council	Southern Midlands
Planning Scheme	Tasmanian Planning Scheme
Planning Scheme Code	C15.0 Landslip Hazard Code
Landslip Hazard Band	Low
Landslip Planning Map Component	Remaining areas slopes 11-20 degrees
Proposed Development Is Exempt From Planning	No
Significant Works	Yes*
Critical Use, Vulnerable Use or Hazardous Use	No
Subdivision that creates a new road or extends an existing road in a medium landslip overlay	No
Development Code to Be Addressed	C15.6.1 Building and works within a landslip hazard area
Additional Information Required for Footing System	NO
Planning Report Requirements	Landslip Hazard Report with an accompanying Geotechnical Site Investigation report prepared using the methodology of the Practice Note Guidelines for Landslide Risk Management 2007 by a geotechnical practitioner
Modelling Timeframe	Building design life

*An assumption is made, that an assessment is to be made based on the 2016 Building Act, regardless of whether significant works is proposed in the low overlay or not, and therefore the proposal it is exempt from planning.

C15.6 Development Standards for Buildings and Works

C15.6.1 Building and works within a landslip hazard area

C15.6.1 Objective

The objective of the code is to ensure that building and works on land within a landslip hazard area can:

(a) minimise the likelihood of triggering a landslip event; and

(b) achieve and maintain a tolerable risk from a landslip.

C15.6.1 Acceptable Solutions

For Building and Works within a Landslip Hazard Area there are no acceptable solutions and therefore performance criteria need to be addressed.

C15.6.1 Performance Criteria

The proposed development needs to be assessed against the following performance criteria:

P1.1

Building and works within a landslip hazard area must minimise the likelihood of triggering a landslip event and achieve and maintain a tolerable risk from landslip, having regard to:

(a) the type, form, scale and intended duration of the development;

(b) whether any increase in the level of risk from a landslip requires any specific hazard reduction or protection measures;

(c) any advice from a State authority, regulated entity or a council; and

(d) the advice contained in a landslip hazard report.

P1.2

A landslip hazard report also demonstrates that the buildings and works do not cause or contribute to landslip on the Site, on adjacent land or public infrastructure.

P1.3

If landslip reduction or protection measures are required beyond the boundary of the Site the consent in writing of the owner of that land must be provided for that land to be managed in accordance with the specific hazard reduction or protection measures.

Directors Determination

Objectives

As proposed works at the Site are considered significant works, the Directors Determination - Landslip Hazard Areas directly applies and therefore the building surveyor must ensure:

- that the proposed works considers the AS 2870 site classification, any further geotechnical site investigation (low) and any relevant landslip management plan; and
- that the proposed works can achieve and maintain a tolerable risk for the intended life of the building including significant work and the installations for the management and disposal of stormwater, sewage, water storage overflow or other wastewater, will not cause or contribute to landslip movement on the site or adjacent land; and
- that sufficient information has been provided in this report for the design of the footing system

Proposed development

It is a planning requirement that a Landslip Hazard Report is prepared for the Site on the basis that the proposed development involves the following significant works:

- Excavation equal to or greater than 1m in depth, including temporary excavations for the installation or maintenance of services or pipes;
- Removal, redirection, or introduction of drainage for surface or groundwater;

The Landslip Hazard Report must be prepared with an accompanying AS1726 Geotechnical Site Investigation report using the methodology of the Practice Note Guidelines for Landslide Risk Management 2007 prepared by a geotechnical Practitioner[3].

[3] Geotechnical practitioner means any of the following: (a) an engineer-civil; (b) a geotechnical engineer licensed as an engineer-civil acting within their area of competence; (c) an engineering geologist with the qualifications and expertise specified in the Certificates by Qualified Persons for an Assessable Item Determination made by the Director of Building Control, as amended or substituted from time to time, acting within their area of competence;

Investigation Objectives

Landslip Hazard Report with an accompanying Geotechnical Site Investigation report prepared using the methodology of the Practice Note Guidelines for Landslide Risk Management 2007 by a geotechnical practitioner.

Scope of Works

The Site has been investigated with remote sensing, a Site Walk over, soil coring and dynamic cone penetrometer (DCP) testing.

Desktop Investigation

Other than the discovery of deep gouged into the landscape due to tunnel erosion from uncontrolled drainage, there is no evidence of deep or shallow seated slope instability at the Site. Dispersive soil management measures are presented within this report.

Investigation Findings

The proposed driveway crossover gradient is at 11° which is at the lower limit of the government landslide trigger code. There is a very low potential for landslip in this setting, however consideration needs to be given to soil dispersion recommendations and general recommendations presented in Appendix H.

Landslide Scenarios

Scenario	Mechanism, Material, Affect & Receptor	Material Class	Water Content	Type of Movement	Failure Mechanism	Observed In the Field
S1	Rotational failure in fill	Fine	Wet	Rotational	Earth slide	No

Landslip Spatial-Temporal Pattern

Scenario	Mechanism, Material, Affect & Location	Trigger	Potential Size	Potential Rate	Travel Distance
S1	Rotational failure in fill	Rainfall; surface-water concentration	Very Small	Very Slow	2m

Landslip Probability

Scenario	Material & Mechanism	Likelihood of Occurrence			Treatment
		Present	Proposed Without Treatment	Proposed With Treatment	
S1	Rotational failure in fill	Rare	Unlikely	Rare	No treatment required other than general recommendations presented in GSI report

Landslip Risk To Property

Scenario	Material & Mechanism	Elements most at Risk	Untreated Risk to Property After Development			Residual (Treated) Risks to Property		
			Likelihood	Consequence	Risk	Likelihood	Consequence	Risk
S1	Rotational failure in fill	Dwelling	Unlikely	Minor	Low	Rare	Minor	Very Low

Landslip Risk To Life

Hazard	**Scenario 1**
Treatment	**Without Treatment**
Lithology & Mechanism	Rotational failure in fill
Likelihood	Unlikely
Indicative Annual Probability	0.0001
Use of Affected Structure or Site, and person most at risk	Dwelling resident
Probability of spatial impact (0–1)	0.35
Portion of Hours Per Day	12
Days Per Year	240
Daily Probability	0.329
Rate	Very Slow
Temporal spatial probability allowing for evacuation (0–1)	0.95
Probability of NOT evacuating (0–1) (= 1 – evacuation probability)	0.05
Location (≤3 words)	Person In Building
Vulnerability (≤7 words)	Very low fatality inside dwelling
*Vulnerability Value (0–1)	0.05
Risk for Person Most at Risk	2.88E-08
Occupancy Number of People	3
Total Risk	8.63E-08
Tolerable Risk Category	public most at risk, existing slope
Tolerable Risk Value	1.00E-04
Risk Evaluation	**Acceptable**

Concluding Statement

It has been concluded from this assessment that there is no evidence of slope instability which requires management to mitigate risks to a tolerable level. It is concluded that:

- Type, form, scale, and duration of works are consistent with residential construction and temporary disturbance only.
- Risk does not increase with development; proposed treatments effectively reduce hazards including batter instability and dispersive soils.
- Assessment aligns with AGS (2007c) and Tasmanian Planning Scheme; no contrary advice identified from State or Council.
- This report provides required landslip hazard advice, documenting scenarios, likelihood, consequences, and recommended treatments for compliance.
- Development will not cause or contribute to landslip on-site, adjacent land, or public infrastructure with treatment measures applied.
- All hazard reduction and stabilisation measures remain within site boundaries; no off-site consent or third-party works are required.
- Proposed use is low-intensity and long-duration, with minimal slope disturbance, ensuring tolerable risk is maintained across the building life.
- Development form involves limited excavation, suitable for long-term occupation without altering slope stability.
- Risk level is expected to remain stable over the building life, with no significant change anticipated under managed drainage and land use.
- Design incorporates drainage controls and adaptable foundations, allowing adjustment to future changes in slope or groundwater conditions.
- Essential utilities and services can be safely installed and maintained with no interruption expected from slope instability.

- Site requires only standard drainage and erosion control measures, with no need for extraordinary landslip hazard reduction works.
- No hazard reduction measures are required beyond site boundaries; all stability controls are contained within the property.
- There is no existing landslip management plan applying to this site or adjacent land that requires integration.
- No hazardous chemicals will be used, handled, generated, or stored on the site.

Recommendations

General

For Class P Sites, the designer should be a qualified engineer experienced in the design of footing systems for buildings.

Dispersive soil Management

Findings

The results presented in Appendix F indicate:

- Deeper soil Layers comprises Emerson Class 1 category soils which are considered severely dispersive. This layer is only present is BH03, BH04, and BH05.
- Most of the soil except for Layer 4 is considered either not dispersive (Class 4 or greater) or only slightly dispersive (Class 3).
- A 0.4 to 0.8m deep non dispersive capping layer is present over the top of Layer 4 in BH03. BH04, and BH05.

Site specific recommendations

- The shallow bedrock (is of advantage at the Site, at this provides the opportunity to intercept dispersive soil layers in cuts with retaining walls founded onto bedrock.
- Dispersive soil layers should be protected from surface water runoff by either installing a retaining wall or battering back the exposed soil, treating it with gypsum or lime, and covering it with 0.3 m of nondispersive loam topsoil.
- Where soil surfaces are disturbed, they should ideally be paved or treated with gypsum and covered with loam.
- Certain parts of the Site lack dispersive soils, while the planned wastewater absorption area (BH05) contains dispersive soil that will need to be managed.
- Avoid stormwater absorption trenches; instead, distribute stormwater along contour-parallel swale drains. Vegetate these swales to help prevent erosion and boost evapotranspiration.
- All surface water collected on paved surfaces should be directed to designated swale drains. If impervious gravel surfaces are used, water from these areas can be distributed over the site using shallow swale drains. Testing indicates that the dispersive soil is as shallow as 0.4 m, so the swales should be constructed shallowly with appropriate mounding. Alternatively, if deeper swales are excavated, they must be lined.
- It is essential to ensure that water does not enter beneath buildings and pavements. Water intrusion can cause significant damage to structural components due to the potential development of tunnel erosion.

For further guidance, general recommendations are presented in **Appendix H**.

Soil Exposure Classification

The soil has been tested for salinity impacts on footings in accordance with AS2870, as well as preliminary pH testing as a proxy to potential sulphate aggressivity.

- It is generally recommended that where possible, soil Layer 2 is not used as a founding base for pavement or a slab given the more severe exposure class rating of B2 for both salinity and B2 for pH.
- Otherwise, 20 to 25 MPa concrete is generally recommended with 40 mm cover using a damp-proofing membrane or 50mm cover without. A minimum curing time of 3 days is recommended.

Plumbing

Refer to hydraulic design drawings for detailed plumbing advice and requirements.

Backfilled trenches can direct surface water and form tunnels. If dispersive soil is encountered, treat it with gypsum or lime. All service trenches should be bedded and backfilled with compacted sand to prevent tunnel formation.

Refer to Table 4 to assess soil movement (Ys) around pipework for different depth ranges.

Table 4 Millimetres soil movement (Ys) for determining plumbing requirements for various soil depths *

Building	Profiles	P*	E Ys >75	H2 Ys 60-75	H1 Ys 40-60	M Ys 20-40	S Ys 0-20	A Ys 0
Shed	BH03	YES					0-1.3	1.3-3
Dwelling	BH01,BH02,BH04	YES				0-0.7	0.7-1.3	1.3-3

* Depths in this table are based on surfaces at the time of testing and do not allow for the influence of any additional fill added to the soil profile unless the Iss calculation depth has been modified based on the proposed cut and fill (see 'Footing Minimum Target Depths'). Where additional fill is proposed (and not indicated in the attached plans) Enviro-Tech are to be advised of final FFL's so the Site classification can be recalculated according to the specific fill reactivity and thickness used in the design.

Class A and S

When pipework service trench basses fall within Class A to S depth range as shown in Table 5, and all plumbing recommendations herein have been implemented, the drainage system does not require any additional protection and should be installed following the AS/NZS 3500 series standards.

Class M

When pipework service trench excavations intercept the Class M depth range as shown in Table 5, and all plumbing recommendations herein have been implemented, all stormwater and sanitary plumbing drains should have fittings set at their midposition during installation to allow 0.5ys movement in any direction. Pipe wrappings can be used at critical points.

AS3500.2:2021 Appendix G of AS3500.2:2021 should be referred for general advice.

Stormwater Management

Stormwater absorption trenches are not advised for use at the Site. Stormwater should be collected and directed into a lined swale drain that follows the land's contour. Swale drains are recommended to be lined due to dispersive soil only being approximately 0.4m deep, and possibly less in some areas. Stormwater from all impervious surfaces is to be collected and conveyed to a swale drain. If dispersive soils are deeper than expected, lining is not necessary and the swale may be vegetated.

As part of the building design plan, swale drains are recommended upslope of earth retaining structures, soil cuts, filled areas and the proposed building Site to capture and divert Site stormwater flow.

Surface drainage shall be considered in the design of the footing system, and necessary modifications shall be included in the design documentation. The surface drainage of the site shall be controlled from the beginning of the preparation and construction of the site. The drainage system shall be completed after the completion of the building construction.

Ideally, the areas around the footprint of the building should be graded or drained so that the water cannot pond against or near the building. As soon as footing construction has been completed, the ground immediately adjacent to the building should be graded to a uniform fall of 50mm minimum

away from the building over the first metre. The final provision of paving to the edge of the building can greatly limit soil moisture variations due to seasonal wetting and drying.

Wastewater

Soil at BH05 consists of Layers 2 through 6. The limiting layer is Layer 4, which contains Category 6 clay and occurs at depths between 0.4 and 0.8 meters. Layer 4 is classified as severely dispersive and can be identified by its grey colour. The remaining soils are mainly Loamy Sand (Category 1), except for Layer 5, which is classified as Sandy Clay Loam.

Wastewater is recommended to undergo secondary treatment prior to distribution over shallow loamy sand soils. A no-dig system design is preferred. Additionally, applying gypsum or lime at a rate of 1.0 kg/m to the wastewater distribution area, including at least 5 meters downgradient, is advised as a precaution. The dispersive soil layer is not to be disturbed through excavation.

Temporary Site Drainage

It is recommended that drainage protection works (cut off drains/mounds) are put in place above (upgradient of) the work area to prevent water and sediment from accumulating in and around footings and reduce the risk of erosion and instability around any proposed earth retaining structures.

Permanent Cut Batters – Soil and Rock

To ensure that cuts remain serviceable, it is recommended that unretained cuts in soil do not exceed 1V: 2H and unsupported baters in bedrock do not exceed 2V: 1H. Before cuts are approached by workers, cuts must be appropriately scaled to remove any loose soil and rock. The bedrock should not be increased beyond 2.0 m height relative to depth below natural level, without inspection by a suitably qualified person to ensure that these cuts are safe to work under.

Filling Works

- In the case where either of the following conditions occur, the Site is classified as Class P (AS2870 Clauses 2.5.2 and 2.5.3), in which case footings are to be designed in accordance with engineering specifications:
    - FILL OTHER THAN SAND exceeds 0.4 m depth.
    - SAND FILL exceeds 0.8 m depth.
- It is recommended that footing (edge beams, internal beams, and load support thickenings) concentrated loads are transferred through the fill to target founding layers.
- Subject to engineering advice, edge beams, internal beams, and load support thickenings may need to be founded on natural ground.
- SAND or FCR is always recommended rather than fill containing SILT or CLAY.
- Compacted CLAY or SAND FILL on well drained slopes should not exceed 1V:2H unless supported by an engineered retaining wall.
- Compacted stable rock fill on well drained slopes should not exceed 2V:3H unless supported by an engineered retaining wall.
- Any proposed filling works must be in accordance with AS3798 'Earthworks for Residential and Commercial Developments'.
- Before placing fill for landscaping, all topsoil should be removed from the filled area.
- Ideally, the fill should be free draining and placed to prevent water ponding. The fill should be placed in layers no greater than 150mm height and suitably compacted.

Long-term erosion management

The following measures are generally recommended for maintaining long-term erosion stability of soil slopes:

- Slopes exceeding 1V: 4H and up to 1V: 3H will need to be effectively stabilised with mulch/topsoil mixes, drill/broadcast seeding, hydroseeding or soil binders.
- Slopes up to 1V:2Hcan be stabilised with straw mulching.
- Slopes exceeding 1V: 2H and up to 1V:1.5H may be effectively stabilised with hydromulching
- Slopes exceeding 1V:1.5H but no greater than 1V: 1H will generally require measures such as erosion control blankets.

Building Pad Preparation

Any organic matter or other deleterious materials will need to be removed from the building envelope.

Topsoil containing grass roots must be removed from the area on which the footing will rest.

Earthworks should be carried out in accordance with AS3798 ‘Earthworks for Residential and Commercial Developments’. Unsuitable materials in structural fill are listed in AS2870 Section 4.3.

The base of the excavation must be generally level but may slope not more than 1:40 to allow excavations to drain.

Pad Preparation - Compaction

Ordinarily, compaction is not recommended for CLAY soils, but in this case, Emerson Class 1 to Class 2 soil layers is to be compacted if exposed at surface.

It is recommended that any crushed rock, sand or granular soils across the building pad, filled areas and the base of the footing excavations are compacted with several passes with a medium weight (~80 kg) plate compactor.

Bored Pier Impediments - Obstructions

There were no obvious impediments to auguring such as cobbles or boulders obstructions which may be of concern.

Foundation Maintenance

Details on appropriate site and foundation maintenance practises from the CSIRO BTF 18 Foundation Maintenance and Footing Performance: A Homeowner’s Guide are presented in Appendix I of this report.

Kris Taylor, BSc (hons)

Environmental & Engineering Geologist

Notes About Your Assessment

The Site classification provided and footing recommendations including foundation depths are assessed based on the subsurface profile conditions present at the time of fieldwork and may vary according to any subsequent *Site works* carried out. *Site works* may include changes to the existing soil profile by cutting more than 0.5 m and filling more than 0.4 to 0.8 m depending on the type of material and the design of the footing. All footings must be founded through fill *other than* sand not exceeding 0.4 m depth or sand not exceeding 0.8 m depth, or otherwise a Class P applies (AS2870 Clauses 2.5.2 and 2.5.3).

For reference, borehole investigation depths relative to natural soil surface levels are stated in borehole logs where applicable.

In some cases, variations in actual Site conditions may exist between subsurface investigation boreholes. At the time of construction, if conditions exist which differ from those described in this report, it is recommended that the base of all footing excavations be inspected to ensure that the founding medium meets the requirement referenced herein or stipulated by an engineer before any footings are poured.

The site classification assumes that the performance requirements as set out in Appendix B of AS 2870 are acceptable and that site foundation maintenance is carried out to avoid extreme wetting and drying.

It is the responsibility of the homeowner to ensure that the soil conditions are maintained and that abnormal moisture conditions do not develop around the building. The following are examples of poor practises that can result in abnormal soil conditions:

- The effect of trees being too close to a footing.
- Excessive or irregular watering of gardens adjacent to the building.
- Failure to maintain Site drainage.
- Failure to repair plumbing leaks.
- Loss of vegetation near the building.

The pages that make up the last six pages of this report are an integral part of this report. The notes contain advice and recommendations for all stakeholders in this project (i.e. the structural engineer, builder, owner, and future owners) and should be read and followed by all concerned.

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Appendix A Mapping

Figure 1 Site Borehole Locations

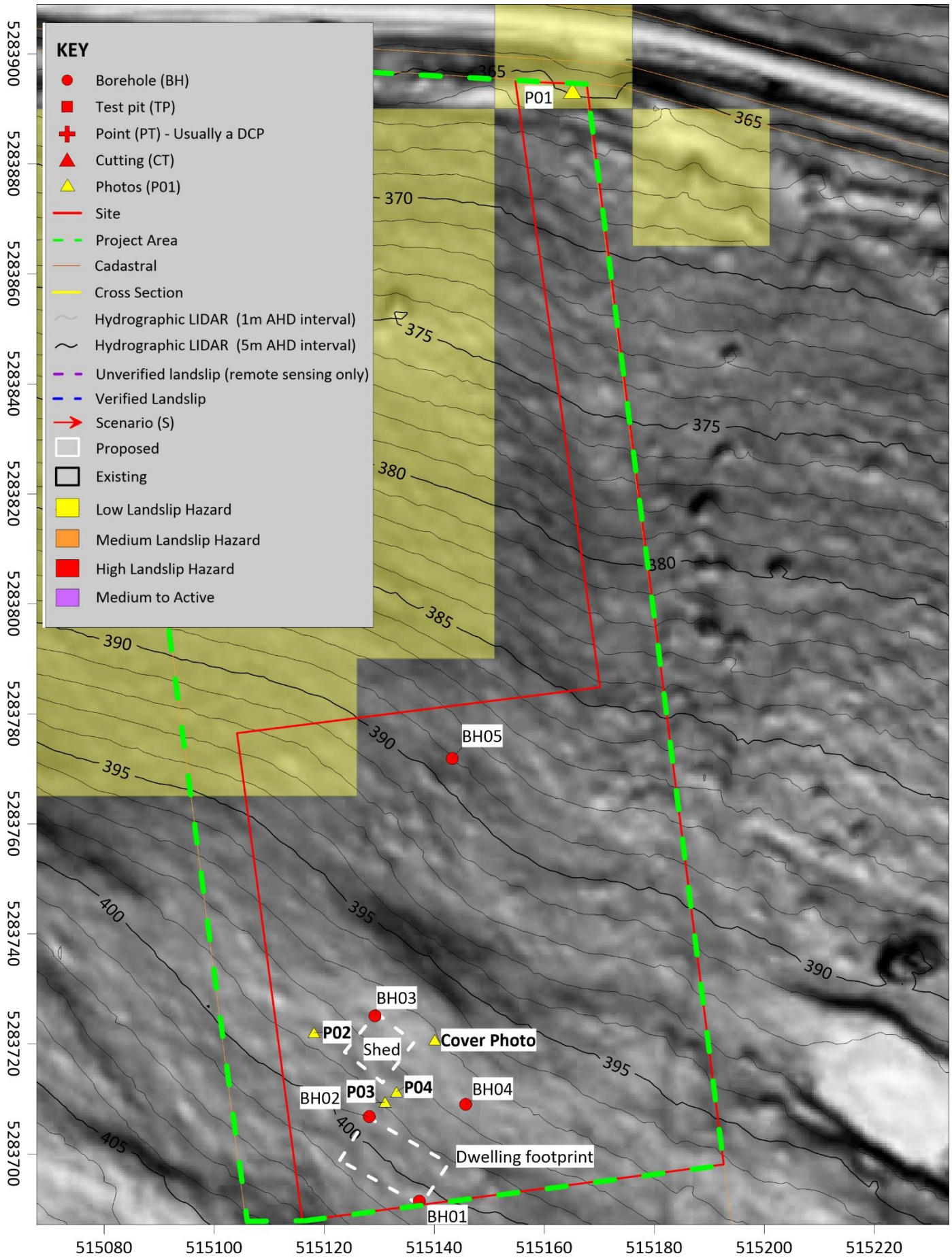

Figure 2 Hill shade model showing photo location and landslip overlay

Appendix B Site Photos

Photo 1 capturing the proposed driveway crossover/cut location which falls within the low landslide hazard overlay

Photo 2 Showing the proposed shed location with exposed sandstone bedrock

Photo 3 Showing the proposed dwelling location with exposed sandstone bedrock

Photo 4 Showing the proposed dwelling location with exposed sandstone bedrock

Appendix C Borehole Logs

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Positioning: GDA94 & mAHD

ASSESSMENT: Geotechnical Site Investigation
STRUCTURE: Dwelling And Shed
EASTING: 515137.5 **ACCURACY**
NORTHING: 5283691.5 **HORIZ:** 0.61m **VERT:** ~0.1m

Borehole : BH01
DATE TESTED: 26/08/2025
LOGGED BY: M. Scalisi
ELEVATION: 400.6

LOCATION: 570 Huntingdon Tier Road - Bagdad
CLIENT: Troy and Cheryllyn Thompson

EQUIPMENT: AMS Powerprobe 9120 RAP
ESTIMATED GROUND m (m AHD):

DEPTH (m)	GRAPHIC	DESCRIPTION	DENSITY CONSIST. STRENGTH	LAYER	ELEVATION (mAHD)	MOISTURE Index	MOISTURE %	MOISTURE Well	SAMPLE	TEST	Cu (kPa)	UCS (kg/cm²)	(IS50 MPa) (CBR) NSPT	NDCP/100mm
0.0	SM	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch	very loose	2	400.5		6		DS				(1)	0.5
													(1)	0.5
													(3)	2.0
					400.3	Dry							(3)	6.0
	SM	SOIL & COBBLES/BOULDERS: Silty SAND, yellowish brown, well sorted, fine to medium grained sand, trace roots, trace clay, 5 % roots and charcoal	loose to dense	3									(17)	9.0
0.5					400.1		9		DS				(9)	6.0
													(9)	5.0
					399.9								(7)	
		Distinctly Weathered SANDSTONE Bedrock brownish yellow		6										
					399.7								(REF)	REF

Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock

End of borehole at 0.9m depth.

GROUNDWATER: Not Encountered

PAGE 1 of 1

TESTING: Penetrometer: AS 1289.6.3.2

DCP Blows per 100mm. For penetrometer blows per 100mm <1, distance travelled per blow is measured and converted back to blows per 100mm

DS: disturbed sample; PV: pocket vane; PP: pocket penotrometer; FV(Ømm): downhole field vane; U50: undisturbed 50mm sample; REF: DCP refusal

enviro·tech CONSULTANTS

Positioning: GDA94 & mAHD

ASSESSMENT: Geotechnical Site Investigation
STRUCTURE: Dwelling And Shed
EASTING: 515128 **ACCURACY**
NORTHING: 5283707 **HORIZ:** 0.6m **VERT:** ~0.1m

Borehole : BH02
DATE TESTED: 26/08/2025
LOGGED BY: M. Scalisi
ELEVATION: 399.6

LOCATION: 570 Huntingdon Tier Road - Bagdad
CLIENT: Troy and Cheryllyn Thompson

EQUIPMENT: AMS Powerprobe 9120 RAP
ESTIMATED GROUND m (m AHD):

DEPTH (m)	GRAPHIC	DESCRIPTION	DENSITY CONSIST. STRENGTH	LAYER	ELEVATION (mAHD)	MOISTURE Index	MOISTURE %	MOISTURE Well	SAMPLE	TEST	Cu (kPa)	UCS (kg/cm²)	(IS50 MPa) (CBR) NSPT 0 10 20 30 40	NDCP/100mm 0 5 10 15 20
0.0	SM	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch	very loose	2	399.5	Dry	10						(1)	0.4
													(1)	0.4
	SC	SOIL & COBBLES/BOULDERS: Clayey SAND, yellowish brown, well sorted, fine grained sand, with gravel, trace roots, trace silt, 5 % roots and charcoal		5	399.3				DS				(1)	0.5
													(1)	0.5
0.5		Distinctly Weathered SANDSTONE Bedrock brownish yellow	extremely low	6	399.1				PL	IS 50			0.02 MPa	
													(REF)	REF
													(REF)	

Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock

End of borehole at 0.5m depth.

GROUNDWATER: Not Encountered

PAGE 1 of 1

TESTING: Penetrometer: AS 1289.6.3.2

DCP Blows per 100mm. For penetrometer blows per 100mm <1, distance travelled per blow is measured and converted back to blows per 100mm

DS: disturbed sample; PV: pocket vane; PP: pocket penotrometer; FV(Ømm): downhole field vane; U50: undisturbed 50mm sample; REF: DCP refusal

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Positioning: GDA94 & mAHD

ASSESSMENT: Geotechnical Site Investigation
STRUCTURE: Dwelling And Shed
EASTING: 515129.5 **ACCURACY**
NORTHING: 5283725 **HORIZ:** 0.6m **VERT:** ~0.1m

Borehole : BH03
DATE TESTED: 26/08/2025
LOGGED BY: M. Scalisi
ELEVATION: 397.7

LOCATION: 570 Huntingdon Tier Road - Bagdad
CLIENT: Troy and Cheryllyn Thompson

EQUIPMENT: AMS Powerprobe 9120 RAP
ESTIMATED GROUND m (m AHD):

DEPTH (m)	GRAPHIC	DESCRIPTION	DENSITY CONSIST. STRENGTH	LAYER	ELEVATION (mAHD)	MOISTURE Index	MOISTURE %	MOISTURE Well	SAMPLE	TEST	Cu (kPa)	UCS (kg/cm²)	(IS50 MPa) (CBR) NSPT	NDCP/100mm
0.0	SM	SOIL & COBBLES/BOULDERS: Silty SAND trace gravel, trace clay, black, well sorted, fine grained sand	medium dense to dense	1	397.6	Moist							(28)	14.0
					397.4								(30)	15.0
													(30)	15.0
													(30)	4.0
	SM	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch	medium dense	2	397.2	Slightly Moist							(7)	5.0
0.5													(3)	1.9
	SM	SOIL & COBBLES/BOULDERS: Silty SAND, yellowish brown, well sorted, fine to medium grained sand, trace roots, trace clay, 5 % roots and charcoal	loose to medium dense	3	397.0								(3)	2.8
													(4)	2.8
					396.8	Dry							(12)	7.0
													(9)	6.0
1.0	CH	CLAY with sand, grey, mottled yellowish brown, high plasticity, fine grained sand	very stiff	4			18		DS				(7)	5.0
					396.6								(9)	6.0
													(9)	9.0
					396.4									
		Distinctly Weathered SANDSTONE Bedrock brownish yellow		6										
1.5					396.2								(REF)	REF

Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock

End of borehole at 1.5m depth.

GROUNDWATER: Not Encountered

PAGE 1 of 1

TESTING: Penetrometer: AS 1289.6.3.2

DCP Blows per 100mm. For penetrometer blows per 100mm <1, distance travelled per blow is measured and converted back to blows per 100mm

DS: disturbed sample; PV: pocket vane; PP: pocket penotrometer; FV(Ømm): downhole field vane; U50: undisturbed 50mm sample; REF: DCP refusal

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Positioning: GDA94 & mAHD

ASSESSMENT: Geotechnical Site Investigation
STRUCTURE: Dwelling And Shed
EASTING: 515146
NORTHING: 5283709
ACCURACY
HORIZ: 0.77m **VERT:** ~0.1m

Borehole : BH04
DATE TESTED: 26/08/2025
LOGGED BY: M. Scalisi
ELEVATION: 397.8

LOCATION: 570 Huntingdon Tier Road - Bagdad
CLIENT: Troy and Cheryllyn Thompson

EQUIPMENT: 50mm Christie Post Driver
ESTIMATED GROUND m (m AHD):

DEPTH (m)	GRAPHIC	DESCRIPTION	DENSITY CONSIST. STRENGTH	LAYER	ELEVATION (mAHD)	MOISTURE Index	MOISTURE %	MOISTURE Well	SAMPLE	TEST	Cu (kPa)	UCS (kg/cm²)	(IS50 MPa) (CBR) NSPT	NDCP/100mm
0.0	SM	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch		2	397.7									
	SM	SOIL & COBBLES/BOULDERS: Silty SAND, yellowish brown, well sorted, fine to medium grained sand, trace roots, trace clay, 5 % roots and charcoal		3	397.5	Dry								
0.5	CH	CLAY with sand, grey, mottled yellowish brown, high plasticity, fine grained sand	very stiff	4	397.3	Slightly Moist								
					397.1									
1.0					396.9									
					396.7									
					396.5									
		Distinctly Weathered SANDSTONE Bedrock brownish yellow		6										
1.5		Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock End of borehole at 1.5m depth.			396.3									

GROUNDWATER: Not Encountered

TESTING:

DS: disturbed sample; PV: pocket vane; PP: pocket penotrometer; FV: downhole field vane; U50: undisturbed 50mm sample; REF: DCP refusal

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Positioning: GDA94 & mAHD

ASSESSMENT: Geotechnical Site Investigation
STRUCTURE: Dwelling And Shed
EASTING: 515143.5
NORTHING: 5283772
ACCURACY
HORIZ: 0.6m **VERT:** ~0.1m

Borehole : BH05
DATE TESTED: 26/08/2025
LOGGED BY: M. Scalisi
ELEVATION: 389.3

LOCATION: 570 Huntingdon Tier Road - Bagdad
CLIENT: Troy and Cheryllyn Thompson

EQUIPMENT: 50mm Christie Post Driver
ESTIMATED GROUND m (m AHD):

DEPTH (m)	GRAPHIC	DESCRIPTION	DENSITY CONSIST. STRENGTH	LAYER	ELEVATION (mAHD)	MOISTURE Index	MOISTURE %	MOISTURE Well	SAMPLE	TEST	Cu (kPa)	UCS (kg/cm²)	(IS50 MPa) (CBR) NSPT	NDCP/100mm
0.0	SM	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch		2	389.3									
	SM	SOIL & COBBLES/BOULDERS: Silty SAND, yellowish brown, well sorted, fine to medium grained sand, trace roots, trace clay, 5 % roots and charcoal		3	389.1	Moist								
0.5	CH	CLAY with sand, grey, mottled yellowish brown, high plasticity, fine grained sand		4	388.9	Slightly Moist								
1.0	SC	SOIL & COBBLES/BOULDERS: Clayey SAND, yellowish brown, well sorted, fine grained sand, with gravel, trace roots, trace silt, 5 % roots and charcoal		5	388.7	Dry	12		DS					
		Distinctly Weathered SANDSTONE Bedrock brownish yellow		6	388.5									
		Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock End of borehole at 1.2m depth.			388.3									
					388.1									

GROUNDWATER: Not Encountered

TESTING:

DS: disturbed sample; PV: pocket vane; PP: pocket penotrometer; FV: downhole field vane; U50: undisturbed 50mm sample; REF: DCP refusal

Appendix D Core Photographs

BH01

BH02

BH03

*** 1 metre core tray length**

BH04

BH05

*** 1 metre core tray length**

Appendix E Explanatory Notes

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USCS Soil Classification Methodology

Soil classification was undertaken in accordance with the Unified Soil Classification System (USCS) and AS 1726 – Geotechnical Site Investigations, using a combination of particle size distribution and plasticity assessment. This process was applied consistently to all soil layers encountered.

1. Particle Size Distribution (Wet Sieve Analysis)

Particle size analysis was performed by wet sieving in accordance with Australian Standard sieve sizes:

- Gravel fraction: >2.36 mm
- Sand fraction: 0.075 mm to 2.36 mm
- Fines fraction (silt + clay): <0.075 mm

Samples were soaked (often overnight) to fully disperse fines prior to sieving. Wet sieving is particularly effective for Tasmanian soils, which are often dispersive, ensuring accurate quantification of the fines fraction. The oversize fraction (>63 mm) was excluded from the mass percentages before classification.

2. Plasticity Assessment

Plasticity of the fines fraction was determined using:

- Laboratory Atterberg limits, where available, with liquid limit (WL) and plasticity index (PI) plotted on the Plasticity Chart (AS 1726) to determine the fines classification (silt vs clay) and plasticity level (low, medium, high).
- Field index tests (where Atterberg limits were not available), following Table 1 & Table 2:
    - Dry strength – resistance of dried soil to crushing.
    - Dilatancy – reaction of a moist soil pat to shaking.
    - Toughness – resistance of a soil thread near the plastic limit.

Table 1 Field Assessment of Fine-Grained Soils (adapted from AS 1726 Table 7)

Dry Strength		Dilatancy (reaction to shaking)		Toughness (consistency near plastic limit)	
None	The dry specimen crumbles into powder with mere pressure of handling.	None	No visible reaction or change in the specimen.	Low	Only slight pressure is required to roll the thread near the plastic limit. The thread and the lump are weak and soft.
Low	The dry specimen crumbles into powder with some finger pressure.	Slow	Water appears slowly on the surface of the specimen during shaking and does not disappear during squeezing.		
Medium	The dry specimen breaks into pieces or crumbles with considerable finger pressure.			Medium	Medium pressure is required to roll the thread to near the plastic limit. The thread and the lump have medium stiffness.
High	The dry specimen cannot be broken with finger pressure. Specimen will break into pieces between thumb and a hard surface.	Rapid	Water appears quickly on the surface of the specimen during shaking and disappears during squeezing.	High	Considerable pressure is required to roll the thread near the plastic limit. The thread and the lump have very high stiffness.
Very High	The dry specimen cannot be broken between the thumb and a hard surface.				

Table 2 Identification of Fine-Grained Soils by Visual–Tactile Methods (adapted from AS 1726 Table 8)

Soil description	Identification of inorganic fine-grained soils		
	Dry Strength	Dilatancy	Toughness and Plasticity
SILT	None to low	Slow to rapid	Low or thread cannot be formed
Clayey SILT — Clay/silt mixtures of low plasticity	Low to medium	None to slow	Low to medium
Silty CLAY — Silt/clay mixtures of medium plasticity	Medium to high	None to slow	Medium
High plasticity CLAY	High to very high	None	High

3. Classification Hierarchy

3.1 Fine- vs Coarse-Grained determination

- Fine-grained soils: More than 35% (by mass) passes the 0.075 mm sieve → classify using Table 3
- Coarse-grained soils: More than 65% (by mass) is retained on the 0.075 mm sieve → classify using Table 4.

3.2 Coarse-grained soils (Table 4):

1. **Determine Gravel vs Sand:**
    - Gravel (G*) – more than 50% of the coarse fraction is retained on the 2.36 mm sieve.
    - Sand (S*) – less than 50% of the coarse fraction is retained on the 2.36 mm sieve.
2. **Assign fines modifiers:**
    - ≤5% fines: "Clean" gravels/sands (GW, GP, SW, SP).
    - 5–12% fines: Dual classification (e.g., SP-SM, GW-GM).
    - ≥12% fines: Silty or clayey modifiers (GM, GC, SM, SC) based on fines plasticity from Atterberg limits or field index tests.

3.3 Fines classification for coarse-grained soils

When coarse-grained soils contain ≥12% fines, the fines fraction is classified as silty or clayey based on:

- Atterberg limits where available; or
- Field index tests (Table 1 & Table 2) where Atterberg limits are not available.

3.4 Fine-grained soils (Table 3)

Fine-grained soils are those with >35% (by mass) passing the 0.075 mm sieve.

- With Atterberg limits available: WL and PI are plotted on the Plasticity Chart (AS 1726) to determine plasticity level (low, medium, or high) and USCS classification (ML, CL/CI/CH, MH, OL, OH).
- Where Atterberg limits are not available: The fines are classified directly in accordance with Table 3 by comparing field index test results (dry strength, dilatancy, toughness) to the criteria given for each USCS group. This allows direct assignment of ML, CL/CI/CH, MH, or OL/OH without reference to the A-line.

Organic soils (OL, OH) are identified based on colour, odour, and fibrous texture in addition to field index characteristics.

4. Integration of Results

The final USCS group symbol for each layer was determined by integrating:

- The proportion of gravel, sand, and fines from wet sieve analysis.
- The classification of the fines fraction using either Atterberg limits or field index methods.
- The classification hierarchy in Table 3 & Table 4.

This combined approach ensures that soil classification is both quantitatively accurate and fully compliant with AS 1726, while allowing consistent classification whether laboratory Atterberg limit testing is available.

Table 3 Classification of Fine-Grained Soils (adapted from AS 1726 Table 10)

Major Division	Group Symbol	Typical names	Field classification of silt and clay			Laboratory classification
			Dry strength	Dilatancy	Toughness	% <0.075
SILT and CLAY (low to medium plasticity, %)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
	CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
	OL	Organic silt	Low to medium	Slow	Low	Below A line
SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
	CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
	OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
Highly organic soil	Pt	Peat, highly organic soil	—	—	—	—

Table 4 Classification of Coarse-Grained Soils (adapted from AS 1726 Table 9)

Major Division	Group Symbol	Typical names	Field classification of sand and gravel	Laboratory classification
GRAVEL (more than half of coarse fraction is larger than 2.36 mm)	GW	Gravel and gravel–sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤5% fines, Cu > 4, 1 < Cc < 3
	GP	Gravel and gravel–sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤5% fines, fails to comply with above
	GM	Gravel–silt mixtures and gravel–sand–silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥12% fines, fines are silty

Major Division	Group Symbol	Typical names	Field classification of sand and gravel	Laboratory classification
	GC	Gravel–clay mixtures and gravel–sand–clay mixtures	'Dirty' materials with excess plastic fines, medium to high dry strength	≥12% fines, fines behave as clay
SAND (more than half of coarse fraction is smaller than 2.36 mm)	SW	Sand and gravel–sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤5% fines, Cu > 6, 1 < Cc < 3
	SP	Sand and gravel–sand mixtures, little or no fines, uniform sands	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤5% fines, fails to comply with above
	SM	Sand–silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥12% fines, fines are silty
	SC	Sand–clay mixtures	'Dirty' materials with excess plastic fines, medium to high dry strength	≥12% fines, fines are clayey

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Standard Methodology for Determination of Soil Reactivity and Index of Shrink–Swell (Ips) for SIFE Investigations

1. Introduction

This methodology outlines the procedures adopted by Enviro-Tech Consultants Pty. Ltd. for determining soil reactivity and deriving the Index of Shrink–Swell (Ips) for each soil layer in accordance with the principles of AS 2870. The method combines Australian Standard testing procedures with enhanced correlation techniques developed from an extensive dataset of over 2,000 field and laboratory tests.

The approach ensures consistent, accurate classification of soil reactivity across a wide range of soil types. By combining standard and modified testing procedures, it enables calculation of profile movement for complex soil profiles, accounting for groundwater levels, bedrock depth, and particle size distribution.

2. Sampling and Preparation

2.1 Undisturbed Sampling

Undisturbed samples are collected using a thin-wall sampler to preserve natural soil structure and in-situ moisture conditions when performing shrink–swell testing. A 45 mm diameter core sampler is used for these tests to ensure uniformity and comparability between results. Most other laboratory testing is carried out on disturbed samples, which is one of the advantages of the linear shrinkage and modified linear shrinkage testing methods.

2.2 Sample Identification

All samples are assigned a Unified Soil Classification System (USCS) code using accurate laboratory and field identification techniques in accordance with AS 1726 (detailed procedure included herein). This classification underpins the correlation methods described in later sections.

2.3 Moisture Content Measurement

Field moisture content is recorded at the time of sampling, providing baseline data for correlation to laboratory shrink–swell results.

3. Standard Testing Procedures

3.1 Shrink–Swell Testing

Shrink–swell testing is performed on cohesive soils in accordance with the relevant Australian Standard method for determining the shrink–swell index. This test provides the primary Ips value for these soil types.

3.2 Linear Shrinkage Testing

Linear shrinkage testing is carried out in accordance with the Australian Standard method, which determines shrinkage from a soil prepared at its liquid limit. This standard approach typically excludes a proportion of the sandy fraction.

4. Secondary Modified Linear Shrinkage Method

4.1 Rationale

In practice, the relationship between shrink–swell test results and standard linear shrinkage results is often inconsistent, particularly for non-cohesive or marginally cohesive soils. To improve correlation, a secondary modified linear shrinkage method has been developed.

4.2 Modified Moisture Basis

Instead of preparing samples solely at the liquid limit, this method uses a "modified moisture" content representative of upper-range field moisture conditions for each USCS soil type. These values are derived from a dataset of over 2,000 samples collected predominantly during winter or immediately thereafter, representing the highest seasonal moisture levels without crossing into "abnormal moisture conditions" as defined in AS 2870.

4.3 Application to Non-Cohesive Soils

This approach enables reactivity assessment of sandy and silty soils that are unsuitable for shrink–swell testing due to their inability to remain intact during testing, but which still display measurable reactivity.

5. Gravel and Cobble Fraction Adjustments

5.1 Gravel Fraction

For all materials, the sand fraction is retained in testing, and the gravel fraction is re-added into the calculation. Because gravel has negligible moisture absorption, its proportion is used to adjust shrinkage values downwards.

5.2 Cobbles

Where cobbles are present:

- 0–35% cobbles: shrinkage is scaled according to the proportion of soil matrix between cobbles.
- 35% cobbles: shrinkage is considered negligible, as the soil matrix is insufficient to impart meaningful reactivity.

6. Correlation and Calibration

6.1 Dataset Development

Extensive correlation has been undertaken between:

- Standard shrink–swell results
- Standard linear shrinkage results
- Modified linear shrinkage results

6.2 USCS-Based Correlation

Accurate USCS classification is the key input variable. Once correlations are established for each USCS class, Ips values can be assigned to future samples based solely on classification and moisture parameters, without requiring repeated shrink–swell testing.

7. Predictive Modelling and Database Search Method

Enviro-Tech Consultants maintains a large and continuously expanding database of soil test results, including shrink–swell, linear shrinkage, particle size distribution, USCS classification, and detailed field descriptions (e.g., colour, texture, structure).

When assessing a new Site, we search this database for comparable sites using multiple parameters:

- Geology – parent material type and origin
- USCS classification – precise laboratory classification

- Soil colour and descriptive features – matching field logging records
- Particle size distribution – percentage gravel, sand, and fines

This multi-parameter search allows us to identify highly similar soils and adopt Ips values from past testing at those sites with confidence. The approach reduces the need for repeated shrinkage or shrink–swell testing where soils are well represented in the database, while still meeting the requirements for reliable reactivity estimation.

8. Compliance with AS 2870 – Clause 2.3.2 (C2 & C3)

Our predictive approach aligns directly with the requirements of AS 2870 Clause 2.3.2:

c (ii): We maintain and utilise a database of past test results to estimate soil reactivity for sites with similar soil and geological conditions.

C (iii): Testing is repeated at regular intervals to ensure correlations remain valid. At minimum, reactivity testing is conducted once every 50 sites, but in practice we test far more frequently – typically at least once every 20 sites, and rarely more than six months between tests. On average, new verification testing is undertaken approximately monthly.

This compliance ensures that our methods are both technically robust and standards-compliant, providing clients with defensible, high-quality results.

9. Calculation of Profile Movement

9.1 Ips Values per Layer

An Ips value is determined for each soil layer based on test results or correlations.

9.2 Adjustment for Groundwater and Bedrock

Where groundwater or bedrock occurs within the profile, Ips values are reduced for the affected layers in accordance with AS 2870 principles.

9.3 Design Suction Change Depth (Hs)

Given the lack of statewide, high-resolution climatic data for Tasmania, a conservative Hs value of 3.0 m is adopted for all sites, in preference to regionalised values. This ensures a cautious approach where actual depth of suction change cannot be accurately modelled.

9.4 Surface Suction Change (Δus)

A standard surface suction change of 1.2 is applied in calculations, in line with AS 2870.

10. Advantages of the Modified Method

- Allows for reactivity assessment across all soil types, including non-cohesive sands and silts.
- Provides consistent correlation between laboratory and field methods.
- Enables accurate whole-profile movement estimation based on standardised USCS classification.
- Incorporates gravel and cobble fraction corrections for more realistic movement predictions.
- Reduces reliance on repeat laboratory shrink–swell testing for every sample.
- Fully compliant with AS 2870 Clause 2.3.2 (C2 & C3).

11. Limitations

- The method assumes accurate USCS classification and field moisture determination.
- The modified linear shrinkage method requires prior calibration for each USCS type.
- Adoption of a conservative Hs value may slightly overestimate movement in some locations.

12. Conclusion

This methodology blends rigorous Australian Standard test procedures with enhanced, data-driven correlation techniques, enabling Enviro-Tech Consultants Pty. Ltd. to deliver accurate, consistent, and site-specific soil reactivity assessments across Tasmania. The inclusion of >2,000 test results, gravel and cobble adjustments, predictive modelling from a comprehensive database, and modified moisture testing provides a robust basis for predicting profile movement in varied geological conditions, while maintaining strict compliance with AS 2870.

Appendix F Soil and Rock Testing

Dynamic Cone Penetrometer (DCP)

Dynamic cone penetrometer (DCP) testing was conducted according to AS 1289.6.3.2 with the results presented in **Appendix C**.

Soil Characterisation

Table 5 summarises the soil classification results for each layer encountered, including particle size distribution, plasticity assessment, and the assigned USCS group symbol.

Classifications were undertaken in accordance with AS 1726 – Geotechnical Site Investigations using the methodology provided in the Explanatory Notes section of this report.

Particle size distributions were determined by wet sieve analysis, and fines classifications were based on Atterberg limits where available, or on field index tests (dry strength, dilatancy, toughness) in accordance with AS 1726 Tables 7, 8, 9, and 10.

Full explanatory notes and reference tables are provided in Explanatory Notes section of this report.

Table 5 Summary of the Soil Characterisation

Layer	Soil	Borehole	Depth From (m)	Field Moisture %	Gravel %	Sand %	Fine %	Analysed Plasticity	Assigned USCS
2	SAND	BH01	0.1	5.7	8.4	68.9	22.7		SC
3	Silty SAND	BH01	0.5	8.9	2.7	66.6	30.7		SC
4	CLAY	BH03	1.0	18.4	0.2	24.7	75.1	H	CH
5	Clayey SAND	BH02	0.2	9.5	19.1	54.3	26.6		SC
5	Clayey SAND	BH05	0.9	12.2	0	50.3	49.7	M	

Soil Dispersion (Emerson aggregate test)

Select soil samples were tested for dispersion susceptibility using the Emerson Class number method according to AS1289.3.8.1. The results presented in Table 6 demonstrate that:

- Deeper soil Layers comprises Emerson Class 1 category soils which are considered severely dispersive. This layer is only present is BH03, BH04, and BH05.
- Most of the soil except for Layer 4 is considered either not dispersive (Class 4 or greater) or only slightly dispersive (Class 3).
- A 0.4 to 0.8m deep non dispersive capping layer is present over the top of Layer 4 in BH03. BH04, and BH05.

Table 6 Summary of the Emerson class results.

Layer	Soil	Depth	Sample ID	Emersion Class	Date Tested	Water	pH
2	SOIL & COBBLES/BOULDERS: SAND	0.1	BH01 0.1	Class >4	26/08/2025	DI 13°C	3.6
5	SOIL & COBBLES/BOULDERS: Clayey SAND	0.2	BH02 0.2	Class 3	26/08/2025	DI 13°C	5.3
3	SOIL & COBBLES/BOULDERS: Silty SAND	0.5	BH01 0.5	Class 3	26/08/2025	DI 13°C	5.6
5	SOIL & COBBLES/BOULDERS: Clayey SAND	0.9	BH05 0.9	Class >4	26/08/2025	DI 13°C	
4	CLAY with sand	1	BH03 1.0	Class 1	26/08/2025	DI 13°C	5.5

Soil Aggressivity Testing (Footing Exposure Classification)

Soil samples from across the Site were assessed for potential aggressivity to concrete in accordance with the requirements of AS 2870:2011 – Residential Slabs and Footings (Clauses 5.5.1–5.5.3). Testing was undertaken to determine the salinity exposure class and provide an indicative assessment of sulphate soil potential.

The results are summarised in Table 7 which presents the sampling depth and location, soil texture classification, electrical conductivity (EC1:5), salinity factor (K), calculated saturated extract electrical conductivity (ECe), and the corresponding salinity exposure class (Table 5.1, AS 2870). Soil pH values were also measured and used as a conservative indicator of potential sulphate aggressivity, together with the assigned soil condition class, to derive an indicative sulphate exposure class (Table 5.2, AS 2870).

It is noted that the sulphate assessment has been undertaken on the basis of pH values only, and therefore represents a conservative assumption. Where soils exhibit pH < 5.5 or are otherwise classified within B or C exposure classes, confirmatory laboratory testing of sulphate concentrations may be warranted to refine the exposure classification and confirm appropriate concrete durability requirements.

Salinity testing has been undertaken in accordance with the relevant guidelines and provides a direct basis for assigning salinity exposure classification.

Where aggressive soils are discerned, detailed recommendations for the management of aggressive soils, including concrete strength, curing and reinforcement cover requirements, are presented in Appendix G.

Table 7 Soil Aggressivity Assessment in Accordance with AS 2870:2011

Layer	Location	Depth	Saline Soil Determination					Sulphate Soil Potential^		
		From (m)	USDA Soil Texture Class	EC1:5 mS/cm	K*	Ece dS/m	Exposure Class	pH1:5	Soil Condition Class	Exposure Class
2	BH01	0.1	Loamy sand	1.84	13.0	23.92	B2	3.6	B	B2^
3	BH01	0.5	Loamy sand	0.1	13.0	1.30	A1	5.6	B	A1
4	BH03	1.0	Clay	0.14	5.5	0.77	A1	5.5	B	A2^
5	BH02	0.2	Sandy clay loam	0.07	7.5	0.53	A1	5.3	B	A2^
5	BH05	0.9	Sandy clay loam	0.11	7.5	0.83	A1	5.7	B	A1

^ Preliminary findings based on soil pH only. Further sulphate testing required to rule out sulphate soil exposure risks

*Electrical conductivity of the 1:5 soil–water extract (EC1:5) was measured at 25 °C and converted to an equivalent saturated paste extract (ECe) using texture-based conversion factors (ECe = k × EC1:5) following Slavich, P.G. & Patterson, R.A. (1990). Estimating the electrical conductivity of saturated paste extracts from 1:5 soil:water suspensions and texture. Australian Journal of Soil Research, 28, 453–463.

Rock Point Load Testing

Rock samples collected from the Project Area were tested using a digital rock point load tester which has been manufactured in accordance with AS 4133.4.1. The 'lump' sample method and calculation have been used in the tests.

A sandstone rock sample was collected from the base of BH02 building envelope. The Sandstone inferred to have an extremely low rock strength based on interpretation of the point load testing results (Table 8)

Table 8 Point load index testing results – single test

	Units	BH02
Depth	m	0.400
Layer		6
Test	MPa (IS50)	0.017
Index		EL

Appendix G Geotechnical Interpretation

Footing Minimum Target Depths

Footing design for the proposed structures are to consider the depths of limiting layers at the base of potentially problematic soils. Where practical/allowable, thickened beams may be deepened through problematic soil layers according to engineering specifications (Table 9). Table 10 should be referred to where only 50kPa allowable bearing capacity is required.

Table 9 also presents a summary of the estimated soil depths and associated layers where less than 5mm of vertical soil movement can expected due to soil moisture fluctuations from normal seasonal wetting and drying cycles. Where 5mm tolerances are required, concentrated loads including but not limited to slab edge or internal beam or strip footings shall be supported directly on piers in accordance with minimum target layer depths presented in Table 9, with considerations given to required bearing capacities in accordance with Table 10.

All footing depth, soil movement, and bearing capacity calculations presented in this section are based on interpretive I_{PS} or I_{SS} values derived from field and laboratory data, as outlined in the Explanatory Notes section of this report. These values are used to infer soil reactivity in the absence of direct measurement, in accordance with industry best practice.

Table 9 Soil characteristic surface movements and recommended footing minimum target depths

	Shed	Dwelling		
Footing design parameters	**BH03**	**BH01**	**BH02**	**BH04**
Ys Calculation Depth	0m^	0m^	0m^	0m^
Surface movement Ys (mm)	20	5	5	30
Soil reactivity class	S	S	S	M
Base of problem soil layer (m)*	0.6	0.3	0.4	1.3
Layer at base of problem soil*	3	3	6	6
Pier/Footing minimum target depth (m)#	>1.4^	^0.7	^0.4	>1.4^
Pier/footing minimum target layer#	6	6	6	6
Allowable bearing capacity at min target depth (kPa)#	400	400	400	400

- No problem layers encountered
^ Calculations relative to surface of borehole at the time of investigation
~ Calculated based on revised soil profile depth/thickness following indicative cut and fill. Inferred fill reactivity indicated (Iss value) which is typically based on more reactive soils expected to be encountered within inferred cut.
* Base of problematic soil layer depth below top of borehole surface at the time of testing to achieve 100 kPa allowable bearing capacity or greater.
# Target soil layer depth where Ys values from normal wetting and drying cycles are estimated at less than 5mm vertical movement. >minimum bored pier depths (see bearing capacity table for bored pier design depths).

Soil and Rock Allowable Bearing Capacity & End Bearing Capacity

Soil allowable bearing capacity was calculated from correlations with DCP blow counts. A recommended safety factor of 3 is applied in accordance with AS2870. Where high clay and silt content is observed in the soil, soil allowable bearing capacity is determined from undrained shear strengths using field vane correlated DCP values. Interpretive bearing capacity values are presented in Table 10.

Table 10 Soil allowable bearing capacities and problematic ground conditions.

Depth below investigation surface (m)	Allowable Bearing Capacity (kPa)				
	BH01	BH02	BH03	BH04	BH05
0	30~	20~	>400		
0.1	50~	20~	>400		
0.2	130	30~	>400		
0.3	**250***	30~	370		
0.4	**310**	**SANDSTONE**	150		
0.5	**290**	**REF**	140~		
0.6	**240**		**110***		
0.7	**SANDSTONE**		**170**		
0.8	**SANDSTONE**		**210**		
0.9	**REF**		**240**		
1			**230**		
1.1			**280**		**SANDSTONE**
1.2			**320**		
1.3			**SANDSTONE**	**SANDSTONE**	
1.4			**SANDSTONE**	**SANDSTONE**	
1.5			**REF**		

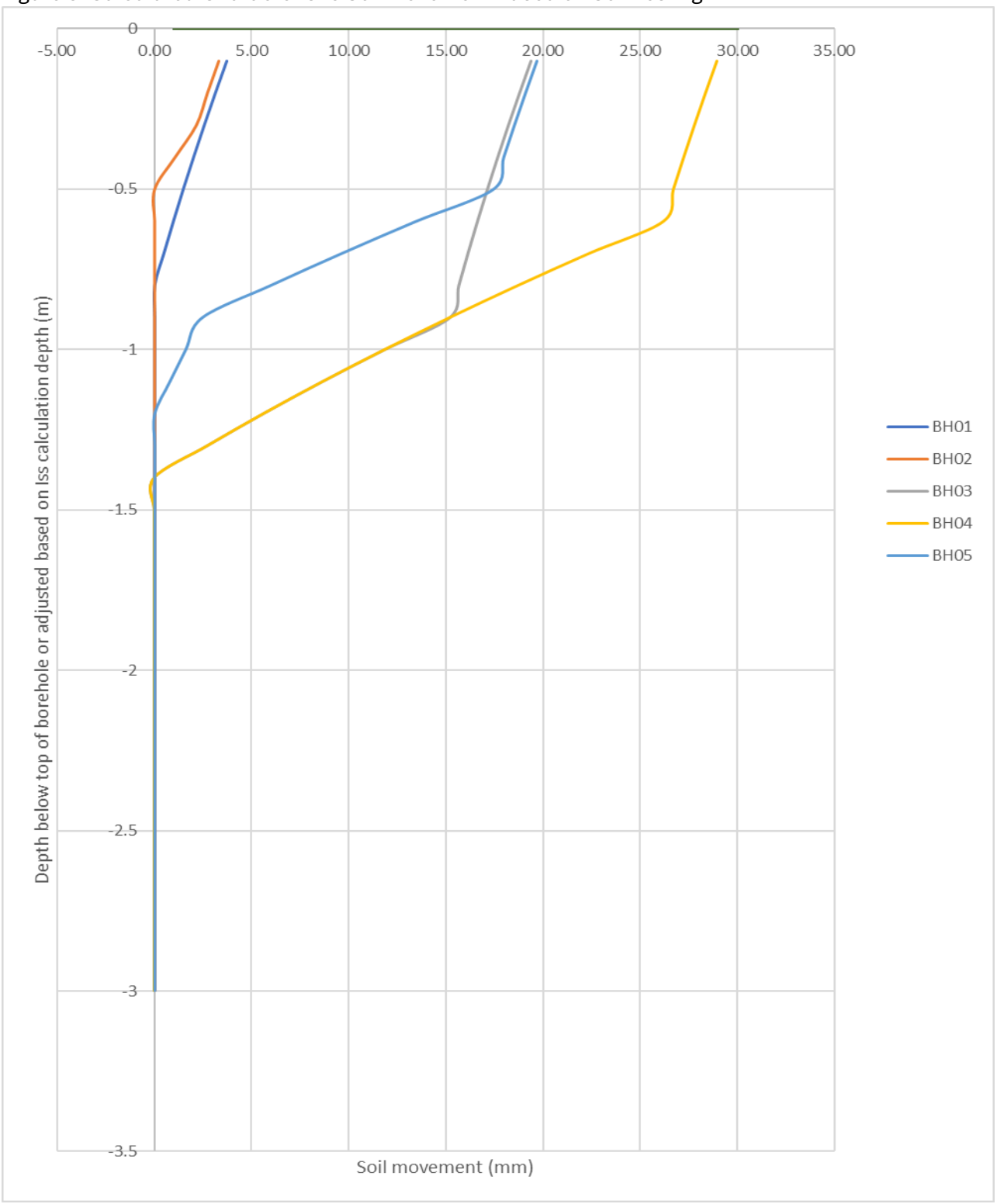
Correlations drawn from DCP and vane shear testing.
REF - Penetrometer Refusal
^ Footings to be founded through the FILL
~ Problematic soil layer attributed to loose, soft, or low allowable bearing capacity soil (<100 kPa)
*Soil layer expected at the base of problematic soil layers at test location (or at surface where problematic soils not encountered) to achieve 100 kPa allowable bearing capacity or greater.

Characteristic Soil Movement (Ys)

The characteristic soil movement (soil reactivity) from wetting and drying cycles is calculated according to AS 2870 Section 2.3. The calculations are based on Iss % testing results or correlations with linear shrink data and are based on complete soil profiles for boreholes drilled within the building Site. In the case of where cut and fill are proposed and building finished floor levels (FFL) are made available, the Iss value is recalculated based on the FFL and estimated cut and fill as per Table 9.

According to AS 2870 Section 2.3, calculations consider the depth of groundwater and bedrock. Soil characteristic movements based on lab testing are presented in Figure 3.

Figure 3 Calculated Characteristic Soil Movement Based on Soil Testing



Footing Exposure Management

The soil aggressivity testing results presented in Table 7 have been interpreted in Table 11 to provide indicative requirements for minimum concrete strength, curing duration and reinforcement cover in accordance with AS 2870:2011. This table builds on the previous classification summary by applying the relevant durability provisions to each individual soil layer encountered across the Site.

From these results presented in Table 11, it is generally discerned that in all investigated areas of the Site:

- It is generally recommended that where possible, soil Layer 2 is not used as a founding base for pavement or a slab given the more severe exposure class rating of B2 for both salinity and B2 for pH.
- Otherwise, 20 to 25 MPa concrete is generally recommended with 40 mm cover using a damp-proofing membrane or 50mm cover without. A minimum curing time of 3 days is recommended.

Table 11 Interpretation of Soil Aggressivity Results – Minimum Concrete Strength, Curing and Cover

Layer	Location	Depth	Exposure Classification		Minimum Concrete	Minimum Days Curing	Cover~
		From (m)	Salinity	Sulphate^	Strength f'c (MPa)^		
2	BH01	0.1	B2	B2^	40	7	55-65^# '
3	BH01	0.5	A1	A1	20	3	40
4	BH03	1.0	A1	A2^	20-25^	3	40-50^ '
5	BH02	0.2	A1	A2^	20-25^	3	40-50^ '
5	BH05	0.9	A1	A1	20	3	40

^Sulphate class is conservatively estimated from soil pH and further testing is required on soil samples to confirm if the low pH is attributed to sulphate or other cations within the soil. If pH conditions are attributed primarily to sulphate, then the indicated exposure classification is expected to reliable but subject to sulphate concentration threshold presented in AS2870.

Where a damp-proofing membrane is installed, the minimum reinforcement cover in saline (non A1) soils may be reduced to 30 mm

' Where a damp-proofing membrane is installed, the minimum reinforcement cover in sulphate (non A1) soils may be reduced by 10 mm.

Appendix H General Advice - Dispersive Soil Management

The Site may be susceptible to tunnel erosion if subsurface drainage is not adequately managed. Tunnel erosion typically initiates in excavated cuts; however, it can also develop where dispersive soils are exposed through excavation, leading to the release of pore water and concentrated groundwater discharge. Additional contributing factors may include broken pipes, ineffective stormwater infrastructure, or unmanaged surface flows. If left unaddressed, these conditions can result in progressive subsoil loss, potentially undermining footings or causing settlement-related damage to the structure.

Tunnel erosion typically progresses upslope, initiated by the dissolution and removal of highly dispersive Class 1 and Class 2 soil layers. As tunnels enlarge, they can undermine surrounding soils that may not be dispersive but are still susceptible to collapse due to loss of subsoil support. If unmanaged, tunnel erosion can extend beyond property boundaries, posing a risk to nearby infrastructure including buildings, roads, and underground services. For further background on the management of Emerson Class 1 soils, refer to the Department of Primary Industries, Parks, Water and Environment (DPIPWE, 2009) guidance document.

Dispersive soils should be managed through a combination of drainage control and ground treatment measures. These may include overland flow management, controlled cut and fill practices, and, in more severe cases, the installation of sand barriers to interrupt subsurface flow paths. Where dispersive soils are exposed—particularly on batters or in excavation faces—chemical treatment using gypsum or lime may be employed to improve soil cohesion and reduce erosion potential. Application rates should be guided by Emerson Class test results, as outlined in Table 12.
Gypsum and hydrated lime are proven effective in mitigating erosion in dispersive soils by displacing sodium ions on clay particles and replacing them with calcium. This cation exchange improves soil structure, increases shear strength, and enhances resistance to tunnel and surface erosion. The effectiveness of treatment is influenced by the soil's properties; higher application rates of gypsum are typically required for soils with greater cation exchange capacity, elevated pH, and lower Emerson Class numbers. Application guidelines should be based on laboratory test results, including Emerson Class assessment, to ensure appropriate treatment dosages.

Table 12 Prescribed gypsum and hydrated lime application rates – see Emerson soil testing results

Dispersive soil Emerson class	Gypsum/Hydrated Lime Application Rate pH < 7.5	Gypsum Application Rate pH > 7.5
Class 3	0 to 0.3 kg/m2	0.2 – 0.5 kg/m2
Class 2	0.5 kg/m2	1.0 kg/m2
Class 1	1.0 kg/m2	1.5 kg/m2

Where practicable, vehicle driveways and parking areas should be located on level or gently sloping terrain to minimise the need for deep excavation and reduce disturbance to dispersive soils identified on Site.

General Recommendations

To minimise disturbance and erosion in areas where Class 1 dispersive soils have been identified, the following measures are recommended:

- **Drainage Control:** Construct soil cut-off mounds or shallow interceptor trenches in non-dispersive soils, no deeper than 0.2 m above the interface with Class 1 dispersive soils. These should be positioned upslope of any proposed cuts to divert surface water before it reaches vulnerable areas.
- **Chemical Treatment:** Apply gypsum or hydrated lime to exposed dispersive soils where surface water movement is expected—particularly on freshly cut embankments, filled areas, service trenches, and zones where topsoil has been removed.
- **Surface Protection:** Cover all severely dispersive soils with either impermeable surfacing (e.g. paving) or a layer of non-dispersive topsoil to reduce erosion and limit moisture ingress.
- **Batter Stabilisation:** Place non-dispersive topsoil over freshly cut batters to protect against surface erosion and reduce the likelihood of tunnel initiation.
- **Remediation of Existing Tunnels:** Where tunnel erosion has already occurred, additional stabilisation of natural or constructed drainage gullies may be required. This may include the use of sand barriers and, in more severe cases, geotextile-wrapped drainage rock structures. When correctly designed, such barriers can intercept subsurface flow, promote controlled surface discharge, and direct water away from at-risk areas.

Key Management Measures for Dispersive Soils in Cut Embankments:

Surface water drainage can erode dispersive soils in embankment cuts. Groundwater discharge may worsen tunnel erosion by accelerating the development of secondary porosity—where subsurface flow progressively enlarges voids within the soil mass, leading to tunnel formation and internal instability. Management considerations:

- **Topsoil Removal Risks:** Earthworks commonly begin with the removal of non-dispersive topsoil, which often acts as a natural protective layer. Once removed, the underlying dispersive soils become highly vulnerable to erosion.
- **Barrier Construction in Cut Slopes:** Where excavation is necessary, erosion can be mitigated through immediate installation of physical barriers:
    - Place a sand layer (sand barrier) over exposed dispersive soil within the cut to interrupt flow paths.
    - Construct an earth retaining wall in front of the cut to contain soil and stabilise the slope face.
- **Timely Implementation:** All erosion control measures must be implemented immediately following excavation to prevent the initiation of tunnel erosion.
- **Use of Retaining Structures:** Low-height retaining walls (e.g., timber sleeper walls) constructed at the base of cut faces can assist in retaining eroding soils and maintaining the effectiveness of sand barriers.

Sand Barriers

To manage dispersive soils exposed in cut slopes, the following layered treatment is recommended:

- **Chemical Stabilisation:** Apply gypsum or hydrated lime at application rates specified in Table 29, based on Emerson Class testing.
- **Sand Layer:** Install a minimum 100 mm thick layer of clean, free-draining sand to act as a barrier and interrupt preferential flow paths.
- **Topsoil Cover:** Place a layer of non-dispersive, free-draining topsoil (such as loam) over the sand barrier to retain the sand in place and facilitate effective revegetation or application of surface treatments.
- **Erosion Control:** Implement surface erosion protection measures as outlined in the Erosion Control section to prevent wash-off and maintain system effectiveness.

Retaining Walls

The following measures are recommended when constructing retaining walls in areas with dispersive soils:

- Retaining walls should be founded on bedrock or non-dispersive soils to reduce the risk of tunnel erosion and structural instability.
- Where walls are constructed in Class 1 dispersive soils, freshly cut surfaces may be treated with gypsum or hydrated lime at application rates specified in Table 29 to reduce erosion potential.

Drainage

Effective drainage is critical in dispersive soil environments to prevent erosion, tunnel formation, and structural damage. The following measures are recommended:

- Divert surface water away from cut and fill slopes to reduce infiltration into dispersive soils.
- A sealed toe drain is essential to prevent water from soaking into freshly cut dispersive soils and migrating through dispersive fill layers beneath paved surfaces.
- For optimal surface drainage over Class 1 soils, install concrete spoon drains in preference to earthen swales to minimise erosion risk.
- Where earthen swale drains are used, stabilise Class 1 soils with gypsum or hydrated lime at a rate adjusted to soil pH. A liner (e.g. 20 mm bentonite layer) beneath topsoil and turf may be used to limit vertical water infiltration.
- Subsurface drains installed in Class 1 soils should be backfilled with a sand mix containing 2% gypsum or hydrated lime to inhibit dispersion and maintain flow pathways.
- Non-perforated drainage pipes should be used to divert water away from identified groundwater discharge points, limiting further erosion.

Filling

The use of dispersive soils as fill presents a significant risk for tunnel erosion, especially where water movement is poorly controlled. The following measures are recommended to reduce risk and ensure long-term stability:

- Dispersive soil used as fill is highly susceptible to tunnel erosion, particularly when exposed to concentrated surface or groundwater flow.
- Groundwater can migrate along the base of and within fill layers, initiating erosion of dispersive materials and undermining overlying structures.
- All proposed filling, especially within or near building footprints, should be carefully managed. This may involve either:
    - Removal of Class 1 dispersive soil from beneath the structure, or
    - Chemical treatment of dispersive fill using gypsum or hydrated lime, applied to the surface of each compacted lift.
    - Preventing water from intercepting dispersive soil by liming the fill or with careful drainage management
- When chemically treating fill:
    - Use 300 mm thick lifts with full application rates as specified in Table 29.
    - For 150 mm thick lifts, halve the application rate accordingly.
- Ensure compaction is achieved close to optimum moisture content, particularly in areas adjacent to footings and structures.
- Paved surfaces over filled areas significantly reduce the risk of tunnel erosion, if cut-off drains are installed to prevent water ingress at the fill base.
- Where feasible, spoon drains and pavement edges at the toe of cut batters should be founded on non-dispersive soil or bedrock to intercept all surface water and eliminate seepage pathways.
- If topsoil is removed prior to filling, and it is classified as slightly dispersive (Class 3) or non-dispersive (Class 4 or higher), it may be replaced with a liner or imported non-dispersive material to protect the dispersive fill beneath.

Roofed and Paved Area Stormwater Management

All captured water on-site, including roof runoff, must be managed to remain at the surface and be evenly dispersed downslope across the Site. Roof runoff must be directed to detention tanks, with overflow discharged via surface irrigation—not into soakage pits. Due to the absence of non-dispersive topsoil, imported loam is required in irrigation areas. Irrigation must either:

1. Be delivered just below the surface, draining directly into the imported loam without contact with dispersive soils; or
2. Be applied via above-ground sprinklers onto imported loam to prevent erosion and maintain surface stability.

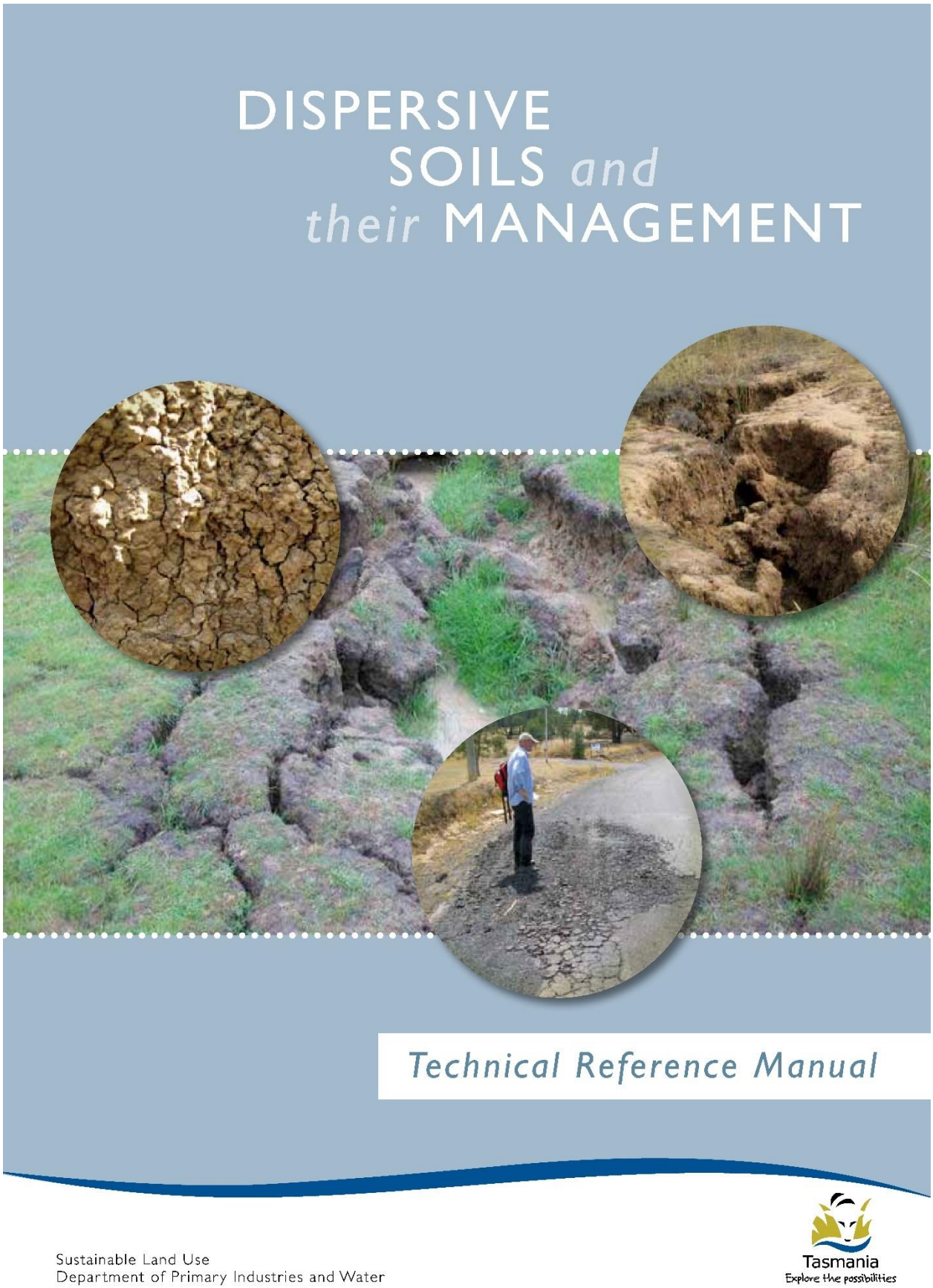
Runoff from pavements and other impervious surfaces must either be captured and redirected into detention tanks for controlled redistribution.

For driveways, runoff should be directed via cross-slope or in-slope alignment into lined side drains or swales. These must convey collected water to designated redistribution areas —such as detention tanks with surface irrigation or into distribution swales. Overflow must be dispersed across imported loam soils which is not located upgradient or downgradient of existing structures and ensuring water is not concentrated near foundations or fill. If distribution swales are used, they must be lined, constructed with low gradients, and designed to promote sheet flow rather than concentrated runoff. Distribution swale overflow must discharge onto non-dispersive imported loam soils.

Service Trenches

An effective measure to prevent stormwater ingress into backfilled service trenches is to ensure the trench surface is well sealed with non-dispersive soils or stable topsoil. As an additional site-specific recommendation, service trenches should be backfilled with compacted sand, which will help prevent water channelisation and reduce the risk of tunnel erosion along trench alignments.

DPIPWE 2009 Dispersive Soils and their Management. Technical Reference Manual. Sustainable Land Use Department of Primary Industries Water and Environment.



4.1 MANAGEMENT OPTIONS FOR TUNNEL EROSION

Past efforts to repair tunnel erosion in agricultural landscapes have relied on mechanical destruction of the tunnel system by deep ripping, contour furrowing, and contour ripping. Unfortunately many of these techniques either failed or resulted in tunnel re-emergence in an adjacent areas (Floyd 1974, Boucher 1995). The use of these 'agricultural' techniques is inappropriate in peri-urban areas where tunnel repair requires a low incidence of re-failure due to the potential for damage to infrastructure. Experience with the construction of earth dams using dispersive clays, demonstrates that repair and prevention of tunnel erosion in urban and peri-urban environments is best achieved using a combination of,

- Identification and avoidance of dispersive soils.
- Precise re-compaction.
- Chemical amelioration.
- Sand blocks and barriers.
- Topsoil, burial and revegetation.

4.2 IDENTIFICATION AND AVOIDANCE OF DISPERSIVE SOILS

The risk of tunnel erosion resulting from construction activities on dispersive soils can often be reduced or eliminated by identifying and avoiding areas containing dispersive soils. The presence and severity of dispersive soils can vary enormously over short distances (Figure 13). In many instances, large scale (ie 10 x 10 or 20 x 20 meter grid) soil survey and screening of soils for dispersion, (using the Emerson crumb test - section 3, Appendix I) can be used to site dwellings and infrastructure away from dispersive soils. Advice should be sought from a suitably qualified and experienced engineer or soil professional.

4.3 COMPACTION

Ritchie (1965) demonstrated that the degree of compaction within the dam wall was the single most important factor in reducing dam failure from piping (tunnel erosion). A high degree of compaction reduces soil permeability, restricting the movement of water and dispersed clay through the soil matrix, which decreases the severity of dispersion and restricts tunnel development (Vacher *et al.* 2004). However, dispersive soils can be difficult to compact as they lose strength rapidly at or above optimum moisture content, and thus may require greater compactive force than other soils (McDonald *et al.* 1981). Bell & Bryun (1997) and Bell and Maud (1994) suggest that dispersive clays must be compacted at a moisture content 1.5 -2% above the optimum moisture content in order to achieve suficent density to prevent piping (Elges 1985).

> Construction of structures such as earth dams and footings for buildings with dispersive soils require geotechnical assessment and advice from a qualified and experienced engineer, in order to determine compaction measures such as the optimal moisture content, number of passes, and maximum thickness of compacted layers.

Normal earth moving machinery including bull-dozers, excavators and graders do not provide sufficient compactive force to reduce void spaces or achieve adequate compaction in dispersive soils. A sheepsfoot roller of appropriate weight is usually required to compact dispersive soils. By comparison a D6 dozer applies only 0.6 kg/cm^2 pressure compared to 9.3 kg/cm^2 for a sheepsfoot roller (Sorensen 1995).

Figure 13. The severity (or sodium content) and depth of dispersive subsoils can vary considerably over short distances. (a). At this site highly dispersive subsoils exist meters away from (b) non-dispersive soils.

4.4 CHEMICAL AMELIORATION

Initiation of tunnel erosion is predominantly a chemical process, so it makes sense to use chemical amelioration strategies when attempting to prevent or repair tunnel erosion in dispersive soils. Despite the widespread use of gypsum and lime to treat sodic soils in agriculture, the use of gypsum and lime to treat tunnel affected areas has been relatively rare (Boucher 1990).

Hydrated lime (calcium hydroxide) has been widely used to prevent piping in earth dams. Rates of application have varied depending on soils and degree of compaction used in construction. Laboratory testing usually indicates that only around 0.5 –1.0% hydrated lime is required to prevent dispersion, however difficulties with application and mixing necessitate higher rates of application (Moore *et al.* 1985). Moore *et al.* (1985) cite examples of the use of hydrated lime to control piping in earth dams at rates between 0.35% (N.S.W. Australia) and 4% (New Mexico). Elgers (1985), and McElroy (1987) recommend no less than 2% hydrated lime (by weight of the total soil material) to prevent dispersion within dam embankments, while Bell and Maud (1994) suggest that 3% - 4% by mass of hydrated lime should be added to a depth of 0.3m on the upper face of embankments. In alkaline (pH >7.0) soils (most sodic subsoils in Tasmania are neutral or alkaline) the effectiveness of hydrated lime is reduced by the formation of insoluble calcium carbonate (Moore *et al.* 1985), such that gypsum is preferred to hydrated lime. It is important to note that agricultural lime (calcium carbonate) is not a suitable substitute for hydrated lime due to its low solubility (McElroy 1987). Also note that excessive applications of lime may raise soil pH above levels required to sustain vigorous plant growth.

Gypsum (calcium sulphate) is more effective than lime for the treatment of dispersive soils as it increases the electrolyte concentration in the soil solution as well as displacing sodium with calcium within the clay structure (Raine and Loch 2003). Gypsum is less commonly used than hydrated lime in dam construction and other works due to its lower solubility, and higher cost. Elges (1985) recommends that in construction, a minimum of 2% by mass of gypsum be used. Bell and Maud (1994) present a means of calculating the amount of gypsum required to displace excess sodium and bring ESP values within desired limits (normally < 5). Be aware that application of excessive amounts of gypsum may cause soil salinity to temporarily rise beyond the desired level for plant growth.

NOTE:

- Use of gypsum in Tasmania is covered under the Fertiliser Act 1993, which has established the allowable limit for cadmium and lead at 10 mg/kg and 5 mg/kg for mercury.
- Gypsum is usually imported into Tasmania from Victoria or South Australia, which have different standards for allowable heavy metal content.
- Purchasers of gypsum should check with suppliers to ensure that gypsum imported into Tasmania is compliant with current regulations.

Alum (aluminium sulphate) has been effectively used to prevent dam failure and protect embankments from erosion. Application rates are not well established. Limited data suggests mixtures of 0.6 –1.0% (25% solution of aluminium sulphate) (Bell and Bruyn 1997, McElroy 1987) to 1.5% (Ouhadi, and Goodarzi 2006) of the total dry weight of soil may be appropriate. Alum is however highly acidic (pH 4-5), and thus alum treated soils will need to be capped with topsoil in order to establish vegetation (Ryker 1987). Soil testing is required to establish appropriate application rates for Tasmanian soils.

Long chain polyacrylamides have been shown to increase aggregate stability, reduce dispersion and maintain infiltration rates in dispersive soils (Levy *et al.* 1992, Raine and Loch 2003). However the effect is highly variable between various polyacrylamide products and the chemical and physical properties of the soil. The benefit of polyacrylamides is generally short due to their rapid degradation (Raine and Loch 2003). Further advice and laboratory testing should be conducted before using polyacrylamides to protect earth dams from piping failure.

Note that appropriate application rates for gypsum, hydrated lime, alum and polyacrylamides have not been established for dispersive soils in Tasmania. Extensive laboratory assessment of materials used for the construction of dams or embankments is required before locally relevant 'rules of thumb' can be established for the use of these products.

4.5 SAND BLOCKS AND SAND BARRIERS

Sand filters were first developed to prevent piping in earth dams. Sand filters prevent dam failure by trapping entrained sand and silt, blocking the exit of the tunnel and preventing further tunnel development (Sherard *et al.* 1977). Following the work of Sherard *et al.* (1977), Richley (1992 and 2000) developed the use of sand blocks to prevent tunnel erosion during installation of an optical fibre cable in highly dispersive soils near Campania, Tasmania. The sand blocks work slightly differently to the sand filters in that they allow the free water to rise to the surface through the sand. The use of sand blocks has recently been modified by Hardie *et al.*, (2007) to prevent re-initiation of tunnel erosion along an optical fibre cable near Dunalley. Modifications to the original technique developed by Richley (1992 and 2000) include (Figure 14 &15);

- Upslope curved extremities to prevent the structure from being by-passed.
- Geotextile on the downslope wall to prevent collapse or removal of sand following settlement or erosion.
- Application of gypsum (around 5% by weight) to ensure infiltrating water contains sufficiently electrolyte to prevent further dispersion.
- Earth mound upslope of the structure to prevent run-on entering the sand blocks.

Figure 15. (a) Installation of sandblock perpendicular to a service trench. Note securing of geotextile to the optical fibre cable to prevent water flowing past the sand block. (b) Sandblock before final topsoiling.

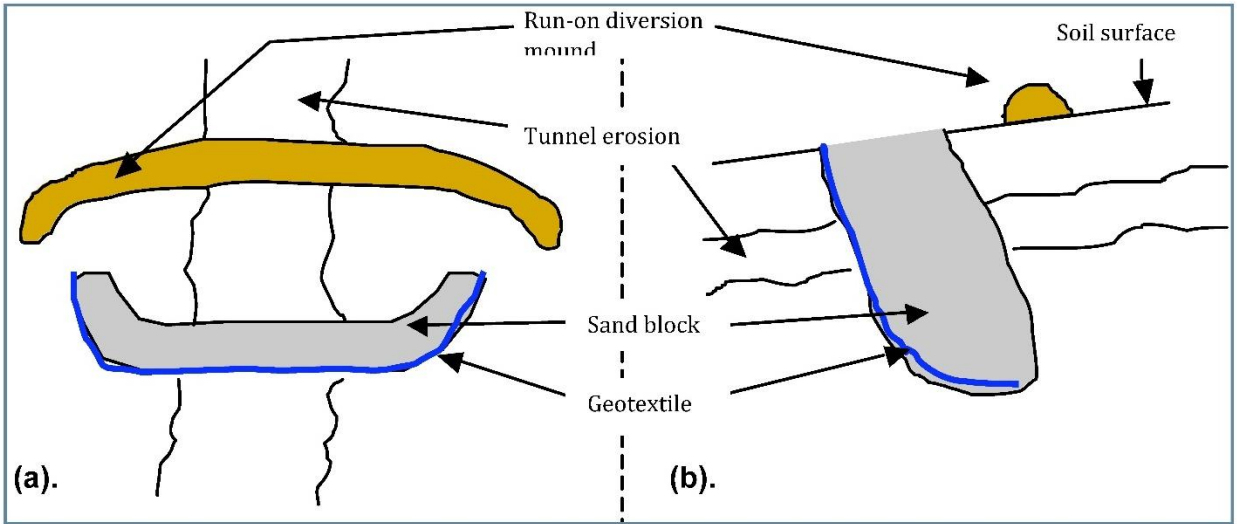


Figure 14. Modified sand block design. (a) plan view, (b) cross section view. The depth of the sand block is determined by the depth of dispersive soils or tunnel erosion. The span length of the structure is determined by the width of the tunnelling.

4.6 USE OF TOPSOIL / BURIAL AND REVEGETATION

Topsoil or burial of exposed dispersive soils reduces the likelihood of subsoil dispersion and initiation of tunnel erosion by;

- Providing a source of salt to increase the electrolyte content of infiltration water.
- Preventing desiccation and subsoil cracking.
- Promoting even infiltration.
- Providing a protective cover from raindrop impact.
- Providing a suitable medium for revegetation.

Topsoil minimises the interaction between water and dispersive clays by providing both a physical and chemical barrier. Topsoil also reduces soil desiccation and development of surface cracks (Sorensen 1995). It is suggested that exposed dispersive subsoils be covered with at least 150mm of non dispersive topsoil and sown with an appropriate mix of grass species. In some cases it will be necessary to protect the topsoil from erosion with 'jute' cloth or similar product.

The suitability of planting trees in tunnel affected areas is influenced by the amount of annual rainfall and frequency of soil cracking resulting from desiccation. Boucher (1995) recommends the preferred option for revegetation of reclaimed tunnel erosion is a widely spaced tree cover in association with a combination of perennial and annual pastures, rather than a dense stand of trees or pasture alone. Experience in Tasmania suggests that in low rainfall areas, or areas in which existing trees or shrubs cause soil drying and cracking, the preferred option for revegetating tunnel affected land is a dense healthy pasture. In high rainfall areas, dense plantings of trees have been successfully used to repair or stabilise tunnel erosion for example Colclough (1973) successfully used Pinus radiata to stabilise tunnel-gully affected land in a moderate rainfall area near Tea Tree, Tasmania.

5.0 ACTIVITIES THAT INCREASE THE RISK OF EROSION ON DISPERSIVE SOILS

ACTIVITIES THAT INCREASE RISK OF INITIATING TUNNEL EROSION, INCLUDE;

- Removal of topsoil.
- Soil excavation or expose of subsoils to rainfall.
- Supply of services via trenches.
- Construction of roads and culverts in dispersive subsoils.
- Installation of sewage and grey water disposal systems in dispersive subsoils.
- Dam construction from dispersive soils.

OPTIONS FOR REDUCING THE RISK OF TUNNEL EROSION DURING CONSTRUCTION AND DEVELOPMENT WORKS ON DISPERSIVE SOILS INCLUDE,

- Where possible do not remove or disturb topsoil or vegetation.
- Ensure that dispersive subsoils are covered with an adequate layer of topsoil.
- Avoid construction techniques that result in exposure of dispersive subsoils.
- Use alternatives to 'cut and fill' construction such as pier and post foundations.
- Where possible avoid the use of trenches for the supply of services ie water & power.
- If trenches must be used, ensure that repacked spoil is properly compacted, treated with gypsum and topsoiled.
- Consider alternative trenching techniques that do not expose dispersive subsoils.
- Ensure runoff from hard areas is not discharged into areas with dispersive soils.
- If necessary create safe areas for discharge of runoff.
- If possible do not excavate culverts and drains in dispersive soils.
- Consider carting non-sodic soil to create appropriate road surfaces and drains without the need for excavation.
- Ensure that culverts and drains excavated into dispersive subsoils are capped with non-dispersive clays mixed with gypsum, topsoiled and vegetated.
- Avoid use of septic trench waste disposal systems; consult your local council about the use of alternative above ground treatment systems.
- Where possible do not construct dams with dispersive soils, or in areas containing dispersive soils.
- If dams are to be constructed from dispersive clays, ensure you consult an experienced, qualified civil engineer to conduct soil tests before commencing construction.
- Construction of dams from dispersive soils is usually possible, using one or a combination of: precise compaction, chemical amelioration, capping with non-dispersive clays, sand filters and adequate topsoiling.

With all forms of construction on dispersive soils, ensure you obtain advice and support from a suitably experienced and qualified engineer or soil professional before commencing work.

Foundation Maintenance and Footing Performance:
A Homeowner's Guide

CSIRO

BTF 18
replaces
Information
Sheet 10/91

Buildings can and often do move. This movement can be up, down, lateral or rotational. The fundamental cause of movement in buildings can usually be related to one or more problems in the foundation soil. It is important for the homeowner to identify the soil type in order to ascertain the measures that should be put in place in order to ensure that problems in the foundation soil can be prevented, thus protecting against building movement.

This Building Technology File is designed to identify causes of soil-related building movement, and to suggest methods of prevention of resultant cracking in buildings.

Soil Types

The types of soils usually present under the topsoil in land zoned for residential buildings can be split into two approximate groups – granular and clay. Quite often, foundation soil is a mixture of both types. The general problems associated with soils having granular content are usually caused by erosion. Clay soils are subject to saturation and swell/shrink problems.

Classifications for a given area can generally be obtained by application to the local authority, but these are sometimes unreliable and if there is doubt, a geotechnical report should be commissioned. As most buildings suffering movement problems are founded on clay soils, there is an emphasis on classification of soils according to the amount of swell and shrinkage they experience with variations of water content. The table below is Table 2.1 from AS 2870, the Residential Slab and Footing Code.

Causes of Movement

Settlement due to construction
There are two types of settlement that occur as a result of construction:

- Immediate settlement occurs when a building is first placed on its foundation soil, as a result of compaction of the soil under the weight of the structure. The cohesive quality of clay soil mitigates against this, but granular (particularly sandy) soil is susceptible.
- Consolidation settlement is a feature of clay soil and may take place because of the expulsion of moisture from the soil or because of the soil's lack of resistance to local compressive or shear stresses. This will usually take place during the first few months after construction, but has been known to take many years in exceptional cases.

These problems are the province of the builder and should be taken into consideration as part of the preparation of the site for construction. Building Technology File 19 (BTF 19) deals with these problems.

Erosion
All soils are prone to erosion, but sandy soil is particularly susceptible to being washed away. Even clay with a sand component of say 10% or more can suffer from erosion.

Saturation
This is particularly a problem in clay soils. Saturation creates a bog-like suspension of the soil that causes it to lose virtually all of its bearing capacity. To a lesser degree, sand is affected by saturation because saturated sand may undergo a reduction in volume – particularly imported sand fill for bedding and blinding layers. However, this usually occurs as immediate settlement and should normally be the province of the builder.

Seasonal swelling and shrinkage of soil
All clays react to the presence of water by slowly absorbing it, making the soil increase in volume (see table below). The degree of increase varies considerably between different clays, as does the degree of decrease during the subsequent drying out caused by fair weather periods. Because of the low absorption and expulsion rate, this phenomenon will not usually be noticeable unless there are prolonged rainy or dry periods, usually of weeks or months, depending on the land and soil characteristics.

The swelling of soil creates an upward force on the footings of the building, and shrinkage creates subsidence that takes away the support needed by the footing to retain equilibrium.

Shear failure
This phenomenon occurs when the foundation soil does not have sufficient strength to support the weight of the footing. There are two major post-construction causes:

- Significant load increase.
- Reduction of lateral support of the soil under the footing due to erosion or excavation.
- In clay soil, shear failure can be caused by saturation of the soil adjacent to or under the footing.

GENERAL DEFINITIONS OF SITE CLASSES

Class	Foundation
A	Most sand and rock sites with little or no ground movement from moisture changes
S	Slightly reactive clay sites with only slight ground movement from moisture changes
M	Moderately reactive clay or silt sites, which can experience moderate ground movement from moisture changes
H	Highly reactive clay sites, which can experience high ground movement from moisture changes
E	Extremely reactive sites, which can experience extreme ground movement from moisture changes
A to P	Filled sites
P	Sites which include soft soils, such as soft clay or silt or loose sands; landslip; mine subsidence; collapsing soils; soils subject to erosion; reactive sites subject to abnormal moisture conditions or sites which cannot be classified otherwise

Tree root growth
Trees and shrubs that are allowed to grow in the vicinity of footings can cause foundation soil movement in two ways:

- Roots that grow under footings may increase in cross-sectional size, exerting upward pressure on footings.
- Roots in the vicinity of footings will absorb much of the moisture in the foundation soil, causing shrinkage or subsidence.

Unevenness of Movement

The types of ground movement described above usually occur unevenly throughout the building's foundation soil. Settlement due to construction tends to be uneven because of:

- Differing compaction of foundation soil prior to construction.
- Differing moisture content of foundation soil prior to construction.

Movement due to non-construction causes is usually more uneven still. Erosion can undermine a footing that traverses the flow or can create the conditions for shear failure by eroding soil adjacent to a footing that runs in the same direction as the flow.

Saturation of clay foundation soil may occur where subfloor walls create a dam that makes water pond. It can also occur wherever there is a source of water near footings in clay soil. This leads to a severe reduction in the strength of the soil which may create local shear failure.

Seasonal swelling and shrinkage of clay soil affects the perimeter of the building first, then gradually spreads to the interior. The swelling process will usually begin at the uphill extreme of the building, or on the weather side where the land is flat. Swelling gradually reaches the interior soil as absorption continues. Shrinkage usually begins where the sun's heat is greatest.

Effects of Uneven Soil Movement on Structures

Erosion and saturation
Erosion removes the support from under footings, tending to create subsidence of the part of the structure under which it occurs. Brickwork walls will resist the stress created by this removal of support by bridging the gap or cantilevering until the bricks or the mortar bedding fail. Older masonry has little resistance. Evidence of failure varies according to circumstances and symptoms may include:

- Step cracking in the mortar beds in the body of the wall or above/below openings such as doors or windows.
- Vertical cracking in the bricks (usually but not necessarily in line with the vertical beds or perpends).

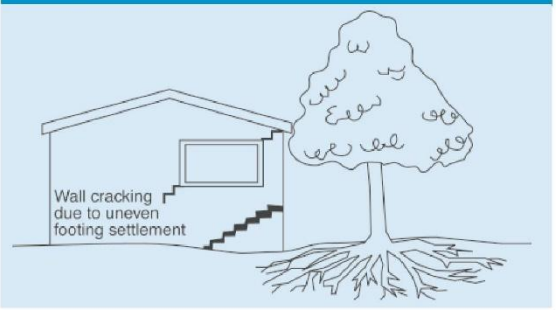
Isolated piers affected by erosion or saturation of foundations will eventually lose contact with the bearers they support and may tilt or fall over. The floors that have lost this support will become bouncy, sometimes rattling ornaments etc.

Seasonal swelling/shrinkage in clay
Swelling foundation soil due to rainy periods first lifts the most exposed extremities of the footing system, then the remainder of the perimeter footings while gradually permeating inside the building footprint to lift internal footings. This swelling first tends to create a dish effect, because the external footings are pushed higher than the internal ones.

The first noticeable symptom may be that the floor appears slightly dished. This is often accompanied by some doors binding on the floor or the door head, together with some cracking of cornice mitres. In buildings with timber flooring supported by bearers and joists, the floor can be bouncy. Externally there may be visible dishing of the hip or ridge lines.

As the moisture absorption process completes its journey to the innermost areas of the building, the internal footings will rise. If the spread of moisture is roughly even, it may be that the symptoms will temporarily disappear, but it is more likely that swelling will be uneven, creating a difference rather than a disappearance in symptoms. In buildings with timber flooring supported by bearers and joists, the isolated piers will rise more easily than the strip footings or piers under walls, creating noticeable doming of flooring.

Trees can cause shrinkage and damage



As the weather pattern changes and the soil begins to dry out, the external footings will be first affected, beginning with the locations where the sun's effect is strongest. This has the effect of lowering the external footings. The doming is accentuated and cracking reduces or disappears where it occurred because of dishing, but other cracks open up. The roof lines may become convex.

Doming and dishing are also affected by weather in other ways. In areas where warm, wet summers and cooler dry winters prevail, water migration tends to be toward the interior and doming will be accentuated, whereas where summers are dry and winters are cold and wet, migration tends to be toward the exterior and the underlying propensity is toward dishing.

Movement caused by tree roots
In general, growing roots will exert an upward pressure on footings, whereas soil subject to drying because of tree or shrub roots will tend to remove support from under footings by inducing shrinkage.

Complications caused by the structure itself
Most forces that the soil causes to be exerted on structures are vertical – i.e. either up or down. However, because these forces are seldom spread evenly around the footings, and because the building resists uneven movement because of its rigidity, forces are exerted from one part of the building to another. The net result of all these forces is usually rotational. This resultant force often complicates the diagnosis because the visible symptoms do not simply reflect the original cause. A common symptom is binding of doors on the vertical member of the frame.

Effects on full masonry structures
Brickwork will resist cracking where it can. It will attempt to span areas that lose support because of subsided foundations or raised points. It is therefore usual to see cracking at weak points, such as openings for windows or doors.

In the event of construction settlement, cracking will usually remain unchanged after the process of settlement has ceased.

With local shear or erosion, cracking will usually continue to develop until the original cause has been remedied, or until the subsidence has completely neutralised the affected portion of footing and the structure has stabilised on other footings that remain effective.

In the case of swell/shrink effects, the brickwork will in some cases return to its original position after completion of a cycle, however it is more likely that the rotational effect will not be exactly reversed, and it is also usual that brickwork will settle in its new position and will resist the forces trying to return it to its original position. This means that in a case where swelling takes place after construction and cracking occurs, the cracking is likely to at least partly remain after the shrink segment of the cycle is complete. Thus, each time the cycle is repeated, the likelihood is that the cracking will become wider until the sections of brickwork become virtually independent.

With repeated cycles, once the cracking is established, if there is no other complication, it is normal for the incidence of cracking to stabilise, as the building has the articulation it needs to cope with the problem. This is by no means always the case, however, and monitoring of cracks in walls and floors should always be treated seriously.

Upheaval caused by growth of tree roots under footings is not a simple vertical shear stress. There is a tendency for the root to also exert lateral forces that attempt to separate sections of brickwork after initial cracking has occurred.

The normal structural arrangement is that the inner leaf of brickwork in the external walls and at least some of the internal walls (depending on the roof type) comprise the load-bearing structure on which any upper floors, ceilings and the roof are supported. In these cases, it is internally visible cracking that should be the main focus of attention, however there are a few examples of dwellings whose external leaf of masonry plays some supporting role, so this should be checked if there is any doubt. In any case, externally visible cracking is important as a guide to stresses on the structure generally, and it should also be remembered that the external walls must be capable of supporting themselves.

Effects on framed structures
Timber or steel framed buildings are less likely to exhibit cracking due to swell/shrink than masonry buildings because of their flexibility. Also, the doming/dishing effects tend to be lower because of the lighter weight of walls. The main risks to framed buildings are encountered because of the isolated pier footings used under walls. Where erosion or saturation cause a footing to fall away, this can double the span which a wall must bridge. This additional stress can create cracking in wall linings, particularly where there is a weak point in the structure caused by a door or window opening. It is, however, unlikely that framed structures will be so stressed as to suffer serious damage without first exhibiting some or all of the above symptoms for a considerable period. The same warning period should apply in the case of upheaval. It should be noted, however, that where framed buildings are supported by strip footings there is only one leaf of brickwork and therefore the externally visible walls are the supporting structure for the building. In this case, the subfloor masonry walls can be expected to behave as full brickwork walls.

Effects on brick veneer structures
Because the load-bearing structure of a brick veneer building is the frame that makes up the interior leaf of the external walls plus perhaps the internal walls, depending on the type of roof, the building can be expected to behave as a framed structure, except that the external masonry will behave in a similar way to the external leaf of a full masonry structure.

Water Service and Drainage

Where a water service pipe, a sewer or stormwater drainage pipe is in the vicinity of a building, a water leak can cause erosion, swelling or saturation of susceptible soil. Even a minuscule leak can be enough to saturate a clay foundation. A leaking tap near a building can have the same effect. In addition, trenches containing pipes can become watercourses even though backfilled, particularly where broken rubble is used as fill. Water that runs along these trenches can be responsible for serious erosion, interstrata seepage into subfloor areas and saturation.

Pipe leakage and trench water flows also encourage tree and shrub roots to the source of water, complicating and exacerbating the problem.
Poor roof plumbing can result in large volumes of rainwater being concentrated in a small area of soil:

- Incorrect falls in roof guttering may result in overflows, as may gutters blocked with leaves etc.
- Corroded guttering or downpipes can spill water to ground.
- Downpipes not positively connected to a proper stormwater collection system will direct a concentration of water to soil that is directly adjacent to footings, sometimes causing large-scale problems such as erosion, saturation and migration of water under the building.

Seriousness of Cracking

In general, most cracking found in masonry walls is a cosmetic nuisance only and can be kept in repair or even ignored. The table below is a reproduction of Table C1 of AS 2870.

AS 2870 also publishes figures relating to cracking in concrete floors, however because wall cracking will usually reach the critical point significantly earlier than cracking in slabs, this table is not reproduced here.

Prevention/ Cure

Plumbing
Where building movement is caused by water service, roof plumbing, sewer or stormwater failure, the remedy is to repair the problem. It is prudent, however, to consider also rerouting pipes away from the building where possible, and relocating taps to positions where any leakage will not direct water to the building vicinity. Even where gully traps are present, there is sometimes sufficient spill to create erosion or saturation, particularly in modern installations using smaller diameter PVC fixtures. Indeed, some gully traps are not situated directly under the taps that are installed to charge them, with the result that water from the tap may enter the backfilled trench that houses the sewer piping. If the trench has been poorly backfilled, the water will either pond or flow along the bottom of the trench. As these trenches usually run alongside the footings and can be at a similar depth, it is not hard to see how any water that is thus directed into a trench can easily affect the foundation's ability to support footings or even gain entry to the subfloor area.

Ground drainage
In all soils there is the capacity for water to travel on the surface and below it. Surface water flows can be established by inspection during and after heavy or prolonged rain. If necessary, a grated drain system connected to the stormwater collection system is usually an easy solution.

It is, however, sometimes necessary when attempting to prevent water migration that testing be carried out to establish watertable height and subsoil water flows. This subject is referred to in BTF 19 and may properly be regarded as an area for an expert consultant.

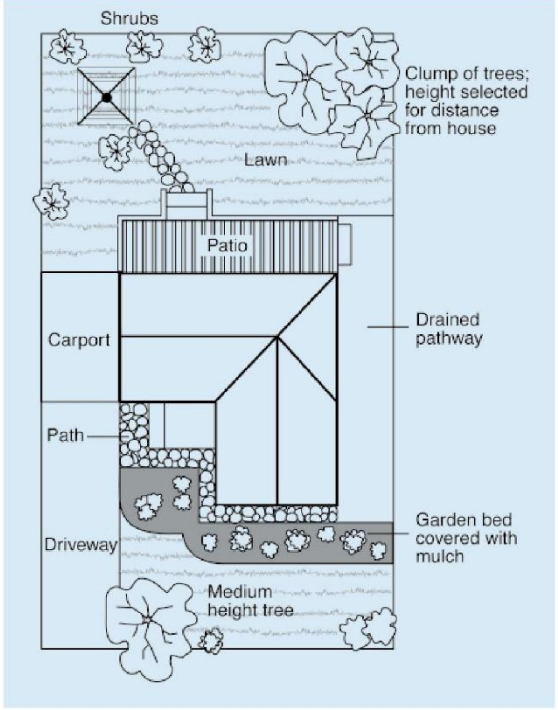
Protection of the building perimeter
It is essential to remember that the soil that affects footings extends well beyond the actual building line. Watering of garden plants, shrubs and trees causes some of the most serious water problems.

For this reason, particularly where problems exist or are likely to occur, it is recommended that an apron of paving be installed around as much of the building perimeter as necessary. This paving

CLASSIFICATION OF DAMAGE WITH REFERENCE TO WALLS

Description of typical damage and required repair	Approximate crack width limit (see Note 3)	Damage category
Hairline cracks	<0.1 mm	0
Fine cracks which do not need repair	<1 mm	1
Cracks noticeable but easily filled. Doors and windows stick slightly	<5 mm	2
Cracks can be repaired and possibly a small amount of wall will need to be replaced. Doors and windows stick. Service pipes can fracture. Weathertightness often impaired	5–15 mm (or a number of cracks 3 mm or more in one group)	3
Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Window and door frames distort. Walls lean or bulge noticeably, some loss of bearing in beams. Service pipes disrupted	15–25 mm but also depend on number of cracks	4

Gardens for a reactive site



should extend outwards a minimum of 900 mm (more in highly reactive soil) and should have a minimum fall away from the building of 1:60. The finished paving should be no less than 100 mm below brick vent bases.

It is prudent to relocate drainage pipes away from this paving, if possible, to avoid complications from future leakage. If this is not practical, earthenware pipes should be replaced by PVC and backfilling should be of the same soil type as the surrounding soil and compacted to the same density.

Except in areas where freezing of water is an issue, it is wise to remove taps in the building area and relocate them well away from the building – preferably not uphill from it (see BTF 19).

It may be desirable to install a grated drain at the outside edge of the paving on the uphill side of the building. If subsoil drainage is needed this can be installed under the surface drain.

Condensation
In buildings with a subfloor void such as where bearers and joists support flooring, insufficient ventilation creates ideal conditions for condensation, particularly where there is little clearance between the floor and the ground. Condensation adds to the moisture already present in the subfloor and significantly slows the process of drying out. Installation of an adequate subfloor ventilation system, either natural or mechanical, is desirable.

Warning: Although this Building Technology File deals with cracking in buildings, it should be said that subfloor moisture can result in the development of other problems, notably:

- Water that is transmitted into masonry, metal or timber building elements causes damage and/or decay to those elements.
- High subfloor humidity and moisture content create an ideal environment for various pests, including termites and spiders.
- Where high moisture levels are transmitted to the flooring and walls, an increase in the dust mite count can ensue within the living areas. Dust mites, as well as dampness in general, can be a health hazard to inhabitants, particularly those who are abnormally susceptible to respiratory ailments.

The garden
The ideal vegetation layout is to have lawn or plants that require only light watering immediately adjacent to the drainage or paving edge, then more demanding plants, shrubs and trees spread out in that order.

Overwatering due to misuse of automatic watering systems is a common cause of saturation and water migration under footings. If it is necessary to use these systems, it is important to remove garden beds to a completely safe distance from buildings.

Existing trees
Where a tree is causing a problem of soil drying or there is the existence or threat of upheaval of footings, if the offending roots are subsidiary and their removal will not significantly damage the tree, they should be severed and a concrete or metal barrier placed vertically in the soil to prevent future root growth in the direction of the building. If it is not possible to remove the relevant roots without damage to the tree, an application to remove the tree should be made to the local authority. A prudent plan is to transplant likely offenders before they become a problem.

Information on trees, plants and shrubs
State departments overseeing agriculture can give information regarding root patterns, volume of water needed and safe distance from buildings of most species. Botanic gardens are also sources of information. For information on plant roots and drains, see Building Technology File 17.

Excavation
Excavation around footings must be properly engineered. Soil supporting footings can only be safely excavated at an angle that allows the soil under the footing to remain stable. This angle is called the angle of repose (or friction) and varies significantly between soil types and conditions. Removal of soil within the angle of repose will cause subsidence.

Remediation

Where erosion has occurred that has washed away soil adjacent to footings, soil of the same classification should be introduced and compacted to the same density. Where footings have been undermined, augmentation or other specialist work may be required. Remediation of footings and foundations is generally the realm of a specialist consultant.

Where isolated footings rise and fall because of swell/shrink effect, the homeowner may be tempted to alleviate floor bounce by filling the gap that has appeared between the bearer and the pier with blocking. The danger here is that when the next swell segment of the cycle occurs, the extra blocking will push the floor up into an accentuated dome and may also cause local shear failure in the soil. If it is necessary to use blocking, it should be by a pair of fine wedges and monitoring should be carried out fortnightly.

This BTF was prepared by John Lewer FAIB, MIAMA, Partner, Construction Diagnosis.

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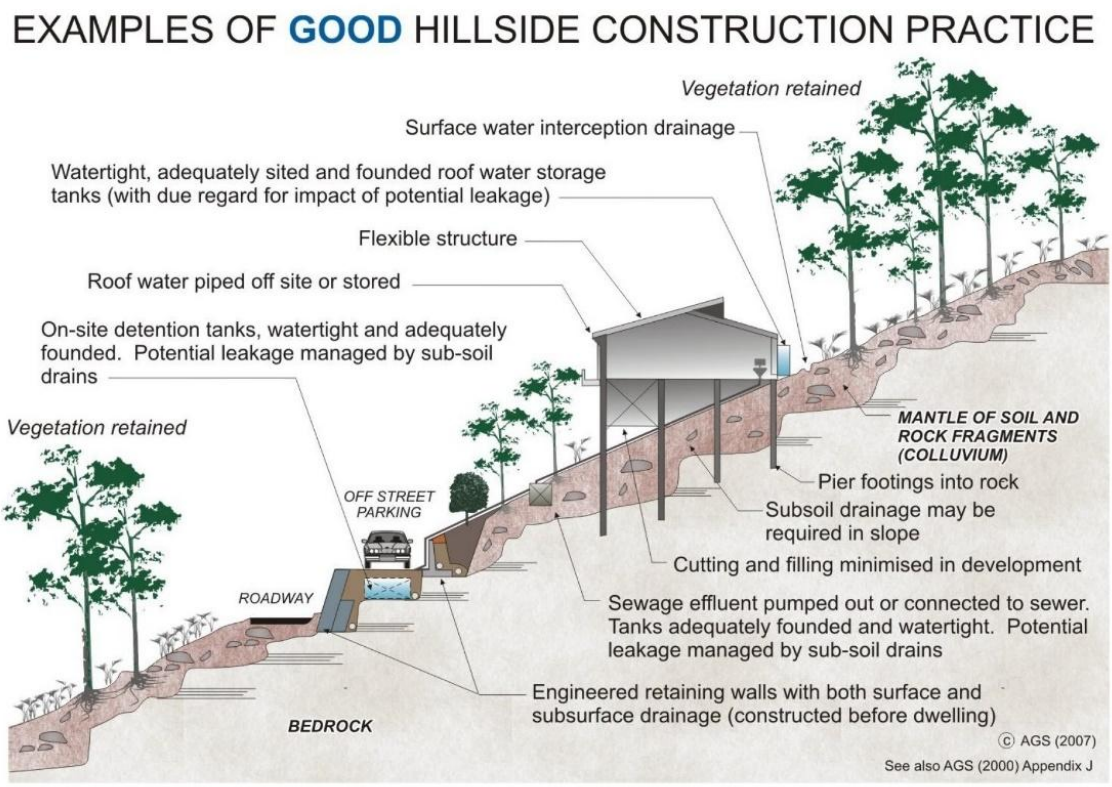
Appendix J Examples of Good Hillside Construction (AGS LRM LR8)

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

HILLSIDE CONSTRUCTION PRACTICE

Sensible development practices are required when building on hillsides, particularly if the hillside has more than a low risk of instability (GeoGuide LR7). Only building techniques intended to maintain, or reduce, the overall level of landslide risk should be considered. Examples of good hillside construction practice are illustrated below.



WHY ARE THESE PRACTICES GOOD?

Roadways and parking areas - are paved and incorporate kerbs which prevent water discharging straight into the hillside (GeoGuide LR5).

Cuttings - are supported by retaining walls (GeoGuide LR6).

Retaining walls - are engineer designed to withstand the lateral earth pressures and surcharges expected, and include drains to prevent water pressures developing in the backfill. Where the ground slopes steeply down towards the high side of a retaining wall, the disturbing force (see GeoGuide LR6) can be two or more times that in level ground. Retaining walls must be designed taking these forces into account.

Sewage - whether treated or not is either taken away in pipes or contained in properly founded tanks so it cannot soak into the ground.

Surface water - from roofs and other hard surfaces is piped away to a suitable discharge point rather than being allowed to infiltrate into the ground. Preferably, the discharge point will be in a natural creek where ground water exits, rather than enters, the ground. Shallow, lined, drains on the surface can fulfil the same purpose (GeoGuide LR5).

Surface loads - are minimised. No fill embankments have been built. The house is a lightweight structure. Foundation loads have been taken down below the level at which a landslide is likely to occur and, preferably, to rock. This sort of construction is probably not applicable to soil slopes (GeoGuide LR3). If you are uncertain whether your site has rock near the surface, or is essentially a soil slope, you should engage a geotechnical practitioner to find out.

Flexible structures - have been used because they can tolerate a certain amount of movement with minimal signs of distress and maintain their functionality.

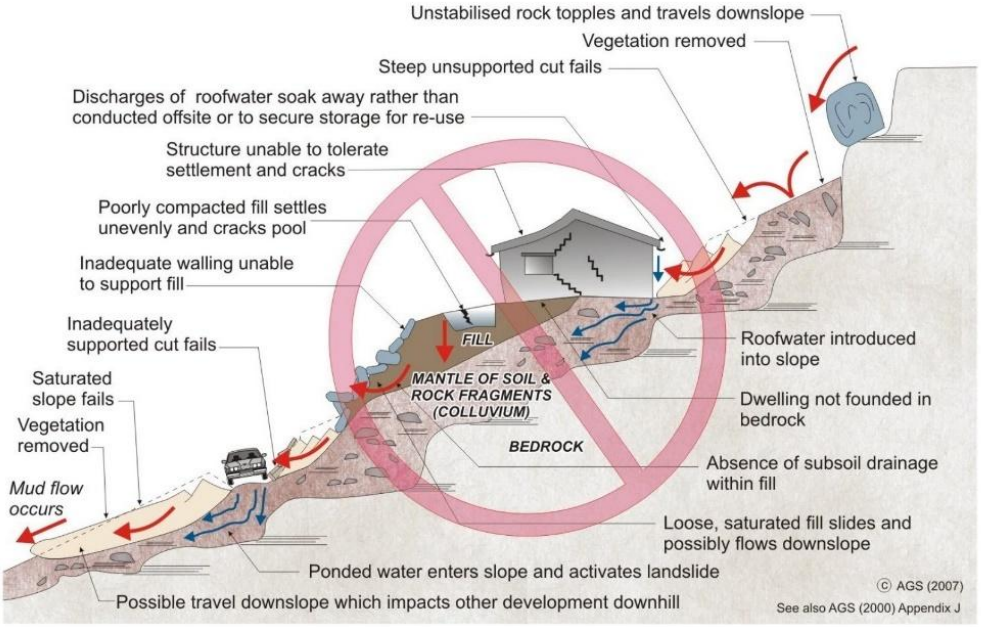
Vegetation clearance - on soil slopes has been kept to a reasonable minimum. Trees, and to a lesser extent smaller vegetation, take large quantities of water out of the ground every day. This lowers the ground water table, which in turn helps to maintain the stability of the slope. Large scale clearing can result in a rise in water table with a consequent increase in the likelihood of a landslide (GeoGuide LR5). An exception may have to be made to this rule on steep rock slopes where trees have little effect on the water table, but their roots pose a landslide hazard by dislodging boulders.

Possible effects of ignoring good construction practices are illustrated on page 2. Unfortunately, these poor construction practices are not as unusual as you might think and are often chosen because, on the face of it, they will save the developer, or owner, money. You should not lose sight of the fact that the cost and anguish associated with any one of the disasters illustrated, is likely to more than wipe out any apparent savings at the outset.

ADOPT GOOD PRACTICE ON HILLSIDE SITES

AUSTRALIAN GEOGUIDE LR8 (CONSTRUCTION PRACTICE)

EXAMPLES OF **POOR** HILLSIDE CONSTRUCTION PRACTICE



WHY ARE THESE PRACTICES POOR?

Roadways and parking areas - are unsurfaced and lack proper table drains (gutters) causing surface water to pond and soak into the ground.

Cut and fill - has been used to balance earthworks quantities and level the site leaving unstable cut faces and added large surface loads to the ground. Failure to compact the fill properly has led to settlement, which will probably continue for several years after completion. The house and pool have been built on the fill and have settled with it and cracked. Leakage from the cracked pool and the applied surface loads from the fill have combined to cause landslides.

Retaining walls - have been avoided, to minimise cost, and hand placed rock walls used instead. Without applying engineering design principles, the walls have failed to provide the required support to the ground and have failed, creating a very dangerous situation.

A heavy, rigid, house - has been built on shallow, conventional, footings. Not only has the brickwork cracked because of the resulting ground movements, but it has also become involved in a man-made landslide.

Soak-away drainage - has been used for sewage and surface water run-off from roofs and pavements. This water soaks into the ground and raises the water table (GeoGuide LR5). Subsoil drains that run along the contours should be avoided for the same reason. If felt necessary, subsoil drains should run steeply downhill in a chevron, or herring bone, pattern. This may conflict with the requirements for effluent and surface water disposal (GeoGuide LR9) and if so, you will need to seek professional advice.

Rock debris - from landslides higher up on the slope seems likely to pass through the site. Such locations are often referred to by geotechnical practitioners as "debris flow paths". Rock is normally even denser than ordinary fill, so even quite modest boulders are likely to weigh many tonnes and do a lot of damage once they start to roll. Boulders have been known to travel hundreds of metres downhill leaving behind a trail of destruction.

Vegetation - has been completely cleared, leading to a possible rise in the water table and increased landslide risk (GeoGuide LR5).

DON'T CUT CORNERS ON HILLSIDE SITES - OBTAIN ADVICE FROM A GEOTECHNICAL PRACTITIONER

More information relevant to your particular situation may be found in other Australian GeoGuides:

- GeoGuide LR1 - Introduction
- GeoGuide LR2 - Landslides
- GeoGuide LR3 - Landslides in Soil
- GeoGuide LR4 - Landslides in Rock
- GeoGuide LR5 - Water & Drainage
- GeoGuide LR6 - Retaining Walls
- GeoGuide LR7 - Landslide Risk
- GeoGuide LR9 - Effluent & Surface Water Disposal
- GeoGuide LR10 - Coastal Landslides
- GeoGuide LR11 - Record Keeping

The Australian GeoGuides (LR series) are a set of publications intended for property owners; local councils; planning authorities; developers; insurers; lawyers and, in fact, anyone who lives with, or has an interest in, a natural or engineered slope, a cutting, or an excavation. They are intended to help you understand why slopes and retaining structures can be a hazard and what can be done with appropriate professional advice and local council approval (if required) to remove, reduce, or minimise the risk they represent. The GeoGuides have been prepared by the Australian Geomechanics Society, a specialist technical society within Engineers Australia, the national peak body for all engineering disciplines in Australia, whose members are professional geotechnical engineers and engineering geologists with a particular interest in ground engineering. The GeoGuides have been funded under the Australian governments' National Disaster Mitigation Program.

CERTIFICATE OF QUALIFIED PERSON – ASSESSABLE ITEM

Section 321

Form 55

To: Troy and Cheryllyn Thompson *Owner /Agent*
570 HUNTINGDON TIER RD *Address*
BAGDAD 7030 *Suburb/postcode*

Qualified person details:

Qualified person: Kris Taylor
Address: 445 Macquarie Street
Hobart 7004
Phone No: 0476 595 889
Fax No:
Licence No: NA
Email address: office@envirotechtas.com.au

Qualifications and Insurance details: Bachelor of Science with Honours in Geology. Loyd's Underwriting $2,000,000.
Soil and rock mechanics.
Soil and rock testing.
(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items

Speciality area of expertise: Geo-technical Reports
(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work: Landslip Hazard Report

Address: 570 Huntingdon Tier Road
Bagdad 7030
Lot No: 3
Certificate of title No: 163955/3

The assessable item related to this certificate: Landslip Hazard Report prepared by a geotechnical practitioner with experience and competence in the preparation of landslip hazard reports

(description of the assessable item being certified)
Assessable item includes –
- *a material;*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: Geotechnical
(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable items, at any stage, as part of – *(tick one)*

(•) building work, plumbing work or plumbing installation or demolition work

OR

( ) a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents:	Enviro-Tech Consultants Pty. Ltd. 2025. Landslip Hazard Assessment Report for a Proposed Dwelling And Shed, 570 Huntingdon Tier Road - Bagdad. Unpublished report for Troy and Cheryllyn Thompson by Enviro-Tech Consultants Pty. Ltd., 26/08/2025.
Relevant calculations:	
References:	Directors Determination - Landslip Hazard Areas Areas Extract from Australian Geomechanics Journal and News of the Australian Geomechanics Society Volume 42 No 1 March 2007. Landslide Risk Management Building on Tasmanian Landscapes: Guidance for Geotechnical Reporting in Tasmania (Mineral Resources Tasmania, 2018)

Substance of Certificate: *(what it is that is being certified)*

Scope and/or Limitations

Tasmanian Planning Scheme – State Planning Provisions: To ensure that a tolerable risk can be achieved and maintained for the type, scale and intensity and intended life of use or development on land within a landslip hazard area.

Directors determinatiopn: lowest level of likely risk from landslip to secure the benefits of a use or development in a landslip hazard area, and which can be managed through routine regulatory measures or by specific hazard management measures for the intended life of each use or development.

I certify the matters described in this certificate.

Qualified person:	*Signed:*	*Certificate No:*	*Date:*
			26/08/2025

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Qualifications and Insurance details: Bachelor of Science with Honours in Geology. Lloyd's Underwriters: soil and rock mechanics, soil and rock testing
(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items

Speciality area of expertise: Geo-technical Reports
(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work: Geotechnical Site Investigation

Address: 570 Huntingdon Tier Road
Bagdad 7030
Lot No: 3
Certificate of title No: 163955/3

The assessable item related to this certificate: Geotechnical Site Investigation written in accordance with AS1726 by a geotechncial practitioner with appropriate experience, training and qualifications.*

(description of the assessable item being certified)
Assessable item includes –
- *a material;*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: Geotechnical including landslide risk assessment in accordance with "Practice Note Guidelines for Landslide Risk Management 2007" published by the Australian Geomechanics Society.*
(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable items, at any stage, as part of – *(tick one)*

- (•) building work, plumbing work or plumbing installation or demolition work

OR

- ( ) a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents: Enviro-Tech Consultants Pty. Ltd. 2025. Geotechnical Site Investigation for Foundations and Wastewater for a Proposed Dwelling And Shed, 570 Huntingdon Tier Road - Bagdad. Unpublished report for Troy and Cheryllyn Thompson by Enviro-Tech Consultants Pty. Ltd., 26/08/2025.

Relevant calculations:

References: - AS1726-2017 Geotechnical Site Investigations

Substance of Certificate: *(what it is that is being certified)*

- An assessment of:
- Foundations for proposed building structures.*

Scope and/or Limitations

The Geotechnical Site Investigation applies to the Site and Project Area as inspected and does not account for future alteration to foundation conditions as a result of earth works, drainage condition changes or variations in site maintenance which are not included within the provided plans.

***This report contains soil classification information prepared in accordance with AS2870 as well as AS2870 extracts which may be used as general guidance for plumbing design. The hydraulic designer is to use their own judgment in the application of this information and this report must be read in in conjunction with hydraulic plans for the proposed development.**

I certify the matters described in this certificate.

Qualified person:	*Signed:*	*Certificate No:*	*Date:*
			26/08/2025

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(description from Column 3 of the Director's Determination - Certificates by Qualified Persons for Assessable Items

Speciality area of expertise: Site and soil evaluation and land application system design*
(description from Column 4 of the Director's Determination - Certificates by Qualified Persons for Assessable Items)

Details of work

Address: 570 Huntingdon Tier Road
Bagdad 7030
Lot No: 3
Certificate of title No: 163955/3

The assessable item related to this certificate: Site and soil evaluation for wastewater management
(description of the assessable item being certified)
Assessable item includes –
- *a material;*
- *a design*
- *a form of construction*
- *a document*
- *testing of a component, building system or plumbing system*
- *an inspection, or assessment, performed*

Certificate details:

Certificate type: On-site wastewater management
(description from Column 1 of Schedule 1 of the Director's Determination - Certificates by Qualified Persons for Assessable Items n)

This certificate is in relation to the above assessable items, at any stage, as part of – *(tick one)*

(•) building work, plumbing work or plumbing installation or demolition work

OR

( ) a building, temporary structure or plumbing installation

In issuing this certificate the following matters are relevant –

Documents:

Enviro-Tech Consultants Pty. Ltd. 2025. Geotechnical Site Investigation for Foundations and Wastewater for a Proposed Dwelling And Shed, 570 Huntingdon Tier Road - Bagdad. Unpublished report for Troy and Cheryllyn Thompson by Enviro-Tech Consultants Pty. Ltd., 26/08/2025.

Site 'On-site wastewater design report' (CKEMP Design)

References:

Substance of Certificate: *(what it is that is being certified)*

- An assessment of Site and soil conditions for on-site wastewater management and design

Scope and/or Limitations

*Site and soil evaluation by Enviro-Tech Consultants Pty. Ltd.
Land application system design is assessed in a separate 'On-site wastewater report' by a licensed building service designer:
- Chris Fysh Licensed Building Services Designer - Civil / Hydraulic (License No: 479819732)

I certify the matters described in this certificate.

Qualified person:

Signed:	*Certificate No:*	*Date:*
		26/08/2025

NATURAL VALUES ASSESSMENT OF 570 HUNTINGDON TIER ROAD (PID 3247834; C.T. 163955/3; LPI 1902997), BAGDAD, TASMANIA

Environmental Consulting Options Tasmania (ECO*tas*) for Troy Thompson

27 August 2025

Mark Wapstra ***ABN 83 464 107 291***

28 Suncrest Avenue *email: mark@ecotas.com.au*

Lenah Valley, TAS 7008 *web: www.ecotas.com.au* *mobile: 0407 008 685*

CITATION

This report can be cited as:

ECO*tas* (2024). *Natural Values Assessment of 570 Huntingdon Tier Road (PID 3247834; C.T. 163955/3; LPI 1902997), Bagdad, Tasmania.* Report by Environmental Consulting Options Tasmania (ECO*tas*) for Troy Thompson, 27 August 2025.

AUTHORSHIP

Field assessment: Mark Wapstra, James Wapstra

Report production: Mark Wapstra, James Wapstra

Habitat and vegetation mapping: Mark Wapstra, James Wapstra

Base data for mapping: LISTmap

Digital and aerial photography: Mark Wapstra, LISTmap, Google Earth, ESRI World Imagery

ACKNOWLEDGEMENTS

Troy Thompson (owner) provided information on the proposed land use.

QUALIFICATIONS

Except where otherwise stated, the opinions and interpretations of legislation and policy expressed in this report are made by the authors and do not necessarily reflect those of the relevant agency. The client should confirm management prescriptions with the relevant agency before acting on the content of this report. This report and associated documents do not constitute legal advice.

Note that any reference to the Department of Primary Industries, Parks, Water & Environment (DPIPWE) now refers to the Department of Natural Resources and Environment Tasmania.

COVER ILLUSTRATION

View of across cleared area of title into DTO.

Please note: the blank pages in this document are deliberate to facilitate double-sided printing.

CONTENTS

SUMMARY

General

Troy Thompson (owner) engaged Environmental Consulting Options Tasmania (ECO*tas*) to undertake a natural values assessment of 570 Huntingdon Tier Road (PID 3247834; C.T. 163955/3; LPI 1902997), Bagdad, Tasmania, primarily to ensure that the requirements of the identified natural values are appropriately considered during any further project planning under local, State and Commonwealth government approval protocols.

Site assessment

A natural values assessment of the study area was undertaken by Mark Wapstra and James Wapstra (ECO*tas*) on 22 Aug. 2025.

Summary of key findings

Threatened flora

- No plant species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) and/or the Tasmanian *Threatened Species Protection Act 1995* (TSPA) are known from database information, or were detected as a consequence of site assessment, from the study area.
- The absence of threatened flora species from the title means that no part of the site is "a threatened flora species" [sic] such that these areas cannot be interpreted as "priority vegetation" (in relation to this value), pursuant to C7.3.1(b) of the *State Planning Provisions.*

Threatened fauna

- No fauna species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) and/or the Tasmanian *Threatened Species Protection Act 1995* (TSPA) are known from database information from the study area.
- The study area supports potential habitat of several species (to different degrees), as follows:
  - *Sarcophilus harrisii* (Tasmanian devil);
  - *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll);
  - *Dasyurus viverrinus* (eastern quoll);
  - *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot);
  - *Myiagra cyanoleuca (*satin flycatcher);
  - *Neophema chrysostoma* (blue-winged parrot);
  - *Tyto novaehollandiae* subsp. *castanops* (masked owl); and
  - *Antipodia chaostola* tax. *leucophaea* (chaostola skipper).

- No part of the title supports "significant habitat for a threatened fauna species" at any reasonable scale, such that it cannot be construed as "priority vegetation" (in relation to this value) pursuant to C7.3.1(c) of the *State Planning Provisions*.

Vegetation types

- The study area supports the following TASVEG mapping unit:
  - *Eucalyptus tenuiramis* forest and woodland on sediments (TASVEG code: DTO).
- Occurrences of DTO equates to a native vegetation community listed as threatened on Schedule 3A of the Tasmanian *Nature Conservation Act 2002*.
- Occurrences of DTO do not equate to a threatened ecological community listed under the Commonwealth *Environment Protection and Biodiversity Protection Act 1999*.
- The presence of "native vegetation [that] forms an integral part of a threatened native vegetation community as prescribed under Schedule 3A of the *Nature Conservation Act 2002*" means that the site is "priority vegetation" (in relation to this value) pursuant to C7.3.1(a) of the *State Planning Provisions*.

Weeds

- No plant species classified as declared weeds within the meaning of the Tasmanian *Biosecurity Act 2019* (*Biosecurity Regulations 2022*) were detected from the study area.

Plant disease

- No evidence of *Phytophthora cinnamomi* (PC, rootrot) was recorded within the study area.
- No evidence of myrtle wilt was recorded within the study area.
- No evidence of myrtle rust was recorded within the study area.

Animal disease (chytrid)

- The study area does not support particular habitats conducive to frog chytrid disease.

Recommendations

natural values described in the main report. The main text of the report provides the relevant context for the recommendations.

Vegetation types

In general terms, minimising the extent of "clearance and conversion" and/or "disturbance" to native vegetation is recommended, within the context of the proposed development being an acceptable use and acknowledging this will include access (largely already established), shed, boundary fencing, and a single residential dwelling with associated hazard management area (and associated elements such as a firefighting water tank).

Threatened flora

None identified – no special management required.

Threatened fauna

Apart from the generic recommendation to minimise the extent of "clearance and conversion" and/or "disturbance" to native vegetation (with acknowledged constraints), specific management in relation to threatened fauna is not recommended.

Weed and disease management

Longer-term special management (e.g. a complex weed management plan) is not considered warranted because owner occupation is considered the most appropriate (and realistic) means of achieving control of any declared species (should they become established), where vigilance and immediate control are practical.

Legislative and policy implications

A permit under Section 51 of the Tasmanian *Threatened Species Protection Act 1995* (TSPA) is not likely to be.

A formal referral to the relevant Commonwealth agency under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) is not considered required.

Development will require a planning permit pursuant to the provisions of the applicable planning scheme but specific permit conditions in relation to natural values to satisfy P1.1 & P1.2 of C7.6.2 of the Natural Assets Code of the *Tasmanian Planning Scheme – Southern Midlands Council* are not recommended.

INTRODUCTION

Purpose

Troy Thompson (owner) engaged Environmental Consulting Options Tasmania (ECO*tas*) to undertake a natural values assessment of 570 Huntingdon Tier Road (PID 3247834; C.T. 163955/3; LPI 1902997), Bagdad, Tasmania, primarily to ensure that the requirements of the identified natural values are appropriately considered during any further project planning under local, State and Commonwealth government approval protocols.

Scope

This report relates to:

- flora and fauna species of conservation significance, including a discussion of listed threatened species (under the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*) potentially present, and other species of conservation significance/interest;
- vegetation types (forest and non-forest, native and exotic) present, including a discussion of the distribution, condition, extent, composition and conservation significance of each community;
- plant and animal disease management issues;
- weed management issues; and
- a discussion of some of the policy and legislative implications of the identified natural values.

This report follows the government-produced *Guidelines for Natural Values Surveys – Terrestrial Development Proposals* (DPIPWE 2015) in anticipation that the report (or extracts of it) may be required as part of various approval processes.

The report format should also be applicable to other assessment protocols as required by the relevant Commonwealth agency (for any referral/approval that may be required under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*), which is unlikely to be required in this case.

More specifically, this assessment and report have been prepared to address specific provisions of the *Tasmanian Planning Scheme – Southern Midlands Council Local Provisions Schedule*, with particular reference to the provisions within the Natural Assets Code.

Limitations

The natural values assessment was undertaken on 22 Aug. 2025. Many plant species have ephemeral or seasonal growth or flowering habits, or patchy distributions (at varying scales), and it is possible that some species were not recorded for this reason. However, every effort was made to sample the range of habitats present in the survey area to maximise the opportunity of recording most species present (particularly those of conservation significance). Late spring and into summer are usually regarded as the most suitable period to undertake most botanical assessments. While some species have more restricted flowering periods, a discussion of the potential for the site to support these is presented.

The survey was also limited to vascular species: species of mosses, lichens and liverworts were not recorded. However, a consideration is made of threatened species (vascular and non-vascular) likely to be present (based on habitat information and database records) and reasons presented for their apparent absence.

Surveys for threatened fauna were largely limited to an examination of "potential habitat" (i.e. comparison of on-site habitat features to habitat descriptions for threatened fauna), and detection of tracks, scats and other signs.

Permit

Any plant material was collected under DNRET permit TFL 24238 (in the name of Mark Wapstra). Relevant data will be entered into DNRET's *Natural Values Atlas* database by the authors.

No vertebrate or invertebrate material was collected. A permit is not required to undertake the type of habitat-level assessment described herein.

STUDY AREA

Land use proposal

At the time of assessment, a specific land use proposal was not provided such that the whole of the title was assessed to facilitate further land use planning that can take appropriate account of natural values.

Overview – cadastral details

The study area (Figures 1-3) comprises of a single title at 570 Huntingdon Tier Road, Bagdad, with the following cadastral details:

- PID: 3247834;
- C.T.: 163955/3; and
- LPI: 1902997.

[computed area: 21,979.901 m^2, measured area: 22.000 m^2 i.e. ca. 2.2 ha]

Current land tenure and other categorisations of the study area are as follows:

- private freehold title; and
- Southern Midlands Council municipality, zoned as Rural Living pursuant to the *Tasmanian Planning Scheme – Southern Midlands Council Local Provisions Schedule* (Figure 4), and almost wholly subject to the Priority Vegetation Area overlay (Figure 5).

The subject title is bound to the east, west and south by private titles (residentially occupied to the east and west), and to the north by Huntingdon Tier Road.

Other site features

The title is part of a more extensive area of native forest that is now part of typical developed and partially-developed "bush blocks", with entrances off the main road (Plates 1 & 2).

Plates 1 & 2. Views of the existing well-formed access

Plates 3 & 4. Views of the existing cleared area

The balance of the title is relatively undisturbed native vegetation, mainly comprising of an open, low diversity woodland (Plates 5 & 6). The boundaries are partly furnished with a post-and-wire fence with an electric fence on part of the western boundary.

Topographically, the title is at ca. 365-405 m a.s.l., with a generally northerly aspect, with no drainage features within ort immediately adjacent to the title.

LISTmap's Fire History layer indicates that the title and surrounds have not been impacted by any formally recorded figures. However, typical for this part of the State and the vegetation present, it is expected that there has been a reasonably frequent fire history. Site assessment indicated some level of recent events (some minor burnt-out tree bases).


Plates 5 & 6. Typical open woodland structure that dominates most of title

While mature habitat modelling indicates a the possible presence of mature elements (Figure 6), site assessment and tree canopy modelling (Figure 7) indicate a regrowth-dominated structure typical of the vegetation type on low nutrient soils. The ground layer is non-complex, generally lacking in coarse woody debris, dense undergrowth, wombat/rabbit burrows or rock outcrops of any note.

The geology of the study area is mapped at a 1:250,000 scale (Figure 8) as Triassic-age "dominantly quartz sandstone" (geocode: Rq) The geology is mentioned because it has a strong influence on the classification of vegetation and the potential occurrence of threatened flora (and to a lesser extent, threatened fauna). The geology was confirmed informally by reference to outcropping rocks and soil types, with the whole site clearly on some form of granitic substrate (Plates 7 & 8).


Plates 7 & 8. Examples of sandy quartz-derived soils

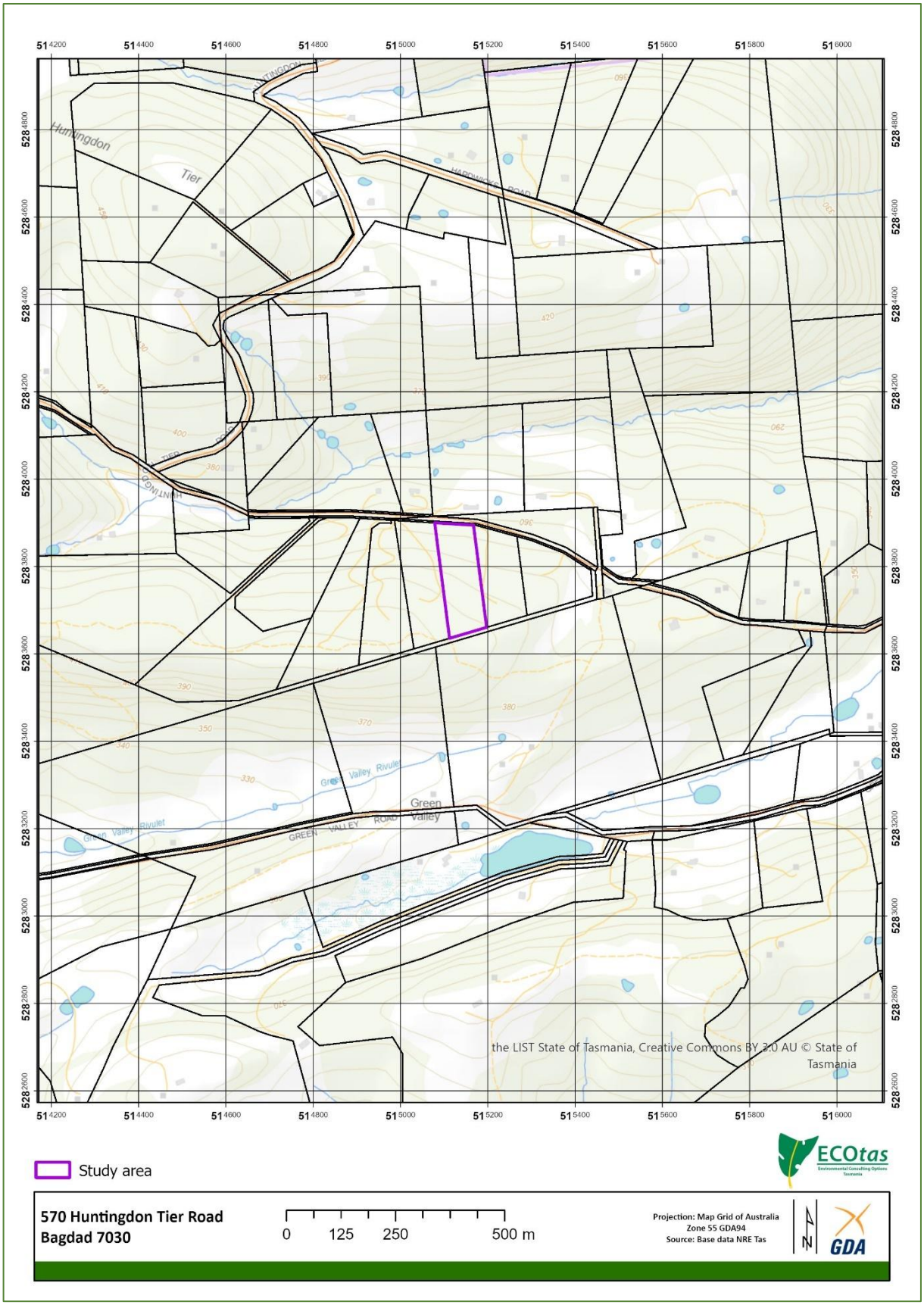

Figure 1. General location of study area

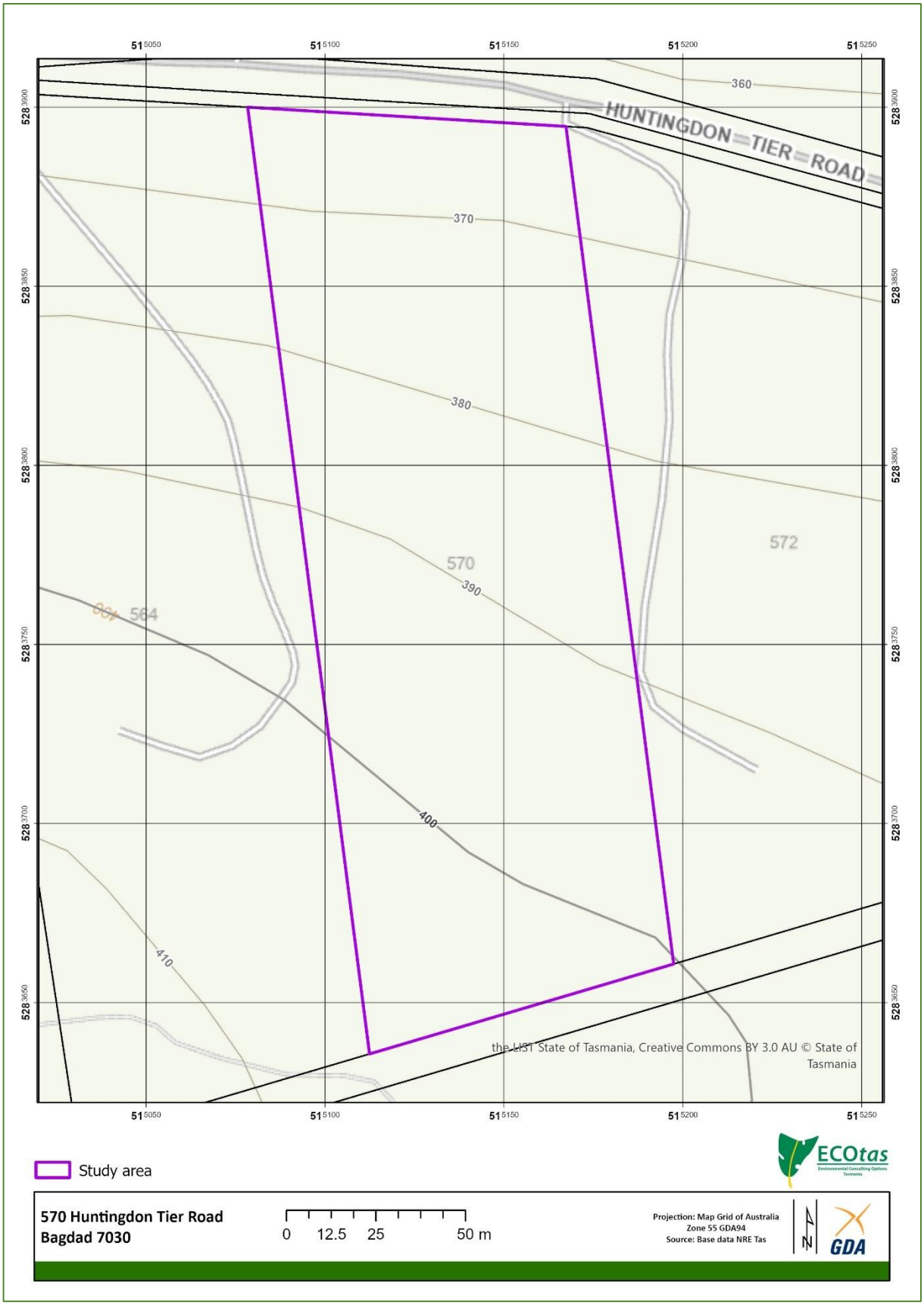

Figure 2. Detailed location of study area showing general topographic and cadastral features

Figure 3. Detailed location of study area showing recent aerial imagery, cadastral boundaries, contours and watercourses

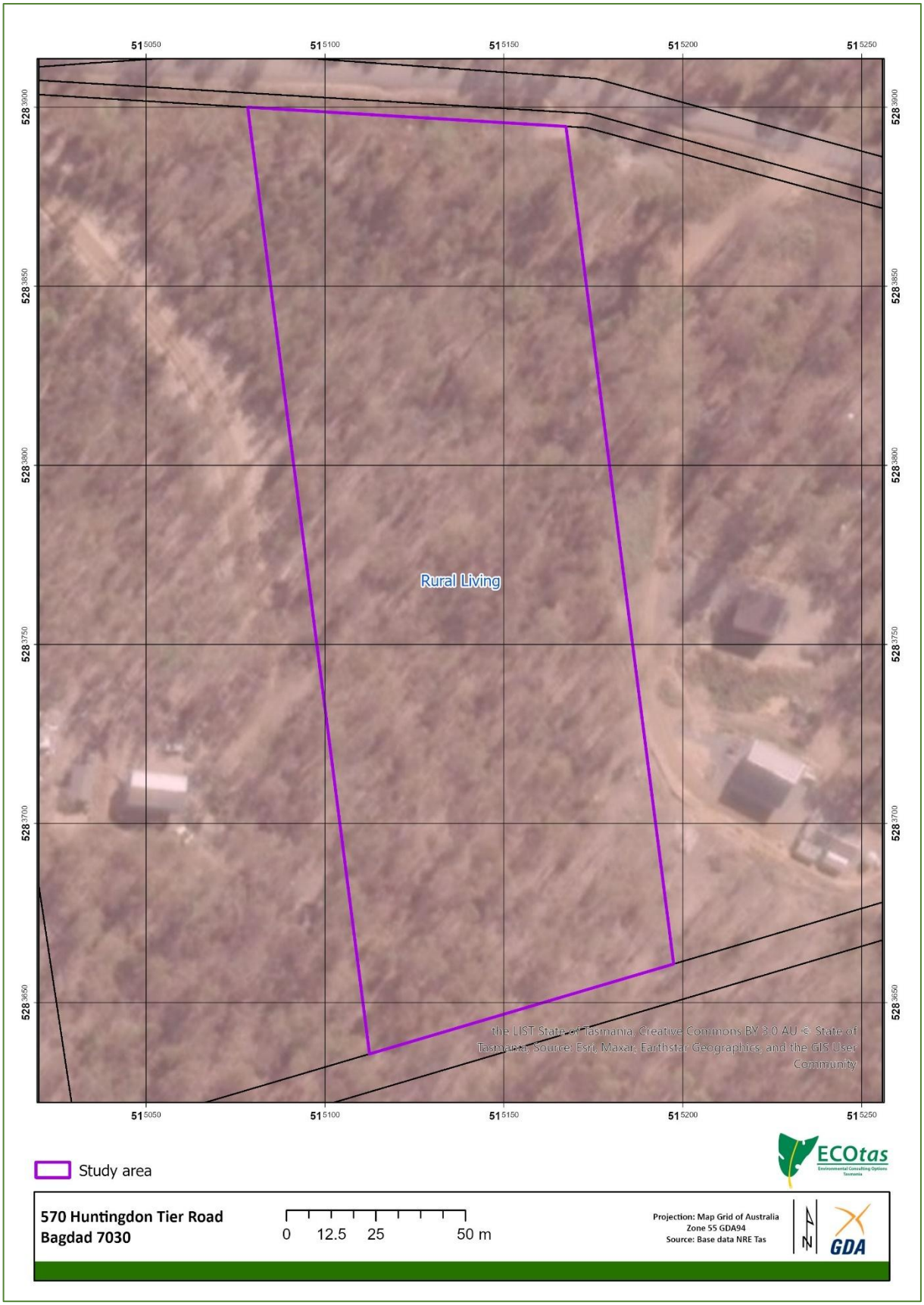

Figure 4. Zoning of study area and surrounds pursuant to the *Tasmanian Planning Scheme*

Figure 5. Extent of Priority Vegetation Area overlay (green hatching) within and adjacent to study area pursuant to *Tasmanian Planning Scheme*

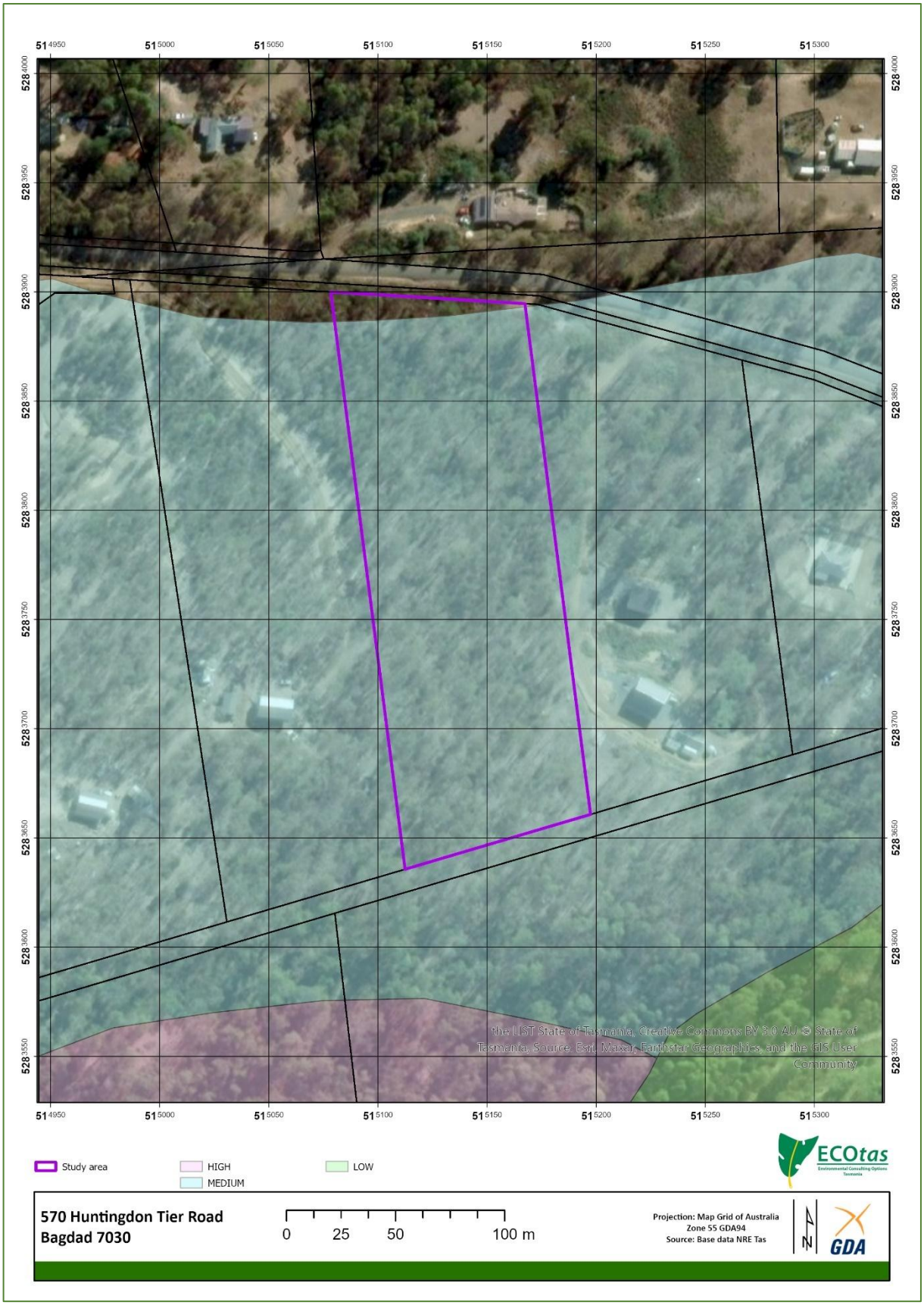

Figure 6. Mature habitat modelling for study area and surrounds

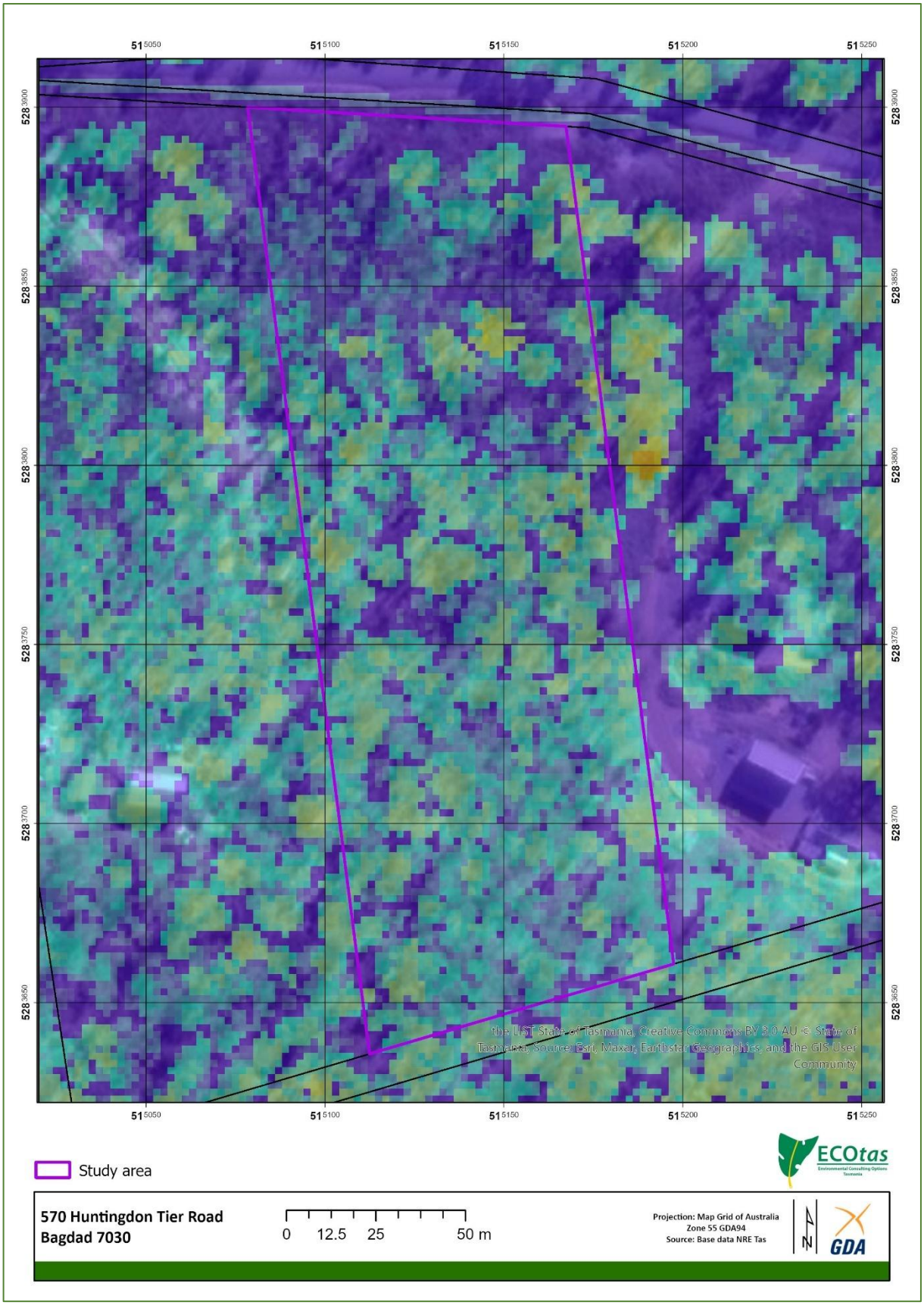

Figure 7. Tree canopy modelling for study area and surrounds

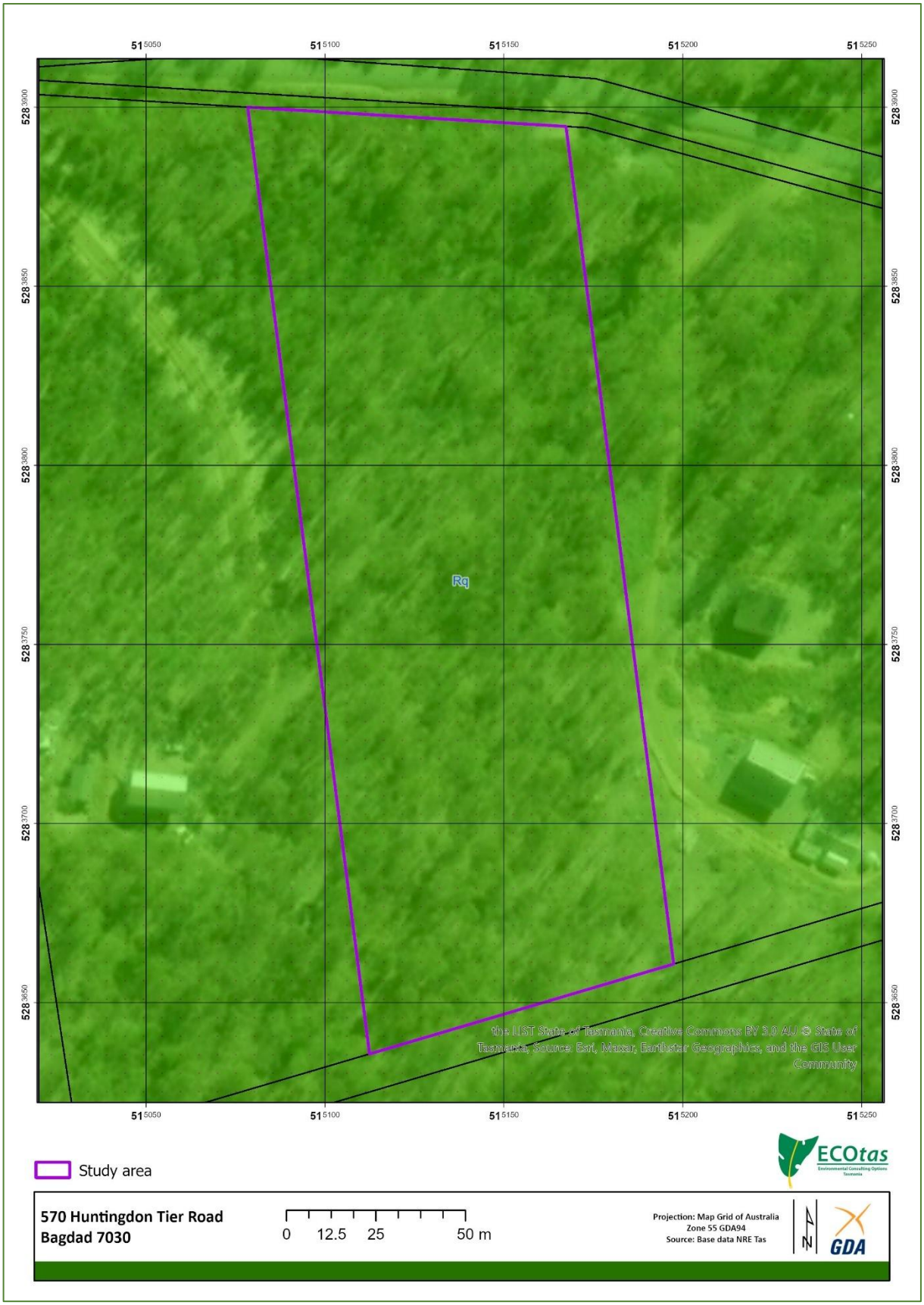

Figure 8. Geology (1:250,000 scale) of study area and surrounds (refer to text for code)

METHODS

Nomenclature

All grid references in this report are in GDA94, except where otherwise stated.

Vascular species nomenclature follows de Salas & Baker (2024) for scientific names and Wapstra et al. (2005+) for common names. Fauna species scientific and common names follow the listings in the cited *Natural Values Atlas* report (DNRET 2024a).

Vegetation classification follows TASVEG 4.0, as described in *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation (*Kitchener & Harris 2013+).

Preliminary investigation

Available sources of previous reports, threatened flora records, vegetation mapping and other potential environmental values were interrogated. These sources include:

- Tasmanian Department of Natural Resources & Environment Tasmania's *Natural Values Atlas* records for threatened flora and fauna (GIS coverage maintained by the author current as at date of report);
- Tasmanian Department of Natural Resources & Environment Tasmania's *Natural Values Atlas* report ECOtas_570HuntingdonRoad for a polygon defining the study area (centred on 515138mE 5283773mN), buffered by 5 km, dated 18 Aug. 2025 (DNRET 2024a) – Appendix E;
- Forest Practices Authority's *Biodiversity Values Database* report, specifically the species' information for grid reference centroid 515138mE 5283773mN (i.e. a point defining the approximate centre of the study area), buffered by 5 km and 2 km for threatened fauna and flora records, respectively, hyperlinked species' profiles and predicted range boundary maps, dated 18 Aug. 2025 (FPA 2024) – Appendix F;
- Commonwealth *Protected Matters Report* for a polygon defining the study area, buffered by 5 km, dated 18 Aug. 2025 (CofA 2024) – Appendix G;
- TASVEG vegetation coverages (as available through GIS coverage and via LISTmap);
- Google Earth, LISTmap orthoimagery and ESRI World Imagery; and
- other sources listed in tables and text as indicated.

Field assessment

The assessment was undertaken by Mark Wapstra & James Wapstra (ECO*tas*) on 22 Aug. 2025. Cadastral data uploaded to the iGIS application guided the in-field assessment (boundaries partially indicated by fences and survey markers). Hand-held GPS was used to waypoint natural values features for future mapping purposes.

The survey was not limited by access due to the simple configuration of the study area with existing access and open vegetation.

Vegetation classification

Vegetation was classified by waypointing vegetation transitions for later comparison to aerial imagery. The structure and composition of the vegetation types was described using a nominal 30 m radius plot at a representative site within the vegetation types, and compiling a "running" species list for the balance of the title.

Threatened (and priority) flora

With reference to the threatened flora, the survey included consideration of the most likely habitats for such species. Hand-held GPS (Garmin GPSMAP 66sr) was used to waypoint the location of any species located.

Threatened fauna

Surveys for threatened fauna were largely limited to an examination of "potential habitat" (i.e. comparison of on-site habitat features to habitat descriptions for threatened fauna), and detection of tracks, scats and other signs, signs.

Weed and hygiene issues

The study area was assessed with respect to plant species classified as declared weeds under the Tasmanian *Biosecurity Act 2019* (*Biosecurity Regulations 2022*) Weeds of National Significance (WoNS) or "environmental weeds" (authors' opinion and as included in *A Guide to Environmental and Agricultural Weeds of Southern Tasmania*, NRM South 2017).

The study area was assessed with respect to potential impacts of plant and animal pathogens, by reference to habitat types and field symptoms.

FINDINGS

Vegetation types

Comments on TASVEG mapping

This section, which comments on the existing TASVEG mapping for the study area, is included to highlight the differences between existing mapping and the more recent mapping from the present study to ensure that any parties assessing land use proposals (via this report) do not rely on existing mapping. Note that TASVEG mapping, which was mainly a desktop mapping exercise based on aerial photography, is often substantially different to ground-truthed vegetation mapping, especially at a local scale. An examination of existing vegetation mapping is usually a useful pre-assessment exercise to gain an understanding of the range of habitat types likely to be present and the level of previous botanical surveys.

In this case, it is useful to examine TASVEG 3.0, 4.0 & Live mapping because while the latter two should be the most up-to-date, the former has been used to inform the *Tasmanian Planning Scheme* and specifically the Regional Ecosystem Model's mapping of the Priority Vegetation Area overlay developed as part of the *Tasmanian Planning Scheme*. In this case, TASVEG 3.0, 4.0 and Live are close to identical, with TASVEG 3.0 4.0 and Live changing the polygon of FRG on the northern part of the subject title to FAG.

TASVEG maps the title as (Figure 9 = TASVEG 3.0 & 4.0; Figure 10 = TASVEG Live):

- *Eucalyptus tenuiramis* forest and woodland on sediments (TASVEG code: DTO)

  DTO is mapped across most of the title, except for northern area close to Huntingdon Tier Road;
- agricultural land [TASVEG 3.0 & 4.0] (TASVEG code: FAG)

  FAG accounts for a small section in the north of the subject title.
- regenerating cleared land [TASVEG Live] (TASVEG code: FRG)

  The polygon of FRG marginally extends into the northern part of the title.
- extra-urban miscellaneous [TASVEG Live] (TASVEG code: FUM)

  FUM accounts for a tiny section in the southeast of the subject title.

Vegetation types recorded as part of the present study

Vegetation types have been classified according to TASVEG 4.0, as described in *From Forest to Fjaeldmark: Descriptions of Tasmania's Vegetation* (Kitchener & Harris 2013+). Table 1 provides information on the mapping units identified from the study area. Refer to Figure 11 that indicates the revised mapping for the study area. Refer to Appendix A for more detailed description of the native vegetation mapping unit identified from the study area.

Conservation significance of identified vegetation types

Occurrences of DTO equates to a native vegetation community listed as threatened on Schedule 3A of the Tasmanian *Nature Conservation Act 2002*.

Occurrences of DTO do not equate to a threatened ecological community listed under the Commonwealth *Environment Protection and Biodiversity Protection Act 1999*.

Occurrences of DTO meet the intent of "priority vegetation" pursuant to the Natural Assets Code of the *State Planning Provisions*, which is defined as follows:

C7.3 Definition of Terms

C7.3.1 In this code, unless the contrary intention appears:

means native vegetation where any of the following apply:

(a) it forms an integral part of a threatened native vegetation community as prescribed under Schedule 3A of the *Nature Conservation Act 2002*;

(b) is a threatened flora species;

(c) it forms a significant habitat for a threatened fauna species; or

(d) it has been identified as native vegetation of local importance.

That is, C7.3.1(a) is applicable.

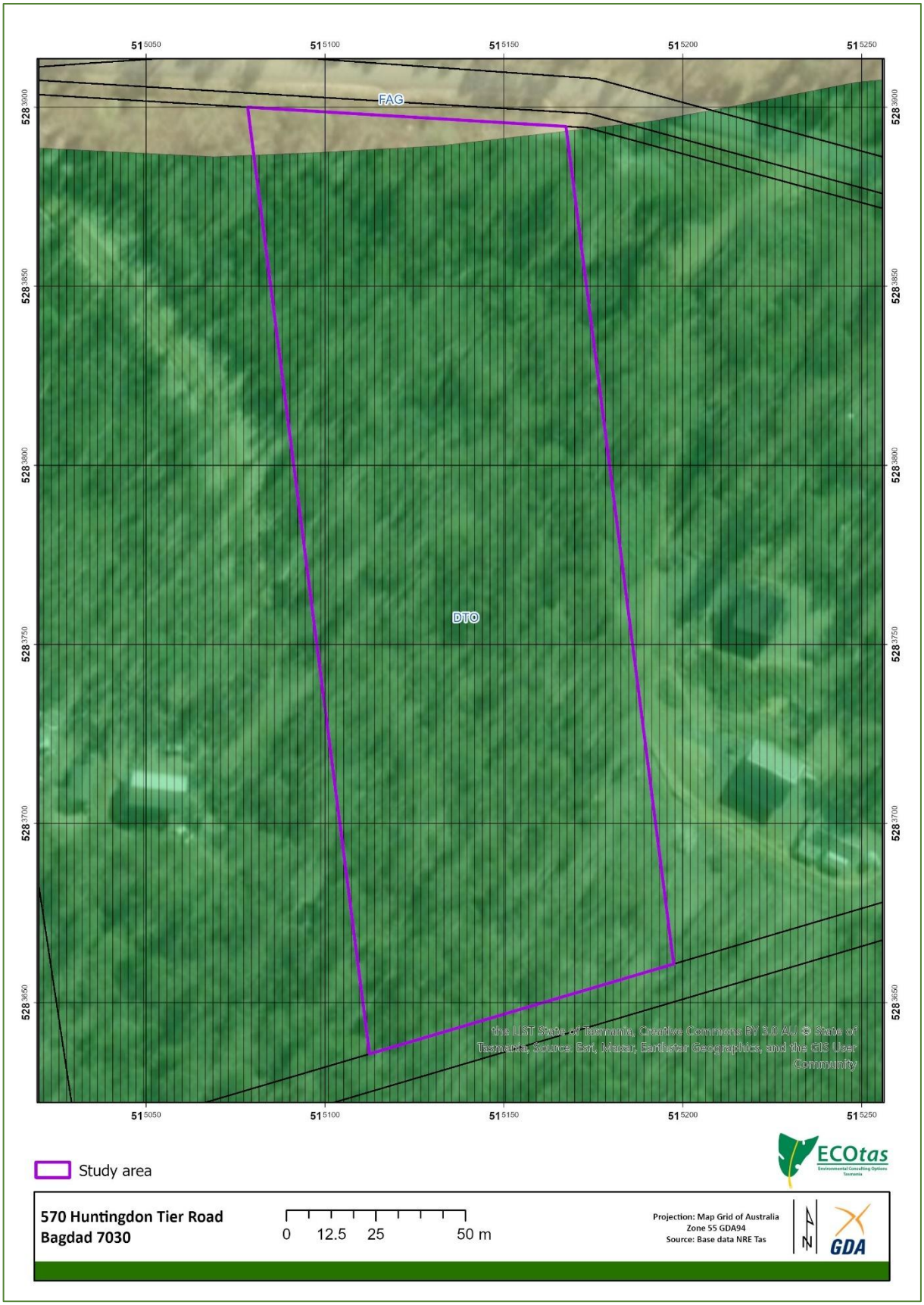

Figure 9. TASVEG 3.0 & 4.0 vegetation mapping for study area and surrounds (see text for codes)

Figure 10. Existing TASVEG Live vegetation mapping for study area and surrounds (see text for codes)

Figure 11. Revised vegetation mapping for study area (see text for codes)

Table 1. Vegetation mapping unit present in study area

[conservation status: NCA – as per Schedule 3A of the Tasmanian *Nature Conservation Act 2002*, using units described by Kitchener & Harris (2013+), relating to TASVEG mapping units (DNRET 2025b); table headings are as per modules in Kitchener & Harris (2013+); EPBCA – as per the listing of ecological communities on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, relating to communities as described under that Act, but with equivalencies to TASVEG units]

TASVEG equivalent (Kitchener & Harris 2013+)	**Conservation priority** TASVEG *EPBCA*	**Comments**
Dry eucalypt forest and woodland		
Eucalyptus tenuiramis forest and woodland on sediments (DTO)	threatened *not threatened*	DTO is confirmed as occupying the whole of the subject title, effectively as per existing TASVEG mapping, noting that areas mapped as FAG, FRG & FUM under TASVEG are now re-coded as DTO (at least within the subject title). DTO is expressed as quite typical for the community with a relatively even-aged canopy dominated by *Eucalyptus tenuiramis* (with only very occasional *Eucalyptus obliqua*) over a variably dense (but generally sparse) sub-canopy of *Exocarpos cupressiformis* and *Allocasuarina littoralis*, in turn over a generally very open understorey of low shrubs, sparse graminoids, very sparse grass, occasional climbers and variably dense (but very low diversity) herbs. Typical for DTO (in this case over sandstone) is quite extensive areas of bare soil and exposed surface rock. Mature elements such as hollow-bearing trees and large coarse woody debris are wholly absent, also quite typical for DTO. The site has been burnt, albeit probably only infrequently and lightly. Apart from the most recent disturbance (fenceline clearing, access drive, pre-prepared excavation for shed and future house site), DTO is in excellent ecological condition with no naturalised plant species or symptoms of plant disease recorded.

Plant species

General information

A total of 25 vascular plant species were recorded from the study area (Appendix B), comprising 18 dicotyledons (including 1 endemic species), 5 monocotyledons, 1 magnoliid (native) and 1 pteridophyte. The absence of naturalised species is notable. The very low diversity is highly typical of low-nutrient sites supporting open *Eucalyptus tenuiramis* forest.

Additional surveys at different times of the year may detect additional short-lived herbs and grasses but a follow-up survey is not considered warranted because of the very low likelihood of species with a high priority for conservation management being present.

Threatened flora

Figure 12 indicates threatened flora species near the study area and Table C1 (Appendix C) provides a listing of threatened flora from within 5,000 m of the study area (nominal buffer width usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded.

Database information indicates that the subject title does not support known populations of flora listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* and/or the Commonwealth *Environment Protection and Biodiversity Protection Act 1999* (Figure 12).

The absence of a threatened flora species from the title means that no part of the site is "a threatened flora species" [sic] such that it cannot be interpreted as "priority vegetation" (in relation to this value) pursuant to C7.3.1(b) of the *State Planning Provisions* (see previous citation of definition of "priority vegetation" at **FINDINGS *Vegetation types*** Conservation significance of identified vegetation types).

Threatened fauna

Figure 13 indicates threatened fauna species near the study area and Table D1 (Appendix D) provides a listing of threatened fauna from within 5,000 m of the study area (nominal buffer width usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded.

Database information indicates that the subject title does not support known populations of fauna listed as threatened on the Tasmanian *Threatened Species Protection Act 1995* (TSPA) and/or the Commonwealth *Environment Protection and Biodiversity Protection Act 1999* (EPBCA) (Figure 13).

Site assessment indicated that the subject title supports ubiquitous potential habitat for a suite of threatened fauna species. This includes potential habitat of species such as *Sarcophilus harrisii* (Tasmanian devil), *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll), *Dasyurus viverrinus* (eastern quoll), *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot), *Tyto novaehollandiae* (masked owl), *Accipiter novaehollandiae* (grey goshawk) and *Aquila audax* (wedge-tailed eagle). Small-scale development is not anticipated to have a significant deleterious impact on these species at any reasonable scale.

Under the *Tasmanian Planning Scheme*, priority vegetation can include the concept of "it forms a significant habitat for a threatened fauna species" (see previous citation of definition of "priority vegetation" at **FINDINGS *Vegetation types*** Conservation significance of identified vegetation types), where "significant habitat" is defined under the *Scheme* as follows:

> "the habitat within the known or core range of a threatened fauna species, where any of the following applies:
>
> (a) is known to be of high priority for the maintenance of breeding populations throughout the species' range; or
>
> (b) the conversion of it to non-priority vegetation is considered to result in a long-term negative impact on breeding populations of the threatened fauna species".

Problematically, the *Scheme* does not define the terms "known" or "core" range, which means this could rely on those used by other agencies such as the Forest Practices Authority and/or the Department of Natural Resources and Environment Tasmania, which are effectively presented in the relevant database reports (DNRET 2024a; FPA 2024). While the subject site is within the so-called "known or core range" of some listed fauna species, it is challenging to assign any part of the site as being of "high priority for the maintenance of breeding populations throughout the species' range" at any reasonable scale for most species (see Appendix D for a more detailed analysis of this) or be in any way construed as meeting the intent of a scenario in which "the conversion of it [i.e. "significant habitat"] to non-priority vegetation [could be] considered to result in a long-term negative impact on breeding populations of the threatened fauna species" (see also Appendix D for a more detailed analysis of this).

The absence of a "significant habitat for a threatened fauna species" from the title means that no part of the site can be interpreted as "priority vegetation" (in relation to this value) pursuant to C7.3.1(c) of the *State Planning Provisions* (see previous citation of definition of "priority vegetation" at **FINDINGS *Vegetation types*** Conservation significance of identified vegetation types).

Figure 12. Distribution of threatened flora close to study area (overview)

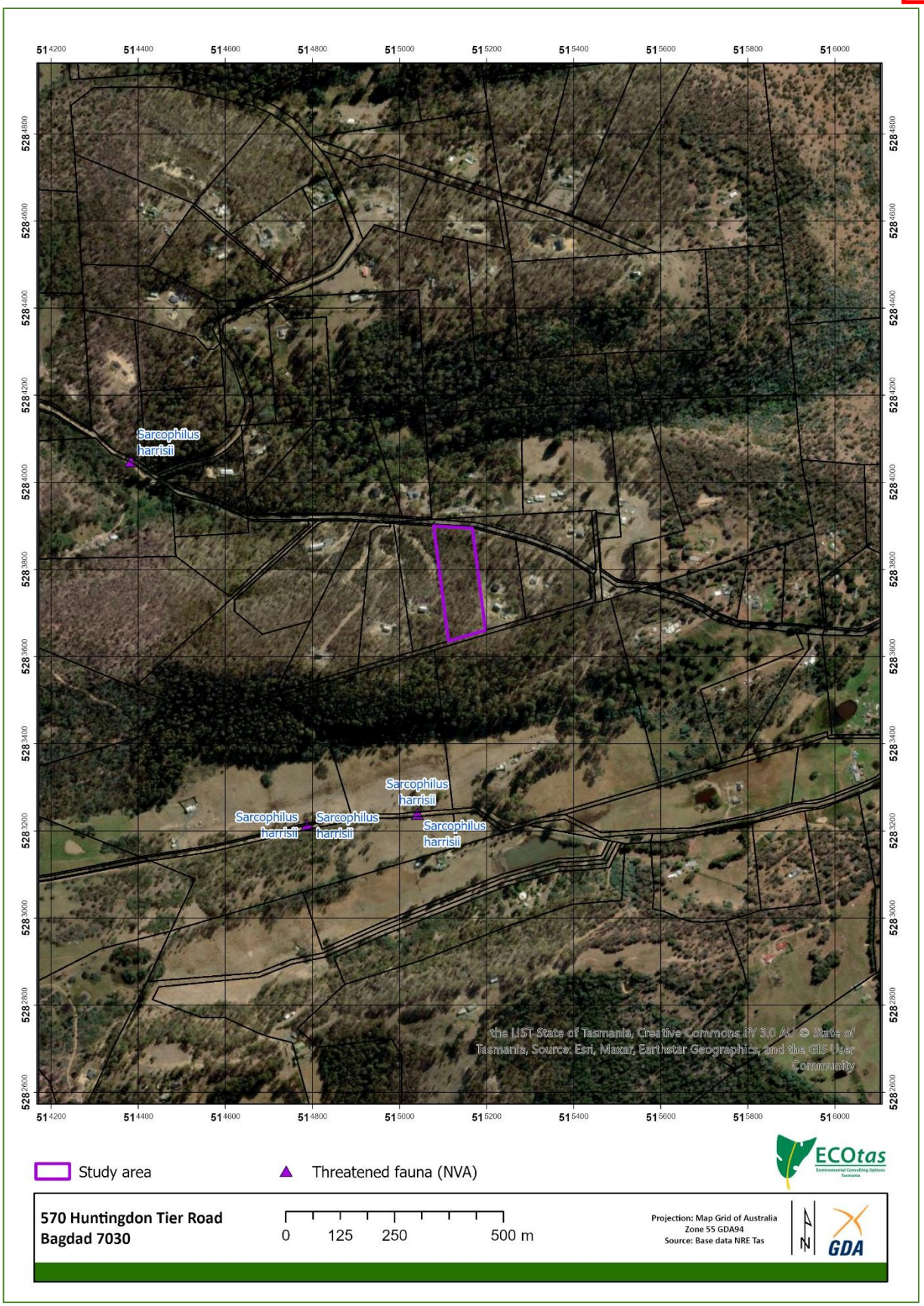

Figure 13a. Distribution of threatened fauna close to study area (overview)

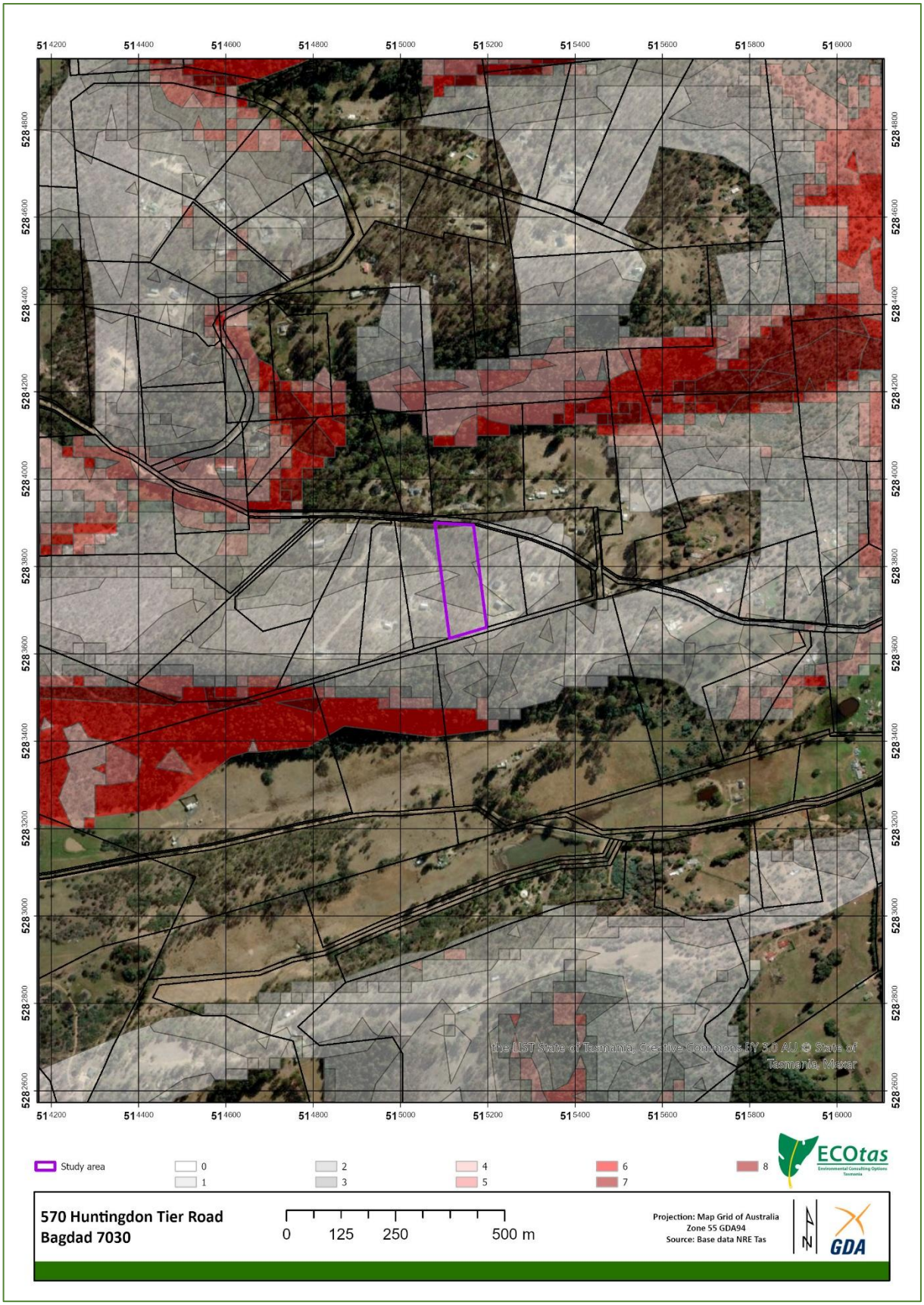

Figure 13b. Potential eagle nesting habitat within title and surrounds (wide)

Other natural values

Weed species

No plant species classified as a declared weed within the meaning of the Tasmanian *Biosecurity Act 2019* (*Biosecurity Regulations 2022*) were detected from the study area.

In this case, owner-occupation is considered the most appropriate means of achieving effective longer-term weed management where vigilance and immediate control of any detected species should be practical.

Several planning manuals provide further guidance on appropriate management actions, which can be referred to develop site-specific prescriptions for any proposed works in the title area. These manuals include:

- Allan, K. & Gartenstein, S. (2010). *Keeping It Clean: A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens*. NRM South, Hobart;
- Rudman, T. (2005). *Interim* Phytophthora cinnamomi *Management Guidelines*. Nature Conservation Report 05/7, Biodiversity Conservation Branch, Department of Primary Industries, Water & Environment, Hobart;
- Rudman, T., Tucker, D. & French, D. (2004). *Washdown Procedures for Weed and Disease Control*. Edition 1. Department of Primary Industries, Water & Environment, Hobart; and
- DPIPWE (2015). *Weed and Disease Planning and Hygiene Guidelines – Preventing the Spread of Weeds and Diseases in Tasmania*. Department of Primary Industries, Parks, Water & Environment, Hobart.

Myrtle wilt

Myrtle wilt, caused by a wind-borne fungus (*Davidsoniella* syn. *Chalara australis*), occurs naturally in rainforest where myrtle beech (*Nothofagus cunninghamii*) is present. The fungus enters wounds in the tree, usually caused by damage from wood-boring insects, wind damage and forest clearing. The incidence of myrtle wilt often increases forest clearing events such as windthrow and wildfire.

The study area does not support *Nothofagus cunninghamii*. No special management is required.

Myrtle rust

Myrtle rust is a disease limited to plants in the Myrtaceae family. This plant disease is a member of the guava rust complex caused by *Austropuccinia psidii*, a known significant pathogen of Myrtaceae plants outside Australia. Infestations are currently limited to NSW, Victoria, Queensland and Tasmania (DPIPWE 2015). No evidence of myrtle rust was noted.

Rootrot pathogen, *Phytophthora cinnamomi*

Phytophthora cinnamomi (PC) is widespread in lowland areas of Tasmania, across all land tenures. However, disease tends not to develop when soils are too cold or too dry. For these reasons, PC is not usually considered a threat to susceptible plant species that grow at elevations higher than

about 700 m or where annual rainfall is less than about 600 mm (e.g. Midlands and Derwent Valley). Furthermore, disease is less likely to develop beneath a dense canopy of vegetation because shading cools the soils to below the optimum temperature for the pathogen. A continuous canopy of vegetation taller than about 2 m is usually sufficient to suppress disease. Hence PC is not usually considered a threat to susceptible plant species growing in wet sclerophyll forests, rainforests (except disturbed rainforests on infertile soils) and scrub e.g. teatree scrub (Rudman 2005; FPA 2009).

The vegetation type identified from the study area can be susceptible to PC. No evidence of PC was observed, with all potentially susceptible plant species appearing very healthy. It is best to assume that the study area is free of the pathogen and that management should be aimed at minimising the risk of introducing it. Refer to the section above (Weed species) for a list of planning manuals that provide appropriate guidelines for managing risks associated with PC.

Chytrid fungus and other freshwater pathogens

Native freshwater species and habitat are under threat from freshwater pests and pathogens including *Batrachochytrium dendrobatidis* (chytrid frog disease), *Mucor amphibiorum* (platypus mucor disease) and the freshwater algal pest *Didymosphenia geminata* (didymo) (Allan & Gartenstein 2010). Freshwater pests and pathogens are spread to new areas when contaminated water, mud, gravel, soil and plant material or infected animals are moved between sites. Contaminated materials and animals are commonly transported on boots, equipment, vehicles tyres and during road construction and maintenance activities. Once a pest pathogen is present in a water system it is usually impossible to eradicate. The manual *Keeping it Clean: A Tasmanian Field Hygiene Manual to Prevent the Spread of Freshwater Pests and Pathogens* (Allan & Gartenstein 2010) provides information on how to prevent the spread of freshwater pests and pathogens in Tasmanian waterways wetlands, swamps and boggy areas.

The part of the title proposed for development does not have permanent freshwater features. Special management should not be required.

Additional "Matters of National Environmental Significance" – Threatened Ecological Communities

CofA (2024) indicates that the following threatened ecological communities listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) are likely to occur within the area:

- Alpine Sphagnum Bogs and Associated Fens [Endangered];
- Lowland Native Grasslands of Tasmania [Critically Endangered];
- Tasmanian Forests and Woodlands dominated by Black Gum or Brookers Gum (*Eucalyptus ovata* / *E. brookeriana*) [Critically Endangered]; and
- Tasmanian White Gum (*Eucalyptus viminalis*) Wet Forest [Critically Endangered].

Existing vegetation mapping (Figures 9 & 10 9) and revised vegetation mapping (Figure 11) indicates that these communities are not present within or adjacent to the subject title i.e. there are no implications under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* in relation to threatened ecological communities.

DISCUSSION

Summary of key findings

Threatened flora

- No plant species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) and/or the Tasmanian *Threatened Species Protection Act 1995* (TSPA) are known from database information, or were detected as a consequence of site assessment, from the study area.
- The absence of threatened flora species from the title means that no part of the site is "a threatened flora species" [sic] such that these areas cannot be interpreted as "priority vegetation" (in relation to this value), pursuant to C7.3.1(b) of the *State Planning Provisions.*

Threatened fauna

- No fauna species listed as threatened on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) and/or the Tasmanian *Threatened Species Protection Act 1995* (TSPA) are known from database information from the study area.
- The study area supports potential habitat of several species (to different degrees), as follows:
  - *Sarcophilus harrisii* (Tasmanian devil);
  - *Dasyurus maculatus* subsp. *maculatus* (spotted-tailed quoll);
  - *Dasyurus viverrinus* (eastern quoll);
  - *Perameles gunnii* subsp. *gunnii* (eastern barred bandicoot);
  - *Myiagra cyanoleuca (*satin flycatcher);
  - *Neophema chrysostoma* (blue-winged parrot);
  - *Tyto novaehollandiae* subsp. *castanops* (masked owl); and
  - *Antipodia chaostola* tax. *leucophaea* (chaostola skipper).
- No part of the title supports "significant habitat for a threatened fauna species" at any reasonable scale, such that it cannot be construed as "priority vegetation" (in relation to this value) pursuant to C7.3.1(c) of the *State Planning Provisions*.

Vegetation types

- The study area supports the following TASVEG mapping unit:
  - *Eucalyptus tenuiramis* forest and woodland on sediments (TASVEG code: DTO).
- Occurrences of DTO equates to a native vegetation community listed as threatened on Schedule 3A of the Tasmanian *Nature Conservation Act 2002*.
- Occurrences of DTO do not equate to a threatened ecological community listed under the Commonwealth *Environment Protection and Biodiversity Protection Act 1999*.
- The presence of "native vegetation [that] forms an integral part of a threatened native vegetation community as prescribed under Schedule 3A of the *Nature Conservation Act 2002*" means that the site is "priority vegetation" (in relation to this value) pursuant to C7.3.1(a) of the *State Planning Provisions*.

Weeds

- No plant species classified as declared weeds within the meaning of the Tasmanian *Biosecurity Act 2019* (*Biosecurity Regulations 2022*) were detected from the study area.

Plant disease

- No evidence of *Phytophthora cinnamomi* (PC, rootrot) was recorded within the study area.
- No evidence of myrtle wilt was recorded within the study area.
- No evidence of myrtle rust was recorded within the study area.

Animal disease (chytrid)

- The study area does not support particular habitats conducive to frog chytrid disease.

Legislative and policy implications

Some commentary is provided below with respect to the key threatened species, vegetation management and other relevant legislation. Note that there may be other relevant policy instruments in addition to those discussed. The following information does not constitute legal advice and it is recommended that independent advice is sought from the relevant agency/authority.

Tasmanian *Threatened Species Protection Act 1995*

Threatened flora and fauna on this Act are managed under Section 51, as follows:

> 51. Offences relating to listed taxa
>
> (1) Subject to subsections (2) and (3), a person must not knowingly, without a permit –
>
> (a) take, keep, trade in or process any specimen of a listed taxon of flora or fauna; or
>
> (b) disturb any specimen of a listed taxon of flora or fauna found on land subject to an interim protection order; or
>
> (c) disturb any specimen of a listed taxon of flora or fauna contrary to a land management agreement; or
>
> (d) disturb any specimen of a listed taxon of flora or fauna that is subject to a conservation covenant entered into under Part 5 of the *Nature Conservation Act 2002*; or
>
> (e) abandon or release any specimen of a listed taxon of flora or fauna into the wild.
>
> (2) A person may take, keep or process, without a permit, a specimen of a listed taxon of flora in a domestic garden.
>
> (3) A person acting in accordance with a certified forest practices plan or a public authority management agreement may take, without a permit, a specimen of a listed taxon of flora or fauna, unless the Secretary, by notice in writing, requires the person to obtain a permit.
>
> (4) A person undertaking dam works in accordance with a Division 3 permit issued under the *Water Management Act 1999* may take, without a permit, a specimen of a listed taxon of flora or fauna.

The simplest interpretation of this is that any activity that results in a specimen (i.e. individual) of listed flora or fauna being "knowingly taken" would require a permit to be issued through Conservation Assessments (Department of Natural Resources and Environment Tasmania), through a formal application process. Note that the Act does not make reference to "potential habitat" such

that activities that result in loss of/disturbance to potential habitat (but not known sites) – which mainly refers to threatened fauna – would not require a permit.

No listed species were detected as a result of site assessment.

Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*

Under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* an action will require approval from the minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance.

Matters of national environmental significance considered under the EPBCA include:

- listed threatened species and communities
- listed migratory species;
- Ramsar wetlands of international importance;
- Commonwealth marine environment;
- world heritage properties;
- national heritage places;
- the Great Barrier Reef Marine Park;
- nuclear actions; and
- a water resource, in relation to coal seam gas development and large coal mining development.

The relevant Commonwealth agency provides a policy statement titled *Matters of National Environmental Significance: Significant Impact Guidelines 1.1* (CofA 2013, herein the *Guidelines*), which provides overarching guidance on determining whether an action is likely to have a significant impact on a matter protected under the EPBCA.

The *Guidelines* define a **significant impact** as:

> *"…an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts"*

and note that:

> *"…all of these factors [need to be considered] when determining whether an action is likely to have a significant impact on matters of national environmental significance".*

The *Guidelines* provide advice on when a significant impact may be likely:

> *"To be 'likely', it is not necessary for a significant impact to have a greater than 50% chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility.*
>
> *If there is scientific uncertainty about the impacts of your action and potential impacts are serious or irreversible, the precautionary principle is applicable. Accordingly, a lack of scientific certainty about the potential impacts of an action will not itself justify a decision that the action is not likely to have a significant impact on the environment".*

The *Guidelines* provide a set of Significant Impact Criteria (CofA 2013), which are "intended to assist…in determining whether the impacts of [the] proposed action on any matter of national environmental significance are likely to be significant impacts". It is noted that the criteria are "intended to provide general guidance on the types of actions that will require approval and the types of actions that will not require approval…[and]…not intended to be exhaustive or definitive".

When considering whether or not an action is likely to have a significant impact on a matter of national environmental significance it is relevant to consider all adverse impacts which result from the action, including indirect and offsite impacts. Indirect and offsite impacts include:

a. 'downstream' or 'downwind' impacts, such as impacts on wetlands or ocean reefs from sediment, fertilisers or chemicals which are washed or discharged into river systems;

b. 'upstream impacts' such as impacts associated with the extraction of raw materials and other inputs which are used to undertake the action; and

c. 'facilitated impacts' which result from further actions (including actions by third parties) which are made possible or facilitated by the action.

For example, the construction of a dam for irrigation water facilitates the use of that water by irrigators with associated impacts. Likewise, the construction of basic infrastructure in a previously undeveloped area may, in certain circumstances, facilitate the urban or commercial development of that area.

Consideration should be given to all adverse impacts that could reasonably be predicted to follow from the action, whether these impacts are within the control of the person proposing to take the action or not. Indirect impacts will be relevant where they are sufficiently close to the proposed action to be said to be a consequence of the action, and they can reasonably be imputed to be within the contemplation of the person proposing to take the action.

Listed ecological communities

The study area does not support any such communities.

Threatened flora

The study area does not support any such species, and while there is potential habitat for some species listed on the Act, site assessment has not detected any occurrences.

Threatened fauna

The study area may support populations of threatened fauna listed on the Act, most notably the Tasmanian devil, spotted-tailed quoll and eastern quoll although no specific evidence such as scats, diggings, dens, shelters or nesting hollows were noted. Note that the study area is within the range of several other species listed on the Act but it is unlikely that any proposal will result in a significant impact on these species (this includes widely-distributed species such as the swift parrot, wedge-tailed eagle and masked owl) – refer to Appendix D for a more detailed consideration of these.

The relevant Commonwealth agency provides a *Significant Impact Guidelines* policy statement (CofA 2013) to determine if referral to the department is required. The *Guidelines* consider a "significant impact" to comprise loss that is likely to lead to a long-term decrease in the size of an important population of a species (unlikely to be the case); reduce the area of occupancy of an important population (also unlikely at any reasonable scale); fragment an existing important population into two or more populations (minor habitat loss will occur but not such that fragmentation will result); adversely affect habitat critical to the survival of a species ("critical habitat" has not been defined per se); disrupt the breeding cycle of an important population (unlikely); modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline (this seems unlikely – see previous commentary); result in invasive species that are harmful to a threatened species becoming established in the threatened species' habitat (unlikely); introduce disease that may cause the species to decline (unlikely to introduce and/or exacerbate Devil Facial Tumour Disease); or interfere substantially with the recovery of the species (unlikely at any reasonable scale).

It is highly unusual for a development within a relatively small lot, even within the range of the aforementioned species where potential habitat has been identified, to trigger a formal referral to the relevant Commonwealth agency. In this case, in our opinion, the scale of the works within potential habitat of the species relative to the wider extent of such habitat means that the impact is not regarded as "significant".

Tasmanian *Forest Practices Act 1985* and associated *Forest Practices Regulations 2017*

The *Regulations* provide the following relevant circumstances in which a Forest Practices Plan is not required.

> 4. Circumstances in which forest practices plan, &c., not required
>
> For the purpose of section 17(6) of the Act, the following circumstances are prescribed:
>
> (a) the harvesting of timber or the clearing of trees, with the consent of the owner of the land, if the land is not vulnerable land and –
>
> (i) the volume of timber harvested or trees cleared is less than 100 tonnes for each area of applicable land per year; or
>
> (ii) the total area of land on which the harvesting or clearing occurs is less than one hectare for each area of applicable land per year –
>
> whichever is the lesser;
>
> (j) the harvesting of timber or the clearing of trees on any land, or the clearance and conversion of a threatened native vegetation community on any land, for the purpose of enabling –
>
> (i) the construction of a building within the meaning of the *Land Use Planning and Approvals Act 1993* or of a group of such buildings; or
>
> (ii) the carrying out of any associated development –
>
> if the construction of the buildings or carrying out of the associated development is authorised by a permit issued under that Act.

On this basis, a proposal subject to a planning permit related to a building and associated development issued pursuant to the Tasmanian *Land Use Planning and Approvals Act 1993* (i.e. under the relevant planning scheme) should not require a Forest Practices Plan.

Tasmanian *Nature Conservation Act 2002*

Schedule 3A of the Act lists vegetation types classified as threatened within Tasmania. The subject title supports *Eucalyptus tenuiramis* forest and woodland on sediments (TASVEG code: DTO), which equates to a listed community (with the same name). The administrative/regulatory mechanism managing threatened communities is through either the Tasmanian *Forest Practices Act 1985* (and associated *Forest Practices Regulations 2017*) or the local planning scheme, depending on the zone and code provisions.

Tasmanian *Weed Management Act 1999*

No plant species classified as declared weeds within the meaning of the Tasmanian *Biosecurity Act 2019* (*Biosecurity Regulations 2022*), such that the Act has limited direct application, except by

reference to the *General Biosecurity Duty* under the Tasmanian *Biosecurity Act 2019* (https://nre.tas.gov.au/biosecurity-tasmania/general-biosecurity-duty-(gbd).

In this case, owner-occupation is considered the most appropriate means of achieving effective longer-term weed management where vigilance and immediate control of any detected species should be practical.

Tasmanian *Land Use Planning and Approvals Act 1993*

The applicable planning scheme for the study area is the *Tasmanian Planning Scheme – Southern Midlands Council*. Note that the following is an interpretation of the provisions of the *Scheme* and may not necessarily represent the views Southern Midlands Council. The following does not constitute legal advice. It is recommended that formal advice be sought from the relevant agency prior to acting on any aspect of this statement.

The site is almost wholly subject to the Priority Vegetation Area overlay (Figure 5) and site assessment confirmed that this status is warranted, with particular reference to the presence of Eucalyptus tenuiramis forest and woodland on sediments (TASVEG code: DTO). That is, the Natural Assets Code has application and is considered below.

The purpose of the Natural Assets Code is stated below:

C7.1 The purpose of the Natural Assets Code is:

C7.1.1 To minimise impacts on water quality, natural assets including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes.

C7.1.2 To minimise impacts on coastal and foreshore assets, native littoral vegetation, natural coastal processes and the natural ecological function of the coast.

C7.1.3 To protect vulnerable coastal areas to enable natural processes to continue to occur, including the landward transgression of sand dunes, wetlands, saltmarshes and other sensitive coastal habitats due to sea-level rise.

C7.1.4 To minimise impacts on identified priority vegetation.

C7.1.5 To manage impacts on threatened fauna species by minimising clearance of significant habitat.

The above purpose statements are essentially addressed through the relevant development standards. However, as a general statement, small-scale works should not compromise the intent of the purpose statements. Of the purpose statements, C7.1.4 is of greatest relevance to the present site with respect to the findings of this assessment and report. C7.1.1, C7.1.2 or C7.1.3 do not appear to have direct relevance. The site is not considered to support "significant habitat" of threatened fauna (see **FINDINGS *Threatened fauna*** for details), such that C7.1.5 should not have application.

The application of the Natural Assets Code is stated below:

C7.2 Application of this Code:

C7.2.1 This code applies to development on land within the following areas:

(c) a priority vegetation area only if within the following zone:

(i) Rural Living Zone

C7.2.2 This code does not apply to use.

The proposed development area is zoned as Rural Living and is almost wholly subject to the Priority Vegetation Area overlay under the *Scheme* such that C7.2.1(c)(i) has application.

At this point, however, it is worth discussing the classification of the site with respect to the intention of the *Scheme*'s definition of "priority vegetation", which is:

C7.3 Definition of Terms

C7.3.1 In this code, unless the contrary intention appears:

means native vegetation where any of the following apply:

(a) it forms an integral part of a threatened native vegetation community as prescribed under Schedule 3A of the *Nature Conservation Act 2002*;

(b) is a threatened flora species;

(c) it forms a significant habitat for a threatened fauna species; or

(d) it has been identified as native vegetation of local importance.

Under the Code, a "priority vegetation area" is defined to mean:

land shown on an overlay map in the relevant Local Provisions Schedule, as within a priority vegetation area.

Site assessment indicated that the title does supports a native vegetation community listed as threatened under Schedule 3A of the Tasmanian *Nature Conservation Act 2002*, such that C7.3.1(a) is applicable.

The site does not support threatened flora, such that C7.3.1(b) does not have application.

Site assessment indicated that no part of the title supports "significant habitat for threatened fauna", such that C7.3.1(c) is not considered applicable (see **FINDINGS *Threatened fauna*** for details).

There is no available information to indicate that any part of the title has been otherwise "identified as native vegetation of local importance". It is acknowledged that the Tasmanian Planning Commission produced Information Sheet 2-2024 that clarifies assessment of this component of "priority vegetation". The vegetation within the title does not meet any of the criteria listed in that sheet, except already indicated at C7.3.1(a), such that C7.3.1(d) is not considered applicable.

The relevant development standards of the Natural Assets Code are C7.6.2 (Clearance within a priority vegetation area), and have the following objective:

C7.6 Development Standards for Buildings and Works

C7.6.2 Clearance within a priority vegetation area

Objective:

That clearance of native vegetation within a priority vegetation area:

(a) does not result in unreasonable loss of priority vegetation;

(b) is appropriately managed to adequately protect identified priority vegetation; and

(c) minimises and appropriately manages impacts from construction and development activities.

The above objective statements are essentially addressed through the relevant acceptable solutions or performance criteria. However, as a general statement, small-scale development should not compromise the intent of the objective statements. C7.6.2(a) is relevant as "priority vegetation" will be directly impacted, but the extent of impact can be minimised to some extent. Retention of the balance of native vegetation should satisfy the intent of C7.6.2(b) in that the site would be "appropriately managed to adequately protect identified priority vegetation" and C7.6.2(c) in that the "impacts from construction and development activities" can be "minimised".

The acceptable solution for C7.6.2 is stated as:

A1 Clearance of native vegetation within a priority vegetation area must be within a building area on a sealed plan approved under this planning scheme.

Solution A1 is presumed to not be applicable because the project site will not be subject to a "sealed plan approved under this planning scheme".

The performance criteria P1.1 are stated as:

P1.1

Clearance of native vegetation within a priority vegetation area must be for:

(a) an existing use on the site, provided any clearance is contained within the minimum area necessary to be cleared to provide adequate bushfire protection, as recommended by the Tasmanian Fire Service or an accredited person;

(b) buildings and works associated with the construction of a single dwelling or an associated outbuilding;

(c) subdivision in the General Residential Zone or Low Density Residential Zone;

(d) use or development that will result in significant long term social and economic benefits and there is no feasible alternative location or design;

(e) clearance of native vegetation where it is demonstrated that on-going pre-existing management cannot ensure the survival of the priority vegetation and there is little potential for long-term persistence; or

(f) the clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site.

The fact that P1.1 (a) through (f) are linked by the disjunctive "or" means that only one of these provisions needs to be satisfied. At this stage, it is understood that the planning application (DA2500095) is for a farm shed that does not require bushfire hazard management such that the mosr relevant sub-clause is P1.1(f), which is discussed below. When a planning application is made for a single residential dwelling, P1.1(b) will become applicable.

Satisfaction of P1.1(f) requires that "clearance of native vegetation that is of limited scale relative to the extent of priority vegetation on the site", where the "site" is interpreted as the whole title. "Of limited scale" is open to interpretation, particular with respect to a relatively small lot. In this case, by the end of works (access, fencing, shed, dwelling and associated required elements such as a hazard management area), it is estimated that approximately 50% of the native vegetation within the title will be impacted to some degree. In absolute terms, while this intuitively does not meet the test of "of limited scale", in practical terms, the title is only ca. 2.2 ha in extent meaning that howsoever it is developed, the same area will be impacted. If the title were larger, the proportional impact would be reduced but this is not achievable because all elements are effectively "fixed". Further to this, at some point, the shed will become "ancillary" to the single residential dwelling, and if constructed at the same time as such a dwelling, P1.1(b) probably would have applied.

The performance criteria P1.2 are stated as:

P1.2

Clearance of native vegetation within a priority vegetation area must minimise adverse impacts on priority vegetation, having regard to:

(a) the design and location of buildings and works and any constraints such as topography or land hazards;

(b) any particular requirements for the buildings and works;

(c) minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings;

(d) any mitigation measures implemented to minimise the residual impacts on priority vegetation;

(e) any on-site biodiversity offsets; and

(f) any existing cleared areas on the site.

Reference is made in the opening phrase of P1.2 to the concept of "minimise adverse impacts". First, the use of the term "minimise" anticipates that some level (albeit undefined) of impact is contemplated as being acceptable. Second, the use of the phrase "adverse impact" implies that works must have an "adverse" impact – this being an undefined concept in the *State Planning Provisions*". That there will be impacts to "priority vegetation" is not questioned. The scale of the impact is quantifiable as the area subject to physical clearance (e.g. access, building sites, etc.) and "modification" (e.g. maintained fenceline clearings, hazard management area, etc.), noting that P1.2 only refers to "clearance of native vegetation". The *State Planning Provisions* do not define "clearance", only "clearance and conversion" as "means as defined in the *Forest Practices Act 1985*". That Act defines such an activity in relation to threatened native vegetation communities, which is relevant here. However, the Act (and supporting Regulations) do not have application where a planning permit related to a building and associated development is issued pursuant to the Tasmanian *Land Use Planning and Approvals Act 1993* (i.e. under the relevant planning scheme), rendering this definition somewhat moot.

With respect to the phrase "…having regard to…", this is considered in the manner referred to in *S and S McElwaine and A Hamilton v West Tamar Council and Growth Developments Pty Ltd [2021] TASCAT 4 (17 November 2021)*, where TASCAT stated: "the requirement to 'have regard to' does not elevate P2.1(a) to (f) to mandatory requirements that the proposal must satisfy. The tribunal need only consider those subparagraphs in ascertaining whether the proposal complies with clause E8.6.1 P2.1".

Below the sub-criteria of P1.2 are addressed in turn. The criteria are considered with respect to both a farm shed and access to this (i.e. the current proposal) and a single residential dwelling (i.e. a future proposal) but also makes notes regarding other logical activities (e.g. boundary fencing).

(a) the design and location of buildings and works and any constraints such as topography or land hazards;

With respect to the title, there do not appear to be particular constraints presented by features such as slope, soil type, landslip risks, etc. That is, no part of the title is "better or worse" in terms of the relative impact of a development on natural values except in so far as development in the "back of the block" requires a longer access. Given that this is now established, and that it only marginally divides adjacent areas of native forest, sub-clause (a) is considered satisfied. The location at the top of the slope (at least within the title itself) may also facilitate energy requirements.

(b) any particular requirements for the buildings and works;

Uncertain application in relation to the identified natural values, except perhaps to indicate machinery and vehicle hygiene protocols in relation to weed and hygiene management to minimise the risk of introducing such to the site (but even these should not be critical given access will be from the fully-formed, sealed and well-maintained Huntingdon Tier Road, such that the risk of construction machinery and vehicles introducing weeds and disease to the subject title is considered low. It is noted that the title is already weed-free.

It is accepted that boundary fencing is an acceptable activity. It is assumed that this must be subject to the relevant provisions of the *Boundary Fences Act 1908*, the relevant provisions of the

State Planning Provisions and the *Forest Practices Regulations 2017*. To that end, establishing and maintaining boundary fences is considered acceptable. However, the width of clearing should be, by intent, "minimised" wherever practical given the status of the native vegetation community. Where fencing can be installed without material disturbance to the structure and composition of the vegetation (e.g. a simple post-and-wire fence), this is preferred. However, it is acknowledged that maintenance of a fence can require some adjacent clearing.

(c) minimising impacts resulting from bushfire hazard management measures through siting and fire-resistant design of habitable buildings;

With respect to subsection P1.2(c), a certified bushfire hazard management plan is usually considered to meet the intent of the provision.

(d) any mitigation measures implemented to minimise the residual impacts on priority vegetation;

The "residual impact on priority vegetation" will be the extent of loss of the threatened native vegetation community. No specific "mitigation measures" are proposed beyond recognising that the balance of the title will remain "as is" and subject to the relevant provisions of the Natural Assets Code.

Where "clearance of native vegetation" has extended beyond that indicated in a planning application and/or where it is desirable to "restore" disturbed areas, it is recommended that this be achieved by passive natural regeneration. The vegetation type and its component species is resilient and robust to disturbance and will recover quickly without intervention.

(e) any on-site biodiversity offsets; and

No such offsets have been identified as necessary (see also above).

(f) any existing cleared areas on the site.

Prior to the most recent activities, there were no parts of the title that could be construed as "existing cleared areas). Now that some "cleared" areas are present, development should logically proceed in such areas.

On the basis of the above review, the relevant performance criteria of C7.6.2 are satisfied without the need for specific permit conditions.

Recommendations

The recommendations provided below are a summary of those provided in relation to each of the natural values described in the main report. The main text of the report provides the relevant context for the recommendations.

<u>Vegetation types</u>

In general terms, minimising the extent of "clearance and conversion" and/or "disturbance" to native vegetation is recommended, within the context of the proposed development being an acceptable use and acknowledging this will include access (largely already established), shed, boundary fencing, and a single residential dwelling with associated hazard management area (and associated elements such as a firefighting water tank).

Threatened flora

None identified – no special management required.

Threatened fauna

Apart from the generic recommendation to minimise the extent of "clearance and conversion" and/or "disturbance" to native vegetation (with acknowledged constraints), specific management in relation to threatened fauna is not recommended.

Weed and disease management

Longer-term special management (e.g. a complex weed management plan) is not considered warranted because owner occupation is considered the most appropriate (and realistic) means of achieving control of any declared species (should they become established), where vigilance and immediate control are practical.

Legislative and policy implications

A permit under Section 51 of the Tasmanian *Threatened Species Protection Act 1995* (TSPA) is not likely to be.

A formal referral to the relevant Commonwealth agency under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA) is not considered required.

Development will require a planning permit pursuant to the provisions of the applicable planning scheme but specific permit conditions in relation to natural values to satisfy P1.1 & P1.2 of C7.6.2 of the Natural Assets Code of the *Tasmanian Planning Scheme – Southern Midlands Council* are not recommended.

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APPENDIX A. Vegetation community structure and composition

The table below provides information on the structure and composition of the native vegetation mapping unit identified from the study area.

***Eucalyptus tenuiramis* forest and woodland on sediments (TASVEG code: DTO)**		
DTO is confirmed as occupying the whole of the subject title, effectively as per existing TASVEG mapping, noting that areas mapped as FAG & FUM under TASVEG are now re-coded as DTO (at least within the subject title). DTO is expressed as quite typical for the community with a relatively even-aged canopy dominated by *Eucalyptus tenuiramis* (with only very occasional *Eucalyptus obliqua*) over a variably dense (but generally sparse) sub-canopy of *Exocarpos cupressiformis* and *Allocasuarina littoralis*, in turn over a generally very open understorey of low shrubs, sparse graminoids, very sparse grass, occasional climbers and variably dense (but very low diversity) herbs. Typical for DTO (in this case over sandstone) is quite extensive areas of bare soil and exposed surface rock. Mature elements such as hollow-bearing trees and large coarse woody debris are wholly absent, also quite typical for DTO. The site has been burnt, albeit probably only infrequently and lightly. Apart from the most recent disturbance (fenceline clearing, access drive, pre-prepared excavation for shed and future house site), DTO is in excellent ecological condition with no naturalised plant species or symptoms of plant disease recorded.		
  LHS. Looking across upper slope; RHS. Looking upslope from near road		
Stratum	**Height (m)** **Cover (%)**	**Species** (underline = dominant, parentheses = sparse; + = present)
Trees	15-20 m 30%	*Eucalyptus tenuiramis, (Eucalyptus obliqua)*
Tall shrubs	4-7 m 5%	*Exocarpos cupressiformis, Allocasuarina littoralis, Eucalyptus tenuiramis*
Low shrubs	<1 m 5%	*Lissanthe strigosa, Bossiaea cinerea, Epacris impressa, Acrotriche serrulata, Eucalyptus tenuiramis, Leucopogon collinus, Leucopogon virgatus, Banksia marginata, Ozothamnus obcordatus, Aotus ericoides, Tetratheca labillardierei, Acacia dealbata*
Graminoids	15%	*Lomandra longifolia, Lepidosperma laterale, (Dianella tasmanica), (Stylidium graminifolium)*
Grasses	<5%	*Poa sieberiana*
Herbs	<5%	*Chiloglottis reflexa, Gonocarpus tetragynus, Crassula sieberiana*
Ferns	variable	*Pteridium esculentum*
Climbers	+	*Cassytha pubescens*

APPENDIX B. Vascular plant species recorded from study area

Botanical nomenclature follows *A Census of the Vascular Plants of Tasmania* (de Salas & Baker 2025), with family placement updated to reflect the nomenclatural changes recognised in the *Flora of Tasmania Online* (de Salas 2025+) and APG (2016); common nomenclature follows *The Little Book of Common Names of Tasmanian Plants* (Wapstra et al. 2005+, updated online at www.nre.tas.gov.au).

e = endemic to Tasmania

Table B1. Summary of vascular species recorded from study area

	ORDER				
STATUS	**DICOTYLEDONAE**	**MONOCOTYLEDONAE**	**GYMNOSPERMAE**	**PTERIDOPHYTA**	**MAGNOLIIDS**
	17	5	-	1	1
e	1	-	-	-	-
Sum	**18**	**5**	**0**	**1**	**1**
TOTAL	**25**				

DICOTYLEDONAE	
ASTERACEAE	
Ozothamnus obcordatus	yellow everlastingbush
CASUARINACEAE	
Allocasuarina littoralis	black sheoak
CRASSULACEAE	
Crassula sieberiana	rock stonecrop
ELAEOCARPACEAE	
Tetratheca labillardierei	glandular pinkbells
ERICACEAE	
Acrotriche serrulata	ants delight
Epacris impressa	common heath
Leucopogon collinus	white beardheath
Leucopogon virgatus var. *virgatus*	twiggy beardheath
Lissanthe strigosa subsp. *subulata*	peachberry heath
FABACEAE	
Acacia dealbata subsp. *dealbata*	silver wattle
Aotus ericoides	golden pea
Bossiaea cinerea	showy bossia
HALORAGACEAE	
Gonocarpus tetragynus	common raspwort
MYRTACEAE	
Eucalyptus obliqua	stringybark
e*Eucalyptus tenuiramis*	silver peppermint
PROTEACEAE	
Banksia marginata	silver banksia
SANTALACEAE	
Exocarpos cupressiformis	common native-cherry
STYLIDIACEAE	
Stylidium graminifolium	narrowleaf triggerplant
MAGNOLIIDS	
LAURACEAE	
Cassytha pubescens	downy dodderlaurel
MONOCOTYLEDONAE	
ASPARAGACEAE	
Lomandra longifolia	sagg
ASPHODELACEAE	
Dianella tasmanica	forest flaxlily
CYPERACEAE	
Lepidosperma laterale	variable swordsedge

ORCHIDTOEAE	
Chiloglottis reflexa	autumn bird-orchid
POACEAE	
Poa sieberiana var. *sieberiana*	grey tussockgrass
PTERIDOPHYTA	
DENNSTAEDTIACEAE	
Pteridium esculentum subsp. *esculentum*	bracken

APPENDIX C. Analysis of database records of threatened flora

Table C1 provides a listing of threatened flora from within 5,000 m of the study area (nominal buffer width usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded.

Table C1. Threatened flora records from within 5,000 m of boundary of study area

Species listed below are listed as rare (r), vulnerable (v), endangered (e), or extinct (x) on the Tasmanian *Threatened Species Protection Act 1995* (TSPA); vulnerable (VU), endangered (EN), critically endangered (CR) or extinct (EX) on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA). Information below is sourced from DNRET's *Natural Values Atlas* (DNRET 2025a) and other sources where indicated. Habitat descriptions are taken from FPA (2022) and TSS (2003+), except where otherwise indicated. Species marked with # are listed in CofA (2025).

Scientific name **Common name**	**Status** TSPA EPBCA	**Tasmanian habitat description (and distribution)**	**Comments on study area and database records**
Asperula scoparia subsp. *scoparia* prickly woodruff	r -	*Asperula scoparia* subsp. *scoparia* is widespread in Tasmania, and is mainly found in native grasslands and grassy forests, often on fertile substrates such as dolerite-derived soils. Forested sites are usually dominated by *Eucalyptus globulus* and *E. viminalis* (lower elevations) and *E. tasmaniensis* (higher elevations).	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Austromelanelixia [syn. *Melanelia*] *piliferella* lichen	v -	*Austromelanelixia piliferella* is known from one collection from dry sandstone bluffs in degraded dry sclerophyll forest near Kempton. Elsewhere, the species typically grows on bark.	Potential habitat absent – site is on sandstone but there are no notable outcrops of such.
Austrostipa blackii crested speargrass	r -	The habitat of *Austrostipa blackii* is poorly understood because of confusion with other species. In its "pure" form (i.e. long coma), *A. blackii* is a species of very near-coastal sites such as the margins of saline lagoons, creek outfalls and vegetated dunes. Further inland, where it seems to grade into other species, it occurs in open grassy woodlands.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Barbarea australis riverbed wintercress	e EN # only	*Barbarea australis* is a riparian species found near river margins, creek beds and along flood channels adjacent to the river. It tends to favour the slower reaches, and has not been found on steeper sections of rivers. It predominantly occurs in flood deposits of silt and gravel deposited as point bars and at the margins of base flows, or more occasionally or between large cobbles on sites frequently disturbed by fluvial processes. Some of the sites are a considerable distance from the river, in flood channels scoured by previous flood action, exposing river pebbles. Most populations are in the Central Highlands, but other populations occur in the northeast and upland areas in the central north.	Potential habitat absent (wholly atypical of all reported sites).

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
Brachyscome perpusilla tiny daisy	r -	*Brachyscome perpusilla* is found on rockplates and grassy herbfields, substrates including dolerite, sandstone and granite.	Potential habitat absent (wholly atypical of all reported sites).
Brachyscome rigidula cutleaf daisy	v -	*Brachyscome rigidula* is found in the Midlands, East Coast and in parts of the eastern Central Highlands of Tasmania, where it occurs in rough pasture, grassland and grassy woodland on dry rocky hills and flats.	Potential habitat absent (wholly atypical of all reported sites).
Caladenia anthracina blacktip spider-orchid	e CR # only	*Caladenia anthracina* has a restricted distribution in the Powranna/Campbelltown/Ross area, occurring in grassy woodland with *Acacia dealbata* (silver wattle) and bracken on well-drained sandy soil. Two historical sites from the Derwent Valley are presumed extinct.	Potential habitat absent (wholly atypical of all reported sites).
Caladenia caudata tailed spider-orchid	v VU # only	*Caladenia caudata* has highly variable habitat, which includes the central north: *Eucalyptus obliqua* heathy forest on low undulating hills; the northeast: *E. globulus* grassy/heathy coastal forest, *E. amygdalina* heathy woodland and forest, *Allocasuarina* woodland; and the southeast: *E. amygdalina* forest and woodland on sandstone, coastal *E. viminalis* forest on deep sands. Substrates vary from dolerite to sandstone to granite, with soils ranging from deep windblown sands, sands derived from sandstone and well-developed clay loams developed from dolerite. A high degree of insolation is typical of many sites.	Potential habitat marginally present. The survey was conducted within the flowering period of the species in southern Tasmania (Wapstra 2018). The species was not detected.
Colobanthus curtisiae grassland cupflower	r VU # only	*Colobanthus curtisiae* occurs in lowland grasslands and grassy woodlands but is also prevalent on rocky outcrops and margins of forest on dolerite on the Central Highlands (including disturbed sites such as log landings and snig tracks).	Potential habitat absent (wholly atypical of all reported sites).
Dianella amoena grassland flaxlily	r EN # only	*Dianella amoena* occurs mainly in the northern and southern Midlands, where it grows in native grasslands and grassy woodlands.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Glycine latrobeana clover glycine	v VU # only	*Glycine latrobeana* occurs in a range of habitats, geologies and vegetation types. Soils are usually fertile but can be sandy when adjacent to or overlaying fertile soils. The species mainly occurs on flats and undulating terrain over a wide geographical range, including near-coastal environments, the Midlands, and the Central Plateau. It mainly occurs in grassy/heathy forests and woodlands and native grasslands.	Potential habitat absent (wholly atypical of all reported sites).

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
Goodenia [syn. *Velleia*] *paradoxa* spur velleia	v -	*Goodenia paradoxa* is known from the Hobart and Launceston areas, and the Midlands and the Derwent Valley, where it occurs in grassy woodlands or grasslands on dry sites. It has been recorded up to 550 m a.s.l. at sites with an annual rainfall range of 450-750 mm.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Hyalosperma demissum moss sunray	e -	*Hyalosperma demissum* grows on rock pavements or shallow sandy soils in some of Tasmania's driest regions, and also in scalded patches in *Eucalyptus amygdalina* heathy/grassy woodland. The underlying substrate is mostly Jurassic dolerite, with occasional occurrences on Triassic sandstone and also Cainozoic sediments with a laterite lag. The elevation range of recorded sites in Tasmania is 30-470 m a.s.l., with an annual rainfall range of less than 600 mm.	Potential habitat marginally present (albeit atypical). Species not detected (strong seasonal constraint on detection and/or identification but potential habitat very limited and survey timed when annual herbs have started appearing).
Lepidium hyssopifolium soft peppercress	e EN #	The native habitat of *Lepidium hyssopifolium* is the growth suppression zone beneath large trees in grassy woodlands and grasslands (e.g. over-mature black wattles and isolated eucalypts in rough pasture). *Lepidium hyssopifolium* is now found primarily under large exotic trees on roadsides and home yards on farms. It occurs in the eastern part of Tasmania between sea-level to 500 metres a.s.l. in dry, warm and fertile areas on flat ground on weakly acid to alkaline soils derived from a range of rock types. It can also occur on frequently slashed grassy/weedy roadside verges where shade trees are absent.	Potential habitat absent (wholly atypical of all reported sites).
Leucochrysum albicans subsp. *tricolor* grassland paperdaisy	e EN # only	*Leucochrysum albicans* subsp. *tricolor* occurs in the west and on the Central Plateau and the Midlands, mostly on basalt soils in open grassland. This species would have originally occupied *Eucalyptus pauciflora* woodland and tussock grassland, though most of this habitat is now converted to improved pasture or cropland.	Potential habitat absent (wholly atypical of all reported sites).
Parietaria debilis shade pellitory	r -	*Parietaria debilis* occurs around muttonbird rookeries, on cliffs/rocks in the salt spray zone, in moist shaded areas in dune scrubs, and under rock overhangs in forested gullies.	Potential habitat absent (wholly atypical of all reported sites).
Pterostylis commutata midlands greenhood	e CR # only	*Pterostylis commutata* is restricted to Tasmania's Midlands, where it occurs in native grassland and *Eucalyptus pauciflora* grassy woodland on well-drained sandy soils and basalt loams.	Potential habitat absent (wholly atypical of all reported sites).
Pterostylis ziegeleri grassland greenhood	v VU # only	*Pterostylis ziegeleri* occurs in the State's south, east and north, with an outlying occurrence in the northwest. In coastal areas, the species occurs on the	Potential habitat absent.

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
		slopes of low stabilised sand dunes and in grassy dune swales, while in the Midlands it grows in native grassland or grassy woodland on well-drained clay loams derived from basalt.	
Scleranthus fasciculatus spreading knawel	v -	*Scleranthus fasciculatus* is only recorded from a few locations in the Midlands and southeast. The vegetation at most of the sites is *Poa* grassland/grassy woodland. *Scleranthus fasciculatus* appears to need gaps between the tussock spaces for its survival and both fire and stock grazing maintain the openness it requires. Often found in areas protected from grazing such as fallen trees and branches.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Senecio squarrosus leafy fireweed	r -	*Senecio squarrosus* occurs in a wide variety of habitats. One form occurs predominantly in lowland damp tussock grasslands. The more widespread and common form occurs mainly in dry forests (often grassy) but extends to wet forests and other vegetation types.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Vittadinia burbidgeae smooth new-holland-daisy	r -	*Vittadinia burbidgeae* occurs in native grassland and grassy woodland.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Vittadinia gracilis woolly new-holland-daisy	r -	*Vittadinia gracilis* occurs in native grassland and grassy woodland.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Vittadinia muelleri narrowleaf new-holland-daisy	r -	*Vittadinia muelleri* occurs in native grassland and grassy woodland.	Potential habitat marginally present (albeit atypical). Species not detected (no seasonal constraint on detection and/or identification).
Xerochrysum palustre swamp everlasting	v VU # only	*Xerochrysum palustre* has a scattered distribution with populations in the northeast, east coast, Central Highlands and Midlands, all below about 700 m elevation. It occurs in wetlands, grassy to sedgy wet heathlands and extends to associated heathy *Eucalyptus ovata* woodlands. Sites are usually inundated for part of the year.	Potential habitat absent (wholly atypical of all reported sites).

APPENDIX D. Analysis of database records of threatened fauna

Table D1 provides a listing of threatened fauna from within 5,000 m of the study area (nominal buffer width usually used to discuss the potential of a particular study area to support various species listed in databases), with comments on whether potential habitat is present for the species, and possible reasons why a species was not recorded.

Table D1. Threatened fauna records from 5,000 m of boundary of study area

Species listed below are listed as rare (r), vulnerable (v), endangered (e), or extinct (x) on the Tasmanian *Threatened Species Protection Act 1995* (TSPA); vulnerable (VU), endangered (EN), critically endangered (CR) or extinct (EX) on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBCA). Information below is sourced from the DNRET's *Natural Values Atlas* (DNRET 2025a), Bryant & Jackson (1999), FPA (2025) & McNab (2022); marine, wholly pelagic and littoral species such as marine mammals, fish and offshore seabirds are excluded. Species marked with # are listed in CofA (2025). Note that the use of the descriptions of "potential habitat" and "significant habitat" as provided in FPA (2025) does not imply a direct relationship between these concepts and the concept of "significant habitat" as per C7.3.1 of the *State Planning Provisions*.

Scientific name **Common name**	**Status** TSPA EPBCA	**Tasmanian habitat description (and distribution)**	**Comments on study area and database records**
Accipiter novaehollandiae grey goshawk	e -	***Potential habitat*** is native forest with mature elements below 600 m altitude, particularly along watercourses. ***Significant habitat*** may be summarised as areas of wet forest, rainforest and damp forest patches in dry forest, with a relatively closed mature canopy, low stem density, and open understorey in close proximity to foraging habitat and a freshwater body (i.e. stream, river, lake, swamp, etc.).	***Potential habitat*** absent, except in a general sense. ***Significant habitat*** absent. The species may utilise the greater title area as part of a home range and for foraging but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale. This species should not require further consideration.
Antipodia chaostola tax. *leucophaea* chaostola skipper	e EN #	***Potential habitat*** is dry forest and woodland supporting *Gahnia radula* (usually on sandstone and other sedimentary rock types) or *Gahnia microstachya* (usually on granite-based substrates). ***Significant habitat*** is all potential habitat within 5 km of a known record.	***Potential habitat*** absent. *Gahnia radula* absent. ***Significant habitat*** absent. This species should not require further consideration.
Apus pacificus fork-tailed swift	- - # only	Seasonal migrant (December through March) with habitat open skies over any habitat, more commonly associated with forested hills and mountains (McNab 2022).	***Potential habitat*** widespread but this is a species that flies at high altitude, very fast and highly mobile, feeding on the wing and virtually never perches (McNab 2022). This species should not require further consideration.
Aquila audax subsp. *fleayi* tasmanian wedge-tailed eagle	e EN #	***Potential habitat*** comprises ***potential nesting habitat*** and ***potential foraging habitat***. ***Potential foraging habitat*** is a wide variety of forest (including areas subject to native forest silviculture) and non-forest habitats. ***Potential nesting habitat*** is tall eucalypt trees in large tracts (usually more than 10 ha) of eucalypt or mixed forest. Nest trees are usually amongst the largest in a locality. They are generally in sheltered positions on	***Potential foraging habitat*** widespread. ***Potential nesting habitat*** absent within title because of combination of aspect and stature of forest. No nests were detected. ***Significant habitat*** absent. The species may utilise the greater area as part of a home range and for foraging but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale.

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
		leeward slopes, between the lower and mid sections of a slope and with the top of the tree usually lower than the ground level of the top of the ridge, although in some parts of the State topographic shelter is not always a significant factor (e.g. parts of the northwest and Central Highlands). Nests are usually not constructed close to sources of disturbance and nests close to disturbance are less productive. ***Significant habitat*** is all native forest and native non-forest vegetation within 500 m or 1 km line-of-sight of known nest sites (where the nest tree is still present).	This species should not require further consideration.
Botaurus poiciloptilus australasian bittern	- EN # only	***Potential habitat*** is comprised of wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds or cutting grass growing over a muddy or peaty substrate (TSSC 2011).	***Potential habitat*** absent (no wetlands). This species should not require further consideration.
Ceyx azureus subsp. *diemenensis* [syn. *Alcedo azurea* subsp. *diemenensis*] Tasmanian azure kingfisher	v EN # only	***Potential habitat*** comprises ***potential foraging habitat*** and ***potential breeding habitat***. ***Potential foraging habitat*** is primarily freshwater (occasionally estuarine) waterbodies such as large rivers and streams with well-developed overhanging vegetation suitable for perching and water deep enough for dive-feeding. ***Potential breeding habitat*** is usually steep banks of large rivers (a breeding site is a hole (burrow) drilled in the bank).	***Potential foraging habitat*** absent (no watercourses present). ***Potential breeding habitat*** absent (as above). This species should not require further consideration.
Dasyurus maculatus subsp. *maculatus* spotted-tailed quoll	r VU #	***Potential habitat*** is coastal scrub, riparian areas, rainforest, wet forest, damp forest, dry forest and blackwood swamp forest (mature and regrowth), particularly where structurally complex and steep rocky areas are present, and includes remnant patches in cleared agricultural land. ***Significant habitat*** is all potential denning habitat within the core range of the species. ***Potential denning habitat*** for the spotted-tailed quoll includes 1) any forest remnant (>0.5 ha) in a cleared or plantation landscape that is structurally complex (high canopy, with dense understorey and ground vegetation cover), free from the risk of inundation, or 2) a rock outcrop, rock crevice, rock pile, burrow with a small entrance, hollow logs, large	***Potential habitat*** present, albeit atypical for denning because of lack of suitable hollow logs, large tree bases, rock piles, overhangs, etc. No evidence of the species was noted (e.g. scats, etc.). ***Significant habitat*** absent (not within core range). The species may utilise the greater title area as part of a home range and for foraging but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale. This species should not require further consideration.

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
		piles of coarse woody debris and caves. ***FPA's Fauna Technical Note 10*** can be used as a guide in the identification of potential denning habitat.	
Dasyurus viverrinus eastern quoll	- EN #	***Potential habitat*** is all terrestrial native vegetation types, forestry plantations and pasture. Dry forest and native grassland mosaics that are bounded by agricultural land are likely to support higher population densities of eastern quolls.	***Potential habitat*** present. See under spotted-tailed quoll.
Gallinago hardwickii Lathams snipe	- VU #	Seasonal migrant that prefers brackish, fresh and saline habitats including lagoons, lakes, marshes, swamps, wet grasslands and paddocks and wetlands with tussock grasses (McNab 2022).	***Potential habitat*** absent, except in the most general of senses. This species should not require further consideration.
Haliaeetus leucogaster white-bellied sea-eagle	v -	***Potential habitat*** comprises ***potential nesting habitat*** and ***potential foraging habitat***. ***Potential foraging habitat*** is any large waterbody (including sea coasts, estuaries, wide rivers, lakes, impoundments and even large farm dams) supporting prey items (fish). ***Potential nesting habitat*** is tall eucalypt trees in large tracts (usually more than 10 ha) of eucalypt or mixed forest within 5 km of the coast (nearest coast including shores, bays, inlets and peninsulas), large rivers (class 1), lakes or complexes of large farm dams. Scattered trees along river banks or pasture land may also be used. ***Significant habitat*** is all native forest and native non-forest vegetation within 500 m or 1 km line-of-sight of known nest sites (where nest tree still present).	***Potential foraging habitat*** widespread (although this is more likely over open water or farming areas). ***Potential nesting habitat*** absent within title because of combination of aspect and stature of forest. No nests were detected. ***Significant habitat*** absent. The species may utilise the greater title area as part of a home range and for foraging but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale. This species should not require further consideration.
Hirundapus caudacutus white-throated needletail	- VU # only	Seasonal migrant (December through March) with habitat open skies over any habitat, more commonly associated with forested hills and mountains (McNab 2022).	***Potential habitat*** widespread but this is a species that flies at high altitude, very fast and highly mobile, feeding on the wing and virtually never perches (McNab 2022). This species should not require further consideration.
Lathamus discolor swift parrot	e CR #	***Potential breeding habitat*** comprises ***potential foraging habitat*** and ***potential nesting habitat***, and is based on definitions of foraging and nesting trees (see Table A in swift parrot habitat assessment Technical Note). ***Potential foraging habitat*** comprises *E. globulus* or *E. ovata* trees that are old enough to flower. In the Eastern Tiers, potential foraging habitat also includes *E. brookeriana* where it has the potential to contribute a substantial foraging resource. The occurrence of foraging-habitat can be remotely	***Potential foraging habitat*** absent (*Eucalyptus globulus* and *Eucalyptus ovata* not present). ***Potential nesting habitat*** absent (no hollow-bearing trees). ***Significant habitat*** absent. This species should not require further consideration.

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
		assessed, although only to a limited extent, by using mapping layers such as GlobMap (DPIPWE 2010). Due to the scale and inadequacies in current foraging-habitat mapping, potential foraging-habitat density within operational areas should be identified by ground-based surveys as per Table B in the swift parrot habitat assessment Technical Note. For management purposes ***potential nesting habitat*** is considered to comprise eucalypt forests that contain hollow-bearing trees. The FPA mature habitat availability map (see Technical Note 2) predicts the availability of hollow-bearing trees using the relevant definitions of habitat provided in Table C of the swift parrot habitat assessment Technical Note. The mature habitat availability map is designed to be used to make landscape-scale assessments and may not be reliable for stand-level assessments required during the development of a Forest Practices Plan. At the stand-level the availability and distribution of hollow-bearing trees across a coupe or operation area is best determined from a ground-based assessment (see Table C in the swift parrot habitat assessment Technical Note). ***Significant habitat*** is all potential breeding habitat within the SE potential breeding range and the NW breeding areas. The site is not within a Swift Parrot Important Breeding Area (SPIBA).	
Myiagra cyanoleuca satin flycatcher	- - # only	Seasonal migrant (November through march) with habitat scrub, wet and dry sclerophyll forests, woodlands and creeklines (McNab 2022).	***Potential habitat*** present. This is a spring-summer migrant that may utilise the greater study area for foraging and nesting but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale. This species should not require further consideration.
Neophema chrysostoma blue-winged parrot	- VU #	Seasonal migrant (October through April) with habitat agricultural lands, crops, dams, paddocks, coastal scrub, open grassy woodlands, heathland and saltmarshes (McNab 2022). ***Potential habitat*** includes native eucalypt forest, native eucalypt woodlands, grasslands and wetlands (FPA 2024).	***Potential habitat*** present. The species may utilise the greater title area as part of its residency period in Tasmania but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale, noting absence of hollow-bearing trees. This species should not require further consideration.

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
Perameles gunnii subsp. *gunnii* eastern barred bandicoot	- VU # only	***Potential habitat*** is open vegetation types including woodlands and open forests with a grassy understorey, native and exotic grasslands, particularly in landscapes with a mosaic of agricultural land and remnant bushland. ***Significant habitat*** is dense tussock grass-sagg-sedge swards, piles of coarse woody debris and denser patches of low shrubs (especially those that are densely branched close to the ground providing shelter) within the core range of the species.	***Potential habitat*** present. ***Significant habitat*** absent. The species may utilise the greater title area as part of a home range and for foraging but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale. This species should not require further consideration.
Prototroctes maraena Australian grayling	v VU #	***Potential habitat*** is all streams and rivers in their lower to middle reaches.	***Potential habitat*** absent (no watercourses present). This species should not require further consideration.
Pseudemoia pagenstecheri tussock skink	v -	***Potential habitat*** is grassland and grassy woodland (including rough pasture with paddock trees), generally with a greater than 20% cover of native grass species, especially where medium to tall tussocks are present.	***Potential habitat*** absent (no areas with greater than 20% cover of tussock-forming grass species present). This species should not require further consideration.
Ranoidea [syn. *Litoria*] *raniformis* subsp. *major* green and golden frog	v VU #	***Potential habitat*** is permanent and temporary waterbodies, usually with vegetation in or around them, including features such as natural lagoons, permanently or seasonally inundated swamps and wetlands, farm dams, irrigation channels, artificial water-holding sites such as old quarries, slow-flowing stretches of streams and rivers and drainage features. ***Significant habitat*** is still or very slow flowing water bodies, with at least some vegetation, and a lack of obvious pollutants (oils, chemicals, etc.).	***Potential habitat*** absent (no ephemeral of permanent watercourses or still waterbodies present). ***Significant habitat*** absent. This species should not require further consideration.
Sarcophilus harrisii tasmanian devil	e EN #	***Potential habitat*** all terrestrial native habitats, forestry plantations and pasture. Devils require shelter (e.g. dense vegetation, hollow logs, burrows or caves) and hunting habitat (open understorey mixed with patches of dense vegetation) within their home range (427 km^2). ***Significant habitat*** is a patch of potential denning habitat where three or more entrances (large enough for a devil to pass through) may be found within 100 m of one another, and where no other potential denning habitat with three or more entrances may be found within a 1 km radius, being the approximate area of the smallest recorded devil home range. ***Potential denning habitat*** is areas of burrowable, well-drained soil, log piles or sheltered overhangs such as cliffs, rocky outcrops, knolls, caves and earth	***Potential habitat*** present, albeit atypical for denning because of lack of suitable hollow logs, large tree bases, rock piles, overhang, etc.). No evidence of the species was noted (e.g. scats, etc.). ***Significant habitat*** absent (no potential denning habitat present). The species may utilise the greater title area as part of a home range and for foraging but small-scale development within the context of surrounding land uses should not have a significant impact at any reasonable scale. This species should not require further consideration.

Scientific name Common name	Status TSPA EPBCA	Tasmanian habitat description (and distribution)	Comments on study area and database records
		banks, free from risk of inundation and with at least one entrance through which a devil could pass.	
Tyto novaehollandiae subsp. *castanops* masked owl	e VU #	***Potential habitat*** is all areas with trees with large hollows (≥15 cm entrance diameter). Remnants and paddock trees (in any dry or wet forest type) in agricultural areas may constitute potential habitat. ***Significant habitat*** is any areas within the core range of native dry forest with trees over 100 cm dbh with large hollows (≥15 cm entrance diameter).	Potential foraging and temporary roosting habitat widespread. ***Potential breeding habitat*** absent due to the absence of large trees with large tree hollows. ***Significant habitat*** absent. This species should not require further consideration.

APPENDIX E. DNRET's *Natural Values Atlas* report for study area

Appended as pdf file.

APPENDIX F. Forest Practices Authority's *Biodiversity Values Atlas* report for study area

Appended as pdf file.

APPENDIX G. CofA's *Protected Matters* report for study area

Appended as pdf file.

ATTACHMENT

- .shp/.dwg file of revised vegetation mapping

Threatened Fauna Range Boundaries

Search Point 515138E,5283773N is within the following fauna range boundaries as at Mon Aug 18 2025 10:18:06 GMT+1000 (Australian Eastern Standard Time)

Common name	Species name	Range Class
grey goshawk	Accipiter novaehollandiae	Potential Range
wedge-tailed eagle	Aquila audax subsp. fleayi	Potential Range
spotted-tailed quoll	Dasyurus maculatus subsp. maculatus	Potential Range
eastern quoll	Dasyurus viverrinus	Potential Range
eastern quoll	Dasyurus viverrinus	Core Range
white-bellied sea-eagle	Haliaeetus leucogaster	Potential Range
swift parrot	Lathamus discolor	SE Potential Range
blue wing parrot	Neophema chrysostoma	Potential Range
eastern barred bandicoot	Perameles gunnii	Core Range
eastern barred bandicoot	Perameles gunnii	Potential Range
tussock skink	Pseudemoia pagenstecheri	Potential Range
tasmanian devil	Sarcophilus harrisii	Potential Range
masked owl	Tyto novaehollandiae	Core Range
masked owl	Tyto novaehollandiae	Potential Range

Showing 1 to 14 of 14 entries

Threatened Fauna Records

Fauna Records within 5000m of 515138E,5283773N
NVA Data Currency: 18/8/2025 (7am)

Species name	Common name	Position accuracy (m)	X	Y	Distance (m)	Obs. type	Obs. date	Obs. state	Project code + Foreign id	NVA id
Tyto novaehollandiae	masked owl	5000	518112	5280683	4289	Sighting	1917-06-06	Present	tmag-fos	NVA
Lathamus discolor	swift parrot	100	519330	5282873	4288	Sighting	2009-08-18	Present	tss data	NVA
Tyto novaehollandiae	masked owl	100	511712	5285883	4024	Sighting	1994-01-01	Present	fpaf	NVA
Tyto novaehollandiae	masked owl	100	511712	5285883	4024	Sighting	1949-12-31	Present	fpaf	NVA
Litoria raniformis	green and gold frog	5000	518222	5280360	4600	Sighting	1937-12-06	Present	tmagvert	NVA
Tyto novaehollandiae	masked owl	5000	518222	5280360	4600	Sighting	1917-06-06	Present	tmagvert	NVA

Showing 1 to 6 of 6 entries

Summary of Threatened Flora Species in Search

Species name	Common name
No data available in table	

Showing 0 to 0 of 0 entries

Threatened Flora Records

Flora Records within 2000m of 515138E, 5283773N

NVA Data Currency: No Data

Species name	Common name	Position accuracy (m)	X	Y	Distance (m)	Obs. type	Obs. date	Obs. state	NVA id
No data available in table									

Showing 0 to 0 of 0 entries

Natural Values Atlas Report

Authoritative, comprehensive information on Tasmania's natural values.

Reference: ECOtas_570HuntingtonRoad
Requested For: MWapstra
Report Type: Summary Report
Timestamp: 10:16:34 AM Monday 18 August 2025

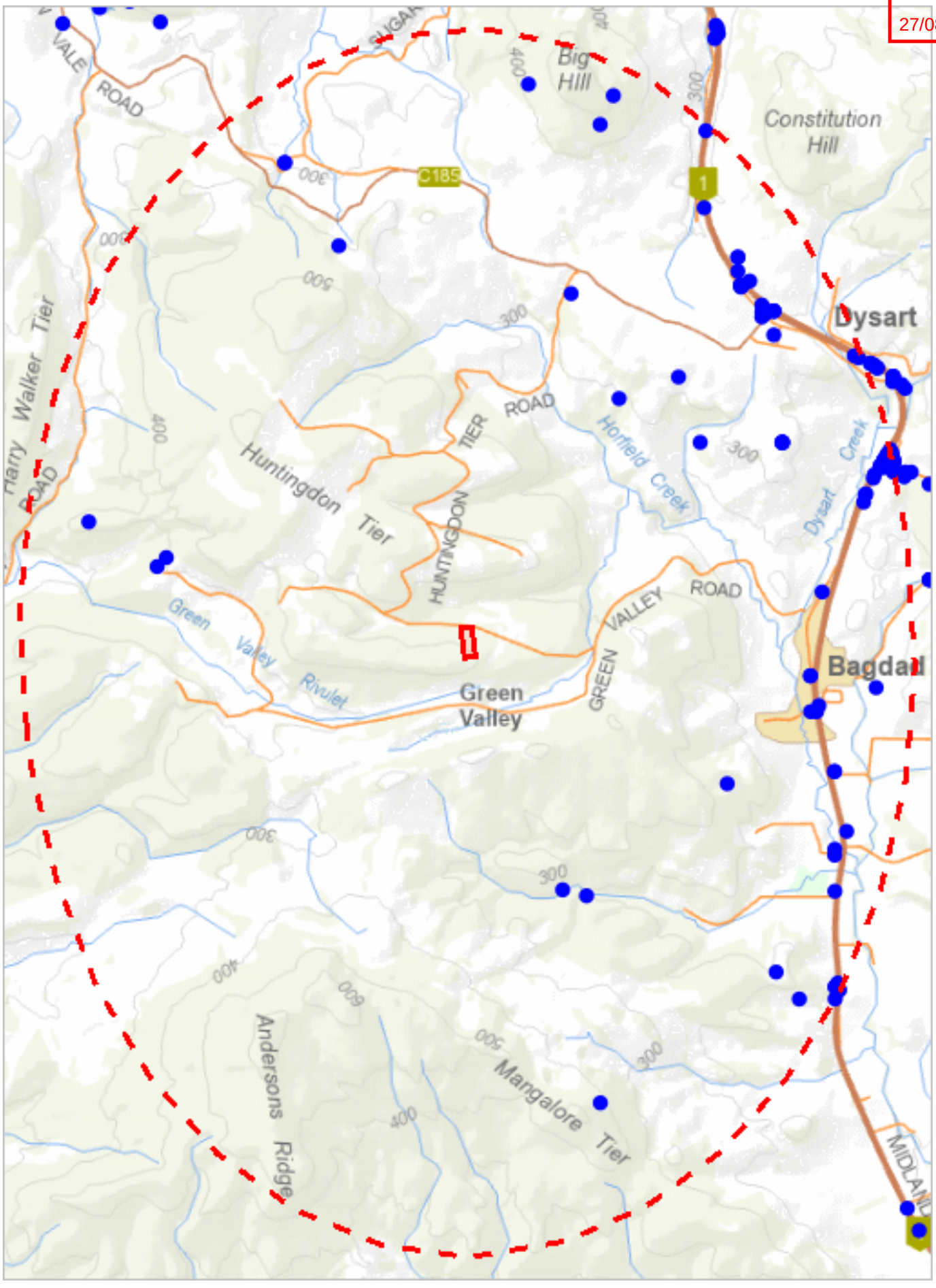
Threatened Flora: buffers Min: 500m Max: 5000m
Threatened Fauna: buffers Min: 500m Max: 5000m
Raptors: buffers Min: 500m Max: 5000m
Tasmanian Weed Management Act Weeds: buffers Min: 500m Max: 5000m
Priority Weeds: buffers Min: 500m Max: 5000m
Geoconservation: buffer 1000m
Acid Sulfate Soils: buffer 1000m
TASVEG: buffer 1000m
Threatened Communities: buffer 1000m
Fire History: buffer 1000m
Tasmanian Reserve Estate: buffer 1000m
Biosecurity Risks: buffer 1000m

The centroid for this query GDA94: 515138.0, 5283773.0 falls within:

Property: 3247834

*** No threatened flora found within 500 metres ***

Threatened flora within 5000 metres



511230, 5278429

Please note that some layers may not display at all requested map scales

Threatened flora within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened flora within 5000 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Asperula scoparia subsp. scoparia	prickly woodruff	r		n	1	24-Nov-2000
Austromelanelixia piliferella		v		n	1	07-Aug-1981
Austrostipa blackii	crested speargrass	r		n	2	01-Jan-2002
Brachyscome perpusilla	tiny daisy	r		n	30	07-Oct-2020
Brachyscome rigidula	cutleaf daisy	v		n	2	20-Aug-2007
Goodenia paradoxa	spur velleia	v		n	13	19-Dec-2010
Hyalosperma demissum	moss sunray	e		n	2	07-Oct-2020
Lepidium hyssopifolium	soft peppercress	e	EN	n	37	07-Apr-2017
Parietaria debilis	shade pellitory	r		n	2	24-Nov-2016
Scleranthus fasciculatus	spreading knawel	v		n	12	23-Feb-2010
Senecio squarrosus	leafy fireweed	r		n	1	25-Nov-1998
Vittadinia burbidgeae	smooth new-holland-daisy	r		e	1	20-Dec-2005
Vittadinia gracilis	woolly new-holland-daisy	r		n	42	19-Dec-2010
Vittadinia muelleri	narrowleaf new-holland-daisy	r		n	6	24-Nov-2014
Vittadinia muelleri (broad sense)	narrow leaf new holland daisy	p		n	4	20-Jul-2007

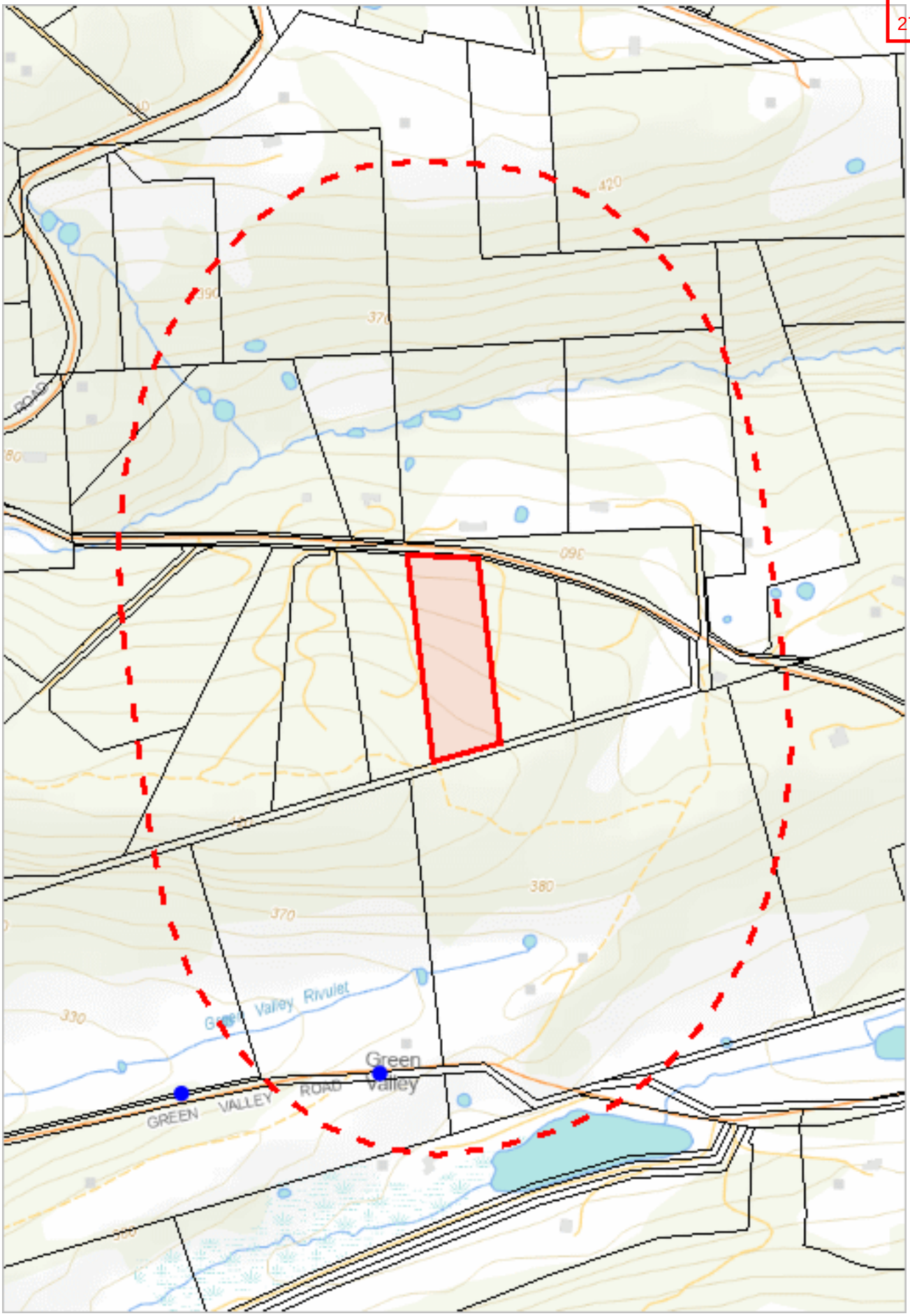
Unverified Records

No unverified records were found!

For more information about threatened species, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 500 metres

515716, 5284500



514559, 5282935

Please note that some layers may not display at all requested map scales

Threatened fauna within 500 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened fauna within 500 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	10-Jun-2004

Unverified Records

No unverified records were found!

Threatened fauna within 500 metres

(based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
Lathamus discolor	swift parrot	e	CR	mbe	1	0	0
Prototroctes maraena	australian grayling	v	VU	ae	1	0	0
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	1	0	1
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	1	0	0
Dasyurus maculatus subsp. maculatus	spotted-tailed quoll	r	VU	n	1	0	0
Accipiter novaehollandiae	grey goshawk	e		n	1	0	0
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	0	0
Perameles gunnii	eastern barred bandicoot		VU	n	1	0	1
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0
Dasyurus viverrinus	eastern quoll		EN	n	0	0	1

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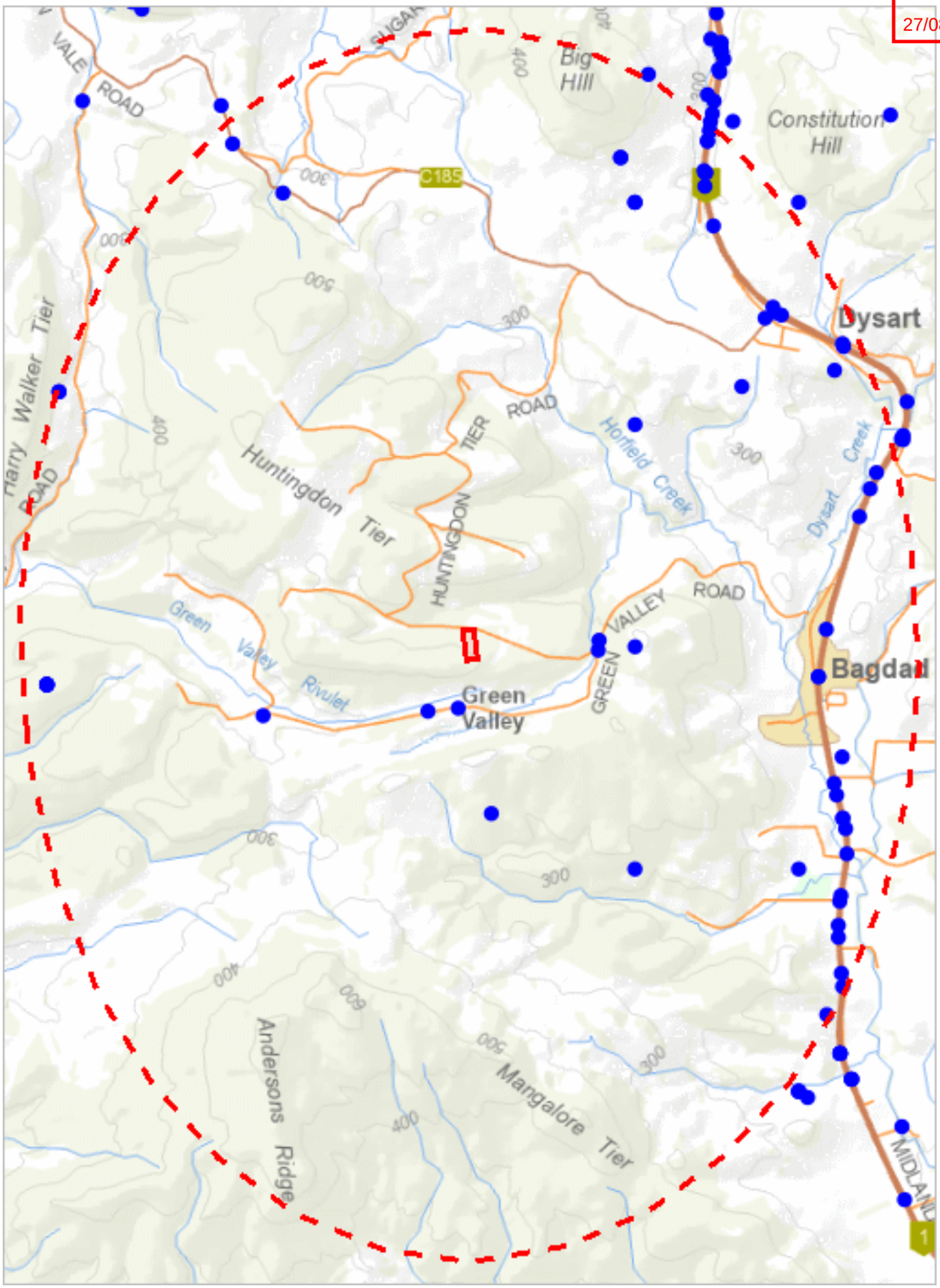
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened fauna within 5000 metres

SMC - KEMPTON
519052, 5289102 REQUESTED
27/08/2025



511230, 5278429

Please note that some layers may not display at all requested map scales

Threatened fauna within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Threatened fauna within 5000 metres

Verified Records

Species	Common Name	SS	NS	Bio	Observation Count	Last Recorded
Accipiter novaehollandiae	grey goshawk	e		n	3	27-Apr-1984
Aquila audax	wedge-tailed eagle	pe	PEN	n	6	02-Jan-2021
Dasyurus maculatus	spotted-tailed quoll	r	VU	n	1	05-Feb-2021
Dasyurus maculatus subsp. maculatus	spotted-tailed quoll	r	VU	n	2	21-Apr-2024
Dasyurus viverrinus	eastern quoll		EN	n	11	26-Jul-2015
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	1	21-Jul-1991
Lathamus discolor	swift parrot	e	CR	mbe	1	18-Aug-2009
Litoria raniformis	green and gold frog	v	VU	n	1	07-Dec-1937
Perameles gunnii	eastern barred bandicoot		VU	n	24	18-Apr-2023
Sarcophilus harrisii	tasmanian devil	e	EN	e	44	09-Oct-2024
Tyto novaehollandiae	masked owl	pe	PVU	n	4	01-Jan-1994

Unverified Records

No unverified records were found!

Threatened fauna within 5000 metres

(based on Range Boundaries)

Species	Common Name	SS	NS	BO	Potential	Known	Core
Litoria raniformis	green and gold frog	v	VU	n	1	0	0
Lathamus discolor	swift parrot	e	CR	mbe	1	0	1
Prototroctes maraena	australian grayling	v	VU	ae	1	0	0
Pseudemoia pagenstecheri	tussock skink	v		n	1	0	0
Tyto novaehollandiae subsp. castanops	masked owl (Tasmanian)	e	VU	e	1	0	1
Haliaeetus leucogaster	white-bellied sea-eagle	v		n	2	0	0
Dasyurus maculatus subsp. maculatus	spotted-tailed quoll	r	VU	n	1	0	0
Accipiter novaehollandiae	grey goshawk	e		n	1	0	0
Sarcophilus harrisii	tasmanian devil	e	EN	e	1	0	0
Perameles gunnii	eastern barred bandicoot		VU	n	1	0	1
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	e	1	0	0
Dasyurus viverrinus	eastern quoll		EN	n	0	0	1

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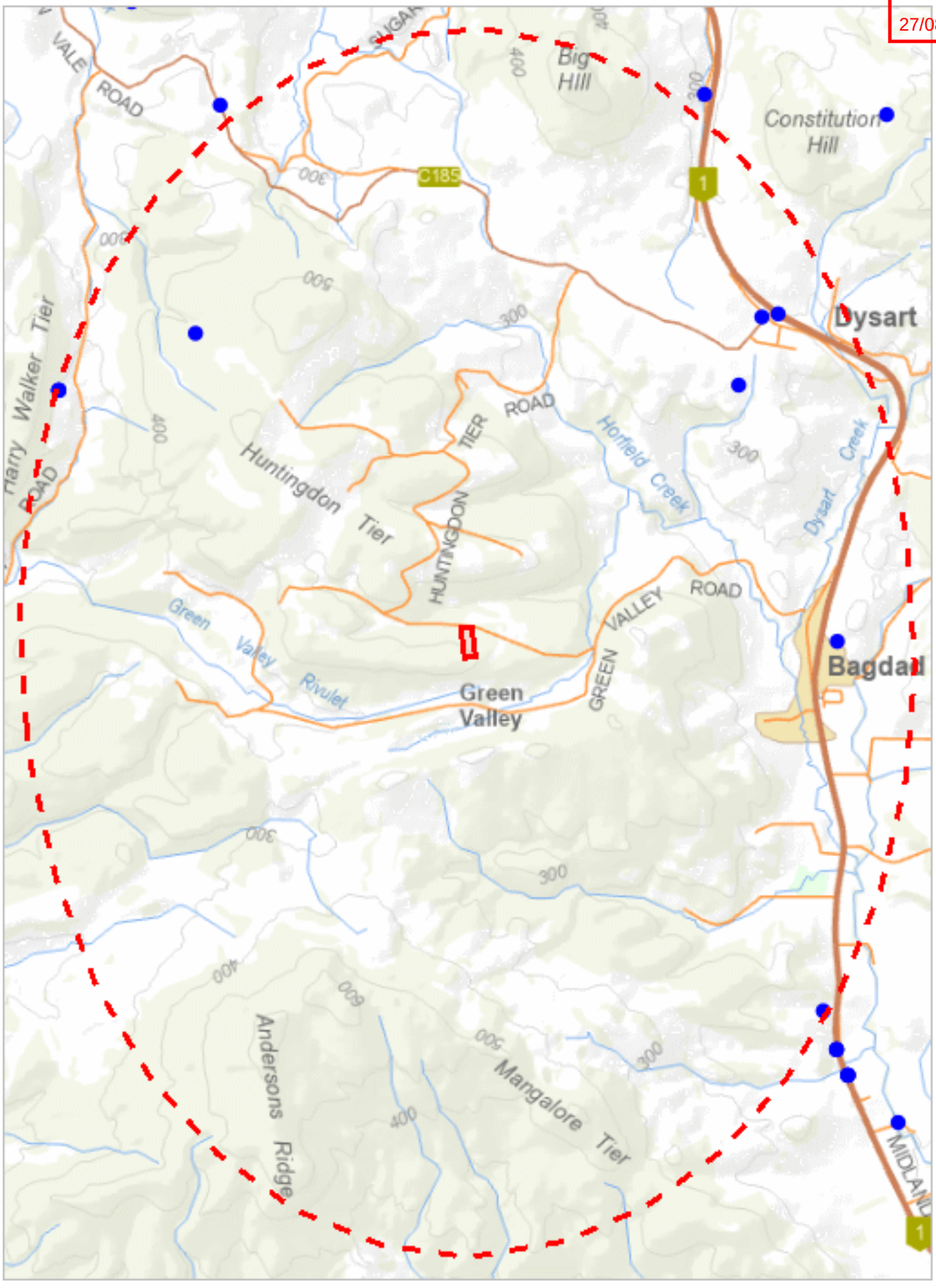
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

*** No Raptor nests or sightings found within 500 metres. ***

Raptor nests and sightings within 5000 metres

SMC - KEMPTON
RECEIVED
27/08/2025

519052, 5289102



511230, 5278429

Please note that some layers may not display at all requested map scales

Raptor nests and sightings within 5000 metres

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Raptor nests and sightings within 5000 metres

Verified Records

Nest Id/Location Foreign Id	Species	Common Name	Obs Type	Observation Count	Last Recorded
359	Falco peregrinus	peregrine falcon	Nest	1	01-Jan-1985
388	Falco peregrinus	peregrine falcon	Nest	1	01-Jan-1985
	Accipiter novaehollandiae	grey goshawk	Sighting	3	27-Apr-1984
	Aquila audax	wedge-tailed eagle	Not Recorded	2	14-Feb-2014
	Aquila audax	wedge-tailed eagle	Sighting	4	02-Jan-2021
	Falco peregrinus	peregrine falcon	Sighting	2	26-May-2021
	Haliaeetus leucogaster	white-bellied sea-eagle	Sighting	1	21-Jul-1991
	Tyto novaehollandiae	masked owl	Sighting	4	01-Jan-1994

Unverified Records

No unverified records were found!

Raptor nests and sightings within 5000 metres

(based on Range Boundaries)

Species	Common Name	SS	NS	Potential	Known	Core
Aquila audax subsp. fleayi	tasmanian wedge-tailed eagle	e	EN	1	0	0
Accipiter novaehollandiae	grey goshawk	e		1	0	0
Haliaeetus leucogaster	white-bellied sea-eagle	v		2	0	0

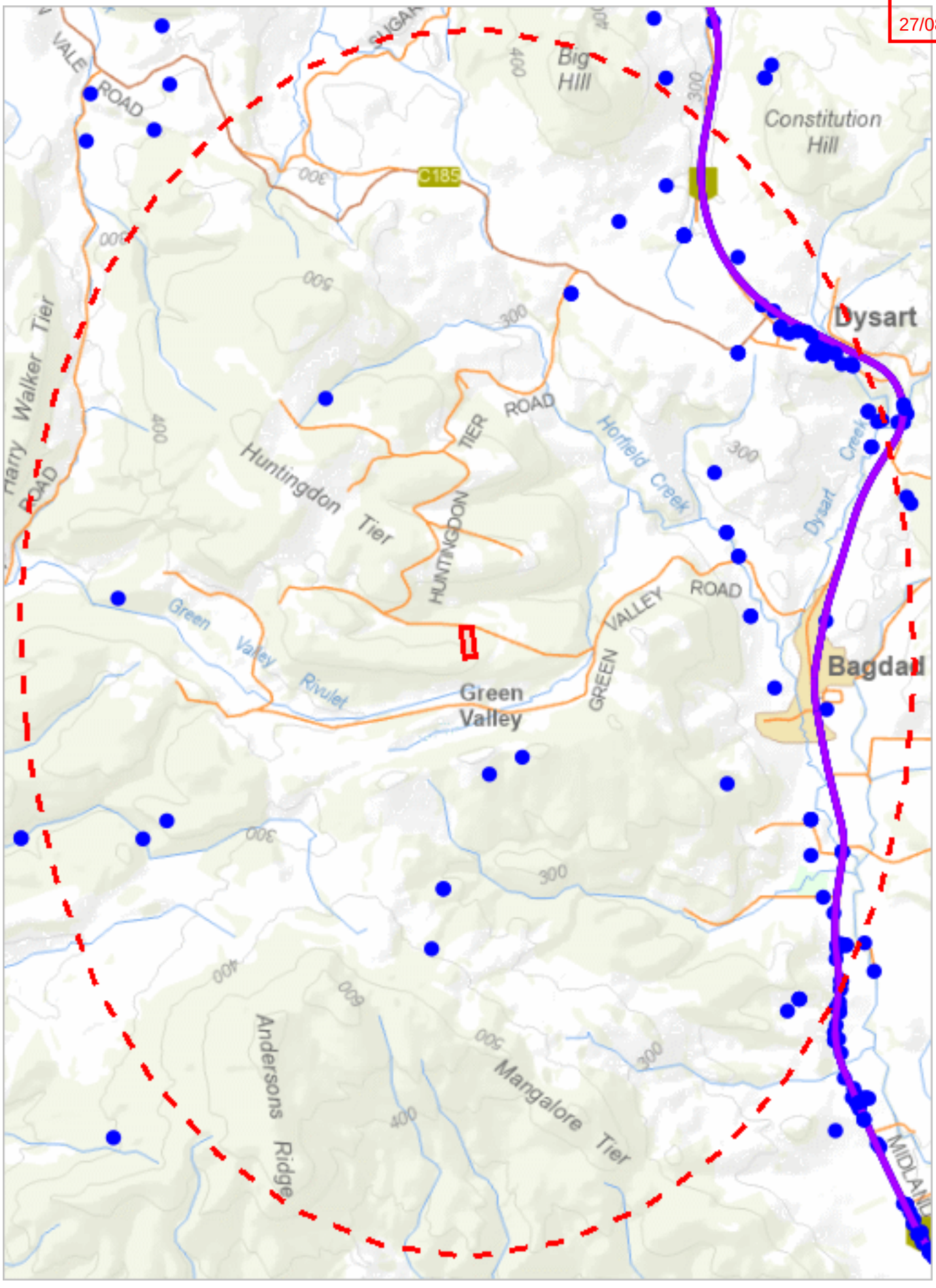
For more information about raptor nests, please contact Threatened Species Enquiries.
Telephone: 1300 368 550
Email: ThreatenedSpecies.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

*** No Tas Management Act Weeds found within 500 metres ***

Tas Management Act Weeds within 5000 m

SMC - KEMPTON
RECEIVED
27/08/2025

519052, 5289102



511230, 5278429

Please note that some layers may not display at all requested map scales

Tas Management Act Weeds within 5000 m

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Tas Management Act Weeds within 5000 m

Verified Records

Species	Common Name	Observation Count	Last Recorded
Carduus nutans	nodding thistle	2	18-Oct-2006
Carduus pycnocephalus	slender thistle	3	25-Nov-2014
Carduus tenuiflorus	winged thistle	6	28-Jun-1992
Chrysanthemoides monilifera subsp. monilifera	boneseed	18	09-Oct-2012
Cirsium arvense var. arvense	creeping thistle	8	22-Nov-2023
Digitalis purpurea	foxglove	1	24-Feb-2006
Echium plantagineum	patersons curse	11	06-Nov-2023
Echium vulgare	vipers bugloss	1	25-Nov-2014
Elodea canadensis	canadian pondweed	2	18-Nov-1967
Eragrostis curvula	african lovegrass	2	17-Apr-2018
Foeniculum vulgare	fennel	17	23-Mar-2016
Genista monspessulana	montpellier broom or canary broom	10	22-Nov-2023
Lepidium draba	hoary cress	4	25-Nov-2014
Marrubium vulgare	white horehound	3	22-Dec-2009
Rubus fruticosus	blackberry	50	23-Mar-2016
Ulex europaeus	gorse	7	23-Mar-2016

Unverified Records

For more information about introduced weed species, please visit the following URL for contact details in your area:

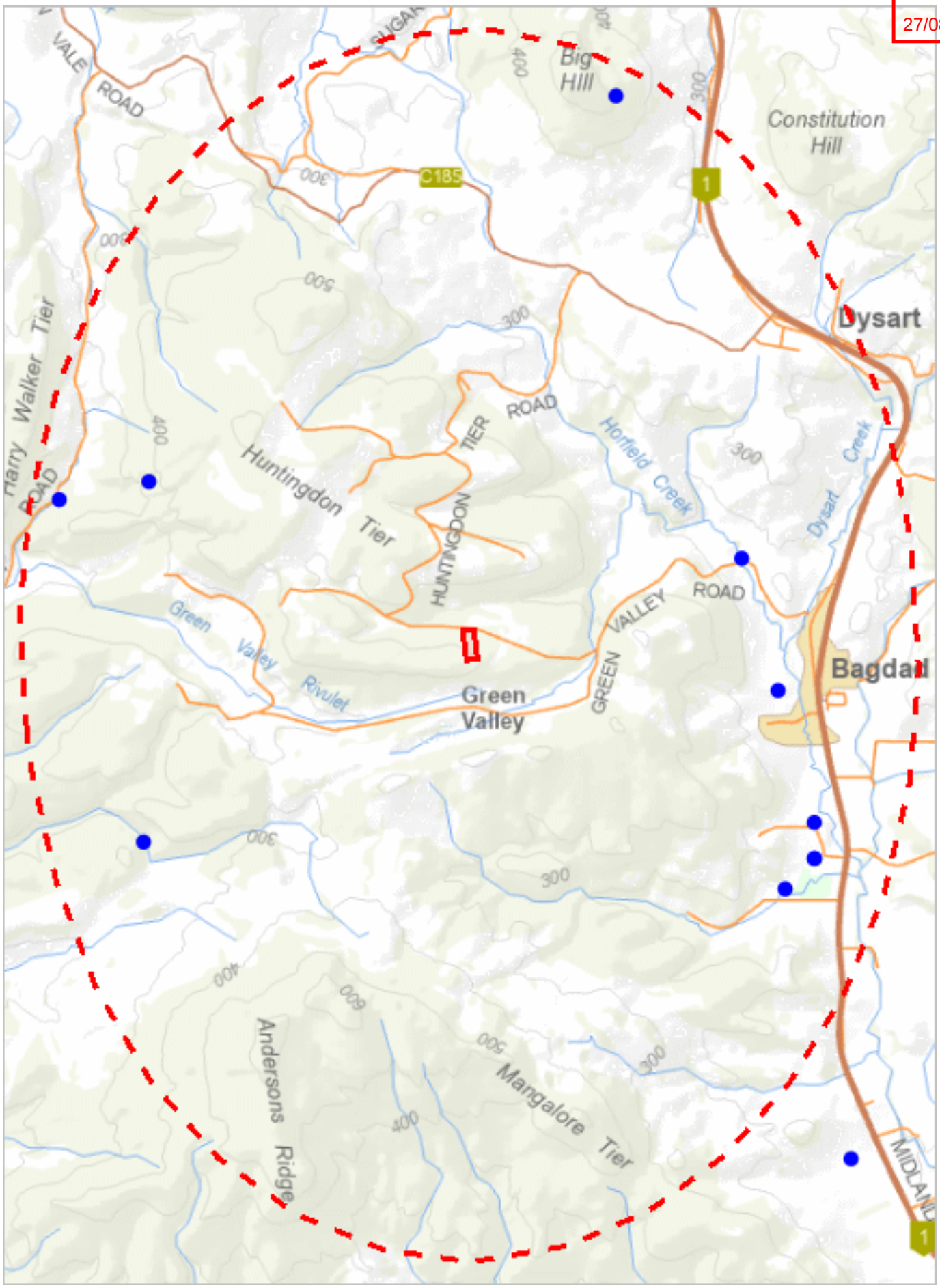
https://www.nre.tas.gov.au/invasive-species/weeds

*** No Priority Weeds found within 500 metres ***

Priority Weeds within 5000 m

SMC - KEMPTON
RECEIVED
27/08/2025

519052, 5289102



511230, 5278429

Please note that some layers may not display at all requested map scales

Priority Weeds within 5000 m

Legend: Verified and Unverified observations

- Point Verified
- Point Unverified
- Line Verified
- Line Unverified
- Polygon Verified
- Polygon Unverified

Legend: Cadastral Parcels

Priority Weeds within 5000 m

Verified Records

Species	Common Name	Observation Count	Last Recorded
Achillea millefolium	yarrow	2	28-Jun-1992
Reseda luteola	weld	4	28-Jun-1992
Rumex obtusifolius	broadleaf dock	3	25-Nov-1998
Verbascum thapsus	great mullein	1	23-Feb-2010

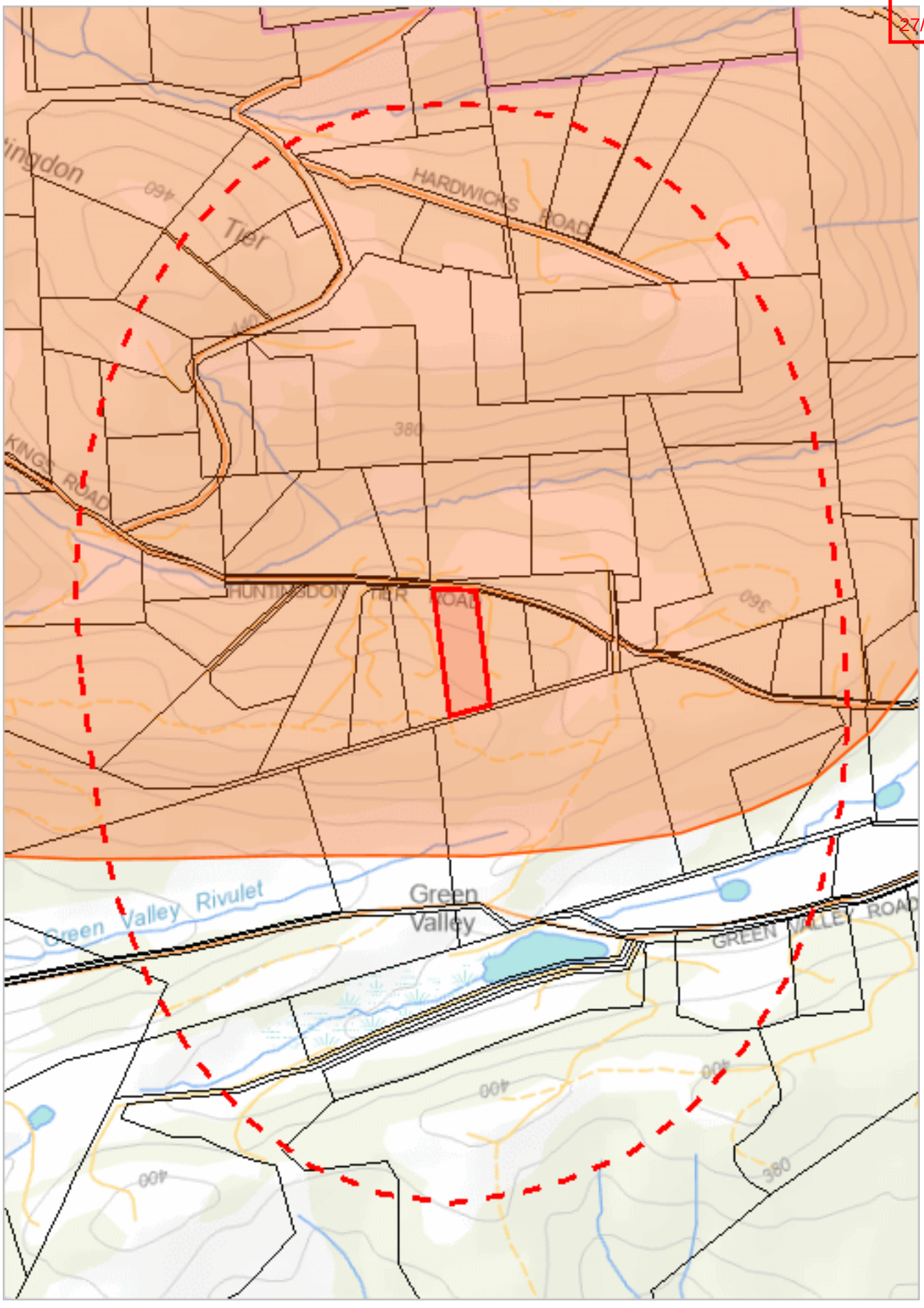
Unverified Records

For more information about introduced weed species, please visit the following URL for contact details in your area:

https://www.nre.tas.gov.au/invasive-species/weeds

Geoconservation sites within 1000 metres

516037, 5285100



514189, 5282435

Please note that some layers may not display at all requested map scales

Geoconservation sites within 1000 metres

Legend: Geoconservation (NVA)

Legend: Cadastral Parcels

Geoconservation sites within 1000 metres

Id	Name	Statement of Significance	Significance Level	Status
2221	Elderslie Sandstone Landforms	Notable example of type.	State	Listed

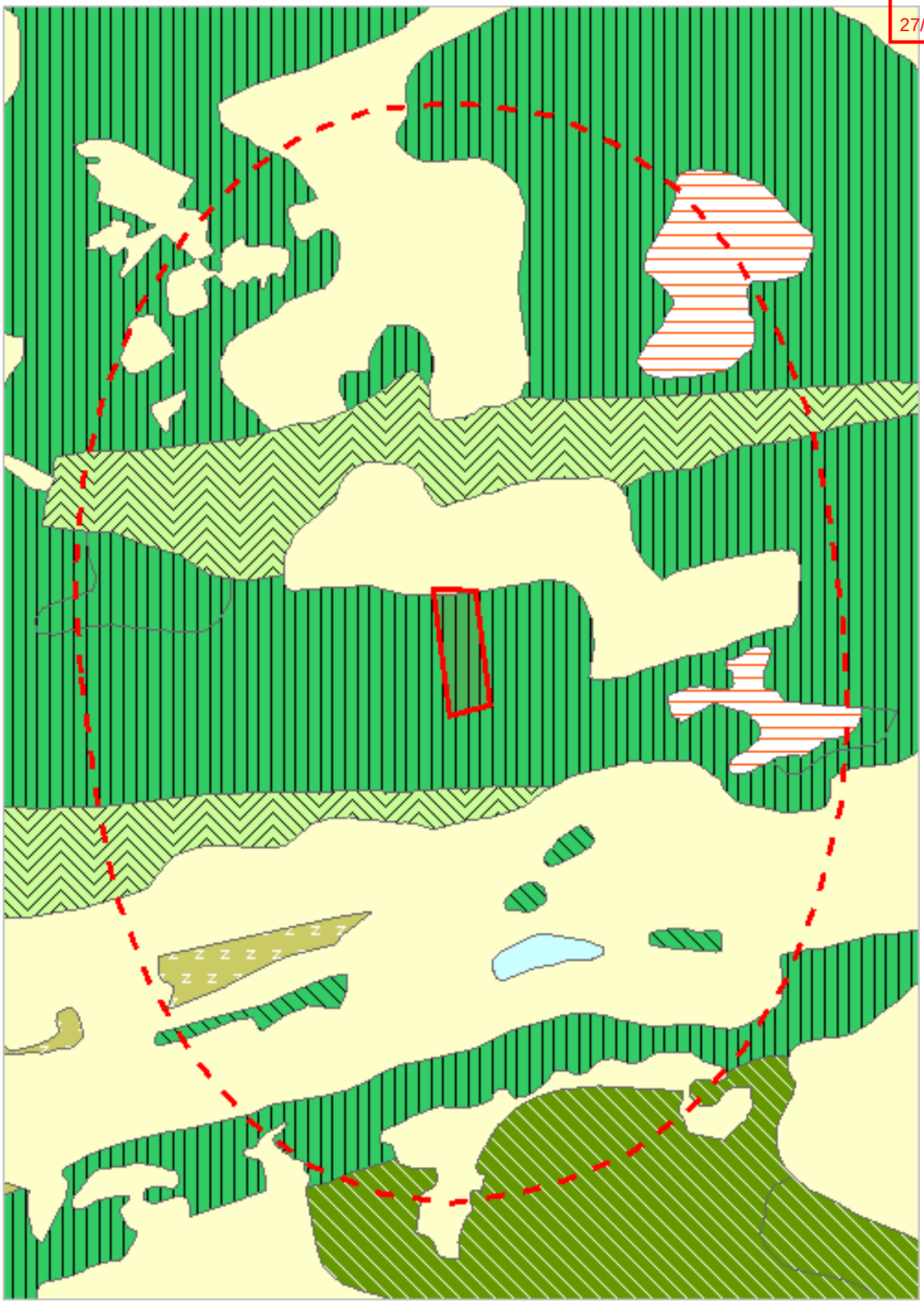
For more information about the Geoconservation Database, please visit the website: https://www.nre.tas.gov.au/conservation/geoconservation or contact the Geoconservation Officer:

Telephone: (03) 6165 4401
Email: Geoconservation.Enquiries@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

*** No Acid Sulfate Soils found within 1000 metres ***

TASVEG 4.0 Communities within 1000 metres

516037, 5285100



514189, 5282435

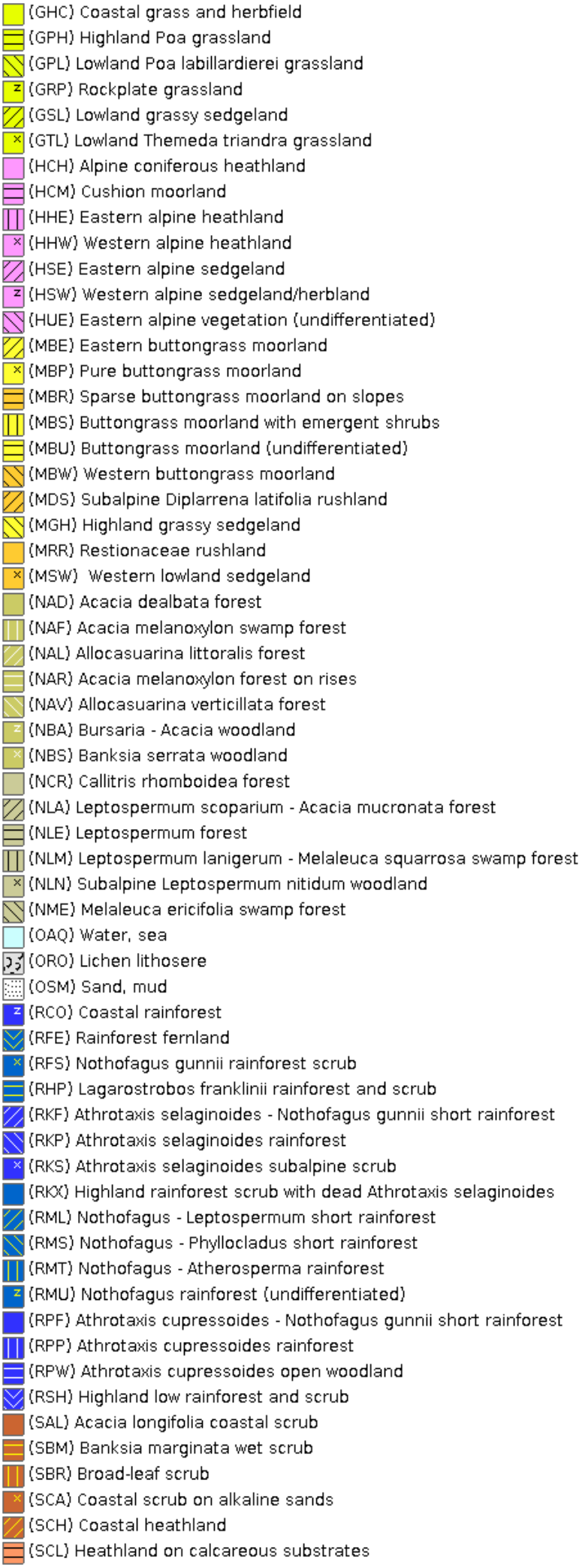
Please note that some layers may not display at all requested map scales

TASVEG 4.0 Communities within 1000 metres

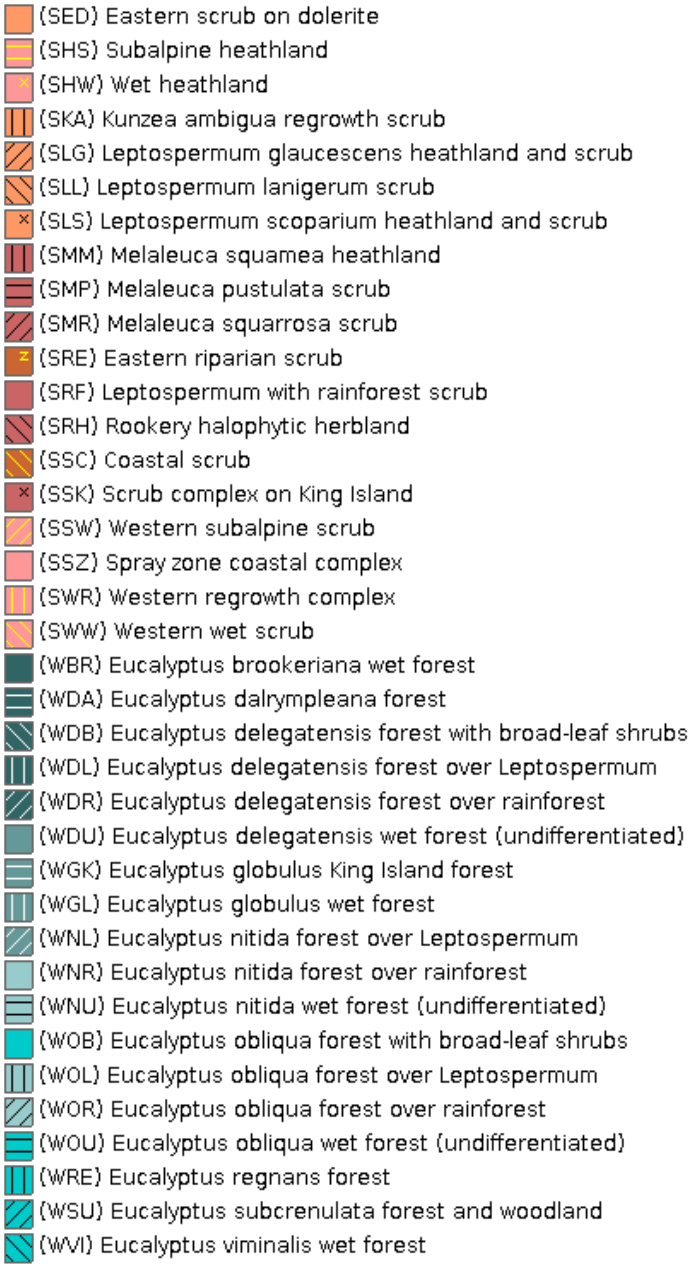
Legend: TASVEG 4.0

- (AAP) Alkaline pans
- (AHF) Freshwater aquatic herbland
- (AHL) Lacustrine herbland
- (AHS) Saline aquatic herbland
- (ARS) Saline sedgeland / rushland
- (ASF) Fresh water aquatic sedgeland and rushland
- (ASP) Sphagnum peatland
- (ASS) Succulent saline herbland
- (AUS) Saltmarsh (undifferentiated)
- (AWU) Wetland (undifferentiated)
- (DAC) Eucalyptus amygdalina coastal forest and woodland
- (DAD) Eucalyptus amygdalina forest and woodland on dolerite
- (DAM) Eucalyptus amygdalina forest on mudstone
- (DAS) Eucalyptus amygdalina forest and woodland on sandstone
- (DAZ) Eucalyptus amygdalina inland forest and woodland on Cainozoic deposits
- (DBA) Eucalyptus barberi forest and woodland
- (DCO) Eucalyptus coccifera forest and woodland
- (DCR) Eucalyptus cordata forest
- (DDE) Eucalyptus delegatensis dry forest and woodland
- (DDP) Eucalyptus dalrympleana - Eucalyptus pauciflora forest and woodland
- (DGL) Eucalyptus globulus dry forest and woodland
- (DGW) Eucalyptus gunnii woodland
- (DKW) King Island Eucalypt woodland
- (DMO) Eucalyptus morrisbyi forest and woodland
- (DMW) Midlands woodland complex
- (DNF) Eucalyptus nitida Furneaux forest
- (DNI) Eucalyptus nitida dry forest and woodland
- (DOB) Eucalyptus obliqua dry forest
- (DOV) Eucalyptus ovata forest and woodland
- (DOW) Eucalyptus ovata heathy woodland
- (DPD) Eucalyptus pauciflora forest and woodland on dolerite
- (DPE) Eucalyptus perriniana forest and woodland
- (DPO) Eucalyptus pauciflora forest and woodland not on dolerite
- (DPU) Eucalyptus pulchella forest and woodland
- (DRI) Eucalyptus risdonii forest and woodland
- (DRO) Eucalyptus rodwayi forest and woodland
- (DSC) Eucalyptus amygdalina - Eucalyptus obliqua damp sclerophyll forest
- (DSG) Eucalyptus sieberi forest and woodland on granite
- (DSO) Eucalyptus sieberi forest and woodland not on granite
- (DTD) Eucalyptus tenuiramis forest and woodland on dolerite
- (DTG) Eucalyptus tenuiramis forest and woodland on granite
- (DTO) Eucalyptus tenuiramis forest and woodland on sediments
- (DVC) Eucalyptus viminalis - Eucalyptus globulus coastal forest and woodland
- (DVF) Eucalyptus viminalis Furneaux forest and woodland
- (DVG) Eucalyptus viminalis grassy forest and woodland
- (FAC) Improved pasture with native tree canopy
- (FAG) Agricultural land
- (FMG) Marram grassland
- (FPE) Permanent easements
- (FPF) Pteridium esculentum fernland
- (FPH) Plantations for silviculture - hardwood
- (FPS) Plantations for silviculture - softwood
- (FPU) Unverified plantations for silviculture
- (FRG) Regenerating cleared land
- (FSM) Spartina marshland
- (FUM) Extra-urban miscellaneous
- (FUR) Urban areas
- (FWU) Weed infestation
- (GCL) Lowland grassland complex

TASVEG 4.0 Communities within 1000 metres



TASVEG 4.0 Communities within 1000 metres



Legend: Cadastral Parcels

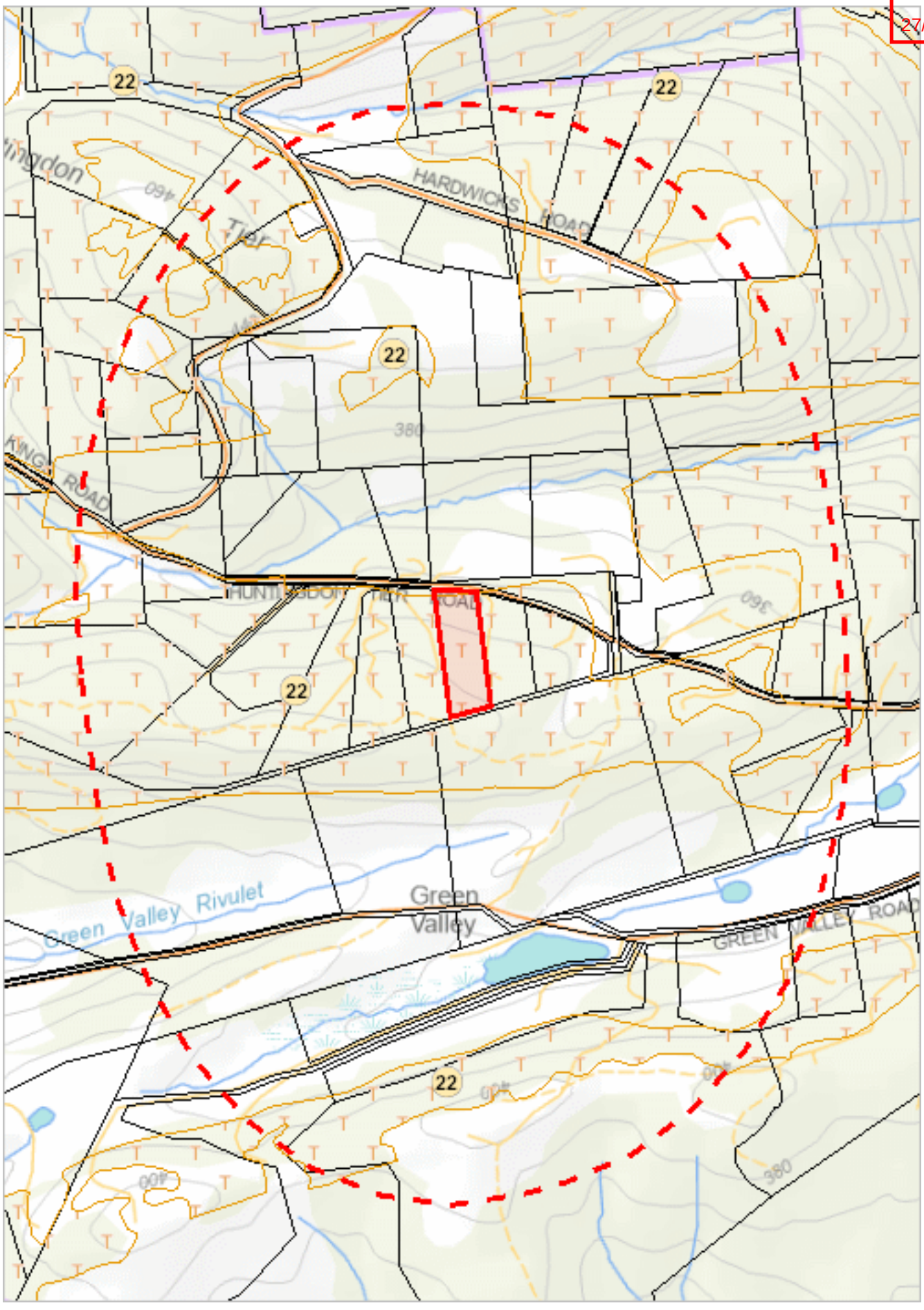
TASVEG 4.0 Communities within 1000 metres

Code	Community	Canopy Tree
DOB	(DOB) Eucalyptus obliqua dry forest	
DPU	(DPU) Eucalyptus pulchella forest and woodland	
DTO	(DTO) Eucalyptus tenuiramis forest and woodland on sediments	
DVG	(DVG) Eucalyptus viminalis grassy forest and woodland	
FAG	(FAG) Agricultural land	ET
FAG	(FAG) Agricultural land	EV
FAG	(FAG) Agricultural land	
FUM	(FUM) Extra-urban miscellaneous	
NBA	(NBA) Bursaria - Acacia woodland	
OAQ	(OAQ) Water, sea	

For more information contact: Coordinator, Tasmanian Vegetation Monitoring and Mapping Program.
Telephone: (03) 6165 4320
Email: TVMMPSupport@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

Threatened Communities (TNVC 2020) within 1000 metres

516037, 5285100



514189, 5282435

Please note that some layers may not display at all requested map scales

Threatened Communities (TNVC 2020) within 1000 metres

Legend: Threatened Communities

- 1 - Alkaline pans
- 2 - Allocasuarina littoralis forest
- 3 - Athrotaxis cupressoides/Nothofagus gunnii short rainforest
- 4 - Athrotaxis cupressoides open woodland
- 5 - Athrotaxis cupressoides rainforest
- 6 - Athrotaxis selaginoides/Nothofagus gunnii short rainforest
- 7 - Athrotaxis selaginoides rainforest
- 8 - Athrotaxis selaginoides subalpine scrub
- 9 - Banksia marginata wet scrub
- 10 - Banksia serrata woodland
- 11 - Callitris rhomboidea forest
- 13 - Cushion moorland
- 14 -Eucalyptus amygdalina forest and woodland on sandstone
- 15 - Eucalyptus amygdalina inland forest and woodland on cainozoic deposits
- 16 - Eucalyptus brookeriana wet forest
- 17 - Eucalyptus globulus dry forest and woodland
- 18 - Eucalyptus globulus King Island forest
- 19 - Eucalyptus morrisbyi forest and woodland
- 20 - Eucalyptus ovata forest and woodland
- 21 - Eucalyptus risdonii forest and woodland
- 22 - Eucalyptus tenuiramis forest and woodland on sediments
- 23 - Eucalyptus viminalis - Eucalyptus globulus coastal forest and woodland
- 24 - Eucalyptus viminalis Furneaux forest and woodland
- 25 - Eucalyptus viminalis wet forest
- 26 - Heathland on calcareous substrates
- 27 - Heathland scrub complex at Wingaroo
- 28 - Highland grassy sedgeland
- 29 - Highland Poa grassland
- 30 - Melaleuca ericifolia swamp forest
- 31 - Melaleuca pustulata scrub
- 32 - Notelaea - Pomaderris - Beyeria forest
- 33 - Rainforest fernland
- 34 - Riparian scrub
- 35 - Seabird rookery complex
- 36 - Sphagnum peatland
- 36A - Spray zone coastal complex
- 37 - Subalpine Diplarrena latifolia rushland
- 38 - Subalpine Leptospermum nitidum woodland
- 39 - Wetlands

Legend: Cadastral Parcels

Threatened Communities (TNVC 2020) within 1000 metres

Scheduled Community Id	Scheduled Community Name
22	Eucalyptus tenuiramis forest and woodland on sediments

For more information contact: Coordinator, Tasmanian Vegetation Monitoring and Mapping Program.
Telephone: (03) 6165 4320
Email: TVMMPSupport@nre.tas.gov.au
Address: GPO Box 44, Hobart, Tasmania, Australia, 7000

*** No Fire History (All) found within 1000 metres ***

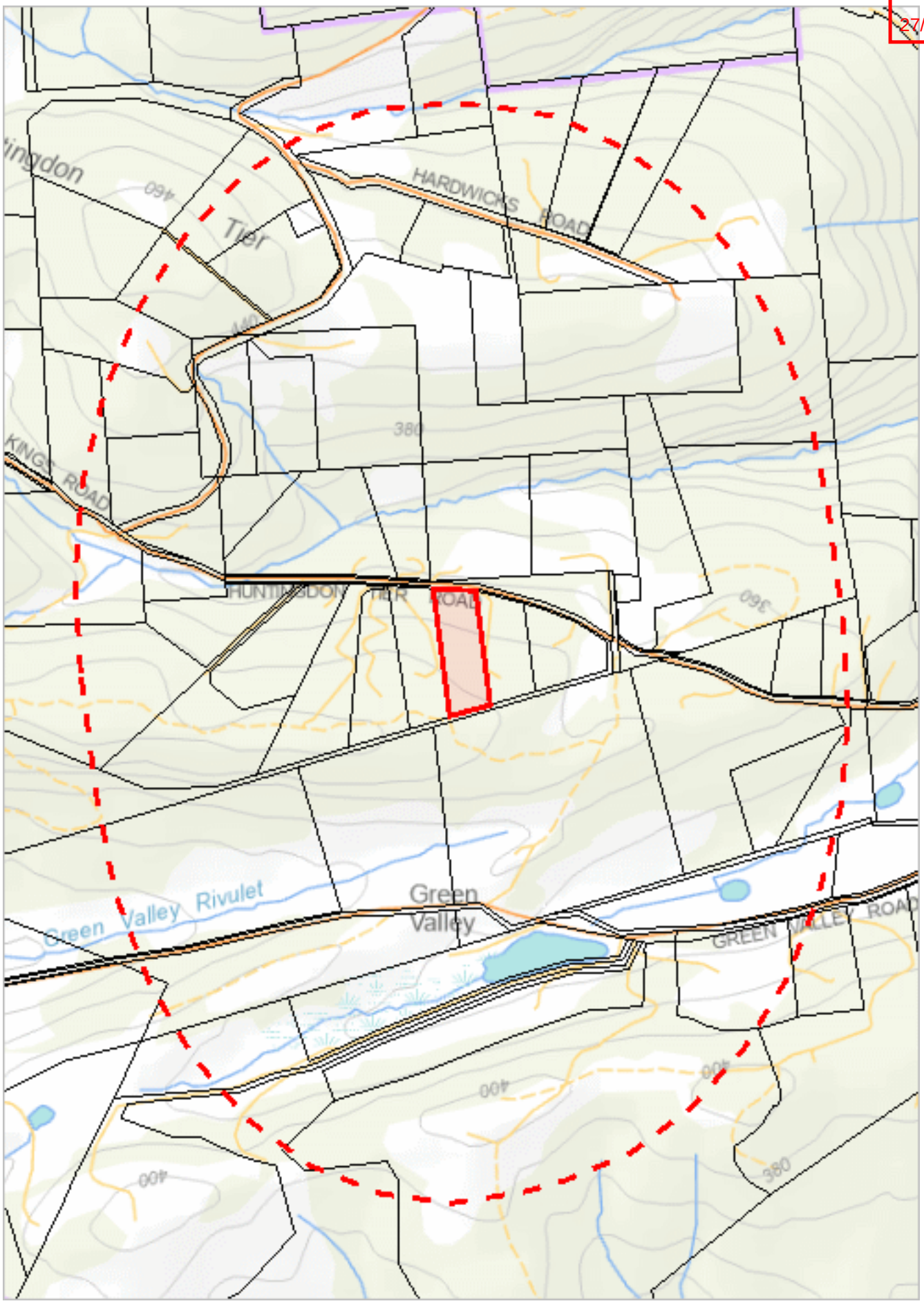
*** No Fire History (Last Burnt) found within 1000 metres ***

*** No reserves found within 1000 metres ***

Known biosecurity risks within 1000 meters

SMC - KEMPTON
RECEIVED
27/08/2025

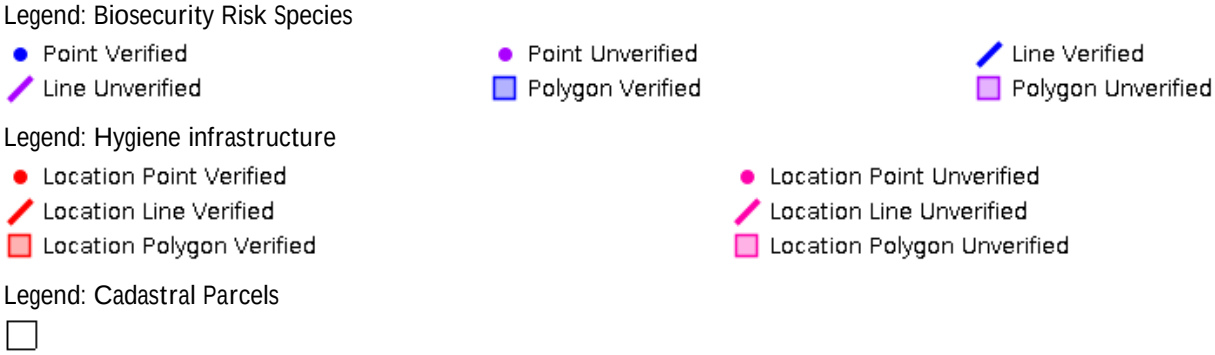
516037, 5285100



514189, 5282435

Please note that some layers may not display at all requested map scales

Known biosecurity risks within 1000 meters



Known biosecurity risks within 1000 meters

Verified Species of biosecurity risk

No verified species of biosecurity risk found within 1000 metres

Unverified Species of biosecurity risk

No unverified species of biosecurity risk found within 1000 metres

Generic Biosecurity Guidelines

The level and type of hygiene protocols required will vary depending on the tenure, activity and land use of the area. In all cases adhere to the land manager's biosecurity (hygiene) protocols. As a minimum always Check / Clean / Dry (Disinfect) clothing and equipment before trips and between sites within a trip as needed https://www.nre.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual

On Reserved land, the more remote, infrequently visited and undisturbed areas require tighter biosecurity measures.

In addition, where susceptible species and communities are known to occur, tighter biosecurity measures are required.

Apply controls relevant to the area / activity:

- Don't access sites infested with pathogen or weed species unless absolutely necessary. If it is necessary to visit, adopt high level hygiene protocols.
- Consider not accessing non-infested sites containing known susceptible species / communities. If it is necessary to visit, adopt high level hygiene protocols.
- Don't undertake activities that might spread pest / pathogen / weed species such as deliberately moving soil or water between areas.
- Modify / restrict activities to reduce the chance of spreading pest / pathogen / weed species e.g. avoid periods when weeds are seeding, avoid clothing/equipment that excessively collects soil and plant material e.g. Velcro, excessive tread on boots.
- Plan routes to visit clean (uninfested) sites prior to dirty (infested) sites. Do not travel through infested areas when moving between sites.
- Minimise the movement of soil, water, plant material and hitchhiking wildlife between areas by using the Check / Clean / Dry (Disinfect when drying is not possible) procedure for all clothing, footwear, equipment, hand tools and vehicles https://www.nre.tas.gov.au/invasive-species/weeds/weed-hygiene
- Neoprene and netting can take 48 hours to dry, use non-porous gear wherever possible.
- Use walking track boot wash stations where available.
- Keep a hygiene kit in the vehicle that includes a scrubbing brush, boot pick, and disinfectant https://www.nre.tas.gov.au/invasive-species/weeds/weed-hygiene/keeping-it-clean-a-tasmanian-field-hygiene-manual
- Dispose of all freshwater away from natural water bodies e.g. do not empty water into streams or ponds.
- Dispose of used disinfectant ideally in town though a treatment or septic system. Always keep disinfectant well away from natural water systems.
- Securely contain any high risk pest / pathogen / weed species that must be collected and moved e.g. biological samples.

Hygiene Infrastructure

No known hygiene infrastructure found within 1000 metres

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 18-Aug-2025

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	31
Listed Migratory Species:	9

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	2
Commonwealth Heritage Places:	None
Listed Marine Species:	15
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	9
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Alpine Sphagnum Bogs and Associated Fens	Endangered	Community may occur within area	In buffer area only
Lowland Native Grasslands of Tasmania	Critically Endangered	Community likely to occur within area	In buffer area only
Tasmanian Forests and Woodlands dominated by black gum or Brookers gum (Eucalyptus ovata / E. brookeriana)	Critically Endangered	Community likely to occur within area	In feature area
Tasmanian white gum (Eucalyptus viminalis) wet forest	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aquila audax fleayi Tasmanian Wedge-tailed Eagle, Wedge-tailed Eagle (Tasmanian) [64435]	Endangered	Breeding likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Ceyx azureus diemenensis](#) Tasmanian Azure Kingfisher [25977]	Endangered	Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Breeding known to occur within area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pterodroma leucoptera leucoptera](#) Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area
[Tyto novaehollandiae castanops (Tasmanian population)](#) Masked Owl (Tasmanian) [67051]	Vulnerable	Breeding known to occur within area	In feature area
FISH			
[Prototroctes maraena](#) Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
[Litoria raniformis](#) Southern Bell Frog, Growling Grass Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
INSECT			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Antipodia chaostola leucophaea](#)			
Tasmanian Chaostola Skipper, Heath-sand Skipper [77672]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
[Dasyurus maculatus maculatus (Tasmanian population)](#)			
Spotted-tail Quoll, Spot-tailed Quoll, Tiger Quoll (Tasmanian population) [75183]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Dasyurus viverrinus](#)			
Eastern Quoll, Luaner [333]	Endangered	Species or species habitat known to occur within area	In feature area
[Perameles gunnii gunnii](#)			
Eastern Barred Bandicoot (Tasmania) [66651]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Sarcophilus harrisii](#)			
Tasmanian Devil [299]	Endangered	Species or species habitat likely to occur within area	In feature area
PLANT			
[Barbarea australis](#)			
Native Wintercress, Riverbed Wintercress [12540]	Endangered	Species or species habitat likely to occur within area	In buffer area only
[Caladenia anthracina](#)			
Black-tipped Spider-orchid [64855]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Caladenia caudata](#)			
Tailed Spider-orchid [17067]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Colobanthus curtisiae](#)			
Curtis' Colobanth [23961]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Dianella amoena](#)			
Matted Flax-lily [64886]	Endangered	Species or species habitat likely to occur within area	In feature area
[Glycine latrobeana](#)			
Clover Glycine, Purple Clover [13910]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Lepidium hyssopifolium](#) Basalt Pepper-cress, Peppercress, Rubble Pepper-cress, Pepperweed [16542]	Endangered	Species or species habitat known to occur within area	In feature area
[Leucochrysum albicans subsp. tricolor](#) Hoary Sunray, Grassland Paper-daisy [89104]	Endangered	Species or species habitat may occur within area	In feature area
[Pterostylis commutata](#) Midland Greenhood [64535]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pterostylis ziegeleri](#) Grassland Greenhood, Cape Portland Greenhood [64971]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Xerochrysum palustre](#) Swamp Everlasting, Swamp Paper Daisy [76215]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#)			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#)			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Numenius madagascariensis](#)			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Tringa nebularia](#)			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [60239]	TAS	In buffer area only
Commonwealth Land - [60240]	TAS	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
[Actitis hypoleucos](#)			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Apus pacificus](#)			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Bubulcus ibis as Ardea ibis](#)			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Breeding known to occur within area overfly marine area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
[Neophema chrysostoma](#) Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Andersons	Nature Reserve	TAS	In buffer area only
Arndell	Conservation Covenant	TAS	In buffer area only
Glenfern	Conservation Covenant	TAS	In buffer area only
Harry Walker Tier	Conservation Area	TAS	In buffer area only
Huntingdon	Nature Reserve	TAS	In buffer area only
Stony Rise	Conservation Covenant	TAS	In buffer area only
Wootton #1	Conservation Covenant	TAS	In buffer area only
Wootton #2	Conservation Covenant	TAS	In buffer area only
Wootton #3	Conservation Covenant	TAS	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
Tasmania RFA	Tasmania	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Bagdad Bypass Project	2011/5982		Completed	In buffer area only
Controlled action				
Tasmania Natural Gas Project - Stage 3	2001/212	Controlled Action	Post-Approval	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

Department of Climate Change, Energy, the Environment and Water
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Canberra ACT 2601 Australia
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ON-SITE WASTEWATER REPORT

Troy and Cheryllyn Thompson

570 Huntingdon Tier Road - Bagdad

Fysh Design Reference: ***CKD-HYD-330***

Date:26/08/2025

For Approval – Rev 0

TABLE OF CONTENTS

1. INTRODUCTION AND SCOPE OF ENGAGEMENT

Fysh Design has been engaged to provide a design for a new wastewater system for the proposed shed and future 3-bedroom dwelling 570 Huntingdon Tier Road, Bagdad

The proposed dwelling will have **Three bedrooms.**

The following report outlines the methodology and assumptions used for the proposed AWTS secondary treatment system.

2. WASTEWATER DESIGN

Site Conditions

Client: Toy and Cheryllyn Thompson

Address: 570 Huntingdon Tier Road Bagdad

Site Area – Approx 2.21ha

Building Type – Proposed residential dwelling

Drainage lines & Water Courses – Free drainage with overland flow run off directly from the southwest, no groundwater encountered.

Vegetation – Mixed native grass species, native trees, bushland

Rainfall in the previous 7 days – 57mm (Campania Weather Station)

Average slope approx. Moderate slope of 14% (8 Deg) to the Northeast

Domestic water supply – Rainwater Tank Supply

Background Information

Mapped Geology – Mineral Resources Tasmania 1:25,000

Rock Type – Quartz Sandstone and Black shale layers

Soil Depth – 0.5m refusal found. (Rock refusal)

Landslide Zoning Low Hazard

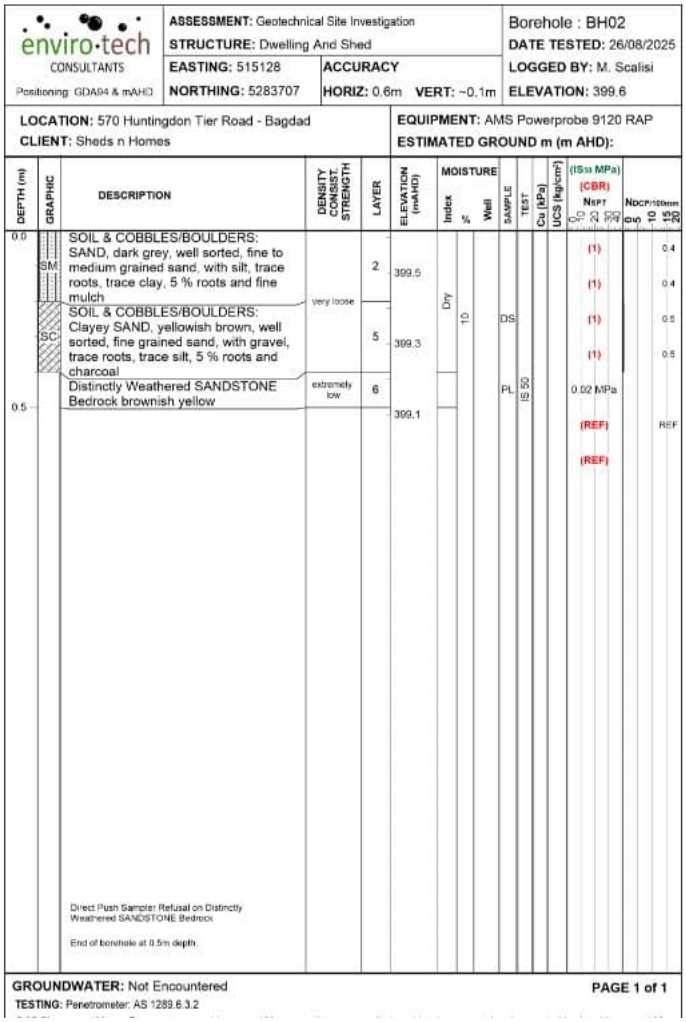
Flood Prone Zoning - None

Local Rainfall Data – Annual rainfall approx. 480mm (Campania Weather Station)

Local Services – Onsite wastewater disposal, Rainwater Tank Supply

A site and soil report and site inspection were conducted by Fysh Design and Enviro-Tech Soil Consultants on the 26th of August (see attached with compiled documents) Figure 1 below displays the soil profile and properties analysed by Enviro-Tech Soil Consultants.

Five auger holes were completed to identify the profile and variation in soil materials on site. Test Hole BH02 was drilled within the approximate location where the proposed wastewater irrigation is to be located, in accordance with AS1547.2012 (refer to figure 04)



enviro·tech CONSULTANTS
Positioning: GDA94 & mAHD

ASSESSMENT: Geotechnical Site Investigation
STRUCTURE: Dwelling And Shed
EASTING: 515128 **ACCURACY**
NORTHING: 5283707 **HORIZ:** 0.6m **VERT:** ~0.1m

Borehole : BH02
DATE TESTED: 26/08/2025
LOGGED BY: M. Scalisi
ELEVATION: 399.6

LOCATION: 570 Huntingdon Tier Road - Bagdad
CLIENT: Sheds n Homes
EQUIPMENT: AMS Powerprobe 9120 RAP
ESTIMATED GROUND m (m AHD):

DEPTH (m)	GRAPHIC	DESCRIPTION	DENSITY CONSIST. STRENGTH	LAYER	ELEVATION (mAHD)	MOISTURE Index	MOISTURE %	MOISTURE Well	SAMPLE	TEST	Cu (kPa)	UCS (kg/cm²)	(IS50 MPa) (CBR) NBPT	NDCP/100mm
0.0	SM	SOIL & COBBLES/BOULDERS: SAND, dark grey, well sorted, fine to medium grained sand, with silt, trace roots, trace clay, 5 % roots and fine mulch	very loose	2	399.5	Dry	10		DS				(1)	0.4
	SC	SOIL & COBBLES/BOULDERS: Clayey SAND, yellowish brown, well sorted, fine grained sand, with gravel, trace roots, trace silt, 5 % roots and charcoal		5	399.3				DS				(1)	0.5
0.5		Distinctly Weathered SANDSTONE Bedrock brownish yellow	extremely low	6	399.1				PL	IS 50			0.02 MPa	
													(REF)	REF
													(REF)	

Direct Push Sampler Refusal on Distinctly Weathered SANDSTONE Bedrock

End of borehole at 0.5m depth

GROUNDWATER: Not Encountered
TESTING: Penetrometer: AS 1289.6.3.2

PAGE 1 of 1

Figure 1, Bore Hole 02 Soil Profile data

BH02

Figure 2 – Bore Hole 02 Soil Samples

Figure 3 – Bore Hole Test Location

Wastewater Loading Certificate for system design (As per Clause 7.4.2(d) of AS1547/2012) (Proposed)

Proposed System Capacity – 6 people @ 120 L/Person/Day **(As per Table 1 of Tasmanian directors' determination for wastewater, for a 3-bedroom dwelling**

Summary of Design Criteria (Proposed) – DIR *4.0/m2/day (Secondary Treatment DIR Rating)*

Q = Design Flow = 720L/Day

Q/ (DIRxLine) separation (1m)

720 / (4.0x1.0) = 180m sqm area / (Minimum rounded required)

This calculation is based on the existing soil most limiting layer as Loams

(Category 3)

Water Supply – Rainwater Tank

Reserve area use - (unused backyard area)

Consequences of changes in loading capacity – A proposed Taylex ABS 1500L Poly or Concrete system (or approved equivalent) the Taylex ABS 1500L Poly or Concrete system Secondary treatment system has an additional peak load capacity of 780L per day with demands only requiring 720L per day, with an overall capacity of 1500L per day. Irrigation area has some redundancy and has been sized conservatively with slope etc.

Consequences of overloading the system – A proposed Taylex ABS 1500L Poly or Concrete system (or approved equivalent) the Taylex ABS 1500L Poly or Concrete system Secondary treatment system has an additional peak load capacity of 780L per day with demands only requiring 720L per day, with an overall capacity of 1500L per day. Irrigation area has some redundancy and has been sized conservatively with slope etc.

Consequences of underloading the system – No odour should occur due to 2 stage solid break down of the proposed system utilizing secondary treatment, so long as the proposed system is maintained by qualified contractor on a quarterly basis.

Consequences poor maintenance or attention – Refer to maintenance section of report.

Other Design considerations

- Use water saving fixtures.
- Remove excess fats and grease from kitchen dishes.
- Ensure no solids are put into the system.
- Food disposal system not to be used.
- Do not dispose of sanitary nappies or napkins to the system.
- Use biodegradable detergents.
- Do not dispose of powerful chemicals, bleaches, or whiteners etc down drain system.
- Spread load of washing machine and dishwasher routines throughout the day

Wastewater Classification and Recommendations

According to AS1547.2012 for on-site wastewater management the natural site soil in the property is classified as Loams (**Category 3).**

Table J1 of AS1547.2012 indicates based on 4 bedroom in the proposed dwelling a conservative population of up to 6 people loading has been adopted. It is proposed all outflow from the proposed building is connected via a DN100 Gravity line to a proposed Taylex ABS 1500L AWTS system (or approved equivalent) then outflows via pumped discharged to adequately sized surface spray irrigation system

An upslope cut off drain table drain is recommended upslope for the irrigation area for peak rainfall events, to prevent water egress into the irrigation area (as per detail)

A DIR of 4.0/mm/day, **Category 3** rating has been applied to this rating due to the presence of Sandy Loams with minor traces of clay, 100mm of sandy loam or topsoil will need to be imported for the surface of the irrigation area to promote absorption and soakage and to ensure **500mm vertical separation from bedrock**. For calculations, please refer to the trench summary reports.

Please see design / construction details at the end of the report for further details on the sub surface area

Wastewater Site Layout

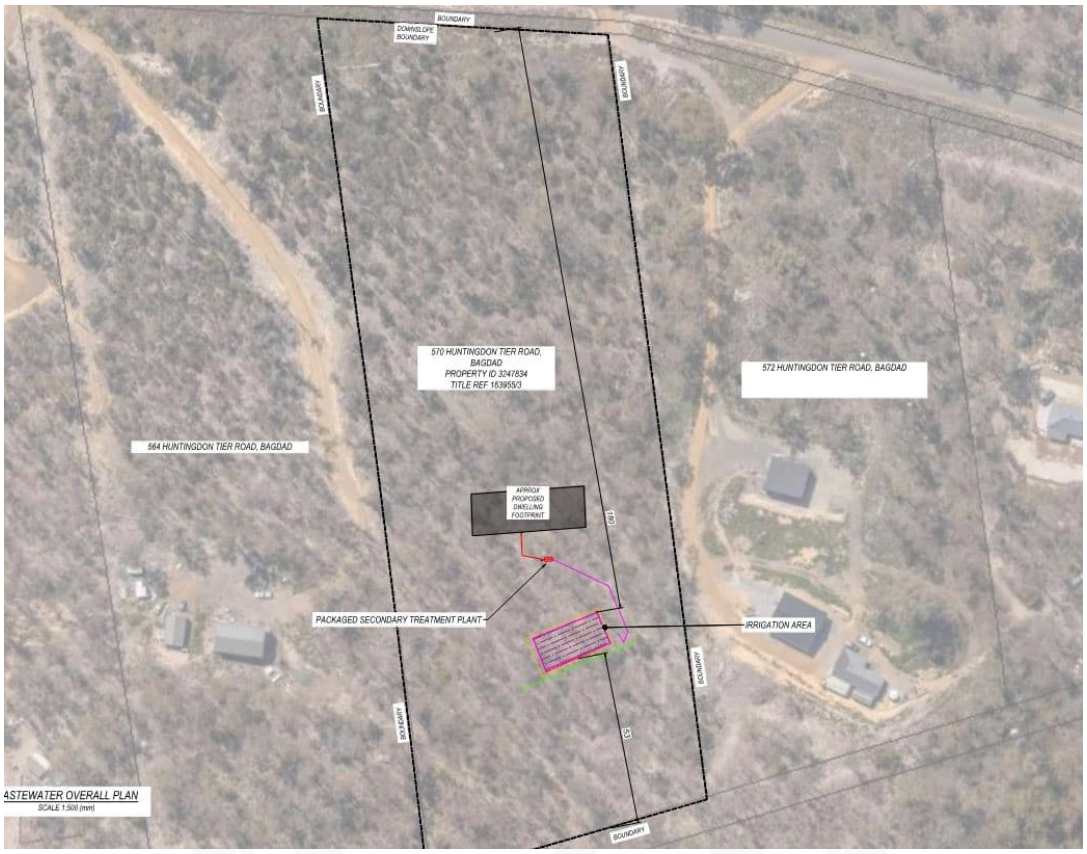


Figure 5: OVERALL SITE LAYOUT

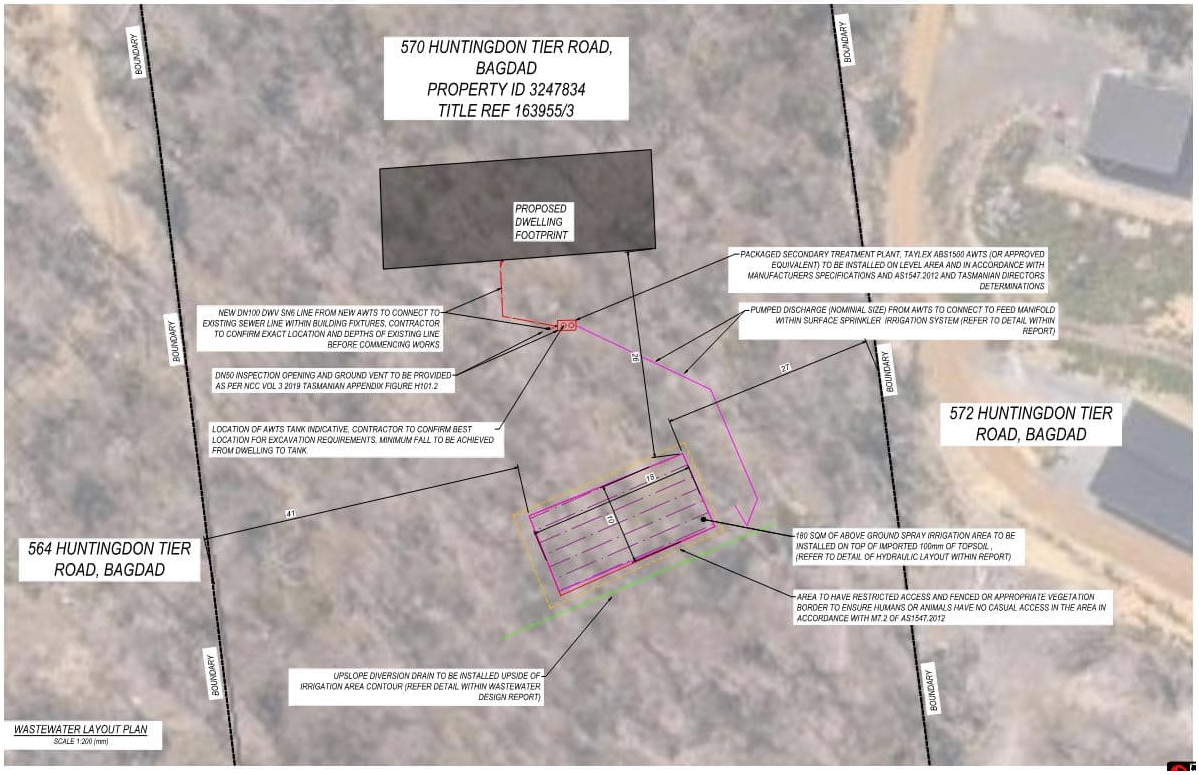


Figure 6: DETAILED WASTEWATER LAYOUT

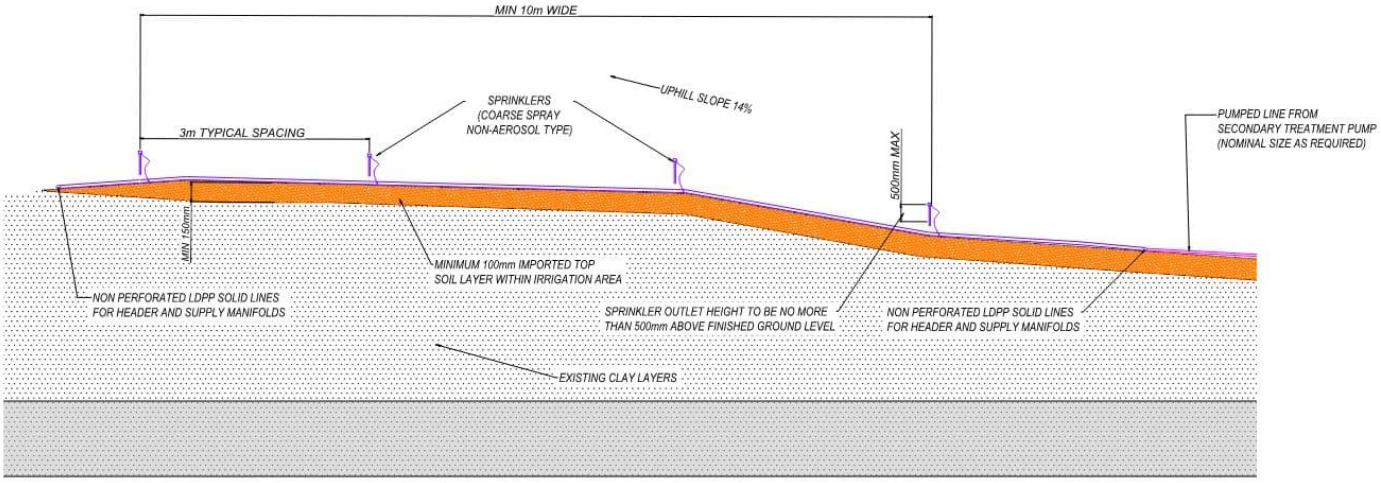


Figure 7: RECOMENDED IRRIGATION CROSS SECTION DETAIL

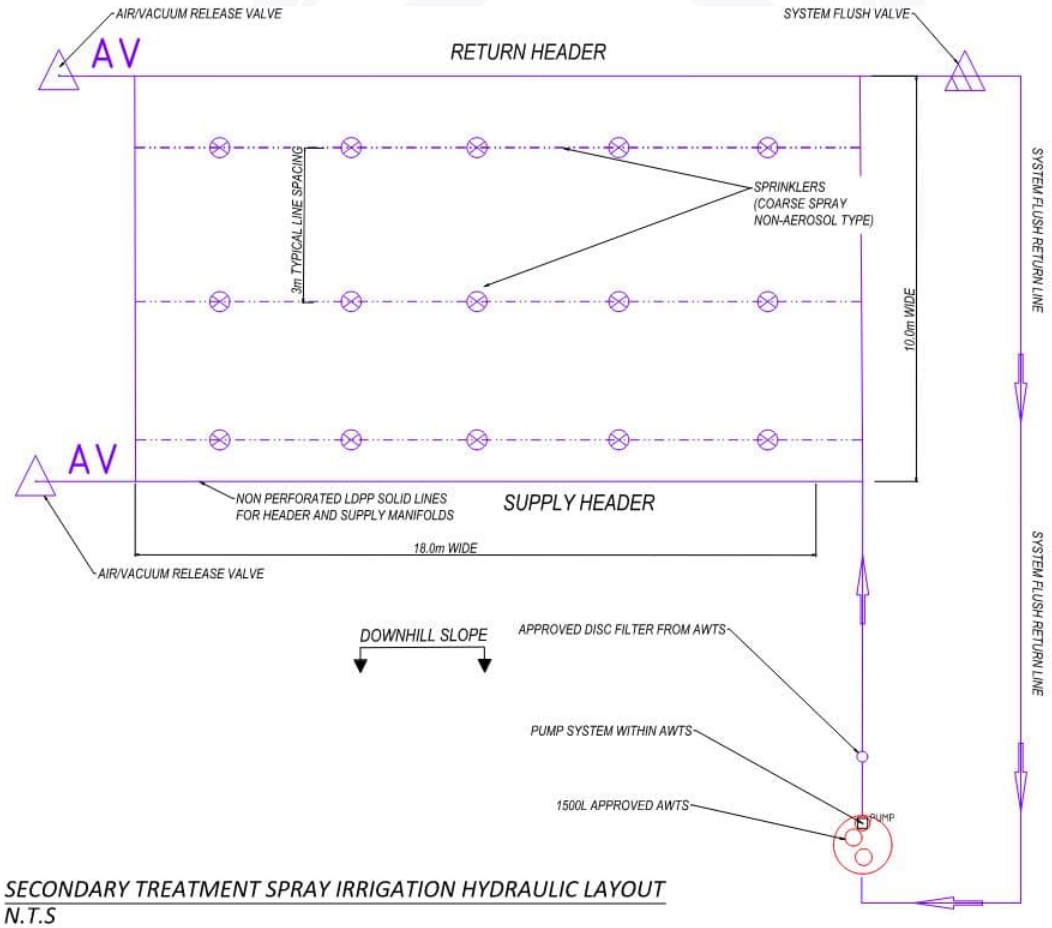


Figure 8: PROPOSED WASTEWATER IRRIGATION LAYOUT

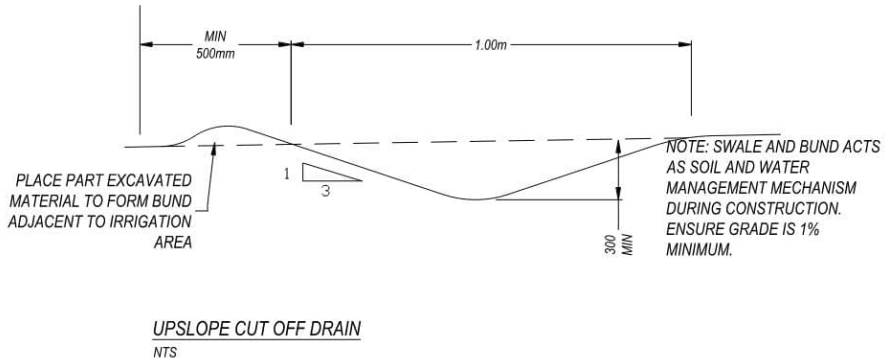


Figure 9: PROPOSED UPSLOPE CUT OFF DRAIN

Figure 10: CLEARED AREA PROPOSED FOR IRRIGATION AREA

- Treatment Sub surface irrigation area dimensions of up to 1 x 18m Long x 10.0m wide x 0.3m deep (180m2 Total)
- Surface Irrigation area to be excavated to a max grade of 10% across the entire footprint where possible, topsoil battered at min 1 in 4 to existing surface where required.
- Base of irrigation area to be excavated level and spearing and compaction MUST be avoided.
- All works onsite to comply with AS3500.2, NCC2022, AS1547.2012 and all council regulations.

- **Spray irrigation area should not be used casually where contact with humans or animals may occur, area should be fenced off, or a vegetation boundary should be formed to prevent accidental traffic by humans or animals may occur in accordance with Table 5.2.2 and M7.2 of AS1547.2012 and General arrangement plan shown on page 7 or appendix A of this report**

Tasmanian directors' determination guideline requirements for on-site wastewater management – building extensions, alterations, or outbuildings.

- A2 acceptable solution has been satisfied due to a new treatment system within the existing site (New Dwelling)

Tasmanian directors' determination guideline requirements for Wastewater (standards for wastewater land application areas)

- A1 acceptable solution has been satisfied as no downstream building present
- A2 acceptable solution has been satisfied with over **250m** distance to a downslope waterway. **Satisfied**
  A3 acceptable solution has been satisfied with **180m** distance to a downslope boundary.
  A4 acceptable solution has been as no water bore detected on site. (Ref Enviro-tech Report)
- A5 acceptable solution has been satisfied as site is free draining and no ponding groundwater on site due to soil properties.
- A6 acceptable solution has been satisfied as due to secondary treatment sub surface irrigation achieving **500mm** distance from bedrock with surface irrigation

3. TRENCH 3 LOADING

Fysh Design

Land suitability and system sizing for on-site wastewater management

Trench 3.0 (Australian Institute of Environmental Health)

Assessment Report
Wastewater Design

Assessment for	Troy and Cheryllyn Thompson 570 Huntingdon Tier Road - Bagdad	Assess. Date Ref. No.	26-Aug-25 CKD-HYD-330
Assessed site(s)	570 Huntingdon Tier Road - Bagdad	Site(s) inspected	26-Aug-25
Local authority	Southern Midlands council	Assessed by	Chris Fysh

This report summarises wastewater volumes, climatic inputs for the site, soil characteristics and sustem sizing and design issues. Site Capability and Environmental sensitivity issues are reported separately, where 'Alert' columns flag factors with high (A) or very high (AA) limitations which probably require special consideration for system design(s). Blank spaces on this page indicate data have not been entered into TRENCH.

Wastewater Characteristics

Wastewater volume (L/day) used for this assessment = 720 (using the 'No. of bedrooms in a dwelling' method)
Septic tank wastewater volume (L/day) = 240
Sullage volume (L/day) = 480
Total nitrogen (kg/year) generated by wastewater = 2.6
Total phosphorus (kg/year) generated by wastewater = 0.8

Climatic assumptions for site (Evapotranspiration calculated using the crop factor method)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Mean rainfall (mm)	36	29	32	32	37	43	36	50	44	47	44	45
Adopted rainfall (R, mm)	36	29	32	32	37	43	36	50	44	47	44	45
Retained rain (Rr, mm)	31	25	27	27	31	37	31	43	37	40	37	38
Max. daily temp. (deg. C)	24	24	22	19	15	13	13	14	16	18	20	22
Evapotrans (ET, mm)	153	135	124	66	32	16	23	36	55	91	99	133
Evapotr. less rain (mm)	**122**	**110**	**97**	**39**	**1**	**-20**	**-7**	**-7**	**18**	**51**	**62**	**95**

Annual evapotranspiration less retained rain (mm) = 560

Soil characterisitics

Texture = Loams Category = 3 Thick. (m) = 0.5
Adopted permeability (m/day) = 1.5 Adopted LTAR (L/sq m/day) = 4 Min depth (m) to water = 15

Proposed disposal and treatment methods

Proportion of wastewater to be retained on site:	All wastewater will be disposed of on the site
The preferred method of on-site primary treatment:	In a package treatment plant
The preferred method of on-site secondary treatment:	Above-ground
The preferred type of in-ground secondary treatment:	None
The preferred type of above-ground secondary treatment:	Surface irrigation
Site modifications or specific designs:	Not needed

Suggested dimensions for on-site secondary treatment system

Total length (m) =	18
Width (m) =	10
Depth (m) =	0.25
Total disposal area (sq m) required =	180
comprising a Primary Area (sq m) of:	180
and a Secondary (backup) Area (sq m) of:	

Sufficient area is available on site

To enter comments, click on the line below 'Comments'. (This yellow-shaded box and the buttons on this page will not be printed.)

Comments
LTAR is based on secondary treatment effluent (4.0DIR) Surface Spray Irrigatoin Rate Based on a 4 bedrooms with a conservative rate of 6 people at 120 L per day on Rainwater Tank supply (Category 3 soil)

Figure 9: WASTEWATER ASSESSMENT REPORT

Fysh Design
Land suitability and system sizing for on-site wastewater management
Trench 3.0 (Australian Institute of Environmental Health)

Site Capability Report
Wastewater Design

Assessment for	Troy and Cheryllyn Thompson	Assess. Date	26-Aug-25
	570 Huntingdon Tier Road - Bagdad	Ref. No.	CKD-HYD-330
Assessed site(s)	570 Huntingdon Tier Road - Bagdad	Site(s) inspected	26-Aug-25
Local authority	Southern Midlands council	Assessed by	Chris Fysh

This report summarises data relating to the physical capability of the assessed site(s) to accept wastewater. Environmental sensitivity and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) site limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
AA	Expected design area	sq m	180		Very high		
	Density of disposal systems	/sq km	1		Very low		
	Slope angle	degrees	8		Low		
	Slope form	Convex spreading			Very low		
	Surface drainage	Mod. good			Low		
	Flood potential	Site floods <1:100 yrs			Very low		
	Heavy rain events	Rare			Low		
	Aspect (Southern hemi.)	Faces NE or NW			Low		
	Frequency of strong winds	Infrequent			Moderate		
	Wastewater volume	L/day	720		Moderate		
	SAR of septic tank effluent		0.8		Very low		
	SAR of sullage		1.9		Low		
	Soil thickness	m	0.5		Moderate		
AA	Depth to bedrock	m	0.5		Very high		
A	Surface rock outcrop	%	5		High		
	Cobbles in soil	%	5		Low		
	Soil pH		4.5		Moderate		
	Soil bulk density	gm/cub. cm	1.2		Very low		
A	Soil dispersion	Emerson No.	3		High		
	Adopted permeability	m/day	1.5		Very low		
	Long Term Accept. Rate	L/day/sq m	4				

Figure 10: SITE CAPABILITY REPORT

Fysh Design
Land suitability and system sizing for on-site wastewater management
Trench 3.0 (Australian Institute of Environmental Health)

Environmental Sensitivity Report
Wastewater Design

Assessment for	Troy and Cheryllyn Thompson	Assess. Date	26-Aug-25
	570 Huntingdon Tier Road - Bagdad	Ref. No.	CKD-HYD-330
Assessed site(s)	570 Huntingdon Tier Road - Bagdad	Site(s) inspected	26-Aug-25
Local authority	Southern Midlands council	Assessed by	Chris Fysh

This report summarises data relating to the environmental sensitivity of the assessed site(s) in relation to applied wastewater. Physical capability and system design issues are reported separately. The 'Alert' column flags factors with high (A) or very high (AA) limitations which probably require special consideration in site acceptability or for system design(s). Blank spaces indicate data have not been entered into TRENCH.

Alert	Factor	Units	Value	Confid level	Limitation Trench	Limitation Amended	Remarks
A	Cation exchange capacity	mmol/100g	30		High		
	Phos. adsorp. capacity	kg/cub m	1		Moderate		
	Annual rainfall excess	mm	-560		Very low		
	Min. depth to water table	m	15		Very low		
	Annual nutrient load	kg	3.4		Very low		
	G'water environ. value	Indust non-sensit			Very low		
	Min. separation dist. required	m	1		Very low		
	Risk to adjacent bores						Factor not assessed
	Surf. water env. value	Indust non-sensit			Very low		
	Dist. to nearest surface water	m	200		Moderate		
	Dist. to nearest other feature	m	40		Moderate		
	Risk of slope instability	Low			Low		
	Distance to landslip	m	100		Moderate		

Figure 11: ENVIROMENTAL SENSITIVITY REPORT

4. MAINTENANCE AND MONITORING

- 4.1 Each installation must be serviced and monitored at not less than 3 monthly intervals in accordance with the conditions of accreditation, the conditions of permit / maintenance specified in a Schedule of Maintenance and manufacturer's requirements.
- Notes:
- (1) Only a licensed plumber and or his or her qualified technician can carry out the maintenance and required monitoring of the system other than electrical work unless licensed to do so.
- (2) The licensed plumber and his or her technician may need to complete training by the supplier before carrying out any maintenance on the system. The licensed plumber and their technician must comply with the applicable Directors Determination with regard to the training, reporting requirements and qualifications required to carry out servicing on the STS.
- (3) The maintenance and monitoring intervals may be combined provided the monitoring frequency remains at 3-month intervals.
- 4.2 The owner of the system must enter into and maintain a maintenance contract with a suitable licenced plumbing contractor.
- 4.3 The owner must notify the council that a maintenance contract is in place for the maintenance of the STS.
- 4.4 The system must be operated and maintained to ensure it performs continuously and without any intervention between inspections carried out by the plumber.
- 4.5 A service report is to be prepared by the plumber who carried out the work detailing the inspection of the installation and the results of all servicing tests and conditions at the completion of all scheduled or unscheduled services or inspections.
- 4.6 The service report is to be accompanied by a signed document certifying that the system is operating and performing adequately.
- 4.7 A copy of the service report and certifying document is to be provided to the occupant and council. Each service report is to contain a statement reminding the user about items and products that must not be placed in the system.
- 4.8 Each service must include monitoring the operation of the system and associated land application system.
- 4.9 Maintenance must be carried out on all mechanical, electrical and functioning components of the system including the associated land application system as appropriate.
- 4.10 The monitoring, servicing and reporting of the installation must include but not be restricted to the following matters, as appropriate:
- 4.10.1 Reporting on weather conditions, ambient temperature, effluent temperature
- 4.10.2 Odour
- 4.10.3 Check and test pump
- 4.10.4 Check and test air blower, fan or air venturi and clean/replace air filters
- 4.10.5 Check and test alarm system
- 4.10.6 Check slime growth on membranes and report the on condition of membranes
- 4.10.7 Check and report operation of sludge return, sludge level and de-sludging
- 4.10.8 Check and record water meter reading (if fitted)
- 4.10.9 Check and record operation of irrigation area, irrigation fittings Department of Justice – Certificate of Accreditation Doc/20/66067 Date of Issue: 14/08/20 Director of Building Control Page 13 of 20 Delegate of Minister for Building and Construction

4.10.10 Check and clean/replace irrigation filters.

4.10.11 Check and report on water quality (testing for pH, Turbidity, EC and dissolved oxygen)
4.10.12 Check, and replenish chlorine disinfection system.

4.10.13 Cleaning of the following items at above the waterline – I. clarifier II. pipework III. valves IV. walls of chambers.

Maintenance requirements for wastewater tanks

Visual inspection is to be performed annually, and pumped out regularly, once scum and sludge occupy two thirds of the tank volume and reduces settling volume below 24 hours retention, at no less than 2.5 - 3-year intervals.

Any visible wet spots or uneven grass colour can show signs of pipe blockage, blocked or damage irrigation lines shall be replaced if required.

5. CONCLUSION

This report has demonstrated that the proposed development at 570 Huntingdon Tier Road Bagdad, complies with the onsite wastewater quality conditions of Southern Midlands Council plumbing and environmental requirements.

Please contact cfysh@fyshdesign.com.au if you require any additional information.

Yours sincerely

Chris Fysh

Director

Fysh Design

Building Services Designer Licence: 479819732

Mob: 0414 149 394

Email: cfysh@fyshdesign.com.au

FYSH DESIGN
CIVIL HYDRAULIC

SMC EXEMPTION
RECEIVED
13/10/2025

WASTEWATER OVERALL PLAN

SCALE 1:500 (mm)

DIAL BEFORE YOU DIG

REV	DESCRIPTION	DATE
0	FOR APPROVAL CF	26/08/2025

FYSH DESIGN
UNIT 4, 160 BUNGANA WAY
CAMBRIDGE TAS
PH: 0414 149 394
ACCREDITATION: BSD LICENCE NO. 479819732

NORTH

PROPOSED WASTEWATER SYSTEM

CLIENT: TROY AND CHERYLLYN THOMPSON
570 HUNTINGDON TIER ROAD, BAGDAD

DRAWING TITLE
WASTEWATER OVERALL LAYOUT PLAN

SCALE 1:100

DESIGNED	DRAWN	SCALE	REVISION
CF	CF	AS NOTED	0
PROJECT	SHEET NO.		
CKD-HYD-330	H01		

SMC EXEMPTION
RECEIVED
13/10/2025

570 HUNTINGDON TIER ROAD,
BAGDAD
PROPERTY ID 3247834
TITLE REF 163955/3

PROPOSED DWELLING FOOTPRINT

PACKAGED SECONDARY TREATMENT PLANT, TAYLEX ABS1500 AWTS (OR APPROVED EQUIVALENT) TO BE INSTALLED ON LEVEL AREA AND IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS AND AS1547.2012 AND TASMANIAN DIRECTORS DETERMINATIONS

NEW DN100 DWV SN6 LINE FROM NEW AWTS TO CONNECT TO EXISTING SEWER LINE WITHIN BUILDING FIXTURES, CONTRACTOR TO CONFIRM EXACT LOCATION AND DEPTHS OF EXISTING LINE BEFORE COMMENCING WORKS

PUMPED DISCHARGE (NOMINIAL SIZE) FROM AWTS TO CONNECT TO FEED MANIFOLD WITHIN SURFACE SPRINKLER IRRIGATION SYSTEM (REFER TO DETAIL WITHIN REPORT)

DN50 INSPECTION OPENING AND GROUND VENT TO BE PROVIDED AS PER NCC VOL 3 2019 TASMANIAN APPENDIX FIGURE H101.2

LOCATION OF AWTS TANK INDICATIVE, CONTRACTOR TO CONFIRM BEST LOCATION FOR EXCAVATION REQUIREMENTS, MINIMUM FALL TO BE ACHIEVED FROM DWELLING TO TANK.

180 SQM OF ABOVE GROUND SPRAY IRRIGATION AREA TO BE INSTALLED ON TOP OF IMPORTED 100mm OF TOPSOIL , (REFER TO DETAIL OF HYDRAULIC LAYOUT WITHIN REPORT)

AREA TO BE CLEARED AND HAVE RESTRICTED ACCESS AND FENCED OR APPROPRIATE VEGETATION BORDER TO ENSURE HUMANS OR ANIMALS HAVE NO CASUAL ACCESS IN THE AREA IN ACCORDANCE WITH M7.2 OF AS1547.2012

UPSLOPE DIVERSION DRAIN TO BE INSTALLED UPSIDE OF IRRIGATION AREA CONTOUR (REFER DETAIL WITHIN WASTEWATER DESIGN REPORT)

564 HUNTINGDON TIER ROAD, BAGDAD

572 HUNTINGDON TIER ROAD, BAGDAD

BOUNDARY

92

27

41

18

10

WASTEWATER LAYOUT PLAN
SCALE 1:200 (mm)

REV	DESCRIPTION		DATE
0	FOR APPROVAL	CF	26/08/2025

FYSH DESIGN
UNIT 4, 160 BUNGANA WAY
CAMBRIDGE TAS
PH: 0414 149 394
ACCREDITATION: BSD LICENCE NO. 479819732

NORTH

PROPOSED WASTEWATER SYSTEM
CLIENT: TROY AND CHERYLLYN THOMPSON
570 HUNTINGDON TIER ROAD, BAGDAD
DRAWING TITLE
WASTEWATER LAYOUT PLAN

SCALE 1:100

DESIGNED	DRAWN	SCALE
CF	CF	AS NOTED
PROJECT	SHEET NO.	REVISION
CKD-HYD-330	H02	0

DIAL BEFORE YOU DIG

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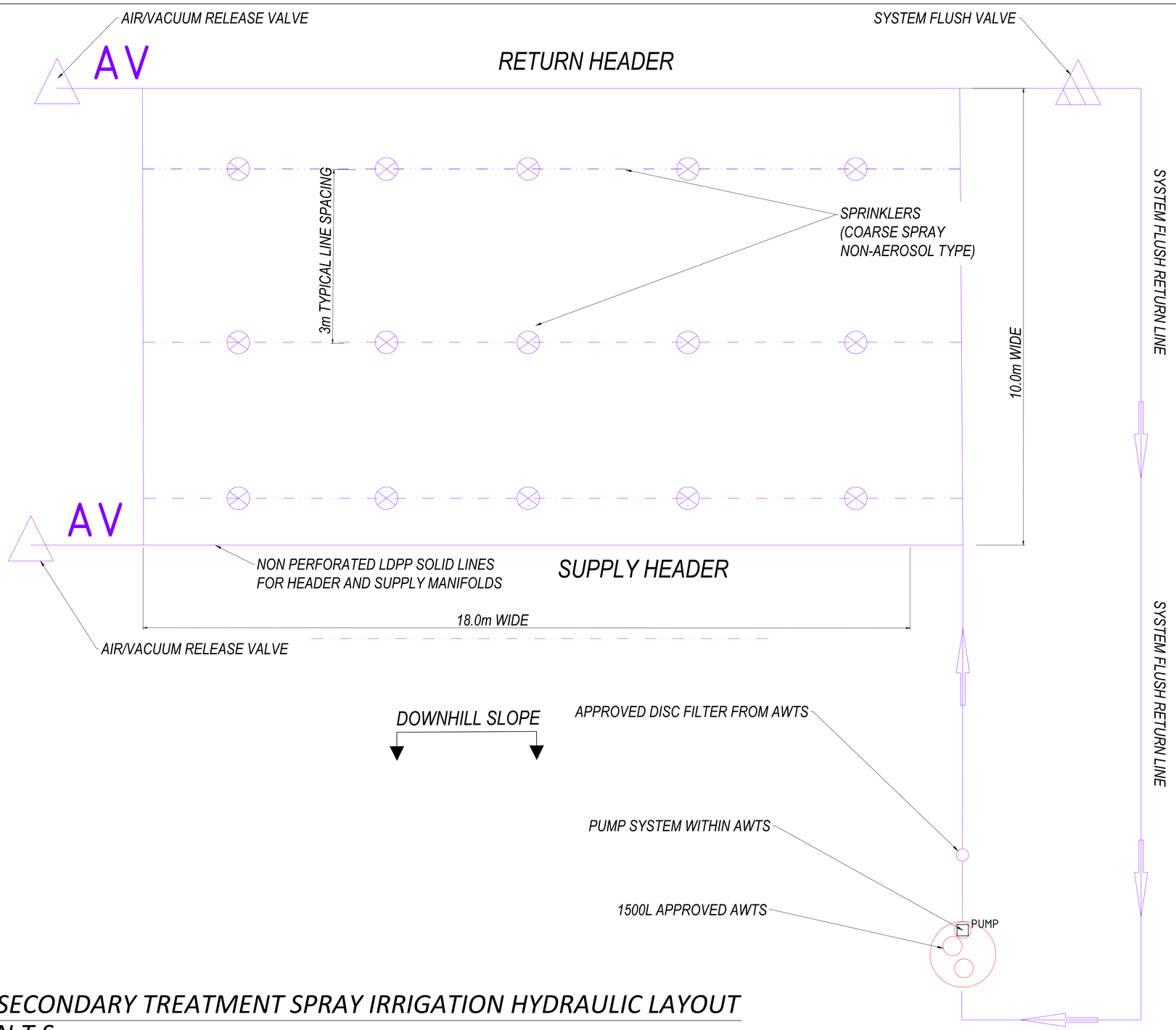
13/10/2025



SECONDARY TREATMENT SPRAY IRRIGATION HYDRAULIC LAYOUT
N.T.S

DIAL BEFORE YOU DIG

REV	DESCRIPTION	DATE
0	FOR APPROVAL CF	26/08/2025

REV	DESCRIPTION	DATE

FYSH DESIGN
UNIT 4, 160 BUNGANA WAY
CAMBRIDGE TAS, 7170
PH: 0414 149 394
ACCREDITATION: BSD LICENCE NO. 479819732

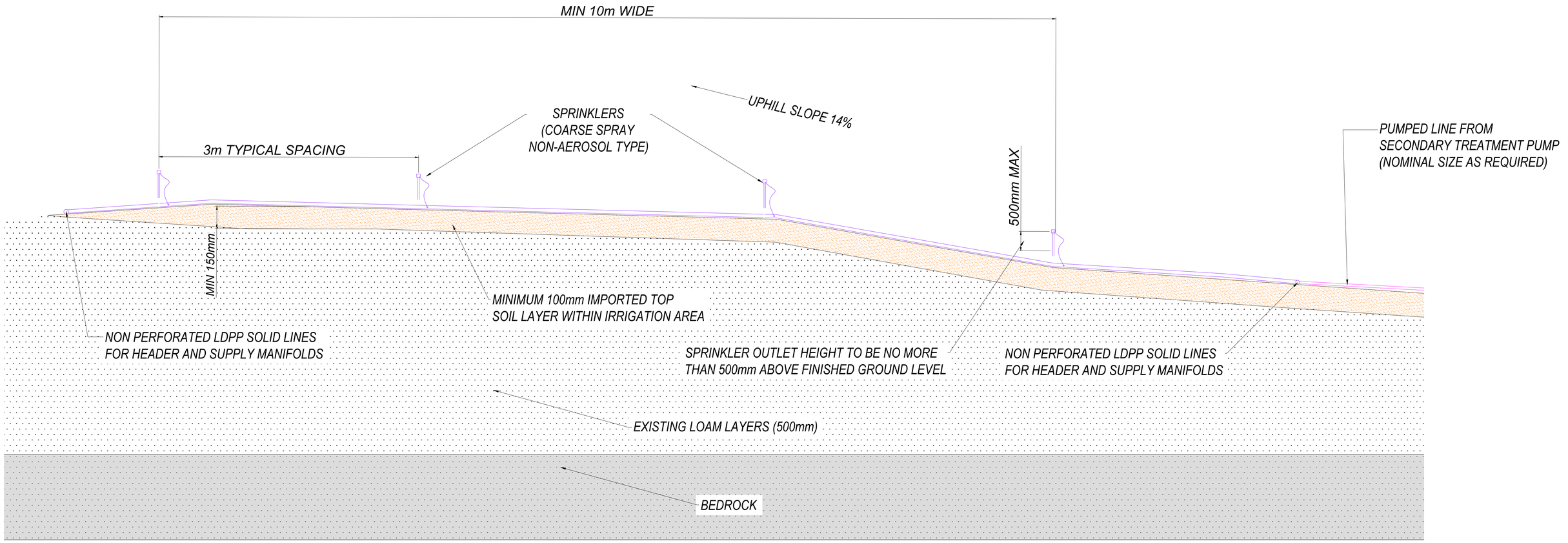
PROPOSED WASTEWATER SYSTEM

CLIENT: TROY AND CHERYLLYN THOMPSON
570 HUNTINGDON TIER ROAD, BAGDAD

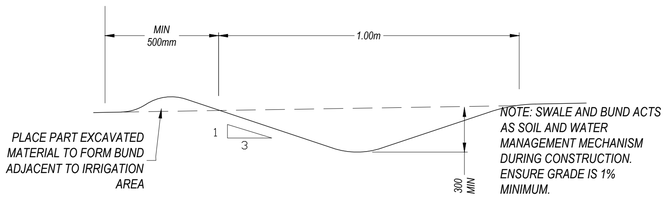
DRAWING TITLE
IRRIGATION LAYOUT DETAIL (SYSTEM 1)

SCALE 1:100

DESIGNED	DRAWN	SCALE
CF	CF	AS NOTED
PROJECT	SHEET NO.	REVISION
CKD-HYD-330	H01	0



SECONDARY TREATMENT SPRAY IRRIGATION CROSS SECTION DETAIL
N.T.S



UPSLOPE CUT OFF DRAIN
NTS

DESIGN NOTES:

1. FINIAL FINISHED SURFACE WITH SANDY LOAM TO BE A MINIMUM OF 100mm ABOVE AGGREGATE WITH TURF COVER OR MULCHED WITH APPROPRIATE VEGETATION (EG NATIVE GRASSES AND SMALL SHRUBS AT 1 PLANT PER 1m2)
2. THE TURF OR VEGETATION IS AN ESSENTIAL COMPONENT OF THE SYSTEM AND MUST BE MAINTAINED WITH REGULAR MOWING AND OR TRIMMING AS NEEDED
3. THE DISTRIBUTION PIPE GRID MUST BE ABSOLUTELY LEVEL TO ALLOW EVEN DISTRIBUTION OF EFFLUENT AROUND THE ABSORPTION AREA - IT IS RECOMMENDED THAT THE LEVEL BE VERIFIED BY RUNNING WATER INTO THE SYSTEM BEFORE BACKFILLING AND COMMISSIONING TRENCH
4. ALL WORKS ON SITE TO COMPLY WITH AS3500, AS1547.2012, NCC VOL 3 2019
5. PUMP TO BE CAPABLE OF DELIVERING THE TOTAL FLOW RATE REQUIRED AT ALL LATERALS WHILST PROVIDING A 1.5m RESIDUAL HEAD (SQUIRT HEIGHT) AT THE HIGHEST ORIFICE (WITH NO MORE THAN 15% VARIATION IN SQUIRT HEIGHT ACROSS THE ENTIRE BED
6. FOR BEDS WITH INDIVIDUAL LATERALS, NO MORE THAN 15m LONG, IT IS ACCEPTABLE TO ADOPT A FLOW RATE 4-5L/MIN/LINEAL METER. TOTAL DYNAMIC HEAD (INCLUDING FRICTION LOSS) WILL NEED TO BE DETERMINED ON A SITE- SPECIFIC BASIS
7. INDIVIDUAL FLUSH POINTS MUST BE INSTALLED FOR EACH LATERAL. THIS MAY BE A SCREW CAP FITTING ON A 90 DEGREE ELBOW LEVEL WITH THE BED SURFACE OR PRESSURE CONTROLLED FLUSH VALE INSIDE AN IRRIGATION BOX

REV	DESCRIPTION	DATE
0	FOR APPROVAL CF	26/08/2025

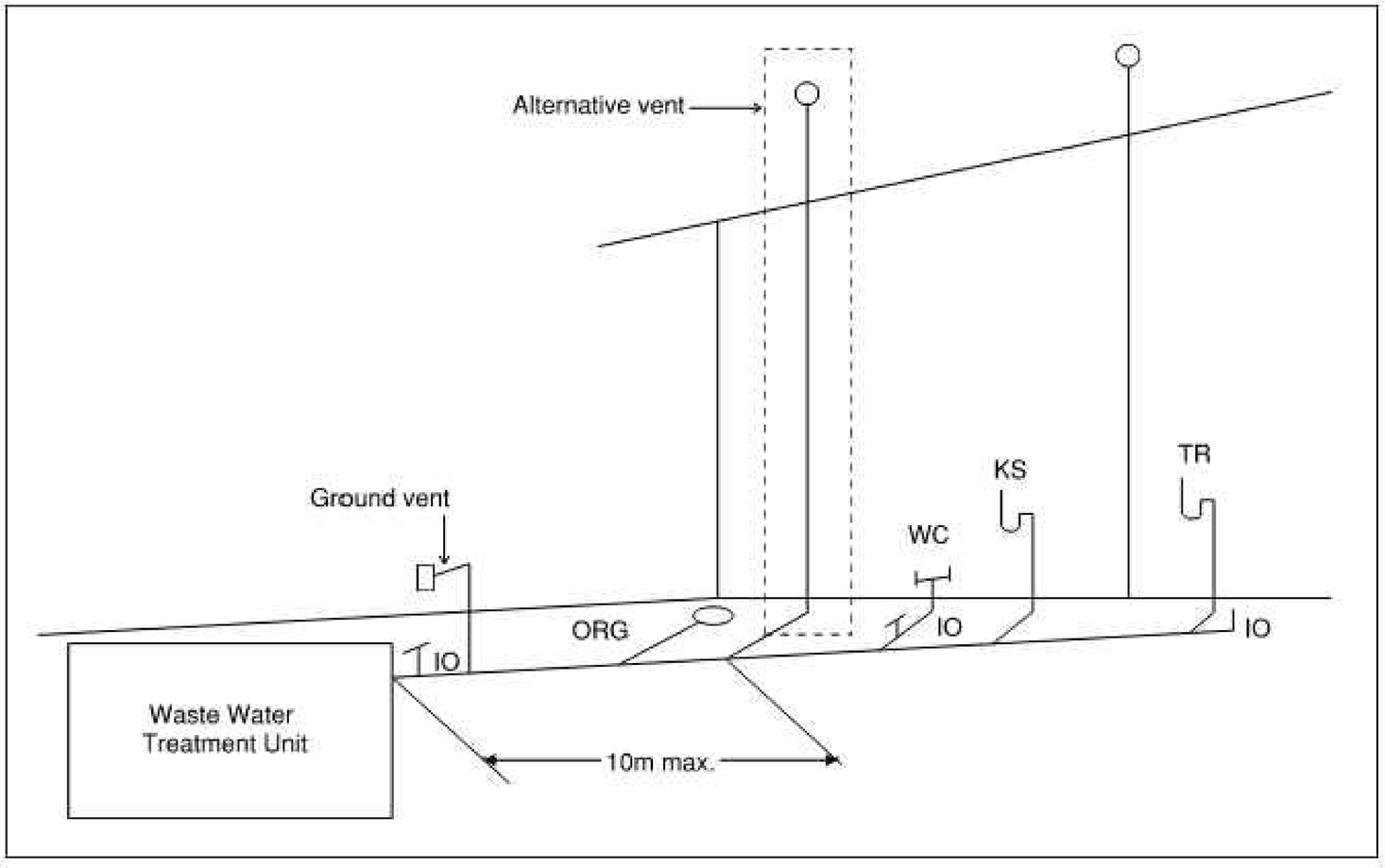
REV	DESCRIPTION	DATE

FYSH DESIGN
UNIT 4, 160 BUNGANA WAY
CAMBRIDGE TAS, 7170
PH: 0414 149 394
ACCREDITATION: BSD LICENCE NO. 479819732

PROPOSED WASTEWATER SYSTEM
CLIENT: TROY AND CHERYLLYN THOMPSON
570 HUNTINGDON TIER ROAD, BAGDAD
DRAWING TITLE
WASTEWATER IRRIGATION CROSS SECTION SYSTEM 1

SCALE 1:100
DESIGNED CF
DRAWN CF
PROJECT CKD-HYD-330
SHEET NO. H02
SCALE AS NOTED
REVISION 0

SMC EXEMPTION
RECEIVED
13/10/2025



TAS FIGURE H101.2 ALTERNATIVE VENTING ARRANGEMENTS

VENTS MUST TERMINATE IN ACCORDANCE WITH AS3500.2

ALTERNATIVE VENTING TO BE USED BY EXTENDING A VENT TO TERMINATE AS IF AN UPSTREAM VENT, WITH THE VENT CONNECTION BETWEEN THE LAST SANITARY FIXTURE OR SANITARY APPLIANCE AND ONSITE WASTEWATER MANAGEMENT SYSTEM. USE OF A GROUND VENT IS NOT RECOMMENDED

INSPECTION OPENINGS MUST BE LOCATED AT THE INLET TO AN ONSITE WASTEWATER MANAGEMENT SYSTEM TREATMENT UNIT AND THE POINT OF CONNECTION TO THE LAND APPLICATION SYSTEM AND MUST TERMINATE AS CLOSE AS PRACTICAL TO THE UNDERSIDE OF AN APPROVED INSPECTION OPENING COVER INSTALLED AT THE FINISHED SURFACE LEVEL

ACCESS OPENINGS PROVIDING ACCESS FOR DESLUDGING OR MAINTENANCE OF ON-SITE WASTEWATER MANAGEMENT SYSTEM TREATMENT UNITS MUST TERMINATE AT OR ABOVE FINISHED SURFACE LEVEL

ALTERNATIVE VENT IS THE PREFERRED ARRANGEMENT WHERE POSSIBLE.

TASMANIAN WASTEWATER VENTING REQUIREMENTS DETAIL

REV	DESCRIPTION	DATE
0	FOR APPROVAL CF	26/08/2025

REV	DESCRIPTION	DATE

FYSH DESIGN
UNIT 4, 160 BUNGANA WAY
CAMBRIDGE TAS, 7170
PH: 0414 149 394
ACCREDITATION: BSD LICENCE NO. 47981973Z

PROPOSED WASTEWATER SYSTEM
CLIENT: TROY AND CHERYLLYN THOMPSON
570 HUNTINGDON TIER ROAD, BAGDAD
DRAWING TITLE
WASTEWATER VENTING DETAIL

SCALE 1:100
DESIGNED CF
DRAWN CF
PROJECT CKD-HYD-330
SHEET NO. H03
SCALE AS NOTED
REVISION 0

CERTIFICATE OF THE RESPONSIBLE DESIGNER

Section 94
Section 106
Section 129
Section 155

Form **35**

To: Troy and Cheryllyn Thompson *Owner name*
570 Huntingdon Tier Road *Address*
Bagdad *Suburb/postcode*

Designer details:

Name: Christopher Fysh
Category: Building Services Designer – Civil / Hydraulic
Business name: Fysh Design
Phone No: 0414149394
Business address: Unit 4, 160 Bungana Way
Cambridge Tas
Fax No:
Licence No: 479819732
Email address: cfysh@fyshdesign.com.au

Details of the proposed work:

Owner/Applicant Troy and Cheryllyn Thompson *Owner name* CKD-HYD-330
Address: 570 Huntingdon Tier Road
Bagdad

Type of work: Building work ☐ Plumbing work ☒ *(X all applicable)*

Description of work:

Wastewater Design

(new building / alteration / addition / repair / removal / re-erection water / sewerage / stormwater / on-site wastewater management system / backflow prevention / other)

Description of the Design Work (Scope, limitations or exclusions): *(X all applicable certificates)*

Certificate Type:	Certificate	Responsible Practitioner
	☐ Building design	Architect or Building Designer
	☐ Structural design	Engineer or Civil Designer
	☐ Fire Safety design	Fire Engineer
	☐ Civil design	Civil Engineer or Civil Designer
	☑ Hydraulic design	Building Services Designer
	☐ Fire service design	Building Services Designer
	☐ Electrical design	Building Services Designer
	☐ Mechanical design	Building Service Designer
	☐ Plumbing design	Plumber-Certifier; Architect, Building Designer or Engineer
	☐ Other (specify)	

Deemed-to-Satisfy: ☑ Performance Solution: ☐ *(X the appropriate box)*

Other details:

Design documents provided:

The following documents are provided with this Certificate –

Document description:		
Drawing-numbers: Wastewater Design Report Rev 0	Prepared by: Fysh Design	Date:26/08/2025
Schedules:	Prepared by:	Date:
Specifications:	Prepared by:	Date:
Computations:	Prepared by:	Date:
Performance solution proposals:	Prepared by:	Date:
Test reports:	Prepared by:	Date:

Standards, codes or guidelines relied on in design process:

AS1547.2012, AS3500.2, NCC 2022, Council EHO regulations and requirements

Any other relevant documentation:

Insurance details:
CGU Civil / Hydraulic Liability Professional Indemnity CGU PI 05-21 $5,000,000
CGU General and Product Public Liability $20,000,000

Attribution as designer:

I Christopher Fysh ..... am responsible for the design of that part of the work as described in this certificate;

The documentation relating to the design includes sufficient information for the assessment of the work in accordance with the *Building Act 2016* and sufficient detail for the builder or plumber to carry out the work in accordance with the documents and the Act;

This certificate confirms compliance and is evidence of suitability of this design with the requirements of the National Construction Code.

	Name: (print)	*Signed*	*Date*
Designer:	Christopher Fysh		26/08/2025
Licence No:	479819732		

Assessment of Certifiable Works: (TasWater)

Note: single residential dwellings and outbuildings on a lot with an existing sewer connection are not considered to increase demand and are not certifiable.

If you cannot check ALL of these boxes, LEAVE THIS SECTION BLANK.

TasWater must then be contacted to determine if the proposed works are Certifiable Works.

I confirm that the proposed works are not Certifiable Works, in accordance with the Guidelines for TasWater CCW Assessments, by virtue that all of the following are satisfied:

- [x] The works will not increase the demand for water supplied by TasWater
- [x] The works will not increase or decrease the amount of sewage or toxins that is to be removed by, or discharged into, TasWater's sewerage infrastructure
- [x] The works will not require a new connection, or a modification to an existing connection, to be made to TasWater's infrastructure
- [x] The works will not damage or interfere with TasWater's works
- [x] The works will not adversely affect TasWater's operations
- [x] The work are not within 2m of TasWater's infrastructure and are outside any TasWater easement
- [x] I have checked the LISTMap to confirm the location of TasWater infrastructure
- [x] If the property is connected to TasWater's water system, a water meter is in place, or has been applied for to TasWater.

Certification:

I ..Christopher Fysh..... being responsible for the proposed work, am satisfied that the works described above are not Certifiable Works, as defined within the *Water and Sewerage Industry Act 2008,* that I have answered the above questions with all due diligence and have read and understood the Guidelines for TasWater CCW Assessments.

Note: the Guidelines for TasWater Certification of Certifiable Works Assessments are available at: www.taswater.com.au

	Name: (print)	*Signed*	*Date*
Designer:	Christopher Fysh		26/08/2025

RESULT OF SEARCH

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

SEARCH OF TORRENS TITLE

VOLUME	FOLIO
163955	3
EDITION	DATE OF ISSUE
2	27-Mar-2015

SEARCH DATE : 30-Jul-2025
SEARCH TIME : 11.31 AM

DESCRIPTION OF LAND

Parish of STRANGFORD Land District of MONMOUTH
Lot 3 on Sealed Plan 163955
Derivation : Part of Lot 37092, 106A-3R-29P Gtd. to Robert William Kenner.
Prior CT 162782/102

SCHEDULE 1

C906695, D3452 & D136987 TRANSFER to ELIZABETH MARY BASTICK Registered 27-Mar-2015 at noon

SCHEDULE 2

Reservations and conditions in the Crown Grant if any
SP163955 FENCING PROVISION in Schedule of Easements
SP163955 WATER SUPPLY RESTRICTION
SP163955 SEWERAGE AND/OR DRAINAGE RESTRICTION
SP162782 FENCING PROVISION in Schedule of Easements
SP157454 & SP162782 WATER SUPPLY RESTRICTION
SP157454 & SP162782 SEWERAGE AND/OR DRAINAGE RESTRICTION
SP157454 FENCING COVENANT in Schedule of Easements
D87378 AGREEMENT pursuant to Section 71 of the Land Use Planning and Approvals Act 1993 Registered 15-Jul-2013 at noon

UNREGISTERED DEALINGS AND NOTATIONS

N272973 PRIORITY NOTICE reserving priority for 90 days TRANSFER ELIZABETH MARY BASTICK to CHERYLLYN HEATHER THOMPSON and TROY ANTHONY THOMPSON Lodged by JM LEGAL & CONVEYANC on 27-Jun-2025 BP: N272973

FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

OWNER CHERYL ANN SHADBOLT, PAULA ROBERTA STEENHOLDT & ELIZABETH MARY BASTICK

FOLIO REFERENCE FR 162782/102

GRANTEE PART OF LOT 30266, 49A-3R-0Ps GTD TO WILLIAM JOSEPH BEDFORD & PART OF LOT 37092, 106A-3R-29Ps GTD TO ROBERT WILLIAM KENNER

PLAN OF SURVEY

BY SURVEYOR DAVID BRUCE MILLER
BROOKS LARK & CARRICK SURVEYORS
UNIT 1B 120 CAMBRIDGE ROAD ROSNY PARK
PH 6244-6256 FAX 6244-6221 MOB. 0418-120-796

LOCATION
LAND DISTRICT OF MONMOUTH
PARISHES OF HUNTNGDON & STRANGFORD

SCALE 1: 6000 LENGTHS IN METRES

REGISTERED NUMBER
SP163955

~~APPROVED~~
EFFECTIVE FROM 15 JUL 2013
Alice Kaw
Recorder of Titles

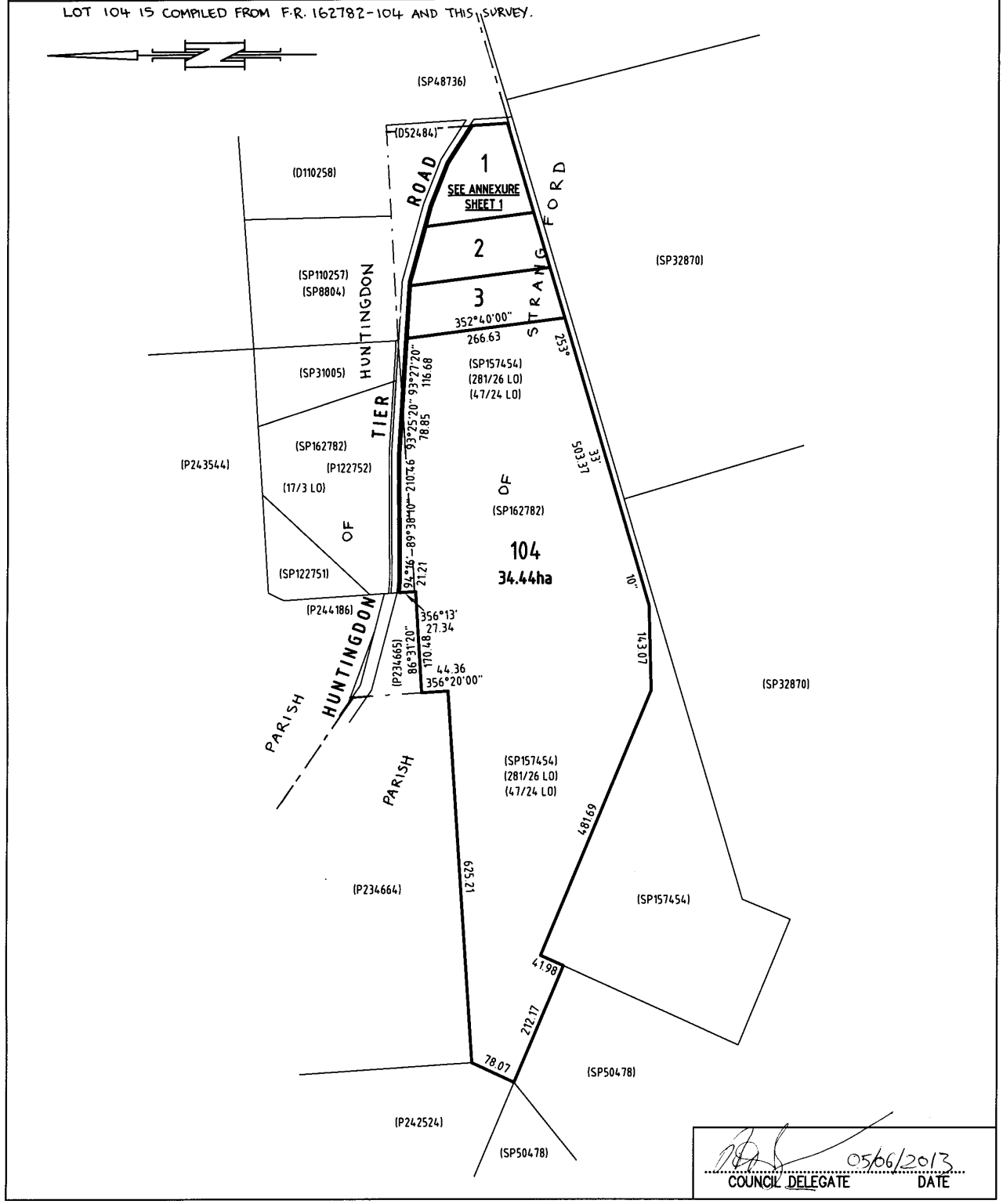
MAPSHEET MUNICIPAL CODE No. 125 (5028)

LAST UPI No. 1902997

LAST PLAN No. SP162782

ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN

LOT 104 IS COMPILED FROM F.R. 162782-104 AND THIS SURVEY.



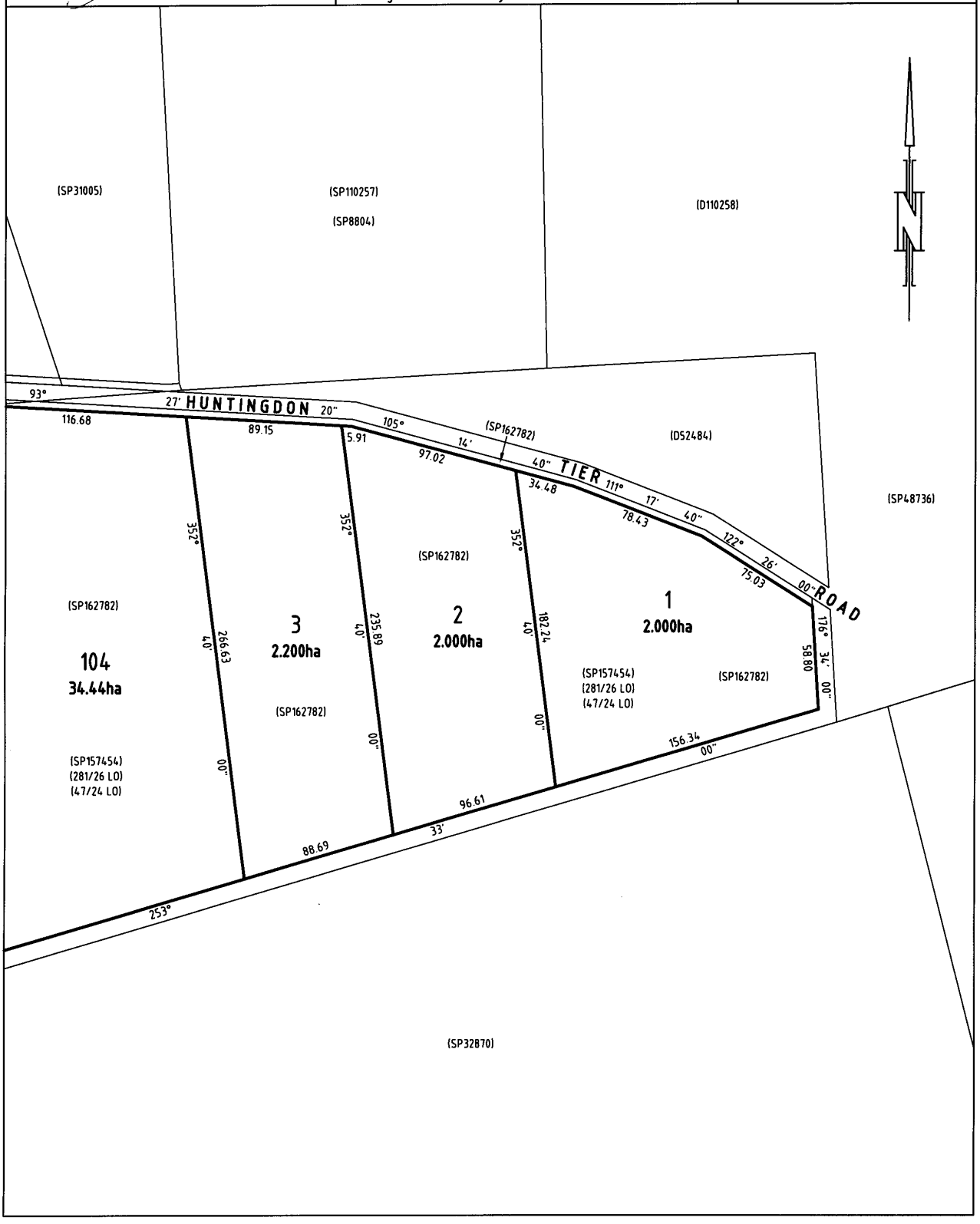
FOLIO PLAN

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

PLAN OF SURVEY ANNEXURE SHEET SHEET 1 OF 1 SHEETS	OWNER SEE PLAN OF SURVEY FOLIO REFERENCE FR 162782/102 SCALE 1: 2000 LENGTHS IN METRES	Registered Number SP163955
SIGNED FOR IDENTIFICATION PURPOSES Council Delegate 05/06/13 Date	THIS ANNEXURE SHEET FORMS PART OF THE ATTACHED INDEX PLAN THE SURVEYORS CERTIFICATE EXTENDS TO THE DETAILS ON THIS SHEET Registered Land Surveyor 20/3/2012 Date	~~APPROVED~~ EFFECTIVE FROM 15 JUL 2013 Recorder of Titles



SCHEDULE OF EASEMENTS	Registered Number
NOTE: THE SCHEDULE MUST BE SIGNED BY THE OWNERS & MORTGAGEES OF THE LAND AFFECTED. SIGNATURES MUST BE ATTESTED.	SP163955

EASEMENTS AND PROFITS

Each lot on the plan is together with:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as may be necessary to drain the stormwater and other surplus water from such lot; and
(2) any easements or profits a prendre described hereunder.
Each lot on the plan is subject to:-
(1) such rights of drainage over the drainage easements shown on the plan (if any) as passing through such lot as may be necessary to drain the stormwater and other surplus water from any other lot on the plan; and
(2) any easements or profits a prendre described hereunder.
The direction of the flow of water through the drainage easements shown on the plan is indicated by arrows.

FENCING PROVISION

In respect of each lot shown on the plan, the Vendors Elizabeth Mary Bastick, Cheryl Ann Shadbolt and Paula Roberta Steenholdt, ~~and Anthony Robert Kenner~~ shall not be required to fence.

Signed by **Elizabeth Mary Bastick**)
one of the registered proprietors of the land)
comprised in folio of the register)
Volume 162782 Folio 102 in the presence of:)

Witness Signature..... C.W. STEENHOLDT (CHRISTOPHER WILFRED STEENHOLDT)
Witness Name.....
Witness Address..... 270 Cygnet Coast Rd 7109
Witness Occupation..... Manager

Signed by the Registered Proprietors

Cheryl Ann Shadbolt Paula Roberta Sheenholdt Elizabeth Mary Bastick

(USE ANNEXURE PAGES FOR CONTINUATION)

SUBDIVIDER: Elizabeth Mary Bastick, Cheryl Ann Shadbolt and Paula Roberta Steenholdt FOLIO REF: 162782/102 SOLICITOR & REFERENCE: Worrall Lawyers SES:020812	PLAN SEALED BY: Southern Midlands Council DATE: 05/06/2013 3164967 REF NO. Council Delegate
NOTE: The Council Delegate must sign the Certificate for the purposes of identification.	

SCHEDULE OF EASEMENTS

RECORDER OF TITLES

Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

ANNEXURE TO SCHEDULE OF EASEMENTS PAGE 2 OF 2 PAGES	Registered Number SP 163955
SUBDIVIDER: Elizabeth Mary Bastick, Cheryl Ann Shadbolt and Paula Roberta Steenholdt FOLIO REFERENCE: 162782/102	

Signed by **Cheryl Ann Shadbolt**)
one of the registered proprietors of the land)
comprised in folio of the register)
Volume 162782 Folio 102 in the presence of:)

× C A Shadbolt

Witness Signature. × .....
Witness Name. × JOHN BASTICK
Witness Address. × 45A CORINTH ST, HOWRAH TAS 7018
Witness Occupation × FINANCIAL PLANNER.

Signed by **Paula Roberta Steenholdt**)
one of the registered proprietors of the land)
comprised in folio of the register)
Volume 162782 Folio 102 in the presence of:)

× P Steenholdt

Witness Signature. × .....
Witness Name. × CHRISTOPHER WILFRED STEENHOLDT (CHRISTOPHER WILFRED STEENHOLDT)
Witness Address. × 270 Cygnet Coast Rd, 7109
Witness Occupation × Manager

Signed by the Registered Proprietors

× C A Shadbolt
Cheryl Ann Shadbolt

× P Steenholdt
Paula Roberta Sheenholdt

× E Bastick
Elizabeth Mary Bastick

NOTE: Every annexed page must be signed by the parties to the dealing or where the party is a corporate body be signed by the persons who have attested the affixing of the seal of that body to the dealing.