Gunnedah Shire Council

18 September 2025

Notification of Development Application No. 2025/093

Site Description: Lot: 28 DP: 755474, Lot: 27 DP: 755474
Bushs Lane GUNNEDAH, 210 Bushs Lane GUNNEDAH.

Notice is given that a Development Application has been submitted for Council's consideration that involves a Torrens Title Subdivision of two (2) lots into sixty-one (61) residential lots, including construction of new road reserve.

The address of the proposed development is Bushs Lane GUNNEDAH, 210 Bushs Lane GUNNEDAH.

The applicant is Kerry Elizabeth Pty Ltd and Gunnedah Shire Council is the consent authority.

The Development Application is considered 'Integrated Development', as an approval is required from the Rural Fire Service under Section 100B of the *Rural Fires Act 1993* and Department of Planning, Housing and Infrastructure – Water under Section 91E of the *Water Management Act 2000*.

The Development Application has been placed on public exhibition for a period of **32** days. The documents may be inspected at Council's office during office hours 9am-4pm or on Council's website http://www.gunnedah.nsw.gov.au/.

Any person may make a written submission about this application to the General Manager, Gunnedah Shire Council, PO Box 63, Gunnedah NSW 2380 or via email council@gunnedah.nsw.gov.au. The issues you raise will be included in the evaluation of the development application, along with the other matters Council must consider.

Submissions should be received no later than 5.00pm on **20 October 2025.** All submissions **must** include disclosure of any reportable political contribution or gift made in the previous two years.

If the submission includes an objection to the proposal, the grounds of objection must be given. You are advised that you may request that your name and address not be disclosed by stating prominently "OBJECTION IN CONFIDENCE" on your submission for reason that disclosure would result in detriment to you. However, Council may be obliged to release these details under the Freedom of Information Act 1989 even if these words are used in the submission. Further, submissions that do not contain the author's name and address may not be considered as Council will be unable to validate the submissions authenticity.

If you have any enquiries in relation to this Development Application, please contact Council's Duty Planner on 02 6740 2100.

Yours faithfully

Wade Hudson
MANAGER DEVELOPMENT ASSESSMENT

Contact: 02 6740 2100
Reference: 2025/093

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PO Box 63 (63 Elgin Street) Gunnedah NSW 2380
T +61 2 6740 2100 E council@gunnedah.nsw.gov.au
www.gunnedah.nsw.gov.au

Development Consent Cover Sheet – Council's Use

Made under the Environmental Planning & Assessment Act.1979

LAST UPDATED 23 JULY 2021

Date: 01/09/2025

DEVELOPMENT APPLICATION NUMBER

Development Application Number: 2025/093

APPLICANT DETAILS

Name(s): J Ewing C/- Stewart Surveys Pty Ltd

[redacted]

LAND TO BE DEVELOPED

Address: 210 Bushs Lane, Gunnedah

Lot Number: 27 & 28 DP Number: 755474 Site Area: 90.65 Ha

BRIEF DESCRIPTION AND USE OF PROPOSED DEVELOPMENT

Torrens Title Subdivision of 2 lots into 61 Lots + road.

PROPOSED DEVELOPMENT DETAILS

☐ Local Development

☒ Integrated Development (requires approval under another Act)

☐ Designated Development (requires an EIS to be submitted)

Total Project Value: $5,176,000.00

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PO Box 63 (63 Elgin Street) Gunnedah NSW 2380
T +61 2 6740 2100 E council@infogunnedah.com.au
www.gunnedah.nsw.gov.au

Pre-Lodgement Application Form

Portal Application number: PAN-565211

Applicant contact details

First given name	Jarad
Other given name/s	
Family name	Ewing
Contact number	[redacted]
Email	[redacted]
Address	[redacted]
Application on behalf of a company, business or body corporate	Yes
ABN	28143618124
ACN	143618124
Name	KERRY ELIZABETH PTY LTD
Trading name	KERRY ELIZABETH PTY LTD
Is the nominated company the applicant for this application	Yes

Owner/s of the development site

Owner/s of the development site	A company, business, government entity or other similar body owns the development site
Owner #	1
Company, business or body corporate name	Kerry Elizabeth Pty Ltd
ABN / ACN	

I declare that I have shown this document, including all attached drawings, to the owner(s) of the land, and that I have obtained their consent to submit this application. - Yes

Note: It is an offence under Section 10.6 of the Environmental Planning and Assessment Act 1979 to provide false or misleading information in relation to this application.

Site access details

Are there any security or site conditions which may impact the person undertaking the inspection? For example, locked gates, animals etc.	No

Developer details

ABN	
ACN	
Name	
Trading name	
Address	
Email Address	

Development details

Application type	Development Application
Site address #	1
Street address	210 BUSHS LANE GUNNEDAH 2380
Local government area	GUNNEDAH

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Lot / Section Number / Plan	28/-/DP755474 ☑ 27/-/DP755474 ☑
Primary address?	Yes
Planning controls affecting property	Land Application LEP Gunnedah Local Environmental Plan 2012 Land Zoning R5: Large Lot Residential Height of Building NA Floor Space Ratio (n:1) NA Minimum Lot Size 9000 m² Heritage NA Land Reservation Acquisition NA Foreshore Building Line NA

Proposed development

Selected common application types	Subdivision
Description of development	Subdivide lots 27 & 28 in DP755474 into Sixty one large lot residential holdings. Construction of a new looped road intersecting in two locations with Robert Gordon Road. Construction of a storm water drain and detention structure and provision of services to each lot.
Dwelling count details	
Number of dwellings / units proposed	
Number of storeys proposed	
Number of pre-existing dwellings on site	
Number of dwellings to be demolished	
Existing gross floor area (m2)	0
Proposed gross floor area (m2)	0
Total site area (m2)	0
What is the estimated development cost, including GST?	$5,176,000.00
Estimated development cost	$5,176,000.00
Do you have one or more BASIX certificates?	
Subdivision	
Number of existing lots	2
Type of subdivision proposed	Torrens Title
Number of proposed lots	61
Proposed operating details	
Number of staff/employees on the site	

Number of parking spaces

Number of loading bays	
Is a new road proposed?	Yes
Description of the proposed roadworks	New looped around, as part of the four stage development, as outlined in the SoEE.
Concept development	
Is the development to be staged?	Yes, this application is for staged development which may include concept and/or multiple stages.

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Is it a concept only application?	No
Description of the proposed staging of the development	Please see page 8 of the SoEE which out lines the four stages of the development in detail.
Crown development	
Is this a proposed Crown development?	No

Related planning information

Is the application for integrated development?	No
Is your proposal categorised as designated development?	No
Is your proposal likely to significantly impact on threatened species, populations, ecological communities or their habitats, or is it located on land identified as critical habitat?	No
Is this application for biodiversity compliant development?	No
Does the application propose a variation to a development standard in an environmental planning instrument (eg LEP or SEPP)?	No
Is the application accompanied by a Planning Agreement ?	No
Section 68 of the Local Government Act	
Is approval under s68 of the Local Government Act 1993 required?	Yes
Have you already applied for approval under s68 of the Local Government Act?	No
Would you like to apply for approval under s68 of the Local Government Act?	No
10.7 Certificate	
Have you already obtained a 10.7 certificate?	
Tree works	
Is tree removal and/or pruning work proposed?	Yes
Please provide a description of the proposed tree removal and/or pruning work	Please see full BDAR report in appendix F for full values.
Number of trees to be impacted by the proposed work	
Land area to be impacted by the proposed work	13.2
Units	Hectares
Approximate area of canopy REQUESTED to be removed	13.2
Units	Hectares
Local heritage	
Does the development site include an item of environmental heritage or sit within a heritage conservation area.	No
Are works proposed to any heritage listed buildings?	No
Is heritage tree removal proposed?	No
Affiliations and Pecuniary interests	
Is the applicant or owner a staff member or councillor of the council assessing the application?	No

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Does the applicant or owner have a relationship with any staff or councillor of the council assessing the application?	No
Political Donations	
Are you aware of any person who has financial interest in the application who has made a political donation or gift in the last two years?	No
Please provide details of each donation/gift which has been made within the last 2 years	

Sustainable Buildings

Is the development exempt from the *State Environmental Policy (Sustainable Buildings) 2022* Chapter 3, relating to non-residential buildings?	Yes
Provide reason for exemption. Is the development any of the following:	Development that is wholly residential

Payer details

Provide the details of the person / entity that will make the fee payment for the assessment.

The *Environmental Planning and Assessment Regulation 2021* and Council's adopted fees and charges establish how to calculate the fee payable for your development application. For development that involves building or other works, the fee for your application is based on the estimated cost of the development.

If your application is for integrated development or requires concurrence from a state agency, additional fees will be required. Other charges may be payable based on the Council's adopted fees and charges. If your development needs to be advertised, the Council may charge additional advertising fees.

Once this application form is completed, it and the supporting documents will be submitted to the Council for lodgement, at which time the fees will be calculated. The Council will contact you to obtain payment. Note: When submitting documents via the NSW Planning Portal, credit card information should not be displayed on documents attached to your development application. The relevant consent authority will contact you to seek payment.

The application may be cancelled if the fees are not paid:

First name	Jarad
Other given name(s)	
Family name	Ewing
Contact number	[redacted]
Email address	[redacted]
Billing address	[redacted]

Application documents

The following documents support the application.

Document type	Document file name
Cost estimate report	5448_ESTIMATED COST OF WORKS
Other	Appendix G - SSS Report Appendix H - LUCRA Report Appendix B - Contamination Investigation Appendix F - BDAR Report Appendix C - Heritage Assessment Appendix D - Traffic Impact Assessment Appendix A- Plans Appendix K- Koala SEPP Appendix J - Soil Landscape Appendix L - Deposited Plans Appendix E - BOSET Search Appendix I - Bushfire Prone Land Search Results

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	5448_Concept Plan_Sheet 1_July 2025 5448_DA Ltr to Council
Owner's consent	Owners Consent (2)
Preliminary Engineering Drawings	Engineering Not required
Statement of environmental effects	5448_SoEE July 2025

Applicant declarations

I declare that all the information in my application and accompanying documents is , to the best of my knowledge, true and correct.	Yes
I understand that the development application and the accompanying information will be provided to the appropriate consent authority for the purposes of the assessment and determination of this development application.	Yes
I understand that if incomplete, the consent authority may request more information, which will result in delays to the application.	Yes
I understand that the consent authority may use the information and materials provided for notification and advertising purposes, and materials provided may be made available to the public for inspection at its Offices and on its website and/or the NSW Planning Portal	Yes
I acknowledge that copies of this application and supporting documentation may be provided to interested persons in accordance with the Government Information (Public Access) 2009 (NSW) (GIPA Act) under which it may be required to release information which you provide to it.	Yes
I agree to appropriately delegated assessment officers attending the site for the purpose of inspection.	Yes
I have read and agree to the collection and use of my personal information as outlined in the Privacy Notice	Yes
I confirm that the change(s) entered is/are made with appropriate authority from the applicant(s).	

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Gunnedah Shire Council

Owners Consent

Made under the *Environmental Planning and Assessment Act 1979* and *Local Government Act 1993*

ABOUT THIS FORM

You can use this form to demonstrate that all owners have consented to the lodging of an application where Council is the consent authority.

LAND RELATING TO THE APPLICATION

Address: 210 Bush's Lane

Town/Suburb: Gunnedah State: NSW Postcode: 2380

Lot Number: 27 & 28 Section Number: DP Number: 755474

OWNERS DETAILS

Name(s): Kerry Elizabeth Pty Ltd

[redacted]

I/WE, THE OWNER(S) GIVE CONSENT TO

Nominated Agent: Stewart Surveys Pty Ltd

TO ACT ON MY/OUR BEHALF TO

- Lodge all relevant applications for development consent, CCs, CDCs, Subdivision Works Certificates, Subdivision Certificates, Appointment of Principal Certifier, Building Information Certificates, Occupation Certificates, Planning Proposal and Section 68 Applications.
- Have discussions with all relevant authorities.
- Do all things required to be done, or provide all information and documents necessary to obtain such approvals.
- Where applicable, withdraw the application/s and obtain a refund of relevant fees paid.

CONSENT OF ALL OWNERS

As the owner(s) of the property, I/we consent to this application to apply for approval to carry out the development described herein and state that the information contained herein is, to the best of my/our knowledge, true and correct. I/we hereby give permission for Council authorised personnel to carry out inspections of the land and buildings as necessary for the purpose of assessing this application without prior notice of entry.

Name: Jarad Ewing

Signature: [signature] Date: 18/3/25

Name: .....

Signature: ..... Date: .....

Note: if ownership is under a company name, please provide evidence that the signatory on the application has the authority to sign on behalf of the company, by providing authority on company letterhead.

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PO Box 63 (63 Elgin Street) Gunnedah NSW 2380
T +61 2 6740 2100 E council@infogunnedah.com.au
www.gunnedah.nsw.gov.au

21 August 2025
Our Ref: 5448

The General Manager
Gunnedah Council
63 Elgin Street
GUNNEDAH NSW 2380

Dear Sir,

DEVELOPMENT APPLICATION – SUBDIVISION OF LOT 27 & 28 IN DP755474, 210 BUSH'S LANE, GUNNEDAH

On behalf of Kerry Elizabeth Pty Ltd, we hereby submit the Development Application for the proposed subdivision of Lot 27 & 28 in DP755474, located at 210 Bush's Lane, Gunnedah.

The proposed development involves the subdivision of the site into sixty-one (61) large lot residential holdings, with an area exceeding 9,000 square metres, over three (3) stages. The application includes the construction of a new looped road, stormwater drainage infrastructure, and the extension of services to each lot.

The application has been prepared in accordance with the Gunnedah Local Environmental Plan 2012, the Gunnedah Development Control Plan 2012, and other relevant legislation. Mitigation measures have been outlined to address potential environmental impacts, ensuring compliance with applicable planning and environmental requirements.

The following documents have been enclosed and form part of this development application:

- Statement of Environmental Effects, Prepared by Stewart Surveys Pty Ltd.
- Specialty reports included in the SoEE appendix:
  - Appendix A – Development Plans
  - Appendix B – Preliminary Site Contamination Investigations
  - Appendix C – Aboriginal Cultural Heritage Assessment Report
  - Appendix D – Traffic Impact Assessment
  - Appendix E – Biodiversity Offset Scheme Search
  - Appendix F – Biodiversity Development Assessment Report
  - Appendix G – Site Servicing Strategy

EXHIBITION COPY

Stewart Surveys Pty Ltd
ABN 65 002 886 508
109 Conadilly Street
PO Box 592
Gunnedah NSW 2380
T 02 6742 2966
office@stewartsurveys.com
www.stewartsurveys.com

- Appendix H – Land Use Conflict Risk Assessment Report
- Appendix I – Bushfire Prone Land Search
- Appendix J – Soil Landscapes
- Appendix K – State Environmental Planning Policy (Biodiversity Conservation) 2021 Assessment Report
- Appendix L – Deposited Plans and Title Searches

° Cost Estimate

° Owners Consent forms

Following the return of the DA in April 2025 we have amended the staging of the works, obtained further contamination investigations and reports and stormwater management design and calculations. A letter from JSE Design is appended addressing the issues raised by engineering in the return letter. We trust the DA will now be sufficient for council to lodge and undertake a full assessment.

Stewart Surveys is lodging this application electronically on behalf of the applicant, please contact Jarad Ewing [redacted]

We trust that the information provided is sufficient for the assessment of this application. Should you require any further details or clarification, please do not hesitate to contact us at (02) 6742 2966 or via email at office@stewartsurveys.com.

Once you have reviewed the DA documents, we would be happy to have a meeting with staff to discuss the development.

Yours faithfully
STEWART SURVEYS PTY LTD

Kathryn Stewart

Kathryn Stewart
BLArch (UNSW), MEnvMgmt (UNSW)
Registered Landscape Architect #001493

EXHIBITION COPY

JSE DESIGN

Simon Bugeja
simon@jsedesign.com.au
0433 269 645

23-429 Peel Street,
Tamworth NSW 2340
jsedesign.com.au

8 August 2025

Kathryn Stewart
Stewart Surveyors Pty Ltd
[redacted]

Subject: Stormwater Management Plan – 210 Bush Lane Application

Dear Kathryn,

We write in response to Council's recent comment regarding the classification of the proposed detention basin within the development at 210 Bushs Lane as an online basin, and to clarify its appropriateness under current NSW regulatory guidance.

After discussions with the Department of Planning, Industry and Environment – Water (DPIE Water), the watercourse traversing the subject site has been confirmed to be a 1st order stream. This classification is critical in understanding the applicability of permissible stormwater infrastructure within the associated riparian corridor. This would be formally confirmed through GTA's from DPIe Water during the Development Assessment.

According to the DPIE publication '*Controlled Activities: Guidelines for Riparian Corridors on Waterfront Land*', Table 2 specifically permits the construction of online detention basins for 1st and 2nd order streams.

While the existing stream may be noted as a 1st order stream, this also allows for the stream to be realigned (Table 2) and overlay with the swale along the rear of proposed Lot 42-50.

The design aims for the basin to function intermittently, staying dry between storm events. It will include vegetated surfaces and stabilised inlets and outlets to reduce ecological and geomorphic disturbance. The basin is not meant to be a permanent water body or a barrier to natural flow. Its size is based on reducing post-development peak flows to pre-development levels, as outlined in Section C.5 of the Gunnedah DCP 2025.

We trust that the above information is suitable confirmation to be passed on to Gunnedah Shire Council with respect to their comments/ concerns for the above mentioned development.

Please do not hesitate to contact us should further information or discussions be required.

Yours sincerely,

Simon Bugeja
JSE Design
[redacted]

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** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (17 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

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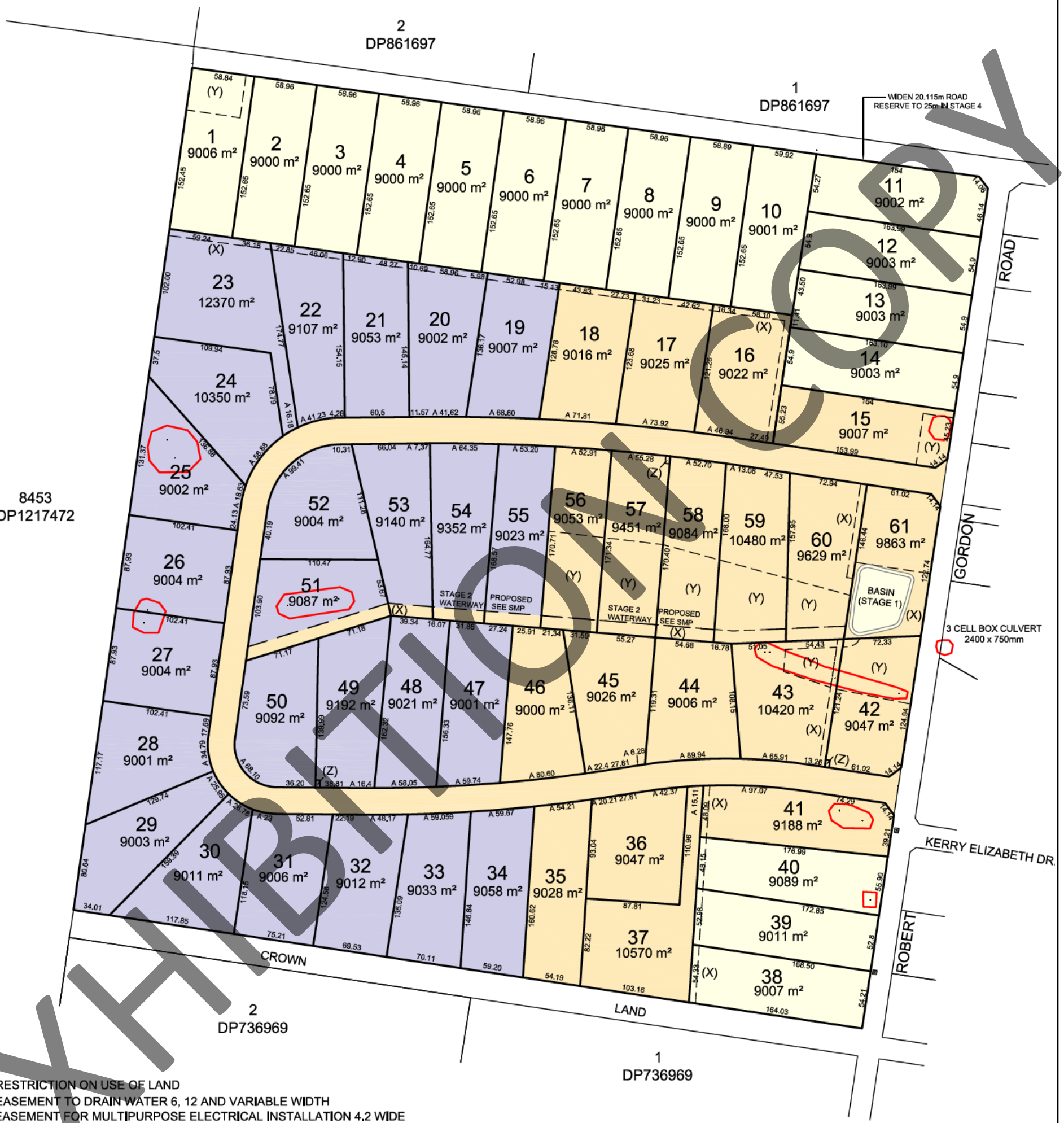

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400
REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

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Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH STAGING PLAN

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KS | Scale: 1:4000 @ A3 | Sheet: 1

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N
W E
S

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

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Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH AERIAL PHOTO

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 2

Reference: 5448

Stewart Surveys

Development Application

Statement of Environmental Effects

Subdivision of Lot 27 & 28 in DP75574

210 Bush's Lane, Gunnedah

Date: August 21, 2025

Prepared For: Kerry Elizabeth Pty Ltd

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Stewart Surveys Pty Ltd

107-109 Conadilly Street Gunnedah, PO Box 592 Gunnedah, NSW, 2380 office@stewartsurveys.com

DOCUMENT CONTROLS

Proponent	Mr Jarad Ewing & Mrs Pip Ewing
Document Description	Statement of Environmental Effects
File Reference	5448
Date	**21 August 2025**
Prepared for	**Client Name:** Kerry Elizabeth Pty Ltd [redacted]
Prepared by	**Kathryn Stewart** Bachelor of Landscape Architecture (UNSW) Masters of Environmental Management (UNSW) Registered Landscape Architect (#001493) **Felicity Stevens** Bachelor of Sustainability (UNE) Stewart Surveys Pty Ltd ABN: 65 002 886 508 PO Box 592, Gunnedah NSW 2380 (02) 6742 2966 Office@stewartsurveys.com
Site Particulars	**Lot Particulars:** Lots 27 & 28 in DP755474 **Address:** 210 Bush's Lane, Gunnedah **Local Government Area:** Gunnedah

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Enquiries should be addressed to Stewart Surveys Pty Ltd

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INTRODUCTION

This Statement of Environmental Effects (SoEE) has been prepared for Kerry Elizabeth Pty Ltd by Stewart Surveys Pty Ltd. This Statement of Environment Effects accompanies a staged development application for a new road subdivision.

The land to which this SoEE applies is the property known as 210 Bush's Lane, Gunnedah being Lot 27 & 28 in DP755474. The land is zoned R5 large Lot Residential under the Gunnedah Local Environmental Plan, 2012. The Land also comes under the provision of the Gunnedah Development Control Plan 2012 (referred to as the DCP).

This Development Application has given consideration to both the objectives of the zoning, development control plans and the impact the development will have on the environment.

A concept plan showing the proposed subdivision is attached to this application.

1. SITE CONTEXT AND CHARACTER

The site is located on the corner of Bush's Lane and Robert Gordon Road and is currently vacant and utilised for agricultural pursuits of cattle grazing and fodder crops. Improvements on the site include a steel set of cattle yards and rural fencing.

The subject site is regular in shape with Lot 27 having a total area of 30.35 hectares and Lot 28 having an area of 30.15 hectares. Combined this provides a total site area of 60.5 hectares. The site is rectangular in shape with 753.5 metres frontage to Bush's Lane and 810 metres frontage Robert Gordon Road.

There is native vegetation along an intermittent water course which transects the centre of the site. The unnamed watercourse flows in an easterly direction into Blackjack Creek a tributary of the Namoi River. Bushs Lane is of gravel formation with one residence across the site frontage, on the opposite of the road. Robert Gordon Road is of bitumen construction with a number of rural residential holdings across the site's frontage. A large three cell box culvert has been constructed under Robert Gordon Road in the watercourse alignment, taking water from the site through the culvert and into the unnamed watercourse east of the site.

The site locality plan below in **Figure 1** highlights the location of the property within the Gunnedah residential area.

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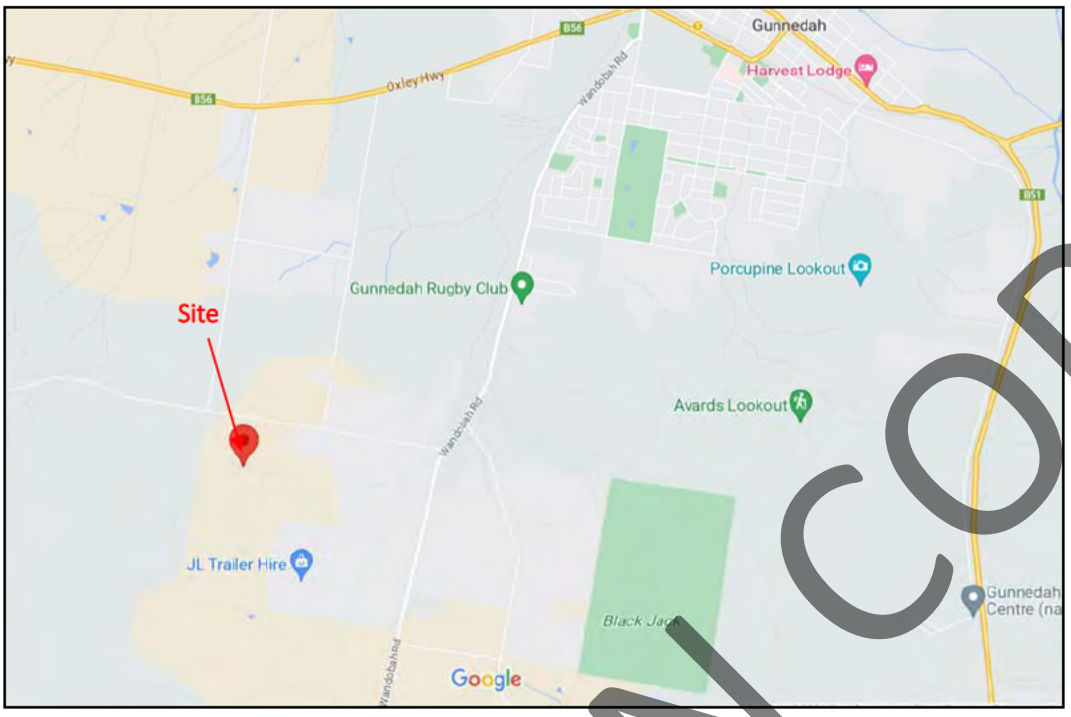

Figure 1: Site Locality (Google Maps)

The aerial photograph and site photos below show the existing site vegetation and character. They also show the adjoining developments surrounding the property.

Figure 2: Aerial View of 210 Bush's Lane

EXHIBITION COPY

Figure 3: Looking South West across the site to Blackjack Mountain

Figure 4: Looking north along the eastern boundary at Robert Gordon Road

EXHIBITION COPY

Figure 5: Eastern Boundary looking North from Watercourse towards Bush's Lane

Figure 6: View West along watercourse from Eastern Boundary

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2. DESCRIPTION OF DEVELOPMENT

It is proposed to subdivide Lots 27 & 28 in DP755474 into sixty one (61) large lot residential holdings with an area exceeding 9,000 square metres, over three (3) stages. The development includes the construction of a new looped road intersecting in two locations with Robert Gordon Road. Construction of a stormwater drain and detention structure and provision of services to each lot. **Figure 7** shows the proposed subdivision layout.

The proposed stages are described as:

Stage 1: 6 Lots on Robert Gordon Road and 11 Lots Bushs Lane, (Lots 1 to 14, 38, 39 and 40)

Stage 2: 19 Lots and new road construction (Lots 15 – 18, 35-37, 42-46 and 56-61)

Stage 3: 25 Lots and new road construction (Lots 19-34 and 47-55)

The proposed staging has been determined on the following basis:

- Financial basis to enable the sale of lots to fund the subsequent stages, for example Stage 1, which fronts existing bitumen Robert Gordon Road requires limited financial output to provide the holdings, the funds from the sale of these lots can contribute to Stage 2 development costs which are a lot higher.
- Saleability basis the client does not wish to flood the market with lots, rather releasing lots in a staged manner to allow the timing of each stage to be governed by market demand.
- Social Conscious basis, the client does not wish to sell the lots on Bushs Lane opposite the approved solar farm until this is constructed so that future buyers are aware of the visual and other impacts this development will have on the locality.

The size of the lots will range from 9000 square metres to 12,280 square metres with frontages ranging from 25.923 metres to 90.386 metres. There are two battle axe holdings proposed and lot access is being via Robert Gordon Road, Bush's Lane and a proposed new looped road. The concept plan below in **Figure 7** shows the proposed subdivision layout.

The design has taken into consideration the topogrpahy of the land and fall of the existing waterway to ensure the lots and roads can adequately drain into this system and the location of the waterway easement is wholly within one property to allow fencing but also allows other lots to drain into the propsoed waterway.

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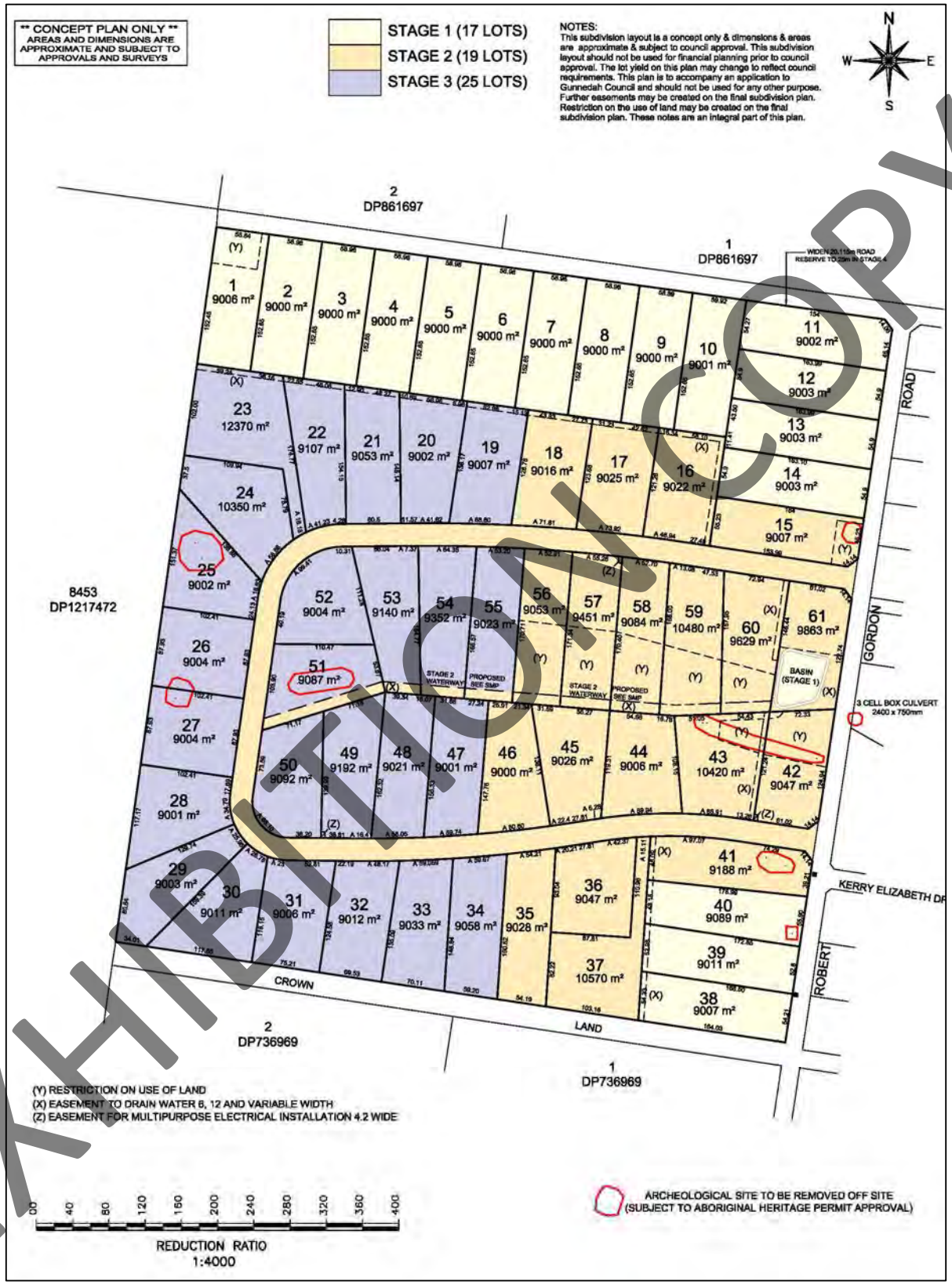

Figure 7: Plan of Proposed Subdivision (refer attachment for full sized plan)

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3. ENVIRONMENTAL PLANNING AND ASSESSMENT ACT, 1979 (EPAA)

The Environmental Planning and Assessment Act, 1979 (EPAA) is the principal piece of legislation overseeing the assessment and determination of development proposals in NSW. It aims to encourage the proper management, development and conservation of resources, the protection of the environment, and ecologically sustainable development. Environmental Planning Instruments including the State Environmental Planning Policies and the Gunnedah Local Environmental Plan, 2012 come under the overarching principles of the EPAA to provide local controls and planning legislation.

4. GUNNEDAH LOCAL ENVIRONMENTAL PLAN, 2012

The proposed subdivision is on land zoned as R5 Large Lot Residential under the Gunnedah Local Environment Plan, 2012. The minimum lot size mapped for the site is 9000 square metres.

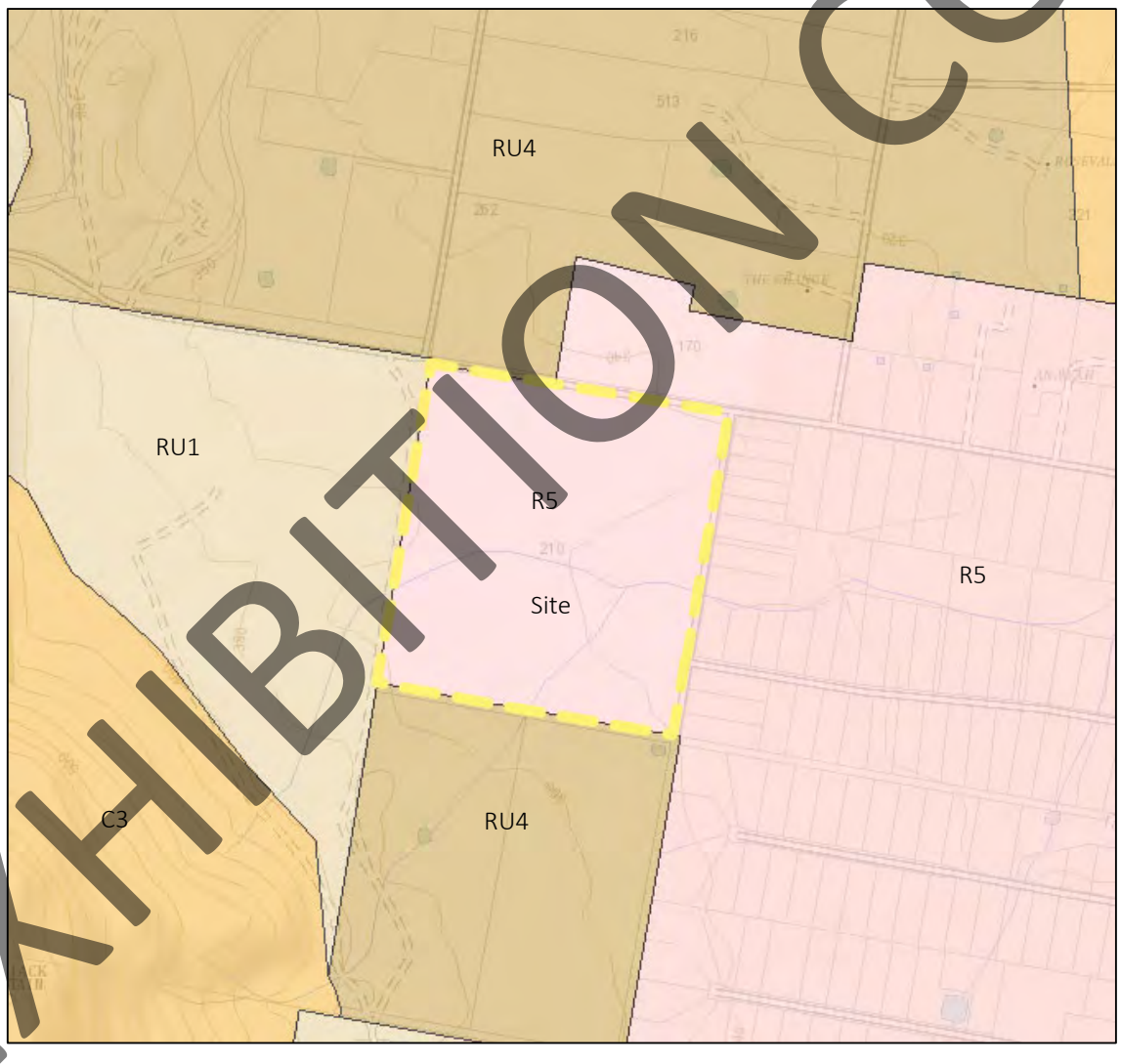

Figure 8: Land zoning map (EPlanning)

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The objectives of the zone outlined in the Gunnedah Local Environmental Plan are as follows:

- To provide residential housing in a rural settling preserving, and minimizing impacts on, environmentally sensitive locations and scenic quality.
- To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future.
- To ensure that development in the area does not unreasonably increase the demand for public services or public facilities.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To provide a restricted range of opportunities for employment, development and community facilities and services that do not unreasonably or significantly detract from –
    a) the primary residential function, character and amenity of the neighbourhood, and
    b) the quality of the natural and built environments.

With approval, the proposed subdivision will allow for the creation of lots capable of having a dwelling constructed in a semi-rural setting. The site is located in a large lot residential area, that has ready access to services, which will need to be extended. A Land Use Conflict Assessment Report has been prepared for the development to assess potential conflicts with the adjoining RU4 Primary Production (Small Lots) zone, this is outlined in section 5.3 of this report and proposes mitigation measures to abate potential conflicts between the residential zone and the adjoining RU1 and RU4 land. The proposed subdivision will allow for more efficient use of the land providing increased opportunity for residential development is an area of town which is popular for small acreage properties conveniently located to the CBD and other dwelling developments. The subject site was assessed in detail for suitability and potential conflicts by the Department of Planning when rezoned from RU4 to R5 in 2024. We believe the proposed development is compatible with the surrounding land uses, environment and suitable for large lot residential development. The subdivision is permissible under clause 4.1 minimum lot size of the GLEP, 2012 with council consent.

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5. DEVELOPMENT CONTROL PLAN

The following table outlines the Gunnedah Development Control Plan section 5 – subdivision requirements and how the proposed development complies.

Table 1: Gunnedah Development Control Plan Review

Gunnedah DCP 2012 – Subdivision (Clause 5)			
	Objectives/Strategies	Assessment	Consistency (Y/N/NA)
5.1 Lot Size	Lot Size Map and Clause 4.1 of the Gunnedah LEP 2012 prescribe the MLS for all new allotments.	The minimum lot size is 9000m² The proposed Lot size ranges from 9000m² to 1,2280m²	Y
	Residential Lots must be able to accommodate a rectangle suitable for building purposes measuring 10m x 15m behind the street setback	The Street Setback for the development is 25m and all lots can accommodate a 10x15m rectangle behind the setback line.	Y
	Easement should not encumber more than 10% of the lot area.	There is a twelve (12) metre wide easement proposed to drain water on Lot 51, and 53 to 61 parallel with the southern boundary of the lots. The encumbrance of this easement on each lot is as follows: **Lot 1 Total Lot Area 9006 total easement area 2035m² = 22.6%** **Lot 15 Total Lot Area 9007, Total easement area 1,340m² = 14.8%** **Lot 16 Total Lot Area 9022, total easement area 1118m² = 12.4%** Lot 17 Total Lot Area = 9025, total easement area 443.1 m² = 5% Lot 18 Total Lot Area = 9016, total easement area 429.3 m² = 4.7% Lot 19 Total Lot Area = 9007m² total easement area = 408.6m² = 4.8% Lot 20 Total Lot area is 9002, total easement area is 453.8 m² = 5% Lot 21 Total Lot Area = 9053, total easement area is 367 m² = 4% Lot 22 Total Lot Area 9107, total easement area = 413.5 m² = 4.5% Lot 23 Total Lot Area 12370, total easement area = 572.4 m² = 4.6% Lot 38 Total Lot Area 9007, total easement area = 326m² = 3.6% Lot 39 Total Lot Area 9011, total easement area = 317.8m² = 3.5%	Variation Requested

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		Lot 40 Total Lot Area 9089, total easement area = 289m² = 3% Lot 41 Total Lot Area = 9188, Total easement area = 288m² = 3% **Lot 51 Total Lot Area 9087 Total Easement area 1680m = 18%** Lot 53 Total Lot Area 9140 Total Easement area 467m² = 5% Lot 54 Total Lot Area 9352 Total Easement area 562m² = 6% Lot 55 Total Lot Area 9023 Total Easement area 620m² = 7% **Lot 56 Total Lot Area 9053 Total Easement area 4,772m² = 52%** **Lot 57 Total Lot Area 9451 Total Easement area 4887m² = 52%** **Lot 58 Total Lot Area 9084 Total Easement area 4,452m² = 49%** **Lot 59 Total Lot Area 10480 Total Easement area 4,585m² = 43%** **Lot 60 Total Lot Area 9629 Total Easement area 2,839m² = 29.4%** **Lot 61 Total Lot Area 9863 Total Easement area 4,677m² = 47%** Three (3) lots will contain a power easement for pad mounted substation. The location of these substations is not determined until the detailed design construction certificate stage however are likely to be on Lots 42, 49 and 57. The area of these easements is as follows: Lot 42 Electrical easement 29m² =0.3% of block (9047m²) Lot 49 Electrical easement 29m² = 0.3% of block (9192m²) Lot 57 – Electrical easement 29m2+ stormwater easement of 655m²=684m² = 7% of block The encumbrance of easement is greater than 10% of the total lot area on **Lots 1, 15, 16, 51 and 56 to 61**. These are largely due to the combination of stormwater and restriction as to user to protect the native vegetation as outlined in the BDAR report. Given the lots are large residential holdings with an unencumbered area of	

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		approximately 50% of 4500m² or greater and the encumbrance which is for the benefit of the whole subdivision and wider community is considered acceptable to still provide large residential holdings.	
	The ratio of depth to frontage is a maximum of five (5) to one (1).	Table 2 outlines the frontage to depth ratio of all lots. This does not apply to Battle-axe holdings. All lots have a depth to frontage ratio of less than 5:1.	Y
5.2 Service Strategy	All DAs shall provide a servicing strategy to demonstrate that it is feasible for the subdivision to be serviced in accordance with Council's requirements.	A site servicing strategy is attached to this application.	Y
5.3 Sewer	The sewer strategy needs to identify the method of providing sewer to the proposed lots in accordance with Council's Requirements.	The subject site is not located in a reticulated sewer area. Onsite sewer management systems will be installed as part of a future house development application.	Y
5.4 Water	The method of providing water needs to be identified in the Servicing Strategy.	The subject site will be serviced by Council's reticulated water system, a VPA has been entered to upgrade the pump facilities at the Gallen Reservoir and it is proposed to construct new water mains along the proposed new road and Bushs Lane to enable construction of a water service to each lot. The full description and staging of these works is outlined in the site services strategy.	Y
5.5 Storm Water Drainage	Consideration must be given to flows up to the 1 in 100 year ARI for existing natural flow, existing development flow and post development flow. Minor flows are to be designed to a 1 in 5 year ARI. Major flows are to be defined to a designated overland flow path up to a 1 in 100 year ARI.	A constructed waterway will be run parallel to the southern boundaries of Lots 51 and 53 to 61 to convey water to the existing box culvert under Robert Gordon Road. An existing dam on the property will be modified to provide on-site detention with controlled outlet pit to mitigate the impacts of the development. Runoff from the other lots will be collected in table drains along the proposed new road, Robert Gordon Road and Bushs lane, where it is conveyed to the watercourse.	Y

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	Measures to control stormwater flow and water quality are required. Lot layout and easements are to be established so that no future development will rely upon pump out, infiltration systems or any other method other than connection to the gravity piped system.	A full stormwater management plan has been prepared for this development and is appended to this report. A twelve (12) metre and variable wide easement will be created for the stormwater infrastructure to protect infrastructure in perpetuity.	
5.6 Tele communications	Telecommunications are to be provided underground.	It is proposed to provide underground telecommunications services to all lots in the subdivision. Refer to the site services strategy for details.	Y
5.7 Electricity	When the MLS is up to and including 9.9ha the subdivision is to be serviced by underground electricity.	It is proposed to provide underground electrical services to all lots in the subdivision. Refer to the site services strategy for details.	Y
5.8 Battle Axed Shaped Lots	Min area for battle axed shape lots is 800m² including access corridor within R2, R3 and RU5. Within all other zones, the minimum with of a handle is 15 metres, with a maximum length of 300m.	There are two battle axe shaped blocks are proposed in this development. Lot 23 the handle is 15 metres wide by 78.79 metres long. Lot 37 the handle is 15 metres wide by 109.66 metres long	Y
5.9 Industrial Lots	Shall have a min street frontage and square width of 24m and an area of 1000m²	The site is not an industrial Lot.	NA
5.10 Road Network Design	For development involving more than 20 lots a detailed TIA is to be submitted with the DA. Road network design must include consideration of vehicular, pedestrian and cyclist safety. When the MLS is up to and including 3000m² kerb and gutter is required for subdivision. Subdivision design shall ensure that individual allotments are within 400m	The proposed subdivision consists of a total of 61 Lots. A Traffic Impact Assessment has been prepared for this development and is appended to this report, refer to section 12 of this report for more details. Kerb and gutter is not required for rural residential roads with a minimum lot size of 9,000m². The provisions for allotments being within 400m of the collector road is for town residential zones and does not apply to rural residential subdivisions. Staging of road	Y

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	walking distance of a collector road.	construction works. It is proposed to stage the road construction works as follows: Stage 1: No new Road construction as lots front Robert Gordon Road Stage 2: Construction of new road Stage 3: Construction of new road Stage 4: Construction of Bushs Lane. Justification for construction of Bushs Lane in Stage 4 is that there is not expected to be any additional traffic generated by the development on Bushs Lane until lots fronting this road are constructed. The TIA confirms that the increased traffic on Bushs Lane West of the intersection with Robert Gordon Drive is only expected to increase by 15% following construction of the stage 4 Lots. The DCP notes that bitumen pavement is required generally when there is a future increase in traffic movements, which will occur in Stage 4.	
5.11 Staged Subdivision	When a subdivision is to be staged, these stages must be clearly identified.	The proposed development will be constructed in 4 stages. Each stage is described and defined in section 2 of this report and the development plans.	Y
5.12 Cul-De-Sac	Design must accommodate stormwater drainage overland flow paths Alternative cul-de-sac configuration will be assessed on merit, e.g., "hammer-head" or "Y" shapes	This development does not include any cul-de-sac roads.	N/a
5.13 Landscaping	Subdivision involving new road construction shall include street tree planting of suitable species. Landscape plans shall be provided for all dual use drainage reserves to enhance recreational opportunities and visual amenity without	A landscape plan has been prepared for the development outlining street tree plantings of Jacaranda mimosifolia. Trees are only proposed on the inside of the road to avoid conflicts with water and power services. The design allows for 44 trees representing a ratio of 1 tree per lot fronting the new road.	Y

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	compromising drainage function. Estate entry walls are to be located within the development site and form part of the proposed lot.	There are no estate walls or drainage reserves in this subdivision.	
5.14 Site Access	Public road access is required to all lots.	All lots will have public road access from Robert Gordon Road, Bush's Land and the new road in the subdivision. Refer to section 12 of this report for more details on access and traffic.	Y
5.15 Lot Orientation	Allotments are to be designed to provide solar access for future development. Orientation must minimise overshadowing.	The proposed allotments are north and east facing and are considered to provide adequate solar access for future development. This development does not result in any overshadowing.	Y
5.16 Open Space	For residential subdivision, open space must: -Be buffered from main roads -Be safely accessible by pedestrian and cycle ways links -connectivity must be maximised -walkable access to highest number of population -have high passive surveillance opportunities - minimum slope - provide complimentary uses of open space that ensure ongoing usability	There is no open space proposed.	NA
5.17 Vegetation	Subdivision must accommodate the retention of any significant trees/vegetation.	Generally, the site is open cultivation country with some scattered trees and native trees lining the existing waterway. Unfortunately, the construction of the waterway will necessitate the removal of some vegetation along the waterway. This will be offset by entering the biodiversity offset scheme as outlined in the BDAR report. The trees are similar in character to other native vegetation on the site and on the adjoining properties and therefore they are	Y

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		not considered to be of high significant.	
5.18 Garbage Collection	Subdivision must be designed to accommodate for the legal movement of garbage collection vehicles.	The proposed new road is a looped road and therefore does not require any garbage truck turning and is suitable for garbage collection vehicles.	Y
5.19 Community Title Subdivision	Must include community facilities that are shared between the residents of the development.	The proposed subdivision is not a community title development	NA
5.20 Contamination	Land contamination must be addressed.	The subject site is not contaminated refer to section 9 of this report and the appended Preliminary site investigation (contamination) report.	Y
Clause 5.21 Road widths	Rural Residential Road 100-500AADT Travel Lane: 3m Parking Lane: 1.5m Full road Formation: 9m Footpath: 8m Total Reserve: 25m	The TIA outlines that the development will generate 451 vehicles per day. The proposed new road has a total reserve width of 25 metres and is consistent with the requirements for a rural residential road with daily traffic of less than 500 vehicles. The development is compliant with the DCP.	Y
5.22 Additional Controls	The subject site Lot 27 & 28 in DP755474 is not identified as having additional development controls.	Not Applicable	N/a

Table 2: Depth to Frontage Ratio of Lots

Lot Number	Frontage	Depth	Depth to Frontage Ratio
1	58.839	152.65	2.6:1
2	58.96	152.65	2.6:1
3	58.96	152.65	2.6:1
4	58.96	152.65	2.6:1
5	58.96	152.65	2.6:1
6	58.96	152.65	2.6:1
7	58.96	152.65	2.6:1
8	58.96	152.65	2.6:1
9	58.96	152.65	2.6:1
10	59.915	152.65	2.5:1
11	46.144	163.989	3.6:1
12	54.9	163.989	3.0:1
13	54.9	163.997	3.0:1
14	54.9	164	3.0:1
15	45.23	164	3.6:1
16	74.424	121.534	1.6:1

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17	73.917	123.678	1.7:1
18	71.809	128.776	1.8:1
19	68.596	136.17	2.0:1
20	53.192	145.137	2.7:1
21	60.5	154.154	2.5:1
22	45.512	174.765	3.8:1
23	16.184	174.765	N/a - Battle Axe Lot
24	58.88	136.883	2.3:1
25	42.759	136.883	3.2:1
26	87.93	102.409	1.2:1
27	87.93	102.409	1.2:1
28	52.474	102.409	2.0:1
29	25.923	129.738	5.0:1
30	26.80	159.39	5.9:1
31	75.816	118.152	1.6:1
32	70.36	124.583	1.8:1
33	59.059	135.087	2.3:1
34	59.67	146.842	2.5:1
35	54.212	160.622	3.0:1
36	90.384	110.957	1.2:1
37	15.114	203.549	N/a - Battle Axe Lot
38	54.208	168.495	3.1:1
39	52.8	172.852	3.3:1
40	55.90	176.989	3.2:1
41	39.218	176.989	4.5:1
42	61.023	121.242	2.0:1
43	79.17	121.242	1.5:1
44	89.934	119.309	1.3:1
45	56.489	136.106	2.4:1
46	80.604	147.761	1.8:1
47	59.742	156.333	2.6:1
48	58.05	162.323	2.8:1
49	55.211	162.323	2.9:1
50	177.79	139.985	0.8:1
51	96.397	142.352	1.5:1
52	157.416	110.467	0.7:1
53	73.414	164.77	2.2:1
54	64.353	168.572	2.6:1
55	53.198	170.701	3.2:1
56	52.906	171.337	3.2:1
57	55.278	171.337	3.1:1
58	52.704	170.401	3.2:1
59	60.609	168.004	2.8:1
60	72.939	157.949	2.2:1
61	61.022	146.436	2.4:1

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We have given appropriate consideration to requirements under section 5 subdivision of the Gunnedah Development Control Plan and believe the proposed development is consistent with all controls except clause 5.1 where the easements on proposed Lots 51 and 59 encumber more than ten percent (10%)

of the total lot area. Variation to clause 5.1 of the Gunnedah Development Control Plan, is requested for this development.

Lots 51 and 59 are large residential holdings with an unencumbered area of 7,407m² (Lot 51) and 7,825m² (Lot 59). This area far exceeds the requirements for a standard residential property and allows the benefits of a large lot residential holding for ancillary activities. The easement on both holdings is along the back boundary and does not fragment lots. The encumbrance is for stormwater drainage, which is for the benefit of the whole subdivision and wider downstream community and on this basis it is considered acceptable. We believe the holdings will still be attractive blocks for purchase. It is requested that council supports this request for a variation to clause 5.1 of the DCP.

6. POTENTIAL ENVIRONMENTAL IMPACT OF THE PROPOSED DEVELOPMENT AND MITIGATION MEASURES

The following section of the report identifies potential environmental impacts and the proposed mitigation measures of the development.

6.1 LANDFORM, SOILS & DRAINAGE

The site generally falls evenly in a easterly direction. There is an intermittent watercourse located on the site, this is an order 1 stream (Strahler) falling into the Blackjack Creek, which is a tributary of the Namoi River. The grade of the land is approximately 1 metre in 25 metres or 4%. The elevation of the site ranges from 367 metres in the south western corner of the property to 330 metres at the existing box culvert under Robert Gordon Road.

The soil landscapes at the site have been mapped as the *Fulwoods Road* soil profile on the eSpade portal. This soil is described as transferral soil with extremely long pediment foot slopes comprising of coalescing alluvium dans below sandstone hills. Soils are mostly degraded very deep to giant, moderately well drained, red and brown earths with deep well drained red earths common on upper foot slopes.

The soil landscape is described as having limitations and qualities including moderate soil fertility, localised foundation hazard, widespread recharge zone, localised salinity hazard and localised gully and sheet erosion hazard. The fulwoods road landscape is widespread around the Gunnedah residential areas and does not pose any significant limitation to the development.

It is a requirement that an erosion and sediment control plan be developed for the site before the construction certificate is issued. Erosion and Sediment control measures are required to avoid any damage to the environment, caused by construction works associated with the development.

There are two natural waterways through the site which can be described as intermittent gullies. Generally, these watercourses are empty but during rain events they convey water to the east into the Blackjack Creek catchment.

The subdivision layout has been designed to minimise impact on this waterway, the design allows lots to fall into the waterway or into table drains along the proposed new road and at the rear of lots. The

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existing three cell box culvert (2400 x 750mm each), shown in **Figure 9** under Robert Gordon Road, has a large capacity to cater for storm events. A stormwater management plan has been prepared as part of this development application to size the proposed stormwater infrastructure in accordance with Gunnedah Shite Council's engineering and subdivision guidelines.

Figure 9: Existing Culvert on Robert Gordon Road

Figure 10: Topographic map showing the watercourse on the site (Eplanning)

6.2 VEGETATION & HABITAT

The subject site has been widely cultivated with a fodder crop planted at the time of inspection. There are scattered native trees, predominantly along the watercourse in the central part of the site. The photographs in **Figure 2** to **Figure 4** illustrate the existing vegetation present on the site. Ecologist Dr

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Tom Pollard has been engaged to prepare a Biodiversity Development Assessment Report for this application/ his assessment of the vegetation is as follows:

Site vegetation consists of:

- *cropped land (non-native vegetation) (the majority of the site*
- *PCT101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion (occurs as planted vegetation and derived grassland)*
- *PCT434 - White Box grass shrub hill woodland on clay to loam soils on volcanic and sedimentary hills in the southern Brigalow Belt South Bioregion (occurs as shrubland without an overstorey, woodland and derived grassland)*

Most native vegetation at the site is present in a very low condition (vegetation integrity scores of <15), with only small areas of low to moderate condition vegetation present (vegetation integrity scores of between 30-40).

Areas of PCT434 at the site are broadly consistent with the BC Act threatened ecological community 'White Box Yellow Box Blakely's Red Gum Woodland'.

Targeted threatened flora searches undertaken within areas of suitable habitat at the site did not locate any individuals.

Habitat values for threatened fauna at the site are minimal with key habitat features such as hollow-bearing trees virtually absent. However, some foraging habitat for several threatened microbats and birds could potentially occur. Targeted searches for koalas (scat searches and spotlighting) did not record any evidence of usage of areas of suitable habitat at the site.

The proposal would remove areas of PCT434 woodland that would require ecosystem credits. All other areas of vegetation to be removed have low condition below the threshold for which ecosystem credits are required. No species credits would be required. Generally, the lots are adequately sized to accommodate a driveway and building envelope without clearing of PCT434 woodland areas. However, the small size of retained areas of PCT434 within individual lots and potential future direct and indirect impacts mean that they would be considered as 100% loss in the BAM calculator and therefore require offsets.

We have attached the Plant Community Type (PCT) profiles for PCT101 and PCT 434 to this report.

Gunnedah Council does not have a tree preservation order.

The removal of trees and groundcovers is required for the construction of the new looped road and waterway through the site. The position of the waterway has been determined south of the existing waterway to allow the retention of most of the mature native trees.

Figure 11 shows the subdivision layout and waterway easement on the aerial photo, this demonstrates the impacts on existing trees.

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Figure 11: Aerial Photo of the Subdivision Layout

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6.3 LAND USE CONFLICT ASSESSMENT REPORT

As part of the rezoning of this land the Department of Primary Industries requested a Land Use Conflict Assessment Report (LUCRA) to determine the suitability of the site for residential development, ensuring no conflicts with adjoining rural land uses.

The proposed rural residential development is low density with a minimum lot size of 9000 square metres. The road reserves surrounding the site on three boundaries provide separation between agricultural land and the future residents on the subject site. The establishment of a 30 metre buffer is recommended along the northern and southern boundary of the property to provide 50 metres separation to grazing land uses. This buffer, in combination with fencing, existing tree lines, good farming practices and education should ensure the risks at the site can be reduced in probability and consequence. The risk assessment has assessed the risk rating for potential identified conflicts, following these mitigation measures and the resulting risk ratings are all less than 10, which is acceptable. This LUCRA report was considered acceptable to the department in the rezoning application.

Figure 12: LUCRA Plan

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7. STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY CONSERVATION) 2021

State Environmental Planning Policy (Biodiversity & Conservation) 2021 applies to all of NSW. Chapters 2 and 4 of this SEPP apply to this development application, and a separate State Environmental Planning Policy (Biodiversity & Conservation) 2021 is appended to this report.

8. BIODIVERSITY CONSERVATION ACT, 2016

The Biodiversity Conservation Act 2016 is legislation which applies to the whole of NSW. The purpose of the act is to protect the following biodiversity values:

a) vegetation integrity—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state,
b) habitat suitability—being the degree to which the habitat needs of threatened species is present at a particular site,
c) biodiversity values, or biodiversity-related values, prescribed by the regulations.

The subject site is not mapped as being in an area of high biodiversity value under the Biodiversity Offset Scheme. We have appended the search results.

Under Clause 7.2 of the Biodiversity Conservation Regulation 2017, the allowable clearing threshold for a lot less than 1 hectare in size is 0.25 hectare, or 2,500 square metres.

The proposed development exceeds the clearing threshold with the construction of the proposed loop road and will therefore triggers a Biodiversity Development Application Report to be prepared under the Biodiversity Conservation Act. Ecologist Tom Pollard of Birdwing Ecological has been engaged to prepare the BDAR assessment. The impacts of the development have been assessed and ecosystem credits for any clearing will be applied to the development consent along with proposed mitigation measures outlined in the report. The BDAR Report is appended to this assessment.

By entering the Biodiversity Offset Scheme the proposed development is compliant with the Biodiversity Conservation Act, 2016.

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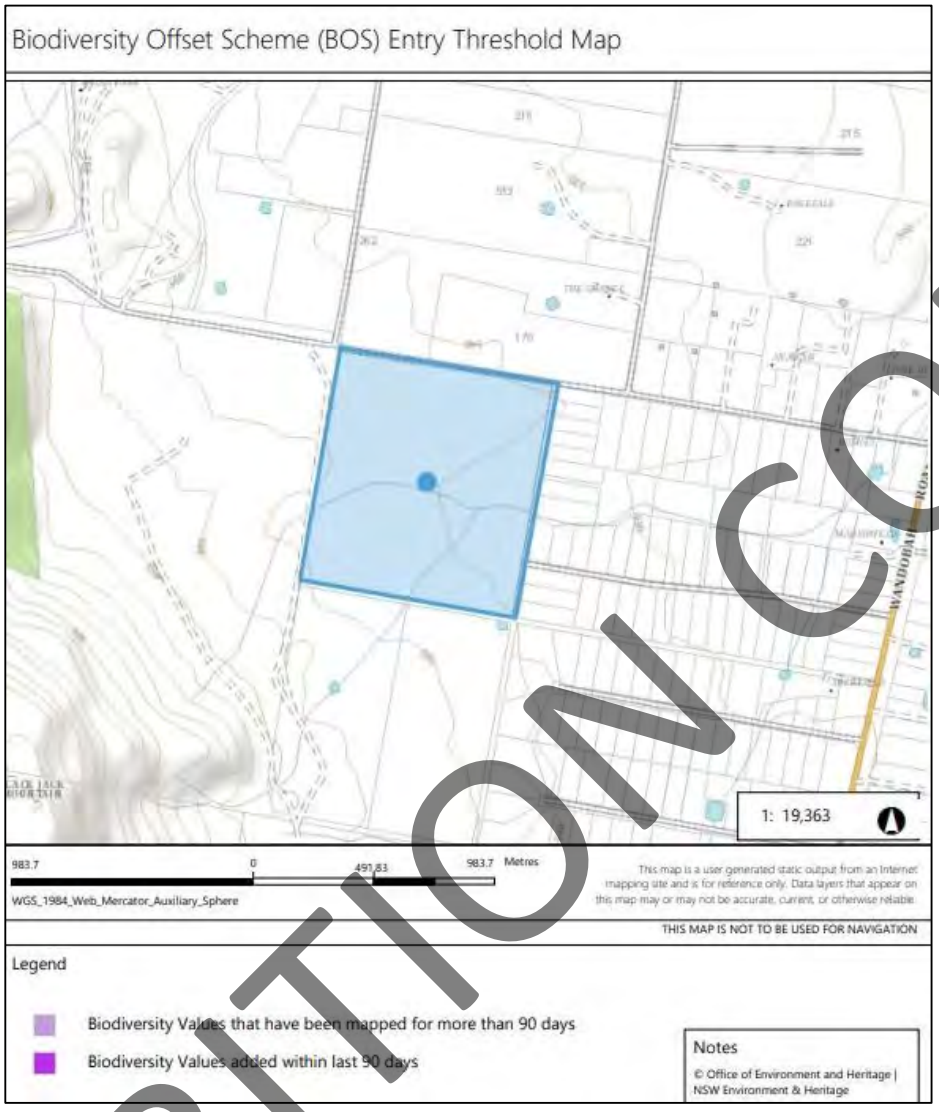

Figure 13: Biodiversity Search

9. CONTAMINATION & STATE ENVIRONMENTAL PLANNING (RESILIENCE AND HAZARDS) 2021

State Environmental Planning Policy (Resilience and Hazards) 2021 applies to each development application lodged in NSW. The objective of this policy is to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment.

The policy states that a consent authority must not consent to the carrying out of any development on land unless it has considered whether the land is contaminated.

The subject site is located adjacent to a former extractive industry, which included underground coal mining, open cut coal mining, coal loading facilities and the like. All mining activities on the adjoining property have ceased and the site is currently undergoing remediation in accordance with the resource regulator requirements.

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A Preliminary Site Investigation report has been prepared to assess the site for potential contamination by East West Enviro Ag dated November 2022. This report undertook a number of soil samples to determine any likelihood of contamination as a result of previous land uses. The report concluded that the risk for contamination from the site from previous landuses is low and the site is fit for the proposed residential development.

We believe this report addresses the requirements under SEPP (Resilience & Hazards), 2021 and no further investigations or remediation is required under the SEPP.

10. WATER MANAGEMENT ACT, 2000

The Water Management Act's (WM Act) main objective is to manage NSW water in a sustainable and integrated manner that will benefit today's generations without compromising future generations' ability to meet their needs. The WM Act is administered by NSW Department of Planning and Environment – Water (previously Department of Primary Industries Water) and establishes an approval regime for activities within waterfront land.

Controlled activity approval is typically required for work within 40 m of the highest bank of a river, lake or estuary. Section 91E of the Act outlines that it is an offense to carry out a controlled activity within waterfront land without approval. The proposed works to construct a stormwater channel is potentially a controlled activity under the *Water Management Act 2000 (WM Act).* Therefore, the development is integrated and assessment of the impact of any proposed controlled activity is required to ensure that no more than minimal harm will be done to waterfront land as a consequence of carrying out the controlled activity. Application for a controlled Activity approval will be made as part of the detailed design prior to the issue of a construction certificate.

11. HERITAGE

OzArk Environmental and Heritage has been engaged to carry out an Archaeological Assessment on Lot 27 and 28 in DP 755474 to assess the Aboriginal cultural heritage of the site. The study area covered approximately 60.5 hectares of agricultural land at 210 Bush's Lane, Gunnedah. The field survey was undertaken on 21 March 2024.

There are a total of seven Aboriginal heritage sites recorded on the property:

1. BL-IF1 (Isolated find)
2. BL-OS1 (Artefact scatter)
3. BL-OS2 (Artefact scatter)
4. BL-OS3 (Artefact scatter)
5. BL-OS4 (Artefact scatter)
6. Marshmead 2 (Artefact scatter)
7. Marshmead 4 (Artefact scatter)

These sites are scattered across the property as shown on the enclosed development plans, **Figure 7**. The land owner has decided to apply for an Aboriginal Heritage Impact Permit to enable the relocation of the artefacts to the Red Chief Local Aboriginal Land Council building. The location of the sites on

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residential properties are difficult to maintain and relocation will ensure the protection of these artefacts and greater community access to view them.

The recommendations of the report are as follows:

1. The proposed development may proceed at the study area without further archaeological investigation.
2. The planning design of the subdivision should consider the locations of the recorded Aboriginal sites (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4, Marshmead 2, and Marshmead 4) and be designed in such a way that harm to the sites is avoided or minimized.
3. If future works are proposed in the study area, then the general management principles listed in Section 9 should be followed depending on whether the recorded Aboriginal sites (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4, Marshmead 2, and Marshmead 4) can be avoided.
4. The initial purchaser of a lot with any recorded Aboriginal site must be informed of the site's location, its protection under the National Parks and Wildlife Act 1974, and the need to avoid ground disturbance.

The Aboriginal Heritage Impact Permit will be applied for prior to application for a construction certificate.

During Construction, all contractors need to be aware of the presence of Aboriginal Heritage and their legal requirements to protect these sites. Sites should be identified and fenced to exclude unauthorised access. If any additional artefacts or relics of Aboriginal heritage are uncovered during construction, contractors are to cease works immediately in this area and following the RMS unexpected heritage finds guideline (available on the RMS website).

12. ACCESS AND TRAFFIC

The proposed subdivision has frontage to the existing bitumen sealed Robert Gordon Road and gravel road, Bushs Lane. There is also an unformed crown road along the southern boundary of the development.

As part of the development in stages 2 and 3 it is proposed to construct a new 25 metre wide looped road through the development. The road will be designed to meet Austroads Guidelines and the Gunnedah Development Control Plan requirements for a Rural Residential Road, with traffic volumes of 100-500AADT, being as follows:

Travel Lane: 3m

Parking Lane: 1.5m

Full road Formation: 9m

Footpath: 8m

Total Reserve: 25m

The road will be bitumen sealed and as part of the detailed design, a geotechnical investigation will be undertaken to determine a suitable pavement design for the site. Table drains will be constructed parallel to the road on both sides within the road reserve to convey stormwater runoff to the waterway within the site or at Robert Gordon Road.

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In stage 4 Bushs Lane, when lots fronting this road are created, will be updated to bitumen seal. The road will be designed to meet Austroads Guidelines and the Gunnedah Development Control Plan requirements for a Rural Residential Road, with traffic volumes of 100-500AADT, being as follows:

Travel Lane: 3m

Parking Lane: 1.5m

Full road Formation: 9m

Footpath: 8m

Total Reserve: 25m

There is no construction of the Crown Road south of the site proposed, as this road does not service the development site and no existing holdings are disadvantaged by this road remaining unconstructed.

Intersect Traffic Pty Ltd has been engaged to prepare a traffic impact assessment (TIA) for the development. This report is appended to this application. This assessment reviews the impact of the proposed 61-lot residential subdivision including the existing road situation, traffic impacts, subdivision access and layout, parking, public transport, pedestrian, and cycleway requirements.

The TIA has estimated additional traffic as a result of this development to be 451 daily trips, 44 AM peak hour trips, and 48 PM peak hour trips. The assessment concludes that the existing road network can accommodate additional traffic and local intersections will operate with uninterrupted flow conditions. The subdivision internal road layout and subdivision design are satisfactory and safe intersection sight distance can be achieved. Concluding, that the proposed development can be supported from a traffic impact perspective as it complies with relevant requirements and will not adversely impact the local road network.

Each lot will be provided with a rural driveway constructed in accordance with the RMS Rural access for Single Unit Truck and Gunnedah Shire Council's standard detail as shown in **Figure 14**. It will be determined during detailed design if a concrete pipe or dish is most appropriate for each driveway. The finished driveway levels and details of the proposed stormwater drainage will form part of the construction certificate documents.

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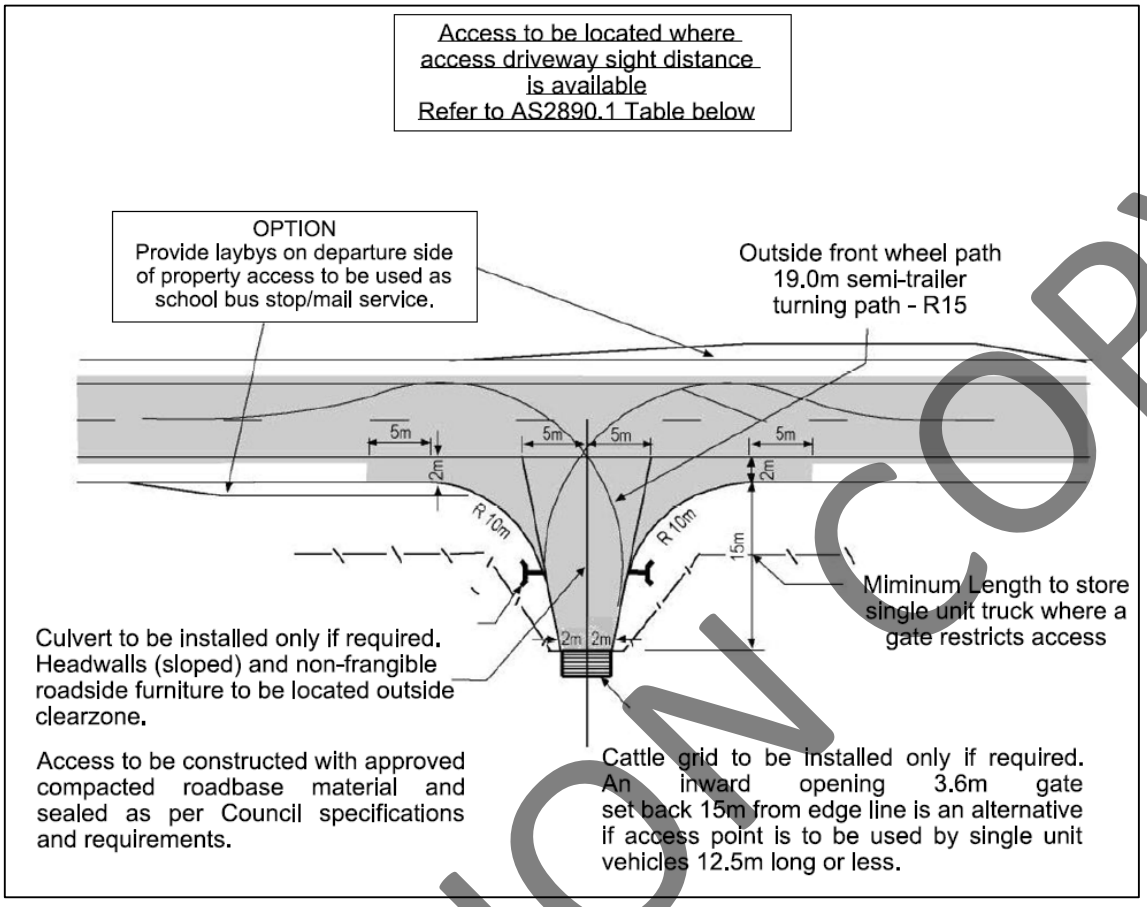

Figure 14: Driveway for Single Unit Truck (RMS)

We believe the proposed development meets the Gunnedah Development Control Plan and Engineering Guidelines for subdivision and development road access requirements and the TIA demonstrates that the development does not require any existing road infrastructure upgrades to meet the Roads and Maritime Service or Austroad requirements.

13. SERVICE STRATEGY

Please refer to the attached Site Servicing Strategy Report for this development.

VOLUNTARY PLANNING AGREEMENT (VPA)

During the rezoning of this property, it was identified that the Gallen water reservoir which services this area, did not have adequate pumping equipment to cater for the development. A Voluntary Planning Agreement (VPA) was entered by the land owner to pay for upgrades to this system to enable servicing. This VPA is titled:

170 and 210 Bush's Lane Planning Agreement under s7.4 of the Environmental Planning and Assessment Act 1979

It should be conditioned that the VPA is enacted by payment of the outlined contribution prior to the issue of a construction certificate.

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HEADWORKS CHARGES

It is requested that this application is conditioned so that headworks contributions or charges are applied prior to issue of the subdivision certificate for each stage. Noting that headworks will not apply until the value of VPA contribution is reached. The development will not be utilising the water services until this time, and we believe this is aligned with the community expectations.

14. BUSHFIRE PRONE LAND

We have conducted a search and the subject site is not mapped as Bushfire Prone Land in the Gunnedah Shire. **Figure 15** shows an extract of the Bushfire Prone Land surrounding the site. Although the subject site is not bushfire prone, it is evident that there are large areas of bush fire prone land in the site's vicinity. To mitigate risk the subdivision design allows for two way exit via the looped road rather than a cul-de-sac design. There are no requirements under the Rural Fire Service Act for this development.

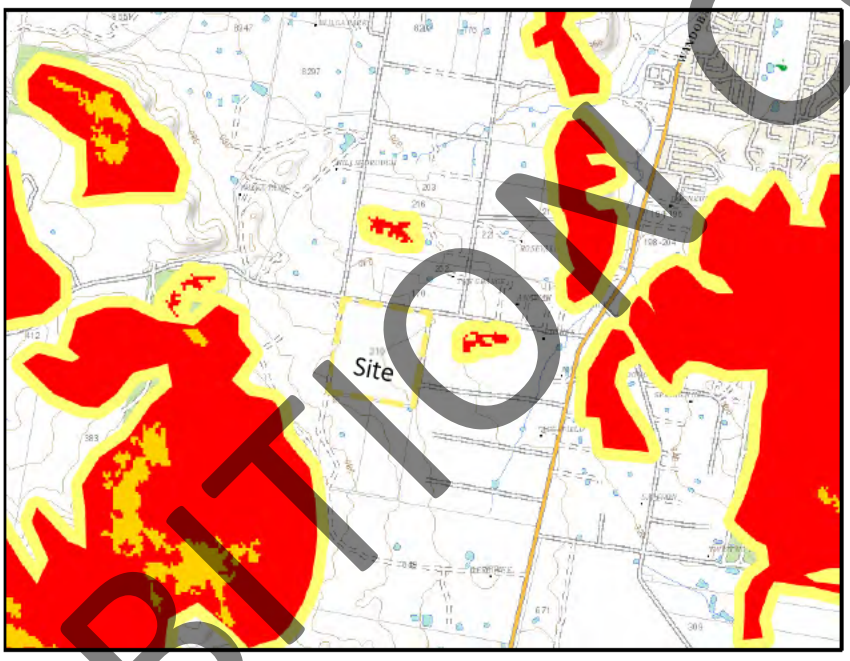

Figure 15: Bushfire Prone Land (Eplanning Portal)

15. FLOOD PRONE LAND

The subject site is not mapped as flood prone land in the GLEP, as shown in **Figure 16.**

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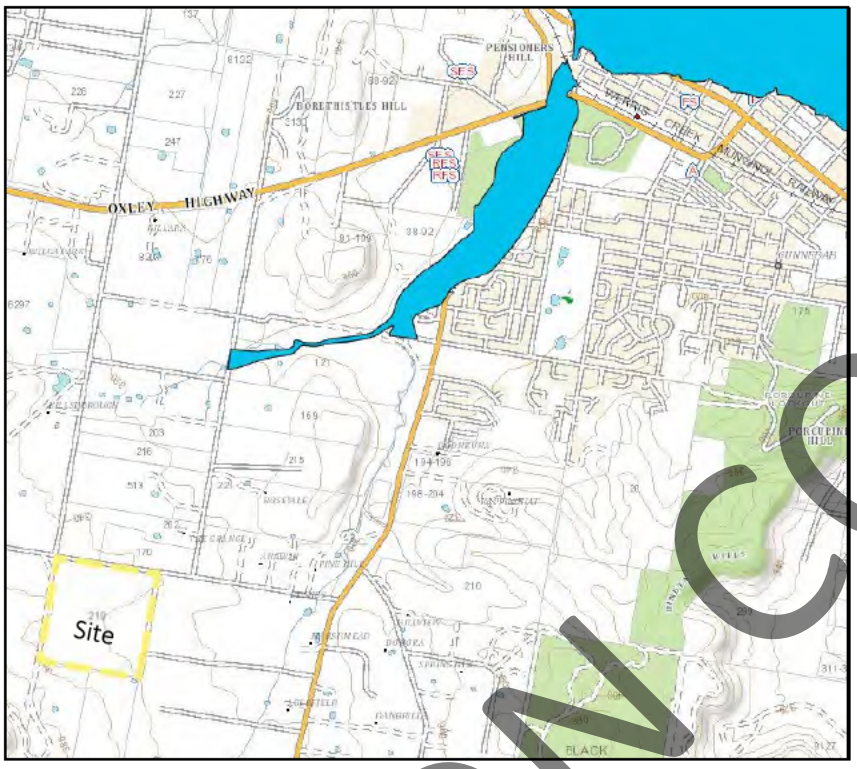

Figure 16: Flood Planning under the GLEP, 2012 (ePlanning Portal)

16. SUMMARY OF ENVIRONMENTAL ISSUES

The subdivision will cause the following:

- Creation of 61 additional residential lots over four (4) stages.
- Pump upgrades to the Gallen Reservoir to improve water supply in this area, as outlined in the VPA.
- Extension of water services to 61 lots.
- Proposed construction of new 25 metre wide road reserve in stage 2 & 3.
- Update to Bushs Lane to construct a bitumen Road and widen the road reserve to 25 metres in stage 4.
- Construction of 61 new property access driveways.
- Construction of formed waterway and detention basis as identified in the Stormwater Management Plan, to adequately mitigate increased stormwater runoff from the development.
- Clearing of vegetation triggering the Biodiversity Offset Scheme as identified in the BDAR report.
- Disturbance to sites of Aboriginal Heritage triggering requirement for a Heritage Impact Permit.

The development will result in an increase in traffic and demand on services and town infrastructure. However, this will be offset by the economic benefit of the development, additional rates paid by land owners and VPA contribution to the Gallen Reservoir upgrade.

Steps should be taken to mitigate any potential environmental impacts caused by the development. Construction works are extensive, including cut and fill for the new road construction, battering of

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footpath areas, service extension and construction of driveways at the property. These disturbances should only be temporary and return to normal when work is completed.

All construction waste will be transported to a licenced waste management facility by the land owner.

The following table provides a summary of the mitigation measures recommended in this statement of environmental effects report. These mitigation measures are to be implemented throughout the construction and operation phase of the project.

Table 3: Proposed Mitigation Measures

Issue	Mitigation Measure
General	All construction works will be carried out by licenced trades persons and experienced civil earthworks contractors.
Noise	Carefully check all plant and equipment to ensure they are in good working order producing minimal noise in accordance with industry best practice Where practical operate machines at low speed or power and switch off when not in use. Machinery is to be operated in accordance with manufacturers recommendations. Works to be carried out during normal day time hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm). No work is permitted outside these hours
Air Quality	Cover all open trucks transporting spoil and fill to and from the site. Once construction is complete, stabilise all exposed areas so natural revegetation can occur Prohibit burning of timber and other combustible materials Regularly inspect and maintain all construction equipment to reduce the potential for excessive emissions Cease construction works if extreme wind conditions prevail
Traffic & Transport	New driveway construction to be in accordance with AS2890, the RMS standard detail for Rural Driveway – Single unit truck and Gunnedah Shire Council's Engineering Guidelines for Subdivision and development. Street signage shall be installed including street name for the new road, and a give way sign at each intersection. All driveways are to be bitumen sealed from the road formation to the property boundary.
Flora and Fauna	Include flora and fauna management measures (including weed management strategies) in the CEMP Ensure no tree or shrub clearing without project superintendent approval Where required, mark boundaries of trench with tape on site to ensure that the extent of disturbance is minimised as far as practical Rehabilitate trench and disturbance area as soon as practical to allow for regeneration No chemicals, herbicides or pesticides are to be used at this site If any native fauna is found within the project site area, works will stop and fauna relocated or WIRES will be contacted. If any damage occurs to vegetation outside of the boundaries of the work site as a result of the construction works, the Project Manager will be notified and will establish strategies for mitigation of impacts and site restoration. Works are not to harm threatened fauna

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	Works are not to create a barrier to fauna movement
Cultural Heritage	Application for an Aboriginal Heritage Impact Permit is to be made to relocate all items of Aboriginal Cultural significance identified in the Heritage Assessment for this development. This application is to be prepared by a suitably qualified archaeologist. If any additional artefacts or relics of Aboriginal heritage are uncovered during construction, cease works immediately in this area and following the RMS unexpected heritage finds guideline (available on the RMS website) Ensure all project staff and sub-contractors are advised of their legal responsibilities under the National Parks and Wildlife Act 1974 and the Heritage Act 1977 All Recommendations in the Ozark Aboriginal Cultural Heritage Assessment Report for the development are to be followed:
Stormwater and Water Quality	Implement all measures outlined in the Stormwater Management Plan for this development. No dirty water may be released into drainage lines and/or waterways. Water quality control measures are to be used to prevent any materials (e.g. concrete, grout, sediment etc) entering drain inlets or waterways. Measures to control pollutants from stormwater and spills will be investigated and incorporated in the pavement drainage system at locations where it discharges to the receiving drainage lines. Measures aimed at reducing flow rates during rain events and potential scour will also be incorporated in the design of the pavement drainage system. Implement an erosion and sediment control plan and put in place temporary measures such as straw bales and silt fences to minimise the potential for sediment laden runoff entering watercourses. In the event of a chemical, fuel or sediment leak or spill clean-up immediately to a state which is no less than its condition prior to the discharge.
Soil and Erosion	Site management will incorporate best management erosion and sediment control practices such as those found in the Department of Housing's "Blue Book (4th Edition) on erosion and sediment control. Linear silt stop fencing to be installed down slope of all affected areas and stockpiles. Silt fencing will be installed before excavation begins. Sandbags, hay bales wrapped in geotextile fabric etc. will be used to slow water flow and trap sediment. No straw bales are to be used. Any overburden will be placed in the form of a bund upslope of the site where necessary to reduce surface water entering the site. All erosion and silt control devices will be visually inspected weekly to ensure effectiveness as well as after each rainfall event. Prevent sediment moving off-site and sediment laden water entering any water course, drainage lines, or drain inlets. Reduce water velocity and capture sediment on site. Where possible, divert clean water around the site
Waste Management	All surplus material, off cuts, and other debris resulting from the work shall be removed from site and disposed of to a licensed waste management facility, such as the Gunnedah Waste Management Facility located on Quia Road. Waste material, other than vegetation and tree mulch, is not to be left on site once the works have been completed. Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day. All demolition works to be undertaken in accordance with Australian Standard AS 2601 – 2001, The Demolition of Structures.

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17. CONCLUSION

This development will enable 210 Bush's Lane, Gunnedah, to be subdivided into sixty-one (61) rural residential lots with an area exceeding 9000 square metres, for residential occupation.

The development is similar to other residential lots within the vicinity of the site and provides additional housing and more efficient use of the land. This proposed subdivision will not cause any major alterations to existing land uses on the site or conflicts with surrounding land uses. The environmental impacts of the development managed by the mitigation measures outlined above the development should have no long term adverse impacts on the environment.

It is believed the subdivision concept complies with the provision of the LEP and with approval of the requested variations to the DCP is permissible with council consent.

The site is located adjacent to the current R5 Large Lot Residential zone and well serviced along part of the site with efficient extension of services available. The proposed development meets the both local and regional planning provisions and will allow the site to be developed into rural residential holdings. This will meet a shortcoming in residential supply in Gunnedah and assist in making Gunnedah a vibrant place to live.

This Statement of Environmental Effects has been prepared by our office to accompany a council application. To the best of our knowledge, the content of this statement is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

EXHIBITION COPY

REFERENCES

Department of Lands, *Spatial Information Exchange,* Available at [https://six.maps.nsw.gov.au/wps/portal/]. Abbreviated as DL SIX

New South Wales Government, *Gunnedah Local Environmental Plan 2012,* Available at [http://www.legislation.nsw.gov.au]

Gunnedah Development Control Plan, available at [https://www.gunnedah.nsw.gov.au/index.php/development/landuse-planning/development-control-plan]

Google Mapping, Available at [http://maps.google.com.au/]

Aboriginal Heritage Information Management System (AHIMS) Web Services, Available at [https://www.environment.nsw.gov.au/awssapp/]

NSW ePlanning Spatial Viewer available at [www.planningportal.nsw.gov.au/spatialviewer]

EXHIBITION COPY

APPENDIX A

CONCEPT PLAN FOR PROPOSED SUBDIVISION OF LOTS 27 & 28 DP755474, 210 BUSHS LANE, GUNNEDAH, PREPARED BY STEWART SURVEYS PTY LTD, DATED 9 JULY 2025, REF: 5448. SHEET 1-2.

LANDSCAPE PLAN PROPOSED SUBDIVISION OF LOTS 27 & 28 IN DP 755474, 210 BUSHS LAND, GUNNEDAH, PREPARED BY STEWART SURVEYS PTY LTD, DATED 9 JULY 2025, REF 5448 SHEET 1-2.

EXHIBITION COPY

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (17 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

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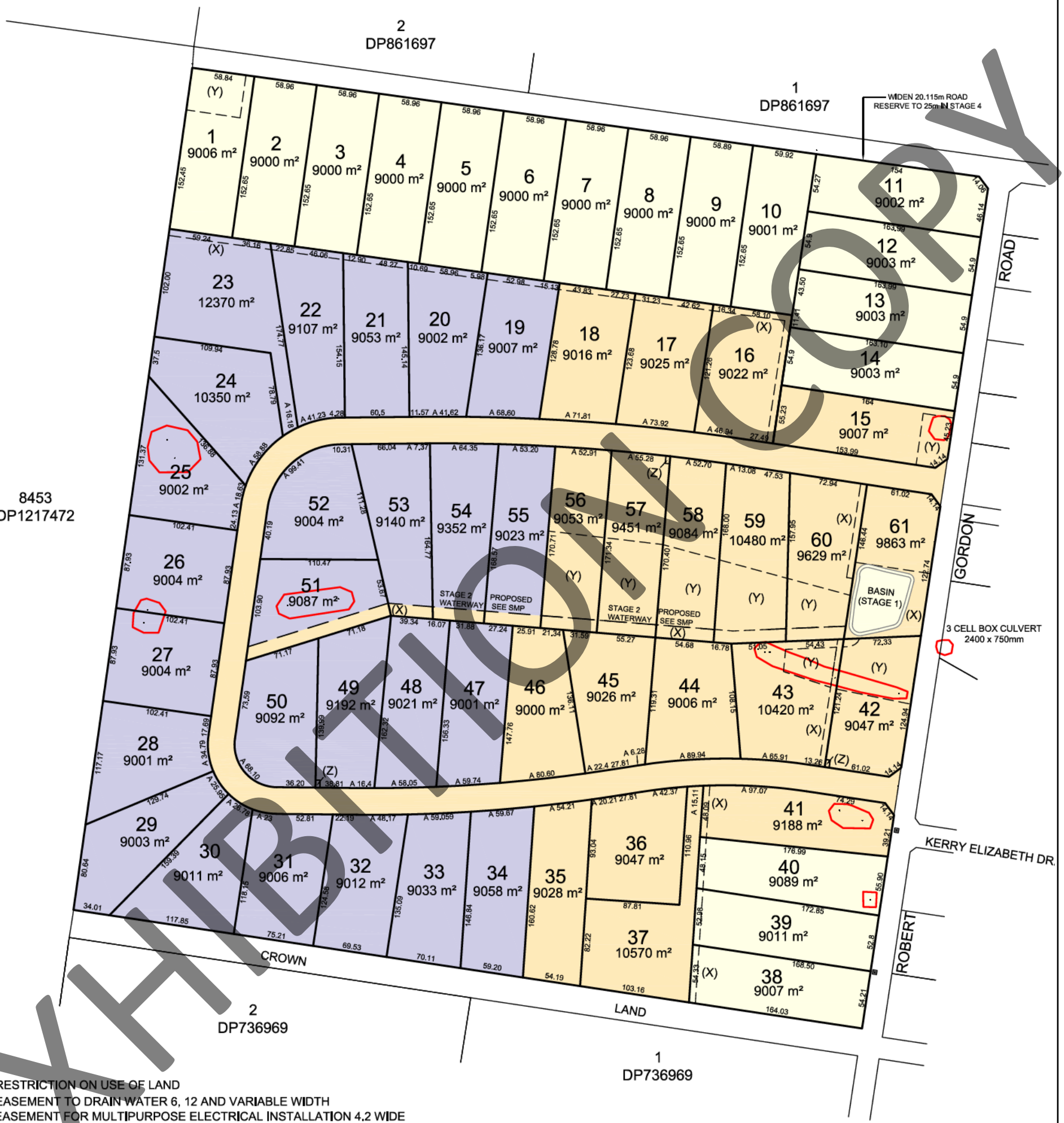

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400
REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

EXHIBITION COPY

Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH STAGING PLAN

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KS | Scale: 1:4000 @ A3 | Sheet: 1

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

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W E
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(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

EXHIBITION COPY

Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH AERIAL PHOTO

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 2

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

NOTE - ALL STREET TREE PLANTING TO BE UNDERTAKEN IN STAGE 3

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N W E S

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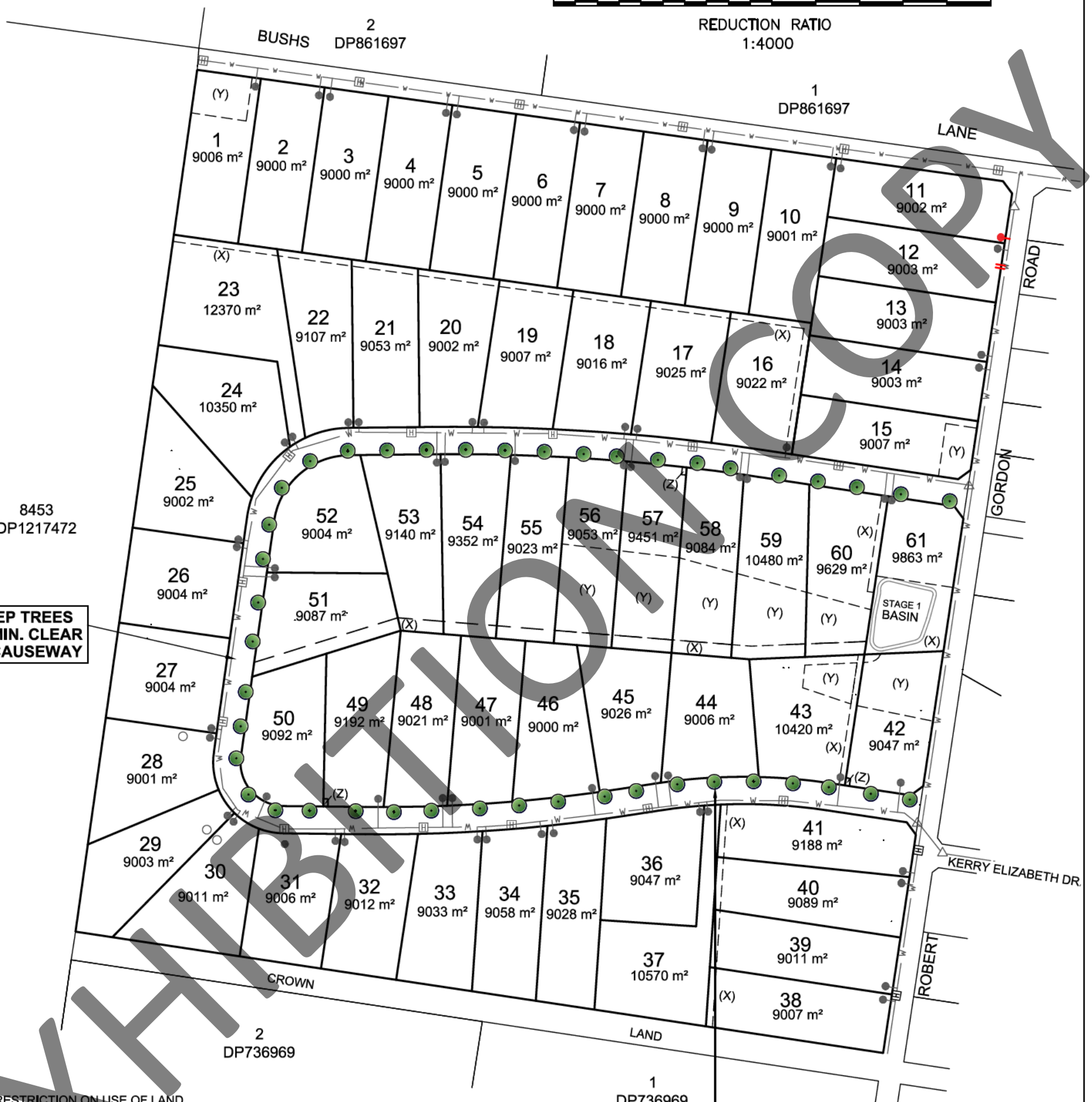
REDUCTION RATIO
1:4000



(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

PROPOSED STREET TREE PLANTING
PLANTING IN NEW ROAD RESERVE
APPROXIMATE SPACING 36m
REFER SHEET 2 FOR SETOUT GUIDELINES AND DETAILS

PLANT SCHEDULE

SYM	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT & SPREAD	POT SIZE	QTY
STREET TREES					
+	Jacaranda mimosifolia	Jacaranda	15m x 8m	5 Litre	43

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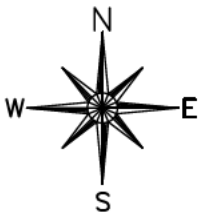
Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

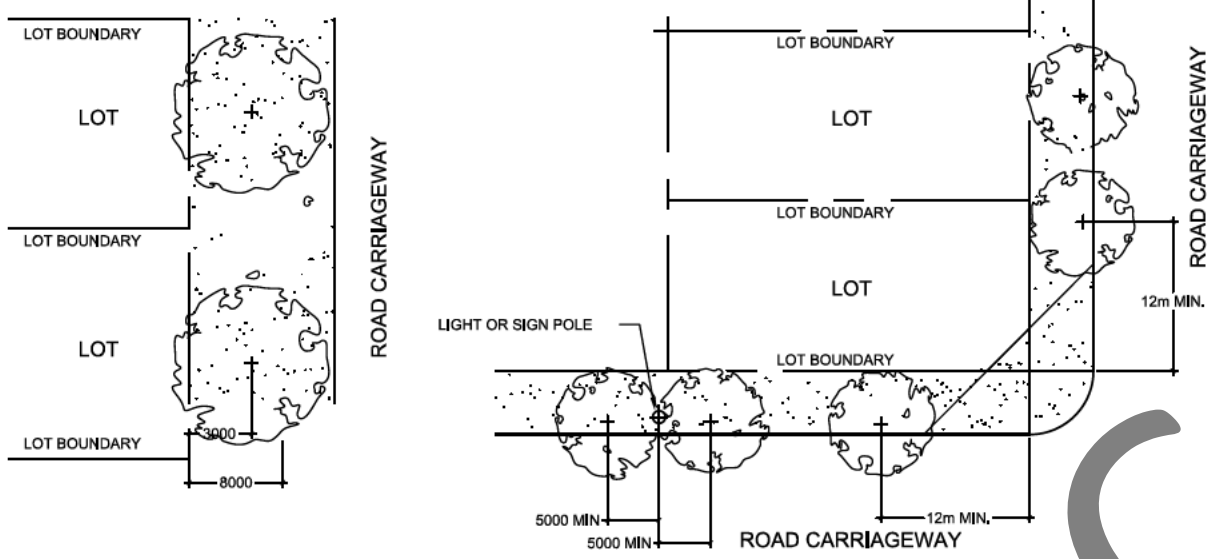
DESCRIPTION: **LANDSCAPE PLAN**
PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474
210 BUSHS LANE, GUNNEDAH

Date: 3 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 1

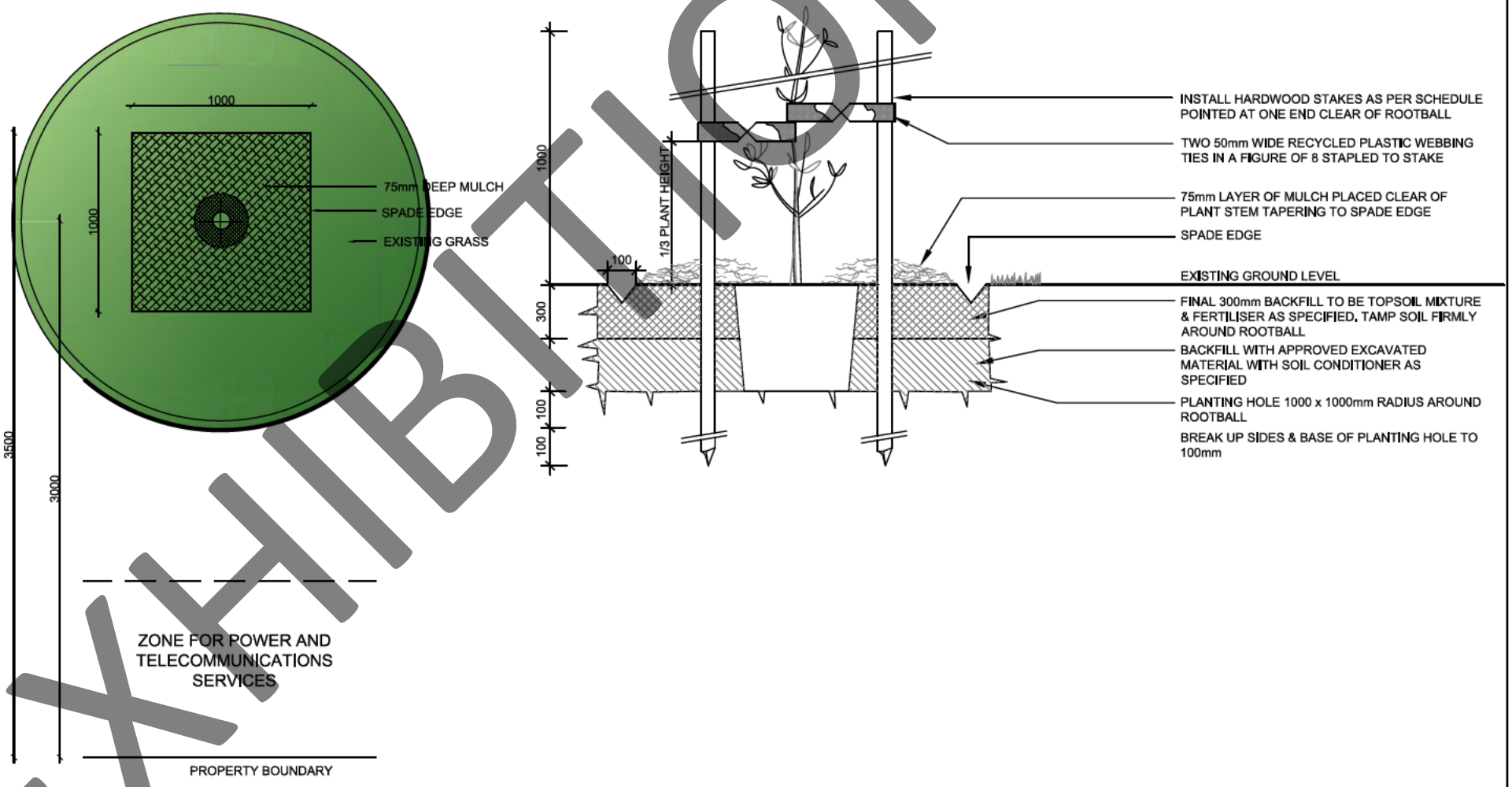


CENTERLINE OF STREET TREES ARE TO BE SETOUT 3m FROM PROPERTY BOUNDARY
1.0 MIN. 5m CLEARANCE FROM DRIVEWAYS
2.0 MIN 5m. CLEARANCE FROM SERVICE LINES INTO LOTS
3.0 MIN. 5m CLEARANCE FROM LIGHT POLES
4.0 MIN. 5m CLEARANCE FROM STORMWATER OUTLETS
5.0 MIN. 3m CLEARANCE FROM STORMWATER PITS
6.0 MIN. 8m CLEARANCE FROM ROAD CORNER/INTERSECTION
7.0 MIN. 7m FROM PEDESTRIAN CROSSINGS
8.0 GENERALLY PLACED CENTRALLY TO LOT BOUNDARIES

FINAL LOCATION OF STREET TREES TO BE DETERMINED ON SITE AS INSTRUCTED BY SUPERINTENDENT



1 STREET TREE SETOUT DETAIL



2 TYPICAL STREET TREE PLANTING

EXHIBITION COPY

Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: **LANDSCAPE PLAN** PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH

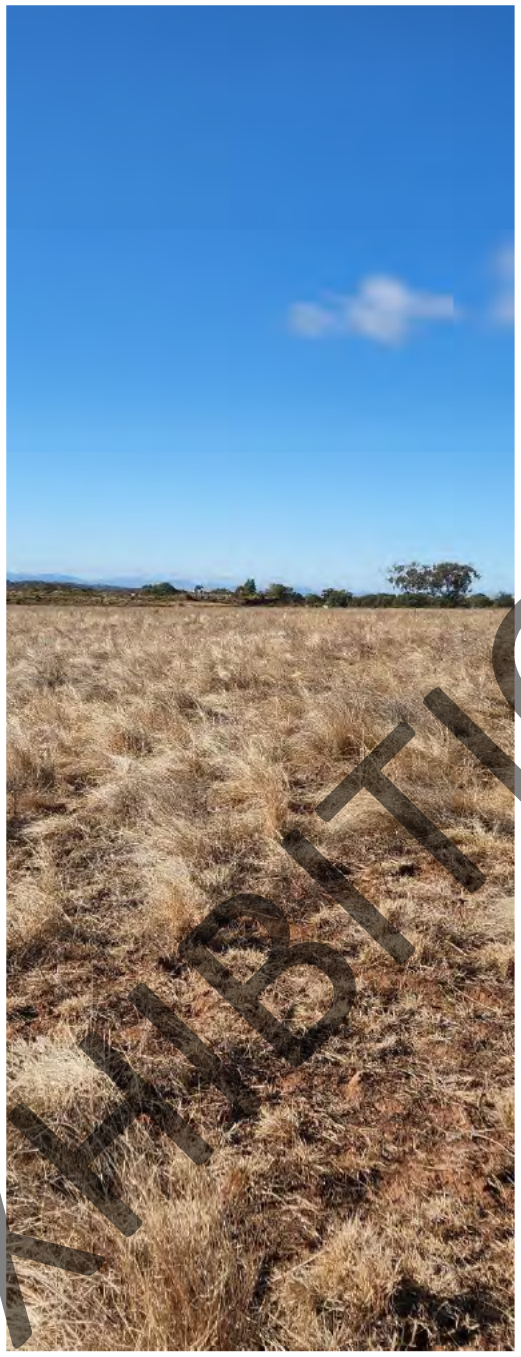
Date: 3 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 2

APPENDIX B

PRELIMINARY SITE INVESTIGATION, LOT 27 & 28 DP755474, 210 BUSH'S LANE, GUNNEDAH NSW 2380. PREPARED BY EAST WEST TAMWORTH, DATED 4TH NOVEMBER 2022.

GSG LABORATORIES, EXTENSION WORKS PRELIMINARY SITE INVESTIGATION, PREPARED BY EWING REAL ESTATE, 210 BUSHS LANE, GUNNEDAH

EXHIBITION COPY



Ewing Real Estate

Preliminary Site Investigation

Lot 27 and 28 DP 755474

210 Bushs Lane, Gunnedah, NSW, 2380

EXHIBITION COPY

Document ID: EW221364
Issued By: Stephanie Cameron
Issue No: 1
Date of Issue: 04/11/2022

results you can rely on

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TAMWORTH NSW 2340
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This document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. This document should not be used or copied without the written authorisation of East West Enviroag Pty Ltd for Ewing Real Estate.

Stephanie Cameron demonstrates the relevant qualifications, competencies, and experience appropriate to undertake this site investigation under Schedule B9 of the National Environment Protection (Assessment of Site Contamination) Measure 1999. Stephanie holds current membership of the Australian Contaminated Land Consultants Association, the Royal Australian Chemical Institute, the Australasian Land and Groundwater Association, and Soil Science Australia.

East West is a long-established Tamworth-based laboratory undertaking environmental, construction, and agricultural testing. East West is accredited with the National Association of Testing Authorities and the Australasian Soil and Plant Analysis Council. East West have been successfully involved in many environmental sampling and monitoring projects for over the past 15 years.

This report does not provide a complete assessment of the environmental integrity of the site and is limited to the scope defined herein. Should any reader require that other matters be considered apart from those considered within this report, they should then make their own investigations and form their own conclusions.

This report has been prepared by:

Stephanie Cameron
B. App.Sci

Ainslee Roser
B. Env.Sci & Mgt

Issue	Rev.	Date	Author	Approved	Issued To
Final	01	4 November 2022	A.Roser	S.Cameron	S.Cameron

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EXECUTIVE SUMMARY

East West was requested to conduct a preliminary site investigation on behalf of Ewing Real Estate, to investigate the past use Lot 27 and 28 DP 755474 (210 Bushs Lane, Gunnedah, NSW) in the Parish of Gunnedah, County of Pottinger, and Local Government Area of Gunnedah Shire Council. The lot is currently owned by 2728 Pty Ltd.

The objective of this preliminary site investigation is to determine whether previous use has contaminated the site, and will assess the suitability of the site for its proposed use or the need for further investigation or site sampling in accordance with National Environment Protection Measures (NEPM) guidelines (National Environment Protection Council, 2009). The scope of works included a desktop investigation with site environmental screening, a site history search including historical aerial photographs, and a site field investigation.

Site history shows the site has been held primarily by former agricultural proprietors (including a dairymen), clerks and linesman. The current owner, who has owned the property since March 1990. A site inspection was conducted on 28 July 2022 where photos were taken and the site was assessed for possible contamination risks and obvious signs of surface contamination. As a result of previous use as light agricultural the potential for contaminants of concern includes Total recoverable hydrocarbons (TRH), BTEX, OCP, OPP and heavy metals.

Contaminants of potential concern were not identified in soil samples at concentrations in excess of assessment criteria in all samples analysed. No further testing is recommended.

Considering the assessment contained within this report, East West has determined the risk of contamination of the site from previous use as being low for the proposed residential development.

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1. Introduction

East West has been engaged by Kathryn Stewart of Stewart Surveys Pty Ltd on behalf of their client Ewing Real Estate to carry out a preliminary site investigation on the site held as Lot 27 and 28 DP 755474 (210 Bushs Lane, Gunnedah, NSW) in the Parish of Gunnedah, County of Pottinger, and Local Government Area of Gunnedah Shire Council.

The assessment was conducted as required by the EPA guideline 'Contaminated Land: Guidelines for Consultants Reporting on Contaminated Land' (NSW EPA, 2020) and consists of:

- Identifying all past and present potentially contaminating activities;
- Identifying potential contamination types;
- Discussing the site condition;
- Providing an assessment of site contamination; and
- Assessing the need for further investigation.

The scope of work undertaken in this report comprises of:

- Compilation of a site history covering the last 100 years;
- Historical aerial photographs;
- Detailed inspection of the site; and
- Analysis of the results and recommendations for the site.

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2. Scope of works

The scope of work undertaken relates solely to the site known as Lot 27 and 28 DP 755474 (210 Bushs Lane, Gunnedah, NSW).

The scope of work undertaken in this preliminary site investigation comprises:

- A description of the site and a summary of site history;
- Assessment of potential for contamination;
- Systematic sampling of the site with enough samples taken for adequate site characterisation;
- Systematic grid-sampling of one onsite stockpiles;
- Details of sampling and analysis;
- Development a conceptual site model characterising site contamination based upon available data; and
- Analysis of the results of the investigation and conclude with any recommendations about the site

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3. Site description

The site is situated within the locality of Gunnedah, approximately five kilometres south-west of Gunnedah's main centre with an approximate area of 598,500 m^2 (59.85 hectares).

The site is currently owned by 2728 Pty Ltd who have owned the property since April 2012 (InfoTrack, 2022). It is understood that the site is proposed for rezoning to R5 – Large Residential Lots and subdivision of the site into 61 separate lots.

The site is zoned as RU4 – Primary Production Small Lots under the Gunnedah Local Environment Plan 2012. The site comprises agricultural land with cropping across the site and an ephemeral creek line through the property that feeds into a dam on site (Figure 1) One existing stockpiles reside on the site which appears to be excess fill from a surrounding development (Figure 33). This stockpile was assessed for potential contaminants (Appendix D)

The site has frontage to Bushs Lane and Robert Gordon Road. The site is surrounded by farmland to the north, west and south, with a recent residential development to the east (approximately 10 years ago as identified through historical aerial imagery (Google Earth)). Dense vegetation lines the site on the property to the west, with sparse tree lines along the creek line and on the southern border of the site. The site is dominated by native and exotic grasses, with cropping activities being undertaken on site at the time of the site inspection (ploughing), with moderate slopes toward the east/south-east from the site.

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Figure 1 210 Bushs Lane (April 2022 – Google Earth)

3.1. Land Use

The site is currently vacant and has been vacant since at least the 1950s as assessed by historical aerial imagery (NSW Government Spatial Services, 2022).

The site is located in a region that has been historically used for agricultural activities. Agricultural activities include mixed farming of dairy cattle, other stock and grain crops. Livestock and grain farming are major land uses. Figure 2 and Figure 3 show the site in its current condition

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3.1.1. Neighbouring land use

The site is surrounded by other mostly empty rural lots zoned RU4 - Primary Production Small Lots to the north and south consisting of agricultural properties, RU1 – Primary Production to the west with dense vegetation and access roads and R5 – Large Lot Residential to the east. The Oxley Highway is 2.7 kilometres north. The nearest business (Gunnedah Mower and Chainsaw Centre) as identified through aerial imagery is located at 78 Bushs Lane, Gunnedah approximately 700 metres east of the site.

The land to the west of the site was historically used for mining activities (refer to Figure 12 and Figure 13). From this aerial imagery there appeared to be a coal washery adjacent to the north western border of the site, and as such runoff from the washery may have run onto the site. This mining site has been remediated as shown on current aerial imagery.

3.2. Geology and hydrogeology

According to the NSW 1:250,000 Geological Series Sheet, the bedrock geology of the site primarily consists of the Gladstone Formation (sandy shale, shaley sandstone, limestone and coal) from the Upper Permian period, with alluvium (clay, silt, sand and gravel) from the Quaternary period in the north-eastern portion of the site.

The nearest surface water is an ephemeral creek line that runs through the site, and an onsite dam. Groundwater runoff primarily travels towards the east/south-east. There are no published groundwater bores on site according to the Water NSW website. There are two published groundwater bores within 500 metres of the site; one to the south-east, and one to the north-east of the site that may be impacted by any potential contaminants on site (GW900537 and GW044880) (Figure 6). Groundwater data from the Bureau of Meteorology's 'Australian Groundwater Explorer' has been used to populate Figure 6.

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Figure 2 View to the south-east as from SP10 sample location

Figure 3 View to the north from SP10 sampling location

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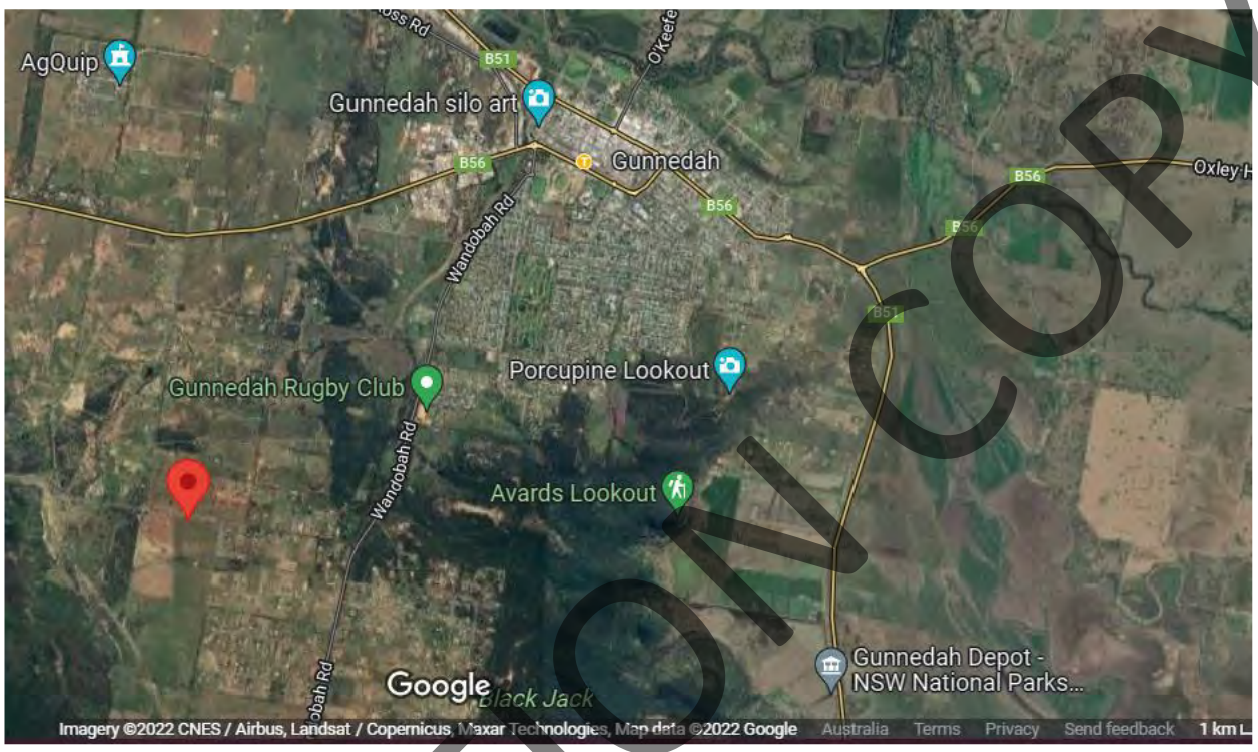

Figure 4 Regional locality plan demonstrates the location of the site (red pin) in reference to the town of Gunnedah and surrounds (source: Google maps August 2022)

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Figure 5: Surrounding land use in relation to the location of the site (red pin) (Source: Google maps August 2022).

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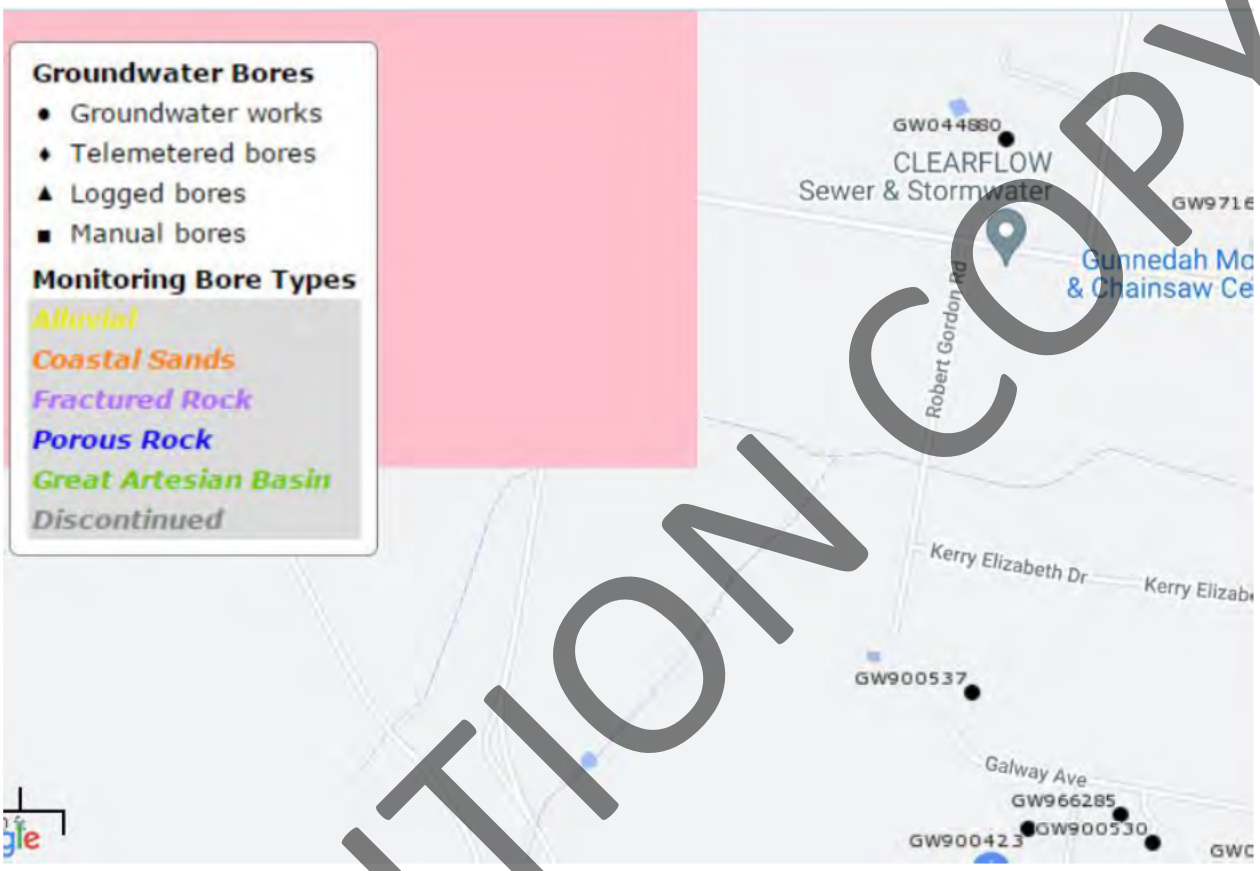

Figure 6 Groundwater bore data available from Water NSW on 4 August 2022 within 500 metres of the site. Data for those bores is located below

Table 3-1 Groundwater bore data sourced from the Bureau of Meteorology's 'Australian Groundwater Explorer' on 4 August 2022

Bore ID	State	Bore Depth (m)	Drilled Date	Purpose	Status	Latitude	Longitude
GW900537.1.1	NSW	49.63	29/03/1993	Water supply	Unknown	-31.019428	150.21099
GW044880.1.1	NSW	Unknown	Unknown	Water supply	Unknown	-31.009261	150.211696

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4. Site investigation

4.1. Local site history

A site historical information review was conducted in order to ascertain historical past use of the site for the last one hundred years. The site history was provided by InfoTrack and includes a review of historical deeds, easements and leases. The site history is available from 1909. To ascertain a better picture of the site's history, selected aerial photographs have been included.

The site is currently owned by 2728 Pty Ltd who have owned the property since April 2012 (InfoTrack, 2022). Other previous owners were shown by the site history search to have been primarily former agricultural proprietors (including a dairymen), clerks and linesman. Aerial photographs illustrate changes to the site from 1956 onwards (Figure 7 to Figure 11).

Aerial photographs were included in the history search to determine if the site had been developed or used for purposes other than agricultural practices. Clear historical aerial photographs were only available from 1956, which illustrates that the site proposed for subdivision has not been subject to historical development. Dairyman ownership was from 1927 to 1958, and the 1956 aerial photograph does not show any sheds or infrastructure required for extensive dairy practices, therefore the farming practices undertaken on site are considered to be general agricultural practices.

There are currently no documented leases or easements on the site. The summary of owners' report can be found in Table 4-1 through to Table 4-3.

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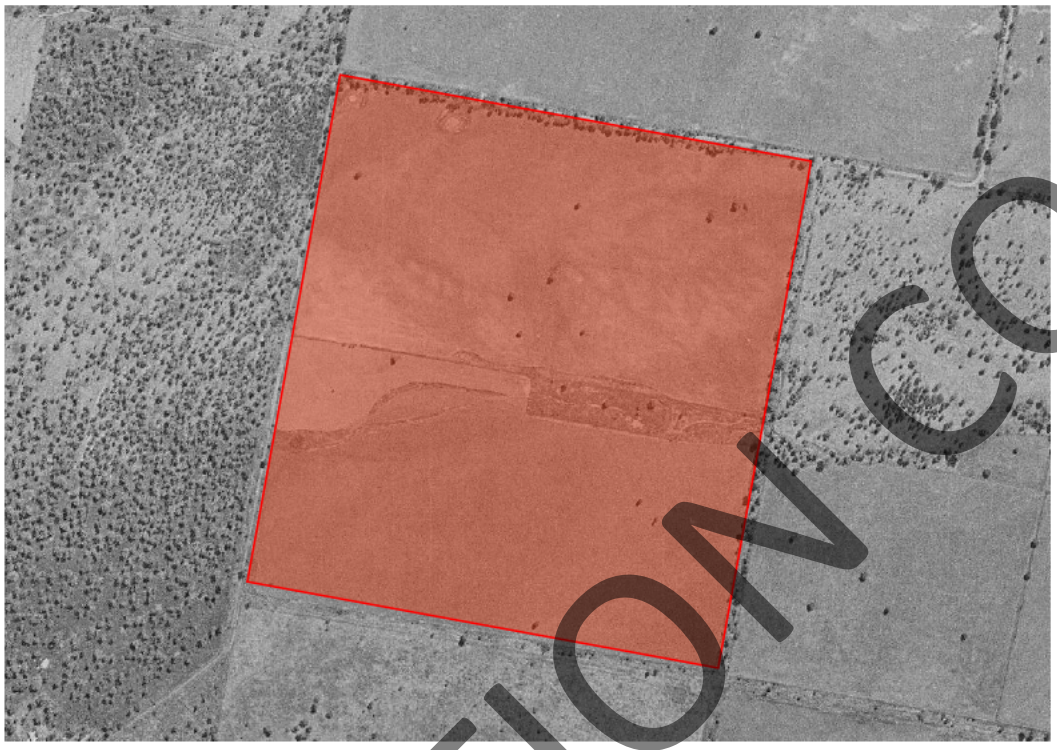

Figure 7 Historical aerial photograph of the site (development area shown in red) from August 1956

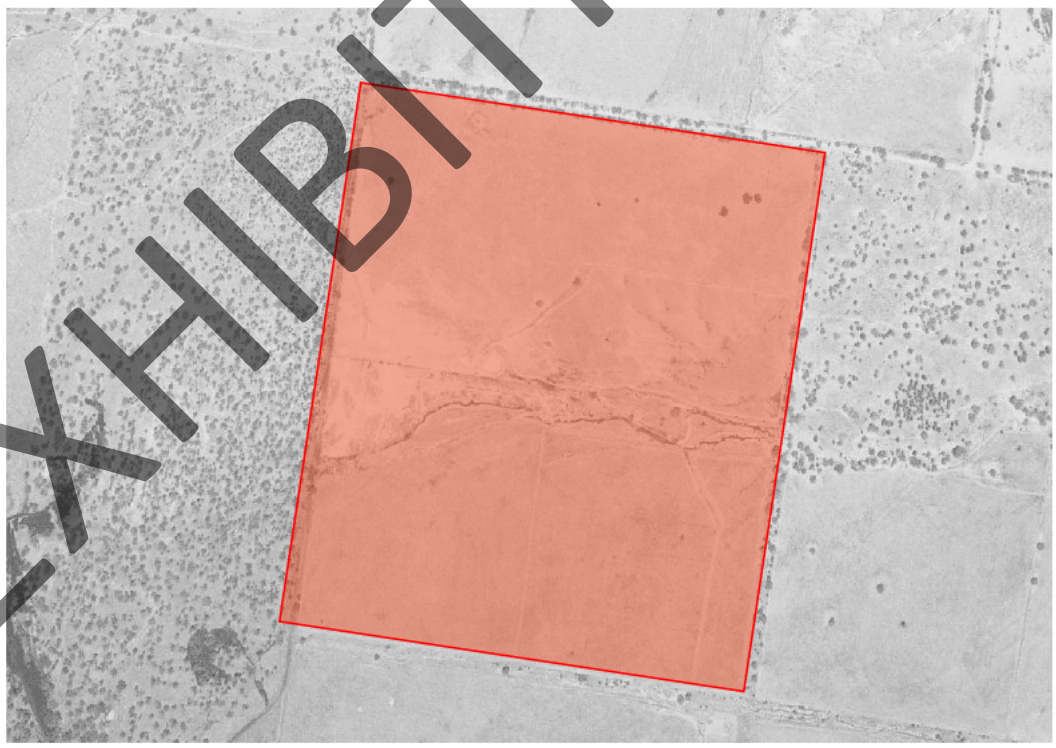

Figure 8 Historical aerial photograph of the site (development area shown in red) from October 1966

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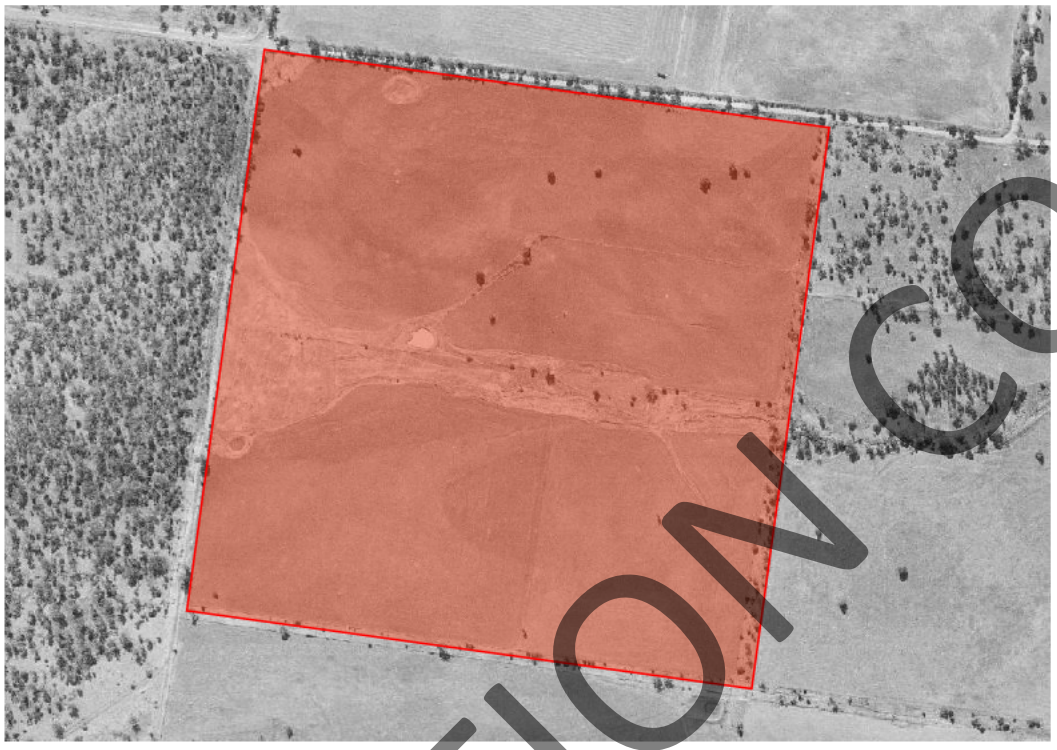

Figure 9 Historical aerial photograph of the site (development area shown in red) from June 1975

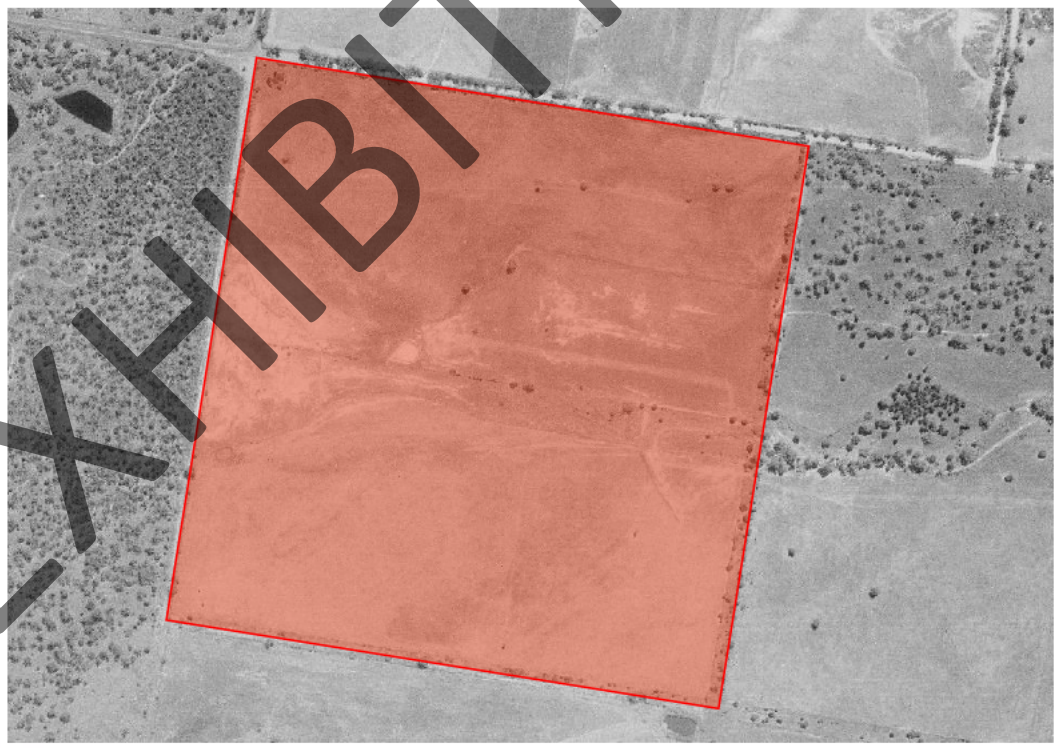

Figure 10: Historical aerial photograph of the site (development area shown in red) from March 1984

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Figure 11 Historical aerial photograph of the site (development area shown in red) from August 1998

Figure 12: Mining activities west of the site in 1984 (development area shown in red)

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Figure 13 Mining activities west of the site in 1998 (development area shown in red)

Table 4-1 Summary of owners' report for Lot 27 D.P. 755474

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
27.02.1909 (1909 to 1909	Edward Joseph Bowling	Volume 1961 Folio 57
29.04.1909 (1909 to 1923)	Robert Mitchell Walker (Farmer)	Volume 1961 Folio 57
29.09.1923 (Noted on title)	Surrendered	Volume 1961 Folio 57 Now Crown Land
14.11.1922 (1922 to 1927) (Noted on Crown Plan)	Robert Mitchell Walker (Farmer)	Crown Tenure Conditional Purchaser 1922/17 Gunnedah
19.01.1927 (1927 to 1958)	Thomas Finley (Farmer and Dairyman)	Crown Tenure Conditional Purchaser 1922/17 Gunnedah (Book 1466 No. 144) Now Volume 7430 Folio 27
07.03.1958 (1958 to 1958)	Edith Emily Finlay (Widow) Arthur Thomas Finlay (Mechanic)	Volume 7430 Folio 27

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Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
17.09.1958 (1958 to 1971)	Robert Abraham Ashford Alford (Farmer)	Volume 7430 Folio 27
17.05.1971 (1971 to 1972)	Stephen Early Alford (Clerk) Malcolm John Robinson (National Servicemen) (Section 94 application not investigated)	Volume 7430 Folio 27
20.10.1972 (1972 to 1972)	Stephen Early Alford (Clerk) Sarah Ruth Robinson (Married woman) Malcolm John Robinson (linesman) Ronald Douglas Robinson (Clerk) Iris Irene Gardner (Married woman)	Volume 7430 Folio 27
20.10.1972 (1972 to 1973)	Frederick Joseph Robinson (Postal employee) Sarah Ruth Robinson (Married Woman) Malcolm John Robinson (linesman) Ronald Douglas Robinson (Clerk)	Volume 7430 Folio 27
15.10.1973 (1973 to 1996)	Sarah Ruth Robinson (Married woman) Malcolm John Robinson (Linesman) Ronald Douglas Robinson (Clerk) (Section 93 application not investigated)	Volume 7430 Folio 27 Now 27/755474

Table 4-2 Summary of owners' report for Lot 28 D.P. 755474

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
03.12.1908 (1908 to 1909)	Joel Curtis	Volume 1939 Folio 171
01.02.1909 (1909 to 1909)	Charles Walter Roberts (Farmer)	Volume 1939 Folio 171
19.08.1909 (19090 to 1911)	Francis James Roberts (Farmer)	Volume 1939 Folio 171
03.04.1911 (1911 to 1912)	Eliza Baxter (Married woman)	Volume 1939 Folio 171
29.02.1912 (Noted on title)	Surrender	Volume 1939 Folio 171 Now Crown Land
28.07.1911 (1911 to 1926) (Noted on crown plan)	Eliza Baxter (Married woman)	Crown Tenure Conditional Purchaser 1911/85 Gunnedah

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Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
20.12.1926 (1926 to 1961)	Thomas Bush (Farmer)	Crown Tenure Conditional Purchaser 1911/85 Gunnedah (Book 1458 No. 524) Now Volume 5209 Folio 40
02.11.1961 (1961 to 1963)	Benjamin Herbert Bush (Seed merchant) Samuel Thomas Bush (Taxi proprietor)	Volume 5209 Folio 40
04.10.1963 (1963 to 1971)	Robert Abraham Ashford Alford (Farmer)	Volume 5209 Folio 40
17.05.1971 (1971 to 1972)	Stephen Early Alford (Clerk) Malcolm John Robinson (National servicemen) (Section 94 application not investigated)	Volume 5209 Folio 40
20.10.1972 (1972 to 1972)	Stephen Early Alford (Clerk) Sarah Ruth Robinson (Married woman) Malcolm John Robinson (Linesman) Ronald Douglas Robinson (Clerk) Iris Irene Gardner (Married woman)	Volume 5209 Folio 40
20.10.1972 (1972 to 1973)	Frederick Joseph Robinson (Postal employee) Sarah Ruth Robinson (Married woman) Malcolm John Robinson (Linesman) Ronald Douglas Robinson (Clerk)	Volume 5209 Folio 40
15.10.1973 (1973 to 1996)	Sarah Ruth Robinson (Married woman) Malcolm John Robinson (Linesman) Ronald Douglas Robinson (Clerk) (Section 93 application not investigated	Volume 5209 Folio 40 Now 28/755474

Table 4-3 Summary of owners' report for Lots 27 & 28 D.P. 755474

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
23.05.1996 (1996 to 2011)	Malcolm John Robinson Ronald Douglas Robinson	27/755474 & 28/755474
04.04.2011 (2011 to 2012)	Jarad Robert Ewing	27/755474 & 28/755474
16.04.2012 (2012 to date)	# 2728 Pty Ltd	27/755474 & 28/755474

 # Denotes current registered proprietor

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4.2. Site inspection

A site inspection was conducted 28 July 2022, where East West attended the site. The site was inspected and photos taken (see Figure 2, Figure 3 and Appendix A). The above ground site inspection and observations for potential contamination sources revealed:

- Farming practices undertaken historically and currently on the site;
- Drainage of the site is primarily towards the south-southeast;
- Existing stockpile of fill (refer to Figure 33);
- No physical evidence of asbestos was indicated on the site;
- No visible signs of chemical leaks within the site boundaries;
- No obvious odours;
- No visible signs of responses to toxic contaminants from existing flora that surrounded the site; and
- No visible on-site losses of dangerous goods or discarding of explosive materials.

The site inspection revealed the presence of one stockpile of unknown fill which required testing for classification.

4.3. Possible contaminant sources

There is a low risk of surface soil contamination from the previous use of the site as an agricultural pastoral area. There also exists low potential for contamination from small localised spills from chemical or equipment use. The existing stockpile on site may be a contaminant source, and due to their unknown contents. Testing of the stockpile was undertaken on the 30th September 2022, with a validation report provided in Appendix D.

The most likely types of contamination would be:

- Pastoral Agricultural Use: Total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), phenols, 17 heavy metals, polychlorinated biphenyls (PCBs), benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine and organophosphate pesticide, from the use of agricultural chemicals, repair and maintenance of vehicles and machinery.

During the site inspection East West noted the following environmental sensitive receptors surrounding the site:

- An ephemeral creek line that runs through the site;
- Residential properties opposite Bushs Lane and Robert Gordon Road.

4.4. Potential receptors

The potential receptors include:

- Future developers of the site including construction personnel for future residential dwellings;
- Flora and fauna surrounding the site;

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- Neighbouring residents of the site; and
- Agricultural dams on site, ephemeral waterways through the site and downstream watercourses.

4.5. Exposure pathways

Possible exposure pathways include:

- Ingestion (via soil or water), dermal contact, or inhalation of surface soil contamination;
- Accessing soil for home grown fruits and vegetables; and
- Inhalation through air transport of soil particulates (dust).

4.6. Conceptual site model

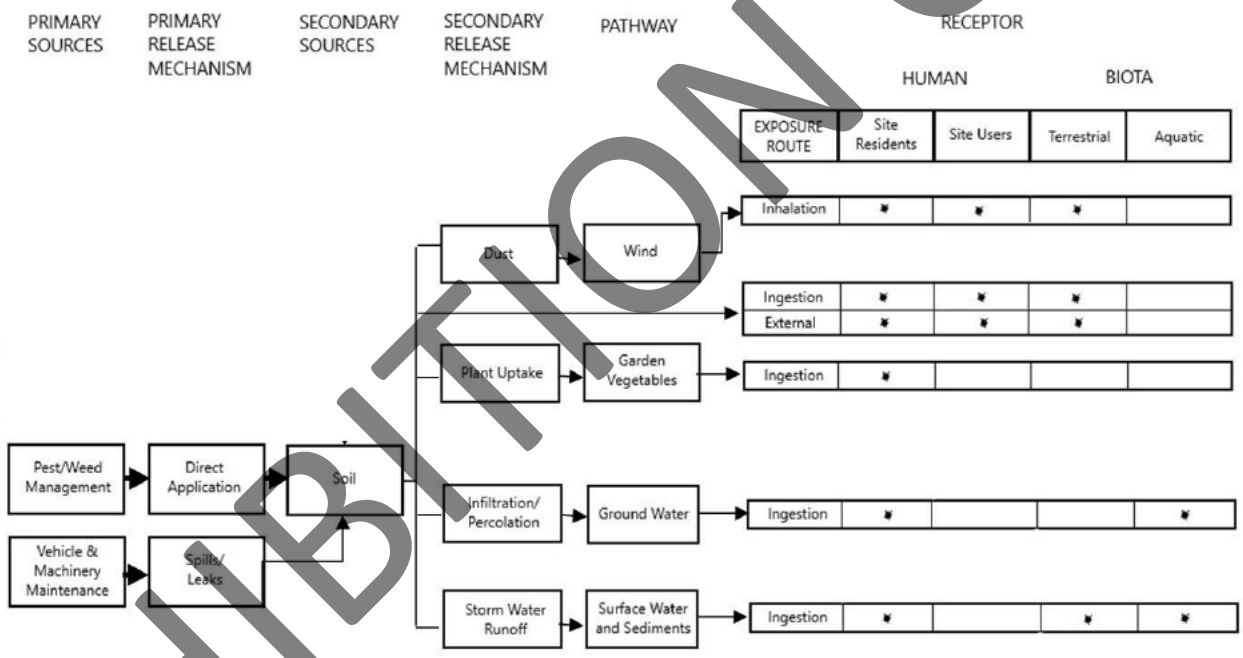

Figure 14 Conceptual Site Model (CSM) of the site (Lot 27 & 28 DP755474). The CSM illustrates potential exposure pathways between their source and receptors

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5. Sampling and analysis plan

17 sampling locations were selected by East West over the proposed development area on 28 July 2022 in addition to the ten samples undertaken as part of two previous soil investigations taken across the site in August 2014 and October 2014 by East West. The 17 sample locations were chosen in order to achieve a systematic sampling pattern across the site. 17 topsoil samples (SP1 through to SP17) and one duplicate topsoil sample for Quality Control (QC) at SP2 was collected at a depth of 0-200 millimetres using a ute-mounted auger (refer to images in Appendix A). According to the NSW EPA's *Contaminated Sites – Sampling Design Guidelines* (NSW EPA, 1995), these surface soils are most likely to be contaminated and come into contact with future users of the area or construction workers. Soil cores were also taken at the 17 sample locations and duplicate location at a depth of up to 1.5 metres where possible to visually check for any fill or visual sources of contamination.

Sampling rationale was to collect approximately one topsoil sample for every two lots, with the 17 additional locations to test areas of the site not investigated by the previous sample locations from the 2014 soil investigations. If a location is found to have more than the contaminant's acceptable limit, then it will be classified as a hotspot and require further assessment, remediation, removal or management. Sampling began in the northern 'half' of the site (on the northern side of the creek line), and then sampling was undertaken on the southern 'half' of the property south of the creek line, with 17 samples (in addition to the 10 undertaken in 2014) collected in total to cover the ~598,500m^2 for an accurate representation of the contamination status.

All samples were collected carefully to ensure no cross-contamination occurred between sampling. One location (SP2) was selected for QC duplicate to provide an estimate of any error in sampling and/or laboratory analysis.

The stockpile identified during the site inspection was sampled in accordance with the 'NSW EPA Waste Classification Guidelines Part 1: Classifying waste' (NSW EPA, 2014) on 30th September 2022. 11 samples were undertaken for characterisation of the stockpiles assuming the material to be homogenous and the stockpile size to be 2,880m^3, as provided by the client.
A systematic grid-sampling pattern was utilised for sampling. Sampling was uniformly distributed throughout the stockpile, including sampling at varying depths.

To effectively preserve the samples, each sample for contamination analysis was placed in a new glass jar with plastic screw-top lid and sealed. The samples were assigned a job number, date, sample location, sampler, and a unique sample number.
A sample log for each sample was filled in with the date, job number, site address, GPS coordinates, samplers, sample locations, and sample names. The soil jars were carefully transported back to East West and a filled and signed chain of custody (COC) accompanied the samples to their destination at Envirolab. The sample containers were wrapped in bubble wrap to ensure they did not break during transit and

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transported via overnight express in a cooled esky. A Sample Receipt Advice (SRA) was provided once Envirolab had received the samples. The sample logs, COC, and SRA can be found in Appendix C.

All samples were collected in accordance with the NSW EPA Sampling Design Guidelines (NSW EPA, 1995) and National Environmental Protection (Assessment of Site Contamination) Measure 1999. Sampling was performed on 28 July 2022 by Stephanie Cameron and Ainslee Roser.

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Figure 15 Mud Map of sample collection locations for the site Lot 27 & 28 DP 755474 (210 Bushs Lane, Gunnedah, NSW). Samples taken as part of August 2014 sampling are shown in orange, October 2014 sampling in yellow, and July 2022 sampling in red. Mud map is for illustrative purposes only

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Table 5-1 Sample log from site investigation 28 July 2022

SAMPLE ID	DEPTH	GPS COORDINATES	DESCRIPTION
EW221364 – SP1	0-200mm	31°04'6.32552"S 150°12"19.27008"E	North of creek line, west of southern most scattered trees. No rock or groundwater was encountered to 1.5m.
EW221364 – SP2	0-200mm	31°04'1.99832"S 150°12"19.46232"E	North of creek line, between Bushs Lane and SP1. No rock or groundwater was encountered to 1.5m.
EW221364 – SP2 (duplicate sample)	0-200mm	31°04'1.99832"S 150°12"19.46232"E	North of creek line, between Bushs Lane and SP1. No rock or groundwater was encountered to 1.5m.
EW221364 – SP3	0-200mm	31°04'7.071432"S 150°12"24.60708"E	North of creek line, southeast of middle scattered trees. No rock or groundwater was encountered to 1.5m.
EW221364 – SP4	0-200mm	31°04'7.1618"S 150°12"29.76408"E	North of creek line, north of dam. No groundwater was encountered, rock encountered at 1.3m
EW221364 – SP5	0-200mm	31°04'9.7124"S 150°12"32.3892"E	North of creek line, between SP4 and Robert Gordon Road. No rock or groundwater was encountered to 1.5m.
EW221364 – SP6	0-200mm	31°04'3.50492"S 150°12"34.30584"E	North of creek line, northeast corner of property. No rock or groundwater was encountered to 1.5m.
EW221364 – SP7	0-200mm	31°04'2.65316"S 150°12"30.71236"E	North of creek line, west of SP6. No rock or groundwater was encountered to 1.5m.
EW221364 – SP8	0-200mm	31°05'8.30812"S 150°12"32.3622"E	South of creek line, west of entry gate. No rock or groundwater was encountered to 1.5m.
EW221364 – SP9	0-200mm	31°05'6.9148"S 150°12"24.59952"E	South of creek line, south of dam. No rock or groundwater was encountered to 1.5m.
EW221364 – SP10	0-200mm	31°05'6.09016"S 150°12"19.2402"E	South of creek line, south of western end of stockpile. No rock or

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SAMPLE ID	DEPTH	GPS COORDINATES	DESCRIPTION
			groundwater was encountered to 1.5m.
EW221364 – SP11	0-200mm	31°05'5.602"S 150°12"12.39408"E	South of creek line, south of western end of stockpile. No rock or groundwater was encountered to 1.5m.
EW221364 – SP12	0-200mm	31°05'9.598"S 150°12"12.00276"E	South of creek line, northeast of cattle yard. No rock or groundwater was encountered to 1.5m.
EW221364 – SP13	0-200mm	31°10'2.13332"S 150°12"18.15336"E	South of creek line, between southern fence and SP10. No rock or groundwater was encountered to 1.5m.
EW221364 – SP14	0-200mm	31°10'6.6324"S 150°12"23.43564"E	South of creek line, northwest of isolated tree. No rock or groundwater was encountered to 1.5m.
EW221364 – SP15	0-200mm	31°11'2.7884"S 150°12"30.80016"E	South of creek line, opposite south-eastern stockpile. No rock or groundwater was encountered to 1.5m.
EW221364 – SP16	0-200mm	31°15'5.3116"S 150°12"31.4296"E	South of creek line, southeast corner of property. No rock or groundwater was encountered to 1.5m.
EW221364 – SP17	0-200mm	31°15'6.2144"S 150°12"34.93872"E	South of creek line, north-eastern corner of southern paddock (below creek line). No rock or groundwater was encountered to 1.5m.

Table 5-2 Soil sample logs (combined) from 2014

SAMPLE ID	DEPTH	GPS COORDINATES (eastings and northings)	DESCRIPTION
EW140537-2	0-100mm	-31°01'916" 150°12'116"	SP1 Side of road (Sample collected by WP)
EW140537-3	0-100mm	-31°01'007" 150°12'099"	SP2 Adjacent gate & shipping container (EW)
EW140537-4	0-100mm	-31°00'949" 150°12'112"	SP3 Half Way to Gully/Tree (EW)

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SAMPLE ID	DEPTH	GPS COORDINATES (eastings and northings)	DESCRIPTION
EW140537-5	0-100mm	-31°01'838" 150°12'134"	SP4 Crest of ridge (EW)
EW140537-6	0-100mm	-31°01'717" 150°12'158"	SP5 Adjacent to Blackjack Road and intersection (EW)
EW140641-1	0-100mm	-31°00'887" 150°12'210"	SP1 Head of gully – floor
EW140641-2	0-100mm	-31°00'362" 150°12'263"	SP2 Floor of gully adjacent to soil stockpile
EW140641-3	0-100mm	-31°00'881" 150°12'376"	SP3 Floor of gully below soil stockpile
EW140641-4	0-100mm	-31°00'876" 150°12'503"	SP4 Overflow drain below dam
EW140641-5	0-100mm	-31°00'785" 150°12'474"	SP5 Crest of ridge mid paddock

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6. Results

6.1. Soil assessment criteria

Health Investigation Levels (HILs) are Tier 1 risk based generic assessment criteria used for the assessment of potential risks to human health from chronic exposure to contaminants in soil. They are intentionally conservative and based on a reasonable worst-case scenario for generic land use settings. The HILs selected for the soil assessment criteria are the Residential HILs A guidelines which are determined as low-density residential with direct access to soils. These HILs have been selected as they most closely reflect the potential land use of the proposed subdivision development.

Ecological investigation levels (EILs) urban residential/public open space is broadly equivalent to the HIL A, HIL B and HIL C land use scenarios. The protection levels for the generic land use settings are 80% for urban residential areas and public open space. EILs apply principally to contaminants in the top 2 metres of soil at the finished surface/ground level which corresponds to the root zone and habitation zone of many species.

Ecological screening levels (ESLs) for the adopted carbon fraction ranges are based on TRH analysis with F1 being obtained after subtraction of BTEX. The ESLs selected for the soil assessment criteria are for urban residential and public open space.

Health Screening Levels (HSLs) are Tier 1 risk based generic soil assessment criteria used for the assessment of potential risks to human health from chronic inhalation exposure of petroleum vapour emanating off petroleum contaminated soils (Vapour Risk). They are intentionally conservative and based on a reasonable worst-case scenario for generic soil types, contamination depth and land use settings including Residential (HSLs A/B), Open Space/Recreational (HSLs C) and Commercial Industrial (HSLs D). HSLs A soil assessment criteria for sandy clay from 0 to <1 metre was adopted on the basis that the proposed land use is for a large lot residential subdivision and onsite topsoil comprising of sandy clay.

NEPM Management Limits –residential, parkland and public open space land use.
Management Limits for petroleum have been developed for prevention of explosive vapour accumulation, prevention of the formation of observable Light Non-aqueous Phase Liquids (LNAPL) and protection against effects on buried infrastructure. Residential, parkland and public open space management limits (fine) have been adopted based on the proposed land use and onsite topsoil comprising of sandy clay.

NEPM Soil Ecological Assessment Levels
Soil ecological assessment was not considered warranted based on the following:

- The proposed land use is as large lot residential; and
- There are no onsite or immediately adjacent offsite sensitive ecological receptors.

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The guidelines have been located through the NSW Environment and Protection Authority (EPA) and they indicate suitable threshold values for contaminants in soil from the appropriate guidelines outlined in the 'National Environment Protection (Assessment of Site Contamination) Measure' (National Environment Protection Council, 2013).

6.2. Discussion of results

All 18 topsoil samples (including one QC sample) were tested for total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), phenols, 17 heavy metals, polychlorinated biphenyls (PCBs), benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine and organophosphate pesticide analysis at Envirolab (NATA accreditation 2901) with results included in Appendix B.

All topsoil sample results at SP1 through to SP17 sample locations indicate concentrations for tested analytes below detectable limits of instrument analysis or below the soil assessment criteria – HIL Residential A threshold values (National Environment Protection Council, 2011).

Full result summary tables of soil analyses are available in Appendix B and summarised in Table 6-1. The tables contain NEPM investigation and screening guidelines with each maximum permissible concentration of a contaminant for each specified HIL, the analytes (element and compounds tested for), the units of the results (i.e. mg/kg is milligram per kilogram or ppm of soil), and the results of each sample collected. Statistical analyses of the results are included. Values over the maximum permissible concentration of a contaminant will be highlighted and further appropriate health investigation and evaluation is required.

Table 6-1 Results summary table

Object tested	Samples outside LOR	Samples exceeding NEPM threshold	Pass/fail
Heavy metals	Chromium (all samples), copper (all samples), lead (all samples), nickel (all samples), zinc (all samples).	Nil	Pass
PAHs	Nil	Nil	Pass
Organochlorine pesticides	Nil	Nil	Pass
BTEX	Nil	Nil	Pass
TRH	Nil	Nil	Pass
TPH	Nil	Nil	Pass

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The full laboratory and associated project documents are attached in Appendix C.
Results from the previous soil sampling on site are also summarised in Appendix B.
Results of the Stockpile assessment are summarised in Appendix B, with the full report attached in Appendix D. The Stockpile Assessment found the material to be suitable for reuse on site.

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7. Quality assurance/quality control

7.1. QA/QC documentation

All samples were transported to the laboratories for analysis with relevant COC documentation containing the following:

- Site identification;
- Sampler(s);
- Nature of the sample – soil;
- Collection date; and
- Analysis to be performed

Original COC and sample receipts advisory (SRA) documentation can be found in Appendix C. Envirolab duplicate data are presented in Appendix C

7.2. Laboratories

Samples were submitted to NATA accredited laboratory:

- Envirolab (primary intra-laboratory) – NATA accreditation 2901

As part of their National Association of Testing Authorities (NATA) accreditation, laboratories are required to carry out routine in-house quality control (QC) procedures, which are presented in Appendix C.

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8. Conclusion

The site identified as Lot 27 and 28 DP 755474 (210 Bushs Lane, Gunnedah, NSW) was subjected to a Preliminary Site Investigation. The site is planned to be subdivided into large lot residential lots. The proposed development area is approximately 598,500 m^2 (59.85 hectares) and was the sampling area of focus. Investigations into the site's history revealed that the site has been subjected to agricultural practices. Use of the site for agriculture could have lingering contaminants of potential concern.

A preliminary site assessment with limited systematic sampling across the proposed development area was conducted on the 28 July 2022 in order to assess the contamination status of the soil. Contaminants of potential concern were not identified in soil samples at concentrations in excess of assessment criteria in all samples analysed. No further testing is recommended.

The results of the preliminary site investigation indicate risks for contamination of the site from previous use as being low for the proposed residential development.

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9. Report limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only.

This report does not provide a complete assessment of the environmental integrity of the site and is limited by the scope as defined above.

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10. References

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APPENDIX A – Site photos

Figure 16 SP1 soil core

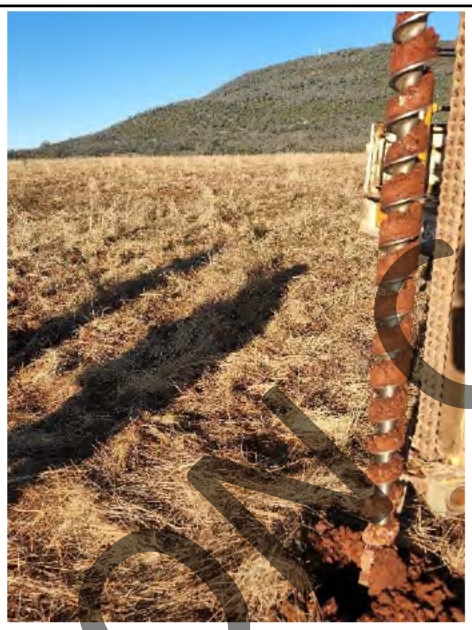

Figure 17 SP2 soil core

Figure 18 SP3 soil core

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Figure 19 SP4 soil core

Figure 20 SP5 soil core

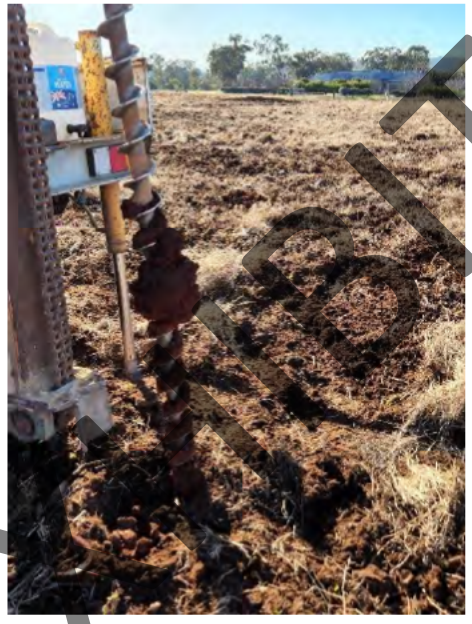

Figure 22 SP6 soil core

Figure 21 SP7 soil core

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Figure 23 SP8 soil core

Figure 24 SP9 soil core

Figure 25 SP10 soil core

Figure 26 SP11 soil core

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Figure 27 SP12 soil core

Figure 28 SP13 soil core

Figure 29 SP14 soil core

Figure 30 SP15 soil core

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Figure 31 SP16 soil core

Figure 32 SP17 soil core

Figure 33 Existing stockpile south of the creek line

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APPENDIX B – Full Analysis Results Table

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	PAHs																		
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b, j + k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Napthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (Half)	Benzo(a)pyrene TEQ (LOR)	Benzo(a)pyrene TEQ calc (PQL)	PAHs (Sum of total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0 5	0 05
NSW 2014 General Solid Waste CT1 (No Leaching)					0.8														200
NSW 2014 General Solid Waste CT2 (No Leaching)					3.2														800
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion (Sand)																			
0-1m													3						
1-2m																			
2-4m																			
>=4m																			
NEPM 2013 Table 1B(4) Generic EIL - Urban, Res, & Public Open Space													170						
NEPM 2013 Table 1B(5) ESLs for Urban Res (Coarse Soil)																			
0-2m					0.7														
NEPM 2013 Table 1B(5) ESLs for Urban Res (Fine Soil)																			
0-2m					0.7														
NEPM 2013 Table 1A(1) HILs Res A Soil																3	3	3	300
Field ID	Date																		
221364-1	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-2	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-3	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-4	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-5	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-6	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-7	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-8	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-9	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-10	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-11	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-12	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-13	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-14	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5

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221364-15	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-16	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-17	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
221364-18	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0 5	<0.5	<0.5
	Mean (mg/L)	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0 5	0 05
	Std Dev	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0.00	0 00	0.00	0.00	0.00	0 00	0.00	0.00	0 00
	CV	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0.00	0 00	0.00	0.00	0.00	0 00	0.00	0.00	0 00
	α at 95% (n-1)	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746
	95% UCL	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0 5	0 05
	Guidelines Pass/Fail	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**

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	Organochlorine Pesticides							
	Aldrin and dieldrin	Chlordane	DDD-DDE-DDT	Endosulfan	Endrin	Heptachlor	HCB	Methoxychlor
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NSW 2014 General Solid Waste CT1 (No Leaching)				60				
NSW 2014 General Solid Waste CT2 (No Leaching)				240				
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion (Sand)								
0-1m								
1-2m								
2-4m								
>=4m								
NEPM 2013 Table 1B(4) Generic EIL - Urban, Res, & Public Open Space			180					
NEPM 2013 Table 1B(5) ESLs for Urban Res (Coarse Soil)								
0-2m								
NEPM 2013 Table 1B(5) ESLs for Urban Res (Fine Soil)								
0-2m								
NEPM 2013 Table 1A(1) HILs Res A Soil	7	50	260	300	10	7	10	400
Field ID	Date							
221364-1	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-2	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-3	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-4	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-5	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-6	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-7	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-8	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-9	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-10	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-11	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-12	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-13	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-14	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

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221364-15	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-16	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-17	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
221364-18	28/07/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
	Mean (mg/L)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Std Dev	0.00	0.00	0 00	0 00	0.00	0.00	0.00	0 00
	CV	0.00	0.00	0 00	0 00	0.00	0.00	0.00	0 00
	α at 95% (n-1)	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746
	95% UCL	0.1	0.1	0.1	0.1	0.01	0.1	0.1	0.1
	Guidelines Pass/Fail	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**	**PASS**

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		BTEX						TRH							TPH				
		Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10	C6-C10 (F1 minus BTEX)	C10-C16	C10-C16 (F2 minus Napthalene)	C16-C34	C34-C40	C10-C40 (Sum of total)	C6-C9	C10-C14	C15-C28	C29-C36	+C10-C36 (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0 2	0 5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	50
NSW 2014 General Solid Waste CT1 (No Leaching)		10	288	600			1000								650				10000
NSW 2014 General Solid Waste CT2 (No Leaching)		40	1152	2400			4000								2600				40000
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion (Sand)																			
0-1m		0 5	190	55			40		45		110								
1-2m		0 5	220				60		70		240								
2-4m		0 5	310				95		110		440								
>=4m		0 5	540				170		200										
NEPM 2013 Table 1B(4) Generic EIL - Urban, Res, & Public Open Space																			
NEPM 2013 Table 1B(5) ESLs for Urban Res (Coarse Soil)																			
0-2m		50	85	70			105		180		120	300	2800						
NEPM 2013 Table 1B(5) ESLs for Urban Res (Fine Soil)																			
0-2m		65	105	125			45		180		120	1300	5600						
NEPM 2013 Table 1A(1) HILs Res A Soil																			
Field ID	Date																		
221364-1	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-2	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-3	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-4	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-5	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-6	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-7	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-8	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-9	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-10	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-11	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-12	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-13	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50

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221364-14	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-15	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-16	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-17	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
221364-18	28/07/2022	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
	Mean (mg/L)	0 2	0 5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	50
	Std Dev	0.00	0.00	0.00	0 00	0 00	0 00	0.00	0.00	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	CV	0.00	0.00	0.00	0 00	0 00	0 00	0.00	0.00	0 00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	α at 95% (n-1)	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746
	95% UCL	0 2	0 5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	50
	Guidelines Pass/Fail	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

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HEAVY METALS

		Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		4	0.4	5	5	5	0.1	5	5
NSW 2014 General Solid Waste CT1 (No Leaching)		100	20	100		100	4	40	
NSW 2014 General Solid Waste CT2 (No Leaching)		400	80	400		400	16	160	
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion (Sand)									
0-1m									
1-2m									
2-4m									
>=4m									
NEPM 2013 Table 1B(4) Generic EIL - Urban, Res, & Public Open Space		100		580	230	1100		350	670
NEPM 2013 Table 1B(5) ESLs for Urban Res (Coarse Soil)									
0-2m									
NEPM 2013 Table 1B(5) ESLs for Urban Res (Fine Soil)									
0-2m									
NEPM 2013 Table 1A(1) HILs Res A Soil		100	20	100	7000	300	200	400	8000
Field ID	Date								
221364-1	28/07/2022	4	<0.4	31	11	11	<0.1	17	24
221364-2	28/07/2022	4	<0.4	38	8	12	<0.1	14	10
221364-3	28/07/2022	<4	<0.4	38	8	11	<0.1	14	10
221364-4	28/07/2022	5	<0.4	17	11	13	<0.1	16	40
221364-5	28/07/2022	5	<0.4	18	8	13	<0.1	11	30
221364-6	28/07/2022	5	<0.4	28	9	13	<0.1	15	20
221364-7	28/07/2022	4	<0.4	26	11	13	<0.1	13	52
221364-8	28/07/2022	<4	<0.4	28	6	9	<0.1	10	15
221364-9	28/07/2022	<4	<0.4	22	19	12	<0.1	26	27
221364-10	28/07/2022	<4	<0.4	32	13	10	<0.1	22	16
221364-11	28/07/2022	<4	<0.4	28	18	10	<0.1	25	25
221364-12	28/07/2022	<4	<0.4	30	14	11	<0.1	23	29
221364-13	28/07/2022	<4	<0.4	30	17	11	<0.1	32	42
221364-14	28/07/2022	<4	<0.4	25	14	11	<0.1	31	28
221364-15	28/07/2022	<4	<0.4	23	16	12	<0.1	23	28
221364-16	28/07/2022	<4	<0.4	21	17	10	<0.1	20	26
221364-17	28/07/2022	<4	<0.4	26	14	11	<0.1	22	23
221364-18	28/07/2022	<4	<0.4	26	17	11	<0.1	22	25
	Mean (mg/L)	4.5	0.4	27.1	12.8	11.3	0.1	19.8	26.1
	Std Dev	0.548	0.000	5.785	4.004	1.188	0.000	6.449	10.698
	CV	0.122	0.000	0 214	0.312	0.105	0.000	0.326	0.410
	α at 95% (n-1)	1.746	1.746	1.746	1.746	1.746	1.746	1.746	1.746
	95% UCL	4.7	0.4	28.9	14.1	11.7	0.1	21.9	29.6
	Guidelines Pass/Fail	PASS	PASS	PASS	PASS	PASS	PASS	PASS	PASS

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Results Summary August 2014 sampling

ANALYTE	Units	SP1 140537-2	SP 2 140537-3	SP 3 140537-4	SP 4 140537-5	SP 5 140537-6	*DECC Guidelines NEPM Standard Residential*	*DECC Guidelines NEPM Limited Residential*	*DECC Guidelines NEPM Schedule B Industrial*
Arsenic	*Mg/kg*	5	<4	4	<4	<4	***<100***	***<500***	***<3000***
Cadmium	*mg/kg*	<0.4	<0.4	<0.4	<0.4	<0.4	***<20***	***<150***	***<900***
Chromium	*mg/kg*	8	25	18	9	27	***<100***	***<500***	***<3600***
Copper	*mg/kg*	15	19	22	10	9	***<6000***	***<30000***	***<240000***
Lead	*mg/kg*	11	14	13	12	12	***<300***	***<1200***	***<1500***
Mercury	*mg/kg*	<0.1	<0.1	<0.1	<0.1	<0.1	***<40***	***<120***	***<730***
Nickel	*mg/kg*	15	31	26	11	16	***<400***	***<1200***	***<6000***
Zinc	*mg/kg*	160	65	75	33	26	***<7400***	***<60000***	***<400000***
TRH C6-C10 Fraction	*mg/kg*	<25	<25	<25	<25	<25	***<45***	-	-
TRH >C10-C16 Fraction	*mg/kg*	<50	<50	53	<50	<50	***<110***	-	-
TRH >C16-C34 Fraction	*mg/kg*	180	140	250	<100	<100	***<300 coarse <1300 fine***	-	***<1700 coarse <2500 fine***
TRH >C34-C40 Fraction	*mg/kg*	<100	<100	<100	<100	<100	***<2800 coarse <5600 fine***	-	***<3300 coarse <6600 fine***
Benzene	*mg/kg*	<0.2	<0.2	<0.2	<0.2	<0.2	***<0.5***	-	-
Toluene	*mg/kg*	<0.5	<0.5	<0.5	<0.5	<0.5	***<160***	-	-
Ethylbenzene	*mg/kg*	<1	<1	<1	<1	<1	***<55***	-	-
Xylene (o, m & p)	*mg/kg*	<2	<2	<2	<2	<2	***<40***	-	-
Naphthalene	*mg/kg*	<1	<1	<1	<1	<1	***<3***	-	-

Standard Residential: *is residential with garden/accessible soil (home grown produce contributing less than 10% of vegetable and fruit intake: no poultry); this category includes children's daycare centres, kindergartens, preschools and primary schools*
Limited Residential: *where there are minimal opportunities for soil access: includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats This classification does not include public parks and gardens or residential with substantial vegetable gardens and poultry*
Industrial/Commercial*: includes premises such as shops and offices as well as factories and industrial sites*

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Results summary October 2014 sampling

ANALYTE	Units	SP1 140641-1	SP 2 140641-2	SP 3 140641-3	SP 4 140641-4	SP 5 140641-5	DECC Guidelines NEPM Standard Residential	DECC Guidelines NEPM Limited Residential	DECC Guidelines NEPM Schedule B Industrial
Arsenic	Mg/kg	<4	<4	<4	<4	<4	**<100**	**<500**	**<3000**
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4	**<20**	**<150**	**<900**
Chromium	mg/kg	17	19	18	23	14	**<100**	**<500**	**<3600**
Copper	mg/kg	11	14	22	13	7	**<6000**	**<30000**	**<240000**
Lead	mg/kg	10	12	14	12	11	**<300**	**<1200**	**<1500**
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	**<40**	**<120**	**<730**
Nickel	mg/kg	19	21	23	20	12	**<400**	**<1200**	**<6000**
Zinc	mg/kg	36	51	50	35	32	**<7400**	**<60000**	**<400000**
TRH C6-C10 Fraction	mg/kg	<25	<25	<25	<25	<25	**<45**	-	-
TRH >C10-C16 Fraction	mg/kg	<50	<50	<50	<50	<50	**<110**	-	-
TRH >C16-C34 Fraction	mg/kg	<100	120	350	<100	<100	**<300 coarse <1300 fine**	-	**<1700 coarse <2500 fine**
TRH >C34-C40 Fraction	mg/kg	<100	<100	110	<100	<100	**<2800 coarse <5600 fine**	-	**<3300 coarse <6600 fine**
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	**<0.5**	-	-
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	**<160**	-	-
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1	**<55**	-	-
Xylene (o, m & p)	mg/kg	<2	<2	<2	<2	<2	**<40**	-	-
Naphthalene	mg/kg	<1	<1	<1	<1	<1	**<3**	-	-

Standard Residential: *is residential with garden/accessible soil (home grown produce contributing less than 10% of vegetable and fruit intake no poultry); this category includes children's daycare centres, kindergartens, preschools and primary schools*
Limited Residential: *where there are minimal opportunities for soil access includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats This classification does not include public parks and gardens or residential with substantial vegetable gardens and poultry*
Industrial/Commercial *includes premises such as shops and offices as well as factories and industrial sites*

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Results summary for stockpile analysis

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	Column 13	Column 14	Column 15	Column 16
Chemicals and other attributes	**Absolute maximum concentration** (mg/kg dry weight unless otherwise specified)	**Maximum average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Sample 221364-19**	**Sample 221364-20**	**Sample 221364-21**	**Sample 221364-22**	**Sample 221364-23**	**Sample 221364-24**	**Sample 221364-25**	**Sample 221364-26**	**Sample 221364-27**	**Sample 221364-28**	**Sample 221364-29**	**Average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Comments**
1. Mercury	1	0.5	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	Within Limit
2. Cadmium	1	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	Within Limit
3. Lead	100	50	10	11	10	10	11	10	10	10	11	10	9	10.2	Within Limit
4. Arsenic	40	20	<4	<8	<4	<4	<4	<4	<4	<4	<4	<4	<4	4.4	Within Limit
5. Chromium (total)	150	75	16	17	16	14	16	15	17	14	16	16	15	15.6	Within Limit
6. Copper	200	100	13	14	12	12	14	13	14	12	13	13	12	12.9	Within Limit
7. Nickel	60	30	17	19	18	16	18	16	18	16	17	17	15	17	Within Limit
8. Zinc	300	150	30	32	28	29	31	31	30	26	30	29	26	29.3	Within Limit
11. Total Polycyclic Aromatic	40	20	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Within Limit

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Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	Column 13	Column 14	Column 15	Column 16
Chemicals and other attributes	**Absolute maximum concentration** (mg/kg dry weight unless otherwise specified)	**Maximum average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Sample 221364-19**	**Sample 221364-20**	**Sample 221364-21**	**Sample 221364-22**	**Sample 221364-23**	**Sample 221364-24**	**Sample 221364-25**	**Sample 221364-26**	**Sample 221364-27**	**Sample 221364-28**	**Sample 221364-29**	**Average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Comments**
Hydrocarbons (PAHs)															
12. Benzo(a)pyrene	1	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Within Limit
13. Benzene	0.5	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	Within Limit
14. Toluene	65	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Within Limit
15. Ethyl-benzene	25	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Within Limit
16. Xylene	15	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Within Limit
17. Total Petroleum Hydrocarbons (TPHs) C_{10}-C_{36}	500	250	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	Within Limit

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APPENDIX C – Certificate of Analysis & Supporting Documents

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Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 301761

Client Details

Client	East West Enviroag Pty Ltd
Attention	Stephanie Cameron
Address	82 Plain St, Tamworth, NSW, 2340

Sample Details

Your Reference	**EW221364**
Number of Samples	18 Soil
Date samples received	29/07/2022
Date completed instructions received	29/07/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	05/08/2022
Date of Issue	05/08/2022

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Results Approved By
Giovanni Agosti, Group Technical Manager
Josh Williams, Organics and LC Supervisor
Kyle Gavrily, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	120	91	90	90	90

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	80	74	82	83	80

EXHIBITION COPY

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	80	80	80	80	86

vTRH(C6-C10)/BTEXN in Soil				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	85	79	78

EXHIBITION COPY

svTRH (C10-C40) in Soil						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022	04/08/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	88	93	97	89	100

svTRH (C10-C40) in Soil						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022	04/08/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	102	86	85	86	85

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svTRH (C10-C40) in Soil						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022	04/08/2022	04/08/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	86	76	83	83

svTRH (C10-C40) in Soil				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	04/08/2022	04/08/2022	04/08/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	85	84	82

EXHIBITION COPY

PAHs in Soil						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	86	90	89	93	87

EXHIBITION COPY

PAHs in Soil						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	91	89	95	102

EXHIBITION COPY

PAHs in Soil						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	94	90	93	90	87

EXHIBITION COPY

PAHs in Soil				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	89	89	86

EXHIBITION COPY

Organochlorine Pesticides in soil						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	83	85	84	86	82

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Organochlorine Pesticides in soil						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	86	81	87	87

EXHIBITION COPY

Organochlorine Pesticides in soil						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	82	86	85	84

EXHIBITION COPY

Organochlorine Pesticides in soil				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	85	85	84

EXHIBITION COPY

PCBs in Soil						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	83	85	84	86	82

PCBs in Soil						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	86	81	87	87

EXHIBITION COPY

PCBs in Soil						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	87	82	86	85	84

PCBs in Soil				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	85	85	84

EXHIBITION COPY

Acid Extractractable metals in soil						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Arsenic	mg/kg	4	4	<4	5	5
Boron	mg/kg	<3	<3	<3	<3	<3
Barium	mg/kg	220	85	110	230	180
Beryllium	mg/kg	<1	1	1	<1	<1
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	31	38	38	17	18
Copper	mg/kg	11	8	8	11	8
Cobalt	mg/kg	8	8	10	7	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	280	150	210	230	140
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Nickel	mg/kg	17	14	14	16	11
Lead	mg/kg	11	12	11	13	13
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<4	<4	<4	<2	<2
Tin	mg/kg	1	1	1	<1	<1
Zinc	mg/kg	24	10	10	40	30

EXHIBITION COPY

Acid Extractractable metals in soil						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Arsenic	mg/kg	5	4	<4	<4	<4
Boron	mg/kg	<3	<3	<3	<3	<3
Barium	mg/kg	120	240	110	140	57
Beryllium	mg/kg	<1	<1	<1	1	1
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	28	26	28	22	32
Copper	mg/kg	9	11	6	19	13
Cobalt	mg/kg	4	6	5	11	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	140	330	170	480	210
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Nickel	mg/kg	15	13	10	26	22
Lead	mg/kg	13	13	9	12	10
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<4	<4	<2	<2	<4
Tin	mg/kg	1	2	1	<1	1
Zinc	mg/kg	20	52	15	27	16

EXHIBITION COPY

Acid Extractractable metals in soil						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022	03/08/2022	03/08/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Boron	mg/kg	<3	<3	<3	<3	<3
Barium	mg/kg	87	86	76	100	140
Beryllium	mg/kg	<1	<1	<1	<1	<1
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	28	30	30	25	23
Copper	mg/kg	18	14	17	14	16
Cobalt	mg/kg	10	12	14	10	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Manganese	mg/kg	350	380	580	580	410
Molybdenum	mg/kg	<1	<1	<1	<1	<1
Nickel	mg/kg	25	23	32	31	23
Lead	mg/kg	10	11	11	11	12
Antimony	mg/kg	<7	<7	<7	<7	<7
Selenium	mg/kg	<4	<2	<4	<2	<4
Tin	mg/kg	<1	<1	<1	<1	<1
Zinc	mg/kg	25	29	42	28	28

EXHIBITION COPY

Acid Extractractable metals in soil				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	02/08/2022	02/08/2022	02/08/2022
Date analysed	-	03/08/2022	03/08/2022	03/08/2022
Arsenic	mg/kg	<4	<4	<4
Boron	mg/kg	<3	<3	<3
Barium	mg/kg	380	62	120
Beryllium	mg/kg	<1	<1	<1
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	21	26	26
Copper	mg/kg	17	14	17
Cobalt	mg/kg	10	10	10
Mercury	mg/kg	<0.1	<0.1	<0.1
Manganese	mg/kg	390	300	400
Molybdenum	mg/kg	<1	<1	<1
Nickel	mg/kg	20	22	22
Lead	mg/kg	10	11	11
Antimony	mg/kg	<7	<7	<7
Selenium	mg/kg	<2	<4	<2
Tin	mg/kg	<1	1	<1
Zinc	mg/kg	26	23	25

EXHIBITION COPY

Moisture						
Our Reference		301761-1	301761-2	301761-3	301761-4	301761-5
Your Reference	UNITS	221364-1	221364-2	221364-3	221364-4	221364-5
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Moisture	%	18	18	18	13	13

Moisture						
Our Reference		301761-6	301761-7	301761-8	301761-9	301761-10
Your Reference	UNITS	221364-6	221364-7	221364-8	221364-9	221364-10
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Moisture	%	20	15	13	16	17

Moisture						
Our Reference		301761-11	301761-12	301761-13	301761-14	301761-15
Your Reference	UNITS	221364-11	221364-12	221364-13	221364-14	221364-15
Date Sampled		28/07/2022	28/07/2022	28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	01/08/2022	01/08/2022	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	02/08/2022	02/08/2022	02/08/2022	02/08/2022	02/08/2022
Moisture	%	18	15	9.9	18	13

Moisture				
Our Reference		301761-16	301761-17	301761-18
Your Reference	UNITS	221364-16	221364-17	221364-18
Date Sampled		28/07/2022	28/07/2022	28/07/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	01/08/2022	01/08/2022	01/08/2022
Date analysed	-	02/08/2022	02/08/2022	02/08/2022
Moisture	%	16	28	11

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Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more suscept ble to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

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QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301761-2
Date extracted	-			01/08/2022	1	01/08/2022	01/08/2022		01/08/2022	01/08/2022
Date analysed	-			03/08/2022	1	03/08/2022	03/08/2022		03/08/2022	03/08/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	87	86
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	87	86
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	86	85
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	87	86
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	81	81
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	91	90
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	92	91
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	91	1	120	101	17	94	87

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	01/08/2022	01/08/2022		[NT]	[NT]
Date analysed	-			[NT]	11	03/08/2022	03/08/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	80	80	0	[NT]	[NT]

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QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301761-2
Date extracted	-			01/08/2022	1	01/08/2022	01/08/2022		01/08/2022	01/08/2022
Date analysed	-			04/08/2022	1	04/08/2022	04/08/2022		04/08/2022	04/08/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	120	114
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	99	109
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	79
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	120	114
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	99	109
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	71	79
Surrogate o-Terphenyl	%		Org-020	86	1	88	90	2	97	109

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	01/08/2022	01/08/2022		[NT]	[NT]
Date analysed	-			[NT]	11	04/08/2022	04/08/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	91	86	6	[NT]	[NT]

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QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301761-2
Date extracted	-			01/08/2022	1	01/08/2022	01/08/2022		01/08/2022	01/08/2022
Date analysed	-			03/08/2022	1	03/08/2022	03/08/2022		03/08/2022	03/08/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	78
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	79
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	78
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	71
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	80
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	87
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	69
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0 05	0	80	80
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	96	1	86	92	7	84	87

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	01/08/2022	01/08/2022		[NT]	[NT]
Date analysed	-			[NT]	11	03/08/2022	03/08/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	<0.05	<0 05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	94	96	2	[NT]	[NT]

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QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301761-2
Date extracted	-			01/08/2022	1	01/08/2022	01/08/2022		01/08/2022	01/08/2022
Date analysed	-			03/08/2022	1	03/08/2022	03/08/2022		03/08/2022	03/08/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	74
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	75
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	79
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	79
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	78
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	74
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	79
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	78
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	84
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	70	72
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	88	1	83	87	5	84	85

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QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	01/08/2022	01/08/2022		[NT]	[NT]
Date analysed	-			[NT]	11	03/08/2022	03/08/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	11	87	86	1	[NT]	[NT]

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QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301761-2
Date extracted	-			01/08/2022	1	01/08/2022	01/08/2022		01/08/2022	01/08/2022
Date analysed	-			03/08/2022	1	03/08/2022	03/08/2022		03/08/2022	03/08/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	115	80
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	88	1	83	87	5	84	85

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	01/08/2022	01/08/2022		[NT]	[NT]
Date analysed	-			[NT]	11	03/08/2022	03/08/2022		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	11	87	86	1	[NT]	[NT]

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QUALITY CONTROL: Acid Extractractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	301761-2
Date prepared	-			02/08/2022	1	02/08/2022	02/08/2022		02/08/2022	02/08/2022
Date analysed	-			03/08/2022	1	03/08/2022	03/08/2022		03/08/2022	03/08/2022
Arsenic	mg/kg	4	Metals-020	<4	1	4	4	0	96	#
Boron	mg/kg	3	Metals-020	<3	1	<3	<3	0	94	##
Barium	mg/kg	1	Metals-020	<1	1	220	230	4	100	104
Beryllium	mg/kg	1	Metals-020	<1	1	<1	<1	0	93	78
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	90	85
Chromium	mg/kg	1	Metals-020	<1	1	31	32	3	99	80
Copper	mg/kg	1	Metals-020	<1	1	11	11	0	98	104
Cobalt	mg/kg	1	Metals-020	<1	1	8	8	0	93	70
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	103	109
Manganese	mg/kg	1	Metals-020	<1	1	280	310	10	97	#
Molybdenum	mg/kg	1	Metals-020	<1	1	<1	<1	0	89	##
Nickel	mg/kg	1	Metals-020	<1	1	17	17	0	96	81
Lead	mg/kg	1	Metals-020	<1	1	11	11	0	98	77
Antimony	mg/kg	7	Metals-020	<7	1	<7	<7	0	91	##
Selenium	mg/kg	2	Metals-020	<2	1	<4	<4	0	86	##
Tin	mg/kg	1	Metals-020	<1	1	1	1	0	92	##
Zinc	mg/kg	1	Metals-020	<1	1	24	24	0	95	73

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QUALITY CONTROL: Acid Extractractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	02/08/2022	02/08/2022		[NT]	[NT]
Date analysed	-			[NT]	11	03/08/2022	03/08/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	[NT]	[NT]
Boron	mg/kg	3	Metals-020	[NT]	11	<3	<3	0	[NT]	[NT]
Barium	mg/kg	1	Metals-020	[NT]	11	87	84	4	[NT]	[NT]
Beryllium	mg/kg	1	Metals-020	[NT]	11	<1	<1	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	28	26	7	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	18	17	6	[NT]	[NT]
Cobalt	mg/kg	1	Metals-020	[NT]	11	10	10	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Manganese	mg/kg	1	Metals-020	[NT]	11	350	360	3	[NT]	[NT]
Molybdenum	mg/kg	1	Metals-020	[NT]	11	<1	<1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	25	24	4	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	10	10	0	[NT]	[NT]
Antimony	mg/kg	7	Metals-020	[NT]	11	<7	<7	0	[NT]	[NT]
Selenium	mg/kg	2	Metals-020	[NT]	11	<4	<4	0	[NT]	[NT]
Tin	mg/kg	1	Metals-020	[NT]	11	<1	<1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	25	21	17	[NT]	[NT]

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Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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Report Comments

All Metals in soil:
- # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.
-## Low spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS
- The PQL has been raised for Se due to interferences from analytes (other than those being tested) in sample/s 301761-1 to 3,6,7,10,11,13,15 and 17.

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Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	East West Enviroag Pty Ltd
Attention	Stephanie Cameron

Sample Login Details

Your reference	EW221364
Envirolab Reference	301761
Date Sample Received	29/07/2022
Date Instructions Received	29/07/2022
Date Results Expected to be Reported	05/08/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	18 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	11
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

Nil

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Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
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www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	PCBs in Soil	Arsenic	Boron	Barium	Beryllium	Cadmium	Chromium	Copper	Cobalt	Mercury	Manganese	Molybdenum	Nickel	Lead	Antimony	Selenium	Tin	Zinc
221364-1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-8	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-9	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-11	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-12	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-14	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-15	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-16	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-17	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
221364-18	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

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Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt. Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph 03 9763 2500 / melbourne@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph 07 3266 9532 / brisbane@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: East West Enviroag

Contact Person: Steph Cameron

Phone: 02 6762 1733

Sampler: N/A

Address: 82 Plain Street Tamworth 2340

Phone: 02 6762 1733 Mob: 0447 116 818

Email: stephanie.c@eastwestonline.com.au
anne.m@eastwestonline.com.au
jason.l@eastwestonline.com.au
annemarie@eastwestonline.com.au
admin@eastwestonline.com.au

Client Project Name / Number / Site etc (ie report title):
EW221364

PO No.: EW221364

Envirolab Quote No. :

Date results required:
Standard
Note: Inform lab in advance if urgent turnaround is required - surcharges apply

Report format: esdat / equis /

Lab Comments:

Sample information					Tests Required	Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample		Provide as much information about the sample as you can
	221364-1		28/07/2022	Soil	Combo 5 (17 x Heavy Metals) All samples	
	221364-2		28/07/2022	Soil		
	221364-3		28/07/2022	Soil		
	221364-4		28/07/2022	Soil		
	221364-5		28/07/2022	Soil		
	221364-6		28/07/2022	Soil		
	221364-7		28/07/2022	Soil		
	221364-8		28/07/2022	Soil		
	221364-9		28/07/2022	Soil		
	221364-10		28/07/2022	Soil		
	221364-11		28/07/2022	Soil		
	221364-12		28/07/2022	Soil		
	221364-13		28/07/2022	Soil		
	221364-14		28/07/2022	Soil		
	221364-15		28/07/2022	Soil		
	221364-16		28/07/2022	Soil		
	221364-17		28/07/2022	Soil		
	221364-18		28/07/2022	Soil		

Relinquished by (Company): East West
Print Name: Kristen Engelbrecht
Date & Time: 28/07/2022
Signature:

Received by (Company):
Print Name:
Date & Time:
Signature:

Lab use only:
Samples Received: Cool or Ambient (circle one)
Temperature Received at: (if applicable)
Transported by: Hand delivered / courier

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APPENDIX D – Stockpile Validation Report

EXHIBITION COPY

eastwest
geo ag enviro

82 Plain Street Tamworth NSW 2340
e admin@eastwestonline.com.au
t 02 6762 1733
f 02 6765 9109
abn 82 125 442 382

eastwestonline.com.au

14 October 2022

Jarad Ewing
[redacted]

STOCKPILE WASTE CLASSIFICATION VALIDATION REPORT
210 BUSHS LANE, GUNNEDAH, NSW

Dear Jarad,

Eleven (11) samples of excavated natural material (ENM), representing approximately 2,880m^3 (measurements provided by client), were independently sampled by East West on the 30th September 2022 for validation from 210 Bushs Lane, Gunnedah, NSW. The samples will determine the level of contaminants in the ENM for validation purposes. Tthe proposed stockpiled material is to be spread across the site at 210 Bushs Lane, as detailed by the client. Table 1 contains a log of the samples collected, and figure 1 depicts the sampling map. Figure 2 shows the stockpile sampled.

Table 1: Soil Sampling Log

Sample	Identification	Notes
221364 -19	31°0'57', 150°12'6	South-east corner of stockpile
221364 -20	31°0'57', 150°12'6	North-east corner of stockpile
221364 -21	31°0'57', 150°12'6	Second in from south-east corner of stockpile
221364 -22	31°0'57', 150°12'6	Second in from north-east corner of stockpile
221364 -23	31°0'57', 150°12'6	Middle of stockpile on southern side
221364 -24	31°0'57', 150°12'6	Middle of stockpile on northern side
221364 -25	31°0'57', 150°12'6	Third in from south-west corner
221364 -26	31°0'57', 150°12'6	Second in from south-west corner
221364 -27	31°0'57', 150°12'6	South-west corner of stockpile
221364 -28	31°0'57', 150°12'6	North-west corner of stockpile
221364 -29	31°0'57', 150°12'6	Second in from north-west corner

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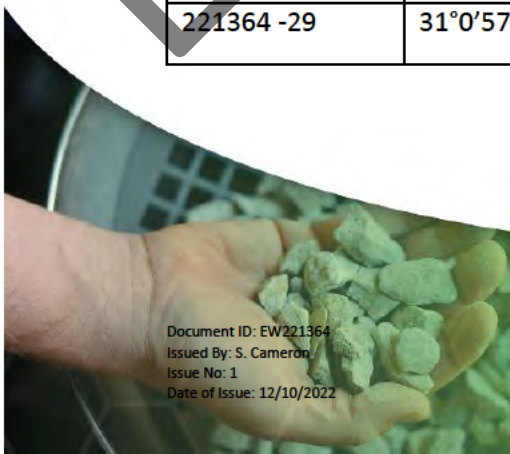

Figure 1: Samples collected from stockpile adjacent to Creekline, 210 Bushs Lane Gunnedah, NSW

Figure 2: Sampled stockpile at 210 Bushs Lane (view from the south)

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All contaminant testing required was carried out by Envirolab (NATA accreditation 2901) for heavy metals (As, Cd, Cr, Cu, Pg, Hg Ni, Zn); polynuclear aromatic hydrocarbons (PAHs); benzene, toluene, ethylbenzene, xylene (BTEX), and Total Petroleum Hydrocarbons (TPHs). The certificate of analysis containing these results are enclosed (307178).

A results summary of significant analysis for the stockpiled material is contained in Table 2. The first column contains analytes (chemicals and other attributes tested for), the second column is the absolute maximum concentration for characterisation and the third column the maximum average concentration for characterisation. The middle columns show the results for the tests conducted. The second last column contains the average. The last column includes comments on the levels of analytes in the soil.

Levels that measure below the instrument's level of detection are typically below guideline limits for contaminants and are reported as less than (<) the number. The quality control data was reviewed and was not incorporated into the contained information summary as there were no anomalies that needed to be highlighted. Where a number has been reported as less than the instrument's level of detection, the number has been assumed to be 100% of that stated number when calculating the average concentration of the samples for example: <0.05mg/kg ~ 0.05mg/kg.

This investigation was conducted to ensure the materials are able to be used as topsoil at the site (210 Bushs Lane).

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Results Summary Table for the ENM Analysis:

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	Column 13	Column 14	Column 15	Column 16
Chemicals and other attributes	**Absolute maximum concentration** (mg/kg dry weight unless otherwise specified)	**Maximum average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Sample 221364-19**	**Sample 221364-20**	**Sample 221364-21**	**Sample 221364-22**	**Sample 221364-23**	**Sample 221364-24**	**Sample 221364-25**	**Sample 221364-26**	**Sample 221364-27**	**Sample 221364-28**	**Sample 221364-29**	**Average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Comments**
1. Mercury	1	0.5	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	Within Limit
2. Cadmium	1	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	Within Limit
3. Lead	100	50	10	11	10	10	11	10	10	10	11	10	9	10.2	Within Limit
4. Arsenic	40	20	<4	<8	<4	<4	<4	<4	<4	<4	<4	<4	<4	4.4	Within Limit
5. Chromium (total)	150	75	16	17	16	14	16	15	17	14	16	16	15	15.6	Within Limit
6. Copper	200	100	13	14	12	12	14	13	14	12	13	13	12	12.9	Within Limit
7. Nickel	60	30	17	19	18	16	18	16	18	16	17	17	15	17	Within Limit
8. Zinc	300	150	30	32	28	29	31	31	30	26	30	29	26	29.3	Within Limit
11. Total Polycyclic Aromatic Hydrocarbons (PAHs)	40	20	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Within Limit
12. Benzo(a)pyrene	1	0.5	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	Within Limit

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Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10	Column 11	Column 12	Column 13	Column 14	Column 15	Column 16
Chemicals and other attributes	**Absolute maximum concentration** (mg/kg dry weight unless otherwise specified)	**Maximum average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Sample 221364-19**	**Sample 221364-20**	**Sample 221364-21**	**Sample 221364-22**	**Sample 221364-23**	**Sample 221364-24**	**Sample 221364-25**	**Sample 221364-26**	**Sample 221364-27**	**Sample 221364-28**	**Sample 221364-29**	**Average conc. for characterisation** (mg/kg dry weight unless otherwise specified)	**Comments**
13. Benzene	0.5	NA	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	Within Limit
14. Toluene	65	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	Within Limit
15. Ethyl-benzene	25	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Within Limit
16. Xylene	15	NA	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	Within Limit
17. Total Petroleum Hydrocarbons (TPHs) C_{10}-C_{36}	500	250	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	Within Limit

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This investigation of soil samples collected from the stockpile adjacent the creekline at 210 Bushs Lane, Gunnedah, NSW was conducted to ensure the materials are able to be reused at the site (210 Bushs Lane).

Based on the analysis conducted on the samples collected from stockpile adjacent the creekline at 210 Bushs Lane Gunnedah, NSW, representing approximately 2,880m^3 material, it can be reused on site at 210 Bushs Lane as topsoil.

Yours faithfully,

Stephanie Cameron
Independent consultant for agriculture & the environment
B.App.Sc

Enc. Envirolab Certificate of Analysis 307178

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Appendix A – Envirolab results

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CERTIFICATE OF ANALYSIS 307178

Client Details

Client	East West Enviroag Pty Ltd
Attention	Stephanie Cameron
Address	82 Plain St, Tamworth, NSW, 2340

Sample Details

Your Reference	**EW221364**
Number of Samples	11 Soil
Date samples received	04/10/2022
Date completed instructions received	05/10/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	12/10/2022
Date of Issue	12/10/2022

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Results Approved By
Hannah Nguyen, Metals Supervisor
Kyle Gavrily, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		307178-1	307178-2	307178-3	307178-4	307178-5
Your Reference	UNITS	221364-19	221364-20	221364-21	221364-22	221364-23
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	91	94	102	94	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		307178-6	307178-7	307178-8	307178-9	307178-10
Your Reference	UNITS	221364-24	221364-25	221364-26	221364-27	221364-28
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	106	101	101	81	99

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vTRH(C6-C10)/BTEXN in Soil		
Our Reference		307178-11
Your Reference	UNITS	221364-29
Date Sampled		30/09/2022
Type of sample		Soil
Date extracted	-	06/10/2022
Date analysed	-	07/10/2022
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	97

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svTRH (C10-C40) in Soil						
Our Reference		307178-1	307178-2	307178-3	307178-4	307178-5
Your Reference	UNITS	221364-19	221364-20	221364-21	221364-22	221364-23
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	91	91	90	91

svTRH (C10-C40) in Soil						
Our Reference		307178-6	307178-7	307178-8	307178-9	307178-10
Your Reference	UNITS	221364-24	221364-25	221364-26	221364-27	221364-28
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	90	89	89	88	89

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svTRH (C10-C40) in Soil		
Our Reference		307178-11
Your Reference	UNITS	221364-29
Date Sampled		30/09/2022
Type of sample		Soil
Date extracted	-	06/10/2022
Date analysed	-	07/10/2022
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	89

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PAHs in Soil						
Our Reference		307178-1	307178-2	307178-3	307178-4	307178-5
Your Reference	UNITS	221364-19	221364-20	221364-21	221364-22	221364-23
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	10/10/2022	10/10/2022	10/10/2022	10/10/2022	10/10/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	112	113	111	111	110

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PAHs in Soil						
Our Reference		307178-6	307178-7	307178-8	307178-9	307178-10
Your Reference	UNITS	221364-24	221364-25	221364-26	221364-27	221364-28
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	10/10/2022	10/10/2022	10/10/2022	10/10/2022	10/10/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	111	111	110	110	112

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PAHs in Soil		
Our Reference		307178-11
Your Reference	UNITS	221364-29
Date Sampled		30/09/2022
Type of sample		Soil
Date extracted	-	06/10/2022
Date analysed	-	10/10/2022
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	106

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Acid Extractable metals in soil						
Our Reference		307178-1	307178-2	307178-3	307178-4	307178-5
Your Reference	UNITS	221364-19	221364-20	221364-21	221364-22	221364-23
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/10/2022	10/10/2022	10/10/2022	10/10/2022	10/10/2022
Date analysed	-	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022
Arsenic	mg/kg	<4	<8	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	17	16	14	16
Copper	mg/kg	13	14	12	12	14
Lead	mg/kg	10	11	10	10	11
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	17	19	18	16	18
Zinc	mg/kg	30	32	28	29	31

Acid Extractable metals in soil						
Our Reference		307178-6	307178-7	307178-8	307178-9	307178-10
Your Reference	UNITS	221364-24	221364-25	221364-26	221364-27	221364-28
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	10/10/2022	10/10/2022	10/10/2022	10/10/2022	10/10/2022
Date analysed	-	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	17	14	16	16
Copper	mg/kg	13	14	12	13	13
Lead	mg/kg	10	10	10	11	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	16	18	16	17	17
Zinc	mg/kg	31	30	26	30	29

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Acid Extractable metals in soil		
Our Reference		307178-11
Your Reference	UNITS	221364-29
Date Sampled		30/09/2022
Type of sample		Soil
Date prepared	-	10/10/2022
Date analysed	-	11/10/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	15
Copper	mg/kg	12
Lead	mg/kg	9
Mercury	mg/kg	<0.1
Nickel	mg/kg	15
Zinc	mg/kg	26

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Moisture						
Our Reference		307178-1	307178-2	307178-3	307178-4	307178-5
Your Reference	UNITS	221364-19	221364-20	221364-21	221364-22	221364-23
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
Moisture	%	5.8	4.4	4.9	3.5	3.7

Moisture						
Our Reference		307178-6	307178-7	307178-8	307178-9	307178-10
Your Reference	UNITS	221364-24	221364-25	221364-26	221364-27	221364-28
Date Sampled		30/09/2022	30/09/2022	30/09/2022	30/09/2022	30/09/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/10/2022	06/10/2022	06/10/2022	06/10/2022	06/10/2022
Date analysed	-	07/10/2022	07/10/2022	07/10/2022	07/10/2022	07/10/2022
Moisture	%	3.5	4.0	2.0	2.9	3.4

Moisture		
Our Reference		307178-11
Your Reference	UNITS	221364-29
Date Sampled		30/09/2022
Type of sample		Soil
Date prepared	-	06/10/2022
Date analysed	-	07/10/2022
Moisture	%	3.5

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Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more suscept ble to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

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Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

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QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	307178-2
Date extracted	-			06/10/2022	1	06/10/2022	06/10/2022		06/10/2022	06/10/2022
Date analysed	-			07/10/2022	1	07/10/2022	07/10/2022		07/10/2022	07/10/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	109	101
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	109	101
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	116	109
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	114	105
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	101	95
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	106	99
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	108	101
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	112	1	91	93	2	119	107

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	06/10/2022	06/10/2022		[NT]	[NT]
Date analysed	-			[NT]	11	07/10/2022	07/10/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	97	108	11	[NT]	[NT]

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QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	307178-2
Date extracted	-			06/10/2022	1	06/10/2022	06/10/2022		06/10/2022	06/10/2022
Date analysed	-			07/10/2022	1	07/10/2022	07/10/2022		07/10/2022	07/10/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	99	100
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	106	106
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	99
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	99	100
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	106	106
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	86	99
Surrogate o-Terphenyl	%		Org-020	91	1	90	91	1	100	91

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	06/10/2022	06/10/2022		[NT]	[NT]
Date analysed	-			[NT]	11	07/10/2022	07/10/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	89	89	0	[NT]	[NT]

EXHIBITION COPY

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	307178-2
Date extracted	-			06/10/2022	1	06/10/2022	06/10/2022		06/10/2022	06/10/2022
Date analysed	-			10/10/2022	1	10/10/2022	10/10/2022		10/10/2022	10/10/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	112
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	119
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	118	113
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	117
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	119
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	127	119
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	104
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0 05	0	124	114
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	116	1	112	104	7	110	114

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	06/10/2022	06/10/2022		[NT]	[NT]
Date analysed	-			[NT]	11	10/10/2022	10/10/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	<0.05	<0 05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	106	109	3	[NT]	[NT]

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QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-13	307178-2
Date prepared	-			10/10/2022	1	10/10/2022	10/10/2022		10/10/2022	10/10/2022
Date analysed	-			11/10/2022	1	11/10/2022	11/10/2022		11/10/2022	11/10/2022
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	100	#
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	97	77
Chromium	mg/kg	1	Metals-020	<1	1	16	15	6	99	91
Copper	mg/kg	1	Metals-020	<1	1	13	13	0	97	103
Lead	mg/kg	1	Metals-020	<1	1	10	10	0	103	84
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	96	93
Nickel	mg/kg	1	Metals-020	<1	1	17	17	0	99	84
Zinc	mg/kg	1	Metals-020	<1	1	30	30	0	101	81

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	10/10/2022	10/10/2022		[NT]	[NT]
Date analysed	-			[NT]	11	11/10/2022	11/10/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	15	15	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	12	12	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	9	10	11	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	15	17	12	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	26	30	14	[NT]	[NT]

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Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

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Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

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Report Comments

8 metals in soil:
- # Low spike recovery was obtained for this sample. Sample matrix interference is suspected. However, an acceptable recovery was obtained for the LCS.
- The PQL for As for 307178-2 has been raised due to the low spike recovery. This may reflect other samples where similar in matrix and similar analytical interferences occur.

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CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph 03 9763 2500 / melbourne@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph 07 3266 9532 / brisbane@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: East West Enviroag

Contact Person: Steph Cameron

Phone: 02 6762 1733

Sampler: N/A

Address: 82 Plain Street Tamworth 2340

Phone: 02 6762 1733 Mob: 0447 116 818

Email: stephanie.c@eastwestonline.com.au
anne.m@eastwestonline.com.au
jason.l@eastwestonline.com.au
annemarie@eastwestonline.com.au
admin@eastwestonline.com.au

Client Project Name / Number / Site etc (ie report title):
EW221364

PO No.: EW221364

Envirolab Quote No. :

Date results required:
Standard
Note: Inform lab in advance if urgent turnaround is required - surcharges apply

Report format: esdat / equis /

Lab Comments:
Updated CoC.

Sample information					Tests Required	Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Combo 3 All samples	Provide as much information about the sample as you can
1	221364-19		30/09/2022	Soil		
2	221364-20		30/09/2022	Soil		
3	221364-21		30/09/2022	Soil		
4	221364-22		30/09/2022	Soil		
5	221364-23		30/09/2022	Soil		
6	221364-24		30/09/2022	Soil		
7	221364-25		30/09/2022	Soil		
8	221364-26		30/09/2022	Soil		
9	221364-27		30/09/2022	Soil		
10	221364-28		30/09/2022	Soil		
11	221364-29		30/09/2022	Soil		

Relinquished by (Company): East West
Print Name: Kristen Engelbrecht
Date & Time: 5/10/2022
Signature:

Received by (Company): ELS Sydney
Print Name:
Date & Time: 04/10/2022 11:00
Signature:

Lab use only: 307178
Samples Received: Cool or Ambient (circle one)
Temperature Received at: 18°C (if applicable)
Transported by: Hand delivered / courier

Updated COC 05/10/2022 ~~09:14~~ 09:14

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CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 42 43 44

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph 03 9763 2500 / melbourne@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph 07 3266 9532 / brisbane@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph 0406 350 706 / adelaide@envirolab.com.au

Client: East West Enviroag	**Client Project Name / Number / Site etc (ie report title):** EW221364
Contact Person: Steph Cameron	
Phone: 02 6762 1733	**PO No.: EW221364**
Sampler: N/A	**Envirolab Quote No. :**
Address: 82 Plain Street Tamworth 2340	**Date results required:** Standard *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02 6762 1733 **Mob:** 0447 116 818	**Report format: esdat / equis /**
Email: stephanie.c@eastwestonline.com.au, anne.m@eastwestonline.com.au, jason.l@eastwestonline.com.au, annemarie@eastwestonline.com.au, admin@eastwestonline.com.au	**Lab Comments:**

Sample information					Tests Required	Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample		Provide as much information about the sample as you can
1	221364-19		30/09/2022	Soil	Combo 5 (10 x Heavy Metals) All samples	
2	221364-20		30/09/2022	Soil		
3	221364-21		30/09/2022	Soil		
4	221364-22		30/09/2022	Soil		
5	221364-23		30/09/2022	Soil		
6	221364-24		30/09/2022	Soil		
7	221364-25		30/09/2022	Soil		
8	221364-26		30/09/2022	Soil		
9	221364-27		30/09/2022	Soil		
10	221364-28		30/09/2022	Soil		
11	221364-29		30/09/2022	Soil		

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 307178
Date Received: 04/10/22.
Time Received: 1100.
Received By: VC
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Relinquished by (Company): East West	**Received by (Company):** ELS SYD	***Lab use only:***
Print Name: Kristen Engelbrecht	**Print Name:** Victoria Chan	**Samples Received: Cool or Ambient (circle one)**
Date & Time: 30/09/2022	**Date & Time:** 04/10/22 @ 1100	**Temperature Received at:** 18°C (if applicable)
Signature:	**Signature:**	**Transported by: Hand delivered / courier**

EXHIBITION COPY

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	East West Enviroag Pty Ltd
Attention	Stephanie Cameron

Sample Login Details

Your reference	EW221364
Envirolab Reference	307178
Date Sample Received	04/10/2022
Date Instructions Received	05/10/2022
Date Results Expected to be Reported	12/10/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	11 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	18
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

EXHIBITION COPY

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Acid Extractable metalsin soil
221364-19	✓	✓	✓	✓
221364-20	✓	✓	✓	✓
221364-21	✓	✓	✓	✓
221364-22	✓	✓	✓	✓
221364-23	✓	✓	✓	✓
221364-24	✓	✓	✓	✓
221364-25	✓	✓	✓	✓
221364-26	✓	✓	✓	✓
221364-27	✓	✓	✓	✓
221364-28	✓	✓	✓	✓
221364-29	✓	✓	✓	✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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EXTENSION WORKS PRELIMINARY SITE INVESTIGATION

PREPARED FOR:

Company Name:
Ewing Real Estate

Site:
210 Bushs Lane,
Gunnedah, NSW, 2380.

EXHIBITION C

Document verification

Extension Works - Preliminary Site Investigation,
210 Bushs Lane, Gunnedah, NSW, 2380.
EW251085

Version	Date	Prepared by	Reviewed by	Approved by
Final 1.0	04/07/2025	Matthew Grinter	Steph Cameron	Steph Cameron

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This document is uncontrolled when printed.

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GEOTECHNICAL | AGRICULTURAL | ENVIRONMENTAL | SAMPLING

GSG Laboratories acknowledges the Traditional Custodians of the land on which we work, and pay

DISCLAIMER: This report has been prepared on the basis of information available to the author at the time of print. The author accepts no responsibility or liability for any omissions or variances in values or target levels listed from time. The author accepts no responsibility or liability for any loss, damage or injury arising from actions taken over the content of this report. This report may only be relied upon in relation to the matters investigated within it.

respect to their Elders past, present and emerging.

GSG LABORATORIES

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1. Executive Summary

GSG Laboratories was engaged by Ewing Real Estate, to undertake extension works as part of a further preliminary site investigation (PSI) of the past use Lot 27 and 28 DP 755474 (210 Bushs Lane, Gunnedah, NSW) in the Parish of Gunnedah, County of Pottinger, and Local Government Area of Gunnedah Shire Council, after a directive from Gunnedah Shire Council given the sites proximity to a coal handling facility which neighbours the western border of the subject site proposed for development.

The client intends to create a sixty-one-lot subdivision across both the lots. The legal boundary for 210 Bushs Lane Gunnedah is Lots 27 & 28 DP755474 (The site). The site is currently zoned R5 large residential.

An additional site visit was conducted on the 15th of June 2025 by GSG Laboratories to undertake hotspot sampling across the site on the Western Boundary as directed by Gunnedah Shire Council.

The data indicates the ten (10) samples collected from a depth of 0-0.2m at nine (9) locations (BH1 to BH9) across the site, analysing the contamination status of total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), eight heavy metals and benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine, organophosphate and PCB present in the soil, were all below the thresholds for the NEPM HIL A guidelines and management limits for residential, parkland and public open space. The investigation revealed no imported fill or visible underground contamination. There were no odours or obvious signs of contamination on the site.

Considering the results of the assessments described in this report and the previous preliminary investigation (ref EW223164), Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah 2380, and contaminants of concern being below the relevant NEPM guidelines the site is deemed as low risk to future users or neighbours of the site.

Further, in accordance with Section 4.6 of the State Environment Planning Policy (Resilience and Hazards) 2021, the site does not require any further investigation. Therefore, the site is recommended for future development and has a low risk of contamination affecting future residents of the site.

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1.1. Scope of works

GSG Laboratories was engaged by Ewing Real Estate, to undertake further investigation as part of a previous preliminary site investigation (PSI) at 210 Bushs Lane, Gunnedah, NSW 2380 (*refer figure 1-1)*, after a directive from Gunnedah Shire Council given the sites proximity to an old coal handling facility, a potentially contaminating activity (PCA), which neighbours the western borders of 210 Bushs Lane, Gunnedah. This updated investigation draws information from a previous version of the Preliminary Site Investigation issued by East West Enviroag P/L on November 4, 2023 (ref: EW221364).

The site ownership has since changed from 2728 Pty Ltd to Kerry Elizabeth Pty Ltd in 2024 as trustee for Ewing Family Trust. The current owners still intend to create a sixty-one-lot residential subdivision across the site (*refer figure 1-2).* The legal boundary for 210 Bushs Lane, Gunnedah is Lots 27 & 28 DP755474 (The site). The site was recently rezoned as R5 – Large Residential with minimum lot size of 9,000m^2.

Figure 1-1: Subject site for the preliminary site investigations at 210 Bushs Lane, Gunnedah (highlighted yellow) (sixmaps 2025).

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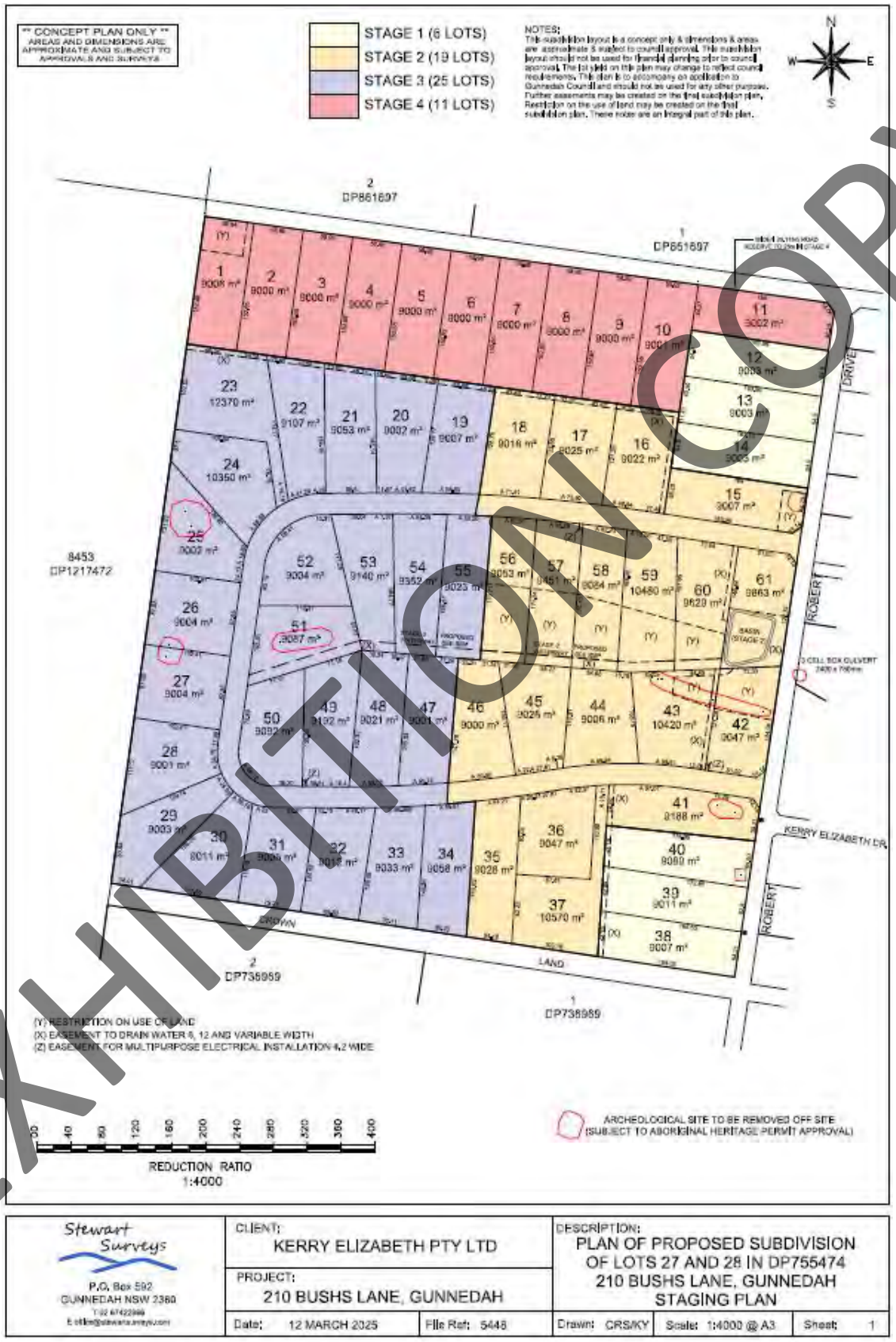

Figure 1-2: Proposed sixty-one lot subdivision planned for 210 Bushs Lane, Gunnedah.

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The site is still comprised of agricultural land with cropping across the site and an ephemeral creek line through the property that feeds into a dam on site. There is still an existing soil stockpile on the site, a result of excess fill from a surrounding development, which was assessed for potential contaminants as part of previous preliminary investigations and found to meet Excavated Natural Material (ENM) and NEPM Guidelines for reuse on a residentially zoned site.

The site has frontage to Bushs Lane and Robert Gordon Road. The site is surrounded by farmland to the north, west and south, with a recent residential development to the east. Dense vegetation lines the site on the property to the west, with sparse tree lines along the creek line and on the southern border of the site.

The focus locations for further investigation highlighted recently by Gunnedah Shire Council are presented in figure 1-3. Further focussed soil testing will determine whether there is any risk of contamination present along the site's western boundary.

Figure 1-3: Focus locations indicated by Gunnedah Shire Council for further investigation at 210 Bushs Lane, Gunnedah, NSW (yellow crosses) approximate locations.

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1.2. Assessment Guidelines

This assessment was conducted as directed by the EPA guideline 'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites (NSW EPA, 2022)' and consists of:

- Identifying past and present potentially contaminating activities;
- Identifying potential contamination types;
- A discussion of the site condition;
- Providing an assessment of site contamination; and
- Assessing the need for further investigation.

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2. Data quality objectives

Table 2-1: Data quality objectives for PSI at 210 Bushs Lane, Gunnedah, 2380.

Step 1: State the problem
The sites at 210 Bushs Lane, Gunnedah is proposed to be subdivided into sixty-one separate 9,000m^2 maximum size lots. Given the subject sites proximity to coal handling industry, further Preliminary Site Investigation was required by Gunnedah Shire Council.
Step 2: Identify the decisions
From a planning and management perspective, the following decisions are required to be made: • Is significant contamination present on the land? • Is the land suitable for its proposed use in its current state? • Is remediation required prior to the proposed use of the land? • Is remediation of the land likely to be required to mitigate potential off-site impacts?
Step 3: Identify inputs to the decision
From a planning and management perspective, the following inputs are required: • Appraise the site history and undertake a site investigation to ascertain potentially contaminating activities (PCA) that may have occurred on site and adjacent to the site; • Where PCAs are identified, and the presence or extent of contamination cannot be established through site history or visual inspection, soil sampling and analyses would be undertaken.
Step 4: Define the study boundaries
The study boundaries are defined as the sites named Lots 27 & 28 DP755474, 210 Bushs Lane Gunnedah, NSW, 2380.
Step 5: Develop a decision rule/analytical approach
• Contamination on the site is determined by comparing analytical results to the health and ecological criteria in Schedule B1 of the '*National Environment Protection Measure (Assessment of Site Contamination) (ASC NEPM) (National Environment Protection Council, 2013)*'; • Suitability of the land for its proposed use in its current state is decided by reviewing the sampling results against the criteria for residential land use in the ASC NEPM; • Requirements for remediation is decided based on the presence and nature of contamination on site in the context of the land's proposed use.
Step 6: Specify performance or acceptance criteria
The identification of the acceptable limits on decision errors are used to establish performance goals for limiting uncertainties in the data to avoid incorrect decisions being made through accurate data. In order to minimise decision errors; • Sampling would be undertaken in accordance with the NSW EPA *'Sampling Design Guidelines for contaminated land (NSW EPA, 2022)*', which is designed to provide a cohesive methodology for all consultants to adopt in their sampling;

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• NATA accredited analytical Laboratory to undertake analysis of the samples, and to utilise the data provided in the laboratory's analytical certificates, which by law can only bear the NATA endorsement if the data has met an adequate level of quality and reliability.
Step 7: Develop the plan and optimise the design for obtaining data
Based on steps 1 to 6, the PSI was designed as follows: 1. Undertake a desktop review of previous preliminary investigations, historical data and aerial imagery; 2. Confirm presence/absence of potential contamination hotspots along the western boundary of the site through inspection of the site; 3. Collect soil samples from locations targeted as hotspots by Gunnedah Shire Council along the Western Boundary of the site and previous investigations of suspected PCA locations on a random stratified grid pattern across the site to achieve 95% of the sampling density as recommended by NSW EPA '*Sampling Design Part 1 – Application; Contaminated Land Guidelines (NSW EPA, 2022)*'; 4. Analyse the samples for a broad suite of chemicals that include potential contaminants likely to have arisen from identified PCAs.

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3. Site identification

This report is guided by the requirements of the '*Contaminated Land Guidelines: Consultants reporting on contaminated land (NSW EPA, 2022)*'.

The scope of work undertaken relates solely to the areas of soil sampled within Lots 27 & 28 DP755474, 210 Bushs Lane Gunnedah, NSW, 2380. Previous preliminary investigations in 2023 identified a low risk of contamination for a residential development of this site. This further preliminary investigation will focus on hotspots identified by Gunnedah Shire Council requiring further investigation.

The scope of work undertaken in this preliminary contaminated site investigation comprises:

- An updated summary of site history covering the last 100 years, including historical aerial photographs;
- An updated description of potential for contamination;
- Hotspot sampling of the western boundary, with details of sampling and analysis;
- Assessment of the results of the further investigation, and
- And updated conclusions and any recommendations about the site.

3.1. Site characterisation

The sites are located within the locality of Gunnedah and combined cover an approximate area of 59ha *(refer figure 3-1)*. The sites are currently zoned R5 Large Residential.

The nearest natural surface water is an ephemeral creek line that runs through the subject site, and an onsite dam *(refer figures 3-2 and 3-3)*. Surface water runoff travels towards the south east of the site.

There are two groundwater bores/monitoring wells within 500m of the site (refer figure 3-4 and Table 3-1). The analysis of the soil data from previous investigations determined ground water sampling was not required and, in this instance, it wasn't considered.

The underlying geology for the subject sites sourced from the Tamworth 1;250,000 geological map is presented below:

Map Sheet	Code	Formation	Age	Group	Dominant lithology	Description
Tamworth 1:1250,000 Geological Map	Pug	Gladstone	Upper Permium Period	North	Sandy Shale and alluvium	Sandy shale, shaley sandstone, limestone and coal

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Figure 3-1: Combined area of the subject sites approximately 59ha.

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Figure 3-2: The nearest natural downslope surface waters, are ephemeral creeks through the property which runs from south west towards the north east of the site (sixMaps 2025).

Figure 3-3: The nearest natural downslope surface waters, are ephemeral creeks through the property and a surface water dam (Google Earth 2025).

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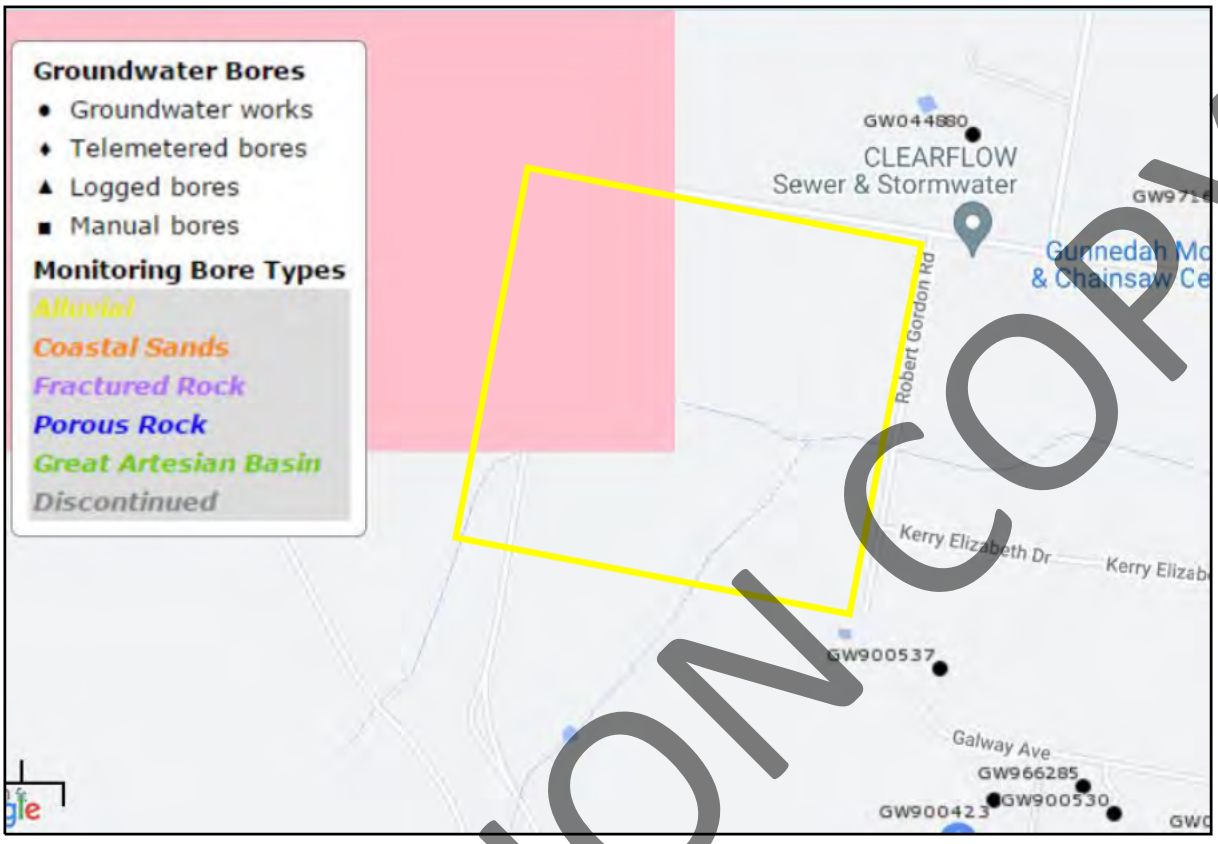

Figure 3-4: Groundwater bore data available from Water NSW on 4 August 2022 within 500 metres of the site (yellow border). Data for those bores is located below

Table 3-1 Groundwater bore data sourced from the Bureau of Meteorology's 'Australian Groundwater Explorer' on 4 August 2022

Bore ID	State	Bore Depth (m)	Drilled Date	Purpose	Status	Latitude	Longitude
GW900537.1.1	NSW	49.63	29/03/1993	Water supply	Unknown	-31.019428	150.21099
GW044880.1.1	NSW	Unknown	Unknown	Water supply	Unknown	-31.009261	150.211696

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4. Historical review

A due diligence report supplied by InfoTrack was used to review the historical details of the subject site.

Digital aerial photographs available online were included in the history search to determine if the site had been subject to any potentially contaminating historical activities. Historical aerial photographs were only available from 1956 *(figure 4-1)*, 1966 *(figure 4-2)*, 1975 *(figure 4-3)*, 1984 *(figure 4-4)*, 1998 *(figure 4-5)*, 2015 *(figure 4-6)*, and current *(figure 4-7)*.

The historical imagery from 1956 to 2025 shows that the site proposed for subdivision has not been subject to historical development. Previous investigations identified dairymen ownership from 1927 to 1958, and the 1956 and a summary of owners is listed in table 4-1. Aerial photographs do not show any sheds or infrastructure required for extensive dairy practices, therefore the farming practices undertaken on site were deemed of general agricultural practices. From aerial photos in 1998 coal mining operations can be observed on the western boundary of the subject site from 1984 with a lessening towards minimal activity observed in 2025.

No other major construction or land development apart from typical agricultural activities has occurred on the sites between 1956 to present day. There are currently no documented leases or easements on the site.

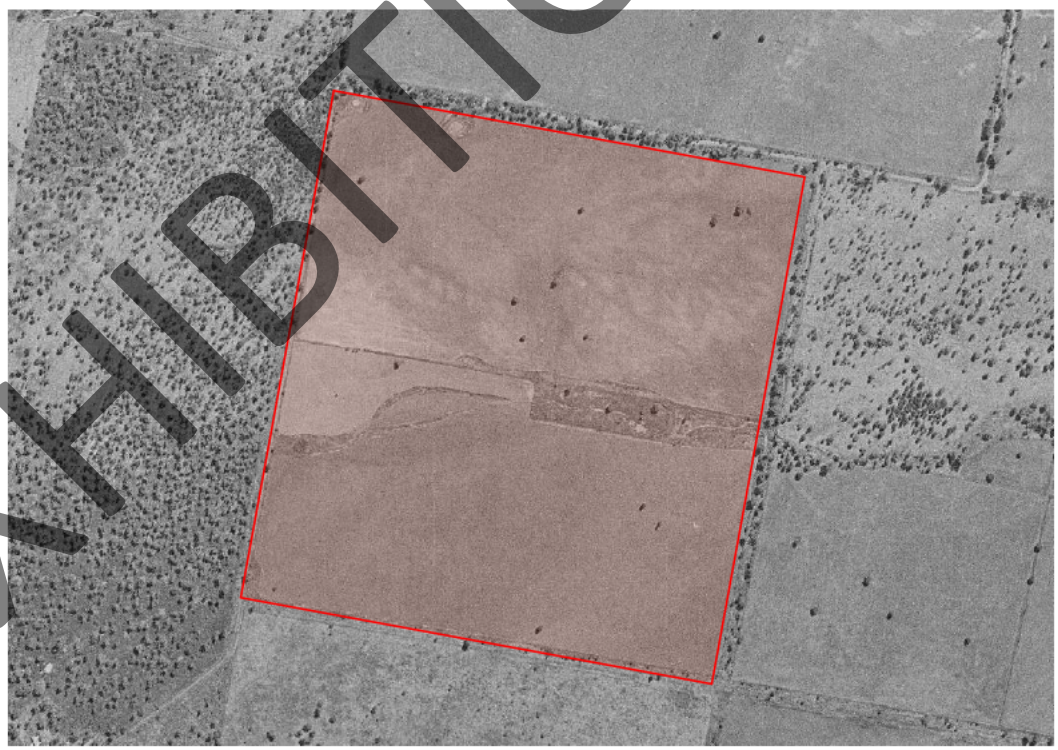

Figure 4-1: Historical Imagery 1956.

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Figure 4-2: Historical Imagery 1966.

Figure 4-3: Historical Imagery 1975.

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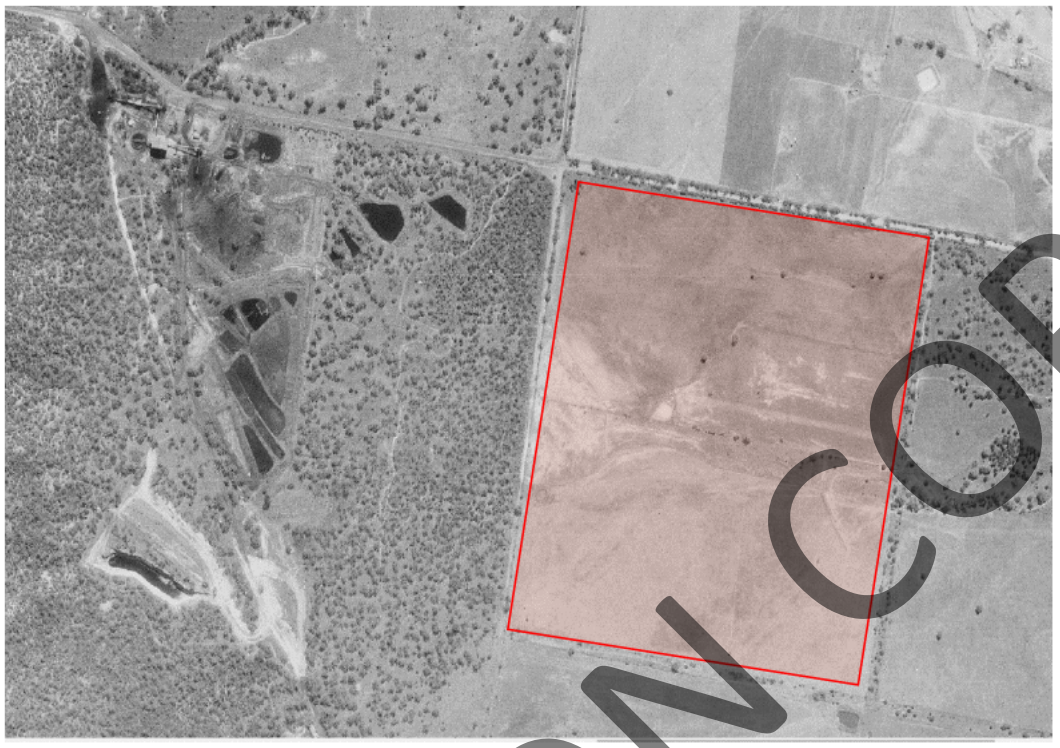

Figure 4-4: Historical Imagery 1984 – showing mining activities on western side.

Figure 4-5: Historical Imagery 1998– showing mining activities on western side.

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Figure 4-6: Historical Imagery 2015 - showing mining activities on western side.

Figure 4-7: Historical Imagery 2025 - showing mining activities on western side.

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Table 4-1 Summary of owners' report for Lots 27 & 28 D.P. 755474

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
23.05.1996 (1996 to 2011)	Malcolm John Robinson Ronald Douglas Robinson	27/755474 & 28/755474
04.04.2011 (2011 to 2012)	Jarad Robert Ewing	27/755474 & 28/755474
16.04.2012 (2012 to 2024)	2728 Pty Ltd	27/755474 & 28/755474
10.10.2024 (2024 to current)	#Kerry Elizabeth Pty Ltd	27/755474 & 28/755474

 # Denotes current registered proprietor

4.1. Identification of potentially contaminating activities (PCAs)

There is an increased risk of surface and subsurface soil contamination from the site's proximity to former coal handling activities upslope of the subject site and past agricultural activities undertaken on the subject site. There is no contaminated land notices for the site listed on the NSW EPA Public Register.

The most likely types of contaminants of potential concern (COPC) would be:

- top and sub soil depth for Total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), phenols, 17 heavy metals, polychlorinated biphenyls (PCBs), benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine and organophosphate pesticide.

GSG Laboratories conducted a further site visit on the 15th of June 2025. Previous site visits are reported in prior preliminary investigations.

The inspection of the site for potential contamination sources revealed the following observations:

- The site is a consists of two vacant lots;
- Grassed areas and well established natural trees;
- Farming practices undertaken historically and currently on the site;
- Drainage is predominantly to the south south east;
- Fencing separating the two subject sites;
- Existing soil stockpile of fill classified previously as ENM and below NEPM Residential HIL-A Guidelines;
- No obvious odours;
- No physical evidence of asbestos was indicated on the site
- No visible signs of responses to toxic contaminants from existing flora within the two sites; and
- No visible on-site losses of dangerous goods or discarding of explosive materials.

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4.2. Site Condition and Surrounding Environment

During the site inspection GSG Laboratories noted the following environmental sensitive receptors surrounding the site:

- Large trees in the neighbouring properties,
- Garden beds in the neighbouring properties,
- Grassed areas.

The potential receptors include:

- Future developers of the site including demolition and construction personnel for future residential dwellings;
- Future residents and visitors to the site,
- Flora and fauna surrounding the site;
- Neighbouring properties of the site; and
- Downslope watercourses receiving stormwater run-off from the site.

Possible exposure pathways include:

- Ingestion (via soil or water), dermal contact, or inhalation of surface soil contamination; and
- Inhalation through air transport of soil particulates (dust).
- Migration through groundwater
- Migration through surface water.

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5. Conceptual site model

A Conceptual Site Model (CSM) considers the environment at the site investigation, potential risks to human health, and contaminants of concern. It functions to identify current complete, or potentially complete pathways to receptors and the potential for future risks from future use of the site. Where a pathway is incomplete, there is no exposure to receptors.

This CSM is limited to the sites shown in Figure 1-1.

5.1. Contaminants of concern

Contaminants may be present on the land such as fuel, oil and grease, from the neighbouring upslope coal mining activities and typical agricultural related chemicals from previous farming practices on the property and its neighbouring properties. Please note this report is only focused on the status of the soil contamination at the site with respect to historical coal handling activities. Previous preliminary investigations of the site addressed contamination risks from former agricultural activities on the subject site.

5.2. Potential pathways

Due to the sites intended use as residential land, the potential pathways include:

- Direct contact (e.g., through soil, surface water);
- Inhalation;
- Migration through groundwater; and
- Migration through surface water and sediments.

5.3. Potential receptors

Potential human receptors on site include:

- Construction workers clearing and constructing at the site;
- Future users of the site (including residents).

Potential ecological receptors of the site include:

- Underlying terrestrial biota in the soil;
- Underlying groundwater; and
- Vegetation with plant root zones in the soil of this site.

5.4. Identification of complete pathways

- Surface run-off from the site would travel from west to east towards Robert Drive,
- There is not an underground bore present at the site,
- The nearest ephemeral watercourse runs through the middle of the site from west to east as shown in figure 3-2 & 3-3.

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6. Environmental site investigation

6.1. Scope of work

To ascertain the potential for current and past contaminating activities on the sites, the following was undertaken:

- Desktop review
  - Review of historical imagery;
  - Site history investigation;
  - Review of soil, topography, geology and surface and groundwater; and
- Site investigation
  - Prior site walkovers to visually identify any potential hotspots; and
  - Sampling per the EPA Sampling Design Guidelines for Contaminated Land (NSW EPA, 2022) in the 2023 report and this current further investigation.
- PSI report
  - Provision of a stage 1 PSI report with sampling results and recommendations based on testing results from 2023 and this further preliminary investigation.

6.2. Methodology

An additional site visit was conducted on the 15th of June 2025 by GSG Laboratories to undertake hotspot sampling across the western edge of the subject site (refer to figure 1-3) at the request of Gunnedah Shire Council.

Nine (9) locations (*refer figure 6-1)* were sampled on Lots 27 & 28 DP755474, 210 Bushs Lane, Gunnedah. Sample locations BH1 to BH9 were augured to 1.5m using a trailer mounted drill rig *(refer figure 6-2 to 6-10).* At these nine (9) locations soil samples were collected from the surface at 0 to 0.2m.

All samples were collected in accordance with the NSW EPA *'Sampling Design Guidelines for Contaminated Land (NSW EPA, 2022)'* and the National Environment Protection Measure (NEPM). Sampling and auguring was undertaken by Matthew Grinter and Emily Bolsom.

To preserve the samples effectively, each sample was placed in a new glass jar with a plastic screw-top lid and sealed. The samples were labelled with a job number, date, sample location, sampler, and a unique sample number. This information was also entered into a sample log *(table 6-1)* together with details of the site address, GPS coordinates at each soil sample point, samplers and sample locations.

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The soil jars were carefully transported back to the GSG Laboratory, where the sample containers were wrapped in bubble wrap to ensure they did not break during transit and then transported via overnight express in a cooled esky, accompanied by a filled and signed chain of custody (CoC) form to Envirolab (NATA Accreditation #2901). A Sample Receipt Advice (SRA) was provided once Envirolab had received the samples. The CoC and SRA for the extension testing can be found in Appendix.

GSG Laboratories also collected and included one intra-lab QA/QC duplicate on each site which was also tested by Envirolab (251085-5 primary, 251085-6 duplicate of BH5).

Table 6-1: Sampling log

SAMPLE ID	Borehole	DEPTH	Latitude/ Longitude	DESCRIPTION
251085-1	BH1	0-0.2m	-31°00'57.79"(S), 150°12'06.60"(E)	0-0.3m black clay 0.3-1.5m red gravelly clay
251085-2	BH2	0-0.2m	-31°00'51.57"(S), 150°12'07.86"(E)	0-0.4m light brown silty gravel 0.4-1.5m weathered rock
251085-3	BH3	0-0.2m	-31°00'46.97"(S), 150°12'09.04"(E)	0-0.4m light brown silty gravel 0.4-1.5m weathered rock
251085-4	BH4	0-0.2m	-31°00'43.39"(S), 150°12'09.86"(E)	0-1.1m red clay 1.1-1.5m weather rock and refusal at 1.5m
251085-5	BH5-A	0-0.2m	-31°00'38.76"(S), 150°12'10.67"(E)	0-1.5m red clay
251085-6	BH5-B			
251085-7	BH6	0-0.2m	-31°00'46.65"(S), 150°12'12.42"(E)	0-1.2m red clay 1.2-1.5m weathered rock
251085-8	BH7	0-0.2m	-31°00'49.13"(S), 150°12'15.38"(E)	0-1.5m red gravelly clay
251085-9	BH8	0-0.2m	-31°00'50.05"(S), 150°12'21.55"(E)	0-1.3m red clay 1.3-1.5m weathered rock
251085-10	BH9	0-0.2m	-31°00'51.44"(S), 150°12'25.56"(E)	0-1.5m red clay

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Figure 6-1: Sample map with locations of BH1 to BH9 marked with GPS accurate yellow pins.

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Figure 6-2: Sample location BH1.

EXTERNAL COPY

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Figure 6-3: Sample location BH2.

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Figure 6-4: Sample location BH3.

EXTERNAL COPY

Figure 6-5: Sample location BH4.

EXTRA COPY

Figure 6-6: Sample location BH5 A & B.

EXTERNAL COPY

Figure 6-7: Sample location BH6.

Figure 6-8: Sample location BH7.

EXAMPLE ONLY

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Figure 6-9: Sample location BH8.

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Figure 6-10: Sample location BH9.

6.3. Assessment criteria

The assessment criteria adopted for this investigation are the health investigation and health screening levels (HILs and HSLs respectively) presented in Schedule B1 to the NEPM. The specific values are shown in Appendix B. HILs and HSLs are Tier 1 risk based generic soil assessment criteria used for the assessment of potential risks to human health presented by non-volatile or semi-volatile contaminants (HILs) or due to chronic inhalation exposure of petroleum vapour emanating off petroleum contaminated soils (HSLs, which relate to Vapour Risk). HILs and HSLs are intentionally conservative and are based on reasonable worst-case scenarios for generic soil types, contamination depth and land use settings. These include Residential with ('A') or without ('B') exposed and accessible soil, Open Space/Recreational ('C') and Commercial Industrial ('D')

HIL 'A' and HSL 'A' soil assessment criteria for sandy soil (fine) from 0 to <1 metres were adopted based on the proposed subdivision of the site.

The NEPM also provides additional criteria such as Management Limits for assessing the aesthetic and physical effects of high-level hydrocarbon contamination and Ecological Investigation and Screening Levels (EILs and ESLs) for residential occupation, for situations where sensitive ecological receptors may be involved such as flora and fauna surrounding the site; neighbouring residential properties of the site; and downslope watercourses receiving stormwater run-off from the site.

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6.4. Analytical Results

A further nine (9) locations were sampled on the western side of Lots 27 & 28 DP755474, 210 Bushs Lane Gunnedah, NSW, 2380. Sample locations BH1 to BH9 were all tested for total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), eight heavy metals and benzene, toluene, ethylbenzene, xylene (BTEX), organochlorines, organophosphates and polychlorinated biphenyls (PCB). All soil samples were tested by Envirolab (NATA accreditation 2901).

A summary of the analytical data of the samples tested is summarised below in table 6-2. The complete analytic data set is presented against the HIL A and management limits guidelines in Tables 6-3, 6-4, 6-5, 6-6, 6-7 and 6-8. The 95% UCL confidence limits may not apply due to a lower sampling frequency.

The data indicates the ten (10) samples collected from a depth of 0-0.2m at nine (9) locations (BH1 to BH9) across the site, were all below the thresholds for NEPM HIL-A guidelines and management limits for total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), eight heavy metals and benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine, organophosphate and PCB.

Table 6-2: Summary of analysis boreholes.

Analyte tested	**Samples outside Limit of Reporting (LOR/EQL)**	**Samples exceeding 50% NEPM threshold for Residential HIL A**	**Samples exceeding NEPM threshold for Residential HIL A**	**Samples exceeding NEPM threshold for Management limits**
Heavy metals	Chromium, Copper, Lead, Nickel, Zinc (all samples) Arsenic (252085-3 to 10)	Nil	Nil	N/A
PAHs	Nil	Nil	Nil	Nil
BTEX	Nil	Nil	Nil	Nil
TRH	N/A	N/A	N/A	Nil
Organochlorine	Nil	Nil	Nil	N/A
Organophosphate	Nil	Nil	Nil	N/A
PCB	Nil	Nil	Nil	N/A

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6.5. Quality assurance/quality control (QA/QC)

All samples were transported to the laboratories for analysis accompanied by CoC documentation containing the following:

- Site identification;
- Sampler(s);
- Nature of the sample – soil;
- Collection date; and
- Analysis to be performed.

The original CoC and the laboratory's sample receipt advice (SRA) are presented in Appendix C.

A field duplicate was taken from locations BH5 (251085-5 primary, 251085-6) and were analysed by Envirolab. The repeatability of the duplicate was assessed by calculating the Relative Percent Differences (RPDs).

The soil duplicates are within the adopted acceptance criteria of 30-50% of the RPD for all tested contaminants and the results are in Appendix C. Please note the differences at the lower limits create a higher % difference but minimal significant difference. Refer to RPDs in Appendix.

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Table 6-3: Results table summary total recoverable hydrocarbons.

			Benzene	Toluene	Ethylbenzene	m+p-xylene	o-Xylene	Total +ve Xylenes	TRH C6 - C10	vTRH C6 - C10 less BTEX (F1)	TRH >C10-C16	TRH >C10-C16 less Naphthalene (F2)	TRH >C16-C34	TRH >C34-C40	Total +ve TRH (>C10-C40)	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	Total +ve TRH (C10-C36)
NEPM 2013 Table 1B(7) Management limits for TPH Fractions F1-F4 in soil					65	105	125			45	800		1000		3500	10000				
Lab ID	**Field ID**	**Date sampled**																		
251085-1	BH1	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-2	BH2	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-3	BH3	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-4	BH4	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-5	BH5	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-6	BH5	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-7	BH6	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-8	BH7	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-9	BH8	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
251085-10	BH9	15/06/2025	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<25	<50	<100	<100	<50
		Mean	0.2	0.5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	50
		std dev	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		CV	0.000	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		α at 95% (n-1)	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
		95% UCL Average (mg/kg)	0.2	0.5	1	2	1	1	25	25	50	50	100	100	50	25	50	100	100	50
		Management Limits Pass/Fail	N/A	N/A	Pass	Pass	Pass	N/A	N/A	Pass	Pass	N/A	Pass	N/A	Pass	Pass	N/A	N/A	N/A	N/A

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Table 6-4: Results summary for Poly Aromatic Hydrocarbons (PAHs).

			Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b,j+k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	Benzo(a)pyrene TEQ calc (zero)	Benzo(a)pyrene TEQ calc(half)	Benzo(a)pyrene TEQ calc(PQL)	Total +ve PAH's
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(1) HILs Res A Soil							0.7								170			3	3	3	300
Lab ID	**Field ID**	**Date sampled**																			
251085-1	BH1	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.5	<0.5	<0 5	0.1
251085-2	BH2	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-3	BH3	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-4	BH4	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-5	BH5	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-6	BH5	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-7	BH6	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-8	BH7	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-9	BH8	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
251085-10	BH9	15/06/2025	<0.1	<0.1	<0.1	<0.1	<0.05	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5	<0.5	<0 5	<0.05
		Mean	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.06
		std dev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016
		CV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.287
		α at 95% (n-1)	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
		95% UCL Average (mg/kg)	0.1	0.1	0.1	0.1	0.05	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.06
		HIL A Pass/Fail	N/A	N/A	N/A	N/A	Pass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Pass	N/A	N/A	Pass	Pass	Pass	Pass

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Table 6-5: Results summary for eight heavy metals.

			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 HIL A Residential			100	20	100	6000	300	10	400	7400
Lab ID	**Field ID**	**Date sampled**								
251085-1	**BH1**	**15/06/2025**	<4	<0.4	38	23	12	<0.1	40	56
251085-2	**BH2**	**15/06/2025**	<4	<0.4	10	12	14	<0.1	11	22
251085-3	**BH3**	**15/06/2025**	5	<0.4	12	11	13	<0.1	15	29
251085-4	**BH4**	**15/06/2025**	5	<0.4	40	9	12	<0.1	17	17
251085-5	**BH5**	**15/06/2025**	4	<0.4	42	11	12	<0.1	21	16
251085-6	**BH5**	**15/06/2025**	5	<0.4	43	11	12	<0.1	20	18
251085-7	**BH6**	**15/06/2025**	8	<0.4	15	11	14	<0.1	18	41
251085-8	**BH7**	**15/06/2025**	5	<0.4	15	9	13	<0.1	18	44
251085-9	**BH8**	**15/06/2025**	5	<0.4	17	10	12	<0.1	18	36
251085-10	**BH9**	**15/06/2025**	6	<0.4	21	8	15	<0.1	20	49
		Mean	**5**	**0.4**	**25**	**12**	**13**	**0.1**	**20**	**33**
		std dev	**1.197**	**0.000**	**13.663**	**4.223**	**1.101**	**0.000**	**7.657**	**14.47**
		CV	**0.235**	**0.000**	**0.540**	**0.367**	**0.085**	**0.000**	**0.387**	**0.441**
		α at 95% (n-1)	**1.833**	**1.833**	**1.833**	**1.833**	**1.833**	**1.833**	**1.833**	**1.833**
		95% UCL Average (mg/kg)	**6**	**0.4**	**33**	**14**	**14**	**0.1**	**24**	**41**
		HIL-A Pass/Fail	**Pass**	**N/A**	**Pass**	**Pass**	**Pass**	**N/A**	**Pass**	**Pass**

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Table 6-6: Results summary for organochlorines.

			HCB	α-BHC	gamma-BHC	beta-BHC	Heptachlor	delta-BHC	Aldrin	Heptachlor Epoxide	gamma-Chlordane	alpha-Chlordane	Endosulfan I	pp-DDE	Dieldrin	Endrin	pp-DDD	Endosulfin II	pp-DDT	Endrin Aldehyde	Endosulfan Sulphate	Methoxychlor	Mirex	Total DDT+DDD+DDE
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(1) HILs Res A Soil			10				6		6		50	50	270		6	10		300	180			300	10	240
Lab ID	**Field ID**	**Date sampled**																						
251085-1	BH1	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-2	BH2	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-3	BH3	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-4	BH4	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-5	BH5	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-6	BH5	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-7	BH6	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-8	BH7	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-9	BH8	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-10	BH9	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Mean	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		std dev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		CV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		α at 95% (n-1)	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
		95% UCL Average (mg/kg)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		HIL-A Pass/Fail	Pass	N/A	N/A	N/A	Pass	N/A	Pass	N/A	Pass	Pass	Pass	N/A	Pass	Pass	N/A	Pass	Pass	N/A	N/A	Pass	Pass	Pass

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Table 6-7: Results summary for organophosphates.

			Azinphos-methyl (Guthion)	Bromophos-ethyl	Chlorpyrifos-methyl	Chlorpyriphos	Coumaphos	Diazinon	Dichlorvos	Dimethoate	Disulfoton	Ethion	Fenamiphos	Fenitrothion	Fenthion	Malathion	Methidathion	Mevinphos	Parathion	Parathion-Methyl	Phorate	Phosalone	Ronnel
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(1) HILs Res A Soil						160																	
Lab ID	**Field ID**	**Date sampled**																					
251085-1	BH1	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-2	BH2	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-3	BH3	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-4	BH4	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-5	BH5	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-6	BH5	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-7	BH6	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-8	BH7	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-9	BH8	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-10	BH9	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Mean	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		std dev	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		CV	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		α at 95% (n-1)	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
		95% UCL Average (mg/kg)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
		HIL-A Pass/Fail	N/A	N/A	N/A	Pass	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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Table 6-8: Results summary for PCB's.

			Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total +ve PCBs (1016-1260)
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
NEPM 2013 Table 1A(1) HILs Res A Soil										1
Lab ID	Field ID	Date sampled								
251085-1	BH1	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-2	BH2	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-3	BH3	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-4	BH4	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-5	BH5	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-6	BH5	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-7	BH6	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-8	BH7	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-9	BH8	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
251085-10	BH9	15/6/2025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mean (mg/L)			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Std Dev			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
CV			0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
α at 95% (n-1)			1.833	1.833	1.833	1.833	1.833	1.833	1.833	1.833
95% UCL			0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
HIL-A Pass/Fail			N/A	N/A	N/A	N/A	N/A	N/A	N/A	PASS

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6.6. Conclusion

GSG Laboratories was engaged by Ewing Real Estate, to undertake a preliminary site investigation (PSI) at 210 Bushs Lane, NSW, 2380, after a directive from Gunnedah Shire Council given the sites proximity to previous coal handling activities which neighbours the western border of the subject site to undertake extension testing as part of preliminary site investigations.

The client intends to create a sixty-one-lot subdivision across the site. The legal boundary for 210 Bushs Lane Gunnedah, NSW, 2380 is Lots 27 and 28 DP755474. Both sites are currently zoned R5 large residential.

A site visit was conducted on the 15th of June 2025 by GSG Laboratories to undertake further hotspot sampling across the site. Nine (9) locations were sampled on Lots 27 and 28 DP755474. Sample locations BH1 to BH9 were augured to 1.5m using a trailer mounted drill rig. At all locations soil samples were collected from the surface at 0 to 0.2m.

The data indicates the ten (10) samples collected from a depth of 0-0.2m at nine (9) locations (BH1 to BH9) across the site, analysing the contamination status of total recoverable hydrocarbons (TRH), polycyclic aromatic hydrocarbons (PAHs), eight heavy metals and benzene, toluene, ethylbenzene, xylene (BTEX), organochlorine, organophosphate and PCB present in the soil, were all below the thresholds for the NEPM HIL A guidelines and management limits for residential, parkland and public open space. The investigation revealed no imported fill or visible underground contamination. There were no odours or obvious signs of contamination on the site.

Considering the results of the assessments described in this report and the previous preliminary investigation (ref EW223164), Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah 2380, and contaminants of concern being below the relevant NEPM guidelines the site is deemed as low risk to future users or neighbours of the site.

Further, in accordance with Section 4.6 of the State Environment Planning Policy (Resilience and Hazards) 2021, the site does not require any further investigation. Therefore, the site is recommended for future development and has a low risk of contamination affecting future residents of the site.

6.7. Report limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only.

This report does not provide a complete assessment of the environmental integrity of the site and is limited by the scope as defined above.

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Appendix A – Envirolab Results

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Envirolab Services Pty Ltd
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12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 383452

Client Details

Client	GSG Laboratories Pty Ltd
Attention	Stephanie Cameron
Address	82 Plain St, Tamworth, NSW, 2340

Sample Details

Your Reference	**EW251085**
Number of Samples	10 Soil
Date samples received	17/06/2025
Date completed instructions received	17/06/2025

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	24/06/2025
Date of Issue	23/06/2025

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Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	20/06/2025	20/06/2025	20/06/2025	20/06/2025	20/06/2025
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	69	70	74	76	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	20/06/2025	20/06/2025	20/06/2025	23/06/2025	23/06/2025
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	82	79	86	93	108

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svTRH (C10-C40) in Soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	19/06/2025	19/06/2025	20/06/2025	20/06/2025	20/06/2025
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	82	81	77	72	78

svTRH (C10-C40) in Soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	20/06/2025	20/06/2025	20/06/2025	20/06/2025	20/06/2025
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	79	75	78	79	77

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PAHs in Soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.1	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	95	97	96	95	95

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PAHs in Soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	94	94	95	95	91

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Organochlorine Pesticides in soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	98	100	99	97	98

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Organochlorine Pesticides in soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive Aldrin+Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	97	98	98	98	94

EXHIBITION COPY

Organophosphorus Pesticides in Soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	98	100	99	97	98

EXHIBITION COPY

Organophosphorus Pesticides in Soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	97	98	98	98	94

EXHIBITION COPY

PCBs in Soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	91	94	93	92	92

PCBs in Soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	21/06/2025	21/06/2025	21/06/2025	21/06/2025	21/06/2025
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	92	92	93	92	89

EXHIBITION COPY

Acid Extractable metals in soil						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	20/06/2025	20/06/2025	20/06/2025	20/06/2025	20/06/2025
Arsenic	mg/kg	<4	<4	5	5	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	38	10	12	40	42
Copper	mg/kg	23	12	11	9	11
Lead	mg/kg	12	14	13	12	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	40	11	15	17	21
Zinc	mg/kg	56	22	29	17	16

Acid Extractable metals in soil						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	20/06/2025	20/06/2025	20/06/2025	20/06/2025	20/06/2025
Arsenic	mg/kg	5	8	5	5	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	43	15	15	17	21
Copper	mg/kg	11	11	9	10	8
Lead	mg/kg	12	14	13	12	15
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	20	18	18	18	20
Zinc	mg/kg	18	41	44	36	49

EXHIBITION COPY

Moisture						
Our Reference		383452-1	383452-2	383452-3	383452-4	383452-5
Your Reference	UNITS	251085-1 BH1	251085-2 BH2	251085-3 BH3	251085-4 BH4	251085-5 BH5A
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	19/06/2025	19/06/2025	19/06/2025	19/06/2025	19/06/2025
Moisture	%	16	11	9.5	18	15

Moisture						
Our Reference		383452-6	383452-7	383452-8	383452-9	383452-10
Your Reference	UNITS	251085-6 BH5B	251085-7 BH6	251085-8 BH7	251085-9 BH8	251085-10 BH9
Depth		0-0.2m	0-0.2m	0-0.2m	0-0.2m	0-0.2m
Date Sampled		15/06/2025	15/06/2025	15/06/2025	15/06/2025	15/06/2025
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	18/06/2025	18/06/2025	18/06/2025	18/06/2025	18/06/2025
Date analysed	-	19/06/2025	19/06/2025	19/06/2025	19/06/2025	19/06/2025
Moisture	%	14	7.8	6.1	18	14

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Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES. Total Phosphate determined stochiometrically from Phosphorus (assumed to be present as Phosphate). Where salts (oxides, chlorides etc.) are calculated from the element concentration stoichiometrically there is no guarantee that the salt form is completely soluble in the acids used in the preparation.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

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Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more suscept ble to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

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QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			20/06/2025	1	20/06/2025	20/06/2025		20/06/2025	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	113	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	113	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	113	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	110	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	113	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	114	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	117	[NT]
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	119	1	69	68	1	99	[NT]

EXHIBITION COPY

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			20/06/2025	1	19/06/2025	19/06/2025		20/06/2025	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	72	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	123	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	93	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	72	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	123	[NT]
Surrogate o-Terphenyl	%		Org-020	79	1	82	81	1	76	[NT]

EXHIBITION COPY

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			21/06/2025	1	21/06/2025	21/06/2025		21/06/2025	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	96	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0 05	0	88	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	98	1	95	95	0	99	[NT]

EXHIBITION COPY

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			21/06/2025	1	21/06/2025	21/06/2025		21/06/2025	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	106	1	98	100	2	103	[NT]

EXHIBITION COPY

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			21/06/2025	1	21/06/2025	21/06/2025		21/06/2025	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dime hoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-me hyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	106	1	98	100	2	103	[NT]

EXHIBITION COPY

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			21/06/2025	1	21/06/2025	21/06/2025		21/06/2025	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	95	1	91	93	2	97	[NT]

EXHIBITION COPY

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			18/06/2025	1	18/06/2025	18/06/2025		18/06/2025	[NT]
Date analysed	-			20/06/2025	1	20/06/2025	20/06/2025		20/06/2025	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	105	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	98	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	38	38	0	99	[NT]
Copper	mg/kg	1	Metals-020	<1	1	23	24	4	107	[NT]
Lead	mg/kg	1	Metals-020	<1	1	12	12	0	97	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	105	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	40	42	5	100	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	56	56	0	94	[NT]

EXHIBITION COPY

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

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Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Air volumes are typically provided by customers (often as flow rate(s) and sampling time(s) and/or simply volumes) sampled or exposure times (determines 'volume' passive badges are exposed to)). Hence in such circumstances the volume measurement is inevitably not covered by Envirolab's NATA accreditation. An exception may occur where Envirolab Newcastle does the sampling where accreditation exists for certain types of sampling and hence volume determination(s). Note air volumes are often used to determine concentrations for dust and/or analyses on filters, sorbents and in impingers. For canister sampling, the air volume is covered by Envirolab's NATA accreditation.

Urine Analysis - The BEI values listed are taken from the 2022 edition of "TLVs and BEIs Threshold Limits" by ACGIH.

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LAND REGISTRY SERVICES

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 27/755474

SEARCH DATE	TIME	EDITION NO	DATE
10/10/2024	10:55 AM	5	26/6/2024

LAND

LOT 27 IN DEPOSITED PLAN 755474
LOCAL GOVERNMENT AREA GUNNEDAH
PARISH OF BLACK JACK COUNTY OF POTTINGER
(FORMERLY KNOWN AS PORTION 27)
TITLE DIAGRAM CROWN PLAN 4159.1781

FIRST SCHEDULE

KERRY ELIZABETH PTY LTD (T AT453052)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 AT453053 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
3 AU165864 PLANNING AGREEMENT PURSUANT TO SECTION 7.6 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Stewart Surveys Pty Ltd PRINTED ON 10/10/2024

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title.
Warning: the information appearing under notations has not been formally recorded in the Register.

DYE & DURHAM TERRAIN PTY LTD - hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with section 96B(2) of the Real Property Act 1900.

Note: Information contained in this document is provided by DYE & DURHAM TERRAIN PTY LTD (ABN 35 164 894 517), https://dyedurhamterrain.com/ an approved NSW Information Broker

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D&D Terrain

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 28/755474

SEARCH DATE	TIME	EDITION NO	DATE
10/10/2024	10:58 AM	5	26/6/2024

LAND

LOT 28 IN DEPOSITED PLAN 755474
LOCAL GOVERNMENT AREA GUNNEDAH
PARISH OF BLACK JACK COUNTY OF POTTINGER
(FORMERLY KNOWN AS PORTION 28)
TITLE DIAGRAM CROWN PLAN 4160.1781

FIRST SCHEDULE

KERRY ELIZABETH PTY LTD (T AT453052)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 AT453053 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
3 AU165864 PLANNING AGREEMENT PURSUANT TO SECTION 7.6 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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APPENDIX A

CONCEPT PLAN FOR PROPOSED SUBDIVISION OF LOTS 27 & 28 DP755474, 210 BUSHS LANE, GUNNEDAH, PREPARED BY STEWART SURVEYS PTY LTD. REF: 5448. SHEET 1-2.

LANDSCAPE PLAN PROPOSED SUBDIVISION OF LOTS 27 & 28 IN DP 755474, 210 BUSHS LAND, GUNNEDAH, PREPARED BY STEWART SURVEYS PTY LTD. REF 5448 SHEET 1-2.

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** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (6 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)
STAGE 4 (11 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N
W E
S

2
DP861697

1
DP861697

WIDEN 20.115m ROAD RESERVE TO 25m IN STAGE 4

1 9006 m² | 2 9000 m² | 3 9000 m² | 4 9000 m² | 5 9000 m² | 6 9000 m² | 7 9000 m² | 8 9000 m² | 9 9000 m² | 10 9001 m² | 11 9002 m²

12 9003 m² | 13 9003 m² | 14 9003 m² | 15 9007 m² | 16 9022 m² | 17 9025 m² | 18 9016 m² | 19 9007 m² | 20 9002 m² | 21 9053 m² | 22 9107 m² | 23 12370 m²

24 10350 m² | 25 9002 m² | 26 9004 m² | 27 9004 m² | 28 9001 m² | 29 9003 m² | 30 9011 m² | 31 9006 m² | 32 9012 m² | 33 9033 m² | 34 9058 m² | 35 9028 m² | 36 9047 m² | 37 10570 m² | 38 9007 m² | 39 9011 m² | 40 9089 m² | 41 9188 m² | 42 9047 m² | 43 10420 m² | 44 9006 m² | 45 9026 m² | 46 9000 m² | 47 9001 m² | 48 9021 m² | 49 9192 m² | 50 9092 m² | 51 9087 m² | 52 9004 m² | 53 9140 m² | 54 9352 m² | 55 9023 m² | 56 9053 m² | 57 9451 m² | 58 9084 m² | 59 10480 m² | 60 9629 m² | 61 9863 m²

DRIVE

ROBERT

KERRY ELIZABETH DR

ROBERT

BASIN (STAGE 2)

3 CELL BOX CULVERT 2400 x 750mm

STAGE 3 WATERWAY

PROPOSED SEE SMP

STAGE 2 WATERWAY

PROPOSED SEE SMP

8453
DP1217472

2
DP736969

CROWN LAND

1
DP736969

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

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Stewart Surveys
P.O. Box 592
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CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH STAGING PLAN

Date: 12 MARCH 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 1

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an Integral part of this plan.

N
W E
S

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

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CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH AERIAL PHOTO

Date: 12 MARCH 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 2

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

NOTE - ALL STREET TREE PLANTING TO BE UNDERTAKEN IN STAGE 3

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N W E S

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REDUCTION RATIO
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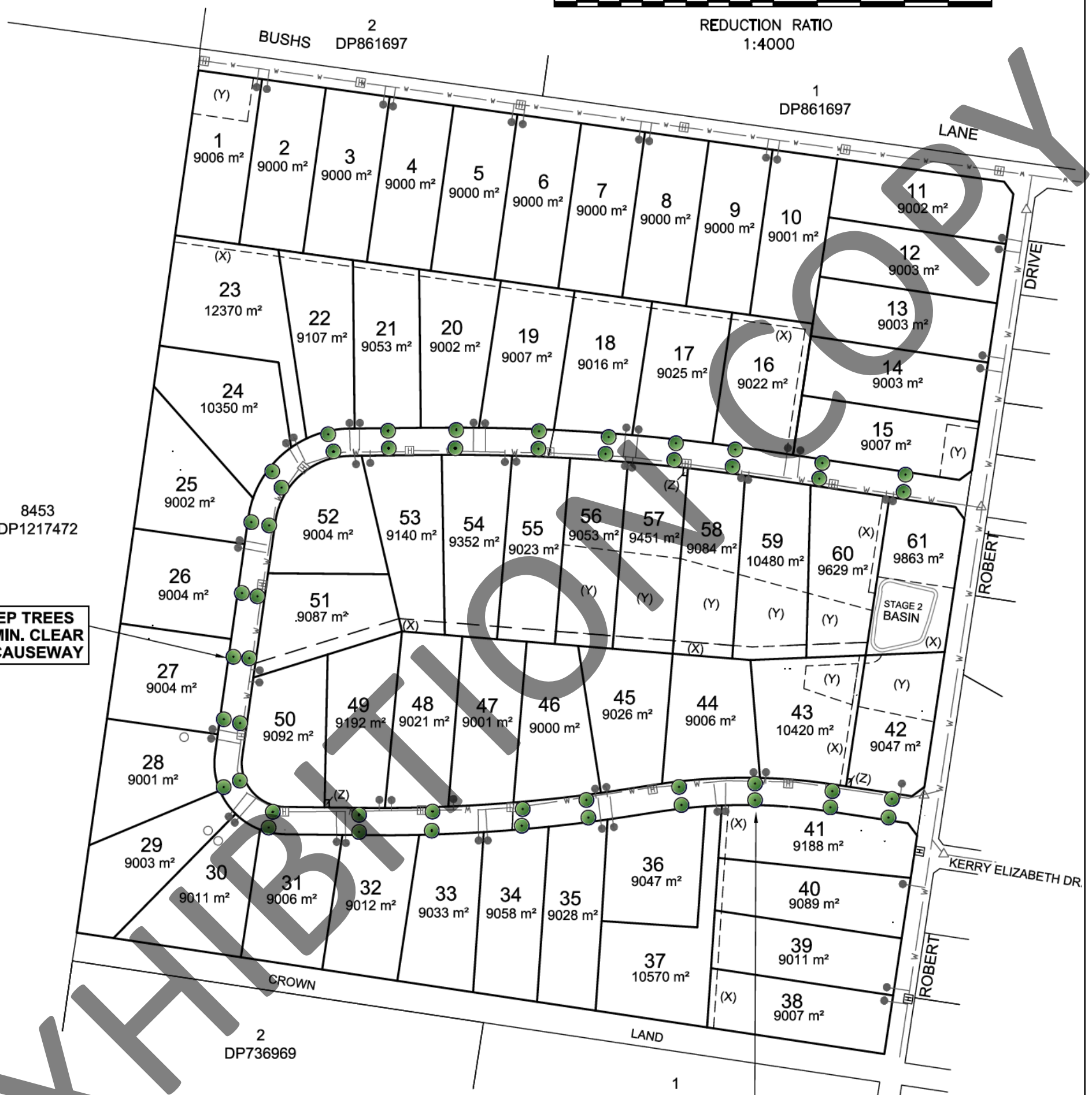

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

PROPOSED STREET TREE PLANTING
PLANTING IN NEW ROAD RESERVE
APPROXIMATE SPACING 36m
REFER SHEET 2 FOR SETOUT GUIDELINES AND DETAILS

PLANT SCHEDULE

SYM	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT & SPREAD	POT SIZE	QTY
STREET TREES					
+	Jacaranda mimosifolia	Jacaranda	15m x 8m	5 Litre	48

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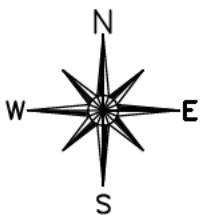
CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

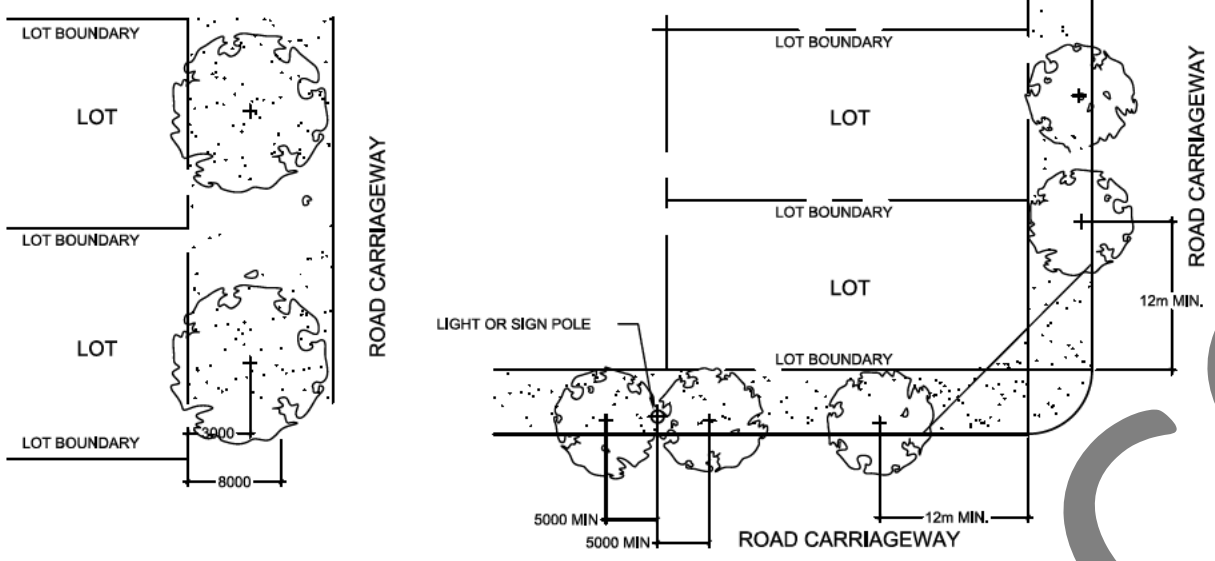
DESCRIPTION: **LANDSCAPE PLAN**
PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474
210 BUSHS LANE, GUNNEDAH

Date: 26 MARCH 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 1

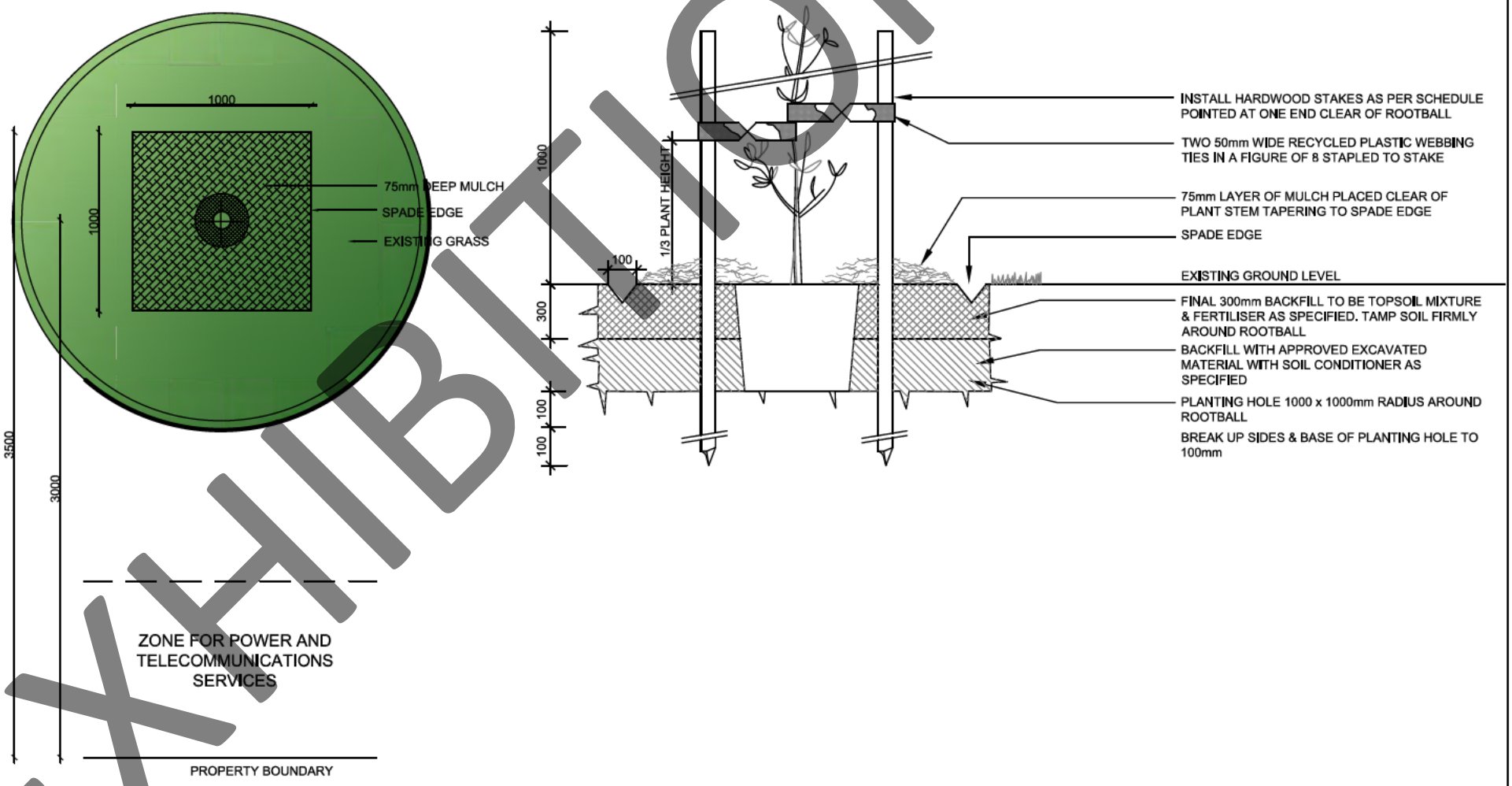


CENTERLINE OF STREET TREES ARE TO BE SETOUT 3m FROM PROPERTY BOUNDARY
1.0 MIN. 5m CLEARANCE FROM DRIVEWAYS
2.0 MIN 5m. CLEARANCE FROM SERVICE LINES INTO LOTS
3.0 MIN. 5m CLEARANCE FROM LIGHT POLES
4.0 MIN. 5m CLEARANCE FROM STORMWATER OUTLETS
5.0 MIN. 3m CLEARANCE FROM STORMWATER PITS
6.0 MIN. 8m CLEARANCE FROM ROAD CORNER/INTERSECTION
7.0 MIN. 7m FROM PEDESTRIAN CROSSINGS
8.0 GENERALLY PLACED CENTRALLY TO LOT BOUNDARIES

FINAL LOCATION OF STREET TREES TO BE DETERMINED ON SITE AS INSTRUCTED BY SUPERINTENDENT



1 STREET TREE SETOUT DETAIL



2 TYPICAL STREET TREE PLANTING

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CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

Date: 26 MARCH 2025 | File Ref: 5448

DESCRIPTION: **LANDSCAPE PLAN**
PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474
210 BUSHS LANE, GUNNEDAH

Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 2

APPENDIX C

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT, 210 BUSHS LAND GUNNEDAH. PREPARED BY OZARK ENVIRONMENT & HERITAGE, JUNE 2024 REF:4237.

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View east across the study area.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

REZONING OF LOTS 27 AND 28 DP755474 AT 210 BUSHS LANE, GUNNEDAH

GUNNEDAH SHIRE LOCAL GOVERNMENT AREA, NSW

JUNE 2024

EXHIBITION COPY

Report prepared by

OzArk Environment & Heritage

for Stewart Surveys Pty Ltd on behalf of 2728 Pty Ltd

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Heritage NSW

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT COVER SHEET

Report Title	Aboriginal Cultural Heritage Assessment Report: Rezoning of Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah
Author(s) Name	Tenae Robertson
Author(s)' Organisation Name (if applicable)	OzArk Environment & Heritage
Author(s) contact details	145 Wingewarra St DUBBO NSW 2830 Email: tenae@ozarkehm.com.au Phone: 02 6882 0118
Address of Subject Area	Address: 210 Bush Lane Title Reference: Lots 27 and 28 DP755474 Local Government Area: Gunnedah Shire
Report prepared for	Stewart Surveys Pty Ltd on behalf of 2728 Pty Ltd Kathryn Stewart [redacted]
Date of Report	June 2024
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Stephanie Rusden, OzArk Environment & Heritage Senior Archaeologist

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DOCUMENT CONTROLS

Proponent	2728 Pty Ltd
Client	Stewart Surveys Pty Ltd
Document Description	Aboriginal Cultural Heritage Assessment Report: Rezoning of Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah.
File Location	OzArk Job No.
Clients\ Stewart Surveys\ ACHAR	4237

Document Status: V3.0 FINAL	Date: 5 June 2024
OzArk internal edits	V1.0 TR author 18/4/24 V1.1 SR review 22/4/24 V1.2 TR amends 24/4/24
OzArk and client edits	V2.0 OzArk to client V2.1 OzArk amends 29/4/24
Final document	V3.0 OzArk finalises document 5/6/24
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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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ABBREVIATIONS AND GLOSSARY

ACHAR	Aboriginal Cultural Heritage Assessment Report. As set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, all developments where harm to Aboriginal objects is likely must be assessed in an ACHAR.
ACHCRs	*Aboriginal Cultural Heritage Consultation Requirements for Proponents*. Guidelines for conducting Aboriginal community consultation for developments where harm to Aboriginal objects is likely.
AHIMS	Aboriginal Heritage Information Management System. Administered by the DCCEEW, AHIMS is the central register of all Aboriginal sites within NSW.
AHIP	Aboriginal Heritage Impact Permit. Issued by Heritage NSW to allow harm to Aboriginal objects.
BP	Years before present
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP.
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water. DCCEEW contains the Environment and Heritage Group including Heritage NSW.
DPE	NSW Department of Planning and Environment. Former NSW department responsible for planning approvals. Now DPHI.
DPHI	NSW Department of Planning, Housing and Infrastructure. DPHI contains the Planning agency and administers the EP&A Act.
GSE	Ground surface exposure. A measure of factors that may reveal surface artefacts such as erosion scalds.
GSV	Ground surface visibility. A measure of factors that may obscure the detection of surface artefacts such as leaf litter.
Heritage NSW	Government department tasked with ensuring compliance with the NPW Act. Heritage NSW is advised by the Aboriginal Cultural Heritage Advisory Committee (ACHAC).
NPW Act	*National Parks and Wildlife Act 1974*. Primary legislation governing Aboriginal cultural heritage within NSW.

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PAD	Potential archaeological deposit. Indicates that a particular location has potential to contain subsurface archaeological deposits, although no Aboriginal objects are visible.
Pleistocene:	Geological epoch which lasted from about 2.5 million years ago to 10,000 BCE. This period spans the world's recent period of repeated glaciations. Aboriginal occupation of Australia occurs during the upper Pleistocene.
RAP	Registered Aboriginal Party. An individual or group who have indicated through the ACHCR process that they wish to be consulted regarding the project.

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EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged Stewart Surveys Pty Ltd (Stewart Surveys; the client), on behalf of 2728 Pty Ltd (the proponent) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed rezoning of Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah, NSW (the proposal). The proposal is in the outskirts of Gunnedah, approximately 5 kilometres (km) southwest of the town centre near King Jack Mountain, in the Gunnedah Shire Local Government Area.

The study area for this proposal has been previously subject to an archaeological assessment completed by Gaynor in 2021. At the time of the survey and initial report writing period, the proposal was considered able to be adequately assessed under the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). However, the initial report prepared by Gaynor (2021), having been submitted to Heritage NSW, was deemed insufficient to support the rezoning process and required more comprehensive assessment to meet the requirements of Ministerial Direction 2.3, Heritage Conservation. Thus, at the recommendation of Heritage NSW, an ACHAR has been prepared for the proposal.

The study area covers approximately 60.5 hectares (ha) of agricultural land at Lots 27 and 28 DP755474, 210 Bushs Lane, Gunnedah, NSW.

The field survey was undertaken on 21 March 2024 by OzArk Archaeologist, Tenae Robertson, with the assistance of Cindy Foley and Gary Griffiths (representing of Greg Griffiths). Five previously unrecorded Aboriginal sites were recorded within the study area (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4). Two sites, previously recorded by Gaynor (29-1-0256 [Marshmead 2] and 29-1-0288 [Marshmead 4]) are located within the study area. Artefacts were identified in association with the Marshmead 4 site, and the site extent has been updated. Further, no Aboriginal cultural values specific to the study area have been identified through consultation with the Aboriginal community.

As the proposal is a rezoning, there are no identified impacts which may cause harm to the recorded Aboriginal sites at this time. However, subsequent subdivision and development should take into consideration the location of the known Aboriginal sites and aim to reduce impact if possible.

Recommendations concerning Aboriginal cultural values within the study area are as follows:

1. The proposed land rezoning may proceed at the study area without further archaeological investigation.
2. The planning design of the subdivision should consider the locations of the recorded Aboriginal sites (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4, Marshmead 2 and

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Marshmead 4) and be designed in such a way that harm to the sites is avoided or minimised.

3. If future works are proposed in the study area, then the general management principles listed in **Section 9** should be followed depending on whether the recorded Aboriginal sites (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4, Marshmead 2 and Marshmead 4) can be avoided.
4. The initial purchaser of a lot with any recorded Aboriginal site must be informed of the site's location, its protection under the *National Parks and Wildlife Act 1974*, and the need to avoid ground disturbance.

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1 INTRODUCTION

1.1 DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged Stewart Surveys Pty Ltd (Stewart Surveys; the client), on behalf of 2728 Pty Ltd (the proponent) to prepare an Aboriginal Cultural Heritage Assessment Report (ACHAR) for the proposed rezoning of Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah, NSW (the proposal).

The proposal is in the outskirts of Gunnedah, approximately 5 kilometres (km) southwest of the town centre near King Jack Mountain, in the Gunnedah Shire Local Government Area (**Figure 1-1**).

1.2 BACKGROUND

The study area for the proposal has been previously subject to an archaeological assessment completed by Gaynor in 2021. At the time of the survey and initial report writing period, the proposal was considered able to be adequately assessed under the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). However, the initial report prepared by Gaynor (2021), having been submitted to Heritage NSW, was deemed insufficient to support the rezoning process and required more comprehensive assessment to meet the requirements of Ministerial Direction 2.3, Heritage Conservation. Thus, at the recommendation of Heritage NSW, an ACHAR has been prepared for the proposal.

The results of the archaeological assessment completed by Gaynor (2021) are detailed in **Section 5.3.2**.

1.3 STUDY AREA

The study area covers approximately 60.5 hectares (ha) of agricultural land at Lots 27 and 28 DP755474, 210 Bushs Lane, Gunnedah, NSW (**Figure 1-2**).

The study area consists of gently sloping terrain mostly cleared of vegetation. Vegetation that remains is primarily clustered around an ephemeral drainage feature which intersects the central portion of the study area from east to west.

1.4 PROPOSAL OVERVIEW

The study area is currently zoned RU4 – Primary Production Small Lots and is proposed to be rezoned to R5 - Large Lot Residential. As the proposal is a rezoning of land, not all impacts are known at this stage. Rather, ground disturbance is assumed to be possible anywhere in the study area.

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Figure 1-1: Map showing the location of the proposal.

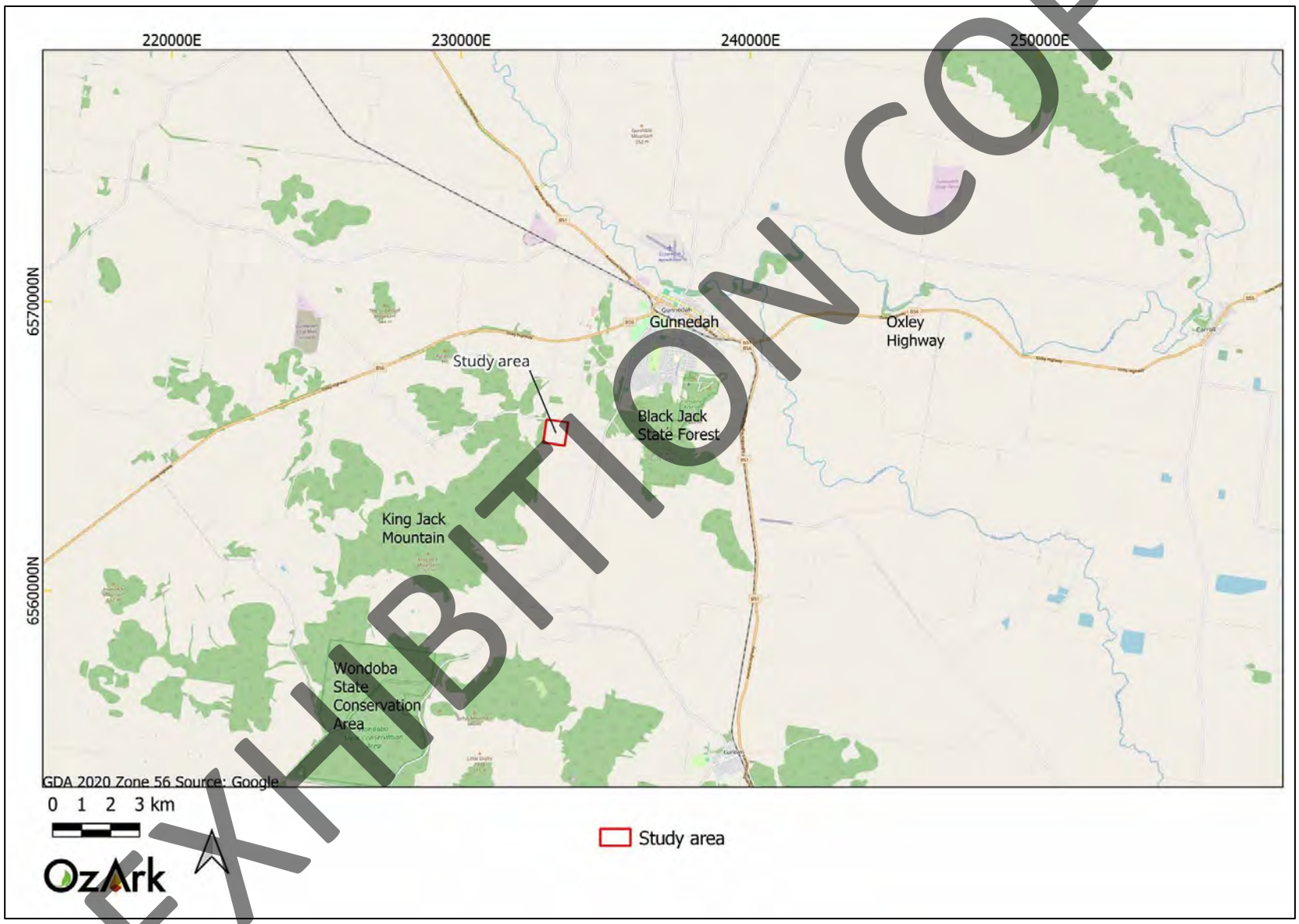

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Figure 1-2: Aerial showing the study area.

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2 THE ABORIGINAL CULTURAL HERITAGE ASSESSMENT

2.1 RELEVANT LEGISLATION

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Burra Charter 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

2.1.1 Commonwealth legislation

2.1.1.1 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act, administered by the Commonwealth Department of Climate Change, Energy, the Environment and Water, provides a framework to protect nationally significant flora, fauna, ecological communities, and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. These lists may include Aboriginal cultural sites or sites in which Aboriginal people have interests. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have an impact on one of the matters of national environment significance listed by the Act. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to national/commonwealth heritage places.

2.1.1.2 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is aimed at the protection from injury and desecration of areas and objects that are of significance to Aboriginal Australians. This legislation has usually been invoked in emergency and conflicted situations.

Applicability to the proposal

It is noted there are no Commonwealth or National heritage listed places within the study area, and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply.

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2.1.2 State legislation

2.1.2.1 Environmental Planning and Assessment Act 1979 (EP&A Act)

This Act establishes requirements relating to land use and planning. The main part of the EP&A Act that relate to planning proposals is Part 3 (Planning Instruments). Division 3.4 (LEPs) states:

3.33 Planning proposal authority to prepare explanation of and justification for proposed instrument—the planning proposal

(1) Before an environmental planning instrument is made under this Division, the planning proposal authority is required to prepare a document that explains the intended effect of the proposed instrument and sets out the justification for making the proposed instrument (the planning proposal).

(2) The planning proposal is to include the following—

(a) a statement of the objectives or intended outcomes of the proposed instrument,

(b) an explanation of the provisions that are to be included in the proposed instrument,

(c) the justification for those objectives, outcomes and provisions and the process for their implementation (including whether the proposed instrument will give effect to the local strategic planning statement of the council of the area and will comply with relevant directions under section 9.1),

(d) if maps are to be adopted by the proposed instrument, such as maps for proposed land use zones; heritage areas; flood prone land—a version of the maps containing sufficient detail to indicate the substantive effect of the proposed instrument,

(e) details of the community consultation that is to be undertaken before consideration is given to the making of the proposed instrument.

(3) The Planning Secretary may issue requirements with respect to the preparation of a planning proposal.

Applicability to the proposal

This ACHAR forms part of the supporting information for this planning proposal. It includes consultation with the Registered Aboriginal Parties (RAPs) identified in **Section 3.2**.

2.1.2.1 Planning Proposals - Rezoning

Heritage assessment for planning proposals for rezoning are required to follow the broad approach described in the *Local Planning Directions* (NSW Department of Planning & Environment; now Department of Planning Housing, and Infrastructure [DPHI]), *Ministerial Direction 3.2, Heritage Conservation*, which requires planning proposals to address the conservation of Aboriginal objects as follows:

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Direction 3.2

(1) A planning proposal must contain provisions that facilitate the conservation of:

(a) items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance to an area, in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item, area, object or place, identified in a study of the environmental heritage of the area,

(b) Aboriginal objects or Aboriginal places that are protected under the *National Parks and Wildlife Act* 1974, and

(c) Aboriginal areas, Aboriginal objects, Aboriginal places or landscapes identified by an Aboriginal heritage survey prepared by or on behalf of an Aboriginal Land Council, Aboriginal body or public authority and provided to the relevant planning authority, which identifies the area, object, place or landscape as being of heritage significance to Aboriginal culture and people.

Applicability to the proposal

The *Local Planning Directions* (NSW DPHI), Ministerial Direction 3.2, Heritage Conservation has been followed according to Direction 3.2 (1c) as the assessment considers '*Aboriginal objects, Aboriginal places or landscapes identified by an Aboriginal heritage survey*' undertaken initially in conjunction with the Red Chief Local Aboriginal Land Council (LALC) (Gaynor 2021) and with representatives from the Gomeroi Native Title Applicant as part of the current assessment.

2.1.2.2 National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act provides for the protection of Aboriginal objects (sites, objects, and cultural material) and Aboriginal places. Under the Act (Part 6), an Aboriginal object is defined as: any deposit, object, or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

It is an offence under Section 86 of the NPW Act to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. Section 87 of the Act provides a series of defences against the offences listed in Section 86, such as:

- The harm was authorised by and conducted in accordance with the requirements of an *Aboriginal Heritage Impact Permit* (AHIP) under Section 90 of the Act

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- The defendant exercised 'due diligence' to determine whether the action would harm an Aboriginal object
- The harm to the Aboriginal object occurred during the undertaking of a 'low impact activity' (as defined in the regulations).

Under Section 89A of the Act, it is a requirement to notify the Secretary of the Department of Climate Change, Energy, the Environment and Water (DCCEEW) of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on Aboriginal Heritage Information Management System (AHIMS).

Applicability to the proposal

Any Aboriginal sites within the study area are afforded legislative protection under the NPW Act.

The Secretary of DCCEEW will be notified of the location of an Aboriginal object recorded by sending the relevant details to the AHIMS register.

2.2 ASSESSMENT APPROACH

The archaeological assessment followed the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010).

The Aboriginal cultural heritage assessment followed the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide; OEH 2011) and the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs) (DECCW 2010b).

2.3 PURPOSE AND OBJECTIVES

The purpose of this study is to identify and assess heritage constraints relevant to the proposed works.

The study will apply the Code of Practice, the Guide, and the ACHCRs in the completion of the Aboriginal cultural heritage assessment to meet the following objectives:

Objective One: Undertake background research on the study area to formulate a predicative model for site location within the study area

Objective Two: Identify and record Aboriginal cultural heritage values within the survey areas. This includes intangible cultural values, Aboriginal objects, and any landforms likely to contain further archaeological deposits

Objective Three: To assess the significance of any recorded Aboriginal cultural values, Aboriginal objects, or sites in consultation with RAPs

Objective Four: Assess the likely impacts of the proposed work to Aboriginal cultural heritage values and provide management recommendations.

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2.4 REPORT COMPLIANCE WITH THE CODE OF PRACTICE

The Code of Practice establishes requirements that should be followed by all archaeological investigations where harm to Aboriginal objects may be possible. **Table 2-1** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-1: Report compliance with the Code of Practice.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 1a	Review previous archaeological work	**Section 5**
Requirement 1b	Review AHIMS searches	**Section 5.3.1**
Requirement 2	Review the landscape context	**Section 4**
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Section 5**
Requirement 4a	Develop predictive model	**Section 5.4**
Requirement 4b	Present predictive model results	**Section 5.4.3**
Requirement 5a	Archaeological survey sampling strategy	**Section 6.1**
Requirement 5b	Archaeological survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Archaeological survey units	**Section 4.1.1**
Requirement 6	Site definition	**Section 5.4.1**
Requirement 7a	Site recording information to be recorded	**Section 6.4**
Requirement 7b	Site recording: scales for photography	All artefact photographs employed a centimetre scale bar.
Requirement 8a	Geospatial information	All artefact locations were logged using a non-differential handheld GPS.
Requirement 8b	Datum and grid coordinates	All coordinates are provided in GDA Zone 56.
Requirement 9	Record survey coverage data	**Section 6.1**
Requirement 10	Analyse survey coverage	**Section 6.3**
Requirement 11	Archaeological Report content and format	This report adheres to this Requirement.
Requirement 12	Records	OzArk undertakes to maintain all survey records for at least five years.
Requirement 13a	Notifying Heritage NSW of breaches	Not applicable
Requirement 13b	Providing Heritage NSW with information	Not applicable
Requirement 14	Test excavation which is not excluded from the definition of harm	The test excavation did not take place in any of the landforms identified in Requirement 14.
Requirement 15a	Consultation regarding test excavation	Consultation has included the ACHCRs, see **Section 3.2**.
Requirement 15b	Developing a test excavation sampling strategy	N/A
Requirement 15c	Providing Heritage NSW with notification of the test excavation	N/A
Requirement 16a	Test excavation that can be carried out in accordance with the Code of Practice	N/A
Requirement 16b	Objects recovered during test excavations	N/A
Requirement 17	When to stop test excavations	N/A

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Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 18–20	Artefact recording	The procedures for artefact recording were adhered to during the investigation.

2.5 DATE OF ARCHAEOLOGICAL ASSESSMENT

The field survey was undertaken on the 21 March 2024.

2.6 OZARK INVOLVEMENT

2.6.1 Field survey

The fieldwork survey was undertaken by Tenae Robertson (OzArk Project Archaeologist, B Archaeological Practice, Australian National University).

2.6.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report author: Tenae Robertson
- Reviewer: Stephanie Rusden (OzArk Senior Archaeologist, BS University of Wollongong, BA University of New England).

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3 ABORIGINAL COMMUNITY CONSULTATION

3.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

australianstogether.org.au

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony, and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups. Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

Living on this land for more than 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area, as well as cultural and spiritual values like totemism that were fundamental in resource management. There was a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

In much of eastern Australia, Aboriginal communities live their lives like most Australians. However, in certain crucial areas, particularly associated with family, leadership roles and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

3.2 ABORIGINAL COMMUNITY CONSULTATION

A major aim of this assessment is to identify any cultural values within the landscape in which the proposal is located so that those values can be recognised and incorporated into the proposal's management recommendations.

The Aboriginal cultural heritage assessment of the proposal has followed the ACHCRs (DECCW 2010b). A log and copies of correspondence with Aboriginal community stakeholders is presented in **Appendix 1**.

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The ACHCRs include four main stages, and these will be detailed in the following sections.

3.2.1 ACHCRs Stage 1

The aim of Stage 1 is to identify the RAPs who wish to be consulted about the proposal.

An advertisement was placed in the *Gunnedah Times Classifieds* on 21 December 2024 to solicit expressions of interest (**Appendix 1 Figure 1**).

A letter seeking information from various agencies was sent on 21 December 2024 (**Appendix 1 Figure 2**). These agencies were: Office of the Registrar, *Aboriginal Land Rights Act 1983*; Heritage NSW; National Native Title Tribunal; National Native Title Services Corporation Ltd (NTSCORP); Red Chief LALC, Gunnedah Shire Council, and the North West Local Land Services.

Letters were sent to individuals and groups whose contact details had been provided by the government agencies.

By the closing date for registration concerning this proposal, 22 groups or individuals registered to be consulted as RAPs:

- AT Gomeroi Cultural
- Biguundi Biame Gunedarr Traditional People
- Brent Matthews
- Cindy Foley
- Gomeroi Native Title Applicant
- Gomery Cultural Consultants
- Greg Griffiths
- Joshua Matthews
- Kevin Sampson
- Konanggo Aboriginal Cultural Heritage Services
- Long Gully Cultural Services
- Murra Bidgee Aboriginal Corporation
- Nunawanna Aboriginal Corporation
- Stakeholder 1[1]
- Stakeholder 2

[1] Those listed as Stakeholder 1' etc have requested their details remain anonymous.

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- Stakeholder 3
- Stephen Matthews
- Tania Matthews
- Thomas Dhalstrom
- Troy Silver
- WATTAKA Pty Ltd
- White Cockatoo.

Red Chief LALC did not formally register for the proposal but were included in all correspondence for transparency.

3.2.2 ACHCRs Stage 2

The aim of Stage 2 is to provide information about the project to the RAPs.

Detailed project information was provided in the assessment methodology that was issued to all RAPs for their consideration on 19 February 2024 (**Appendix 1 Figure 3**).

3.2.3 ACHCRs Stage 3

The aim of Stage 3 is to acquire information regarding Aboriginal cultural values associated with the proposal through RAP consultation and field work.

To inform the RAPs of the assessment, an assessment methodology was issued to all RAPs for their consideration on 19 February 2024 (**Appendix 1 Figure 3**). This document provided the archaeological context of the study area, a description of the proposed survey, and asked whether there were any cultural values that should be considered in the assessment.

RAPs were provided the stipulated 28 days in which to review and comment on the assessment methodology as per Stage 3 of the ACHCRs. The closing date for comment was 18 March 2024.

Three responses were received from Cindy Foley, Ethan Trewlynn, and Murra Burra Aboriginal Corporation between 19 and 28 February 2024 advising that they had reviewed and supported the methodology.

3.2.3.1 Aboriginal community participation in the survey

The field survey was undertaken with the assistance of RAP representatives on 21 March 2024. The survey was attended by Gary Griffiths (representing Greg Griffiths) and Cindy Foley.

3.2.4 ACHCRs Stage 4

Stage 4 involves the production of a draft ACHAR that is issued to all RAPs for their consideration. The ACHAR will document the results of the assessment, outline opportunities for the

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conservation of Aboriginal cultural values, and suggest recommendations for the management of Aboriginal objects should impacts to these objects be unavoidable.

A draft of this ACHAR was sent to all RAPs on 31 May 2024 with a closing date for review on 30 May 2024 (**Appendix 1 Figure 4**). Responses were received from Thomas Dahlstrom and Murra Bidgee Aboriginal Corporation either supporting the draft report or advising they have no comments (**Appendix 1 Figure 5**).

3.3 CULTURAL VALUES IDENTIFIED THROUGHOUT THE ACHCR PROCESS

No specific cultural values have been identified to date regarding the study area, however, the strong cultural values of Aboriginal communities towards landscapes and cultural heritage sites are recognised.

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4 LANDSCAPE CONTEXT

An understanding of the environmental context of a study area is requisite in any Aboriginal archaeological investigation (DECCW 2010). It is a particularly important consideration in the development and implementation of survey strategies for the detection of archaeological sites. In addition, natural geomorphic processes of erosion and/or deposition, as well as human-activated landscape processes, influence the degree to which the remains of material culture are retained in the landscape as archaeological sites; and the degree to which they are preserved, revealed and/or conserved in present environmental settings.

4.1 TOPOGRAPHY AND HYDROLOGY

The study area is located within the Brigalow Belt South Bioregion, specifically the Liverpool Plains subregion. Within the Brigalow Belt South bioregion, the Liverpool Plains subregion extends from Narrabri south to the east of Coonabarabran and terminates near Willow Tree. The Liverpool Plains sub-region is characterised by undulating hills and sloping plains.

The topography of the study area comprises of a single gentle west to east lower hill slope landform with a general elevation of 360 – 330 metres (m) above sea level (**Figure 4-1** and **Figure 4-2**).

The study area is intersected by two unnamed ephemeral drainage features, both tributaries of Blackjack Creek located over 1 km east of the study area which branches from the Namoi River. The nearest permanent watercourse is Coocooboonah Creek, approximately 3.5 km west of the study area.

Figure 4-1: Example images of topography and drainage of the study area.

1. View east of a lower slope landform unit with the study area.

2. View west of an ephemeral drainage line within the study area.

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Figure 4-2: Topography and drainage of the study area.

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4.1.1 Survey units

Based on the topography of the study area, survey units were identified to capture the major topographical features of the study area. The designation of survey units will allow a comparison of the archaeological potential of each major topographical feature within the study area to understand whether certain landform types are more likely to contain Aboriginal objects than others.

Landform mapping within the study are indicates two main landform types: drainage lines and gentle slopes (**Figure 4-3**).

Survey Unit 1: drainage lines with a 200 m buffer

Survey Unit 2: gentle southwest to east slopes.

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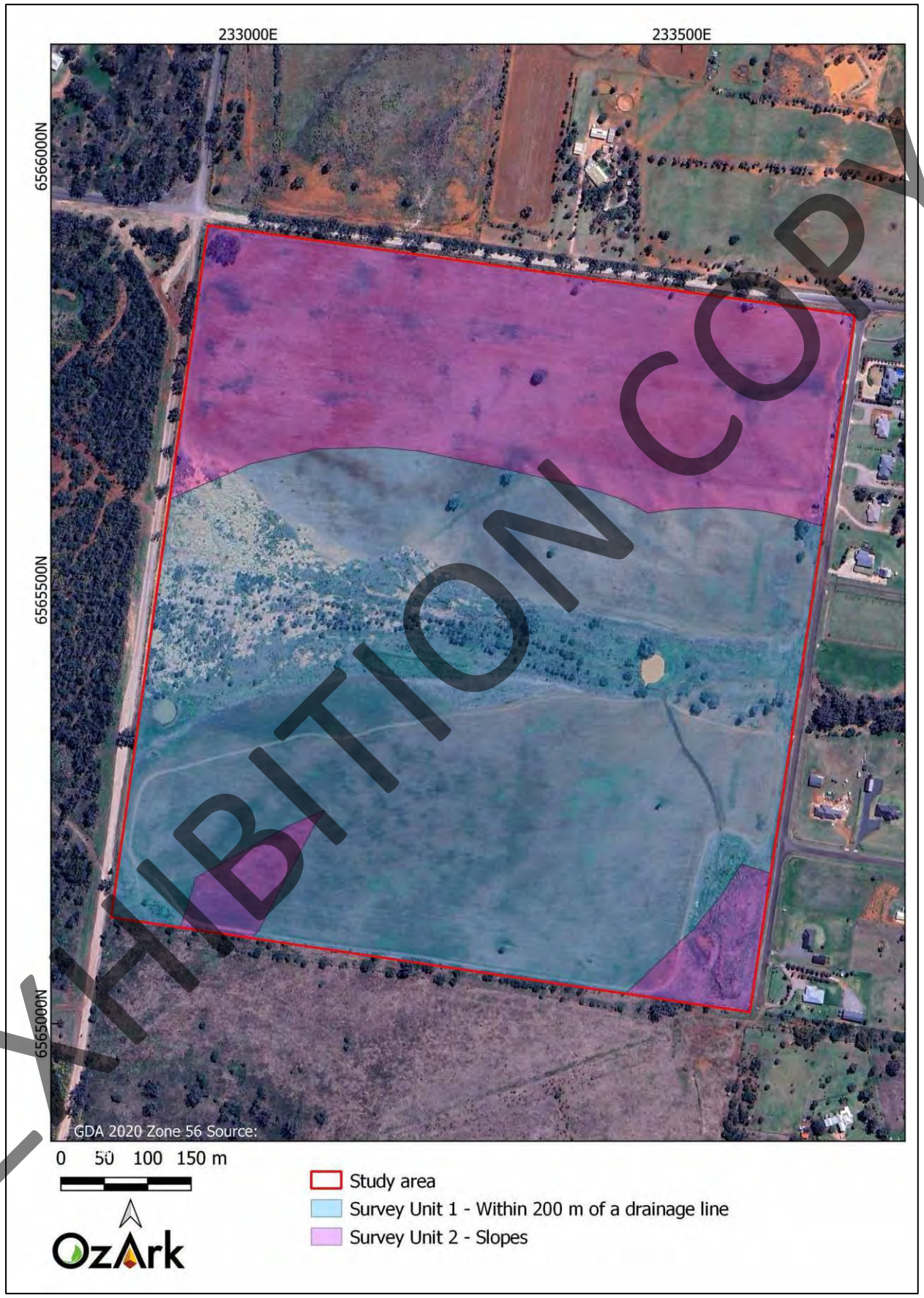
Figure 4-3: Aerial of the study area showing the location of survey units.



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4.2 GEOLOGY AND SOILS

Soil analysis has important ramifications for archaeological research through the potential impact of different soils on human activity (such as agricultural exploitation) and the impact of the soils on archaeological evidence (such as post-depositional movement).

Soils within the study area comprise Fullwoods Roads – brown sodosols. Sodosols are generally characterised by clear or abrupt textural B horizon in which the major part (the upper 0.2 m) is sodic and not strongly acidic (Morgan and Terry 1992:137). Brown sodosols specifically are characterised by dense subsoils that are dispersive. Brown sodosol soils are generally highly erodible and poorly aerated in wet areas and are extremely compacted with low erodibility in dry areas. This suggests that these soils are highly susceptible to erosion in areas where soils are loose or exposed to a water.

Due to the high erodibility of these soils, the preservation of subsurface deposits within this soil landscape is likely to be poor, leading to the displacement of Aboriginal objects, if present. If Aboriginal objects are present, they are more likely to have been exposed by these erosional processes than concealed by soil aggradation.

4.3 VEGETATION

Vegetation within the study area is mostly introduced crop (teff) although native vegetation is present across the middle of the study area in association with the east-west drainage line (Gaynor 2021:10). The native vegetation largely consists of juvenile and semi-mature trees of box and gum species, as well as low shrubbery.

4.4 LAND USE HISTORY AND EXISTING LEVELS OF DISTURBANCE

The study area has been used primarily for cropping and grazing purposes. Disturbances inside the study area appear to be limited to agricultural operations (i.e. ploughing), and the construction of agricultural infrastructure such as fence lines, dams, unsealed tracks, and a stock yard. Additionally, the southeast portion of the study area has been previously utilised for the stockpiling of foreign excavated materials which have since been subject to extensive grading.

4.5 CONCLUSION

The review of the environmental factors associated with the study area allows the following conclusions to be drawn in terms past Aboriginal occupation:

- Topography and hydrology: the gently sloping landforms which dominate the study area would have been hospitable to Aboriginal people. However, due to the ephemeral nature of the drainage which intersects the study area, it is unlikely that long-term occupation would have been possible.
- Geology and soils: landforms which typically comprise outcropping rock, i.e., hills, are not present within the study area, and therefore sources of stone procurement for tool

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manufacture will not be present, although localised rocky hills and ridgelines are present in the close surrounds. The erosional qualities of the soils will have likely caused archaeological deposits, if present, to become displaced. If Aboriginal objects are present, they would likely be revealed by erosional processes, rather than concealed by aggradation.

- Vegetation: the study area may have once supported an open woodland which would have provided some resources for Aboriginal subsistence in the past. However, resources likely to have supported a large population of people would have been present closer to the banks of more permanent water sources in the surrounding area such as the Namoi River. The vegetation clearance which has taken place across the study area for agricultural purposes reduces the likelihood that any culturally modified trees remain present, however, should mature native vegetation remain, particularly along the east-west drainage feature, culturally modified trees may be present.

- Land use: ground surface disturbances such as vegetation clearance, cultivation, grazing, and track construction exist throughout the study area. These activities may have displaced Aboriginal objects and are likely to have reduced the potential for subsurface archaeological material. However, disturbance at a given location does not necessarily mean that there will be no cultural material present, as often a disturbed context will reveal objects which may have previously been subsurface. As noted above, initial vegetation clearing would also have significantly reduced the likelihood of culturally modified trees remaining.

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5 ARCHAEOLOGICAL CONTEXT

5.1 ABORIGINAL PEOPLE OF THE STUDY AREA

The study area is in the traditional territory of the linguistic group of the Kamilaroi people (alternatively: Kamilarai, Kamilari, Kamilroi, Kamilarai, Kamu-laroi, Kaamee'larrai, Kamileroi, Koomilroi, Komleroy, Gamilaroi, & Gamilroi).

The area of the Kamilaroi is described as being rich in both flora and fauna resources, the following are listed as having been exploited for food (Balme 1986: Table 3.2; O'Rourke 1997):

- Animal resources – fish and shellfish (in the vicinity of reliable water sources), possum, koala, wallaby, bandicoot, kangaroo, rat, platypus and reptiles. Bird species included emu, turkey, waterfowl and may others. This also included grubs from the casuarinas and kurrajongs; and
- Plant resources – kurrajong seeds, growing tips and berries, honey, roots, acacia gum, bulrush, pulp, nuts (quandong), grass seeds, other native fruits and flowers and native root vegetables.

All ages and sexes within a community contributed to the procurement of food, with men generally the hunters of large game with women and children hunting smaller game. The types of foods exploited indicate an opportunistic use of the environment.

5.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Aboriginal occupation of Australia begins prior to 50,000 BP (years before present) and possibly earlier than 65,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period and poor preservation of archaeological materials (particularly dateable organic materials).

There are several broad scale regional archaeological studies which either cover the study area itself or are in general proximity to it. A selection of these studies has been summarised in **Table 5-1** below.

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Table 5-1: Summaries of regional archaeological assessments.

Author	Date	Summary
Haglund	1984a	Haglund (1984a) assessed and visually inspected the proposed Red Hill–Top Rocks–Trunk Road 72 coal haulage route. In this assessment, Haglund primarily discusses two previously recorded sites, an artefact scatter recorded by Thompson (1982) and a collection of 20 axe grinding grooves recorded by Haglund in 1982 (referred to as Top Rocks). Upon visual inspection Haglund (1984a) identified that the artefact scatter recorded by Thompson (1982) comprised of several low-density stone artefact sites on a dirt track within 50 m of a minor watercourse [l kely ephemeral]. Haglund (1984a) also identified that the axe grinding grooves were situated on an outcrop of sandstone directly associated with a watercourse and prone to semi-frequent inundation. Additionally, the extensive archaeological deposit adjacent to the grinding groove site was situated on the upper terrace of a riverbank. Overall, no additional Aboriginal sites were recorded within this assessment. However, based on his assessment of the two previous archaeological sites, several observations can be made. These observations are as follows: - Sites have dominantly been recorded in proximity to a watercourse or drainage feature. - There may be a correlation between site density and the permanence of associated watercourses.
	1984b	Haglund (1984b) examined the proposed location for a coal loader, covering 87 hectares (ha) of cultivated / cleared land situated between the North Western Railway and Trunk Road 72, 3 km west of Gunnedah and south of the Namoi River. No Aboriginal sites or places of cultural significance were identified during the assessment despite good ground surface visibility (GSV). The lack of Aboriginal sites identified within the assessment area was attributed to the lack of landforms with identified archaeological sensitivity (i.e. watercourses, ridgelines, hillcrests, etc). It was also suggested that the area may have been a transitory space where hunting and food gathering activities may have taken place, which would not allow for the accumulated deposition of archaeological materials.
	1985	In 1985, Haglund conducted a survey of all previous studies relating to the area immediately north of Gunnedah and the Namoi River. This survey concluded that the archaeology of the area is concentrated along rivers and other permanent waterways. This concentration is a result of both prehistoric land use patterns, in which such locations arguably constituted more permanent camps, and historical land use patterns, such as agriculture, which may have disturbed and/or destroyed the archaeology present in areas away from these waterways (Haglund 1985).
	1987	Haglund returned to Gunnedah in 1986 to conduct two test excavations of sites requiring ground truthing (Haglund 1987). These sites were located on opposite sides of the Namoi River, and one was a portion of the extensive Namoi River/C.W.R. site. Artefacts were recovered at these sites, however, Haglund noted that the artefacts were largely too dispersed to be considered archaeologically significant and were situated in secondary contexts created by vehicle movement and water flows (Haglund 1987).
Appleton	2008	John Appleton (2008) conducted salvage operations at Rocglen Coal Mine, following his 2002 survey of the site of the proposed Belmont Coal Mine (now re-named). The salvage area consisted of three locations close to a creek in Tulcumba, situated 25 km north of Gunnedah. Appleton (2002) had previously noted artefacts, including a silcrete core at Site "B1", a micro-debitage scatter of eight small silcrete flakes at Site "B2", and an extended artefact scatter (over 40 artefacts consisting of three cores, with the remainder flaked pieces and flakes) at Site "B3". The salvage operation noted significant disturbance between 2002 and 2008, caused by agricultural activity or storms and slope-wash. Additional artefacts were recovered at "B1" (eight stone artefacts, no cores), at "B2" (13 stone artefacts), and at "B3" (67 artefacts, including three cores). Appleton interpreted the 'Rocglen Assemblage' as a camping area to which various groups returned over an extended period of time.

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Implications for the study area

The regional context suggests that sites are likely to be recorded in higher frequencies and densities when in proximity to permanent watercourses. Additionally, transitory areas utilised for hunting and gathering practices distant from permanent water are less likely to accumulate archaeological deposits due to the infrequent nature of activities. Landforms with higher archaeological sensitivities include permanent or semi-permanent watercourses, ridgelines, and hill crests. Therefore, as the study area is a gently sloping landform distant to permanent waters, dense archaeological deposits are less likely to occur.

5.3 LOCAL ARCHAEOLOGICAL CONTEXT

5.3.1 Desktop database searches conducted

A desktop search was conducted on the following databases to identify any previously recorded heritage within the study area. The results of this search are summarised in **Table 5-2** and presented in detail in **Appendix 3**.

Table 5-2: Aboriginal cultural heritage: desktop-database search results.

Name of Database Searched	Date of Search	Type of Search	Comment
Commonwealth Heritage Listings	15/02/2024	Gunnedah Shire LGA	No places listed on either the National or Commonwealth heritage lists are located within the study area
National Native Title Claims Search	15/02/2024	Gunnedah Shire Council	The registered claim of the Gomeroi People NC011/006 includes the entire Gunnedah Shire LGA, encompassing the study area.
AHIMS	15/02/2024	15 x 15 km centred on the study area	Two sites AHIMS# 39-1-0256 and 29-1-0255 occur within the study area.
LEP	15/02/2024	Gunnedah LEP 2012	None of the Aboriginal places noted occur near the study area.

A search of the AHIMS database on 15 February 2023 returned 112 results for Aboriginal sites within a 15 km radius of the study area (GDA Zone 56 Eastings: 218269 - 248269; Northings: 6550469 - 6580469). **Figure 5-1** shows the location of these sites in relation to the study area and **Table 5-3** details the site types within the search area.

Three sites returned in the AHIMS search are listed as 'restricted'. These sites are not within the study area and are discussed further within this report. Similarly, AHIMS site 19-2-0272 (Wondoba Grinding Grooves 1) is a duplicate recording of 29-1-0092 (Wondoba SF2) and is also not further discussed.

Based on the coordinates provided by AHIMS, two sites (29-1-0256 [Marshmead 3] and 29-1-0288 [Marshmead 4]) are situated within the study area and one site (29-1-0255 [Marshmead 2]) is located in the adjacent lot to the east of the study area (**Figure 5-1**). However, in the accompanying site cards for Marshmead 2 and Marshmead 3, the location of these sites is reversed (**Figure 5-2**). The survey carried out for the current ACHAR has ground-truthed these sites. It was found that Gaynor's figure from 2011 accurately represents the location of the sites (**Figure 5-2**) while the AHIMS coordinates for the two sites have been incorrectly reversed (**Figure 5-1**). Following the survey outlined in **Section 6**, these coordinates have been corrected in AHIMS. Thus, Marshmead 2 (29-1-0256) is located within the study area, and Marshmead 3 (29-1-0256) is outside the study area.

The figure also shows an additional site (Marshmead 1) located to the east (outside the study area) which does not appear to be registered on AHIMS (**Figure 5-1**).

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The AHIMS data presented in **Figure 5-1** and **Table 5-3** shows the most frequently recorded site type within the search area are stone artefact sites (including artefact scatter, isolated finds, artefact scatters [quantity unspecified], open site, open camp site, open camp site with culturally modified tree [carved or scarred], artefact site [quantity unspecified] with PAD and open site with PAD) which together form 48.15% of all results. Artefact sites within the search area have dominantly been recorded within 200 – 500 m of a watercourse or drainage features across a variety of landforms (such as ridge crests, gentle lower hill slopes, riverbanks, etc). It is also noted that most of these sites were recorded within areas of moderate to high disturbance, such as along road corridors, ploughed paddocks and near residential areas. This is likely due to survey bias resulting from development driven studies rather than an accurate reflection of the distribution of these site types.

Table 5-3: AHIMS site types and frequencies

Site Type	Number	% Frequency
Modified trees (carved or scarred)	36	33.33
Artefact scatter	19	17.59
Grinding grooves	11	10.19
Isolated finds	10	9.26
Artefact site (quantity unspecified)	7	6.48
Open site	6	5.56
Open camp site	5	4.63
Open camp site with culturally modified tree (carved or scarred)	3	2.78
Burial with culturally modified tree (carved or scarred)	2	1.85
Potential archaeological deposit (PAD)	2	1.85
Aboriginal ceremony and dreaming with grinding grooves	1	0.93
Aboriginal resource and gathering	1	0.93
Artefact scatter with grinding grooves	1	0.93
Artefact site (quantity unspecified) with PAD	1	0.93
Open site with PAD	1	0.93
Reinterment	1	0.93
Total	**108**	**100**

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Figure 5-1: Location of previously recorded AHIMS sites in relation to the study area.

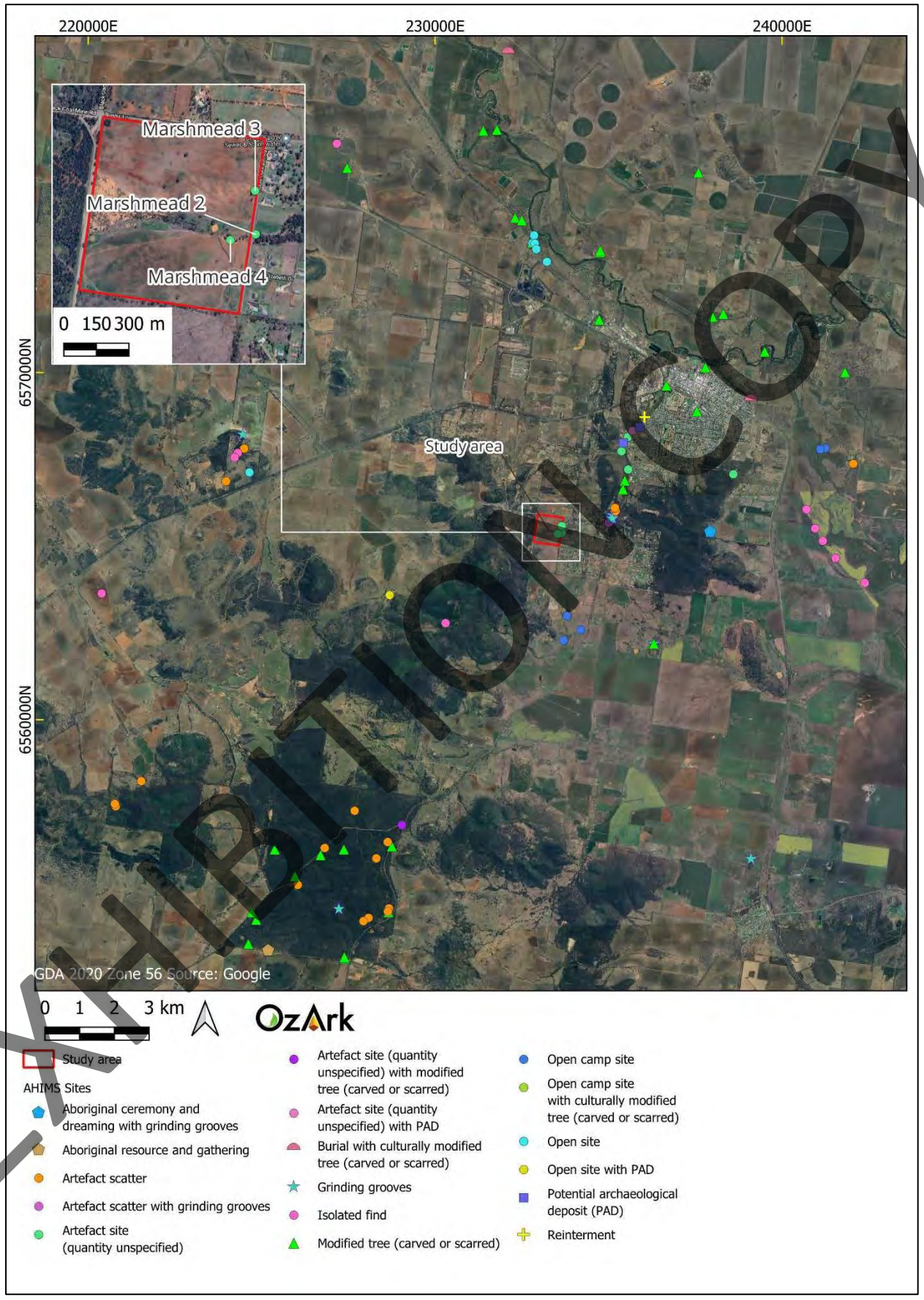

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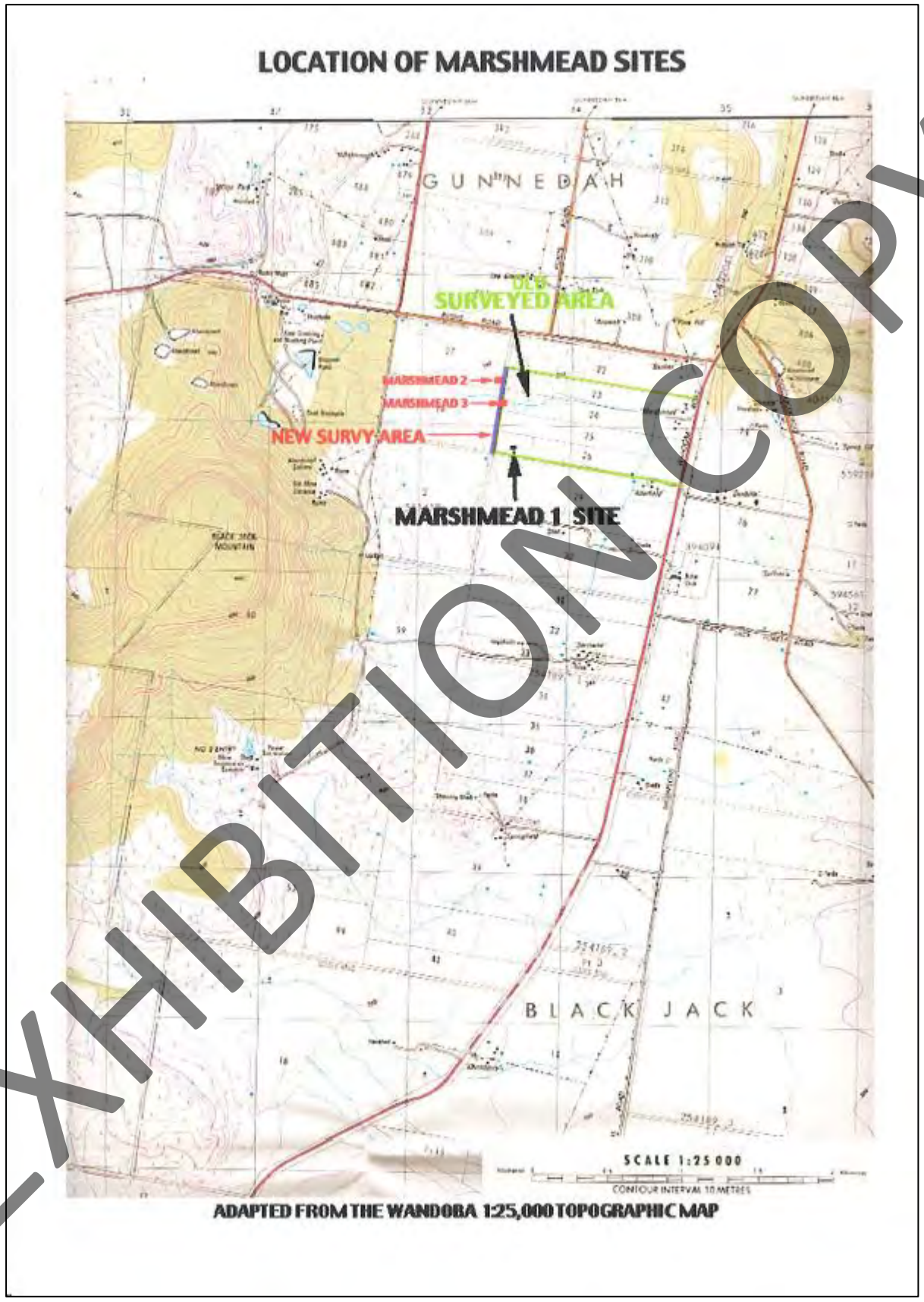
Figure 5-2: Marshmead sites recorded by Gaynor (2011).



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5.3.2 Archaeological investigations within and near the study area

Previous archaeological investigations provide Aboriginal archaeological contexts of local relevance to the study area. A summary of nearby archaeological investigations is provided in **Table 5-4** below:

Table 5-4: Summary of local archaeological investigations near and within the study area.

Author	Date	Summary
Gorecki	1981	In 1981, the area known as 'Authorisation 138' (Mine Authorisation 138) at 'Springfield' was surveyed by Gorecki (1981). Seventeen locations with artefacts were recorded by Gorecki, approximately 5 km south of the current study area. These locations were recorded on AHIMS as three sites. The quantity of artefacts at each site varied, with some locations containing an isolated stone artefact and others containing clusters. All were found adjacent to Springfield Knob and relatively close to minor drainage features. All 17 sites recorded during the investigation comprised of stone artefact scatters and all but one were low density. The main artefact types identified comprised of flakes, scrapers, and cores. One blade and a grindstone were also recorded. The dominant raw material types comprised locally sourced chert, quartz, quartzite and silcrete. One artefact manufactured from petrified wood was also recorded. Gorecki argued that these artefacts were in secondary contexts as agriculture / pastoralism, erosion, and construction of contour banks had disturbed their original locations (Gorecki 1981). It is important to note that no artefacts were found either up slope in the surrounding hills or down slope on the plains.
Appleton	2007	Appleton (2007) surveyed Lot 2, DP848920, Lincoln St, Gunnedah in response to a project to subdivide the site into 137 residential blocks. This area is located on the southern edge of the Gunnedah township approximately 3.5 km northeast of the study area. No artefacts were located during this assessment; however, Appleton does refer to an isolated artefact and nine grinding grooves located by himself in 2006 in the vicinity of Wandobah Road. Appleton's conclusion for his 2007 survey was that the area was most likely a transitory zone between desirable campsites. Appleton noted that Red Chief LALC considered the 2007 study area of cultural significance, as the nearby Porcupine Hill was closely associated with the legendary figure, Red Chief (Appleton 2007).
Hudson	2004	Suzanne Hudson's (2004) assessment of 'Porky's Cave' at Porcupine Hill, Gunnedah, for Red Chief LALC. The cave is approximately 5 km northeast of the study area and contained rock engravings and an ironstone cobble. Appleton refers to the cave as a 'Dreaming site' (Appleton 2007). Hudson recommended that access be restricted on cultural grounds (the cave is of ceremonial significance to the community), safety (due to lose scree), ecological grounds (fires were affecting the resident bat community), and archaeological grounds (trampling and vandalism were gradually destroying the rock engravings).
Gaynor	2011	A survey of the property 'Marshmead' adjacent to the eastern boundary of the study area was completed by Gaynor in 2011.The assessed area included gently sloping land, sloping east towards Blackjack Creek and included cropped land. One stone artefact was located (assumed to be Marshmead 1 shown on **Figure 5-2**. The artefact included a mudstone retouched blade-like flake, recorded in a cultivated paddock. An annexure to this report was necessitated by the reported findings of two Aboriginal artefact sites (Marshmead 2 and Marshmead 3) associated with disturbances through the construction of Robert Gordon Road. The sites were located and it was recommended by the attending Aboriginal site officers that all artefacts be eventually salvaged and kept in the Keeping Place at the Red Chief Museum.
OzArk	2017	A salvage program was undertaken by OzArk for the proposed realignment of Blackjack Creek. The program included the surface salvage of two sites, as well as a subsurface salvage through the means of a grader scrape in areas of PAD. Two backed blades and two cores were recovered through the surface salvage efforts, and 11 flakes and debitage fragments were recovered from the grader scrapes. Chalcedony was the predominant manufacturing material, followed by chert, quartz and volcanic materials. The low density of sites in association with Blackjack Creek was attributed to frequent flooding of the low-lying landforms in which the PADs were located, as well as disturbances to the A-horizon through post-European occupational activities.
Gaynor	2021	In 2021, Gaynor completed an Aboriginal heritage assessment of the current study area. Three stone artefacts were identified within 62 m of each other, manufactured

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Author	Date	Summary
		from mudstone (2) and chalcedony (1). This site is registered as 29-1-0288 (Marshmead 4[). Gaynor notes that these raw materials (mudstone and chalcedony) were not locally available and that dominant raw materials within the study area consisted of quartz and chert. The results suggest that the artefacts do not originate locally and supports Appleton's conclusion that Aboriginal activity in the local region was low intensity and not indicative of long-term occupation. Furthermore, Gaynor's report notes that the artefacts are associated with the edge of an ephemeral drainage feature which traverses the study area.
OzArk	2023	In 2023, OzArk completed an Aboriginal cultural heritage assessment at 170 Bushs Lane in Gunnedah, immediately north of the current study area. Given the assessment areas proximity to the current study area, the landforms are very similar. The only major difference being that no drainage feature is present at 170 Bushs Lane. No Aboriginal sites were recorded during the survey. This was attributed to a variety of factors, including: distance from a watercourse, lack of landforms with identified archaeological potential, and lack of outcropping rock.

5.3.3 Archaeological context: Conclusion

The archaeological investigations surrounding the study area as summarised in **Sections 5.2** and **5.3** indicate that:

Stone artefact sites (as defined in **Section 5.3**) are the most frequent sites recorded in the area, especially in association with watercourses.

- The quantity of stone artefacts present at a site is often correlated to the permanence of the nearest watercourse and resources (i.e. low-density artefacts are more likely to be recorded in association with a drainage feature while high-density artefact scatters are more likely to be recorded near a riverbank or named creek)
- Chert, silcrete, quartz and quartzite are generally the dominant raw materials in the region. Chalcedony is also a common material, as identified in association with Blackjack Creek (OzArk 2017).
- Sites have been recorded across a variety of landforms, including those with moderate to high disturbance.

5.4 PREDICTIVE MODEL FOR SITE LOCATION

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including plant and animal foods, stone and ochre resources and rock shelters, as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes, or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such

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as stone artefacts, stone hearths, shells, and some bones that remain preserved in the current landscape. Even these, however, may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport, both over short- and long-time scales, or (b) the historical impacts associated with the introduction of European farming practices including grazing and cropping, land degradation, and farm related infrastructure. Scarred trees, due to their nature, may survive for up to several hundred years but rarely beyond.

5.4.1 Site types in the region of the study area

The site types listed in **Table 5-5** are present in the region of the study area. The likelihood of these sites being present in the study area is discussed in **Section 5.4.3**.

Table 5-5: Site types recorded in the region of the study area.

Site type	Site description
Isolated finds	May be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
Open artefact scatters	Artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources. Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.
Culturally modified trees	Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.
Grinding grooves	Grinding grooves are the remnants of ground edge hatchet manufacture and sometimes from food preparation. The site is most l kely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have also been recorded on fine-grained granite and quartzite outcrops.
Bora/Ceremonial sites	Places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

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5.4.2 Landform modelling of archaeological potential

The archaeological studies undertaken within the immediate vicinity of the study area provide information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that most sites are present close to watercourses (Haglund 1984a, 1984b, 1982; Gaynor 2011 and 2021). As this study area is intersected by an ephemeral drainage feature where artefacts have already been identified, there is moderate potential for Aboriginal sites to be present. It is noted however that the study area has already been surveyed which resulted in a low-density scatter being recorded and the likelihood of additional substantial Aboriginal sites being recorded is low.

Crucial for the preservation of archaeological deposits is the history of past land use in an area. Historically, the study area has been mostly subjected to low-intensity agricultural operations (ploughing) and vegetation clearing which has likely resulted in disturbance to the topsoils and any surface archaeological deposits within those topsoils. The moderate to high degree of disturbance combined with the soils susceptibility to erosion when exposed to water or disruption would suggest that subsurface archaeological deposits, if present, are likely in a secondary context as well.

5.4.3 Conclusion

Based on knowledge of the environmental contexts of the study area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of landforms within the study area to contain Aboriginal objects (**Table 5-6**), and what types of sites may be present within the study area (**Table 5-7**).

Table 5-6: Likelihood of landforms within the study area to contain Aboriginal objects.

Survey Unit	Landform type	Likelihood to contain Aboriginal objects
1	Within 200 m of a drainage line	Previous investigations by Gaynor (2021) indicates that two sites are present within 200 m of the ephemeral drainage feature with the study area and an additional site has been previously recorded along the same drainage feature immediately east of the study area. Therefore, this landform contains moderate potential for archaeological potential.
2	Gentle slopes	Slopes are a degrading landform, especially in the study area where vegetation removal has accelerated soil loss. Given the slopes in the study area consist of gentle gradients they are still suitable for occupation and often favoured as they are more elevated, however, when distant to water they are less likely to have been subject to long-term repeated occupied.

Table 5-7: Likelihood of certain site types being present in the study area.

Site type	Likelihood of being present in the study area
Isolated finds	As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the study area.
Open artefact scatters	Stone artefact distributions of variable artefact densities are some of the most common Aboriginal sites found within the region. A general correlation between landform and the nature of the evidence of past Aboriginal occupation is evident. As most of the study area consists of gentle slopes and an ephemeral drainage line, low-density scatters with a low complexity of tool types may occur. It is

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Site type	Likelihood of being present in the study area
	noted that the study area already has recorded two low-density artefact sites (29-1-0288 and 29-1-0256), and this raises the poss bility that the area contains further sites of this type.
Culturally modified trees	Due to the near-total clearance of trees from within the study area, this site type is predicted to be very rare. It is also noted that this study area has been previously assessed and no culturally modified trees were identified at the time of investigation.
Grinding grooves	While this site type has been recorded in the surrounding area, they are not predicted to be present within the study area as geological mapping does not suggest sandstone is present and the area has been previously assessed.
Bora/Ceremonial sites	This site type does not necessarily follow landform predictability and are, overall, a rare site type with a low likelihood of being present and remaining extant. These sites are generally identified through consultation with the RAPs.

Implications for the study area

The available archaeological and landscape information suggest that the study area has moderate archaeological potential. While the gentle slopes within the study area are suitable for occupation, they are a degrading landform with a reduced likelihood of subsurface archaeological deposits remaining *in situ*. The distance to a reliable water source indicated a reduced likelihood of repeated or long-term occupation sites being present. However, previously recorded sites within and near to the study area indicate that despite disturbances and distance from named water sources, low-density artefact sites may still be present.

5.5 RESEARCH QUESTIONS

Several research questions can meaningfully be applied to the investigation of the study area. These research questions include:

- Is the area a transitory space to move from camp to camp or was it a resource gathering location?
- Based on Gaynor's (2021) observation of imported raw material, is there any evidence within the study area of it being used as a trade route?
- What tasks were Aboriginal people undertaking at the sites?
- Do the findings within the study area (if any) accord with the regional archaeological context examined in **Section 5.2**?
- Do the survey results support the predictive model set out in **Section 5.4**?

The survey methodology set out in **Section 5** will be framed to help answer these questions; should sites of sufficient significance be encountered. However, based on the results of previous assessments and past disturbances, it not expected that the land within the study area will contain sites of sufficient significance to help answer those research questions that require a robust data set.

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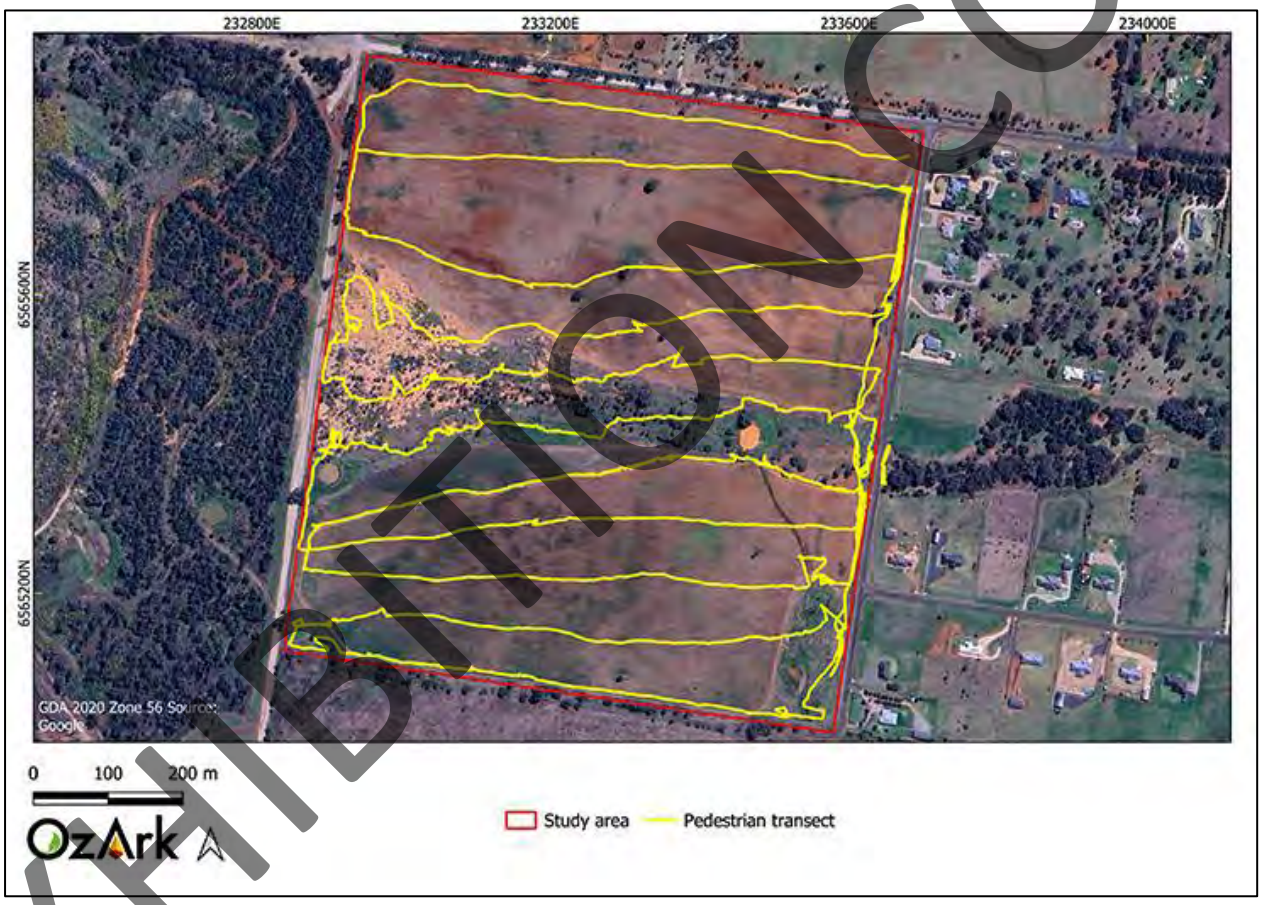
6 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

6.1 SAMPLING STRATEGY AND FIELD METHODS

The archaeological methods utilised in the Aboriginal archaeological assessment follows the Code of Practice. Standard archaeological field survey and recording methods were employed in this study (Burke & Smith 2004).

The study area was inspected on foot by OzArk Project Archaeologist, Tenae Robertson, with the assistance of Cindy Foley and Gary Griffiths (representing Greg Griffiths) (see **Section 3.2.3**). The survey coverage of the OzArk Archaeologist is shown on **Figure 6-1**.

Figure 6-1: Survey coverage across the study area.



6.2 PROJECT CONSTRAINTS

The primary constraint encountered during the survey was low ground surface visibility (GSV) due to the grasses which dominated the northern and southern paddocks on either side of the east-west ephemeral drainage (**Figure 6-2**).

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Figure 6-2: Example images of the GSV within the study area.

1. Example of low GSV within the southern paddock.

2. Example of low GSV within the northern paddock.

6.3 EFFECTIVE SURVEY COVERAGE

Two of the key factors influencing the effectiveness of archaeological survey are ground surface visibility (GSV) and ground surface exposure (GSE). These factors are quantified to ensure that the survey data provides adequate evidence for the evaluation of the archaeological materials across the landscape. For the purposes of the current assessment, these terms are used in accordance with the definitions provided in the Code of Practice.

GSV is defined as:

> *… the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'* (DECCW 2010: 39).

GSE is defined as:

> *… different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals'* (DECCW 2010: 37).

Table 6-1 calculates the effective survey coverage within the study area. In general, **Table 6-1** presents an approximation of the amount of ground surface able to be seen at any location within specific landform units. For example, at any one location within the 200 m of drainage, approximately 21% of the ground surface could be seen. Exposures were largely associated with a large washed-out area in the western extent of the study area, vehicle tracks, and the eroded

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banks of the east-west ephemeral drainage. The amount of visible ground decreased with distance to the drainage and within the gently sloping landforms, in which thick grasses were present.

Table 6-1: Effective survey coverage within the study area.

Survey Unit	Landform	Survey Unit Area (sq m)	Visibility %	Exposure %	Effective Coverage Area (sq m) (= Survey Unit Area x Visibility % x Exposure %)	Effective Coverage % (= Effective Coverage Area / Survey Unit Area x 100)
1	Within 200 m of drainage	396800	70	30	83328	21
2	Gentle slopes	208568	40	10	8342	4

Table 6-2 demonstrates that although the survey efficacy within 200 m of the east-west drainage feature was 21%, this did not hamper the recording of sites generally because the available exposures were in the most archaeologically sensitive areas (i.e. along the banks of the drainage feature).

Table 6-2: Effective survey coverage and incidences of newly recorded sites.

Landform	Landform area (sq m)	Area Effectively Surveyed (sq m) (= Effective Coverage Area)	% of Landform Effectively Surveyed (= Area Effectively Surveyed / Landform x 100)	Number of Sites	Number of Artefacts or Features
1	Within 200 m of drainage	83328	21	4	8
2	Gentle slopes	8342	4	1	1

6.4 ABORIGINAL SITES RECORDED

Table 6-3 summarises the Aboriginal cultural heritage sites recorded during the survey of the study area and **Figure 6-3** shows the location of the recorded Aboriginal sites. Further details on each site follows.

Table 6-3: Aboriginal cultural heritage sites recorded during the survey.

AHIMS ID	Site name	Site type	Coordinates (GDA Zone 56) East	Coordinates (GDA Zone 56) North	Survey Unit
29-1-0294	BL-IF1	Isolated find	233587	6565140	2
29-1-0295	BL-OS1	Artefact scatter	233568	6565218	1
29-1-0296	BL-OS2	Artefact scatter	232912	6565404	1
29-1-0297	BL-OS3	Artefact scatter	233066	6565418	1
29-1-0293	BL-OS4	Artefact scatter	232930	6565562	1

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Figure 6-3: Location and extents of Aboriginal sites within and near to the study area.

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BL-IF1

Site type: Isolated find

GPS coordinates: GDA Zone 56 233587E 6565140N

Location of site: BL-IF1 is located at the eastern extent of Lot 28 DP755474, along the western side of an unsealed track within a ploughed paddock approximately 70 m south-southwest of the intersection between Robert Gordon Road and Kerry Elizabeth Drive, 6 km southwest of the Gunnedah town centre.

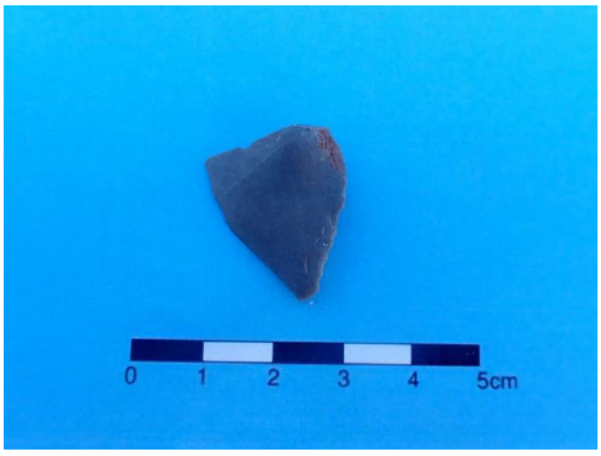
Description of site: BL-IF1 consists of an isolated stone artefact manufactured from a volcanic material located on a very gently inclined landform 233 m south of the east-west ephemeral drainage intersecting the study area (**Table 6-4** and **Figure 6-4**). The paddock has been previously subject to ploughing and stock grazing, and the immediate surrounds of the site have been subject to damming, earth mounding, and subsequent mechanical levelling. Therefore, the object is in a secondary context. GSV at the location was moderate (60%) due to the disturbances and absence of crops. BL-IF1 is not assessed to have the potential for subsurface deposits due to the secondary context of the object and hard-set ground surface.

Table 6-4: BL-IF1 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Volcanic	Complete	Tertiary	20 x 25 x 5

Figure 6-4: BL-IF1. View of site and recorded artefact.

1. View south to BL-IF1 (pink flag).



2. View of the volcanic flake at BL-IF1.

BL-OS1

Site type: Artefact scatter

GPS coordinates: GDA Zone 56 233568E 6565218N

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Location of site: BL-OS1 is in the east of Lot 28 DP755474 within a paddock approximately 30 m directly west of the intersection between Robert Gordon Road and Kerry Elizabeth Drive, 6 km southwest of the Gunnedah town centre.

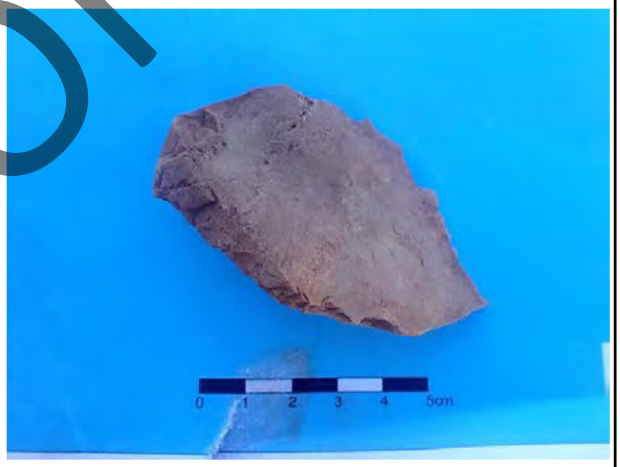
Description of site: BL-OS1 comprises two stone artefacts manufactured from mudstone and a volcanic material (**Table 6-5** and **Figure 6-5**). The site is in an exposure associated with ploughing and vehicle movement approximately 167 m south of the east-west ephemeral drainage which intersects the study area. The objects are in a secondary context, and the site extent measures 40 x 22 m. GSV within the exposure was moderate (50%) with a sparse poorly sorted rocky surface. BL-OS1 is not assessed to have the potential for subsurface deposits due to the secondary context of the objects and thin A horizon soils.

Table 6-5: BL-OS1 artefact attributes.

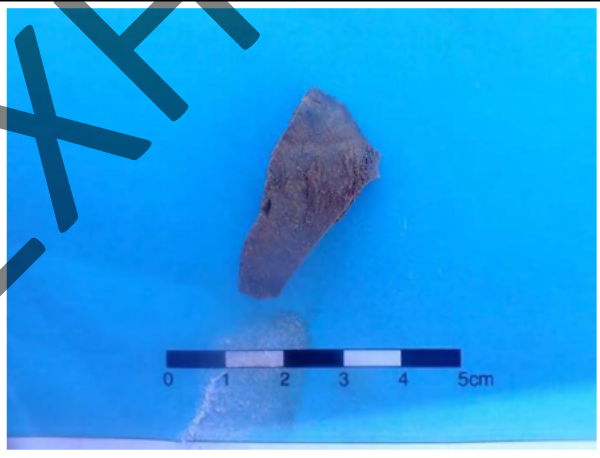
Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Mudstone	Complete	Secondary	80 x 50 x 16
Flake	Volcanic	Complete	Tertiary	37 x 18 x 8

Figure 6-5: BL-OS1. View of site and recorded artefacts.

1. View west across BL-OS1.



2. Mudstone flake from BL-OS1.



3. Volcanic flake from BL-OS1.

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BL-OS2

Site type: Artefact scatter

GPS coordinates: GDA Zone 56 232912E 6565404N

Location of site: BL-OS2 is in the northwest of Lot 28 DP755474, located north of an agricultural dam in the western extent of a ploughed and grazed paddock. The site is situated 520 m south of the Black Jack Road, Bushs Lane, and Blackjack Coal Mine Road intersection.

Description of site: The site comprises of two flakes, one manufactured of porcellanite and the other mudstone, located within a gently sloping landform directly north of the east-west ephemeral drainage intersecting the study area (**Table 6-6** and **Figure 6-6**). An agricultural dam is situated 20 m south of the site. The area has been subject to extensive water sheeting, and the objects are likely to be in a secondary context. GSV at this location was high (70%) between the low scrub and occasional juvenile trees, with a sparse, poorly sorted rocky surface. The site extent measures 25 x 25 m. BL-OS2 is not assessed to have subsurface archaeological potential due to the erosional processes displacing the objects, and the thin A horizon soils.

Table 6-6: BL-OS2 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Porcellenite	Complete	Tertiary	53 x 35 x 10
Flake	Mudstone	Complete	Tertiary	40 x 35 x 15

Figure 6-6: BL-OS2. View of site and recorded artefacts.

1. View west across BL-OS2.

2. View of porcellenite (left) and mudstone (right) flakes at BL-OS2.

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BL-OS3

Site type: Artefact scatter

GPS coordinates: GDA Zone 56 233066E 6565418N

Location of site: BL-OS3 is in the northwest of Lot 28 DP755474, located within an exposure associated with an ephemeral drainage line. The site is situated approximately 522 m southeast of the Black Jack Road, Bushs Lane, and Blackjack Coal Mine Road intersection, and 530 m west of Robert Gordon Road.

Description of site: BL-OS3 consists of two chert artefacts, one flake and one flaked piece, located across two exposures adjacent to the east-west ephemeral drainage (**Table 6-7** and **Figure 6-7**). The site is located approximately 30 m east of a large earth banked area, and directly north of a ploughed paddock. Disturbances to the site include stock trampling and water sheeting. GSV within the site was high (80%), obscured in discreet areas by an ants' nest and gravels. The objects are likely in a secondary context. BL-OS3 is not assessed as having the potential for subsurface deposit due to previous disturbances, erosional processes, and the thin A horizon soils.

Table 6-7: BL-OS3 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Chert	Complete	Tertiary	32 x 21 x 20
Flaked piece	Chert	Complete	Secondary	45 x 35 x 20

Figure 6-7: BL-OS3. View of site and recorded artefacts.

1. View southwest across the western extent of BL-OS3.

2. View southeast across eastern extent of BL-OS3.

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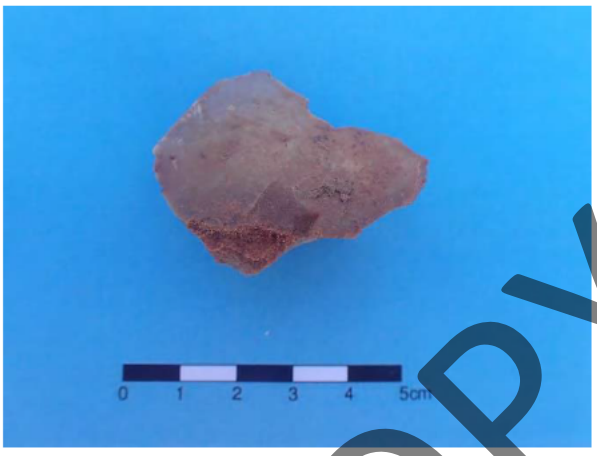
3. View of chert flake from BL-OS3.



4. View of chert flaked piece from BL-OS3.

BL-OS4

Site type: Artefact scatter

GPS coordinates: GDA Zone 56 232930E 6565562N

Location of site: BL-OS4 is in the southwest of Lot 27 DP755474, a washed-out area in the eastern extent of a grazed paddock. The site is situated 368 m south of the intersection between Black Jack Road, Bushs Lane, and Blackjack Coal Mine Road, and 722 m east of Robert Gordon Road.

Description of site: BL-OS4 consists of one chert flake and one silcrete scraper located within an extensive wash-out area in the eastern extent of the paddock (**Table 6-8** and **Figure 6-8**). Disturbances include vegetation clearance, water-sheeting, and stock trampling. GSV within the site was moderate (60%), between the rocky surface, low scrub, and occasional grasses. The objects are likely within a secondary context due to the extensive erosional processes. BL-OS4 has not been assessed as having subsurface potential due to previous disturbances and thin A horizon soils.

Table 6-8: BL-OS4 artefact attributes.

Artefact type	Raw material	Artefact integrity	Stage of reduction	Size (LxWxD) mm
Flake	Mudstone	Complete	Tertiary	40 x 30 x 12
Scraper	Silcrete	Complete	Tertiary	45 x 45 x 20

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Figure 6-8: BL-OS4. View of site and recorded artefacts.

1. View west to BL-OS4.

2. View north across northern extent of BL-OS4.

3. View of chert flake from BL-OS4.

4. View of silcrete flaked piece from BL-OS4.

6.5 PREVIOUSLY RECORDED ABORIGINAL SITES LOCATED

Marshmead 2 (29-1-0256)

Site description: Recorded by Gaynor (2011) as a "*scatter of artefacts around an ants nest*". Information in the site card notes the site is a low-density artefact scatter with an extent measuring 13 x 8 m.

2024 results: The site location was successfully located during the survey however no artefacts were observed. The lack of visible artefacts may be attributed to lower ground surface visibility at the time of the 2024 survey, as well as disturbances such as stock trampling and erosional processes associated with the sloping landform of the site which may have caused the displacement of Aboriginal objects (**Figure 6-9**). Stakes have been previously erected at the site location which was a recommendation in the site card. The coordinates have been ground-truthed, and the site is located in the eastern extent of the study area (**Figure 6-3**).

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Figure 6-9: Images of Marshmead 2 site visit.

1. View north to Marshmead 2.	2. View southeast across Marshmead 2.

Marshmead 3 (29-1-0255)

Site description: Recorded by Gaynor (2011) as a "*two artefacts just 5 m on the south bank of a tributary of Blackjack Creek…*". Information in the site card notes the site is a low-density artefact scatter with 1 x 1 m site extent.

2024 results: The site is not located within the study area and is situated in the adjacent lot to the east (**Figure 6-10**). The site is on the eastern edge of Robert Gordon Road, adjacent to the study area. The site does not extend into the study area.

Figure 6-10: Images of Marshmead 3 site visit.

1. View north to approximate location of Marshmead 3.	2. View of dense vegetation obscuring view and access of Marshmead 3.

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Marshmead 4 (29-1-0288)

Site description: Recorded by Gaynor (2021) as "*one artefact on farm track 97 m west of gate off Robert Gordon Drive and another two on an ants' nest 62 m west just off the farm track*". Information in the site card notes the site is a low-density artefact scatter with a 62 x 5 m.

2024 results: The site was located during the survey and confirmed the AHIMS coordinates are accurate. The artefacts originally recorded by Gaynor at the site could not be located however an additional six artefacts were identified within and near the site extent. These observed manufacturing materials include mudstone, petrified wood, and volcanic materials (**Figure 6-11**). The site extent has been extended to 150 x 15 m to incorporate the additional artefacts identified nearby.

Figure 6-11: Images of Marshmead 4 site visit and identified artefacts.

1. View northwest across Marshmead 4 from eastern extent of site.

2. View east across Marshmead 4 from western extent of site.

3. Selection of artefacts identified at Marshmead 4.

4. View of a petrified wood flake identified at Marshmead 4.

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6.6 ABORIGINAL COMMUNITY COMMENTS ON THE SURVEY

No specific values were attributed to the study area by the site officers in attendance. However, it was noted that the drainage which intersects with the study area is a tributary to Blackjack Creek, with the implication that this may have been a transitory area.

6.7 SUMMARY OF SURVEY RESULTS

The survey resulted in the identification of five previously unrecorded Aboriginal sites. These comprised one isolated find and low-density artefacts scatters. An additional six artefacts were identified in association with previously recorded site Marshmead 4 (29-1-0288) recorded by Gaynor in 2021. The artefacts recorded consisted of mudstone, chert, porcellenite, silcrete, volcanic, and petrified wood materials. The Marshmead 2 site (29-1-0255) was revisited and located within the study area, however no artefacts were observed.

Soils across the study area displayed little to no A-horizon soils remaining. The ground surface contained frequent gravels, including small quartz pebbles and occasional fragments of petrified wood. Some fragments of petrified wood were photographed out of interest but were not assessed as being culturally modified. Most trees within the study area were juvenile, and the occasional mature trees did not appear to be of an age which would date to pre-European clearing. Nevertheless, mature trees were inspected and did not bare any cultural scars.

Areas of mechanically modified earth were observed during the survey, particularly surrounding the east-west drainage feature (**Figure 6-12**). This is assumed to be where foreign materials have been brought in to control the erosion caused by water run-off from the western boundary of the study area.

No landforms within the study area were assessed to have the potential for subsurface deposits. This is unsurprising, as the soils across the study area retain little cultural bearing deposits and the study area is distant from reliable sources with which PADs are often associated, such as those associated with Blackjack Creek approximately 2.5 km northeast of the study area.

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Figure 6-12: Example images of modified earth within the study area.

1. View east of mechanically mounded earth on south bank of drainage feature.	2. View west across mounded banked earth north of the drainage feature.

6.7.1 Discussion

Desktop modelling indicated that there was a relatively low likelihood for Aboriginal site types (excluding stone artefact sites) to be present in the study area due to agricultural and erosional disturbances, as well as the distance of the study area from reliable water sources.

Marshmead 4 and BL-OS1 to BL-OS4 are all located within 200 m of the east-west ephemeral drainage feature. While located outside of the 200 m drainage buffer, BL-IF2 and Marshmead 2 are both situated within 230 m of the drainage feature. The proximity of the sites to the ephemeral water source is indicative of an association between water and Aboriginal activities.

As observed by Gaynor (2021), some manufacturing materials recorded (i.e. mudstone, porcellenite, chalcedony) are not commonly recorded within the Namoi River region (see **Section 5.3.3**). Additionally, the recorded artefacts were largely not manufactured of materials present within the study area, indicating that artefacts were likely carried in from other areas, further consistent with Gaynor's observations.

As artefacts were recorded in low densities, with a variety of materials present, it can be postulated that the manufacturing of stone tools (knapping) was not taking place here. Additionally, the low density of the sites and the distance to a reliable water source indicates that the study area was likely used for infrequent opportunistic hunting and gathering activities, as was a common practice among the Kamilaroi ethnolinguistic group (see **Section 5.1**).

As discussed in **Section 6.5**, the coordinates for the Marshmead 2 and Marshmead 3 sites have been reversed. OzArk will update the coordinates to be accurately reflected on AHIMS.

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6.7.2 Responses to the research questions

In **Section 5.5** several research questions were advanced to guide the survey of the study area. Following the survey, responses to these research questions are set out below.

- Is the area a transitory space to move from camp to camp or was it a resource gathering location?
    - The positioning of the study area between more permanent and semi-permanent watercourses to the east (i.e. Namoi River and Blackjack Creek) and the prominent landscape feature of Blackjack Mountain to the west may indicate that the study area is situated within a transitory space. As indicated by previous regional studies (Haglund 1984b) hunting and gathering locations may not accumulate archaeological deposits. Therefore, while the low-density of the assemblage may suggest either or both activities were taking place, as they are not mutually exclusive.
- Based on Gaynor's (2021) observation of imported raw material, is there any evidence within the study area of it being used as a trade route?
    - The 2024 survey results are consistent Gaynor's observations of imported material within the study area, in that mudstone and porcellenite materials were identified, which are not materials commonly found within the Namoi River area. Given the relatively small assemblage, it cannot be accurately determined whether a trade route intersected with the study area.
- What tasks were Aboriginal people undertaking at the sites?
    - As discussed above, it is possible that Aboriginal people used this space to move between camps, and / or that hunting and resource gathering activities were taking place here.
- Do the findings within the study area (if any) accord with the regional archaeological context examined in **Section 5.2**?
    - The low-density of the recorded sites within the study area are in accordance with the regional context, as previous studies have demonstrated that sites of higher frequencies and densities will be in proximity to reliable waters or within sensitive landforms such as ridgelines and hill crests, all which are absent from this study area (Haglund 1984a, 1984b and 1985).
- Do the survey results support the predictive model set out in **Section 5.4**?
    - The findings within the study area, as discusses in **Section 6.7.1**, support the prediction that low-density artefact scatters may be present in proximity to the ephemeral drainage feature.

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7 SIGNIFICANCE ASSESSMENT

7.1 INTRODUCTION TO SIGNIFICANCE ASSESSMENT

7.1.1 Identifying cultural significance

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all the cultural values and meanings that might be recognised in a place. The *Burra Charter*'s definition of cultural significance is broad and encompasses places that are significant to Indigenous cultures (Burra Charter 2013).

The *Burra Charter* definition of 'place' is also broad and encompasses Indigenous places of cultural significance. 'Place' includes locations that embody spiritual value (such as Dreaming places, sacred landscapes, and stone arrangements), social and historical value (such as massacre sites), as well as scientific value (such as archaeological sites). In fact, one place may be all these things or may embody all these values at the same time.

In some cases, the find-spot of a single artefact may constitute a 'place'. Equally, a suite of related locations may together comprise a single 'place', such as the many individual elements that make up a Songline. These more complex places are sometimes called a cultural landscape or cultural route.

The Guide (OEH 2011: 8–9) notes that cultural significance is comprised of an assessment of social values, scientific values, aesthetic values, and historic values. These values are described below.

7.1.1.1 Social or cultural value

Social or cultural value refers to the spiritual, traditional, historical, or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them.

Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

There is not always consensus about a place's social or cultural value. Because people experience places and events differently, expressions of social or cultural value do vary and, in some instances, will be in direct conflict. When identifying values, it is not necessary to agree with or acknowledge the validity of each other's values, but it is necessary to document the range of values identified.

Social or cultural value can only be identified through consultation with Aboriginal people. This could involve a range of methodologies, such as cultural mapping, oral histories, archival

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documentation, and specific information provided by Aboriginal people specifically for the investigation.

Cultural value involves both traditional links with specific areas, as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of value may not be in accord with interpretations made by the archaeologist: a site may have low archaeological value but high social value, or vice versa.

7.1.1.2 Scientific (archaeological) value

This refers to the importance of a landscape, area, place or object because of its rarity, representativeness, and the extent to which it may contribute to further understanding and information (Burra Charter 2013).

Assessing a site in this context involves placing it into a broader regional framework, as well as assessing the site's individual merits in view of current archaeological discourse. This type of value relates to the ability of a site to answer current research questions and is also based on a site's condition (integrity), content and representativeness.

The overriding aim of cultural heritage management is to preserve a representative sample of the archaeological resource. This will ensure that future research within the discipline can be based on a valid sample of the past. Establishing whether a site can contribute to current research also involves defining 'research potential'. Questions regularly asked when determining significance are: can this site contribute information that no other site can? Is this site representative of other sites in the region?

Information about scientific values will be gathered through any archaeological investigation undertaken. Archaeological investigations must be carried out according to Heritage NSW's Code of Practice (DECCW 2010).

Often scientific values are informed by social values that allow a contemporary understanding of the archaeological data to be understood.

7.1.1.3 Aesthetic value

This refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Burra Charter 2013).

7.1.1.4 Historic value

Historic value refers to the associations of a place with a historically important person, event, phase, or activity in an Aboriginal community. Historic places do not always have physical

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evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have 'shared' historic values with other (non-Aboriginal) communities.

Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage. Consequently, the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. This means it is often necessary to collect oral histories along with archival or documentary research to gain enough understanding of historic values.

7.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Table 7-1 presents a summary of the significance assessment of Aboriginal cultural heritage sites recorded during this assessment. Further details of each of the assessment criteria are provided below.

Social or Cultural Value

The social and cultural value of Aboriginal sites is generally determined through consultation with Aboriginal people. Generally, the Aboriginal community regard all sites as having high cultural significance. This is due to all sites, even displaced artefact sites, being able to provide a connection to their ancestors, as well as being a tangible reminder of the past Aboriginal occupation of the area.

A copy of the initial draft ACHAR was sent to all RAPS on 3 May 2024 with a 28-day review period closing 31 May 2024. No comments were received on the draft ACHAR from any of the RAPs regarding the cultural significance of the recorded sites. As such, all sites have been accorded high cultural significance.

Archaeological/Scientific Value

The significance assessment of the archaeological value for Marshmead 4 by Gaynor (2021) is as follows:

"*Because these artefacts were found on the edge of the main watercourse they would probably have been disturbed by agricultural implements or vehicles in the past nevertheless they were probably dropped in the general vacinity of the watercourse. Because these three artefacts (two made on mudstone and one on chalcedony) are not commonly found in other artefacts scatters around the Namoi River (such as around Broadwater), it would appear that their source is on the southern side of Gunnedah*."

Additionally, Gaynor completed an educational significance assessment for Marshmead 4:

"*Although blade-like artefacts are reasonably common, that artefact having a notched edge, would have a high significance for educational purposes*."

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While Gaynor's 2021 assessment of archaeological significance that chalcedony and mudstone are not common materials within the region, it is noted that chalcedony is not an uncommon material to the area, as demonstrated within the local archaeological context in **Section 5.3** (OzArk 2016). While mudstone may be an uncommon material, the site does not provide ample sample data to compare with surrounding site assemblages within the region. Additionally, the retouched artefacts located within Marshmead 4 have limited scientific value due to their displacement within the archaeological context.

Similarly, the remaining sites within the study area have been assessed to have low archaeological or scientific value, as past land use, such as cultivation, stock grazing, and vegetation clearance, as well as the extensive erosion within the western extent, has disturbed the integrity of all artefact sites. These objects are unstratified, displaced, and low in density, and are therefore unable to yield information regarding occupation within the study area and allow for meaningful comparison to other similar landforms across the region.

Aesthetic Value

All recorded sites do not manifest themselves obviously in the landscape and are difficult for the layperson to appreciate. Additionally, they are in a landscape that has been modified in historic times. As such, all sites are assessed are having low aesthetic value.

Historic Value

The recorded sites do not have any association with historically import persons, places, or events. Therefore, the sites have no historic values.

Table 7-1: Aboriginal cultural heritage: significance assessment.

Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
BL-IF1	High	Low	Low	None
BL-OS1	High	Low	Low	None
BL-OS2	High	Low	Low	None
BL-OS3	High	Low	Low	None
BL-OS4	High	Low	Low	None
Marshmead 3	High	Low	Low	None
Marshmead 4	High	Low	Low	None

7.2.1 Statement of significance

There may be places with intangible cultural significance within the study area, however no specific locations have so far been identified by the Aboriginal community. Likewise, no places of historic or aesthetic value are present.

The scientific value of the sites within the study area are considered to have a low potential to provide further information on the traditional Aboriginal use of the region due to limited

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representational abilities of low-density artefact sites. Additionally, the study area is confined to landforms distant to reliable water sources or landforms which provide shelter, and therefore distant to optimal occupation locations.

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8 ASSESSING HARM

8.1 AVOIDING AND MINIMISING HARM

8.1.1 Conserving significant Aboriginal cultural heritage

An object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk, strives for good conservation outcomes. In particular, OzArk is primarily concerned with the conservation and protection of Aboriginal cultural heritage that is of significance to Aboriginal people.

Two primary objectives when managing harm to an Aboriginal object are:

- Impacts to significant Aboriginal objects and places should always be avoided wherever possible
- Where impacts to Aboriginal objects and places cannot be avoided, proposals should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places using reasonable and feasible measures.

8.1.2 Opportunities to conserve Aboriginal cultural heritage values

At this stage, no specific ground disturbing impacts are proposed as the current proposal (rezoning) is at the planning proposal stage and therefore none of the recorded Aboriginal sites within the study area will be harmed. Impacts subsequent to rezoning such as bulk earthworks associated with subdivision and the construction of dwellings should take into consideration the location of the known Aboriginal sites and aim to reduce impact if possible.

8.2 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROPOSAL

Table 8-1 presents a summary of impacts to Aboriginal cultural heritage associated with the proposal.

Table 8-1: Aboriginal cultural heritage: impact assessment.

Site Name	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial / None)	Consequence of Harm (Total/Partial/No Loss of Value)
BL-IF1	None	None	None
BL-OS1	None	None	None
BL-OS2	None	None	None
BL-OS3	None	None	None
BL-OS4	None	None	None
Marshmead 3	None	None	None
Marshmead 4	None	None	None

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8.3 ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES

Ecologically sustainable development principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. Regarding Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

8.3.1 Intergenerational equity

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity, and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous permits), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of the proposal.

Where there is uncertainty, the precautionary principle should also be followed.

8.3.2 The precautionary principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In relation to Aboriginal cultural heritage values, the precautionary principle should be applied if:

- The proposal involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places
- There is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

8.3.3 Principle of Integration

The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to "*promote the integration of the three components of sustainable development- economic development, social development and environmental protection- as interdependent and mutually reinforcing pillars*".

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The principle of integration ensures mutual respect and reciprocity between economic and environmental considerations:

- Environmental considerations are to be integrated into economic and other development plans, programs, and projects.
- Development needs are to be considered in applying environmental objectives.

8.3.4 Applicability to the proposal

As there are no ground disturbing impacts associated with the proposed rezoning, the proposal will not result in harm to Aboriginal cultural heritage values within the study area. However, future subdivision and development has the potential to harm Aboriginal sites. Harm to any Aboriginal sites must be assessed in a detailed impact assessment once those details are known.

Table 8-2 examines the application of ESD principles to the proposal.

Table 8-2: Application of ESD principles to the proposal.

ESD principle	Response
Avoiding and minimising harm	**Section 9** sets out mechanisms by which to avoid and minimise harm.
The integration principle	The proposed rezoning does not presently have identifiable impacts, and therefore has no environmental consequences. Subsequent subdivision and development has the opportunity to present a strong case for the broader environmental benefits arising from environmentally responsible development.
The precautionary principle	The Aboriginal cultural heritage investigation has followed the precautionary principle though undertaking a robust Aboriginal cultural heritage assessment to ensure that harm to Aboriginal objects and values can be minimised and managed. The survey adopted a precautionary principle when it came to describing and assessing landforms within the study area.
The intergenerational equity principle	The proposal will not harm significant Aboriginal cultural heritage values, however subsequent subdivision and development has the potential to. The Aboriginal cultural heritage assessment has identified the Aboriginal cultural heritage values within the study area so that there will be a manageable diminution of intergenerational equity should the sites recorded here be harmed in future development.

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9 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

9.1 GENERAL MANAGEMENT PRINCIPLES

Appropriate management of cultural heritage items is primarily determined based on their assessed significance as well as the likely impacts of the proposal. **Section 7.2** and **Section 8.2** describe, respectively, the significance / potential of the recorded sites and the likely impacts of the proposal.

The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

- Avoid impact by ensuring that future developments conserve recorded Aboriginal site in the landscape. If this can be done, then a suitable curtilage around the site must not be disturbed by ground disturbing works.

  As there are no ground disturbing works associated with the proposal, there will be no impact to Aboriginal cultural heritage values.

- If impact is unavoidable then approval to disturb sites under the authority of an AHIP must be sought from Heritage NSW. An ACHAR will be required to accompany the AHIP and Aboriginal community consultation must be undertaken (DECCW 2010b). Management and mitigation of recorded Aboriginal sites.

  Should any of the identified Aboriginal sites not be able to be avoided from harm from the subsequent subdivision and development then an AHIP would be required. An ACHAR specific to the harm to the subdivision and development would be required to accompany any future AHIP application.

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10 RECOMMENDATIONS

Under Section 89A of the NPW Act it is mandatory that all newly recorded Aboriginal sites be registered with AHIMS. As a professional in the field of cultural heritage management it is the responsibility of OzArk to ensure this process is undertaken.

To this end it is noted that two previously recorded sites and an additional five previously unrecorded Aboriginal sites were recorded during the assessment.

The following recommendations are made based on these impacts and with regard to:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without an approved AHIP.
- The findings of the current investigations undertaken within the study area
- The interests of the Aboriginal community.

Recommendations concerning Aboriginal cultural values within the study area are as follows:

1. The proposed land rezoning may proceed at the study area without further archaeological investigation.
2. The planning design of the subdivision should consider the locations of the recorded Aboriginal sites (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4, Marshmead 2 and Marshmead 4) and be designed in such a way that harm to the sites is avoided or minimised.
3. If future works are proposed in the study area, then the general management principles listed in **Section 9** should be followed depending on whether the recorded Aboriginal sites (BL-IF1, BL-OS1, BL-OS2, BL-OS3, BL-OS4, Marshmead 2 and Marshmead 4) can be avoided.
4. The initial purchaser of a lot with any recorded Aboriginal site must be informed of the site's location, its protection under the NPW Act, and the need to avoid ground disturbance.

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APPENDIX 1: ABORIGINAL COMMUNITY CONSULTATION

Aboriginal Consultation Log			
Date	Organisation	Comment	Method
20.12.23	Gunnedah Times	Catherine Burrowes (CB) contacted paper to place in 21.12.23 publication - closing date 10.1.2024	phone/email
21.12.23	Heritage NSW	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
21.12.23	Red Chief LALC	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
21.12.23	Office of The Registrar, ALRA	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
21.12.23	National Native Title Tribunal	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
21.12.23	NTSCORP	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
21.12.23	Gunnedah Shire Council	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
21.12.23	North West Local Land Services	CB sent stage 1 agency letter requesting potential stakeholders. Closing date 10.1.24	email
9.1.24.	Gomeroi Applicant	CB received email registering for the project	email
9.1.24.	Gomeroi Applicant	CB replied with thanks	email
11.1.24	ANTC	CB emailed community letter - closing date 31.1.24	email
11.1.24	Alison Sampson	CB emailed community letter - closing date 31.1.24	email
11.1.24	AT Gomeroi Cultural	CB emailed community letter - closing date 31.1.24	email
11.1.24	Brian Draper	CB emailed community letter - closing date 31.1.24	email
11.1.24	Cacatua General Service	CB emailed community letter - closing date 31.1.24	email
11.1.24	Cindy Foley	CB emailed community letter - closing date 31.1.24	email
11.1.24	Stakeholder 3	CB emailed community letter - closing date 31.1.24	email
11.1.24	D F T V Enterprises	CB emailed community letter - closing date 31.1.24	email
11.1.24	Edgerton kwiembal AC	CB emailed community letter - closing date 31.1.24	email
11.1.24	Galamaay Cultural Consultants (GCC)	CB emailed community letter - closing date 31.1.24	email
11.1.24	George Sampson	CB emailed community letter - closing date 31.1.24	email
11.1.24	Glenn Edward Johnson	CB emailed community letter - closing date 31.1.24	email
11.1.24	Gomery Cultural Consultants	CB emailed community letter - closing date 31.1.24	email
11.1.24	Gunjeewong Cultural Heritage Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	email
11.1.24	Jeremy Duncan	CB emailed community letter - closing date 31.1.24	email
11.1.24	Konanggo Aboriginal Cultural Heritage Services	CB emailed community letter - closing date 31.1.24	email

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11.1.24	Michael Long	CB emailed community letter - closing date 31.1.24	email
11.1.24	Michelle Saunders	CB emailed community letter - closing date 31.1.24	email
11.1.24	Murra Bidgee Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	email
11.1.24	Muswel brook Cultural Consultants	CB emailed community letter - closing date 31.1.24	email
11.1.24	Natasha Rogers	CB emailed community letter - closing date 31.1.24	email
11.1.24	Nunawanna Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	email
11.1.24	Red Chief LALC	CB emailed community letter - closing date 31.1.24	email
11.1.24	Thomas Dahlstrom	CB emailed community letter - closing date 31.1.24	email
11.1.24	Vicky Hannah Gomeroi Duncan	CB emailed community letter - closing date 31.1.24	email
11.1.24	WATTAKA Pty Ltd	CB emailed community letter - closing date 31.1.24	email
11.1.24	RAW Cultural Healing	CB emailed community letter - closing date 31.1.24	email
11.1.24	Girragirra Murun Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	email
11.1.24	Wingarra Wilay Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	email
11.1.24	Long Gully Cultural Services	CB emailed community letter - closing date 31.1.24	email
11.1.24	Bigundi Biame Gunnedarr traditonal people	CB emailed community letter - closing date 31.1.24	Post
11.1.24	BJC Cultural Management	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Breeza Plains Cultural	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Brent Mathews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Bunda Consultants	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Buritja Aboriginal Corporation Breeza	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Cheryl Moodie Consultants	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Christine Archbold	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Clifford Matthews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Darrell Mathews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Deslee Mathews	CB emailed community letter - closing date 31.1.24	Post

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11.1.24	Donna Moodie	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Elli Lewis	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Esther Tighe	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Gunida Gunyah	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Hazel Collins	CB emailed community letter - closing date 31.1.24	Post
11.1.24	HECMO Consultants	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Heilamon Cultural Consultants	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Jeff Matthews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Jodie Mckinnon	CB emailed community letter - closing date 31.1.24	Post
11.1.24	John Matthews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Joshua Matthews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Justin Matthews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Katrina Mckinnon	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Kevin Sampson	CB emailed community letter - closing date 31.1.24	Post
11.1.24	KL.KG Saunders Trading Service	CB emailed community letter - closing date 31.1.24	Post
11.1.24	LLoyd Matthews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Lorraine Towney	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Luke Cameron Cultural Management	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Mavonia Welsh	CB emailed community letter - closing date 31.1.24	Post
11.1.24	ME Griffiths Cultural	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Min Min Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Mooki Plains Management	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Mooki River Consultants	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Nammoypathways Aboriginal Corporation	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Namoi Catchment Management Authority	CB emailed community letter - closing date 31.1.24	Post

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11.1.24	Ngoorabul Elders	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Paul Moodie	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Peter Watton	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Robert Miller	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Rodney Mathews	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Roger Mathews Consultancy	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Rona Slater	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Ronald Long	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Roslyn Smith	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Scott Smith	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Sonny Fitzroy	CB emailed community letter - closing date 31.1.24	Post
11.1.24	T&G Culture Consultants	CB emailed community letter - closing date 31.1.24	Post
11.1.24	Gomery Cultural Consultants	CB received email registering for the project	email
11.1.24	Gomery Cultural Consultants	CB replied with thanks	email
11.1.24	Konanggo Aboriginal Cultural Heritage Services	CB received email registering for the project	email
11.1.24	Konanggo Aboriginal Cultural Heritage Services	CB replied with thanks	email
11.1.24	Nunawanna Aboriginal Corporation	CB received email registering for the project	email
12.1.24	Nunawanna Aboriginal Corporation	CB replied with thanks	email
11.1.24	WATTAKA Pty Ltd	CB received email registering for the project	email
12.1.24	WATTAKA Pty Ltd	CB replied with thanks	email
12.1.24	AT Gomeroi Cultural	CB received email registering for the project	email
12.1.24	AT Gomeroi Cultural	CB replied with thanks	email
12.1.24	Long Gully Cultural Services	CB received email registering for the project	email
12.1.24	Long Gully Cultural Services	CB replied with thanks	email
15.1.24	Michael Long	CB received email registering for the project	email
15.1.24	Michael Long	CB replied with thanks	email

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15.1.24	Cindy Foley	CB received email registering for the project	email
18.1.24	Cindy Foley	CB replied with thanks	email
17.1.24	Murra Bidgee Aboriginal Corporation	CB received email registering for the project	email
18.1.24	Murra Bidgee Aboriginal Corporation	CB replied with thanks	email
22.1.24	Bigundi Biame Gunnedarr traditonal people	CB received email registering for the project	email
23.1.24	Bigundi Biame Gunnedarr traditonal people	CB replied with thanks	email
23.1.24	Greg Griffiths	CB received phone call registering fo the project	Phone
24.1.24	Kevin Sampson	TR received phone call registering for the project	Phone
24.1.24	Thomas Dahlstrom	CB received email registering for the project	email
24.1.24	Thomas Dahlstrom	CB replied with thanks	email
24.1.24	Buritja Aboriginal Corporation Breeza	Return to sender letter	Post
24.1.24	Jodie Mckinnon	Return to sender letter	Post
24.1.24	Breeza Plains Cultural	Return to sender letter	Post
24.1.24	Lorraine Towney	Return to sender letter	Post
24.1.24	Nammoypathways Aboriginal Corporation	Return to sender letter	Post
30.1.24	Tania Matthews	CB received email registering for the project	email
30.1.24	Tania Matthews	CB replied with thanks	email
30.1.24	Stakeholder 1	CB received email registering for the project	email
30.1.24	Stakeholder 1	CB replied with thanks	email
30.1.24	Brent Mathews	CB received email registering for the project	email
30.1.24	Brent Mathews	CB replied with thanks	email
30.1.24	Joshua Matthews	CB received email registering for the project	email
30.1.24	Joshua Matthews	CB replied with thanks	email

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1.2.24	Justin Matthews	Return to sender letter	Post
1.2.24	Clifford Matthews	Return to sender letter	Post
1.2.24	LLoyd Matthews	Return to sender letter	Post
1.2.24	Donna Moodie	Return to sender letter	Post
1.2.24	Christine Archbold	Return to sender letter	Post
1.2.24	John Matthews	Return to sender letter	Post
6.2.24	Stakeholder 3	CB received email registering for the project	email
7.2.24	Stakeholder 3	CB replied with thanks	email
6.2.24	Stakeholder 2	CB received email registering for the project	email
7.2.24	Stakeholder 2	CB replied with thanks	email
9.2.24	Heritage NSW & Mudgee LALC	CB sent notification of those who registered for project	email
19.2.24	Gomeroi Applicant	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Gomery Cultural Consultants	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Konanggo Aboriginal Cultural Heritage Services	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Nunawanna Aboriginal Corporation	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	WATTAKA Pty Ltd	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	AT Gomeroi Cultural	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Long Gully Cultural Services	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	White Cockatoo	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Cindy Foley	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Murra Bidgee Aboriginal Corporation	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Bigundi Biame Gunnedarr traditonal people	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Greg Griffiths	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Kevin Sampson	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Thomas Dahlstrom	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email

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19.2.24	Tania Matthews	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Stakeholder 1	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Brent Matthews	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Joshua Matthews	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Stakeholder 3	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Stakeholder 2	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Red Chief LALC	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
19.2.24	Long Gully Cultural Services	CB received email response - *I support the following methodology and everything I read on the information pack.I'd like for anything that's found to be properly managed and put away from the public eye.*	email
19.2.24	Long Gully Cultural Services	CB replied with thanks	email
19.2.24	Troy Silver	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
20.2.24	Stephen Matthews	CB emailed Stage 2/3 draft methodology closing date 18.3.24	email
21.2.24	Murra Bidgee Aboriginal Corporation	CB received email - *I have read the project information and draft methodology for the above project, and I endorse the recommendations made*	email
21.2.24	Murra Bidgee Aboriginal Corporation	CB replied with thanks	email
28.2.24	Cindy Foley	CB received email re Stage 2/3 Methodology - *Looks good to me*	email
28.2.24	Cindy Foley	CB replied with thanks	email
4.4.24	Stakeholder 1	TR receives call wanting to speak to CB about not being invited on fieldwork. CB unavailable. TR says senior team will call back to discuss.	Phone
4.4.24	Stakeholder 1	JB tries to call, leaves message asking to return call to discuss concerns.	Phone
5.4.24	Stakeholder 1	JB tries to call, leaves message asking to return call to discuss concerns.	Phone
5.4.24	Stakeholder 1	JB receives call. Stakeholder 1 is upset they were not offered fieldwork even under unpaid capacity. Stakeholder 1 explains concerns that attending site officers are not elders. JB offers to organise to take Stakeholder 1 to site under volunteer capacity. Stakeholder 1 declines and says they will "just stick their head over the fence next time they are nearby".	Phone
3.5.24	Gomeroi Applicant	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Gomery Cultural Consultants	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Konanggo Aboriginal Cultural Heritage Services	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Nunawanna Aboriginal Corporation	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	WATTAKA Pty Ltd	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	AT Gomeroi Cultural	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Long Gully Cultural Services	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	White Cockatoo	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Condy Foley	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email

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3.5.24	Murra Bidgee Aboriginal Corporation	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Bigundi Biame Gunnedarr Traditional People	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Greg Griffiths	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Kevin Sampson	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Thomas Dahlstrom	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Tania Matthews	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Stakeholder 1	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Brent Matthews	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Joshua Matthews	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Stakeholder 3	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Stakeholder 2	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Red Chief LALC	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Troy Silver	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Stephen Matthews	CB emailed Stage 4 draft ACHAR closing date 31.5.24	email
3.5.24	Thomas Dahlstrom	CB received email from Thomas – *I have no comment on this. May I suggest taking comment from people chosen to participate in paid activities?*	email
3.5.24	Thomas Dahlstrom	CB replied to Thomas with thanks for comment	email
30.5.24	Murra Bidgee Aboriginal Corporation	CB received email from Darleen – *I have read the project information and ACHAR for the above project, I endorse the recommendations made*	email
30.5.24	Murra Bidgee Aboriginal Corporation	CB replied to Darleen with thanks	email

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Appendix 1 Figure 1: Stage 1, Advertisement

Expression of Interest
Cultural Heritage Management

OzArk Environment & Heritage has been engaged by 2728 Pty Ltd (the proponent) to complete an Aboriginal cultural heritage assessment for a proposed subdivision Lots 27 & 28 DP755474, 210 Bush's Lane, Gunnedah within the Gunnedah local government area. These activities may result in harm to Aboriginal cultural heritage.

OzArk is seeking persons or groups who wish to be consulted about the project and this consultation group will assist OzArk and the proponent in the preparation of an Aboriginal Cultural Heritage Assessment Report and to assist Heritage NSW in their consideration and determination of the project.

If you hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects or places in the project area, please register your interest to be consulted.

Registrations can be made by post: OzArk PO Box 2069 Dubbo NSW 2830; email: catherine@ozarkehm.com.au or by phoning OzArk on 02 6882 0118. All submissions should be received no later than Wednesday 10th January 2024.

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Appendix 1 Figure 2: Stage 1 agency letter (sample)

OzArk

21 December 2023

Heritage NSW
Department of Premier and Cabinet
heritagemailbox@environment.nsw.gov.au
Locked Bag 5020
Parramatta NSW 2124

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

PROPOSED RESIDENTIAL SUBDIVISION – 210 BUSH'S LANE, GUNNEDAH

Dear Sir/Madam,

OzArk Environment & Heritage (OzArk) has been engaged by Stewart Surveys on behalf of 2728 Pty Ltd to undertake Aboriginal community consultation as per the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010).

The proponent is proposing to subdivide Lots 27 & 28 DP755474 210 Bush's Lane, Gunnedah, NSW (**Figure 1**). These activities may result in harm to Aboriginal cultural heritage.

We are therefore seeking Expressions of Interest from relevant Aboriginal stakeholder groups and individuals in the area who hold cultural knowledge relevant to determining the significance of Aboriginal objects or places within the Gunnedah LGA.

This consultation group will assist OzArk in preparing the Aboriginal Cultural Heritage Assessment Report (ACHAR) and to assist Heritage NSW and the Department of Planning and Environment in their consideration and determination of the project.

If your organisation can recommend and provide contact details for any known Aboriginal groups or individuals with cultural knowledge relevant to determining the impacts to the cultural significance of the above-mentioned project, please advise our office.

We would appreciate it if you could provide any feedback, by responding to this email catherine@ozarkehm.com.au, regarding these Aboriginal stakeholder groups by COB 10th January 2024, or sooner if possible.

Kind regards,

Catherine Burrowes
Office Manager/ Community Liaison

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OzArk Environment & Heritage

Figure 1: Regional location of the proposal in relation to Gunnedah

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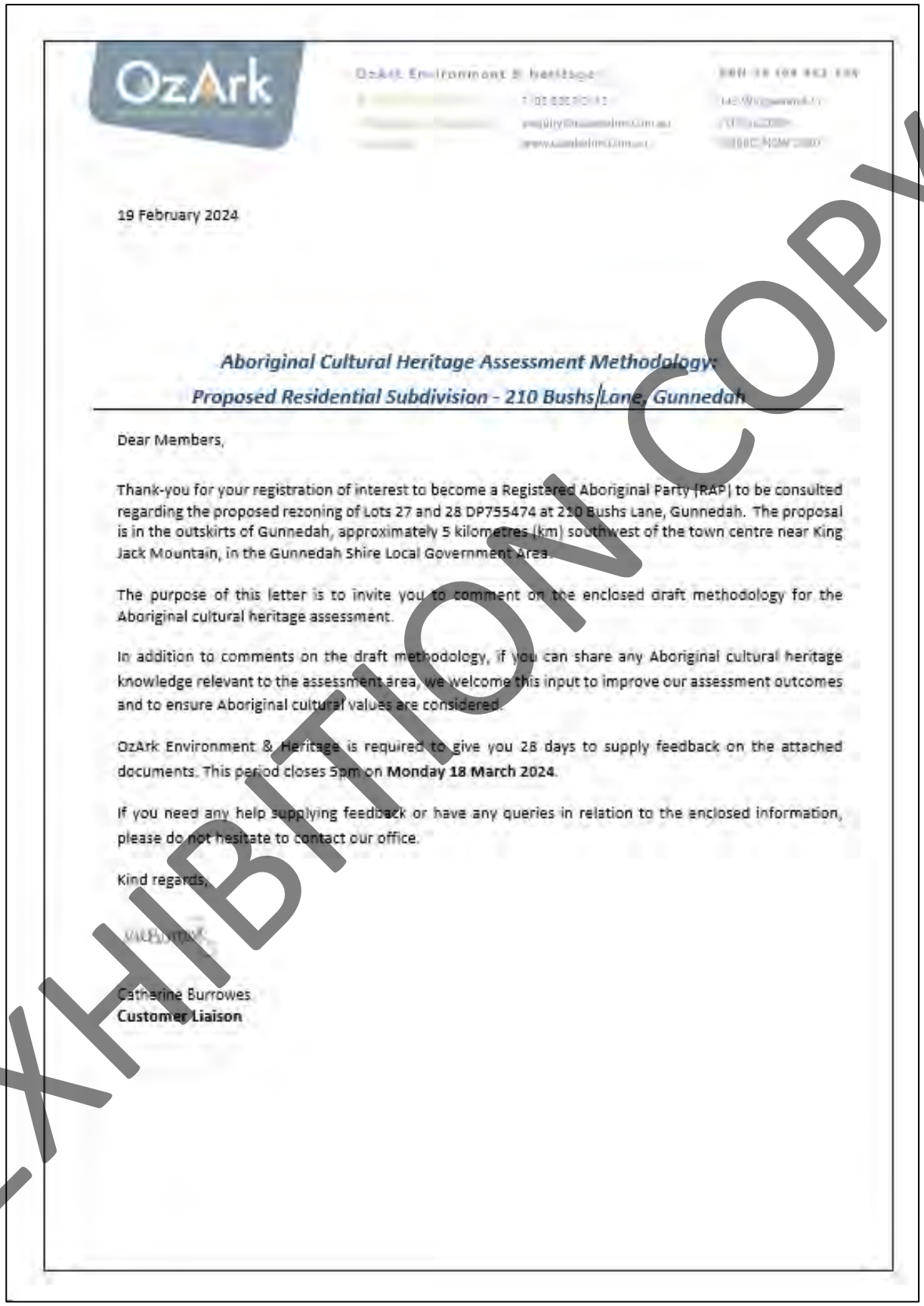
Appendix 1 Figure 3: Example Stage 2/3 RAP cover letter



OzArk Environment & Heritage

19 February 2024

Aboriginal Cultural Heritage Assessment Methodology:
Proposed Residential Subdivision - 210 Bushs Lane, Gunnedah

Dear Members,

Thank-you for your registration of interest to become a Registered Aboriginal Party (RAP) to be consulted regarding the proposed rezoning of Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah. The proposal is in the outskirts of Gunnedah, approximately 5 kilometres (km) southwest of the town centre near King Jack Mountain, in the Gunnedah Shire Local Government Area.

The purpose of this letter is to invite you to comment on the enclosed draft methodology for the Aboriginal cultural heritage assessment.

In addition to comments on the draft methodology, if you can share any Aboriginal cultural heritage knowledge relevant to the assessment area, we welcome this input to improve our assessment outcomes and to ensure Aboriginal cultural values are considered.

OzArk Environment & Heritage is required to give you 28 days to supply feedback on the attached documents. This period closes 5pm on **Monday 18 March 2024**.

If you need any help supplying feedback or have any queries in relation to the enclosed information, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Customer Liaison

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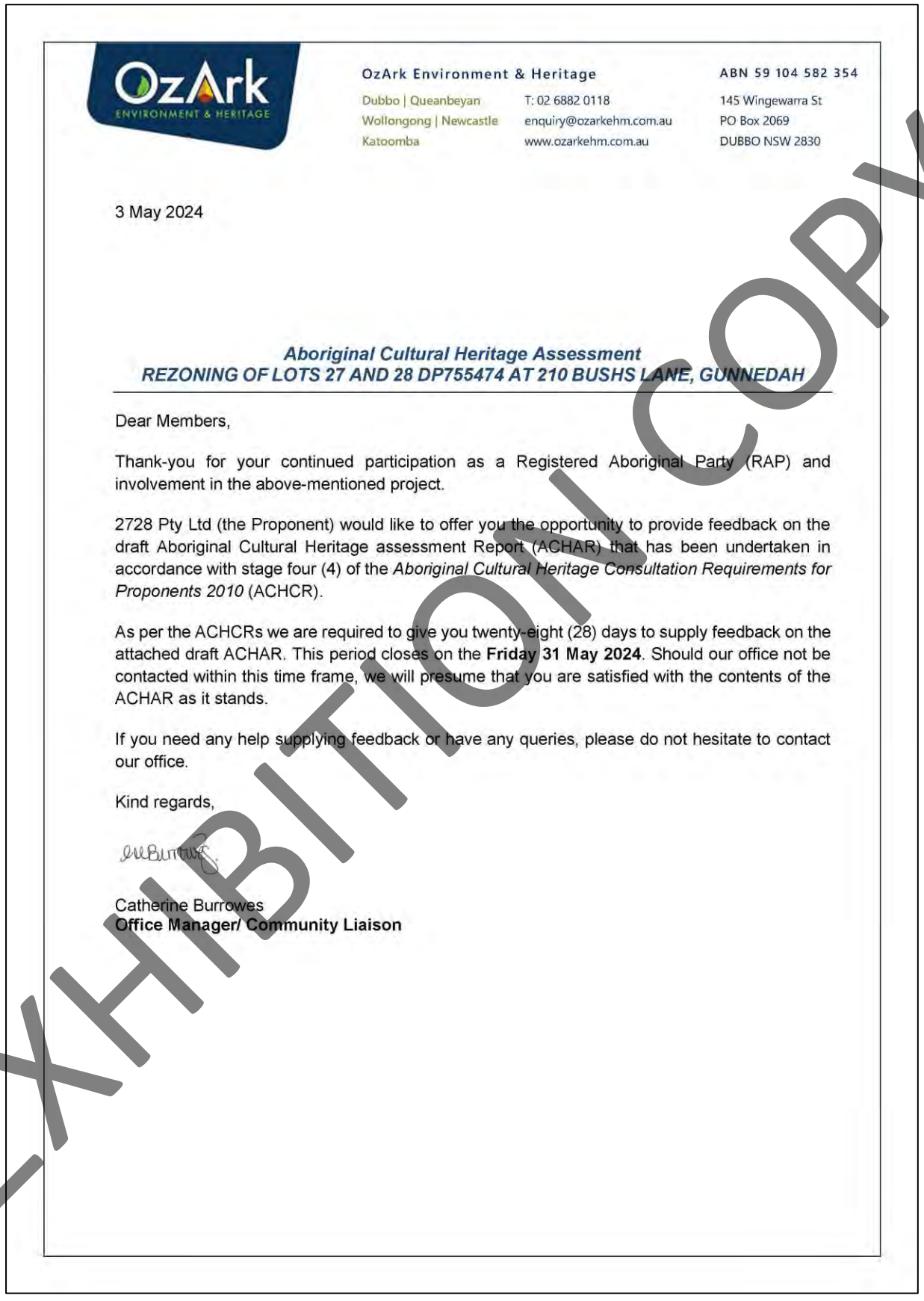
Appendix 1 Figure 4: Stage 4 RAP cover letter



OzArk Environment & Heritage
Dubbo | Queanbeyan
Wollongong | Newcastle
Katoomba
T: 02 6882 0118
enquiry@ozarkehm.com.au
www.ozarkehm.com.au
ABN 59 104 582 354
145 Wingewarra St
PO Box 2069
DUBBO NSW 2830

3 May 2024

Aboriginal Cultural Heritage Assessment
REZONING OF LOTS 27 AND 28 DP755474 AT 210 BUSHS LANE, GUNNEDAH

Dear Members,

Thank-you for your continued participation as a Registered Aboriginal Party (RAP) and involvement in the above-mentioned project.

2728 Pty Ltd (the Proponent) would like to offer you the opportunity to provide feedback on the draft Aboriginal Cultural Heritage assessment Report (ACHAR) that has been undertaken in accordance with stage four (4) of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCR).

As per the ACHCRs we are required to give you twenty-eight (28) days to supply feedback on the attached draft ACHAR. This period closes on the **Friday 31 May 2024**. Should our office not be contacted within this time frame, we will presume that you are satisfied with the contents of the ACHAR as it stands.

If you need any help supplying feedback or have any queries, please do not hesitate to contact our office.

Kind regards,

Catherine Burrowes
Office Manager/ Community Liaison

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Appendix 1 Figure 5: Stage 4 RAP responses

Murra Bidgee Aboriginal Corporation

DJ Darleen Johnson <[redacted]>
To Catherine Burrowes
You replied to this message on 30/05/2024 12:04 PM.

Hi Catherine
I have read the project information and ACHAR for the above project, I endorse the recommendations made.
Kind regards
Darleen
[redacted]

Thomas Dahlstrom

TD Thomas Dahlstrom <[redacted]>
To Catherine Burrowes
You replied to this message on 7/05/2024 4:14 PM.

Hi Catherine

I have no comment on this. May I suggest taking comment from people chosen to participate in paid activities?

Kind regards

Thomas

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APPENDIX 2: ASSESSMENT METHODOLOGY

ABORIGINAL CULTURAL HERITAGE ASSESSMENT METHODOLOGY

LOTS 27 AND 28 DP755474 AT 210 BUSHS LANE, GUNNEDAH

GUNNEDAH SHIRE LOCAL GOVERNMENT AREA, NSW

FEBRUARY 2024

Report prepared by

OzArk Environment & Heritage

for Stewart Surveys Pty Ltd on behalf of 2728 Pty Ltd

OzArk
Environment & Heritage
145 Wingewarra St
(PO Box 2069)
Dubbo NSW 2830
Phone: (02) 6882 0118
Fax: (02) 6882 0630
enquiry@ozarkehm.com.au
www.ozarkehm.com.au

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DOCUMENT CONTROLS

Proponent	2728 Pty Ltd
Client	Stewart Surveys Pty Ltd
Document Description	Assessment Cultural Heritage Assessment Methodology: Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah.
File Location	OzArk Job No.
Clients\ Stewart Surveys\ Assessment Methodology	4237

Document Status: **V3.0 FINAL**	Date: 16 February 2024
Draft V1: OzArk internal edits	V1.0 EM author 15/2/24 V1.1 SR review 16/2/24
Draft V2: OzArk and client edits	V2.0 OzArk to client 19/2/24
Final V3: Final document	V3.0 EM Finalised 19/3/24
Prepared for	Prepared by
Kathryn Stewart Stewart Surveys Pty Ltd PO Box 592 Gunnedah NSW 2830 02 6742 2966 kathryn@stewartsurveys.com	Eleanore Martin Archaeologist OzArk Environment & Heritage 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 eleanore@ozarkehm.com.au

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Enquiries should be addressed to OzArk Environment & Heritage.

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OzArk Environment & Heritage

Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment will take place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

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1 INTRODUCTION

1.1 PREAMBLE

OzArk Environment & Heritage (OzArk) has been engaged Stewart Surveys Pty Ltd (Stewart Surveys; the client), on behalf of 2728 Pty Ltd (the proponent) to prepare an Aboriginal cultural heritage assessment methodology for the proposed rezoning of Lots 27 and 28 DP755474 at 210 Bushs Lane, Gunnedah, NSW (the proposal).

The proposal is in the outskirts of Gunnedah, approximately 5 kilometres (km) southwest of the town centre near King Jack Mountain, in the Gunnedah Shire Local Government Area (**Figure 1-1**).

This methodology is in accordance with Stage 3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs; DECCW 2010b). The proposal information provided here also complies with Stage 2 of the ACHCRs.

The investigation set out in this methodology aims to identify Aboriginal cultural values, both tangible and intangible, that exist in the study area. The results of this investigation will be presented in an *Aboriginal Cultural Heritage Assessment Report* (ACHAR).

1.2 BACKGROUND

The study area for this proposal has been previously subject to an archaeological assessment completed by Ganor in 2021. At the time of the survey and initial report writing period, the proposal was considered able to be adequately assessed under the requirements of the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). However, the initial report prepared by Gaynor (2021), having been submitted to Heritage NSW, was deemed insufficient to support the rezoning process and required more comprehensive assessment to meet the requirements of Ministerial Direction 2.3, Heritage Conservation. Thus, at the recommendation of Heritage NSW, an ACHAR is being prepared for the proposal.

The results of the archaeological assessment completed by Gaynor (2021) are detailed in **Section 3.3**.

1.3 STUDY AREA

The study area describes the area in which all impacts associated with the proposal will be located (**Figure 1-2**). The study area covers approximately 60.5 hectares (ha) of agricultural land at Lots 27 and 28 DP755474, 210 Bushs Lane, Gunnedah, NSW.

The study area consists of gently sloping terrain mostly cleared of vegetation. Vegetation that remains is primarily clustered around an ephemeral drainage feature which intersects the central portion of the study area from east to west.

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1.4 PROPOSAL OVERVIEW

The study area is currently zoned RU4 – Primary Production Small Lots and is proposed to be rezoned to R5 - Large Lot Residential. As the proposal is a rezoning of land, not all impacts are known at this stage. Rather, ground disturbance is assumed to be possible anywhere in the study area.

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Figure 1-1: Location of the study area for the proposal.

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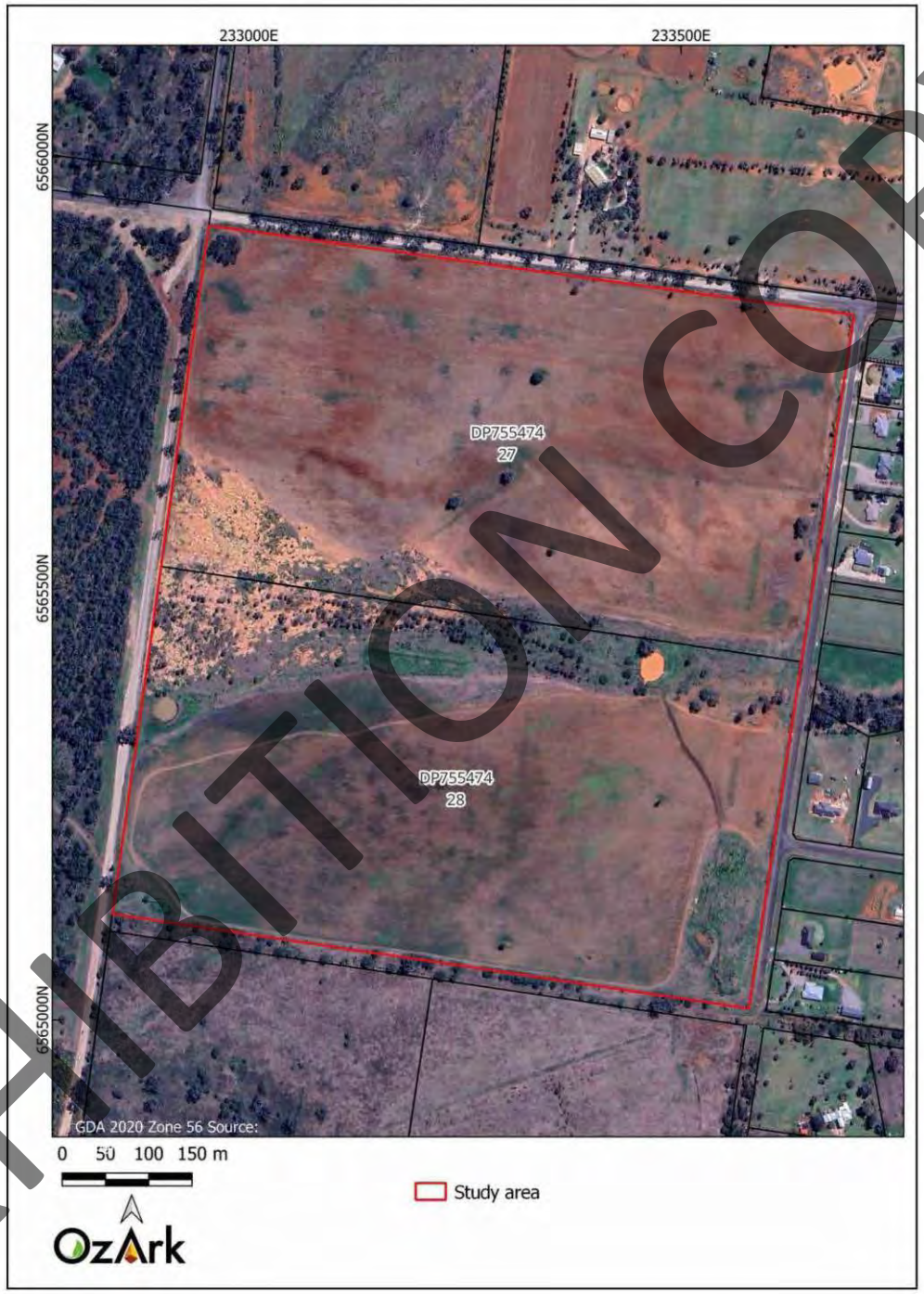
Figure 1-2: Aerial of the study area.



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1.5 CONSULTATION ON THIS METHODOLOGY

Consultation for this proposal has followed the guidelines established in the ACHCRs (DECCW 2010b) whereby an advertisement was placed in the local press and relevant agencies were contacted to ascertain if they were aware of groups or individuals who may have cultural knowledge of the region containing the proposal.

On 21 December 2023 an advertisement was placed in the *Gunnedah Times Classifieds* requesting expressions of interest in being consulted about the proposal. In addition, the following agencies were contacted to identify potential stakeholders for the area: Heritage NSW; the Red Chief Local Aboriginal Land Council (LALC); the Office of The Registrar, *Aboriginal Land Rights Act 1983*; the National Native Title Tribunal; Native Title Services Corporation Limited (NTSCORP); the Gunnedah Shire Council; and the North West Local Land Services.

As a result, the following individuals/groups registered to be consulted about the proposal:

- AT Gomeroi Cultural
- Biguundi Biame Gunedarr Traditional People
- Brent Matthews
- Cindy Foley
- [redacted]
- Gomeroi Native Title Applicant
- Gomery Cultural Consultants
- Greg Griffiths
- Joshua Matthews
- Kevin Sampson
- Konanggo Aboriginal Cultural Heritage Services
- Long Gully Cultural Services
- Murra Bidgee Aboriginal Corporation
- Nunawanna Aboriginal Corporation
- Shareholder 1[1]
- Shareholder 2

[1] Those listed as Stakeholder 1' etc have requested their details remain anonymous.

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- Stephen Matthews
- Tania Matthews
- Thomas Dhalstrom
- Troy Silver
- WATTAKA Pty Ltd
- White Cockatoo.

The Red Chief LALC did not formally register for the proposal but have been registered for transparency.

These individuals/groups constitute the Registered Aboriginal Parties (RAPs) for the proposal.

1.6 LANDSCAPE CHARACTERISTICS OF THE STUDY AREA

The study area is within the Brigalow Belt South Bioregion, specifically the Liverpool Plains subregion. Within the Brigalow Belt South bioregion, the Liverpool Plains subregion extends from Narrabri south to the east of Coonabarabran and terminates near Willow Tree. The Liverpool Plains sub-region is characterised by undulating hills and sloping plains with extensive black earths on low angle slopes and brown clays with alluvial soils (Morgan and Terry 1992:137). The topography of the study area comprises of a single gentle west to east lower hill slope landform with a general elevation of 360 – 330 metres (m) above sea level (see **Figure 1-3**).

Soils within the study area comprise Fullwood Roads – brown sodosols. Sodosols are generally characterised by clear or abrupt textural B horizon in which the major part (the upper 0.2 m) is sodic and not strongly acidic. Brown sodosols specifically are characterised by dense subsoils that are dispersive. Brown sodosol soils are generally highly erodible and poorly aerated in wet areas and are extremely compacted with low erodibility in dry areas. This suggests that these soils are highly susceptible to erosion in areas where soils are loose or exposed to a water.

Vegetation within the study area is mostly introduced crop (teff) although native vegetation is present across the middle of the study area in association with the east-west drainage channel (Gaynor 2021:10: **Figure 1-3**).

The study area is intersected by one unnamed ephemeral drainage feature which branches to the south from an agricultural dam (see **Figure 1-3**). The nearest permanent watercourse is Coocooboonah Creek approximately 3.5 km west of the study area.

The study area is used primarily for cropping purposes. Disturbances inside the study area appear to be limited to agricultural operations (i.e. ploughing), and the construction of agriculture infrastructure (i.e. fence lines, dams and unsealed tracks). An aerial of the study area from 1956

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shows there has been little change in terms of land use (going from a livestock grazing paddock to a cropped paddock) over the past 68 years (**Figure 1-4**).

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Figure 1-3: Topography and drainage of the study area.

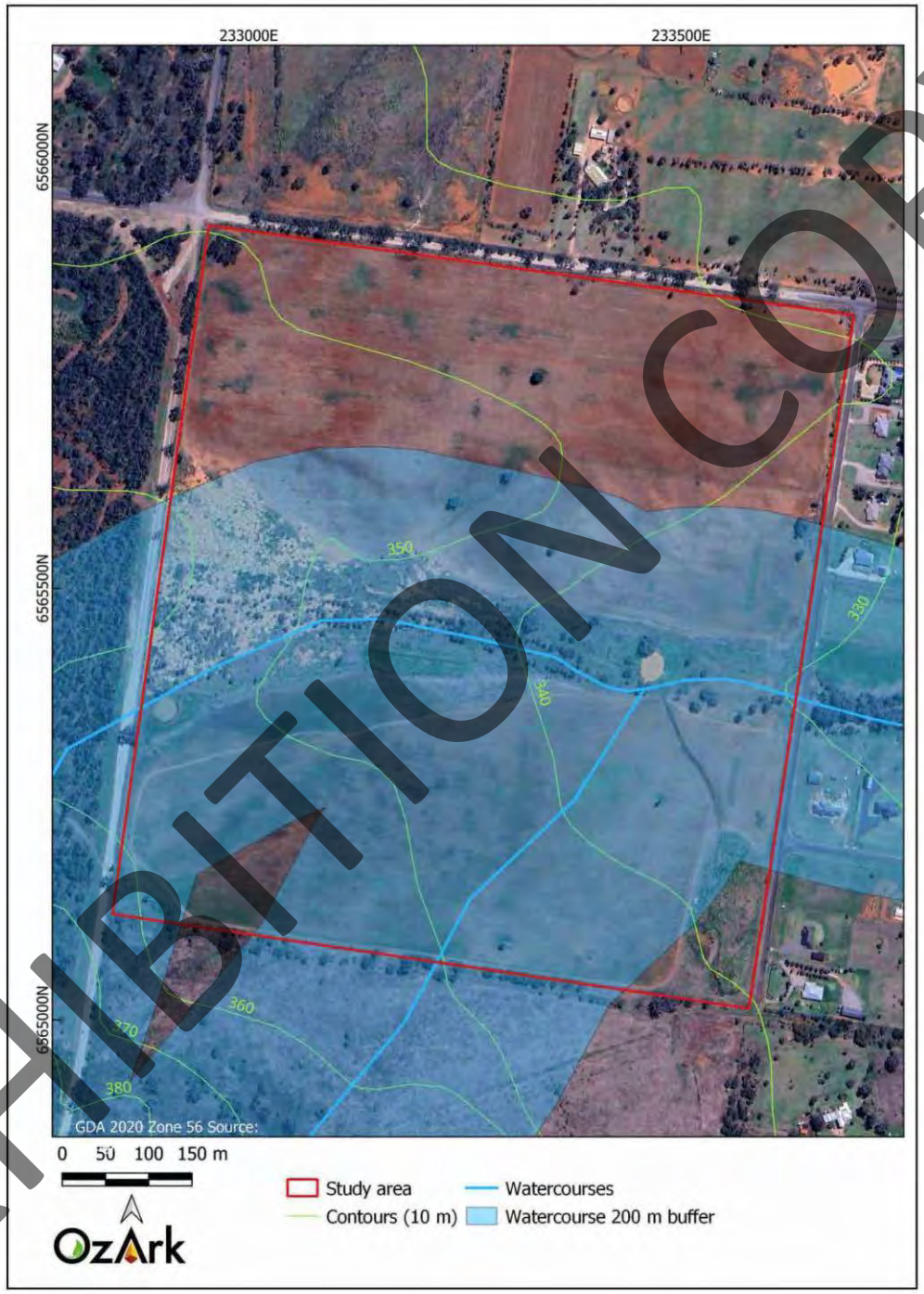

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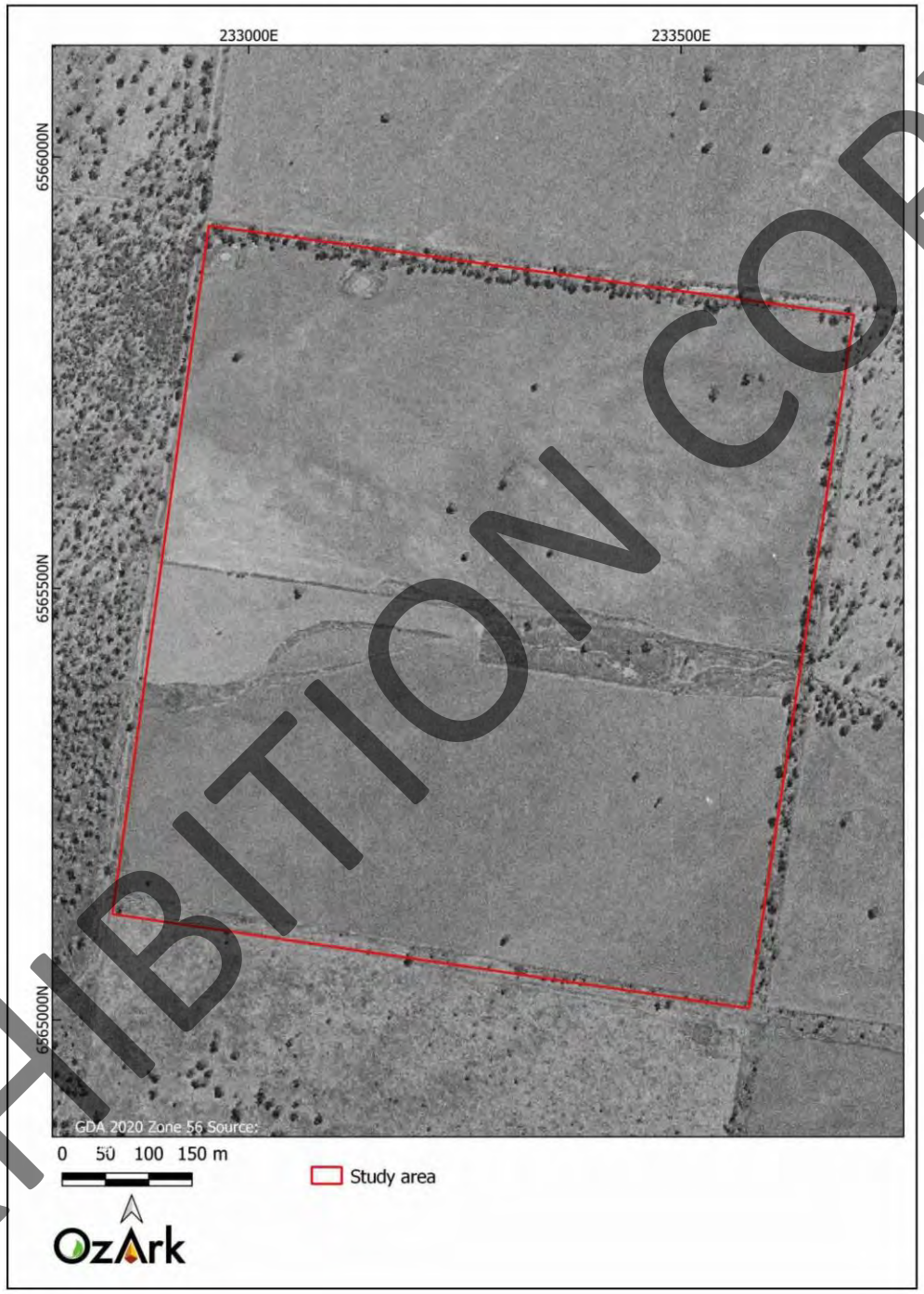
Figure 1-4: 1956 aerial with overlay of study area (source: SS 2021).



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2 CULTURAL VALUES

2.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Fundamentally, culture is living and is not static:

- Culture is acquired - we learn about culture from others in our community, including our parents
- Culture is shared - culture does not exist in a vacuum, it is shared amongst a group of people
- Culture defines core values - because we have been taught our culture and share it with our cultural group, we tend to form the same core values
- Cultures resist change but are not static - culture does and can change, but change is usually slow and gradual.

2.1.1 Connection to Country

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups.

Although in the past (and sometimes into the present) there have been conflicts between different tribal groups, these were rarely over land. Aboriginal and Torres Strait Islander people have such a strong sense of belonging to country; they have no desire to own the land of others.

Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

> *"When we say Country we might mean homeland, or tribal or clan area and in saying so we may mean something more than just a place; somewhere on the map. We are not necessarily referring to place in a geographical sense. But we are talking about the whole of the landscape, not just the places on it."*
>
> Professor Mick Dodson AM, August 2007

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2.1.2 Managing Country

Living on this land for around 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area. Aboriginal and Torres Strait Islander people don't see themselves as 'owning' land, animals, plants, or nature, but rather belonging with these things as equal parts of creation.

The rights of different groups to live in and manage certain areas of land are clear and recorded through art, stories, songs, and dance.

Deep cultural and spiritual values like totemism have also played an important part in Aboriginal and Torres Strait Islander resource management. Totemism is a belief and value system that connects human beings to other animals, plants, and aspects of nature. Groups and individuals are assigned a particular animal that they are related to and must care for. This gives them a profound sense of connection to and responsibility for the natural world.

Aboriginal and Torres Strait Islanders people have a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

Even before 1788 there were complex relationships for long distance trade between Aboriginal and Torres Strait Islander communities especially for coastal shells and stone hatchets. When people from different groups met socially to share resources, for ceremonies or to settle disputes, they brought items to exchange. Items included stones for hatchets, kangaroo skins, timber for spears, ochre or clay for paint and marine shells for decoration. The exchange of objects was not motivated by a desire for wealth accumulation but a social system to build connection between people and groups.

2.1.3 Recognising lore

In much of eastern Australia, Aboriginal communities live their lives like most Australians. However, in certain crucial areas, particularly associated with family, leadership roles and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

2.2 IDENTIFYING CULTURAL VALUES

A major aim of this assessment is to identify any cultural values within the landscape in which the proposal is located so that those values can be recognised and incorporated into the ACHAR's management recommendations.

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Any cultural values relating to the study area will be captured by the OzArk archaeologists (if such information is provided by RAPs during the survey) and included in the ACHAR.

Understanding cultural landscapes can only come from the views of a particular community, in this case, the Aboriginal community. Unless informed, OzArk will not know of the community's feelings towards the cultural landscape in which the project will be located. Should any RAPs have knowledge of cultural values regarding the proposal area that they wish to share or that may affect the survey methodology set out in **Section 5**, OzArk invites them to contact us so that these values can be recorded and/or responded to in the methodology.

2.2.1 Use of information collected

An ACHAR will be prepared for the project which articulates Aboriginal cultural values and associated conservation methods across the proposal area, as identified during the consultations. The ACHAR will be circulated to all RAPs for comment as is set out in the ACHCRs. The ACHAR will be available to Heritage NSW for their consideration of the proposal and the report will be publicly available.

2.2.2 Public / confidential information

Information will be treated in accordance with instructions received by Aboriginal informants. Information described as confidential (culturally sensitive) will not be detailed in the publicly available report. Confidential information should be made available to the proponent, its heritage consultants, and Heritage NSW so that significant cultural values can be conserved. On advice from the provider of the information, a redacted ACHAR would be made available to the wider public where any sensitive cultural information is removed.

2.2.3 Copyright

Information collected for this assessment remains the property of the Aboriginal informants and the author. Without written permission from individual informants and the author information may not be used for purposes other than those outlined above.

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3 ARCHAEOLOGICAL CONTEXT

3.1 ABORIGINAL PEOPLE OF THE STUDY AREA

The study area is in the traditional territory of the linguistic group of the Kamilaroi people (alternatively: Kamilarai, Kamilari, Kamilroi, Kamilarai, Kamu-laroi, Kaamee'larrai, Kamileroi, Koomilroi, Komleroy, Gamilaroi, & Gamilroi).

The area of the Kamilaroi is described as being rich in both flora and fauna resources, the following are listed as having been exploited for food (Balme 1986: Table 3.2; O'Rourke 1997):

- Animal resources – fish and shellfish (in the vicinity of reliable water sources), possum, koala, wallaby, bandicoot, kangaroo, rat, platypus and reptiles. Bird species included emu, turkey, waterfowl and may others. This also included grubs from the casuarinas and kurrajongs; and
- Plant resources – kurrajong seeds, growing tips and berries, honey, roots, acacia gum, bulrush, pulp, nuts (quandong), grass seeds, other native fruits and flowers and native root vegetables.

All ages and sexes within a community contributed to the procurement of food, with men generally the hunters of large game with women and children hunting smaller game. The types of foods exploited indicate an opportunistic use of the environment.

3.2 REGIONAL ARCHAEOLOGICAL CONTEXT

The Aboriginal occupation of Australia begins prior to 50,000 BP (years before present) and possibly earlier than 65,000 BP. Dates exceeding 20,000 years occur in almost all parts of Australia resulting in the expectation that most areas should have a Pleistocene (>12,000 BP) occupational signature. However, such dates remain relatively rare due to a range of factors, both behavioural and post-depositional. These factors include a possible low density of occupation in the Pleistocene period and poor preservation of archaeological materials (particularly dateable organic materials).

There are several broad scale regional archaeological studies which either cover the study area itself or are in general proximity to it. A selection of these studies has been summarised in **Table 3-1** below.

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Table 3-1: Summaries of regional archaeological assessments.

Author	Date	Summary
Haglund	1984a	Haglund (1984a) assessed and visually inspected the proposed Red Hill–Top Rocks–Trunk Road 72 coal haulage route. In this assessment, Haglund primarily discusses two previously recorded sites, an artefact scatter recorded by Thompson (1982) and a collection of 20 axe grinding grooves recorded by Haglund in 1982 (referred to as Top Rocks). Upon visual inspection Haglund (1984a) identified that the artefact scatter recorded by Thompson (1982) comprised of several low-density stone artefact sites on a dirt track within 50 m of a minor watercourse [likely ephemeral]. Haglund (1984a) also identified that the axe grinding grooves were situated on an outcrop of sandstone directly associated with a watercourse and prone to semi-frequent inundation. Additionally, the extensive archaeological deposit adjacent to the grinding groove site was situated on the upper terrace of a riverbank. Overall, no additional Aboriginal sites were recorded within this assessment. However, based on his assessment of the two previous archaeological sites, several observations can be made. These observations are as follows: - Sites have dominantly been recorded in proximity to a watercourse or drainage feature. - There may be a correlation between site density and the permanence of associated watercourses.
	1984b	Haglund (1984b) examined the proposed location for a coal loader, covering 87 hectares (ha) of cultivated / cleared land situated between the North Western Railway and Trunk Road 72, 3 km west of Gunnedah and south of the Namoi River. No Aboriginal sites or places of cultural significance were identified during the assessment despite good ground surface visibility (GSV). The lack of Aboriginal sites identified within the assessment area was attributed to the lack of landforms with identified archaeological sensitivity (i.e. watercourses, ridgelines, hillcrests, etc). It was also suggested that the area may have been a transitory space where hunting and food gathering activities may have taken place, which would not allow for the accumulated deposition of archaeological materials.
	1985	In 1985, Haglund conducted a survey of all previous studies relating to the area immediately north of Gunnedah and the Namoi River. This survey concluded that the archaeology of the area is concentrated along rivers and other permanent waterways. This concentration is a result of both prehistoric land use patterns, in which such locations arguably constituted more permanent camps, and historical land use patterns, such as agriculture, which may have disturbed and/or destroyed the archaeology present in areas away from these waterways (Haglund 1985).
	1987	Haglund returned to Gunnedah in 1986 to conduct two test excavations of sites requiring ground truthing (Haglund 1987). These sites were located on opposite sides of the Namoi River, and one was a portion of the extensive Namoi River/C.W.R. site. Artefacts were recovered at these sites, however, Haglund noted that the artefacts were largely too dispersed to be considered archaeologically significant and were situated in secondary contexts created by vehicle movement and water flows (Haglund 1987).
Appleton	2008	John Appleton (2008) conducted salvage operations at Rocglen Coal Mine, following his 2002 survey of the site of the proposed Belmont Coal Mine (now re-named). The salvage area consisted of three locations close to a creek in Tulcumba, situated 25 km north of Gunnedah. Appleton (2002) had previously noted artefacts, including a silcrete core at Site "B1", a micro-debitage scatter of eight small silcrete flakes at Site "B2", and an extended artefact scatter (over 40 artefacts consisting of three cores, with the remainder flaked pieces and flakes) at Site "B3". The salvage operation noted significant disturbance between 2002 and 2008, caused by agricultural activity or storms and slope-wash. Additional artefacts were recovered at "B1" (eight stone artefacts, no cores), at "B2" (13 stone artefacts), and at "B3" (67 artefacts, including three cores). Appleton interpreted the 'Rocglen Assemblage' as a camping area to which various groups returned over an extended period of time.

3.3 LOCAL ARCHAEOLOGICAL CONTEXT

A search of the Heritage NSW administered Aboriginal Heritage Information Management System (AHIMS) database on 15 February 2023 returned 112 results for Aboriginal sites within a 15 km radius of the study area (GDA Zone 56 Eastings: 218269 - 248269; Northings: 6550469 - 6580469) (see **Table 3-2**). **Figure 3-1** shows the location of these sites in relation to the study area and **Table 3-2** details the site types within the search area.

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Three sites returned in the AHIMS search are listed as 'restricted'. These sites are not within the study area and are discussed further within this report. Similarly, AHIMS site 19-2-0272 (Wondoba Grinding Grooves 1) is a duplicate recording of 29-1-0092 (Wondoba SF2) and is also not further discussed.

Based on the coordinates provided by AHIMS, two sites (29-1-0256 [Marshmead 3] and 29-1-0288 [Marshmead 4]) are situated within the study area and one site (29-1-0255 [Marshmead 2]) is immediately adjacent to the eastern boundary of the study area (**Figure 3-1**). However, in the accompanying site cards for 29-1-0255 (Marshmead 2) and 29-1-0256 (Marshmead 3), the figure provided shows Marshmead 2 within the study area and Marshmead 3 in the adjacent lot to the east (**Figure 3-2**). The figure also shows an additional site (Marshmead 1) located to the east (outside the study area) which does not appear to be registered on AHIMS (**Figure 3-2**).

The AHIMS data presented in **Figure 3-1** and **Table 3-2** shows the most frequently recorded site type within the search area are stone artefact sites (including artefact scatter, isolated finds, artefact scatters [quantity unspecified], open site, open camp site, open camp site with culturally modified tree [carved or scarred], artefact site [quantity unspecified] with PAD and open site with PAD) which together form 48.15% of all results. Artefact sites within the search area have dominantly been recorded within 200 – 500 m of a watercourse or drainage features across a variety of landforms (such as ridge crests, gentle lower hill slopes, riverbanks, etc). It is also noted that most of these sites were recorded within areas of moderate to high disturbance, such as along road corridors, ploughed paddocks and near residential areas. This is likely due to survey bias resulting from development driven studies rather than an accurate reflection of the distribution of these site types.

Table 3-2: AHIMS site types and frequencies

Site Type	Number	% Frequency
Modified trees (carved or scarred)	36	33.33
Artefact scatter	19	17.59
Grinding grooves	11	10.19
Isolated finds	10	9.26
Artefact site (quantity unspecified)	7	6.48
Open site	6	5.56
Open camp site	5	4.63
Open camp site with culturally modified tree (carved or scarred)	3	2.78
Burial with culturally modified tree (carved or scarred)	2	1.85
Potential archaeological deposit (PAD)	2	1.85
Aboriginal ceremony and dreaming with grinding grooves	1	0.93
Aboriginal resource and gathering	1	0.93
Artefact scatter with grinding grooves	1	0.93

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Site Type	Number	% Frequency
Artefact site (quantity unspecified) with PAD	1	0.93
Open site with PAD	1	0.93
Reinterment	1	0.93
Total	**108**	**100**

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Figure 3-1: AHIMS sites in relation to the study area.

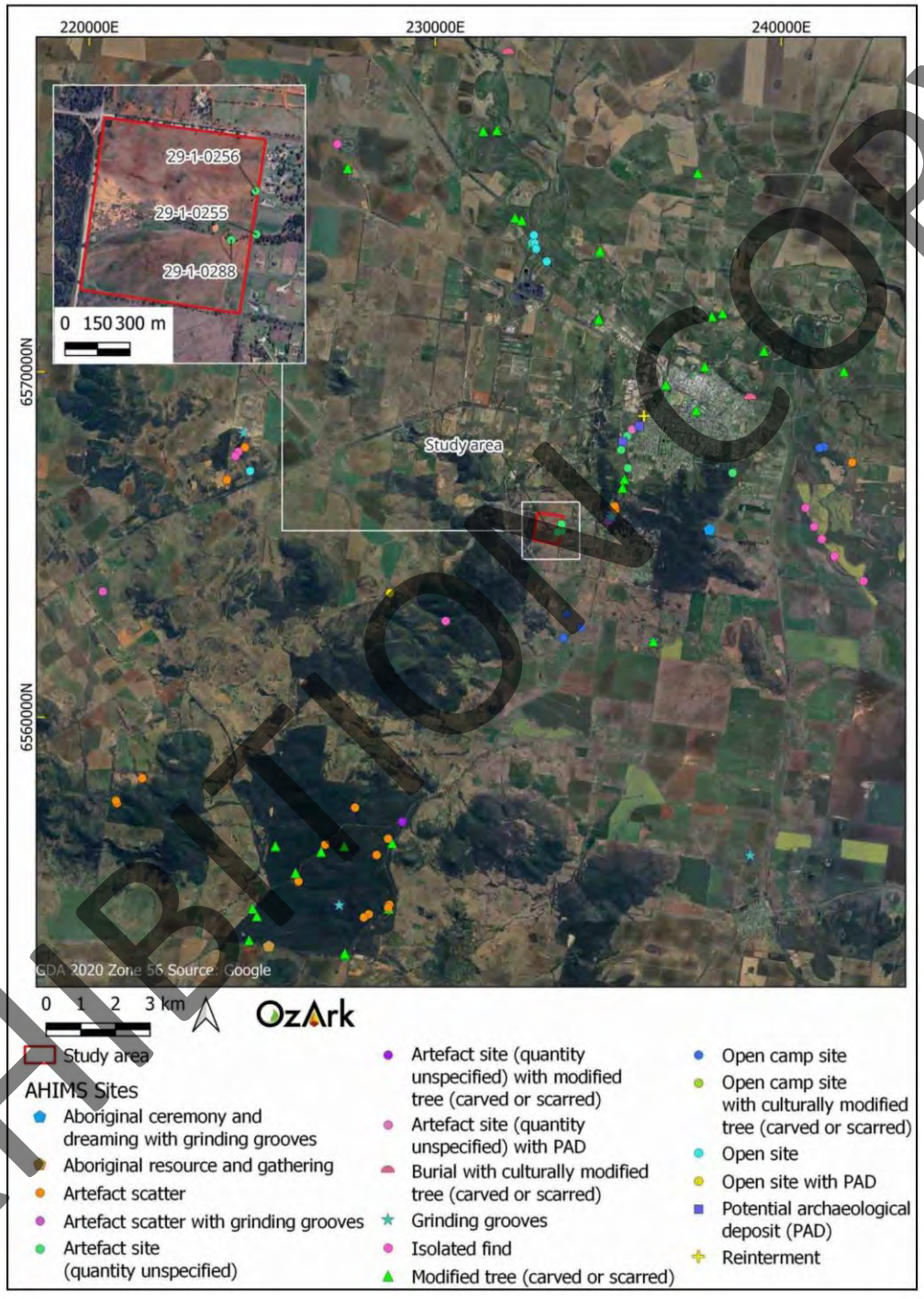

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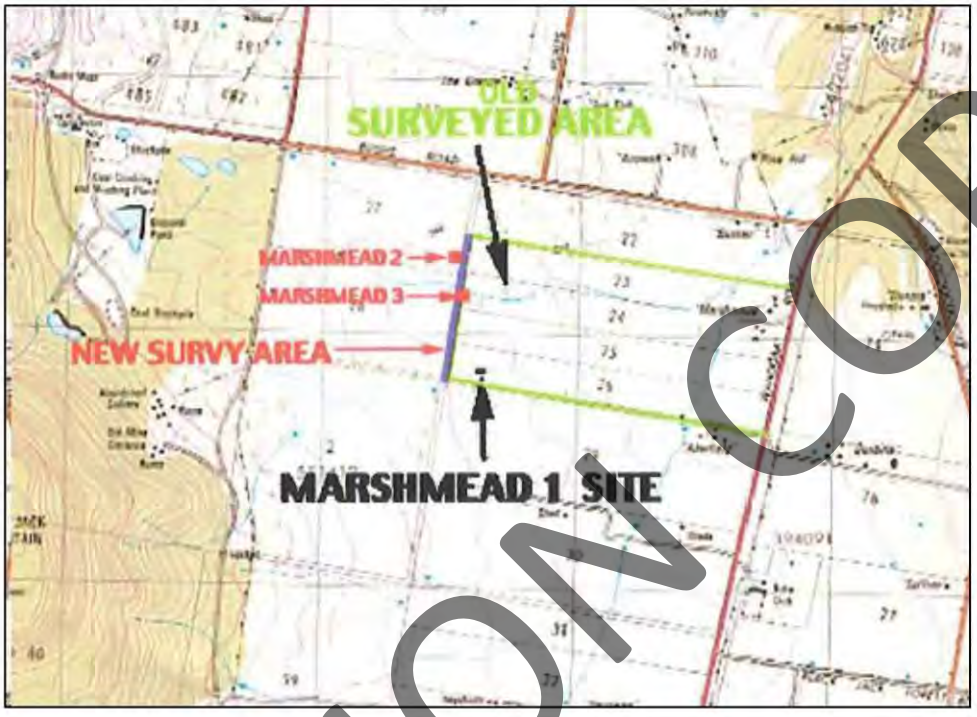
Figure 3-2: Figure provided in the site cards for 29-1-0255 (Marshmead 2) and 29-1-0256 (Marshmead 3).



3.3.1 Archaeological investigations within and near the study area

Previous archaeological investigations provide Aboriginal archaeological contexts of local relevance to the study area. A summary of nearby archaeological investigations is provided in **Table 3-3** below:

Table 3-3: Summary of local archaeological investigations near and within the study area.

Author	Date	Summary
Gorecki	1981	In 1981, the area known as 'Authorisation 138' (Mine Authorisation 138) at 'Springfield' was surveyed by Gorecki (1981). Seventeen locations with artefacts were recorded by Gorecki, approximately 5 km south of the current study area. These locations were recorded on AHIMS as three sites. The quantity of artefacts at each site varied, with some locations containing an isolated stone artefact and others containing clusters. All were found adjacent to Springfield Knob and relatively close to minor drainage features. All 17 sites recorded during the investigation comprised of stone artefact scatters and all but one were low density. The main artefact types identified comprised of flakes, scrapers, and cores. One blade and a grindstone were also recorded. The dominant raw material types comprised locally sourced chert, quartz, quartzite and silcrete. One artefact manufactured from petrified wood was also recorded. Gorecki argued that these artefacts were in secondary contexts as agriculture / pastoralism, erosion, and construction of contour banks had disturbed their original locations (Gorecki 1981). It is important to note that no artefacts were found either up slope in the surrounding hills or down slope on the plains.
Appleton	2007	Appleton (2007) surveyed Lot 2, DP848920, Lincoln St, Gunnedah in response to a project to subdivide the site into 137 residential blocks. This area is located on the southern edge of the Gunnedah township approximately 3.5 km northeast of the

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Author	Date	Summary
		study area. No artefacts were located during this assessment; however, Appleton does refer to an isolated artefact and nine grinding grooves located by himself in 2006 in the vicinity of Wandobah Road. Appleton's conclusion for his 2007 survey was that the area was most likely a transitory zone between desirable campsites. Appleton noted that Red Chief LALC considered the 2007 study area of cultural significance, as the nearby Porcupine Hill was closely associated with the legendary figure, Red Chief (Appleton 2007).
Hudson	2004	Suzanne Hudson's (2004) assessment of 'Porky's Cave' at Porcupine Hill, Gunnedah, for Red Chief LALC. The cave is approximately 5 km northeast of the study area and contained rock engravings and an ironstone cobble. Appleton refers to the cave as a 'Dreaming site' (Appleton 2007). Hudson recommended that access be restricted on cultural grounds (the cave is of ceremonial significance to the community), safety (due to lose scree), ecological grounds (fires were affecting the resident bat community), and archaeological grounds (trampling and vandalism were gradually destroying the rock engravings).
Gaynor	2011	A survey of the property 'Marshmead' adjacent to the eastern boundary of the study area was completed by Gaynor in 201.The assessed area included gently sloping land, sloping east towards Blackjack Creek and included cropped land. One stone artefact was located (assumed to be Marshmead 1 shown in **Figure 3-2**). The artefact included a mudstone retouched blade-like flake, recorded in a cultivated paddock.
Gaynor	2021	In 2021, Gaynor completed an Aboriginal heritage assessment of the current study area. Three stone artefacts were identified within 62 m of each other, manufactured from mudstone (2) and chalcedony (1). This site is registered as 29-1-0288 (Marshmead 4[). Gaynor notes that these raw materials (mudstone and chalcedony) were not locally available and that dominant raw materials within the study area consisted of quartz and chert. The results suggest that the artefacts do not originate locally and supports Appleton's conclusion that Aboriginal activity in the local region was low intensity and not indicative of long-term occupation. Furthermore, Gaynor's report notes that the artefacts are associated with the edge of an ephemeral drainage feature which traverses the study area.
OzArk	2023	In 2023, OzArk completed an Aboriginal cultural heritage assessment at 170 Bushs Lane in Gunnedah, immediately north of the current study area. Given the assessment areas proximity to the current study area, the landforms are very similar. The only major difference being that no drainage feature is present at 170 Bushs Lane. No Aboriginal sites were recorded during the survey. This was attributed to a variety of factors, including: distance from a watercourse, lack of landforms with identified archaeological potential, and lack of outcropping rock.

3.4 ARCHAEOLOGICAL CONTEXT: CONCLUSION

The archaeological investigations surrounding the study area as summarised in **Sections 3.2** and **3.3** indicate that:

- Stone artefact sites (as defined in **Section 3.3**) are the most frequent sites recorded in the area, especially in association with watercourses
- The quantity of stone artefacts present at a site is often correlated to the permanence of the nearest watercourse and resources (i.e. low-density artefacts are more likely to be recorded in association with a drainage feature while high-density artefact scatters are more likely to be recorded near a riverbank or named creek)
- Chert, silcrete, quartz and quartzite are generally the dominant raw materials in the region however the artefacts within the search area were manufactured from mudstone and chalcedony (may have been an anomaly but further investigation in the area would be required)
- Sites have been recorded across a variety of landforms, including those with moderate to high disturbance.

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4 PREDICTIVE MODEL

4.1 LANDFORM MODELLING

The topography of the study area is entirely a gentle lower hillslope, with the highest point being the southwestern-most boundary of the study area with an elevation between 360-370 m which descends towards the east (see **Figure 1-3**). Previous studies of the study area (Gaynor 2021) indicate that that two low-density artefact sites are present in the eastern portion of the study area in landforms adjacent to the ephemeral drainage feature.

Preliminary landform mapping within the study area indicates there are two main landform types (**Figure 4-1**):

- Survey unit 1: drainage lines with a 200 m buffer around them
- Survey Unit 2: gentle southwest to east slopes.

The study area and surrounding land is primarily used for agricultural purpose (cropping and grazing). The ploughing and cropping process within the study area generally disturbs the upper 20 centimetres (cm) of topsoils, displacing surface and upper-subsurface archaeological deposits. Given the soil type's susceptibility to erosive processes, ploughing activities have likely resulted in accelerated gully erosion and soil loss from water wash. Furthermore, erosional process within the study area would be exacerbated by the types of landforms present which have been largely cleared of vegetation.

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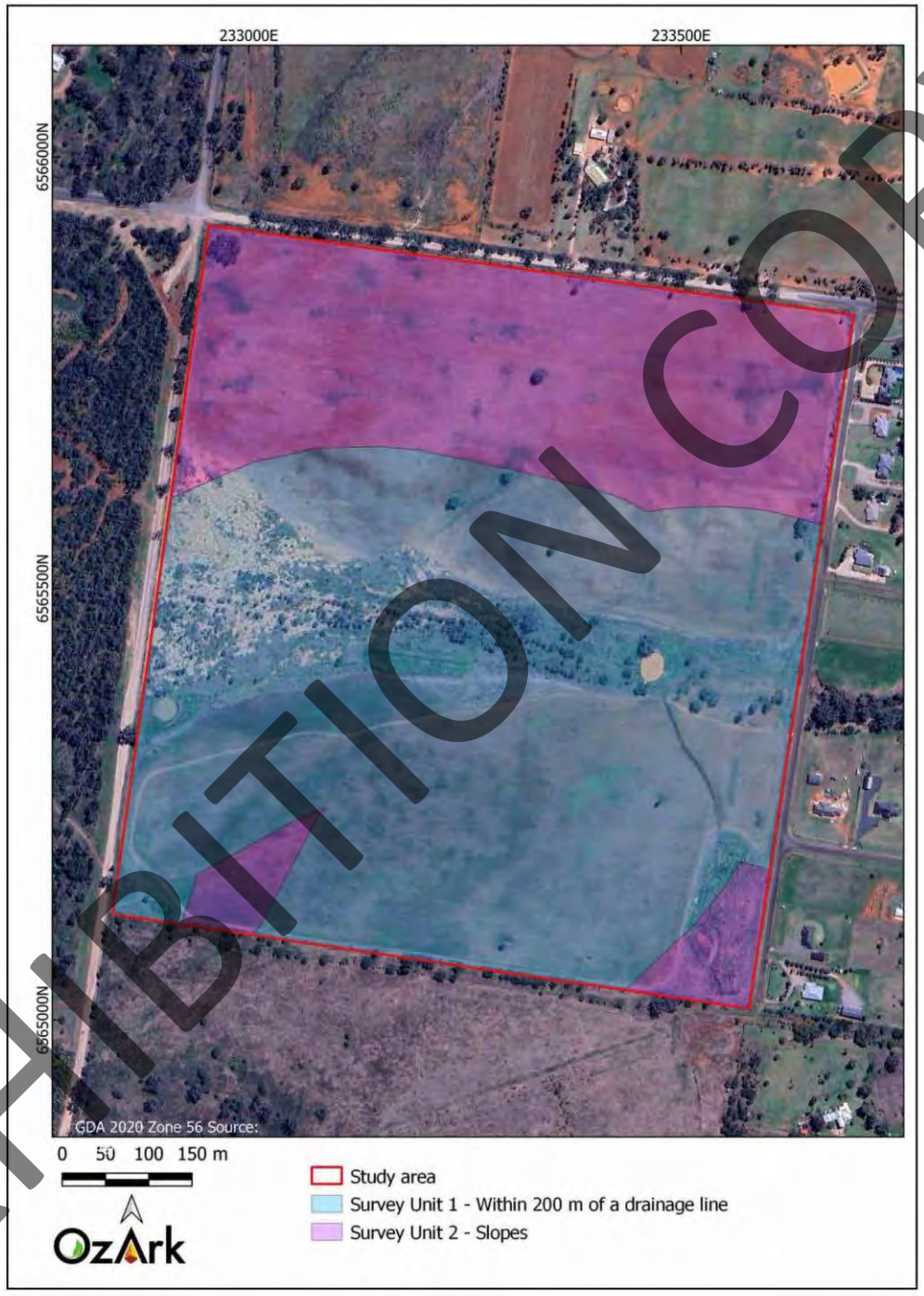
Figure 4-1: Landforms within the study area.



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4.2 PREDICTIVE MODEL FOR THE STUDY AREA

Across Australia, numerous archaeological studies in widely varying environmental zones and contexts have demonstrated a high correlation between the permanence of a water source and the permanence and/or complexity of Aboriginal occupation. Site location is also affected by the availability of and/or accessibility to a range of other natural resources including: plant and animal foods; stone and ochre resources and rock shelters; as well as by their general proximity to other sites/places of cultural/mythological significance. Consequently, sites tend to be found along permanent and ephemeral water sources, along access or trade routes or in areas that have good flora/fauna resources and appropriate shelter.

In formulating a predictive model for Aboriginal archaeological site location within any landscape it is also necessary to consider post-depositional influences on Aboriginal material culture. In all but the best preservation conditions very little of the organic material culture remains of ancestral Aboriginal communities survives to the present. Generally, it is the more durable materials such as stone artefacts, stone hearths, shell, and some bones that remain preserved in the current landscape. Even these however may not be found in their original depositional context since these may be subject to either (a) the effects of wind and water erosion/transport—both over short- and long-time scales—or (b) the historical impacts associated with the introduction of colonial farming practices. Scarred trees, by their nature, may survive for up to several hundred years but rarely beyond.

4.2.1 Site types in the region of the study area

The site types listed in **Table 4-1** are present in the region of the study area. The likelihood of these sites being present in the study area is discussed in **Section 4.2.3**.

Table 4-1: Site types recorded in the region of the study area.

Site type	Site description
Isolated finds	May be indicative of random loss or deliberate discard of a single artefact, the remnant of a now dispersed and disturbed artefact scatter, or an otherwise obscured or subsurface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
Open artefact scatters	Artefact scatters are defined as two or more artefacts, not located within a rock shelter, and located no more than 50 m away from any other constituent artefact. This site type may occur almost anywhere that Aboriginal people have travelled and may be associated with hunting and gathering activities, short- or long-term camps, and the manufacture and maintenance of stone tools. Artefact scatters typically consist of surface scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools but may also include other artefactual rock types such as hearth and anvil stones. Less commonly, artefact scatters may include archaeological stratigraphic features such as hearths and artefact concentrations which relate to activity areas. Artefact density can vary considerably between and across individual sites. Small ground exposures revealing low density scatters may be indicative of a background scatter rather than a spatially or temporally distinct artefact assemblage. These sites are classed as 'open', that is, occurring on the land surface unprotected by rock overhangs, and are sometimes referred to as 'open camp sites'. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas fringing watercourses or wetlands. Larger sites may be expected in association with permanent water sources.

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Site type	Site description
	Topographies which afford effective through-access across, and relative to, the surrounding landscape, such as the open basal valley slopes and the valleys of creeks, will tend to contain more and larger sites, mostly camp sites evidenced by open artefact scatters.
Culturally modified trees	Aboriginal scarred trees contain evidence of the removal of bark (and sometimes wood) in the past by Aboriginal people, in the form of a scar. Bark was removed from trees for a wide range of reasons. It was a raw material used in the manufacture of various tools, vessels, and commodities such as string, water containers, roofing for shelters, shields and canoes. Bark was also removed because of gathering food, such as collecting wood boring grubs or creating footholds to climb a tree for possum hunting. Due to the multiplicity of uses and the continuous process of occlusion (or healing) following removal, it is difficult to accurately determine the intended purpose for any example of bark removal. Scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical because some forms of natural trauma and European bark extraction create similar scars. Many remaining scarred trees probably date to the historic period when bark was removed by Aboriginal people for both their own purposes and for roofing on early European houses. Consequently, the distinction between European and Aboriginal scarred trees may not be clear.
Grinding grooves	Grinding grooves are the remnants of ground edge hatchet manufacture and sometimes from food preparation. The site is most likely to occur on flat outcrops of coarse-grained sandstone in the vicinity of water sources, however, grinding grooves have also been recorded on fine-grained granite and quartzite outcrops.
Bora/Ceremonial sites	Places which have ceremonial or spiritual connections. Ceremonial sites may comprise of natural landscapes or have archaeological material. Bora sites are ceremonial sites which consist of a cleared area and earthen rings.

4.2.2 Landform modelling of archaeological potential

The archaeological studies undertaken within the immediate vicinity of the study area provide information to obtain a sound understanding of the nature and distribution of archaeological sites within the area. Although there is some conjecture about the relationship between stream order, site numbers and densities, the general pattern is that most sites are present close to watercourses (Haglund 1984a, 1984b, 1982; Gaynor 2011 and 2021). As this study area is intersected by an ephemeral drainage feature where artefacts have already been identified, there is moderate potential for Aboriginal sites to be present. It is noted however that the study area has already been surveyed which resulted in a low-density scatter being recorded and the likelihood of substantial Aboriginal sites being recorded is low.

Crucial for the preservation of archaeological deposits is the history of past land use in an area. Historically, the study area has been mostly subjected to low-intensity agricultural operations (ploughing) and vegetation clearing which has likely resulted in disturbance to the topsoils and any surface archaeological deposits within those topsoils. The moderate to high degree of disturbance combined with the soils susceptibility to erosion when exposed to water or disruption would suggest that subsurface archaeological deposits, if present, are likely in a secondary context as well.

4.2.3 Conclusion

Based on knowledge of the environmental contexts of the study area and a desktop review of the known local and regional archaeological record, the following predictions are made concerning the probability of landforms within the study area to contain Aboriginal objects (**Table 4-2**), and what types of sites may be present within the study area (**Table 4-3**).

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Table 4-2: Likelihood of landforms within the study area to contain Aboriginal objects.

Survey Unit	Landform type	Likelihood to contain Aboriginal objects
1	Within 200 m of a drainage line	Previous investigations by Gaynor (2021) indicates that two sites are present within 200 m of the ephemeral drainage feature with the study area and an additional site has been previously recorded along the same drainage feature immediately east of the study area. Therefore, this landform contains moderate potential for archaeological potential.
2	Gentle slopes	Slopes are a degrading landform, especially in the study area where vegetation removal has accelerated soil loss. Given the slopes in the study area consist of gentle gradients they are still suitable for occupation and often favoured as they are more elevated, however, when distant to water they are less likely to have been subject to long-term repeated occupied.

Table 4-3: Likelihood of certain site types being present in the study area.

Site type	Likelihood of being present in the study area
Isolated finds	As isolated finds can occur anywhere, particularly within disturbed contexts, it is predicted that this site type could be recorded within the study area.
Open artefact scatters	Stone artefact distributions of variable artefact densities are some of the most common Aboriginal sites found within the region. A general correlation between landform and the nature of the evidence of past Aboriginal occupation is evident. As most of the study area consists of gentle slopes and an ephemeral drainage line, low-density scatters with a low complexity of tool types may occur. It is noted that the study area already has recorded two low-density artefact sites (29-1-0288 and 29-1-0256), and this raises the possibility that the area contains further sites of this type.
Culturally modified trees	Due to the near-total clearance of trees from within the study area, this site type is predicted to be very rare. It is also noted that this study area has been previously assessed and no culturally modified trees were identified at the time of investigation.
Grinding grooves	While this site type has been recorded in the surrounding area, they are not predicted to be present within the study area as geological mapping does not suggest sandstone is present and the area has been previously assessed.
Bora/Ceremonial sites	This site type does not necessarily follow landform predictability and are, overall, a rare site type with a low likelihood of being present and remaining extant. These sites are generally identified through consultation with the RAPs.

4.3 RESEARCH QUESTIONS

Several research questions can meaningfully be applied to the investigation of the study area. These research questions include:

- Is the area a transitory space to move from camp to camp or was it a resource gathering location?
- Based on Gaynor's (2021) observation of imported raw material, is there any evidence within the study area of it being used as a trade route?
- What tasks were Aboriginal people undertaking at the sites?
- Do the findings within the study area (if any) accord with the regional archaeological context examined in **Section 3.2**?
- Do the survey results support the predictive model set out in **Section 4.2.3**?

The survey methodology set out in **Section 5** will be framed to help answer these questions; should sites of sufficient significance be encountered. However, based on the results of previous assessments and past disturbances, it not expected that the land within the study area will contain

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sites of sufficient significance to help answer those research questions that require a robust data set.

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5 SURVEY METHODOLOGY

5.1 ASSESSMENT APPROACH

The Aboriginal cultural heritage assessment of the study area will follow the *Code of Practice for the Investigation of Aboriginal Objects in New South Wales* (Code of Practice; DECCW 2010). The field inspection will follow the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (The Guide, OEH 2011).

Survey for Aboriginal cultural heritage values will concentrate on the entire study area as the entire area has potential to be impacted by a future subdivision.

5.2 SURVEY AIMS

The aim of any archaeological survey is not to locate each artefact in a landscape but to undertake investigations so that the archaeological potential and archaeological characteristics of all landforms within the study area are known. Therefore, the aims of the survey will be to:

- Inspect all landform types in the study area so that their archaeological potential can be determined
- Inspect the locations of the previously recorded Aboriginal sites and assess their current condition
- Evaluate whether the predictive model set out in **Section 4.2** is valid
- Determine if the research questions set out in **Section 4.2.1** can be answered
- Determine if any landforms of the study area require test excavation to understand the archaeological potential at a particular location
- Undertake sufficient assessment to satisfy Sections 2.2, 2.4, 2.5, 2.6, and 2.7 in the Guide
- Collect sufficient data so that the results can be presented in an ACHAR as set out in Section 3 in the Guide
- Undertake survey and record keeping satisfying Requirements 1–13 of the Code of Practice.

5.3 SURVEY METHODOLOGY

Standard archaeological field survey and recording methods will be employed in this assessment (Burke & Smith 2004) and will follow the Code of Practice.

During the field assessment, greater survey effort will be expended on landforms within Survey Unit 1 (drainages) deemed to have greater Aboriginal archaeological potential. 'Full pedestrian survey' refers to systematic transects walked by surveyors spaced approximately 20 m apart throughout the landform or area being surveyed. 'Targeted pedestrian survey' refers to transects walked by surveyors spaced approximately 20 m apart that will not cover the entire area but

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instead will focus on understanding the archaeological potential of representative landforms within these areas.

As such, the field assessment will include:

- Full pedestrian survey across Survey Unit 1 (**Figure 4-1**)
- Targeted pedestrian survey areas across Survey Unit 2 (**Figure 4-1**)
- All trees deemed to be of sufficient maturity to contain cultural modification will be inspected
- Some areas may not be physically surveyed if the RAPs and OzArk staff agree they are too disturbed or possess a very low likelihood of sites.

In the field, OzArk staff will identify, record and evaluate physical (i.e., archaeological) evidence. Site recording will capture all the information required to complete current AHIMS site recording forms (e.g., site location, site boundary, site plan, representative photographs, artefact recording and feature recording). A RAP will participate in the survey, identifying Aboriginal objects, determining the cultural significance of Aboriginal objects and identifying cultural places or non-physical site types within the study area. OzArk staff understand that cultural knowledge may not be provided in some instances due to cultural sensitivities (e.g., men's and/or women's places). Under these circumstances, to assess the potential impacts, OzArk staff will need to be told, only in general terms, why a particular place is important, and what the significance of the impact will be. OzArk staff will liaise with RAPs on a case-by-case basis to determine how to record the location in a culturally sensitive manner.

5.4 TEST EXCAVATION

It is possible that the survey may identify landforms where test excavation under the Code of Practice (Requirements 14–17) is required. Should such landforms be identified during the survey, the test excavation methodology will be prepared as a separate document that will be circulated to all RAPs for review and comment.

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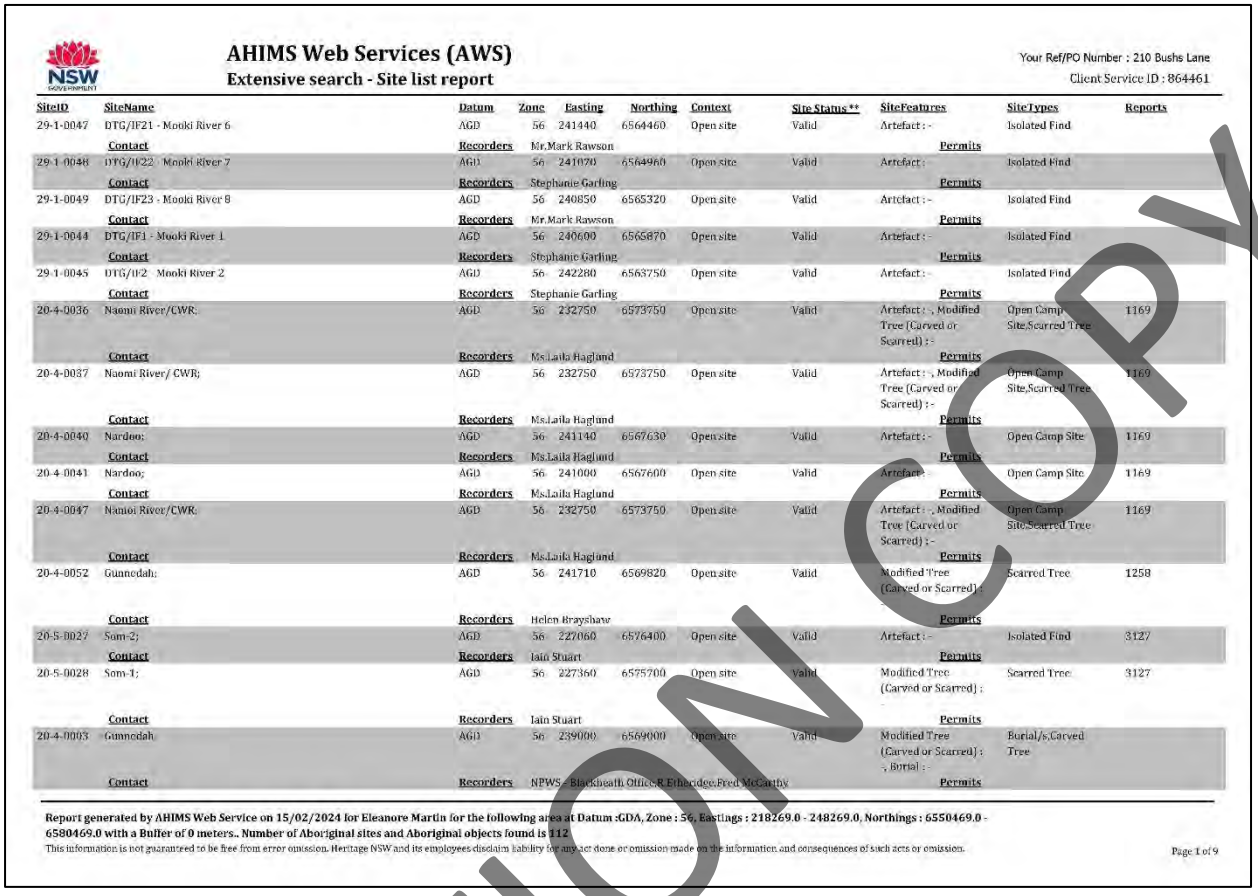
APPENDIX 3: AHIMS SEARCH



AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

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29-1-0047	DTG/IF21 - Mooki River 6	AGD	56	241440	6564460	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Mr.Mark Rawson					Permits		
29-1-0048	DTG/IF22 - Mooki River 7	AGD	56	241070	6564960	Open site	Valid	Artefact :	Isolated Find	
	Contact	Recorders	Stephanie Garling					Permits		
29-1-0049	DTG/IF23 - Mooki River 8	AGD	56	240850	6565320	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Mr.Mark Rawson					Permits		
29-1-0044	DTG/IF1 - Mooki River 1	AGD	56	240600	6565870	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Stephanie Garling					Permits		
29-1-0045	DTG/IF2 - Mooki River 2	AGD	56	242280	6563750	Open site	Valid	Artefact : -	Isolated Find	
	Contact	Recorders	Stephanie Garling					Permits		
20-4-0036	Naomi River/CWR;	AGD	56	232750	6573750	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	1169
	Contact	Recorders	Ms.Laila Haglund					Permits		
20-4-0037	Naomi River/ CWR;	AGD	56	232750	6573750	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	1169
	Contact	Recorders	Ms.Laila Haglund					Permits		
20-4-0040	Nardoo;	AGD	56	241140	6567630	Open site	Valid	Artefact : -	Open Camp Site	1169
	Contact	Recorders	Ms.Laila Haglund					Permits		
20-4-0041	Nardoo;	AGD	56	241000	6567600	Open site	Valid	Artefact : -	Open Camp Site	1169
	Contact	Recorders	Ms.Laila Haglund					Permits		
20-4-0047	Namoi River/CWR;	AGD	56	232750	6573750	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -	Open Camp Site,Scarred Tree	1169
	Contact	Recorders	Ms.Laila Haglund					Permits		
20-4-0052	Gunnedah;	AGD	56	241710	6569820	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	1258
	Contact	Recorders	Helen Brayshaw					Permits		
20-5-0027	Som-2;	AGD	56	227060	6576400	Open site	Valid	Artefact : -	Isolated Find	3127
	Contact	Recorders	Iain Stuart					Permits		
20-5-0028	Som-1;	AGD	56	227360	6575700	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	3127
	Contact	Recorders	Iain Stuart					Permits		
20-4-0003	Gunnedah	AGD	56	239000	6569000	Open site	Valid	Modified Tree (Carved or Scarred) : -, Burial : -	Burial/s,Carved Tree	
	Contact	Recorders	NPWS - Blackheath Office,R Etheridge,Fred McCarthy					Permits		

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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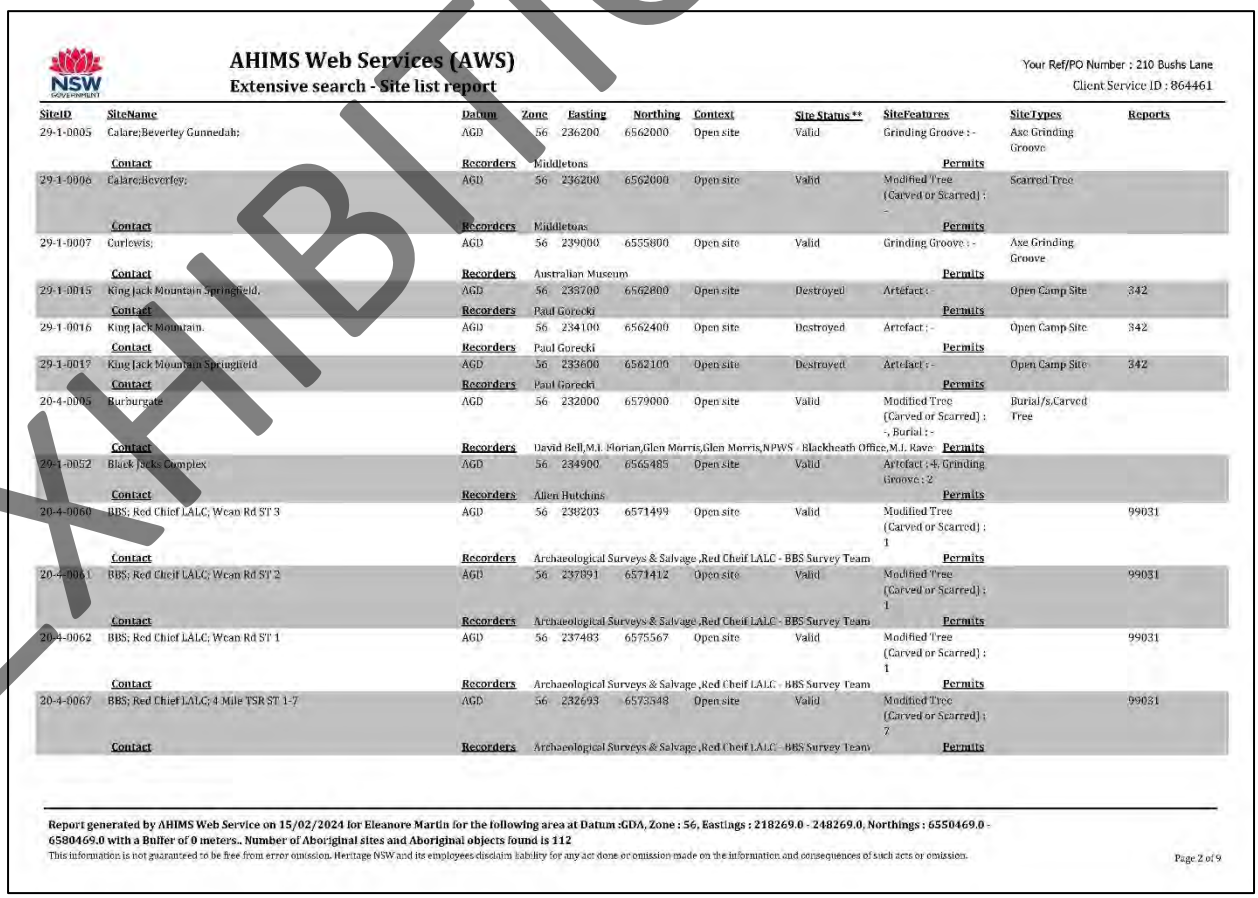

AHIMS Web Services (AWS)
Extensive search - Site list report

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Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Stams **	SiteFeatures	SiteTypes	Reports
29-1-0005	Calare;Beverley Gunnedah;	AGD	56	236200	6562000	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Middletons					Permits		
29-1-0006	Calare;Beverley;	AGD	56	236200	6562000	Open site	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	
	Contact	Recorders	Middletons					Permits		
29-1-0007	Curlewis;	AGD	56	239000	6555800	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	Recorders	Australian Museum					Permits		
29-1-0015	King Jack Mountain Springfield;	AGD	56	233700	6562800	Open site	Destroyed	Artefact :	Open Camp Site	342
	Contact	Recorders	Paul Gorecki					Permits		
29-1-0016	King Jack Mountain;	AGD	56	234100	6562400	Open site	Destroyed	Artefact : -	Open Camp Site	342
	Contact	Recorders	Paul Gorecki					Permits		
29-1-0017	King Jack Mountain Springfield	AGD	56	233600	6562100	Open site	Destroyed	Artefact : -	Open Camp Site	342
	Contact	Recorders	Paul Gorecki					Permits		
20-4-0005	Burburgate	AGD	56	232000	6579000	Open site	Valid	Modified Tree (Carved or Scarred) : -, Burial : -	Burial/s,Carved Tree	
	Contact	Recorders	David Bell,M.L Horian,Glen Morris,Glen Morris,NPWS - Blackheath Office,M.L Rave					Permits		
29-1-0052	Black Jacks Complex	AGD	56	234900	6565485	Open site	Valid	Artefact : 4, Grinding Groove : 2		
	Contact	Recorders	Allen Hutchins					Permits		
20-4-0060	BBS; Red Chief LALC; Wean Rd ST 3	AGD	56	238203	6571499	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
20-4-0061	BBS; Red Cheif LALC; Wean Rd ST 2	AGD	56	237891	6571412	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
20-4-0062	BBS; Red Chief LALC; Wean Rd ST 1	AGD	56	237483	6575567	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
20-4-0067	BBS; Red Chief LALC; 4 Mile TSR ST 1-7	AGD	56	232693	6573548	Open site	Valid	Modified Tree (Carved or Scarred) : 7		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		

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Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

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	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
29-1-0092	BBS; Red Chief LALC; Wondaba SF 2, duplicate of 29-02-0272	AGD	56	227119	6554359	Open site	Valid	Grinding Groove : 10		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
29-1-0093	BBS; Red Chief LALC; Wondoba SF 3	AGD	56	228938	6556779	Open site	Valid	Artefact : -, Modified Tree (Carved or Scarred) : -		99031
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20-4-0083	BBS; Red Chief LALC; Bluevale Rd ST 1	AGD	56	234645	6573276	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
20-4-0084	BBS; Red Chief LALC; 4 Mile TSR (West Paddock) ST 2	AGD	56	232200	6574270	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
20-4-0085	BBS; Red Chief LALC; 4 Mile TSR (West Paddock) ST 1	AGD	56	232396	6574191	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
20-4-0086	BBS; Red Chief LALC; Bluevale Rd ST 2	AGD	56	234658	6573320	Open site	Valid	Modified Tree (Carved or Scarred) : 1		99031
	Contact	Recorders	Archaeological Surveys & Salvage ,Red Cheif LALC - BBS Survey Team					Permits		
29-1-0094	Curlewis Common	GDA	56	242011	6552084	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact T Russell	Recorders	janine koppel					Permits		
29-1-0095	Porcupine Hill Sites	AGD	56	237823	6565225	Open site	Valid	Aboriginal Ceremony and Dreaming : -, Grinding Groove : -		
	Contact T Russell	Recorders	Ms.Suzanne Hudson					Permits		
17-1-0049	Sunnyside AS2	GDA	56	224497	6567811	Open site	Valid	Artefact : 2		
	Contact	Recorders	Mr.John Appleton,Doctor Matthew Whincop,Doctor Matthew Whincop,Whincop Ar					Permits		
29-1-0098	Wandabah 1	AGD	56	235016	6565704	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0099	Wandobah 2	AGD	56	235007	6565704	Open site	Valid	Grinding Groove : 5		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0104	Wondobah 7	AGD	56	235006	6565608	Open site	Valid	Grinding Groove : 1		

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0105	Wondobah 8	AGD	56	235068	6565772	Open site	Valid	Artefact : 50		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0106	wondobah 9	AGD	56	235099	6565818	Open site	Valid	Artefact : 5		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0107	Wondobah 10	AGD	56	235077	6565912	Open site	Valid	Artefact : 50		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0108	Wondobah 11	AGD	56	235461	6567018	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0109	Wondobah 12	AGD	56	235362	6566699	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0110	Wondobah 13	AGD	56	235308	6566448	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr.John Shipp					Permits		
20-4-0163	Cushions Old Tamworth Rd 1	AGD	56	239397	6570411	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Mr.John Shipp					Permits		
20-4-0164	Restriction applied. Please contact ahims@environment.nsw.gov.au					Open site	Valid			
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0100	Wandobah 3	AGD	56	234950	6565608	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0101	wondobah 4	AGD	56	234950	6565602	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0102	wondobah 5	AGD	56	234950	6565602	Open site	Valid	Grinding Groove : 3		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0103	Wondobah 6	AGD	56	235006	6565608	Open site	Valid	Grinding Groove : 1		
	Contact	Recorders	Mr.John Shipp					Permits		
29-1-0131	Wondoba Artefact 9	AGD	56	225938	6555052	Open site	Valid	Artefact : 22		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0111	Wondoba Scar Tree 1	AGD	56	224737	6554048	Open site	Valid	Modified Tree (Carved or Scarred) : 2		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Stams **	SiteFeatures	SiteTypes	Reports
29-1-0112	Wondoba Scar Tree 2	AGD	56	227298	6552922	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0113	Wondoba Scar Tree 3	AGD	56	227261	6552958	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Trent Colley					Permits		
29-1-0114	Wondoba Scar tree 4	AGD	56	227279	6552969	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Leonard Talbott					Permits		
29-1-0115	Wondoba Scar tree 5	AGD	56	224510	6553350	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Trent Colley					Permits		
29-1-0116	Wondoba Scar tree 6	AGD	56	225112	6553147	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Leonard Talbott,Mr.Peter Beale					Permits		
29-1-0117	Wondoba Scar tree 7	AGD	56	225084	6553162	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0118	Wondoba Scar tree 8	AGD	56	225854	6555301	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0119	Wondoba Scar tree 9	AGD	56	224609	6554266	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0120	Wondoba Scar tree 10	AGD	56	226593	6555911	Open site	Valid	Modified Tree (Carved or Scarred) : 2		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0121	Wondoba Scar tree 11	AGD	56	228550	6554268	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact Searle	Recorders	Mr.Trent Colley					Permits		
29-1-0122	Wondoba Resource 1	AGD	56	225080	6553165	Open site	Valid	Aboriginal Resource and Gathering : 10		

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Stams **	SiteFeatures	SiteTypes	Reports
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0123	Wondoba Artefact 1	AGD	56	227975	6554102	Open site	Valid	Artefact : 23		
	Contact Searle	Recorders	Mr.Leonard Talbott					Permits		
29-1-0124	Wondoba Artefact 2	AGD	56	227829	6554000	Open site	Valid	Artefact : 7		
	Contact Searle	Recorders	Mr.Trent Colley					Permits		
29-1-0125	Wondoba Artefact 3	AGD	56	228563	6554374	Open site	Valid	Artefact : 14		
	Contact Searle	Recorders	Mr.Leonard Talbott					Permits		
29-1-0126	Wondoba Artefact 4	AGD	56	228533	6554287	Open site	Valid	Artefact : 14		
	Contact Searle	Recorders	Mr.Leonard Talbott					Permits		
29-1-0127	Wondoba Artefact 5	AGD	56	226712	6556115	Open site	Valid	Artefact : 14		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0128	Wondoba Artefact 6	AGD	56	228528	6556286	Open site	Valid	Artefact : 15		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0129	Wondoba Artefact 7	AGD	56	228200	6555816	Open site	Valid	Artefact : 11		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-1-0130	Wondoba Artefact 8	AGD	56	228200	6555816	Open site	Valid	Artefact : 8		
	Contact Searle	Recorders	Mr.Peter Beale					Permits		
29-2-0271	Wondoba North Artefact 1	GDA	56	227682	6557379	Open site	Valid	Artefact : 14		
	Contact	Recorders	Ms.Daphne Cubby,Miss.Lucy Blackam					Permits		
29-2-0272	Wondoba Grinding Grooves 1 - Duplicate of 29-1-0092	AGD	56	227119	6554359	Open site	Valid	Grinding Groove : 3		
	Contact	Recorders	Ms.Daphne Cubby					Permits		
29-2-0273	Wondoba North Scar Tree 1	AGD	56	225272	6556075	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Ms.Daphne Cubby					Permits		
29-2-0274	Wondoba North Scar Tree 2	AGD	56	227263	6556075	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Ms.Daphne Cubby					Permits		
29-1-0138	GDRF-IF1	AGD	56	230196	6562591	Open site	Valid	Artefact : 1		101309
	Contact	Recorders	Mr.Phillip Cameron					Permits		
29-1-0139	GDRF-OS1 with PAD	AGD	56	228503	6563399	Open site	Valid	Artefact : 2		101309
	Contact	Recorders	Mr.Phillip Cameron					Permits		
29-1-0153	MOOKI RIVER ARTEFACT SCATTER 1	GDA	56	242056	6567372	Open site	Valid	Artefact : 8		
	Contact	Recorders	Mr.Kirwan Williams					Permits		
29-4-0381	NR-OS-001	GDA	56	233225	6573191	Open site	Valid	Artefact : 1		
	Contact	Recorders	Kayandel Archaeological Services,Mr.Lance Syme					Permits		

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
20-4-0382	NR-OS-004	GDA	56	232807	6573729	Open site	Valid	Artefact : 1		
	Contact	Recorders	Kayandel Archaeological Services,Ms.Caroline Hubschmann					Permits		
20-4-0383	NR-OS-006	GDA	56	232854	6573952	Open site	Valid	Artefact : 1		
	Contact	Recorders	Kayandel Archaeological Services,Ms.Caroline Hubschmann					Permits		
20-4-0384	NR-OS-003	GDA	56	232874	6573717	Open site	Valid	Artefact : 1		
	Contact	Recorders	Kayandel Archaeological Services,Mr.Lance Syme					Permits		
20-4-0385	NR-OS-002	GDA	56	232919	6573555	Open site	Valid	Artefact : 1		
	Contact	Recorders	Kayandel Archaeological Services,Mr.Tom Knight					Permits		
20-4-0541	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact	Recorders	Ms.Jane Delaney-John					Permits		
20-4-0542	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact	Recorders	Ms.Jane Delaney-John					Permits		
20-4-0546	Goohli Road Mullaley Nsw	GDA	56	218432	6573784	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Ms.Jane Delaney-John					Permits		
20-4-0539	White Gum Scarred Shield Tree	GDA	56	237795	6570150	Open site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Ms.Jane Delaney-John					Permits		
29-1-0255	Marshmead2	AGD	56	233550	6565188	Open site	Valid	Artefact : -		
	Contact Ms.Tammy Bush	Recorders	Mr.Patrick Gaynor					Permits		
29-1-0256	Marshmead3	AGD	56	233547	6565389	Open site	Valid	Artefact : -		
	Contact Ms.Tammy Bush	Recorders	Mr.Patrick Gaynor					Permits		
20-4-0538	Torrens Road ST2	GDA	56	234731	6571520	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact Ms.Tammy Bush	Recorders	Mr.Patrick Gaynor					Permits		
20-4-0727	BJC01	GDA	56	235374	6567734	Open site	Valid	Artefact : 1		
	Contact	Recorders	Mr.Leigh Bate,Apex Archaeology					Permits		
20-4-0728	BJC02	GDA	56	235556	6568142	Open site	Destroyed	Artefact : 1		103767
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Leigh Bate,Apex Arch					Permits	4091	
20-4-0729	BJC03	GDA	56	235690	6568321	Open site	Destroyed	Potential Archaeological Deposit (PAD) : -, Artefact : 1		103767
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Leigh Bate,Apex Arch					Permits	4091	

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
20-4-0825	BJC02 reinterment	GDA	56	236036	6568717	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Mr.Thomas Dooley					Permits		
20-4-0813	Sunnyside GG1	GDA	56	224454	6568219	Open site	Valid	Grinding Groove : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
20-4-0814	Sunnyside IA1	GDA	56	224311	6567683	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
20-4-0815	Sunnyside IA2	GDA	56	224223	6567358	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
29-1-0258	Mt Somner AS1	GDA	56	220795	6557509	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
29-1-0259	Mt Somner AS2	GDA	56	220769	6557577	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
29-1-0260	Mt Somner AS3	GDA	56	221533	6558230	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
20-4-0977	Sunnyside OS1	GDA	56	224649	6567125	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
16-4-0051	Blackjack Creek PAD 2	GDA	56	235097	6568429	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,OzArk Environmental an					Permits		
20-4-0990	Blackjack Creek PAD 1	GDA	56	235425	6567974	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Stephanie Rusden					Permits		
29-1-0289	Sunnyside AS3	GDA	56	223976	6566869	Open site	Valid	Artefact : -		
	Contact	Recorders	Doctor.Matthew Whincop,Whincop Archaeology Pty Ltd					Permits		
20-4-1015	Waterford Coolamon tree	GDA	56	231784	6576993	Closed site	Valid	Modified Tree (Carved or Scarred) :		
	Contact	Recorders	Mr.Wade Natty,Yawirlawirl Murri Ganuur Descendant Aboriginal Corporation					Permits		
20-4-1016	Waterford canoe tree 1	GDA	56	231389	6576966	Closed site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Wade Natty,Yawirlawirl Murri Ganuur Descendant Aboriginal Corporation					Permits		
20-4-0999	Mary Orr Canoe Tree	GDA	56	236668	6569622	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr.Wade Natty,Yawirlawirl Murri Ganuur Descendant Aboriginal Corporation					Permits		
29-1-0288	Marshmead 4	GDA	56	233540	6565352	Open site	Valid	Artefact : -		104777

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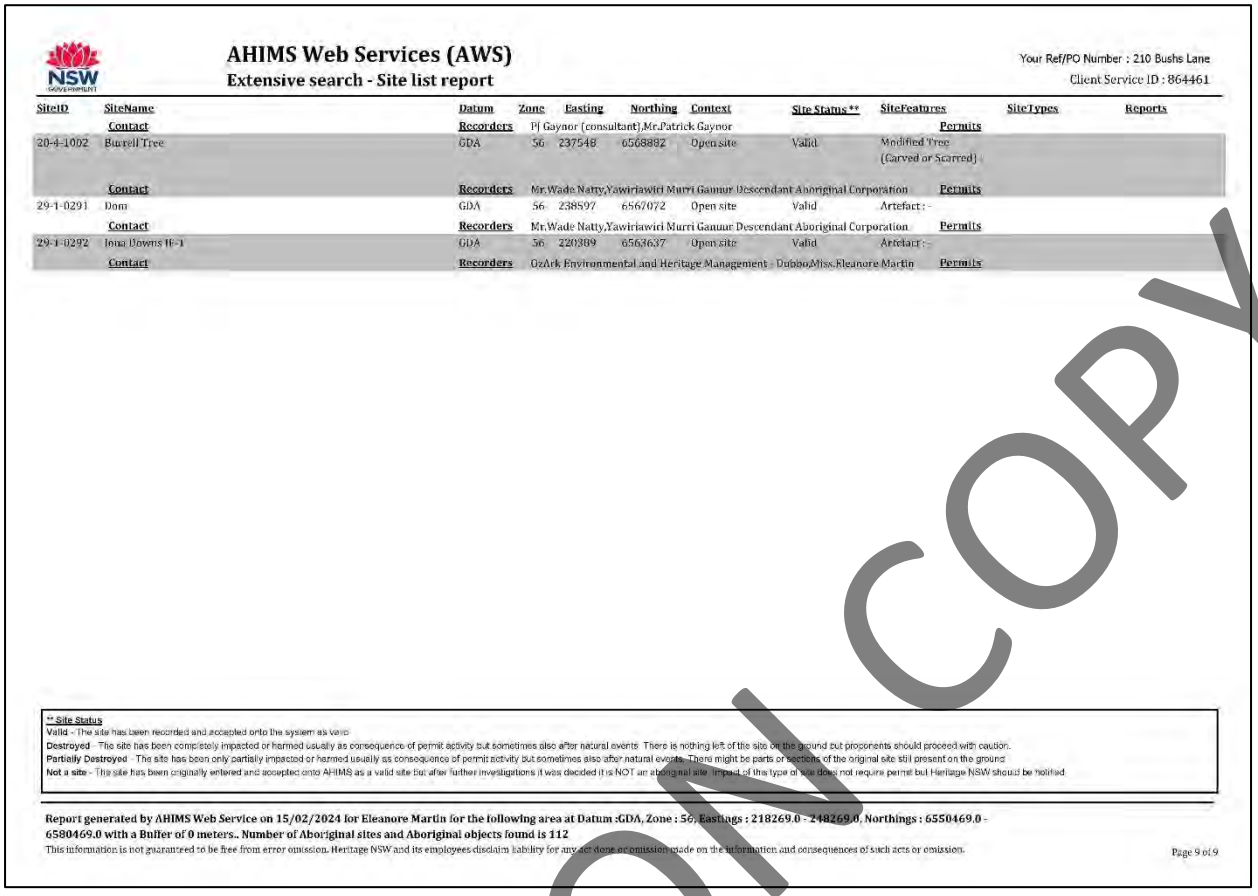

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 210 Bushs Lane
Client Service ID : 864461

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	PJ Gaynor (consultant),Mr.Patrick Gaynor					Permits		
20-4-1002	Burrell Tree	GDA	56	237548	6568892	Open site	Valid	Modified Tree (Carved or Scarred)		
	Contact	Recorders	Mr.Wade Natty,Yawirlawirl Murri Gamur Descendant Aboriginal Corporation					Permits		
29-1-0291	Dom	GDA	56	238597	6567072	Open site	Valid	Artefact : -		
	Contact	Recorders	Mr.Wade Natty,Yawirlawirl Murri Gamur Descendant Aboriginal Corporation					Permits		
29-1-0292	Iona Downs IF-1	GDA	56	220389	6563637	Open site	Valid	Artefact : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo,Miss.Eleanore Martin					Permits		

** Site Status
Valid - The site has been recorded and accepted onto the system as valid
Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.
Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground
Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified.

Report generated by AHIMS Web Service on 15/02/2024 for Eleanore Martin for the following area at Datum :GDA, Zone : 56, Eastings : 218269.0 - 248269.0, Northings : 6550469.0 - 6580469.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 112

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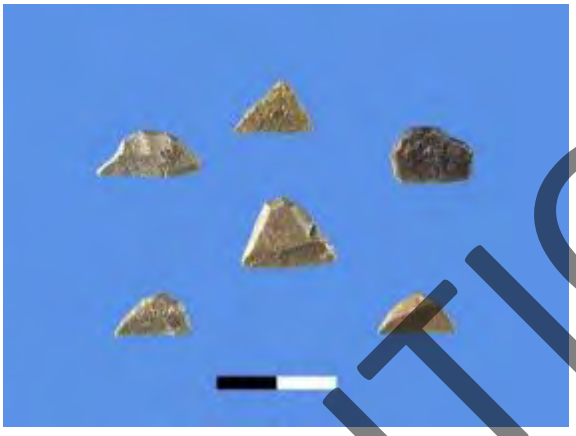
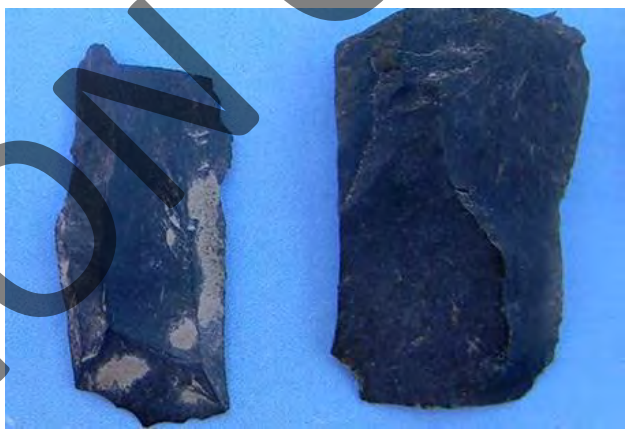
APPENDIX 4: ABORIGINAL HERITAGE: ARTEFACT IDENTIFICATION

A retouched silcrete flake

A quartz flake



Microliths (scale = 1 cm)



Volcanic flakes

Flake characteristics (scale = 1 cm)

A mudstone/tuff core from which flakes have been removed

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APPENDIX D

TRAFFIC IMPACT ASSESSMENT RESIDENTIAL SUBDIVISION LOT 27 & 28 IN DP 755474
210 BUSHS LANE, GUNNEDAH, PREPARED BY INTERSECT TRAFFIC, DATED OCTOBER 2023

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Stewart Surveys Pty Ltd
ABN 65 002 886 508

109 Conadilly Street
PO Box 592
Gunnedah NSW 2380

T 02 6742 2966
office@stewartsurveys.com
www.stewartsurveys.com

TRAFFIC IMPACT ASSESSMENT

RESIDENTIAL SUBDIVISION

LOT 27 & 28 IN DP 755474
210 BUSHS LANE, GUNNEDAH

PREPARED FOR: STEWART SURVEYORS

OCTOBER 2023

EXHIBITION COPY

REF: 23/099

TRAFFIC IMPACT ASSESSMENT
RESIDENTIAL SUBDIVSION
STEWART SURVEYORS

LOTS 27 & 28 IN DP 755474
210 BUSHS LANE, GUNNEDAH

Intersect Traffic Pty Ltd (ABN: 43 112 606 952)

Address:
16 Mount Harris Drive,
Maitland Vale NSW 2320
PO Box 268
East Maitland NSW 2323

Contact:
(mob) 0423 324 188
email: jeff@intersecttraffic.com.au

QUALITY ASSURANCE

This document has been prepared, checked, and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
A	10/10/23	Draft	PA
B	12/10/22	Edit	JG
C		Final Proof / Client Amendments	JG
D		Approved	JG

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This document has been authorised by

Date 12th October 2023

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1. INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) was engaged by Stewart Surveyors on behalf of Ewing Family Trust to prepare a traffic impact assessment (TIA) for a proposed 61 lot residential subdivision on Lots 27 & 28 in DP 755474, 210 Bushs Lane, Gunnedah. The development is proposed as a large lot residential subdivision with a minimum lot size of 0.9 ha. The proposed subdivision plan (Stages 1 – 3) is provided within ***Appendix 1***. Access to all of the lots of the proposed subdivision will be via Bushs Lane, Robert Gordon Road and a new public rural ring road with two connections to Robert Gordon Road.

The aim of this TIA is to determine the likely impact of the traffic generated by the development on the adjacent local and state road network and allow Gunnedah Shire Council to assess the merits of the development in an informed manner.

This report presents the findings of the traffic assessment and includes the following:

1. An outline of the existing situation near the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation, trip distribution and its impact on existing road and intersection capacities.
3. An assessment of the proposed subdivision access and layout.
4. A review of parking, public transport, pedestrian, and cycle way requirements for the proposed development, including assessment against Council, Austroads and TfNSW standards and requirements.
5. A presentation of conclusions and recommendations.

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2. SITE DESCRIPTION

The development site is located in the rural town of Gunnedah near the centre of the Gunnedah local government area. The site is situated on the southwest corner of Bushs Lane and Robert Gordon Road, approximately 7 kilometres southwest of Gunnedah Post Office, approximately 70 kilometres west of Tamworth and northwest of Quirindi and approximately 100 kilometres east of Coonabarabran. The site has road frontages to Bushs Lane at its northern boundary, Robert Gordon Road at its eastern boundary and a crown road reserve to its southern boundary. The site is surrounded by similar zoned land except for RU1 primary production land adjacent to the western boundary. The development site is predominantly cleared gently sloping grazing land. ***Figure 1*** below shows the location of the subdivision.

Figure 1 - Site Location Plan

The site contains the following property descriptors:

- Formal land title of Lots 27 & 28 in DP 755474,
- Residential address of 210 Bushs Lane, Gunnedah,
- Area of approximately 61 hectares, and
- Land zoning of RU4 – Primary Production Small Lots within the Gunnedah LEP (2012).

The site currently has two rural style vehicular accesses via Robert Gordon Road located approximately 75 and 500 metres south of Bushs Lane. ***Photograph 1*** shows the existing site from Robert Gordon Road whilst ***Photograph 2*** shows an existing rural vehicular crossing for the property.

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Photograph 1 -Development site

Photograph 2 Existing site access at Robert Gordon Road

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3. ROAD NETWORK IMPROVEMENTS

There are no known future road network upgrades that will increase the capacity of the road network near the site. Maintenance and rehabilitation works would be undertaken in future in line with Gunnedah Shire Council works programs.

4. EXISTING ROAD NETWORK

Wandobah Road is a 60-kilometre-long rural road which runs between Gunnedah and the Coonabarabran Road. Being a local rural collector road under a functional road hierarchy, it is therefore under the care and control of Gunnedah Shire Council. Its main function is to provide a sealed road connection for rural properties south of Gunnedah. Wandobah Road is a two-lane two-way sealed road with travel lanes approximately 3.5 metres in width with gravel / shoulders varying between 0.5 and 2 metres in width. A speed limit of 100 km/h applied to Wandobah Road near the site and at the time of inspection was observed to be in good condition. ***Photograph 4*** below shows the standard of Wandobah Road near Bushs Lane intersection.

Photograph 3 Wandobah Road

Bushs Lane near the site is a rural road and is a local rural road under a functional road hierarchy therefore it is under the care and control of Gunnedah Shire Council. Its main function is to provide a sealed road access to properties along its length though it does collect traffic from side roads to distribute to Wandobah Road. Bushs Lane is a two-lane two-way sealed road with travel lanes approximately 3.5 metres in width with gravel / shoulders between 0.5 and 1 metres in width. A speed limit of 80 km/h applies to Robert Gordon Road and at the time of inspection was observed to be in good condition. ***Photograph 4*** below shows the standard of Bushs Lane near the Robert Gordon Road priority controlled (give way) T-intersection.

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Photograph 4 Bushs Lane

Robert Gordon Road is a rural road that is constructed for approximately 700 metres south from Bushs Lane past Kerry Elizabeth Drive. As a local road under a functional road hierarchy, it is under the care and control of Gunnedah Shire Council. Near the site Robert Gordon Road is a two-lane two-way rural road with a sealed width of approximately 6 metres and gravel / grassed shoulders of variable width, however the road is not centre line or edge line marked. An 80 km/h speed zoning applies near the site and at the time of inspection, Robert Gordon Road was observed to be in good condition. ***Photograph 5*** below shows the standard of Robert Gordon Road fronting the site.

Photograph 5 Robert Gordon Road near the site

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Kerry Elizabeth Drive near the site is a recently constructed rural road between Wandobah Road and Robert Gordon Drive, servicing approximately 40 large lot residential properties. As a local road under a functional road hierarchy, it is under the care and control of Gunnedah Shire Council. Its main function is to provide a vehicular access for residents along its length from Wandobah Road and Robert Gordon Road. Near the site Kerry Elizabeth Drive is a two-lane two-way rural road with a sealed width of approximately 9 metres, gravel / grassed shoulders and table drains. An 80 km/h speed zoning applies near the site and at the time of inspection, Kerry Elizabeth Drive was observed to be in good condition.

5. TRAFFIC VOLUMES

Intersect Traffic engaged Northern Transport Planning and Engineering (NTPE) to undertake traffic classifier counts on Wandobah Road 80 metres north of Bushs Lane. The counts recorded traffic 24/7 from Friday 28th July to Thursday 3rd August 2023. Gunnedah Shire Council also undertook traffic classifier counts on Bushs Lane (100 metres west of Wandobah Road) and Robert Gordon Drive (south of Bushs Lane) from 26th October 2022 to 5th December 2022. NTPE daily, hourly and summary counts and the Council AADT summary of their counts are presented in ***Appendix 2***.

The AADT counts for each of the roads are:

- Wandobah Road 993 vtpd,
- Bushs Lane 424 vtpd, and
- Robert Gordon Drive 88 vtpd.

It was determined from examination of the NTPE count data that the AM and PM peak hour periods on Wandobah Road occurred between 8.00 am - 9.00 am and 5.00 pm – 6.00 pm, respectively. The heavy vehicle component of Wandobah Road and Bushs Lane counts was approximately 15% of total traffic and was 35% for Robert Gordon Drive. Wandobah Road and Bushs Lane AM and PM peak hour volumes were determined by calculating 9% and 11% AADT respectively.

No counts were undertaken on Kerry Elizabeth Drive however, the 2023 mid-block peak hour traffic volumes were estimated based on The *RTA's Guide to Traffic Generating Development's* and TfNSW's RMS *Technical Direction TDT 2013/04* of 0.71 AM and 0.78 PM vtph for the 40 residential lots in the street.

Based on this data the 2023 mid-block two-way traffic volumes on the road network around the development site are as shown in ***Table 1*** below. Also shown are the predicted 2033 traffic volumes for the road network without this development and based on a background traffic growth rate of 2% per annum for 10 years. As traffic growth in the area has historically been low this growth rate is considered a conservative assumption likely to provide the worst-case prediction for current and future traffic volumes.

Table 1 – 2023 and 2033 traffic volumes without development

Road	Section	2023 AM (vtph)	2023 PM (vtph)	2033 AM (vtph)	2033 PM (vtph)
Wandobah Road	north of Bushs Lane	200	221	244	269
Bushs Lane	west of Wandobah Road	38	47	46	57
Robert Gordon Road	south of Bushs Lane	8	10	10	12
Kerry Elizabeth Drive	west of Wandobah Road	28	31	35	38

The traffic volumes within the table are considered relevant for the analysis and will be utilised within the report.

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6. ROAD CAPACITIES

The capacity of rural roads is generally determined by the capacity of intersections. However, Table 4.5 of the *RTA's Guide to Traffic Generating Developments* provides some guidance on mid-block capacities for rural roads. This table is reproduced below.

Table 4.5
peak hour flow on two-lane rural roads (veh/hr)
(Design speed of 100km/hr)

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

The data for Table 4.5 assumes the following criteria:

- *terrain level* with 20% no overtaking.
- *rolling* with 40% no overtaking.
- *mountainous* with 60% no overtaking.
- 3.7 m traffic lane width with side clearances of at least 2m.
- 60/40 directional split of traffic.

Source: - RTA's Guide to Traffic Generating Developments (2002).

It is assumed that a desirable level of service on the rural roads within the local road network is a level of service C (LoS C). In determining these values, the capacity is the traffic volume when a LoS D is reached. Note the values within the table were reduced by 10% to account for an 80 km/h speed zone for all roads except for Wandobah Road which has a 100 km/h speed zone. Terrain is considered level and with up to 15% heavy vehicle traffic on all roads the following road capacities are determined from the above table:

- Wandobah Road - **1,410 vtph**, and
- Bushs Road, Robert Gordon Drive, Kerry Elizabeth Drive (1410 x 90%) - **1,270 vtph**

The traffic volumes identified above would be suitable for Wandobah Road as a major collector road however as Bushs Lane, Robert Gordon Drive and Kerry Elizabeth Drive are local residential roads under a functional road hierarchy it is considered that the environmental road capacity goals set by TfNSW may be more appropriate. The environmental road capacity thresholds are provided within Table 4.6 of the *RTA's Guide to Traffic Generating Developments* and are reproduced below.

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Table 4.6
Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

Source: - RTA's Guide to Traffic Generating Developments (2002).

Table 4.6 recommends a maximum environmental capacity of 500 vtph for a collector street which would apply to Bushs Road, and 300 vtph for both Robert Gordon Drive and Kerry Elizabeth Drive. Therefore, the two-way mid-block traffic volumes adopted in this assessment are as follows.

- Wandobah Road – 1,410 vtph,
- Bushs Road – 500 vtph, and
- Robert Gordon Drive and Kerry Elizabeth Drive – 300 vtph.

Based on the data collected and reported in ***Section 5*** of this report it can be seen that as existing traffic volumes on the local road network are significantly less than the two-way mid-block road capacity or environmental road capacity for these streets as determined above there is existing spare capacity within the local road network to cater for additional traffic generated by development in the area.

7. ALTERNATE TRANSPORT MODES

Public transport public bus or train services do not operate near the site. However, Hopes Bus Service Pty Ltd operate public bus services in the urban area of Gunnedah and provides school bus services in many of the rural areas of the local government area including morning pick-up and afternoon drop-off along Bushs Lane, Robert Gordon Drive and Kerry Elizabeth Drive on school days and would provide opportunity for residents to use these once the subdivision is inhabited and a demand established.

Being a rural area there are no constructed footways or cycleways near the site, with pedestrians and cyclists being required to use the grassed verges, where available or the sealed road. Use of the sealed road or shoulders on Bushs Lane, Robert Gordon Drive and Kerry Elizabeth Drive would be suitable for some cyclists as traffic volumes are not high, however the use, by cyclists, of the roadway or shoulders on Wandobah Road with its 100 km/h speed limit is suited to experienced cyclists.

There is an off-road shared pathway / cycleway (2 metres wide approximately, on the western verge of Wandobah Road commences approximately 3 kilometres north of the site at Tallowwood Drive, at the southern end of the urban residential development of Gunnedah and extends for approximately 3.6 kilometres to the town skateboard area and sports courts and fields.

Photographs 6 and 7 show the cycleway on Wandobah Road north and south of Kilcoy Street, approximately 400 metres from the southern end of the active sporting facilities.

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Photograph 6 Off-road cycleway north from Kilcoy Street

Photograph 7 Off-road cycleway south from Kilcoy Street

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8. PROPOSED DEVELOPMENT

The proposed development involves the subdivision of the 61-hectare primary production rural property into large lot residential allotments in three stages. The concept subdivision plan is provided in ***Appendix 1***. The specific details of the development are:

- Subdivision of the rural lot into 61 large residential lots comprising:
  - Stage 1 – 6 lots, Stage 2 – 44 lots and Stage 3 - 11 lots,
  - Lot sizes ranging from 0.9 ha to 12.28 ha,
- Site earthworks,
- Provision of utilities and services,
- Construction of one new public loop road comprising:
  - A sealed road within a 25-metre road reserve,
  - Two T-intersection connections with Robert Gordon Road,
  - One situated approximately 300 metres south of the site's northern boundary, and
  - Another approximately 220 metres north of the site's southern boundary,
- Drainage and landscape works, and
- Subdivision construction to Gunnedah Shire Council Road standards.

9. TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's* and TfNSW's RMS *Technical Direction TDT 2013/04* provides specific advice on the traffic generation potential of various land uses. Regarding small primary production residential dwellings, the following advice is provided within the TDT for regional areas.

Rates:

Daily vehicle trips = Average 7.4 per dwelling in regional areas.
PM peak (1) hour = Average 0.78 per dwelling in regional areas.
AM peak (1) hour = Average 0.71 per dwelling in regional areas.

The additional traffic generated on the network by the proposed subdivision can be calculated (rounded-up) as follows:

Daily trips = 61 x 7.4 vtpd
= **451 vtpd.**

PM peak hour trips = 61 x 0.78 vtph
= **48 vtph**.

AM peak hour trips = 61 x 0.71 vtph
= **44 vtph**.

10. TRIP DISTRIBUTION

Before carrying out any traffic assessment the additional AM and PM peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making a number of assumptions as to distribution patterns to and from the development. In distributing the peak hour traffic through the adjacent road network, the following assumptions have been made for this site:

- In the AM 80% of traffic will be outbound and in the PM 70% of traffic will be inbound,

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- 85% of traffic will have origin / destinations north of the site via Bushs Lane and Wandobah Road north and 15% south of the site via Robert Gordon Road, Kerry Elizabeth Drive and Wandobah Road south,
- The 85% north traffic will be split 70% Robert Gordon Road south of Bushs Lane and 15% Bushs Lane west of Robert Gordon Drive, and
- 75% of all traffic will be distributed via the two new site access roads, as 25% of all traffic will utilise property accesses directly; 15% via Bushs Road west of Robert Gordon Road and 10% via Robert Gordon Drive.

There may be some movements different to those assumed however their impact on the assessment is considered to be negligible. Therefore, the adopted development traffic trip distribution for this assessment is shown in ***Figure 2*** below.

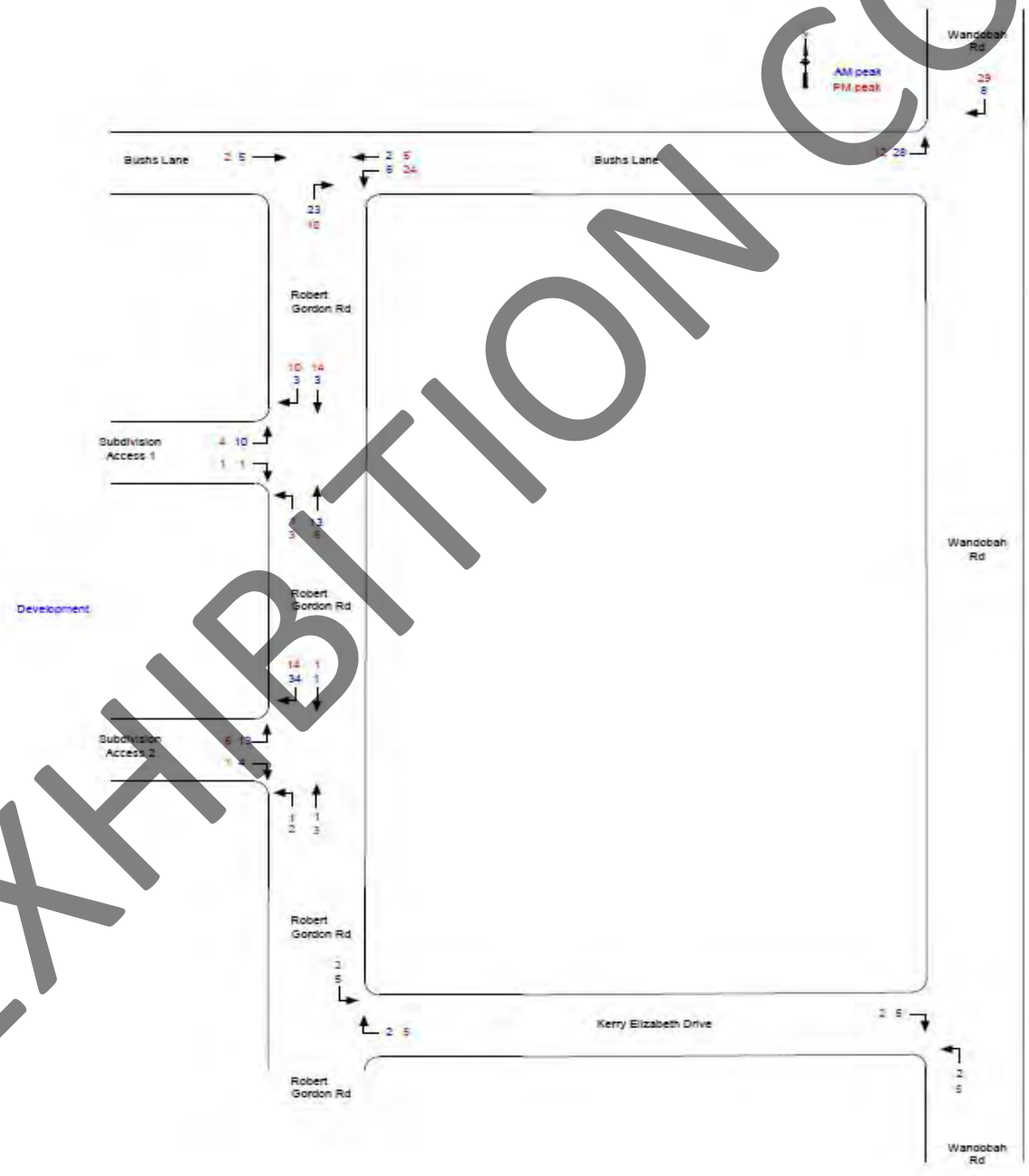

Figure 2 Development Traffic Trip Distribution

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11. TRAFFIC IMPACT ASSESSMENT

11.1 Road Network Capacity

This TIA has determined in ***Section 6*** that the existing road network around the site is currently operating well below its technical capacity and subject to satisfactory intersection performance has spare capacity to cater for additional traffic generated by the subdivision.

Section 10 of this TIA determined that the proposed development of the 61-lot residential subdivision is likely to generate an additional 44 vtph in the AM peak and 48 vtph in the PM peak resulting in the following maximum additional two-way mid-block peak hour trips on the local road network:

- 36 vtph AM and 41 vtph PM on Wandobah Road,
- 7 vtph AM and 7 vtph PM on Wandobah Road south of Kerry Elizabeth Drive,
- 36 vtph AM and 41 vtph PM on Bushs Lane east of Robert Gordon Road,
- 7 vtph AM and 7 vtph PM on Bushs Lane west of Robert Gordon Road
- 29 vtph AM and 34 vtph PM on Robert Gordon Road south of Bushs Lane,
- 7 vtph AM and 7 vtph PM on Kerry Elizabeth Drive east of Robert Gordon Drive, and
- 31 vtph AM and 35 vtph PM on the two new access roads of the development.

The addition of this traffic onto the existing traffic volumes determined in ***Section 5*** will not result in the technical and environmental capacity thresholds of the local road network determined in ***Section 6*** to be reached. Even with 2% p.a. traffic growth over a ten-year period these two-way mid-block peak hour road capacity thresholds are not reached. This is demonstrated below in ***Table 2***.

Table 2 – Mid-block Road Capacity Assessment

Road	Section	Capacity	2023	2023	2033	2033	Development traffic	
		vtph	AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)	AM	PM
Wandobah Road	north of Bushs Lane	1410	236	262	280	310	36	41
Bushs Lane	west of Wandobah Road	500	74	88	82	98	36	41
Robert Gordon Road	south of Bushs Lane	300	37	44	39	46	29	34
Kerry Elizabeth Drive	west of Wandobah Road	300	35	38	42	45	7	7

Therefore, it is concluded that there is sufficient spare capacity within the immediate road network to cater for the proposed residential subdivision without the need to upgrade the adjoining local road network.

11.2 Intersection Capacity

The intersections to be utilised by traffic connecting to the road network which may be impacted by additional traffic from the subdivision are the:

- Wandobah Road / Bushs Lane give-way controlled T- intersection,
- Wandobah Road / Kerry Elizabeth Drive give-way controlled T- intersection,
- Bushs Lane / Robert Gordon Road give-way controlled T- intersection,
- Robert Gordon Road / Kerry Elizabeth Drive give-way controlled T- intersection, and
- Robert Gordon Road / Subdivision Access 1 and 2 give-way controlled T- intersections.

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When determining the need to carry out an intersection analysis reference is made to the following extract from Austroads *Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings (2009)*. Should traffic volumes remain below the thresholds for uninterrupted flow conditions shown in the table below then no intersection analysis is required as it can be assumed the intersections will continue to operate with uninterrupted flow conditions.

- The following table may be used as an initial guide to determine the need for a detailed traffic analysis in accordance with the procedure provided in Part 3 of the Guide to Traffic Management. When the volumes at an intersection are less than those shown, a detailed analysis to demonstrate that adequate capacity is available is unlikely to be necessary. Furthermore, flaring of the approaches is unlikely to be needed based on capacity. However, separate lanes for left or right-turning vehicles may be desirable on the major road for safety reasons.

Major road type[1]	Major road flow (vph)[2]	Minor road flow (vph)[3]
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road flow includes all major road traffic with priority over minor road traffic.
3. Minor road design volumes include through and turning volumes.

Noting the calculated critical traffic flows on the various roads in 2033 are in the order of:

- Wandobah Road - 310 vtph,
- Bushs Lane – 98 vtph,
- Robert Gordon Road - 46 vtph,
- Kerry Elizabeth Drive – 45 vtph, and
- Subdivision accesses – less than 35 vtph

It is therefore noted that the Wandobah Road / Bushs Lane give-way controlled T- intersection, the Wandobah Road / Kerry Elizabeth Drive give-way controlled T- intersection, the Bushs Lane / Robert Gordon Road give-way controlled T- intersection, the Robert Gordon Road / Kerry Elizabeth Drive give-way controlled T- intersection, and the Robert Gordon Road / Subdivision Access 1 and 2 give-way controlled T- intersections all fall below these thresholds within the table above.

Therefore, it can be concluded that the subdivision access intersections and all other local intersections will operate with uninterrupted flow conditions post development. The low traffic volumes at each of these intersections will also only warrant BAR / BAL i.e., basic right turn and basic left turn treatments and as such no improvements to the standard intersections existing or proposed are required. A suitable level of safety at all intersections will occur and the development will not adversely impact on the operation of the local road network.

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Safe Intersection Sight Distance (SISD) at the subdivision access should comply with *Austroads Road Design Guide – Part 4A – Signalised and unsignalised intersections (2020).* Table 3.2 of this Guide indicates SISD at the subdivision access should be a minimum of 185 metres for a speed environment of 80 km/h. By observation on site, the available sight distance from the proposed new public access road intersections can easily be achieved. It is therefore concluded that the proposed subdivision access roads can be located in a suitably safe position, ensuring an acceptable level of road safety is maintained on Robert Gordon Road. The required sight distance will need to be demonstrated on the approved design plans and will need to be checked at construction stage.

11.3 On-Site Car Parking

The development as a residential subdivision does not generate an immediate on-site parking demand however future development of the individual allotments will generate such a demand. The allotments with a minimum size of 0.9 hectare are large enough to ensure on-site parking provisions can be easily accommodated within the lots. Future development on the individual allotments will need to comply with the Gunnedah Shire Council DCP regarding the provision of on-site car parking.

11.4 Alternative Transport Modes

It has been determined in ***Section 7*** that the site is not serviced by public transport and there is little in the way of pedestrian and cycle way infrastructure in the area, however school bus services operate along Robert Gordon Road. The additional alternative transport mode demand from this relatively small residential development is not considered sufficient for there to be a nexus for the extension of public transport services to the site or the construction of external pedestrian and cycle way infrastructure.

11.5 Subdivision Design

The subdivision design is provided in ***Appendix 1***. The internal layout consists of one public "ring" local access road with two T-intersection connections with Robert Gordon Road from which approximately 75% of all new lots will have vehicular access. The design and construction of the rural subdivision roads will need to comply with the Gunnedah Shire Council – *Engineering Guidelines for Subdivisions and Developments – August 2013. Table B – Road Classifications and Formation Widths of Part 2 - Design Guidelines* provides the design pavement and road width standards for the various road hierarchy classifications of roads. For a rural road with less than 500 AADT *Table B* requires the following widths: Road reserve - 25 metres, Travel lanes - 3 metres, Parking lanes 1.5 metres, Footpath service - 8 metres.

The road reserve widths are to comply with Gunnedah Shire Council requirements as specified within conditions of consent for any consent issued for the development. Overall, it is concluded that the concept internal road layout and subdivision design appears satisfactory and compliant with current best practice.

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12. CONCLUSIONS

This traffic impact assessment for a 3 Stage residential subdivision of Lots 27 & 28 in DP 755474, 210 Bushs Lane, Gunnedah has concluded the following:

- The existing local road network around the site is operating below its technical capacity and has capacity to accommodate additional traffic from the subdivision.
- Using rates contained within the TfNSW's RMS's *TDT 2013/04* it is estimated that the development will generate an additional 451 vtpd or 44 vtph in the AM peak and 48 vtph in the PM peak on the local road network.
- There is sufficient spare capacity within the immediate local road network to cater for the proposed residential subdivision without the need to upgrade the adjoining local road network.
- The proposed subdivision access intersections at Robert Gordon Road will operate with uninterrupted flow conditions post development through to and beyond 2033, as will all other local road network intersections in the near vicinity of the site.
- The proposed location of the subdivision access intersections at Robert Gordon Road can permit suitable safe intersection sight distance and will need to be checked during the design phase.
- The development as a residential subdivision does not generate an immediate on-site parking demand however future development of the individual allotments will generate such a demand. The allotments with a minimum size of 0.9 hectares are large enough to ensure on-site parking provisions can be accommodated.
- The additional alternative transport mode demand from this relatively small residential development is not considered sufficient for there to be a nexus for the extension of public transport services to the site or the construction of external pedestrian and cycle way infrastructure.
- The internal road layout and subdivision design is satisfactory and is compliant with current best practice.

13. RECOMMENDATION

Having carried out this traffic impact assessment for a 4 Stage residential subdivision of Lots 27 & 28 in DP 755474, 210 Bushs Lane, Gunnedah it is recommended that the proposal can be supported from a traffic impact perspective as it will not adversely impact on the local road network and complies with all relevant Gunnedah Shire Council, Australian Standard and TfNSW requirements.

JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

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APPENDIX 1
DEVELOPMENT PLANS

EXHIBITION COPY

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (6 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)
STAGE 4 (11 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N
W E
S

2
DP861697

1
DP861697

WIDEN 20.115m ROAD RESERVE TO 25m IN STAGE 4

1 9006 m² | 2 9000 m² | 3 9000 m² | 4 9000 m² | 5 9000 m² | 6 9000 m² | 7 9000 m² | 8 9000 m² | 9 9000 m² | 10 9001 m² | 11 9002 m²
12 9003 m² | 13 9003 m² | 14 9003 m² | 15 9007 m² | 16 9022 m² | 17 9025 m² | 18 9016 m² | 19 9007 m² | 20 9002 m² | 21 9053 m² | 22 9107 m² | 23 12370 m² | 24 10350 m² | 25 9002 m² | 26 9004 m² | 27 9004 m² | 28 9001 m² | 29 9003 m² | 30 9011 m² | 31 9006 m² | 32 9012 m² | 33 9033 m² | 34 9058 m² | 35 9028 m² | 36 9047 m² | 37 10570 m² | 38 9007 m² | 39 9011 m² | 40 9089 m² | 41 9188 m² | 42 9047 m² | 43 10420 m² | 44 9006 m² | 45 9026 m² | 46 9000 m² | 47 9001 m² | 48 9021 m² | 49 9192 m² | 50 9092 m² | 51 9087 m² | 52 9004 m² | 53 9140 m² | 54 9352 m² | 55 9023 m² | 56 9053 m² | 57 9451 m² | 58 9084 m² | 59 10480 m² | 60 9629 m² | 61 9863 m²

DRIVE
ROBERT
ROBERT
KERRY ELIZABETH DR.
CROWN LAND
BASIN (STAGE 2)
STAGE 3 WATERWAY
STAGE 2 WATERWAY
PROPOSED SEE SMP
3 CELL BOX CULVERT 2400 x 750mm

8453
DP1217472

2
DP736969

1
DP736969

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

00 40 80 120 160 200 240 280 320 360 400
REDUCTION RATIO
1:4000

ARCHEOLOGICAL SITE TO BE REMOVED OFF SITE
(SUBJECT TO ABORIGINAL HERITAGE PERMIT APPROVAL)

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Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: PLAN OF PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH STAGING PLAN

Date: 12 MARCH 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 1

APPENDIX 2
TRAFFIC DATA

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1	Wandobah Rd N of Bush's Lane [80]										Northbound					

Friday, 28 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	93.00	-
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	99.50	-
4:00	19	19	0	0	0	0	0	0	0	0	0	0	0	0	87.48	-
5:00	29	25	0	4	0	0	0	0	0	0	0	0	0	0	82.55	130.40
6:00	38	34	1	1	1	0	0	0	0	1	0	0	0	0	73.70	86.60
7:00	83	79	0	3	0	0	0	1	0	0	0	0	0	0	80.53	93.50
8:00	136	120	5	8	2	0	0	1	0	0	0	0	0	0	79.23	91.30
9:00	80	76	2	0	0	0	1	1	0	0	0	0	0	0	77.58	91.21
10:00	47	42	2	2	0	0	0	0	0	1	0	0	0	0	76.73	92.28
11:00	65	60	1	3	0	0	0	1	0	0	0	0	0	0	79.30	97.65
12:00	74	61	2	7	1	0	0	0	0	3	0	0	0	0	79.75	96.79
13:00	50	42	1	6	0	1	0	0	0	0	0	0	0	0	80.50	95.00
14:00	79	70	0	8	0	0	0	0	0	1	0	0	0	0	79.18	97.47
15:00	72	64	4	3	1	0	0	0	0	0	0	0	0	0	78.38	90.79
16:00	81	72	4	5	0	0	0	0	0	0	0	0	0	0	76.45	88.30
17:00	58	53	1	4	0	0	0	0	0	0	0	0	0	0	74.05	84.82
18:00	55	52	1	2	0	0	0	0	0	0	0	0	0	0	76.35	87.20
19:00	31	28	1	2	0	0	0	0	0	0	0	0	0	0	76.40	-
20:00	12	12	0	0	0	0	0	0	0	0	0	0	0	0	92.55	-
21:00	15	14	0	1	0	0	0	0	0	0	0	0	0	0	78.98	-
22:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0	80.53	-
23:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	80.83	-
Total	**1044**	**942**	**25**	**60**	**5**	**1**	**1**	**4**	**0**	**6**	**0**	**0**	**0**	**0**	**81.07**	**94.52**

Saturday, 29 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	72.90	-
1:00	4	3	1	0	0	0	0	0	0	0	0	0	0	0	76.10	-
2:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	67.25	-
3:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	87.25	-
4:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	101.13	-
5:00	12	8	0	4	0	0	0	0	0	0	0	0	0	0	85.05	-
6:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0	70.65	-
7:00	44	36	2	5	0	0	1	0	0	0	0	0	0	0	77.10	95.60
8:00	77	73	0	4	0	0	0	0	0	0	0	0	0	0	78.20	88.50
9:00	81	70	2	8	0	0	1	0	0	0	0	0	0	0	77.05	89.86
10:00	84	75	4	4	0	0	0	1	0	0	0	0	0	0	78.80	94.01
11:00	63	55	4	4	0	0	0	0	0	0	0	0	0	0	77.43	87.76
12:00	69	62	1	6	0	0	0	0	0	0	0	0	0	0	79.33	92.51
13:00	53	46	0	6	1	0	0	0	0	0	0	0	0	0	78.90	94.28
14:00	49	43	2	4	0	0	0	0	0	0	0	0	0	0	77.58	90.77
15:00	47	41	2	3	0	0	1	0	0	0	0	0	0	0	75.83	83.68
16:00	52	44	1	7	0	0	0	0	0	0	0	0	0	0	75.43	89.76
17:00	63	57	0	6	0	0	0	0	0	0	0	0	0	0	75.65	87.47
18:00	54	49	0	5	0	0	0	0	0	0	0	0	0	0	70.53	82.18
19:00	26	22	1	3	0	0	0	0	0	0	0	0	0	0	75.58	-
20:00	27	25	0	2	0	0	0	0	0	0	0	0	0	0	74.18	-
21:00	20	20	0	0	0	0	0	0	0	0	0	0	0	0	75.08	-
22:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0	72.28	-
23:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	64.47	-
Total	**859**	**763**	**20**	**71**	**1**	**0**	**3**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**76.82**	**89.70**

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Sunday, 30 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0	69.55	-
1:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0	76.13	-
2:00	8	7	0	1	0	0	0	0	0	0	0	0	0	0	67.48	-
3:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	73.23	-
4:00	8	6	0	2	0	0	0	0	0	0	0	0	0	0	73.60	-
5:00	8	3	1	4	0	0	0	0	0	0	0	0	0	0	85.00	-
6:00	16	15	0	0	0	0	0	0	0	0	0	1	0	0	78.78	-
7:00	20	17	0	3	0	0	0	0	0	0	0	0	0	0	76.37	88.30
8:00	46	42	3	1	0	0	0	0	0	0	0	0	0	0	77.30	89.07
9:00	55	52	2	0	0	0	1	0	0	0	0	0	0	0	78.33	91.62
10:00	76	65	6	4	0	0	0	0	0	1	0	0	0	0	75.95	91.64
11:00	53	44	1	7	0	1	0	0	0	0	0	0	0	0	77.53	88.33
12:00	49	41	7	1	0	0	0	0	0	0	0	0	0	0	77.85	91.23
13:00	50	44	3	2	0	0	0	0	0	1	0	0	0	0	76.70	101.63
14:00	57	52	1	4	0	0	0	0	0	0	0	0	0	0	75.63	87.91
15:00	65	59	0	6	0	0	0	0	0	0	0	0	0	0	75.83	87.74
16:00	60	50	2	7	0	0	0	1	0	0	0	0	0	0	75.40	92.53
17:00	52	42	2	8	0	0	0	0	0	0	0	0	0	0	76.30	88.11
18:00	27	24	1	2	0	0	0	0	0	0	0	0	0	0	73.80	-
19:00	16	12	1	2	0	0	0	0	0	0	0	1	0	0	77.03	-
20:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0	69.43	-
21:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0	76.77	-
22:00	5	4	0	1	0	0	0	0	0	0	0	0	0	0	81.13	-
23:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	96.97	-
Total	**721**	**629**	**30**	**55**	**0**	**1**	**1**	**1**	**0**	**2**	**0**	**2**	**0**	**0**	**76.75**	**90.73**

Monday, 31 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	69.80	-
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	52.70	-
3:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
4:00	11	10	0	1	0	0	0	0	0	0	0	0	0	0	80.95	-
5:00	38	33	0	5	0	0	0	0	0	0	0	0	0	0	80.43	97.07
6:00	38	32	1	2	0	2	0	0	0	0	0	1	0	0	80.05	87.30
7:00	86	74	2	3	1	5	0	1	0	0	0	0	0	0	80.28	91.31
8:00	156	136	3	10	2	4	0	0	0	1	0	0	0	0	79.80	91.33
9:00	70	60	1	4	0	4	0	0	0	1	0	0	0	0	76.93	89.91
10:00	48	41	1	2	1	2	0	0	0	1	0	0	0	0	74.93	86.80
11:00	55	46	0	3	0	3	0	0	0	3	0	0	0	0	77.25	91.00
12:00	45	39	2	2	1	0	0	0	0	1	0	0	0	0	76.20	87.35
13:00	40	33	4	3	0	0	0	0	0	0	0	0	0	0	78.23	84.60
14:00	58	54	1	1	0	0	0	0	0	2	0	0	0	0	78.23	91.46
15:00	59	51	3	3	2	0	0	0	0	0	0	0	0	0	76.88	91.27
16:00	67	53	3	8	0	0	0	2	0	0	1	0	0	0	76.18	87.02
17:00	88	74	1	11	0	0	0	1	0	1	0	0	0	0	74.53	84.06
18:00	53	44	2	6	1	0	0	0	0	0	0	0	0	0	75.05	90.32
19:00	17	16	0	1	0	0	0	0	0	0	0	0	0	0	68.80	-
20:00	13	11	1	1	0	0	0	0	0	0	0	0	0	0	78.13	-
21:00	8	6	0	2	0	0	0	0	0	0	0	0	0	0	76.60	-
22:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	63.07	-
23:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	59.80	-
Total	**957**	**820**	**25**	**68**	**8**	**20**	**0**	**4**	**0**	**10**	**1**	**1**	**0**	**0**	**74.31**	**89.34**

EXHIBITION COPY

Tuesday, 1 August 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	75.10	-
3:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	79.45	-
4:00	15	13	0	2	0	0	0	0	0	0	0	0	0	0	75.60	-
5:00	43	39	0	2	0	0	0	1	0	0	0	1	0	0	77.38	92.10
6:00	42	37	1	3	0	0	0	0	0	0	0	1	0	0	76.75	89.70
7:00	89	77	3	7	0	0	0	1	0	1	0	0	0	0	77.43	90.33
8:00	159	140	6	10	2	0	0	0	0	0	1	0	0	0	77.38	87.75
9:00	53	44	3	4	1	0	0	0	0	1	0	0	0	0	77.85	92.68
10:00	57	50	1	4	0	0	0	0	0	2	0	0	0	0	74.53	92.20
11:00	48	42	2	4	0	0	0	0	0	0	0	0	0	0	81.15	89.22
12:00	59	50	2	2	0	0	0	2	0	2	1	0	0	0	76.30	90.33
13:00	30	27	1	0	1	0	0	1	0	0	0	0	0	0	76.80	-
14:00	73	68	0	4	1	0	0	0	0	0	0	0	0	0	77.15	88.30
15:00	94	81	4	4	2	0	0	1	0	2	0	0	0	0	76.00	88.97
16:00	67	63	0	3	1	0	0	0	0	0	0	0	0	0	75.23	87.26
17:00	72	65	3	4	0	0	0	0	0	0	0	0	0	0	76.80	96.28
18:00	52	47	0	4	0	0	0	0	0	1	0	0	0	0	75.65	87.05
19:00	22	21	0	1	0	0	0	0	0	0	0	0	0	0	73.85	-
20:00	9	8	0	1	0	0	0	0	0	0	0	0	0	0	75.10	-
21:00	6	5	0	1	0	0	0	0	0	0	0	0	0	0	67.75	-
22:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	56.70	-
23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
Total	**997**	**884**	**26**	**60**	**8**	**0**	**0**	**6**	**0**	**9**	**2**	**2**	**0**	**0**	**75.23**	**90.17**

Wednesday, 2 August 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	79.50	-
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	67.95	-
3:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	77.90	-
4:00	19	17	1	0	0	0	0	1	0	0	0	0	0	0	82.85	-
5:00	31	29	0	2	0	0	0	0	0	0	0	0	0	0	81.53	-
6:00	57	49	2	4	0	0	0	0	0	1	1	0	0	0	78.23	94.22
7:00	82	76	2	4	0	0	0	0	0	0	0	0	0	0	77.00	91.24
8:00	152	143	1	7	0	0	0	1	0	0	0	0	0	0	78.23	89.81
9:00	57	51	1	3	0	0	0	0	0	2	0	0	0	0	77.55	91.63
10:00	60	47	3	6	1	0	1	1	0	1	0	0	0	0	75.93	88.06
11:00	51	45	1	5	0	0	0	0	0	0	0	0	0	0	76.98	92.18
12:00	45	33	3	5	0	1	0	1	0	2	0	0	0	0	77.33	85.37
13:00	60	51	3	6	0	0	0	0	0	0	0	0	0	0	79.50	92.20
14:00	66	60	2	3	0	0	0	0	0	0	1	0	0	0	76.98	94.37
15:00	55	49	0	4	1	0	0	0	0	1	0	0	0	0	76.23	90.79
16:00	64	56	3	5	0	0	0	0	0	0	0	0	0	0	76.60	89.09
17:00	73	61	2	9	0	0	1	0	0	0	0	0	0	0	75.58	89.77
18:00	49	45	0	4	0	0	0	0	0	0	0	0	0	0	73.98	88.20
19:00	20	18	0	2	0	0	0	0	0	0	0	0	0	0	71.98	-
20:00	7	6	0	1	0	0	0	0	0	0	0	0	0	0	72.43	-
21:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	74.25	-
22:00	7	6	0	1	0	0	0	0	0	0	0	0	0	0	76.90	-
23:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	69.00	-
Total	**968**	**855**	**24**	**71**	**2**	**1**	**2**	**4**	**0**	**7**	**2**	**0**	**0**	**0**	**76.28**	**90.53**

EXHIBITION COPY

Thursday, 3 August 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	67.60	-
3:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	83.70	-
4:00	14	13	0	0	0	0	0	1	0	0	0	0	0	0	78.23	-
5:00	37	33	1	2	0	0	0	0	0	1	0	0	0	0	77.78	99.13
6:00	45	40	0	5	0	0	0	0	0	0	0	0	0	0	74.40	91.44
7:00	87	80	0	4	2	0	1	0	0	0	0	0	0	0	79.50	91.17
8:00	154	138	5	10	0	0	1	0	0	0	0	0	0	0	79.10	89.20
9:00	66	59	3	4	0	0	0	0	0	0	0	0	0	0	75.65	89.62
10:00	51	42	3	4	0	0	0	1	0	1	0	0	0	0	76.63	87.77
11:00	51	43	1	4	0	0	0	1	1	0	1	0	0	0	76.78	89.62
12:00	66	58	4	4	0	0	0	0	0	0	0	0	0	0	77.58	93.22
13:00	47	38	2	5	0	0	0	0	0	0	1	0	0	1	77.33	88.68
14:00	66	60	0	3	0	0	1	0	0	1	1	0	0	0	79.83	90.39
15:00	76	62	4	5	3	0	0	1	0	1	0	0	0	0	76.53	92.96
16:00	78	69	1	7	0	0	0	1	0	0	0	0	0	0	76.68	88.84
17:00	62	51	0	10	0	0	0	0	0	1	0	0	0	0	72.83	92.22
18:00	57	50	1	4	0	0	0	0	0	1	1	0	0	0	72.40	84.78
19:00	23	21	0	2	0	0	0	0	0	0	0	0	0	0	78.03	-
20:00	10	9	0	1	0	0	0	0	0	0	0	0	0	0	68.40	-
21:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	74.80	-
22:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	82.97	-
23:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	71.60	-
Total	**1000**	**875**	**25**	**75**	**5**	**0**	**3**	**5**	**1**	**6**	**4**	**0**	**0**	**1**	**76.29**	**90.65**

Weekday Average

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	80.77	-
1:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
2:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	65.84	-
3:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	85.14	-
4:00	16	14	0	1	0	0	0	0	0	0	0	0	0	0	81.02	-
5:00	36	32	0	3	0	0	0	0	0	0	0	0	0	0	79.93	104.67
6:00	44	38	1	3	0	0	0	0	0	0	0	0	0	0	76.63	89.85
7:00	85	77	1	4	1	1	0	1	0	0	0	0	0	0	78.95	91.51
8:00	151	135	4	9	1	1	0	0	0	0	0	0	0	0	78.75	89.88
9:00	65	58	2	3	0	1	0	0	0	1	0	0	0	0	77.11	91.01
10:00	53	44	2	4	0	0	0	0	0	1	0	0	0	0	75.75	89.42
11:00	54	47	1	4	0	1	0	0	0	1	0	0	0	0	78.29	91.93
12:00	58	48	3	4	0	0	0	1	0	2	0	0	0	0	77.43	90.61
13:00	45	38	2	4	0	0	0	0	0	0	0	0	0	0	78.47	90.12
14:00	68	62	1	4	0	0	0	0	0	1	0	0	0	0	78.27	92.40
15:00	71	61	3	4	2	0	0	0	0	1	0	0	0	0	76.80	90.96
16:00	71	63	2	6	0	0	0	1	0	0	0	0	0	0	76.23	88.10
17:00	71	61	1	8	0	0	0	0	0	0	0	0	0	0	74.76	89.43
18:00	53	48	1	4	0	0	0	0	0	0	0	0	0	0	74.69	87.51
19:00	23	21	0	2	0	0	0	0	0	0	0	0	0	0	73.81	-
20:00	10	9	0	1	0	0	0	0	0	0	0	0	0	0	77.32	-
21:00	8	7	0	1	0	0	0	0	0	0	0	0	0	0	74.48	-
22:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	72.03	-
23:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	70.31	-
Total	**993**	**875**	**25**	**67**	**6**	**4**	**1**	**5**	**0**	**8**	**2**	**1**	**0**	**0**	**76.63**	**93.34**

EXHIBITION COPY

Weekend Average

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	71.23	-
1:00	7	7	1	0	0	0	0	0	0	0	0	0	0	0	76.11	-
2:00	5	5	0	1	0	0	0	0	0	0	0	0	0	0	67.36	-
3:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	80.24	-
4:00	6	5	0	1	0	0	0	0	0	0	0	0	0	0	87.37	-
5:00	10	6	1	4	0	0	0	0	0	0	0	0	0	0	85.03	-
6:00	14	13	0	0	0	0	0	0	0	0	0	1	0	0	74.71	-
7:00	32	27	1	4	0	0	1	0	0	0	0	0	0	0	76.73	91.95
8:00	62	58	2	3	0	0	0	0	0	0	0	0	0	0	77.75	88.78
9:00	68	61	2	4	0	0	1	0	0	0	0	0	0	0	77.69	90.74
10:00	80	70	5	4	0	0	0	1	0	1	0	0	0	0	77.38	92.82
11:00	58	50	3	6	0	1	0	0	0	0	0	0	0	0	77.48	88.04
12:00	59	52	4	4	0	0	0	0	0	0	0	0	0	0	78.59	91.87
13:00	52	45	2	4	1	0	0	0	0	1	0	0	0	0	77.80	97.95
14:00	53	48	2	4	0	0	0	0	0	0	0	0	0	0	76.60	89.34
15:00	56	50	1	5	0	0	1	0	0	0	0	0	0	0	75.83	85.71
16:00	56	47	2	7	0	0	0	1	0	0	0	0	0	0	75.41	91.15
17:00	58	50	1	7	0	0	0	0	0	0	0	0	0	0	75.98	87.79
18:00	41	37	1	4	0	0	0	0	0	0	0	0	0	0	72.16	82.18
19:00	21	17	1	3	0	0	0	0	0	0	0	1	0	0	76.30	-
20:00	19	18	0	1	0	0	0	0	0	0	0	0	0	0	71.80	-
21:00	15	15	0	0	0	0	0	0	0	0	0	0	0	0	75.92	-
22:00	7	6	0	1	0	0	0	0	0	0	0	0	0	0	76.70	-
23:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	80.72	-
Total	**790**	**696**	**25**	**63**	**1**	**1**	**2**	**1**	**0**	**1**	**0**	**1**	**0**	**0**	**76.79**	**93.09**

7-Day Average

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	76.95	-
1:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	76.11	-
2:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	66.35	-
3:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	83.50	-
4:00	13	12	0	1	0	0	0	0	0	0	0	0	0	0	82.83	-
5:00	28	24	0	3	0	0	0	0	0	0	0	0	0	0	81.39	104.67
6:00	35	31	1	2	0	0	0	0	0	0	0	0	0	0	76.08	89.85
7:00	70	63	1	4	0	1	0	0	0	0	0	0	0	0	78.31	91.63
8:00	126	113	3	7	1	1	0	0	0	0	0	0	0	0	78.46	89.56
9:00	66	59	2	3	0	1	0	0	0	1	0	0	0	0	77.28	90.93
10:00	60	52	3	4	0	0	0	0	0	1	0	0	0	0	76.21	90.39
11:00	55	48	1	4	0	1	0	0	0	0	0	0	0	0	78.06	90.82
12:00	58	49	3	4	0	0	0	0	0	1	0	0	0	0	77.76	90.97
13:00	47	40	2	4	0	0	0	0	0	0	0	0	0	0	78.28	92.73
14:00	64	58	1	4	0	0	0	0	0	1	0	0	0	0	77.79	91.52
15:00	67	58	2	4	1	0	0	0	0	1	0	0	0	0	76.52	89.46
16:00	67	58	2	6	0	0	0	1	0	0	0	0	0	0	75.99	88.97
17:00	67	58	1	7	0	0	0	0	0	0	0	0	0	0	75.10	88.96
18:00	50	44	1	4	0	0	0	0	0	0	0	0	0	0	73.96	86.62
19:00	22	20	0	2	0	0	0	0	0	0	0	0	0	0	74.52	-
20:00	13	12	0	1	0	0	0	0	0	0	0	0	0	0	75.74	-
21:00	10	9	0	1	0	0	0	0	0	0	0	0	0	0	74.89	-
22:00	6	5	0	0	0	0	0	0	0	0	0	0	0	0	73.37	-
23:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	73.78	-
Total	**935**	**824**	**25**	**66**	**4**	**3**	**1**	**4**	**0**	**6**	**1**	**1**	**0**	**0**	**76.68**	**93.27**

EXHIBITION COPY

1	Wandobah Rd N of Bush's Lane [80]											Southbound			

Friday, 28 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	59.70	-
1:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	98.15	-
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	82.70	-
4:00	5	2	0	3	0	0	0	0	0	0	0	0	0	0	77.60	-
5:00	6	4	1	1	0	0	0	0	0	0	0	0	0	0	73.60	-
6:00	23	20	0	2	1	0	0	0	0	0	0	0	0	0	77.13	-
7:00	33	28	0	3	1	0	0	0	0	1	0	0	0	0	76.60	83.30
8:00	37	31	1	5	0	0	0	0	0	0	0	0	0	0	77.75	84.40
9:00	52	44	2	4	0	1	0	1	0	0	0	0	0	0	78.48	91.38
10:00	61	50	6	4	0	0	0	0	0	1	0	0	0	0	78.33	95.52
11:00	57	47	5	5	0	0	0	0	0	0	0	0	0	0	77.98	90.33
12:00	61	56	0	3	1	1	0	0	0	0	0	0	0	0	78.80	89.42
13:00	66	60	1	3	1	0	1	0	0	0	0	0	0	0	76.08	85.85
14:00	80	66	6	8	0	0	0	0	0	0	0	0	0	0	78.40	93.01
15:00	122	113	3	6	0	0	0	0	0	0	0	0	0	0	79.53	88.53
16:00	109	100	4	5	0	0	0	0	0	0	0	0	0	0	79.15	94.10
17:00	97	90	1	4	0	0	0	1	0	0	0	1	0	0	77.30	90.84
18:00	72	68	0	3	0	0	0	0	0	1	0	0	0	0	78.68	93.37
19:00	50	45	1	4	0	0	0	0	0	0	0	0	0	0	77.30	94.70
20:00	29	28	0	1	0	0	0	0	0	0	0	0	0	0	85.10	98.90
21:00	20	19	0	1	0	0	0	0	0	0	0	0	0	0	82.63	-
22:00	18	16	1	1	0	0	0	0	0	0	0	0	0	0	79.15	-
23:00	11	9	0	2	0	0	0	0	0	0	0	0	0	0	81.23	-
Total	**1015**	**901**	**32**	**69**	**4**	**2**	**1**	**2**	**0**	**3**	**0**	**1**	**0**	**0**	**78.75**	**90.97**

Saturday, 29 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	85.60	-
1:00	5	4	1	0	0	0	0	0	0	0	0	0	0	0	79.80	-
2:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	93.63	-
3:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	81.25	-
4:00	4	3	0	1	0	0	0	0	0	0	0	0	0	0	78.63	-
5:00	4	1	1	2	0	0	0	0	0	0	0	0	0	0	78.60	-
6:00	12	10	0	1	0	0	0	0	0	0	0	0	0	1	86.08	-
7:00	21	18	0	3	0	0	0	0	0	0	0	0	0	0	77.80	-
8:00	33	29	3	1	0	0	0	0	0	0	0	0	0	0	79.85	100.80
9:00	47	42	1	4	0	0	0	0	0	0	0	0	0	0	76.00	94.78
10:00	55	49	3	3	0	0	0	0	0	0	0	0	0	0	77.75	93.00
11:00	78	73	0	4	0	0	1	0	0	0	0	0	0	0	78.50	89.96
12:00	93	85	4	3	1	0	0	0	0	0	0	0	0	0	77.98	90.15
13:00	58	52	3	3	0	0	0	0	0	0	0	0	0	0	80.60	92.23
14:00	74	67	1	5	0	0	0	1	0	0	0	0	0	0	80.88	89.78
15:00	59	55	0	4	0	0	0	0	0	0	0	0	0	0	77.93	85.38
16:00	75	67	4	4	0	0	0	0	0	0	0	0	0	0	78.43	90.13
17:00	88	79	2	7	0	0	0	0	0	0	0	0	0	0	76.48	87.71
18:00	59	54	1	4	0	0	0	0	0	0	0	0	0	0	73.25	87.26
19:00	30	24	0	6	0	0	0	0	0	0	0	0	0	0	77.85	-
20:00	29	28	0	1	0	0	0	0	0	0	0	0	0	0	79.70	93.60
21:00	11	10	0	0	0	1	0	0	0	0	0	0	0	0	80.70	-
22:00	13	13	0	0	0	0	0	0	0	0	0	0	0	0	68.63	-
23:00	17	16	0	1	0	0	0	0	0	0	0	0	0	0	77.78	-
Total	**875**	**789**	**24**	**57**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**1**	**79.32**	**91.23**

EXHIBITION COPY

Sunday, 30 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0	69.43	-
1:00	10	9	0	1	0	0	0	0	0	0	0	0	0	0	81.00	-
2:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0	73.38	-
3:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0	77.35	-
4:00	5	4	0	1	0	0	0	0	0	0	0	0	0	0	72.73	-
5:00	5	3	0	2	0	0	0	0	0	0	0	0	0	0	75.90	-
6:00	12	10	0	2	0	0	0	0	0	0	0	0	0	0	75.23	-
7:00	18	15	0	3	0	0	0	0	0	0	0	0	0	0	77.13	-
8:00	26	24	0	1	0	0	0	0	0	1	0	0	0	0	80.33	-
9:00	31	26	3	0	0	1	1	0	0	0	0	0	0	0	78.65	91.50
10:00	63	53	5	5	0	0	0	0	0	0	0	0	0	0	73.88	86.38
11:00	61	56	3	1	0	0	0	0	0	1	0	0	0	0	78.48	89.73
12:00	70	64	2	4	0	0	0	0	0	0	0	0	0	0	80.25	93.98
13:00	59	56	0	3	0	0	0	0	0	0	0	0	0	0	81.38	93.04
14:00	57	52	2	3	0	0	0	0	0	0	0	0	0	0	77.58	89.35
15:00	77	71	3	3	0	0	0	0	0	0	0	0	0	0	77.23	88.69
16:00	68	62	3	2	0	0	0	1	0	0	0	0	0	0	77.45	93.13
17:00	46	39	4	3	0	0	0	0	0	0	0	0	0	0	75.03	89.91
18:00	39	33	2	4	0	0	0	0	0	0	0	0	0	0	78.88	104.31
19:00	20	17	0	3	0	0	0	0	0	0	0	0	0	0	80.05	-
20:00	16	14	1	0	1	0	0	0	0	0	0	0	0	0	75.28	-
21:00	8	7	1	0	0	0	0	0	0	0	0	0	0	0	80.70	-
22:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	91.90	-
23:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	84.43	-
Total	**722**	**646**	**29**	**41**	**1**	**1**	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**78.07**	**92.00**

Monday, 31 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1:00	2	1	1	0	0	0	0	0	0	0	0	0	0	0	90.35	-
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87.20	-
4:00	3	2	1	0	0	0	0	0	0	0	0	0	0	0	94.65	-
5:00	12	8	0	3	0	1	0	0	0	0	0	0	0	0	77.63	-
6:00	31	23	0	2	2	4	0	0	0	0	0	0	0	0	79.18	-
7:00	45	33	0	4	1	6	0	0	0	1	0	0	0	0	74.75	86.93
8:00	44	32	2	4	1	4	0	0	0	1	0	0	0	0	78.80	89.29
9:00	53	45	2	1	2	2	0	0	0	1	0	0	0	0	76.55	87.87
10:00	46	37	2	2	1	2	0	0	0	2	0	0	0	0	73.08	95.25
11:00	49	45	1	1	0	0	0	0	0	2	0	0	0	0	76.78	90.84
12:00	70	63	2	3	2	0	0	0	0	0	0	0	0	0	77.73	89.30
13:00	51	45	4	0	0	0	0	0	0	2	0	0	0	0	77.43	88.34
14:00	47	41	2	4	0	0	0	0	0	0	0	0	0	0	79.20	91.20
15:00	93	87	2	4	0	0	0	0	0	0	0	0	0	0	77.03	86.77
16:00	110	98	2	7	1	0	0	0	0	1	1	0	0	0	78.08	88.57
17:00	133	119	3	8	0	0	0	3	0	0	0	0	0	0	76.98	86.56
18:00	78	69	1	8	0	0	0	0	0	0	0	0	0	0	74.03	84.91
19:00	46	42	0	4	0	0	0	0	0	0	0	0	0	0	80.28	94.93
20:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0	79.15	-
21:00	12	10	0	2	0	0	0	0	0	0	0	0	0	0	79.73	-
22:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0	82.33	-
23:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	81.33	-
Total	**957**	**832**	**25**	**57**	**10**	**19**	**0**	**3**	**0**	**10**	**1**	**0**	**0**	**0**	**79.65**	**89.29**

EXHIBITION COPY

Sunday, 30 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	8	8	0	0	0	0	0	0	0	0	0	0	0	0	69.43	-
1:00	10	9	0	1	0	0	0	0	0	0	0	0	0	0	81.00	-
2:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0	73.38	-
3:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0	77.35	-
4:00	5	4	0	1	0	0	0	0	0	0	0	0	0	0	72.73	-
5:00	5	3	0	2	0	0	0	0	0	0	0	0	0	0	75.90	-
6:00	12	10	0	2	0	0	0	0	0	0	0	0	0	0	75.23	-
7:00	18	15	0	3	0	0	0	0	0	0	0	0	0	0	77.13	-
8:00	26	24	0	1	0	0	0	0	0	1	0	0	0	0	80.33	-
9:00	31	26	3	0	0	1	1	0	0	0	0	0	0	0	78.65	91.50
10:00	63	53	5	5	0	0	0	0	0	0	0	0	0	0	73.88	86.38
11:00	61	56	3	1	0	0	0	0	0	1	0	0	0	0	78.48	89.73
12:00	70	64	2	4	0	0	0	0	0	0	0	0	0	0	80.25	93.98
13:00	59	56	0	3	0	0	0	0	0	0	0	0	0	0	81.38	93.04
14:00	57	52	2	3	0	0	0	0	0	0	0	0	0	0	77.58	89.35
15:00	77	71	3	3	0	0	0	0	0	0	0	0	0	0	77.23	88.69
16:00	68	62	3	2	0	0	0	1	0	0	0	0	0	0	77.45	93.13
17:00	46	39	4	3	0	0	0	0	0	0	0	0	0	0	75.03	89.91
18:00	39	33	2	4	0	0	0	0	0	0	0	0	0	0	78.88	104.31
19:00	20	17	0	3	0	0	0	0	0	0	0	0	0	0	80.05	-
20:00	16	14	1	0	1	0	0	0	0	0	0	0	0	0	75.28	-
21:00	8	7	1	0	0	0	0	0	0	0	0	0	0	0	80.70	-
22:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	91.90	-
23:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	84.43	-
Total	**722**	**646**	**29**	**41**	**1**	**1**	**1**	**1**	**0**	**2**	**0**	**0**	**0**	**0**	**78.07**	**92.00**

Monday, 31 July 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1:00	2	1	1	0	0	0	0	0	0	0	0	0	0	0	90.35	-
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	87.20	-
4:00	3	2	1	0	0	0	0	0	0	0	0	0	0	0	94.65	-
5:00	12	8	0	3	0	1	0	0	0	0	0	0	0	0	77.63	-
6:00	31	23	0	2	2	4	0	0	0	0	0	0	0	0	79.18	-
7:00	45	33	0	4	1	6	0	0	0	1	0	0	0	0	74.75	86.93
8:00	44	32	2	4	1	4	0	0	0	1	0	0	0	0	78.80	89.29
9:00	53	45	2	1	2	2	0	0	0	1	0	0	0	0	76.55	87.87
10:00	46	37	2	2	1	2	0	0	0	2	0	0	0	0	73.08	95.25
11:00	49	45	1	1	0	0	0	0	0	2	0	0	0	0	76.78	90.84
12:00	70	63	2	3	2	0	0	0	0	0	0	0	0	0	77.73	89.30
13:00	51	45	4	0	0	0	0	0	0	2	0	0	0	0	77.43	88.34
14:00	47	41	2	4	0	0	0	0	0	0	0	0	0	0	79.20	91.20
15:00	93	87	2	4	0	0	0	0	0	0	0	0	0	0	77.03	86.77
16:00	110	98	2	7	1	0	0	0	0	1	1	0	0	0	78.08	88.57
17:00	133	119	3	8	0	0	0	3	0	0	0	0	0	0	76.98	86.56
18:00	78	69	1	8	0	0	0	0	0	0	0	0	0	0	74.03	84.91
19:00	46	42	0	4	0	0	0	0	0	0	0	0	0	0	80.28	94.93
20:00	16	16	0	0	0	0	0	0	0	0	0	0	0	0	79.15	-
21:00	12	10	0	2	0	0	0	0	0	0	0	0	0	0	79.73	-
22:00	11	11	0	0	0	0	0	0	0	0	0	0	0	0	82.33	-
23:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	81.33	-
Total	**957**	**832**	**25**	**57**	**10**	**19**	**0**	**3**	**0**	**10**	**1**	**0**	**0**	**0**	**79.65**	**89.29**

EXHIBITION COPY

Thursday, 3 August 2023

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
1:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	69.40	-
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
3:00	4	4	0	0	0	0	0	0	0	0	0	0	0	0	80.70	-
4:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-
5:00	6	5	0	1	0	0	0	0	0	0	0	0	0	0	73.00	-
6:00	26	20	0	3	1	0	0	0	0	2	0	0	0	0	75.95	-
7:00	36	34	0	2	0	0	0	0	0	0	0	0	0	0	78.45	91.40
8:00	47	35	3	8	0	0	0	0	0	1	0	0	0	0	76.05	87.87
9:00	49	42	2	3	0	0	1	0	1	0	0	0	0	0	79.05	90.39
10:00	44	41	1	1	0	0	0	1	0	0	0	0	0	0	76.88	83.40
11:00	62	52	5	3	0	0	0	1	0	0	1	0	0	0	74.90	88.34
12:00	57	45	2	5	1	0	0	0	0	1	2	0	0	1	78.20	90.91
13:00	56	51	1	1	1	0	1	0	0	1	0	0	0	0	79.10	89.15
14:00	63	56	4	1	1	0	0	0	0	0	1	0	0	0	78.30	91.52
15:00	103	91	3	4	1	0	1	0	0	2	1	0	0	0	77.78	87.98
16:00	127	115	4	5	0	0	0	3	0	0	0	0	0	0	77.63	85.48
17:00	147	140	3	4	0	0	0	0	0	0	0	0	0	0	77.78	87.29
18:00	85	78	1	6	0	0	0	0	0	0	0	0	0	0	76.43	89.03
19:00	45	40	1	3	1	0	0	0	0	0	0	0	0	0	81.63	92.73
20:00	20	20	0	0	0	0	0	0	0	0	0	0	0	0	85.90	-
21:00	11	10	1	0	0	0	0	0	0	0	0	0	0	0	77.63	-
22:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0	74.28	-
23:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	73.20	-
Total	**1003**	**894**	**31**	**50**	**6**	**0**	**3**	**5**	**1**	**7**	**5**	**0**	**0**	**1**	**77.25**	**88.88**

Weekday Average

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	1	1	0	0	0	0	0	0	0	0	0	0	0	0	68.90	-
1:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	80.42	-
2:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	105.25	-
3:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	81.95	-
4:00	2	1	0	1	0	0	0	0	0	0	0	0	0	0	76.90	-
5:00	8	6	0	1	0	0	0	0	0	0	0	0	0	0	76.85	-
6:00	26	21	0	2	1	1	0	0	0	0	0	0	0	0	76.20	82.80
7:00	38	32	1	3	0	1	0	0	0	1	0	0	0	0	76.37	87.01
8:00	42	33	2	5	0	1	0	0	0	1	0	0	0	0	77.52	86.89
9:00	49	41	2	3	1	1	0	0	0	0	0	0	0	0	78.08	88.96
10:00	45	38	2	3	0	0	0	0	0	1	0	0	0	0	77.21	89.77
11:00	55	47	4	2	0	0	0	0	0	1	0	0	0	0	76.85	91.35
12:00	62	54	2	4	1	0	0	0	0	0	0	0	0	0	77.84	90.66
13:00	59	53	2	2	0	0	0	0	0	1	0	0	0	0	77.99	89.15
14:00	65	56	3	4	0	0	0	0	0	1	0	0	0	0	78.08	90.84
15:00	104	96	3	4	0	0	0	0	0	0	0	0	0	0	78.01	87.42
16:00	118	110	2	5	0	0	0	1	0	0	0	0	0	0	77.92	88.29
17:00	128	119	2	5	0	0	0	1	0	0	0	0	0	0	77.48	87.65
18:00	83	77	1	5	0	0	0	0	0	0	0	0	0	0	76.39	87.88
19:00	47	43	0	4	0	0	0	0	0	0	0	0	0	0	79.47	91.11
20:00	22	21	0	1	0	0	0	0	0	0	0	0	0	0	79.91	98.90
21:00	16	14	0	1	0	0	0	0	0	0	0	0	0	0	79.93	-
22:00	11	10	0	0	0	0	0	0	0	0	0	0	0	0	75.83	-
23:00	6	5	0	1	0	0	0	0	0	0	0	0	0	0	77.69	-
Total	**993**	**884**	**28**	**56**	**6**	**4**	**1**	**3**	**0**	**7**	**3**	**1**	**0**	**0**	**78.20**	**92.85**

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Weekend Average

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	7	7	0	0	0	0	0	0	0	0	0	0	0	0	77.51	-
1:00	8	7	1	1	0	0	0	0	0	0	0	0	0	0	80.40	-
2:00	6	6	0	0	0	0	0	0	0	0	0	0	0	0	83.50	-
3:00	5	5	0	0	0	0	0	0	0	0	0	0	0	0	79.30	-
4:00	5	4	0	1	0	0	0	0	0	0	0	0	0	0	75.68	-
5:00	5	2	1	2	0	0	0	0	0	0	0	0	0	0	77.25	-
6:00	12	10	0	2	0	0	0	0	0	0	0	0	0	1	80.65	-
7:00	20	17	0	3	0	0	0	0	0	0	0	0	0	0	77.47	-
8:00	30	27	2	1	0	0	0	0	0	1	0	0	0	0	80.09	100.80
9:00	39	34	2	2	0	1	1	0	0	0	0	0	0	0	77.33	93.14
10:00	59	51	4	4	0	0	0	0	0	0	0	0	0	0	75.81	89.69
11:00	70	65	2	3	0	0	1	0	0	1	0	0	0	0	78.49	89.85
12:00	82	75	3	4	1	0	0	0	0	0	0	0	0	0	79.11	92.07
13:00	59	54	2	3	0	0	0	0	0	0	0	0	0	0	80.99	92.64
14:00	66	60	2	4	0	0	0	1	0	0	0	0	0	0	79.23	89.56
15:00	68	63	2	4	0	0	0	0	0	0	0	0	0	0	77.58	87.03
16:00	72	65	4	3	0	0	0	1	0	0	0	0	0	0	77.94	91.63
17:00	67	59	3	5	0	0	0	0	0	0	0	0	0	0	75.75	88.81
18:00	49	44	2	4	0	0	0	0	0	0	0	0	0	0	76.06	95.78
19:00	25	21	0	5	0	0	0	0	0	0	0	0	0	0	78.95	-
20:00	23	21	1	1	1	0	0	0	0	0	0	0	0	0	77.49	93.60
21:00	10	9	1	0	0	1	0	0	0	0	0	0	0	0	80.70	-
22:00	9	9	0	0	0	0	0	0	0	0	0	0	0	0	80.26	-
23:00	10	10	0	1	0	0	0	0	0	0	0	0	0	0	81.10	-
Total	**799**	**718**	**27**	**49**	**1**	**1**	**1**	**1**	**0**	**1**	**0**	**0**	**0**	**1**	**78.69**	**93.85**

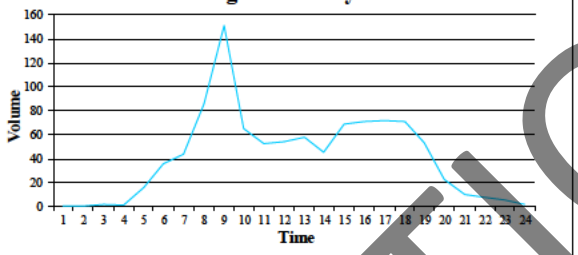
7-Day Average

Time	Total	1	2	3	4	5	6	7	8	9	10	11	12	13	Mean	85th Percentile
0:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	72.35	-
1:00	4	3	0	0	0	0	0	0	0	0	0	0	0	0	80.41	-
2:00	2	2	0	0	0	0	0	0	0	0	0	0	0	0	94.38	-
3:00	3	3	0	0	0	0	0	0	0	0	0	0	0	0	81.19	-
4:00	3	2	0	1	0	0	0	0	0	0	0	0	0	0	76.49	-
5:00	7	5	0	1	0	0	0	0	0	0	0	0	0	0	76.96	-
6:00	22	18	0	2	1	1	0	0	0	0	0	0	0	0	77.47	82.80
7:00	33	28	0	3	0	1	0	0	0	0	0	0	0	0	76.68	87.01
8:00	39	31	2	4	0	1	0	0	0	1	0	0	0	0	78.25	89.21
9:00	46	39	2	3	1	1	0	0	0	0	0	0	0	0	77.86	90.15
10:00	49	42	3	3	0	0	0	0	0	1	0	0	0	0	76.81	89.75
11:00	59	52	3	2	0	0	0	0	0	1	0	0	0	0	77.32	90.92
12:00	67	60	2	4	1	0	0	0	0	0	0	0	0	0	78.20	91.06
13:00	59	53	2	2	0	0	0	0	0	1	0	0	0	0	78.85	90.15
14:00	65	57	2	4	0	0	0	0	0	0	0	0	0	0	78.41	90.48
15:00	94	86	3	4	0	0	0	0	0	0	0	0	0	0	77.88	87.31
16:00	105	97	3	5	0	0	0	1	0	0	0	0	0	0	77.93	89.24
17:00	111	102	3	5	0	0	0	1	0	0	0	0	0	0	76.98	87.98
18:00	74	68	1	5	0	0	0	0	0	0	0	0	0	0	76.30	90.14
19:00	41	36	0	4	0	0	0	0	0	0	0	0	0	0	79.32	91.11
20:00	22	21	0	1	0	0	0	0	0	0	0	0	0	0	79.22	96.25
21:00	14	13	0	1	0	0	0	0	0	0	0	0	0	0	80.15	-
22:00	10	10	0	0	0	0	0	0	0	0	0	0	0	0	77.10	-
23:00	7	7	0	1	0	0	0	0	0	0	0	0	0	0	78.67	-
Total	**937**	**836**	**27**	**54**	**4**	**3**	**1**	**3**	**0**	**6**	**2**	**0**	**0**	**0**	**78.34**	**93.13**

EXHIBITION COPY

Site 1 Wandobah Rd N of Bush's Lane [80] **Northbound**

Day / Time	Fri 28/07/23	Sat 29/07/2023	Sun 30/07/2023	Mon 31/07/2023	Tue 1/08/2023	Wed 2/08/2023	Thu 3/08/2023	W/Day Ave.	W/End Ave.	7 Day Ave
0:00	1	1	9	1	0	1	0	1	5	2
1:00	0	4	10	0	0	0	0	0	7	2
2:00	0	2	8	1	4	2	2	2	5	3
3:00	2	3	6	0	2	2	1	1	5	2
4:00	19	4	8	11	15	19	14	16	6	13
5:00	29	12	8	38	43	31	37	36	10	28
6:00	38	11	16	38	42	57	45	44	14	35
7:00	83	44	20	86	89	82	87	85	32	70
8:00	136	77	46	156	159	152	154	151	62	126
9:00	80	81	55	70	53	57	66	65	68	66
10:00	47	84	76	48	57	60	51	53	80	60
11:00	65	63	53	55	48	51	51	54	58	55
12:00	74	69	49	45	59	45	66	58	59	58
13:00	50	53	50	40	30	60	47	45	52	47
14:00	79	49	57	58	73	66	66	68	53	64
15:00	72	47	65	59	94	55	76	71	56	67
16:00	81	52	60	67	67	64	78	71	56	67
17:00	58	63	52	88	72	73	62	71	58	67
18:00	55	54	27	53	52	49	57	53	41	50
19:00	31	26	16	17	22	20	23	23	21	22
20:00	12	27	11	13	9	7	10	10	19	13
21:00	15	20	10	8	6	6	3	8	15	10
22:00	11	8	5	4	1	7	3	5	7	6
23:00	6	5	4	1	0	2	1	2	5	3
Total	**1044**	**859**	**721**	**957**	**997**	**968**	**1000**	**993**	**790**	**935**



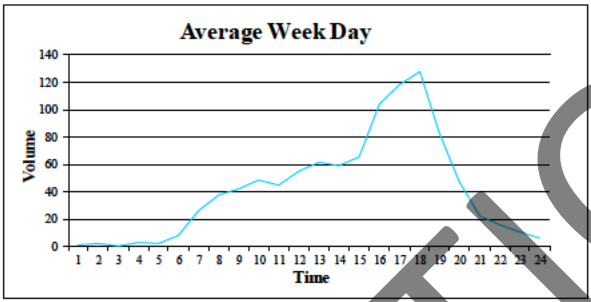
Summary

	from	to	
AM Peak	8 00 AM	9 00 AM	159
PM Peak	3 00 PM	4 00 PM	94
Week Day Average			993
Weekend Day Average			790
7 Day Average			935

EXHIBITION COPY

Site 1 Wandobah Rd N of Bush's Lane [80] **Southbound**

Day / Time	Fri 28/07/23	Sat 29/07/2023	Sun 30/07/2023	Mon 31/07/2023	Tue 1/08/2023	Wed 2/08/2023	Thu 3/08/2023	W/Day Ave.	W/End Ave.	7 Day Ave
0:00	1	5	8	0	3	2	0	1	7	3
1:00	3	5	10	2	4	2	1	2	8	4
2:00	0	3	9	0	1	1	0	0	6	2
3:00	2	2	7	1	3	3	4	3	5	3
4:00	5	4	5	3	2	1	0	2	5	3
5:00	6	4	5	12	9	6	6	8	5	7
6:00	23	12	12	31	25	25	26	26	12	22
7:00	33	21	18	45	42	33	36	38	20	33
8:00	37	33	26	44	39	45	47	42	30	39
9:00	52	47	31	53	42	47	49	49	39	46
10:00	61	55	63	46	35	39	44	45	59	49
11:00	57	78	61	49	65	43	62	55	70	59
12:00	61	93	70	70	50	70	57	62	82	67
13:00	66	58	59	51	66	56	56	59	59	59
14:00	80	74	57	47	69	66	63	65	66	65
15:00	122	59	77	93	109	94	103	104	68	94
16:00	109	75	68	110	128	117	127	118	72	105
17:00	97	88	46	133	133	130	147	128	67	111
18:00	72	59	39	78	88	94	85	83	49	74
19:00	50	30	20	46	50	45	45	47	25	41
20:00	29	29	16	16	26	20	20	22	23	22
21:00	20	11	8	12	12	23	11	16	10	14
22:00	18	13	4	11	6	10	9	11	9	10
23:00	11	17	3	4	5	5	5	6	10	7
Total	**1015**	**875**	**722**	**957**	**1012**	**977**	**1003**	**993**	**799**	**937**



Summary

	from	to	
AM Peak	11:00 AM	12:00 PM	65
PM Peak	5:00 PM	6:00 PM	147
Week Day Average			993
Weekend Day Average			799
7 Day Average			937

EXHIBITION COPY

RE: Traffic Count - Bushs Lane/Robert Gordon Drive

Good Afternoon Kathryn,

Traffic Counts have been completed for Bushs Lane and Robert Gordon Drive as follows;

Site: Bushs Lane – Approx. 100m West of Wandobah Rd intersection
Start Date: 26 Oct 2022
End Date: 05 Dec 2022
85th % Speed: 75.33kph
AADT: 424
Percentage Heavy Vehicles: 16 %

Site: Robert Gordon Drive – Between Bushs Ln and Kerry Elizabeth Dve
Start Date: 26 Oct 2022
End Date: 05 Dec 2022
85th % Speed: 79.02kph
AADT: 88
Percentage Heavy Vehicles: 35 %

Apologies for delay.

Kind Regards,

Toby

Toby Baillie Survey and Land Property Officer
Gunnedah Shire Council
[redacted]
PO Box 63 (63 Elgin Street), GUNNEDAH NSW 2380
www.gunnedah.nsw.gov.au or www.facebook.com/gunnedahshire

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APPENDIX E

BIODIVERSITY OFFSET SCHEME REPORT

EXHIBITION COPY

Stewart Surveys Pty Ltd
ABN 65 002 886 508

109 Conadilly Street
PO Box 592
Gunnedah NSW 2380

T 02 6742 2966
office@stewartsurveys.com
www.stewartsurveys.com

Biodiversity Offset Scheme (BOS) Entry Threshold Map

983.7 0 491.83 983.7 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

EXHIBITION COPY

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days

Notes

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NSW GOVERNMENT

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	01/02/2022 2:16 PM	**BDAR Required***
Total Digitised Area	62.49 ha	60.3ha
Minimum Lot Size Method	LEP	
Minimum Lot Size	9000m2	
Area Clearing Threshold	0.25 ha	
Area clearing trigger Area of native vegetation cleared	Unknown #	>0.25ha
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no	YES
Date of the 90 day Expiry	N/A	

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is '"likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the *Biodiversity Conservation Act 2016.*

The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature Kathryn Stewart Date: 01/02/2022 02:16 PM

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APPENDIX F

Biodiversity Development Assessment Report, 210 Bushs Lane subdivision, Gunnedah
Prepared by Tom Pollard, Birdwing Ecology, Dated March 2025

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Department of Planning and Environment

Biodiversity Development Assessment Report, 210 Bushs Lane subdivision, Gunnedah

Prepared by Tom Pollard, BAAS18071

BIRDWING ecological services

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Final Report March 2025

Document control

Version	Date	Author	Details
1	14/03/2025	T. Pollard	Final issued with development application

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Summary

- The proposed development is for a rural residential subdivision. The development would result in the establishment of 61 residential lots. Access to the new lots would be off Bushs Lane and Robert Gordon Road.
- The BOS applies to the proposed development as native vegetation removal for the proposal exceeds the clearing threshold for the minimum lot size shown in the Gunnedah LEP 2012.
- The subject land supports 12.77 ha of PCT 101 – Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion and 3.05 ha of PCT 435 White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion. This vegetation occurs in a range of condition states (vegetation zones) of low and moderate condition.
- An area of 2.59 ha of PCT 435 within the subject land is consistent with a low to moderate condition example of the threatened ecological community (TEC) *'White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions'.* This vegetation is also consistent with the federally listed EC '*White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland'.*
- The project has been located to occupy an already substantially disturbed site. The majority of the subject land (74.7%) consists of non-native vegetation (cropped land) and a further 23.7% consists of low condition native vegetation below the threshold requiring a biodiversity offset. Only 1.6% of the subject land supports vegetation in medium condition. It is proposed that 75.9% of this better quality vegetation (totalling 0.66 ha) be retained by way of a s88b mechanism under the Conveyancing Act 1919 on the title of individual lots.
- The majority of the proposal avoids removal of TEC vegetation, with only a small area of approximately 0.13 ha of TEC requiring removal. To minimise impacts on the occurrence of this TEC on the subject land, it is proposed that approximately 59.1% of the occurrence of this TEC be protected within s88b areas under the *Conveyancing Act 1919* on individual lot titles The majority of the area of TEC proposed for removal consists of low condition derived native grassland (87.1%).
- The results of the BAM targeted surveys indicate that removal of native vegetation for the proposal would be unlikely to impact on any threatened species and their habitat.
- Possible indirect impacts of the proposed development would include inadvertent impacts on adjacent habitat or vegetation, and transport of weeds and pathogens from the site to adjacent vegetation.
- Recommended mitigation measures consist of:
  - Adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance
  - Using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas
  - Protection of retained trees with s88b mechanism under the *Conveyancing Act 1919*
  - Using Koala friendly fencing around s88b areas
  - Prepare a Vegetation Management Plan for s88b areas
- Table E1 identifies impacts that require an offset (as per BAM Subsection 9.2.2(2.)).

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Table E1 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
101_medium_woodland	PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	-	0.08	2
435_medium_woodland	PCT 435 White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (BC Act)/ White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act)*	0.13	2

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Shortened forms

APZ	asset protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	critically endangered ecological community
DBH	diameter at breast height over bark
EC	ecological community listed under the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	endangered ecological community
HTW	high threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	matters of national environmental significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	plant community type
SAII	serious and irreversible impact
TBDC	Threatened Biodiversity Data Collection
TEC	threatened ecological community
VEC	vulnerable ecological community

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Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the *Biodiversity Conservation Act 2016* (BC Act).

Signature:

Date: 14/03/2025

BAM Assessor Accreditation no: BAAS18071

This BDAR has been prepared to meet the requirements of BAM 2020. Appendix A provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

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ii. Details and experience of author/s and contributors

Authors and contributors

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications
Tom Pollard	BAAS18071	Ecologist	• BAM-C data entry and analysis • BAM plot surveys • targeted threatened flora surveys • targeted threatened fauna surveys • BDAR preparation • mapping and figure preparation	BSc (1st Class Honours University of Queensland PhD (Vegetation ecology) University of Tasmania

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iii. Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.

Signature:

Date: 14/03/2025

BAM Assessor Accreditation no: BAAS18071

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Stage 1: Biodiversity assessment

1. Introduction

1.1 Proposed development

1.1.1 Development overview

The proposed development is for a rural residential subdivision.

The legislative pathway for the proposed development is 'development that requires consent' that is assessed under Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act 1979).

1.1.2 Location

The proposed development is located at 210 Bushs Lane, Gunnedah (refer to Figure 1 and Figure 2).

1.1.3 Proposed development and the subject land

The proposed development is for a 61 lot residential within Lot 27 and 28 in DP755474.

The layout of the proposed development is shown in Figure 3. Main works involved for the subdivision will include:

- Initial clearing of native vegetation.
- Earthworks.
- Construction of associated infrastructure (internal roads, stormwater and drainage).
- Connection of services (power, water, fibre).

It is proposed that the subdivision will be released in 4 stages and therefore the above works will be undertaken to the extent necessary to facilitate the release of each stage.

The subject land boundary is shown in Figure 1, covering a total area of approximately 60.54 ha.

A construction footprint has not been specifically designated for the development, as there would be no separate construction clearing associated with temporary/ancillary construction facilities or infrastructure. The operational footprint of the development coincides with the footprint of the proposed development as shown in Figure 3.

The subject land occurs in the New England-North West region, in an area with generally low relief. Site elevation ranges from approximately 342-372 m above mean sea level. The area is an erosional landscape on sedimentary geology. The subject land topography consists of a gentle slope with an easterly aspect. The subject land includes lower order (1st and 2nd order) waterways.

Previous land use is likely to have included stock grazing, agriculture and removal of timber and firewood. The land is currently used for stock grazing and cropping.

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1.2 Biodiversity Offsets Scheme entry

The BOS applies to the proposed development as native vegetation removal for the proposal exceeds the clearing threshold of 0.25 ha for the minimum lot size of 9000 m^2 (Gunnedah LEP 2012) (refer to Appendix B Biodiversity Values Map and Threshold tool report, The subject land does not include any mapped Biodiversity Values (refer to Figure 4).

1.3 Matters of national environmental significance

The proposed development is not deemed a controlled action and does not need referral under the EPBC Act.

1.4 Information sources

The following key information sources were used in this BDAR:

- Interim Biogeographic Regionalisation for Australia (IBRA) (Subregions - States and Territories) version 7 [ESRI shapefile]. Department of the Environment (2012).
- *Mitchell Landscapes version 3.1* [ESRI shapefile]. NSW Office of Environment and Heritage (2010).
- *BioNet Vegetation Classification Database.* NSW Department of Planning, Industry and Environment (2025). Accessed online via login at https://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx
- *NSW Biodiversity Values Map* https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap
- NSW Office of Environment and Heritage (2020). *Biodiversity Assessment Method.* Office of Environment and Heritage for the NSW Government, Sydney, NSW.
- Department of Planning, Industry and Environment (2020). *Biodiversity Assessment Method 2020 Operational Manual - Stage 1.* State of NSW and Department of Planning, Industry and Environment.
- Department of Planning, Industry and Environment (2023). *Biodiversity Assessment Method 2020 Operational Manual - Stage 2.* State of NSW and Department of Planning, Industry and Environment.
- *NSW BAM Credit Calculator*. Accessed online via login at https://customer.lmbc.nsw.gov.au/assessment/s/userlogin
- *NSW Atlas of NSW Wildlife (BioNet)* (including BioNet 'threatened biodiversity data collection' [TBDC]). Accessed online via login at https://www.environment.nsw.gov.au/asmslightprofileapp/Account/MyApps
- *NSW Threatened Species Profiles* https://www.environment.nsw.gov.au/threatenedspeciesapp/
- *Commonwealth Department of the Environment and Energy Protected Matters Search Tool (PMST).* Accessed online at http://environment.gov.au/epbc/protected-matters-search-tool
- *Australian Government's Species Profiles and Threats (SPRAT) database* http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
- *NSW Wetlands layer* [ESRI Shapefile]. Office of Environment and Heritage (2013).
- *NSW Flora Online.* National Herbarium of NSW, Royal Botanic Garden, Sydney Australia. Available from: http://plantnet.rbgsyd.nsw.gov.au/floraonline.htm
- NSW State Vegetation Type Map – Extant PCT (release vC2.0.M2.1). [Quickview (Vector Data - Geodatabase Format) and SVTM NSW Extant PCT 5m (Raster Data -

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TIFF format)]. State Government of NSW and Department of Planning and Environment (2024).

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2. Methods

2.1 Site context methods

2.1.1 Landscape features

A full site walk over of the subject land was conducted to determine the occurrence of rivers, streams, estuaries or wetlands, karsts, caves, crevices or cliffs, rocks or other areas of geological significance.

2.1.2 Native vegetation cover

Desktop assessment to determine the extent and condition of native vegetation cover on the subject land and assessment area consisted of investigation of available vegetation mapping (State Government of NSW and Department of Planning and Environment 2024), aerial photograph interpretation and knowledge of the vegetation within the assessment area.

It was not possible to estimate the extent of derived grassland communities with native vegetation occurring within the assessment area outside of the subject land due to project time and cost constraints and inability to gain access to the required properties for assessment. Consequently, only mapped PCTs as shown in the NSW SVTM were included to estimate the native vegetation cover in the assessment area.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

Potential plant communities occurring at the subject land and in adjacent areas were determined using available vegetation mapping and aerial photograph interpretation (State Government of NSW and Department of Planning and Environment 2024).

Five potential vegetation types were identified, consisting of:

- PCT 101 – Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion
- PCT 592 – Narrow-leaved Ironbark - cypress pine - White Box shrubby open forest in the Brigalow Belt South Bioregion and Nandewar Bioregion
- PCT 393 – White Box shrubby woodland of the western Liverpool Range, Warrumbungle Range and south-west Pilliga forests, Brigalow Belt South Bioregion
- PCT 433 – White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion
- PCT 435 – White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

Relevant BioNet Flora Survey data was reviewed within a 5 km radius of the subject land.

2.2.2 Mapping native vegetation extent

The extent of native vegetation on the subject land was determined by way of a full site walk over. All vegetation that met the definition of native vegetation under section 60B of the *Local Land Services Act 2013* was mapped as native vegetation.

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Cropped areas of the land were dominated by exotic species and were treated as exotic vegetation.

2.2.3 Plot-based vegetation survey

A plot-based vegetation survey was undertaken on 26 h-28th May 2021, 29th-30 h September 2021, 24th May 2022 and 20th-21st January 2023 in accordance with the BAM (State of NSW and Department of Planning, Industry and Environment 2020). Floristic data was collected from the minimum number of plots established within each vegetation zone to provide information on determining the PCTs present (refer to Figure 5).

Plot locations were initially selected using aerial photography with the aim to sample representative areas within each vegetation zone. On the ground, the final location of plots was randomised by walking a random distance into the vegetation zone and establishing the plot on a random bearing. Floristic data was collected as directed in the BAM methodology consisting of a plot-based floristic vegetation survey within a 400 m^2 area.

2.2.4 Vegetation integrity survey

A vegetation integrity survey was undertaken on 26th-28th May 2021, 29th-30th September 2021, 24th May 2022 and 20th-21st January 2023 in accordance with the BAM (State of NSW and Department of Planning, Industry and Environment 2020). The aim of the survey was to use the BAM to assess PCT structure, function and composition. The number of plots was determined by vegetation zone area (refer to Figure 5).

The survey consisted of data collection within a 400 m^2 survey plot (for measuring composition and structure attributes) nested within a 1000 m^2 survey plot (for measuring function attributes).

These attributes were measured against the relevant benchmark data from the BioNet Vegetation Classification. The use of more appropriate local benchmark data was not proposed to conduct the integrity assessment.

2.3 Threatened flora survey methods

2.3.1 Review of existing information

Habitat constraints and microhabitats were reviewed or each candidate threatened flora species identified by the BAM-C using descriptions in the TBDC.

2.3.2 Habitat constraints assessment

A preliminary assessment of the subject land was undertaken in May 2021 to assess habitat constraints and microhabitats for threatened flora within the subject land. This involved a random meander of the subject land.

2.3.3 Field surveys

Figure 5 shows the location of field surveys for flora undertaken on the subject land.

Threatened flora surveys were required for the potentially occurring species *Cyperus conicus*, Belson's Panic (*Homopholis belsonii*), Lage-leafed Monotaxis (*Monotaxis macrophylla),* Slender Darling Pea (*Swainsona murrayana*) and *Tylophora linearis*.

Targeted surveys for these threatened flora were undertaken in accordance with the NSW Threatened Guideline to Surveying Threatened Plants (OEH 2016). With consideration of the open vegetation present at the site a separation between parallel field-traverses of 10 m

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was selected which was adequate for detection of groundcover species within woodland and derived grassland areas.

2.4 Threatened fauna survey methods

2.4.1 Review of existing information

Habitat constraints and microhabitats were reviewed or each candidate threatened fauna species identified by the BAM-C using descriptions in the TBDC.

2.4.2 Habitat constraints assessment

A preliminary assessment of the subject land was undertaken in May 2021 to identify the presence of habitat constraints and microhabitats occurring on the subject land relevant to each candidate threatened fauna species. This involved a random meander of the subject land. In particular, focus was given to identifying:

- the presence of hollow-bearing trees with suitably sized hollow dimensions (and height above ground where relevant)
- the presence of raptor nest trees
- presence of koala food trees.

2.4.3 Field surveys

Figure 5 shows the location of field surveys for fauna undertaken on the subject land.

Following the habitat constraints assessment, candidate threatened fauna species requiring survey were identified to be *Phascolarctos cinereus* (Koala).

Survey methods for each species are detailed below:

Phascolarctos cinereus (Koala)

- In accordance with (DPE 2022) the suitable koala habitat occurring at the site was surveyed by way of SAT plots and spotlighting.
- In accordance with DPE (2022) as the area of suitable habitat is <5 ha, a single 200 m transect was used. Surveys were undertaken with a 100w Powabeam spotlight (model PL 145, manufacture date 2013).

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2.5 Weather conditions

Table 1 documents the weather conditions at the time that surveys were conducted (drawn from Gunnedah Airport AWS (BoM station 055202)).

Table 1 Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	**Date**	**Time**	**Temperature** (min. & max.)	**Wind (light, mod…)**	**Rainfall** (mm)	**Other conditions relevant to the species**
Habitat constraints survey	26th May 2021	9:00am-12:00pm	4.1 (min) 23.3 (max)	moderate	0.0	
Threatened flora parallel traverses	30th September 2021	1:00pm-5:00pm	9.4 (min) 24.0 (max)	light	0.2	
	20th January 2023	8:00am-5:00pm	16.3 (min) 32.4 (max)	moderate	0.0	
Koala - SAT plots	27th May 2021	9:00am-12:00pm	-0.6 (min) 18.7 (max)	moderate	0.0	no heavy rain in previous 48 hrs
Koala - spotlighting	26th May 2021	6:00pm-7:00pm	4.1 (min) 23.3 (max)	moderate	0.0	
	27th May 2021	6:00pm-6:30pm	-0.6 (min) 18.7 (max)	moderate	0.0	

2.6 Limitations

There were no particular limitations to surveys being conducted.

Appropriate licences to undertake the required survey are listed below:

- Scientific Licence (SL101582).
- Animal Research Authority (15/1405)

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3. Site context

3.1 Assessment area

The proposal is for a site-based development. The assessment area covers approximately 1222 ha and consists of the subject land and the area of land within the 1500 metre buffer zone surrounding the subject land (refer to Figure 2).

3.2 Landscape features

Landscape features identified within the subject land and assessment area are shown on Figure 1 and Figure 2, respectively. A discussion of relevant landscape features is provided below.

3.2.1 IBRA bioregions and IBRA subregions

The subject land and assessment area are located within the Brigalow Belt South bioregion and Liverpool Plains subregion (Interim Biogeographic Regionalisation of Australia (IBRA) version 7, Department of the Environment [2012]).

3.2.2 Rivers, streams, estuaries and wetlands

A full site walk over was conducted to determine the presence of rivers, streams, estuaries and wetlands on the subject land. A desktop analysis was undertaken of the NSW hydrography GIS layer (NSW Department of Customer Service - Spatial Services 2022) and the NSW Wetlands GIS layer (Office of Environment and Heritage 2013) downstream from the site within the assessment area.

Two small ephemeral streams occur on the subject land. These are 1st order and 2nd order minor tributaries of the Namoi River. Two small farm dams of approximately 500 m^2 each also occur. No other rivers, estuaries or wetlands occur on the subject land. Other small tributaries of the Namoi River occur in the assessment area. No estuaries or wetlands occur in the assessment area.

A desktop analysis was undertaken of the NSW hydrography GIS layer (NSW Department of Customer Service - Spatial Services 2022) and the NSW Wetlands GIS layer (Office of Environment and Heritage 2013) downstream from the site within the assessment area.

3.2.3 Habitat connectivity

Some habitat connectivity exists between remnant native forest/woodland vegetation occurring to the west and the east of the subject land through a revegetated drainage line that runs west to east through the subject land. The connectivity is tenuous in the eastern section of this corridor where native trees and shrubs are widely scattered, however these would nonetheless act as stepping stones for fauna movement (particularly of more mobile species) through the subject land. Movement potential for threatened species is likely mostly mobile threatened species (e.g. birds and microbats) and occasional opportunistic usage by species such as the koala.

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

No karsts, caves, crevices or cliffs, rocks or other areas of geological significance occur within or adjacent to the subject land (a full site walk over was conducted).

A desktop analysis was undertaken of NSW imagery and NSW topography GIS layers (NSW Department of Customer Service - Spatial Services 2022) across the assessment area,

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indicating that none of the above-listed features are present to the best of the knowledge of the assessor.

3.2.5 Areas of outstanding biodiversity value

No areas of Outstanding Biodiversity Value have been declared under the *Biodiversity Conservation Act 2016* that occur within the subject land or assessment area.

3.2.6 NSW (Mitchell) landscape

The majority of the subject land and assessment area are located within the 'Breeza Hills Sandstone-Shale Slopes' Mitchell Landscape. A smaller area of the 'Liverpool Alluvial Plains' Mitchell Landscape occurs on the eastern section of the subject land. Other Mitchell Landscapes in the broader assessment area include the 'Breeza Hills Basalt Caps' (Mitchell Landscape, version 3.1, NSW Office of Environment and Heritage [2010]).

3.3 Native vegetation cover

Native vegetation (woody and non-woody) in the assessment area (subject land and 1500 m buffer) was estimated to occupy an area of approximately 426 ha out of a total area of 1222 ha. The corresponding native vegetation cover within the assessment area is therefore 35%, and within the >10-30% vegetation cover class. This figure was arrived at by way of investigation of available vegetation mapping (State Government of NSW and Department of Planning and Environment 2024), aerial photograph interpretation and knowledge of the vegetation within the assessment area.

Table 2 summarises the extent of native vegetation cover within the assessment area.

Table 2 Native vegetation cover in the assessment area

Assessment area (ha)	1222
Total area of native vegetation cover (ha)	426
Percentage of native vegetation cover (%)	35
Class (0-10, >10-30, >30-70 or >70%)	>30-70

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4. Native vegetation, threatened ecological communities and vegetation integrity

4.1 Native vegetation extent

A total area of 15.82 ha of native vegetation (defined in accordance with section 60B of the *Local Land Services Act 2013*) was determined to occur on the subject land (refer to Figure 6).

4.1.1 Areas that are not native vegetation

Areas totalling 45.21 ha within the subject land were cropped at the time of the assessment and dominated by exotic crop species (refer to Figure 6). These areas are therefore considered to be non-native, in accordance with the definition of native vegetation in section 60B of the *Local Land Services Act 2013*.

4.2 Plant community types

4.2.1 Overview

Vegetation within the subject land has been assessed as aligning with the two BioNet Vegetation Classification PCTs identified within Table 3 and their extent is shown in Figure 7. Detailed descriptions of each PCT are provided in the following subsections.

Table 3 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
101	Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	12.77
435	White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	3.05
	Total area	**15.82**

4.2.2 PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion

4.2.2.1 PCT overview

Table 4 PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion

PCT ID	101
PCT name	Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion
Vegetation formation	Grassy Woodlands

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Vegetation class	Floodplain Transition Woodlands
Per cent cleared value (%)	75
Extent within subject land (ha)	12.77

This community on the subject land occurs as a woodland (both natural and planted), a shrubland and a derived grassland.

Where present, the dominant overstorey tree is Poplar Box (*Eucalyptus populnea*) with lesser occurrence of White Cypress Pine (*Callitris glaucophylla*) and White Box (*E. albens*) (in planted area only).

A variety of native midstorey shrub species occur, mostly in the woodland and shrubland areas, and include Green Wattle (*Acacia deanei*), Wilga (*Geijera parviflora*), Western Silver Wattle (*Acacia decora*), *Logania albiflora*, *Eremophila longifolia*, Silver Cassia (*Senna artemisioides* subsp. *zygophylla*), Western Boobialla (*Myopoprum montanum*), Black Rolypoly (*Sclerolaena muricata*), Small-leaf Bluebush (*Maireana microphylla*), False Sandalwood (*Eremophila mitchellii*) and Galvanised Burr (*S. birchii*) and African Boxthorn (*Lycium ferocissimum*)*.

The understorey is grassy and dominated by a variety of mostly native grass and herb species, including grasses such as Couch (*Cynodon dactylon*), Speargrass (*Austrostipa scabra*), Redleg Grass (*Bothriochloa macra*), Queensland Bluegrass (*Dichanthium sericeum*), Purple Wiregrass (*Aristida ramosa*), Blown Grass (*Lachnagrostis filiformis*), Slender Bamboo Grass (*Austrostipa verticillata*), Small Burrgrass (*Tragus australianus*), Spender Rat's Tail Grass (*Sporobolus creber*), Windmill Grass (*Chloris truncata*) and Button Grass (*Dactyloctenium radulans*). Common herbs and twiners include Climbing Saltbush (*Einadia nutans*), Pigweed (*Portulaca oleracea*), *Vittadinia cervicularis*, Yellow Burr-daisy (*Calotis lappulacea*), *Verbena gaudichaudii*, Flannel Weed (*Abutilon oxycarpum*), Flax-leaf Fleabane (*Conyza bonariensis*)*, Maltese Cockspur (Centaurea meletensis)*, Scarlet Pimpernel (*Lysimachia arvensis*)*, Turnip weed (*Rapistrum rugosum*)*, Swamp Dock (*Rumex brownii*), and *Convolvulus graminetinus*, Common Woodruff (*Asperula conferta*), Wooly Plover-daisy (*Leiocarpa tormentosa*), Bluebell (*Wahlenbergia* sp.) and Grassland Wood-sorrel (*Oxalis perennans*), Gargaloo (*Parsonsia eucalyptophylla*) and Desert Jasmine (*Jasminum lineare*).

4.2.2.2 Condition states

PCT 101 on the subject land occurs in a moderate condition as a woodland and low condition as a disturbed shrubland, planted woodland and derived native grassland (refer to Photo 1, Photo 2, Photo 3 and Photo 4).

Areas of regrowth woodland have been subject to past and ongoing disturbances including vegetation clearing and grazing by stock. This woodland vegetation has virtually no regeneration of smaller tree size classes (<30 cm DBH) indicating that only limited recruitment is occurring as a result of the ongoing grazing by stock. Hollow-bearing trees are absent.

The planted woodland and shrubland are both in low condition, lacking components of both structural (e.g. missing strata) and functional diversity, such as minimal fallen dead wood and litter cover. No hollow trees are present in this area.

The low condition derived native grassland occurs where overstorey (and nearly all of the midstorey) species have been removed through vegetation clearing and ongoing stock grazing. Despite this, native species diversity and cover in the understorey is moderate.

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Photo 1 PCT 101 – medium condition woodland

Photo 2 PCT 101 – low condition shrubland

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Photo 3 PCT 101 - low condition planted area

Photo 3 PCT 101 - low condition derived native grassland

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4.2.2.3 Justification of PCT selection

It was determined that PCT 101 was the best fit PCT for this vegetation occurring on the subject land as described below.

As indicated in the PCT description in the BioNet Vegetation Classification, PCT 101 is known to occur in the Brigalow Belt South bioregion and Liverpool Plains subregion. PCT 101 is known to occur on gently undulating slopes in the Brigalow Belt South Bioregion as is present on the subject land.

With reference to the species by growth form for this PCT in the BioNet Vegetation Classification, species relied upon for identification as PCT 101 include dominance of Poplar Box (*Eucalyptus populnea*) with minor occurrence of White Cypress Pine (*Callitris glaucophylla*). A very sparse shrub layer may be present or it is absent in this community. Shrub species recorded at the subject land in this community that are commonly associated with PCT 101 include Wilga (*Geijera parviflora*) and *Maireana microphylla*. The denser diverse shrub regrowth in the shrubland and planted area is a reflection of substantial soil disturbance and prior regeneration activities. A range of the commonly associated grass and forb species are present in this community on the subject land including Slender Bamboo Grass (*Austrostipa verticillata*), Queensland Bluegrass *(Dichanthium sericeum*), Redleg Grass (*Bothriochloa decipiens*), Purple Wiregrass (*Aristida ramosa*), Rough Spear-grass (*Austrostipa scabra*), Swamp Dock (*Rumex brownii*), Climbing Saltbush (*Einadia nutans*, Yellow Burr-daisy (*Calotis lappulacea*) and Flannel Weed (*Abutilon oxycarpum*).

4.2.2.4 Alignment with TECs

Within the BioNet Vegetation Classification PCT 101 is associated with the following TECs:

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (in part).

However, on the subject land PCT 101 is not consistent with the characteristics of this TEC as there is no Grey Box (*Eucalyptus microcarpa*) present as the dominant overstorey tree.

4.2.2.5 Alignment with EPBC Act listed ECs

Within the BioNet Vegetation Classification PCT 101 is associated with the following ECs:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (in part)
- Poplar Box Grassy Woodland on Alluvial Plains (in part)

On the subject land PCT 101 is not consistent with the characteristics of Poplar Box Grassy Woodland on Alluvial Plains as this EC only occurs on cracking clay soils, and the site is on a gentle slope with lighter non-cracking clay soils.

On the subject land PCT 101 is not consistent with the characteristics of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland as this community is not dominated by any of the three constituent tree species of White Box, Yellow Box or Blakely's Red Gum.

4.2.3 PCT 435 White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

4.2.3.1 PCT overview

Table 5 PCT 435 White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

PCT ID	435
PCT name	White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion
Vegetation formation	Dry Sclerophyll Forest (Shrub/grass sub-formation)

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Vegetation class	North-west Slopes Dry Sclerophyll Woodlands
Per cent cleared value (%)	58
Extent within subject land (ha)	3.05

This community on the subject land occurs as a woodland and derived native grassland.

Where present in the woodland areas, the overstorey is dominated by White Box (*Eucalyptus albens*) with a lesser occurrence of Poplar Box (*E. populnea*).

Native midstorey shrub species recorded include Western Boobialla (*Myopoprum montanum*), Berrigan (*Eremophila longifolia*), Western Silver Wattle (*Acacia decora*), Tough Scurf-pea (*Cullen tenax*), Galvanised Burr (*Sclerolaena birchii*), Ruby Saltbush (*Enchylaena tomentosa*), Black Roly Poly (*Sclerolaena muricata*) and African Boxthorn (*Lycium ferocissimum*)*.

The understorey is grassy and dominated by a variety of grass and herb species, including grasses such as Couch (*Cynodon dactylon*), Hairy Panic (*Panicum effusum*), Rough Spear-grass (*Austrostipa scabra*), Wallaby Grass (*Rytidosperma bipartitum*), Slender Rat's-tail Grass (*Sporobolus creber*) and Slender Bottle-washers (*Enneapogon gracilis*). Common herbs and twiners include *Vittadinia cervicularis*, Burr Medic (*Medicago polymorpha*)* Turnip weed (*Rapistrum rugosum)*,* Indian Hedge Mustard (*Sisymbrium orientale*)* Maltese Cockspur (*Centaurea meletensis*)*, Scarlet Pimpernel (*Lysimachia arvensis*)*, Desert Jasmine (*Jasminum lineare*), Wooly Plover-daisy (*Leiocarpa tormentosa)*, Common Woodruff (*Asperula conferta*), Yellow Burr-daisy (*Calotis lappulacea*) Slender Bedstraw (*Galium divaricatum*) and Tufted Bluebell (*Wahlenbergia communis*).

**denotes an exotic species*

4.2.3.2 Condition states

PCT 435 on the subject land occurs in a moderate condition as a woodland and low condition as a derived native grassland (refer to Photo 5 and Photo 6).

Areas of regrowth woodland have been subject to past and ongoing disturbances including vegetation clearing and grazing by stock. This woodland vegetation has virtually no regeneration of smaller tree size classes (<30 cm DBH) indicating that only limited recruitment is occurring as a result of the ongoing grazing by stock. Hollow-bearing trees are absent.

The low condition derived native grassland occurs where overstorey (and nearly all of the midstorey) species have been removed through vegetation clearing and ongoing stock grazing. Despite this, native species diversity and cover in the understorey is moderate.

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Photo 4 PCT 435 – medium condition woodland

Photo 6 PCT 435 - low condition derived native grassland

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4.2.3.3 Justification of PCT selection

It was determined that PCT 435 was the best fit PCT for this vegetation occurring on the subject land as described below.

As indicated in the PCT description in the BioNet Vegetation Classification, PCT 435 is known to occur in the Brigalow Belt South bioregion and Liverpool Plains subregion. PCT 435 is known to occur on red to brown clay to loamy sand soils derived from metamorphic or

sedimentary substrates often with a volcanic (basalt) influence on hillslopes, hillcrests and gullies in low hills and hills landscape patterns. This description fits the landform and soils of the subject land.

With reference to the species by growth form for this PCT in the BioNet Vegetation Classification, species relied upon for identification as PCT 435 include dominance of White Box (*Eucalyptus albens*) in the overstorey and presence of a sparse shrub layer. Several commonly associated grass and forb species are present in this community on the subject land including Rough Spear-grass (*Austrostipa scabra*), Yellow Burr-daisy (*Calotis lappulacea*) and Climbing Saltbush (*Einadia nutans*).

Other White Box PCTs are mapped as occurring in proximity to the subject land (State Government of NSW and Department of Planning and Environment 2024) but these were eliminated as being the best-fit PCT for the following reasons:

- PCT 433 – White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion

The subject land is not located on basalt flats and rises as is typical of PCT 433.

- PCT 393 – White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

This community on the subject land does not include a large variety of shrubs as is typical of PCT 393.

4.2.3.4 Alignment with TECs

Within the BioNet Vegetation Classification PCT 393 is associated with the following TECs:

- White Box - Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (Part).

The PCT 435 vegetation on the subject land is broadly consistent with the characteristics of this TEC, and includes both woodland and derived native grassland areas (refer to Figure 8).

4.2.3.5 Alignment with EPBC Act listed ECs

Within the BioNet Vegetation Classification PCT 393 is associated with the following ECs:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Part)

Determination of this EC is subject to meeting key diagnostic condition classes and thresholds (Table 1 in Department of Climate Change, Energy, the Environment and Water (2023). The vegetation community on site meets the following key diagnostic characteristic:

- The groundcover is predominantly native (the area over which the ground layer is predominantly native with at least 50% of the perennial vegetation cover in the ground layer made up of native species).

Therefore, the PCT 435 vegetation on the subject land is broadly consistent with the characteristics of this EC, and includes both woodland and derived native grassland areas.

4.3 Vegetation zones

Within the subject land PCT 101 was stratified into four vegetation zones; a moderate condition woodland and low condition disturbed shrubland, planted woodland and derived native grassland (refer to Table 6 and Figure 9).

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Vegetation zone 101_low_woodland consists of areas of mature trees, occurring both as a woodland or as isolated paddock trees. This vegetation zone has been subject to past and ongoing disturbances including vegetation clearing and grazing by stock. Virtually no regeneration of smaller tree size classes (<30 cm DBH) is present, indicating that only limited recruitment is occurring as a result of the ongoing grazing by stock. Hollow-bearing trees are absent.

Vegetation zone 101_low_planted and 101_low_shrubland are both in low condition, lacking components of both structural (e.g. missing an overstorey for 101_low_shrubland) and functional diversity, such as minimal fallen dead wood and litter cover. No hollow trees are present in this area.

Vegetation zone 101_low_DNG has been mapped in areas where overstorey (and nearly all of the midstorey) species have been removed through vegetation clearing and ongoing stock grazing. Despite this, native species diversity and cover in the understorey is moderate.

Patch size was calculated using available vegetation mapping and the results of the field survey for all patches of intact native vegetation on and adjoining the subject land. The patch size for all vegetation zones was determined to >100 ha (refer to Table 6).

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Table 6 Vegetation zones and patch sizes

Vegetation zone ID	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
101_medium_woodland	PCT 101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	medium condition woodland	0.21	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	1	1	plot 1 101 woodland
101_low_shrubland	PCT 101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	low condition shrubland	3.65	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	2	2	2	plot 1 101 shrubland plot 2 101 shrubland
101_low_planted	PCT 101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	low condition planted	3.35	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	2	2	2	plot 1 101 planted plot 2 101 planted

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Vegetation zone ID	PCT ID number and name	Condition / other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
101_low_DNG	PCT 101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	low condition derived native grassland	5.57	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	3	6	3	Plot 4 101 DNG Plot 5 101 DNG Plot 6 101 DNG
435_medium_woodland	PCT 435 - White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	medium condition woodland	0.66	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	2	1	Plot 1 435 woodland
435_low_DNG	PCT 435 - White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	low condition derived native grassland	1.78	☐ <5 ha ☐ 5–24 ha ☐ 25–100 ha ☒ >100 ha	1	3	1	Plot 2 435 DNG

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4.4 Vegetation integrity (vegetation condition)

4.4.1 Vegetation integrity survey plots

Data was collected from at least the minimum number of vegetation integrity survey plots for each vegetation zone as detailed in BAM Table 3. Data was also collected in additional plots within the derived native grassland vegetation zones (101_low_DNG and 435_low_DNG).

Only the minimum number of vegetation integrity survey plots that are required in BAM Table 3 were used in the assessment.

4.4.2 Scores

Vegetation integrity scores are shown in Table 7.

Table 7 Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
101_medium_woodland	72.3	39.7	21.5	39.5	No
101_low_shrubland	72.4	1.4	0	4.7	No
101_low_planted	76.2	1.3	5.3	8.1	No
101_low_DNG	50.3	53	1.3	15.3	No
435_medium_woodland	47.5	10.8	23.9	23.1	No
435_low_DNG	39.7	37.5	0.1	11.4	No

4.4.3 Use of benchmark data

These attributes were measured against the relevant benchmark data from the BioNet Vegetation Classification. The use of more appropriate local benchmark data was not proposed to conduct the integrity assessment.

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5. Habitat suitability for threatened species

5.1 Habitat constraints assessment

The following areas of suitable habitat for potentially occurring threatened flora were determined to occur on the subject land:

- *Cyperus conicus* – understorey of woodland
- Belson's Panic – understorey of woodland
- Native Milkwort – understorey of woodland
- Scant Pomaderris – understorey of woodland
- Slender Darling Pea – derived native grasslands and understorey of woodland
- *Tylophora linearis* – understorey of woodland

The habitat constraints assessment for potentially occurring threatened fauna did not identify the presence of any hollow-bearing trees with suitably sized hollow dimensions (and height above ground where relevant) for predicted ecosystem credit species. Nor were any raptor nest trees identified.

Koala food trees were identified as being present on the subject land. In accordance with (DPE 2022) suitable koala food trees present are White Box (*Eucalyptus albens*) and Poplar Box (*Eucalyptus populnea).*

5.2 Identification of threatened species for assessment

5.2.1 Ecosystem credit species

Ecosystem credit species likely to occur on or use the subject land as automatically populated in BAM-C is provided in Table 8.

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Table 8 Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Anomalopus mackayi	*Five-clawed Worm-skink*	Endangered	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints		High
Anthochaera phrygia	Regent Honeyeater (Foraging)	Critically Endangered	Critically Endangered	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	High
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	Moderate

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Calyptorhynchus lathami	Glossy Black-Cockatoo (Foraging)	Vulnerable	Vulnerable	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints		Moderate
Chalinolobus picatus	Little Pied Bat	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☑ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	High
Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	High

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Circus assimilis	Spotted Harrier	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG	Moderate
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☑ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	High
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes		435_medium_woodland 435_low_DNG	High
Falco hypoleucos	Grey Falcon	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☑ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG	Moderate
Falco subniger	Black Falcon	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	Moderate

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	High
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☑ Current survey	No	Habitat constraints		Moderate
Haliaeetus leucogaster	White-bellied Sea-Eagle (Foraging)	Vulnerable	Not Listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints		High

EXHIBITION COPY

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Hamirostra melanosternon	Black-breasted Buzzard (Foraging)	Vulnerable	Not Listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes	Habitat constraints	101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG	Moderate
Hieraaetus morphnoides	Little Eagle (Foraging)	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☑ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate
Hirundapus caudacutus	White-throated Needletail	Not Listed	Vulnerable	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	High

EXHIBITION COPY

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Lathamus discolor	Swift Parrot (Foraging)	Endangered	Critically Endangered	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate
Lophoictinia isura	Square-tailed Kite (Foraging)	Vulnerable	Not Listed	Yes	☒ BAM-C ☐ TBDC ☐ Previous survey ☑ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Listed	No	☒ BAM-C ☐ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate
Neophema pulchella	Turquoise Parrot	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☑ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	High
Nyctophilus corbeni	Corben's Long-eared Bat	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	High

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Petaurus australis	Yellow-bellied Glider	Vulnerable	Vulnerable	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat degraded		High
Polytelis swainsonii	Superb Parrot (Foraging)	Vulnerable	Vulnerable	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☑ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted	Moderate
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	Moderate

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Pteropus poliocephalus	Grey-headed Flying-fox (Foraging)	Vulnerable	Vulnerable	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland	High
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☑ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	High
Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG	Moderate

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The following species were excluded or partially excluded from further assessment (refer to Table 8) in identified vegetation zones for the following reasons:

- *Anthochaera phrygia* (Regent Honeyeater (Foraging), *Chthonicola sagittata* (Speckled Warbler), *Climacteris picumnus victoriae* (Brown Treecreeper (eastern subspecies)), *Daphoenositta chrysoptera* (Varied Sittella), *Glossopsitta pusilla* (Little Lorikeet), *Hieraaetus morphnoides* (Little Eagle (Foraging)), *Lathamus discolor* (Swift Parrot (Foraging)), *Lophoictinia isura* (Square-tailed Kite (Foraging)), *Melanodryas cucullata cucullata* (Hooded Robin (south-eastern form)), *Melithreptus gularis gularis* (Black-chinned Honeyeater (eastern subspecies)), *Nyctophilus corbeni* (Corben's Long-eared Bat), *Polytelis swainsonii* (Superb Parrot (Foraging)), *Pomatostomus temporalis temporalis* (Grey-crowned Babbler (eastern subspecies), and *Pteropus poliocephalus* (Grey-headed Flying-fox (Foraging)) – excluded from 101_low_shrubland, 101_low_DNG and 435_low_DNG as these species are not associated with treeless habitats.
- *Grantiella picta* (Painted Honeyeater) - Mistletoes not present at a density of greater than five mistletoes per hectare.
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo (Foraging)) – excluded due to absence of *Allocasuarina* or *Casuarina* foraging trees.
- Five-clawed Worm-skink (*Anomalopus mackayi)* – excluded as the site does not have cracking clay soils.
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle (Foraging)) - excluded as the subject land is not within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines.
- *Petaurus australis* (Yellow-bellied Glider) – excluded as the subject land is substantially degraded and does not contain hollow-bearing trees.

All other predicted ecosystem credit species were retained.

5.2.2 Species credit species

Predicted flora species credit species as automatically populated in BAM-C is provided in Table 9. Predicted fauna species credit species as automatically populated in BAM-C is provided in Table 10.

Table 9 Predicted flora species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Cyperus conicus	*Cyperus conicus*	Endangered	Not listed	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland

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Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
					zone but not another)		
Bluegrass	*Dichanthium setosum*	Vulnerable	Vulnerable	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Finger Panic Grass	*Digitaria porrecta*	Endangered	Not listed	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Homopholis belsonii	Belson's Panic	Endangered	Vulnerable	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland
Monotaxis macrophylla	Large-leafed Monotaxis	Endangered	Not listed	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Polygala linariifolia	Native Milkwort	Endangered	Not listed	☒ BAM-C ☒ TBDC ☐ Previous survey	Partial (when a species is retained within one vegetation	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland

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Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
				☐ Current survey	zone but not another)		
Scant Pomaderris	*Pomaderris queenslandica*	Endangered	Not listed	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland
Swainsona murrayana	Slender Darling Pea	Vulnerable	Vulnerable	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Yes		101_medium_woodland 101_low_planted 101_low_shrubland 101_low_DNG 435_medium_woodland 435_low_DNG
Austral Toadflax	*Thesium australe*	Vulnerable	Vulnerable	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints - habitat degraded	
Tylophora linearis	Tylophora linearis	Vulnerable	Endangered	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)	Habitat constraints	101_medium_woodland 101_low_planted 435_medium_woodland

The following predicted fauna species credit species were excluded or partially excluded from further assessment (refer to Table 9). Reasons are provided:

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- Cyperus conicus (*Cyperus conicus*), Belson's Panic (*Homopholis belsonii*), Native Milkwort (*Polygala linariifolia*), Scant Pomaderris (*Pomaderris queenslandica)* and Tylophora linearis (*Tylophora linearis*) – partially excluded from 101_low_shrubland, 101_low_DNG and 435_low_DNG as these species are only associated with the understorey of woodlands and not treeless habitats.
- Bluegrass (*Dichanthium setosum*) – excluded as the soils of the subject land are not heavy basaltic black soils and red-brown loams with clay subsoil.
- Finger Panic Grass (*Digitaria porrecta*) - excluded as the subject land does not include any suitable habitat on richer soils.
- Large-leafed Monotaxis (*Monotaxis macrophylla*) – excluded as this species only emerges following fire and no fires have occurred at the subject land within a 10 year period
- Austral Toadflax (*Thesium australe*) - grassy understorey habitat at the site is substantially degraded and this species is unlikely to occur.

All other predicted flora species credit species were retained for further assessment.

Table 10 Predicted fauna species credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater (Breeding)	*Anthochaera phrygia*	Critically Endangered	Critically Endangered	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Bush Stone-curlew	*Burhinus grallarius*	Endangered	Not listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat degraded	

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Glossy Black-Cockatoo (Breeding)	*Calyptorhynchus lathami*	Vulnerable	Vulnerable	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Eastern Pygmy-possum	*Cercartetus nanus*	Vulnerable	Not listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints - habitat degraded	
Large-eared Pied Bat	*Chalinolobus dwyeri*	Vulnerable	Vulnerable	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	Large-eared Pied Bat
White-bellied Sea-Eagle (Breeding)	*Haliaeetus leucogaster*	Vulnerable	Not listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Hamirostra melanosternon	Black-breasted Buzzard (Breeding)	Vulnerable	Not listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey	No	Habitat constraints	

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
					☐ Current survey			
Little Eagle (Breeding)	*Hieraaetus morphnoides*	Vulnerable	Not listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Pale-headed Snake	*Hoplocephalus bitorquatus*	Vulnerable	Not listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints - habitat degraded	
Swift Parrot (Breeding)	*Lathamus discolor*	Endangered	Critically Endangered	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Square-tailed Kite (Breeding)	*Lophoictinia isura*	Vulnerable	Not listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Barking Owl (Breeding)	*Ninox connivens*	Vulnerable	Not listed	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Squirrel Glider	*Petaurus norfolcensis*	Vulnerable	Not listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints - habitat degraded	
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Vulnerable	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Koala	*Phascolarctos cinereus*	Endangered	Endangered	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	Partial (when a species is retained within one vegetation zone but not another)		101_medium_woodland 101_low_planted 435_medium_woodland
Superb Parrot (Breeding)	*Polytelis swainsonii*	Vulnerable	Vulnerable	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey	No	Habitat constraints	

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Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
					☐ Current survey			
Pteropus poliocephalus	Grey-headed Flying-fox (Breeding)	Vulnerable	Vulnerable	Yes	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Masked Owl (Breeding)	*Tyto novaehollandiae*	Vulnerable	Not listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Uvidicolus sphyrurus	Border Thick-tailed Gecko	Vulnerable	Vulnerable	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	
Eastern Cave Bat	*Vespadelus troughtoni*	Vulnerable	Not listed	No	☒ BAM-C ☒ TBDC ☐ Previous survey ☐ Current survey	No	Habitat constraints	

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The following predicted fauna species credit species were excluded. Reasons are provided:

- *Anthochaera phrygia* (Regent Honeyeater (breeding)) – habitat constraints: the subject land is not located within the important habitat map for this species.
- *Burhinus grallarius* (Bush Stone-curlew) - habitat constraints: habitat is degraded and unlikely to be used by this species. Very little fallen dead wood present in any vegetation zone.
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo (Breeding)) – habitat constraints: no living or dead trees present with hollows greater than 15cm diameter and greater than 8m above ground suitable for breeding.
- *Cercartetus nanus* (Eastern Pygmy-possum) - habitat constraints: habitat is degraded and unlikely to be used by this species. Evidenced by a low VI score for 3344_low_woodland of 18 and absence of a native midstorey layer for foraging.
- *Chalinolobus dwyeri* (Large-eared Pied Bat) - habitat constraints: the subject land is not located within proximity to cliffs or within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.
- *Haliaeetus leucogaster* (White-bellied Sea-Eagle (Breeding)) – habitat constraints: the subject land does not contain living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines.
- *Hamirostra melanosternon* (Black-breasted Buzzard (Breeding)) – habitat constraints: subject land does not include land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts.
- *Hieraaetus morphnoides* (Little Eagle (Breeding)) and *Hieraaetus morphnoides* (Square-tailed Kite (Breeding) - habitat constraints: no nest trees are present for either species.
- Pale-headed Snake (*Hoplocephalus bitorquatus*) - habitat constraints: habitat is degraded. Vegetation on the subject land is highly fragmented and has been substantially degraded by way of clearing and stock grazing. No hollow-bearing trees are present.
- Swift Parrot (breeding) - habitat constraints: the subject land is not located within the important habitat map for this species.
- *Ninox connivens* (Barking Owl) and Masked Owl (Breeding) (*Tyto novaehollandiae*) – habitat constraints: no suitable sized hollows present in any trees on the subject land.
- *Petaurus norfolcensis* (Squirrel Glider) - habitat constraints: habitat is degraded and unlikely to be used by this species. Evidenced by an absence of hollow-bearing trees.
- *Petrogale penicillata* (Brush-tailed Rock-wallaby) – habitat constraints: the subject land is not within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines.
- Superb Parrot (Breeding) (*Polytelis swainsonii*) – Habitat constraint: no suitable sized hollows present in any trees on the subject land.
- *Pteropus poliocephalus* (Grey-headed Flying-fox (Breeding)) – habitat constraints: the subject land does not support any breeding camps.
- *Uvidicolus sphyrurus* (Border Thick-tailed Gecko) – habitat constraints: the subject land does not include rock outcrops.

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- *Vespadelus troughtoni* (Eastern Cave Bat) - habitat constraints: the subject land does not include caves. Nor is the subject land within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, crevices or boulder piles, or within two kilometres of old mines, tunnels, old buildings or sheds.

All other predicted species credit species were retained.

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5.3 Presence of candidate species credit species

The presence of candidate species credit species on the subject land is shown in Table 11 (flora) and Table 12 (fauna).

Table 11 Determining the presence of candidate flora species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Cyperus conicus	*Cyperus conicus*	Endangered	Not listed	Targeted threatened species survey	No	No
Belson's Panic	*Homopholis belsonii*	Endangered	Vulnerable	Targeted threatened species survey	No	No
Native Milkwort	*Polygala linariifolia*	Endangered	Not listed	Targeted threatened species survey	No	No
Scant Pomaderris	*Pomaderris queenslandica*	Endangered	Not listed	Targeted threatened species survey	No	No
Slender Darling Pea	*Swainsona murrayana*	Vulnerable	Vulnerable	Targeted threatened species survey	No	No
Tylophora linearis	*Tylophora linearis*	Vulnerable	Endangered	Targeted threatened species survey	No	No

Table 12 Determining the presence of candidate fauna species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Koala	*Phascolarctos cinereus*	Endangered	Endangered	Targeted threatened	No	No

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Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
				species survey		

5.4 Threatened species surveys

Details of targeted threatened species surveys used to determine presence of the species are shown in Table 13 and

None of the candidate threatened flora species was recorded in the targeted survey.

Table 14.

Table 13 Threatened species surveys for candidate flora species credit species on the subject land

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
Cyperus conicus	*Cyperus conicus*	Transects	☒ Yes January 21st 2023 9:00am-4:00pm ☐ No	7.0 hrs 1 person	No	No
Belson's Panic	*Homopholis belsonii*	Transects	☒ Yes January 21st 2023 9:00am-4:00pm ☐ No	7.0 hrs 1 person	No	No
Native Milkwort	*Polygala linariifolia*	Transects	☒ Yes January 21st 2023 9:00am-4:00pm ☐ No	7.0 hrs 1 person	No	No
Scant Pomaderris	*Pomaderris queenslandica*	Transects	☒ Yes January 21st 2023 9:00am-4:00pm ☐ No	7.0 hrs 1 person	No	No
Slender Darling Pea	*Swainsona murrayana*	Transects	☒ Yes September 29th 2021 9:00am-2:30pm ☐ No	5.5 hrs 1 person	No	No

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Common name	Scientific name	Threatened flora species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Tylophora linearis	*Tylophora linearis*	Transects	☒ Yes January 21st 2023 9:00am-4:00pm	☐ No	7.0 hrs 1 person 1 person	No	No

None of the candidate threatened flora species was recorded in the targeted survey.

Table 14 Threatened species surveys for candidate fauna species credit species on the subject land

Common name	Scientific name	Threatened fauna species surveys				Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)		Effort (hours & no. people)		
Koala	*Phascolarctos cinereus*	SAT plots	☒ Yes 26 h May 2021 9:00am-12:00pm	☐ No	3 hour one person	No	No
		Spotlighting	☒ Yes 26 h–27 h May 2021 6:00pm-7:00pm	☐ No	1 hr over 2 consecutive nights (2 hour 1 person total)	No	No

Koala - SAT plots	27th May 2021	9:00am-12:00pm	-0.6 (min) 18.7 (max)	moderate	0.0	no heavy rain in previous 48 hrs
Koala - spotlighting	26th May 2021	6:00pm-7:00pm	4.1 (min) 23.3 (max)	moderate	0.0	
	27th May 2021	6:00pm-7:00pm	-0.6 (min) 18.7 (max)	moderate	0.0	

Although undertaken prior to the release of the Koala (*Phascolarctos cinereus*): Biodiversity Assessment Method Survey Guide (DPE 2022), the Koala surveys were in accordance with this guideline as described below.

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Suitable koala habitat was determined to occur in vegetation zones within PCT 101 (vegetation zone 101_medium_woodland (0.21 ha), 101_low_planted (3.35 ha)) and PCT 435 (vegetation zone 435_medium_woodland (0.66 ha)) within the subject land as there are two koala food tree species present (*Eucalyptus albens* and *E. populnea*) (based on Table 8 Koala use trees – North West Slopes koala modelling region in DPE 2022; refer to Figure 10). This potential habitat was determined to be continuous as it is not separated by non-potential habitat >500m. Vegetation zones 101_low_shrubland, 101_low_DNG and 435_low_DNG were not considered potential habitat as there are no overstorey trees in these vegetation zones.

No current barriers to koala movement are present on the subject land.

Surveys for koala presence consisting of a combination of SAT plots and spotlighting. The location of these surveys is shown in Figure 10.

- In accordance DPE (2022) the suitable koala habitat occurring at the site was surveyed by way of SAT plots and spotlighting (refer to Figure 10).
- No evidence of koala usage was recorded in this survey.

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6. Identifying prescribed impacts

No prescribed impacts are present on the subject land that may impact on any of the threatened entities assessed by this BDAR, as shown in Table 15.

The absence of prescribed impacts was confirmed by way of a full site walk over of the subject land.

Table 15 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	☐Yes / ☒No	n/a	n/a
Human-made structures	☐Yes / ☒No	n/a	n/a
Non-native vegetation	☒Yes / ☐No	extensive cropped areas are present on the subject land covering 45.22 ha	none of the threatened entities identified in the BAM-C are likely to use the cropped land.
Habitat connectivity	☒Yes / ☐No	Some habitat connectivity exists between remnant native forest/woodland vegetation occurring to the west and the east of the subject land through a revegetated drainage line that runs west to east through the subject land. The connectivity is tenuous in the eastern section of this corridor where native trees and shrubs are widely scattered, however these would nonetheless act as stepping stones for fauna movement (particularly of more mobile species) through the subject land. Movement potential for threatened species is likely mostly mobile threatened species (e.g. birds and microbats). However, no confirmed candidate fauna species credit species (as per auto-populated BAM-C list) are potential occurrences that would be likely to be at risk.	n/a

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Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Waterbodies, water quality and hydrological processes	☐Yes / ☒No	n/a	n/a
Wind turbine strikes (wind farm development only)	☐Yes / ☒No	n/a	n/a
Vehicle strikes	☐Yes / ☒No	A minor increase in vehicle movements will occur within the proposed subdivision, both during the construction and operation of the proposed Stage 4 development. However, no confirmed candidate fauna species credit species (as per auto-populated BAM-C list) are potential occurrences that would be likely to be at risk.	n/a

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Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7. Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

The project has been located to occupy an already substantially disturbed site. The majority of the subject land (74.7%) consists of non-native vegetation (cropped land) and a further 23.7% consists of low condition native vegetation below the threshold requiring a biodiversity offset. Only 1.6% of the subject land supports vegetation in medium condition. It is proposed that 75.9% of this better quality vegetation (totalling 0.66 ha) be retained by way of a s88b mechanism under the *Conveyancing Act 1919* on the title of individual lots.

The majority of the proposal avoids removal of the TEC 'White Box - Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions', with only a small area of approximately 0.13 ha of TEC requiring removal. To minimise impacts on the occurrence of this TEC on the subject land, it is proposed that approximately 59.1% of the occurrence of this TEC be retained within the s88b areas. The majority of the area of TEC proposed for removal consists of low condition derived native grassland (87.1%).

The results of the BAM targeted surveys indicate that removal of native vegetation for the proposal would be unlikely to impact on any threatened species and their habitat.

7.1.1 Project design

If ancillary facilities are required for the proposed development these would be located within the existing non-native cropped area. This would therefore result in ancillary facilities being located within areas with a lowest vegetation integrity score.

Of the native vegetation that will be impacted by the proposal, 75.9% of the better quality native vegetation (totalling 0.66 ha) will be retained by way of a s88b mechanism under the *Conveyancing Act 1919* on the title of individual lots.

7.2 Summary of measures to avoid and minimise impacts

Table 16 summarises measures to be taken to avoid and minimise direct and indirect impacts in relation to the development proposal.

Table 16 Avoidance and minimisation measures for direct, indirect and prescribed impacts

Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
Locating the proposal in areas lacking biodiversity values	Areas of highest biodiversity value are avoided.	During project planning	Project planning team

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Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
	The project has been located to occupy an already substantially disturbed site. The majority of the subject land (74.7%) consists of non-native vegetation (cropped land) and a further 23.7% consists of low condition below the threshold requiring a biodiversity offset. Only 1.6% of the subject land supports vegetation in medium condition.		
Locating the proposal where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a low vegetation integrity score)	Areas of better quality native vegetation and threatened species habitat are avoided. The majority of the subject land (74.7%) consists of non-native vegetation (cropped land) and a further 23.7% consists of low condition native vegetation below the threshold requiring a biodiversity offset (vegetation zones 101_low_shrubland - VI score 4.7, 101_low_planted - VI score 8, 101_low_DNG - VI score 15.2, 435_low_DNG - VI score 9.1). Of the remaining vegetation that will be impacted by the proposal, 0.66 ha (75.9%) of the higher condition vegetation (vegetation zones 101_medium_woodland and 435_medium_woodland) would be protected by way of s88b mechanism on individual lot titles (*Conveyancing Act 1919*).	During project planning	Project planning team
Locating the proposal in areas that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC or a highly cleared PCT.	The proposal is located in an area that avoids habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map. The majority of the subject land (74.7%) consists of non-native vegetation (cropped land) without biodiversity values. The project location coincides with an area of 2.44 ha of vegetation that is consistent with the characteristics of a state-listed threatened ecological community (TEC) and commonwealth-listed endangered community (EC).	During project planning	Project planning team

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Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
	PCT 101 is a highly cleared PCT (75% cleared). As the proposal includes removal of 1.0 ha of TEC vegetation and 11.98 ha of PCT 101 (the majority of which occurs in low condition), impacts on TEC/EC vegetation and highly cleared PCTs cannot be avoided.		
Locating the proposal outside of the buffer area around breeding habitat features such as nest trees or caves.	No breeding habitat features and associated buffer areas are located within the subject land.	n/a	n/a
Reducing the proposal's clearing footprint by minimising the number and type of facilities	The proposal does not seek to reduce the proposal's clearing footprint by minimising the number and type of facilities. The project has been located to occupy an already substantially disturbed site. The majority of the subject land (74.7%) consists of non-native vegetation (cropped land) and a further 23.7% consists of low condition below the threshold requiring a biodiversity offset.	During project planning	Project planning team
Locating ancillary facilities in areas that have no biodiversity values	Areas of highest biodiversity value are avoided. If ancillary facilities are required for the proposed development these would be located within previously cropped areas of non-native vegetation with no biodiversity values.	During construction phase of project	Proponent
Locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas with the lowest vegetation integrity scores)	Areas of better condition native vegetation are avoided. If ancillary facilities are required for the proposed development these would be located within previously cropped areas of non-native vegetation with no biodiversity values.	During construction phase of project	Proponent
Locating ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status (e.g. an endangered ecological	Habitat for species and vegetation with a high threat status is avoided If ancillary facilities are required for the proposed development these would be located within	During construction phase of project	Proponent

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Action	Outcome (Describe the outcome of implementing the measure, with reference to specific entities identified in Sections 4 and 5)	Timing	Responsibility
community (EEC) or critically endangered ecological community (CEEC) or is an entity at risk of a serious and irreversible impact (SAII)	previously cropped areas of non-native vegetation with no biodiversity values.		

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8. Impact Assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

Table 17 lists impacts likely to occur on the subject land after steps taken to avoid and minimise impacts (refer to Figure 11).

Table 17 Summary of residual direct impacts

Direct impact (Describe the impact on PCT/TEC/EC or threatened species and their habitat)	BC Act status	EPBC Act status	SAII entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	n/a	n/a	No	construction and operation	11.98 ha
Removal of PCT 435 White Box shrubby woodland of the western Liverpool Range, Warrumbungle Range and south-west Pilliga forests, Brigalow Belt South Bioregion	n/a	n/a	No	construction and operation	1.0 ha
Removal of White Box - Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Critically Endangered	-	Yes	construction	0.13 ha
Removal of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	Critically Endangered	No	construction	0.13 ha

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8.1.2 Change in vegetation integrity score

Table 18 documents the change in vegetation integrity for residual direct impacts on native vegetation, TECs, threatened species and their habitat that were identified on the subject land. Note that 0.47 ha of vegetation within zone 3344_low_woodland is proposed for retention and protection by way of a s88b mechanism on individual lots. Therefore the area of impact is reduced from 0.56 ha to 0.09 ha.

Table 18 Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
101_medium_woodland	101	remove	0.08	65.6	45.3	21.5	40	0	0	0	0	-40
101_low_shrubland	101	remove	3.60	72.4	1.4	0	4.7	0	0	0	0	-4.7
101_low_planted	101	remove	2.85	75.2	1.3	5.3	8	0	0	0	0	-8
101_low_DNG	101	remove	5.44	50.4	53	1.3	15.3	0	0	0	0	-15.3
435_medium_woodland	435	remove	0.13	47.5	6.9	23.9	19.8	0	0	0	0	-19.8
435_low_DNG	435	remove	0.87	29.5	25.2	0.1	9.1	0	0	0	0	-9.1

8.2 Indirect impacts

Table 19 documents residual indirect impacts (likely to occur on native vegetation, threatened entities and their habitat beyond the development footprint).

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Table 19 Summary of residual indirect impacts

Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha) 101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)	irregular	short-term	construction	Moderate likelihood Potential damage to adjacent habitat or vegetation. Mitigation measures are required to minimise this risk.
reduced viability of adjacent habitat due to edge effects	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha) 101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)	constant	long-term (operational)	during operational phase	Low likelihood Edge effect impacts relating to microclimate, vegetation, weeds, hydrology, dieback, soils and fauna. No substantial additional exposed edge of PCT 101 of PCT 435 woodland vegetation would occur.

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Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
reduced viability of adjacent habitat due to noise, dust or light spill	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha) 101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)	irregular	short-term (construction) and long-term (operational)	During construction and operational phase.	Low likelihood Potential for reduced usage of adjacent retained native vegetation by threatened fauna. Noise and dust from construction machinery: Potential impacts from noise and dust from construction machinery will be of short duration during the construction phase. Site habitat value is low for threatened fauna, considering the highly fragmented distribution of woodland trees on the site and lack of hollow-bearing trees. If occupying fauna in adjacent habitats is displaced during construction, the habitats will remain post-works and will be able to be re-occupied. Lights from residential dwellings, associated buildings and car headlights using internal roads: Potential impacts would occur during the occupation phase. However, as mentioned site habitat value is low for threatened fauna, considering the highly fragmented distribution of woodland trees on the site and lack of hollow-bearing trees.

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Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
transport of weeds and pathogens from the site to adjacent vegetation	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha) 101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)	irregular	short-term (construction) and long-term (operational)	During construction and operational phase.	Moderate likelihood Spread of weed seeds and pathogens from construction machinery during construction: Potential impacts would include a further degradation of vegetation condition. Mitigation measures are required to minimise these risks. Spread of garden weeds from backyards to the adjacent vegetation Transfer of weedy garden plants that are spread by birds cannot be effectively controlled.
increased risk of starvation or exposure, and loss of shade or shelter	n/a	n/a	n/a	n/a	n/a	The proposal would not result in an increased risk of starvation or exposure, and loss of shade or shelter for any threatened fauna species.
loss of breeding habitat	n/a	n/a	n/a	n/a	n/a	No candidate species credit species identified by the BAM-C were potential occurrences within the subject land. Therefore, the proposal would also be unlikely to result in a loss of breeding habitat for any threatened species in adjacent areas.

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Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
trampling of threatened flora species	n/a	n/a	n/a	n/a	n/a	No threatened flora species were recorded in the site surveys.
inhibition of nitrogen fixation and increased soil salinity	n/a	n/a	n/a	n/a	n/a	The proposal (both during construction and operation) is unlikely to result in an inhibition of nitrogen fixation and increased soil salinity.
fertiliser drift	n/a	n/a	n/a	n/a	n/a	The proposal (both during construction and operation) is unlikely to result in fertiliser drift.
rubbish dumping	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha) 101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)	irregular	short-term (construction) and long-term (operational)	During construction and operational phase	Low likelihood Degradation (impacting condition) to adjacent native vegetation. Retained areas will be protected by way of a s88b mechanism under the *Conveyancing Act 1919* on individual lots. Due to the exposed, residential nature of the subdivision there is minimal likelihood for rubbish dumping to occur.
Wood collection	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha)	irregular	long-term (operational)	During operational phase	Low likelihood Degradation (impacting condition) to adjacent native vegetation.

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Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
		101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)				Retained areas will be protected by way of a s88b mechanism under the *Conveyancing Act 1919* on individual lots. This would include removal of wood from the protected area.
removal and disturbance of rocks, including bush rock	n/a	n/a	n/a	n/a	n/a	The proposal would not involve the removal and disturbance of rocks, including bush rock..
increase in predators	n/a	n/a	n/a	n/a	n/a	The proposed clearing of a relatively small area of native vegetation within the subject land would not result in an increase in predators.
increase in pest animal populations	n/a	n/a	n/a	n/a	n/a	The relatively small area of proposed woodland vegetation to be cleared within the subject land would not result in an increase in pest animal populations in adjacent retained vegetation.
changed fire regimes	Retained PCT 101 and PCT 435 vegetation (s88b areas)	101_low_DNG (0.13 ha) 101_low_planted (0.49 ha)	constant	long-term (operational)	During operational phase	Low likelihood Potential for increased fire risk in adjacent vegetation. The proposal would not result in an increase in fire risk. The managed

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Indirect impact (Describe impact, e.g. transport of weeds and pathogens form the site to adjacent vegetation)	Impacted entities (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	Extent (ha or zone reference)	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/ timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
		101_low_shrubland (0.05 ha) 101_medium_woodland (0.13 ha) 393_low_DNG (0.91 ha) 435_medium_woodland (0.53 ha)				vegetation within the residential area of this subdivision will likely reduce the overall fire risk to adjoining retained vegetation.
disturbance to specialist breeding and foraging habitat (e.g. beach nesting for shorebirds).	none	n/a	n/a	n/a	n/a	The proposal would not disturb any specialist breeding and foraging habitat.

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8.3 Consistency with other legislation - State Environmental Planning Policy (Biodiversity and Conservation) 2021 – Chapter 4 Koala Habitat Protection 2021

This Policy aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline -

(a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and

(b) by encouraging the identification of areas of core koala habitat, and

(c) by encouraging the inclusion of areas of core koala habitat in environment protection zones.

Part 4.22 (development control of koala habitats) applies to land in relation to which a development application has been made, and has an area of more than 1 hectare, or has, together with adjoining land in the same ownership, an area of more than 1 hectare. The land in question is land in relation to which a development application has been made and is over 1 ha in size. Therefore, the provisions of Koala Habitat Protection 2021 applies.

In accordance with section 4.9, clause (4) 'if the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development'. Table 20 provides a summarised koala habitat assessment report in accordance with the content requirements outlined in Koala Habitat Protection Guidelines (draft) 2019. Note that the guidelines are yet to be updated by the NSW government for the Koala SEPP 2021.

Table 20 Koala habitat assessment report

Koala habitat assessment report
Introduction
The proposed development is for a rural residential subdivision. The proposal land is zoned R5 Large Lot Residential under the Gunnedah Local Environmental Plan 2012, with a minimum lot size of 9000 m^2. The development would result in the establishment of up to 61 residential lots. Access to the new lots would be off Bushs Lane and Robert Gordon Road. Chapter 4 Koala Habitat Protection 2021 applies as Gunnedah Council is listed in Schedule 2 as an LGAs for which the SEPP applies (excluding RU1, RU2 and RU3 land zones). Part 4.2 concerns the development control of koala habitats. The subject land does not have an approved koala plan of management and has an area of at least 1 hectare (including adjoining land within the same ownership). Therefore Chapter 4 Koala Habitat Protection 2021 applies.
Koala habitat values
The site is highly suitable koala habitat as the woodland vegetation contains eucalypt species from Schedule 2 of the Koala SEPP 2021. Suitable koala habitat was determined to occur in PCT 101 (zone 101_low_planted (3.35 ha) & 101_medium_woodland (0.21 ha)) and PCT 435 (zone 435_medium_woodland (0.66 ha)) within the subject land as there are three koala food tree species present in these vegetation zones (*Eucalyptus albens, Eucalyptus populnea and Callitris glaucophylla*) (based on Table 8 Koala use trees – North West Slopes koala modelling region in DPE 2022; refer to Figure 10). The total area of suitable koala habitat was 4.22 ha. The site area does not meet the definition of core koala habitat in Chapter 4 Koala Habitat Protection 2021 as it is not 'an area of land which has been assessed by a suitably qualified and

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Koala habitat assessment report
experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years'. Although there have been 125 DPE BioNet records of the koala within 5 km of the subject land in the previous 18 years', no records have been made on the subject land. The site is located in an area of already substantially fragmented habitat for the Koala, where previous land clearing for farming and residential development has reduced the eucalypt tree cover and created extensive areas that are devoid of koala foraging habitat. Some habitat connectivity exists between koala foraging habitat that occurs to the west and the east of the subject land through a revegetated drainage line that runs west to east through the subject land. The connectivity is tenuous in the eastern section of this corridor where native trees and shrubs are widely scattered, however these would nonetheless act as stepping stones for fauna movement, and potentially occasional opportunistic usage by koalas.
Measures taken to avoid impacts to koalas
Clearing of native vegetation for the proposal would include removal of koala food trees. However, the majority of the woodland trees at the site would be retained and protected by a s88b mechanism under the *Conveyancing Act 1919* on individual lot titles. Clearing of the small number of koala food trees for the proposed development would result in a direct impact on koala habitat in the locality. However, this impact would be minimal, as the koala survey did not find evidence of koalas using the site, and any usage of site habitats is likely to be sporadic and opportunistic. The s88b areas would be fenced with koala friendly fencing (e.g. rural plain wire fencing) to ensure that koala movement through the site is not impeded post-development.
Analysis of potential impacts
Targeted surveys consisted of undertaking searches for koala scats in 3 SAT plots and spotlighting over 2 consecutive nights. A single 200 m spotlighting transect was used. Surveys were undertaken with a 100w Powabeam spotlight (model PL 145, manufacture date 2013). The results of the surveys indicated that there was no evidence of presence of koalas at the subject land or recent usage. Clearing of native vegetation for the proposal would include removal of a small number of koala food trees. However, the majority of the woodland trees at the site would be retained and protected by a s88b mechanism under the *Conveyancing Act 1919* on individual lot titles. Clearing of koala food trees for the proposal would result in a direct impact on koala habitat in the locality. However, this impact would be minimal, as the koala survey did not find evidence of koalas using the site, and any potential usage of food trees on the subject land is likely to be sporadic and opportunistic. Considering the likely opportunistic usage of the site by koalas, the proposal would be unlikely to result in a meaningful increase in the risk of other indirect impacts such as disease, vehicle strike or dog attack on the local koala population.
Plan to manage and protect koalas and their habitat
The majority of the Koala habitat occurring on the subject land would be retained and protected by a s88b mechanism under the *Conveyancing Act 1919* on individual lot titles. The s88b areas would be fenced with koala friendly fencing (e.g. rural plain wire fencing) to ensure that koala movement through the site is not impeded post-development.

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8.4 Mitigating residual impacts – management measures and implementation

Table 21 details proposed mitigation and management measures to be implemented.

Table 21 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Adoption of clearing protocols that identify vegetation to be retained, prevent inadvertent damage and reduce soil disturbance	A no-go zone around section 88B areas (refer to Figure 11) would be clearly delineated (e.g. with pegging, temporary fencing/ high-visibility flagging)	prior to construction of each stage of the development commencing	multiple times	project manager/contractors	high	n/a
	Trees requiring removal would be directionally felled away from any adjacent retained s88b vegetation to avoid damage.	during vegetation clearing operations	irregular	contractors	high	n/a
Using hygiene protocols to prevent the spread of weeds or pathogens between infected and uninfected areas	All construction machinery would be cleaned prior to entering the property to minimise potential for spread of weeds/pathogens to the site.	during construction	irregular	Project manager /contractors	high	n/a
Protection of retained trees	Retained habitat trees to be protected by a Section 88b instrument under the *Conveyancing Act 1919* on the title of individual lots (refer to Figure 11).	prior to the issue of a Subdivision Certificate for each relevant stage	once	Project manager	high	n/a

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Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy (including risk of failure)	MNES (when relevant)
Koala friendly fencing	Fencing to be constructed around the s88b areas will consist of a koala friendly construction method to allow for movement of koalas cross the subject land.	prior to the issue of a Subdivision Works Certificate for stage 2	once	Project manager	high	n/a
Vegetation Management Plan	A Vegetation Management Plan (VMP) is to be prepared by a suitably qualified environmental consultant or bush regenerator for vegetation retained within s88b areas. This plan is to detail the proposed protection (fencing), enhancement (revegetation with endemic species), weed control and maintenance of this vegetation over a 5-year period.	prior to the issue of a Subdivision Works Certificate for stage 2	once	Project manager/contractor (vegetation management specialist)	high	n/a

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9. Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

Table 22 outlines entities at risk of an SAII relevant to the proposed development.

Table 22 Entities at risk of an SAII

Common name	Scientific name	Reason for inclusion in assessment
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	Included in current list of entities at risk of an SAII and is likely to be impacted by the proposal

9.1.1 Additional impact assessment provisions for TECs at risk of an SAII

9.1.1.1 White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

1. Actions to avoid and minimise direct and indirect impacts

The proposal includes removal of a small area of 1.0 ha of White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions (White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland) (refer to Figure 11). However, this TEC is in relatively low condition on the subject land and a relatively small area is to be removed. In addition, an area of 1.44 ha of the best condition woodland occurrence of this TEC on the subject land will be protected by way of s88b mechanism on the title of individual lots and a Vegetation Management Plan will be implemented to improved vegetation condition and habitat within these areas.

To minimise any indirect impacts on retained occurrences within s88b areas on the subject land mitigation measures are proposed.

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2. Current status (excluding impacts of the proposal)

Table 23 Current status – White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Current total geographic extent (ha) of the TEC in NSW	n/a	TBDC	not indicated in the TBDC
Estimated reduction in geographic extent of the TEC since 1970	SAII principle 1 applies - there has been a population reduction of >=80% in 10 years or 3 generations (based on (1) ≥90% reduction where the reduction is measured since 1750 (historical decline))	TBDC	
Extent of reduction in ecological function, describing the degree of environmental degradation or disruption to biotic processes (Principle 2) TBDC displays '<50 individuals or <250 individuals where threats are known', this is to align with current legislative settings. For TECs this principle refers to communities with very high levels of either environmental degradation or disruption of biotic processes, and interactions have an increased risk of failure to sustain their characteristic native species assemblages.			
Evidence of restricted geographic distribution (Principle 3) based on the TEC's geographic range in NSW			
Extent of occurrence (ha)	n/a		not indicated in the TBDC
Area of occupancy (ha)	n/a		not indicated in the TBDC
Number of threat-defined locations	n/a		not indicated in the TBDC

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3. Impact assessment

Table 24 **Impact assessment – White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions**

Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Impact on the geographic extent of the TEC (Principles 1 and 3)			
Area of TEC to be impacted by the proposal (ha)	1.0	N/A	N/A
Area of TEC to be impacted by the proposal as a % of the current geographic extent in NSW (%)	not indicated in the TBDC	N/A	N/A
Direct/indirect impacts likely as a result of the proposal to contribute to loss of flora/fauna species characteristic of the TEC	Vegetation removal will have a minor likelihood of resulting in loss of flora-fauna species characteristic of this TEC. However, this TEC is in relatively low condition on the subject land and only a relatively small area is to be removed. In addition, 1.44 ha of the better quality woodland occurrence of this TEC on the subject land will be protected by way of s88b mechanism on the title of individual lots and a Vegetation Management Plan will be implemented to improved vegetation condition and habitat within these areas. To minimise any indirect impacts on retained occurrences within s88b areas on the subject land mitigation measures are proposed.	BDAR	N/A

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Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Impacts likely to contribute to further environmental degradation or disruption of biotic processes (Principle 2)			
Remaining extent of isolated areas of TEC (ha)	no areas of TEC would be isolated as a result of the development	mapping for BAM assessment and SVTM of assessment area	State Government of NSW and Department of Planning and Environment (2024).
Average distance between remaining remnants – remnant is retained (m)	no areas of TEC would be isolated as a result of the development	mapping for BAM assessment and SVTM of assessment area	State Government of NSW and Department of Planning and Environment (2024).
Average distance between remaining remnants – remnant is removed (m)	no areas of TEC would be isolated as a result of the development	mapping for BAM assessment and SVTM of assessment area	State Government of NSW and Department of Planning and Environment (2024).
Estimated maximum dispersal distance of species associated with the TEC (km)	It is estimated that the maximum dispersal distance for native grasses and other species with light weight wind dispersed seeds (i.e. having the greatest dispersal capacity) would be at least 1 km. Species with limited dispersal capacity such as eucalypts would be able to disperse and transfer genetic material by dispersing around the periphery of the development footprint through unimpacted TEC.	N/A	N/A
Area to perimeter ratio of remaining remnants (ratio)	no areas of TEC would be isolated following development	mapping for BAM assessment and SVTM of assessment area	State Government of NSW and Department of Planning and Environment (2024).
Vegetation integrity analysis			
Vegetation Zone 435_medium_woodland (Composition score)	47.5	N/A	N/A
Vegetation Zone 435_medium_woodland (Structure score)	6.9	N/A	N/A

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Criteria	Data/ information	Data sources	Details of data deficiency, assumptions, reasons for low confidence in information (e.g. TBDC indicates data is unknown or deficient)
Vegetation Zone 435_medium_woodland (Function score)	23.9	N/A	N/A
Vegetation Zone 435_low_DNG (Composition score)	29.5	N/A	N/A
Vegetation Zone 435_low_DNG (Structure score)	25.2	N/A	N/A
Vegetation Zone 435_low_DNG (Function score)	0.1	N/A	N/A

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10. Impact summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 25 details impacts on native vegetation and TECs or ECs that do not require an offset (as per BAM Subsection 9.2.1(3.)) (refer to Figure 12).

The vegetation integrity score of the following vegetation zones are <17 and the vegetation is associated with threatened species habitat (as represented by ecosystem credits) and does not represent a CEEC and therefore no offset (ecosystem credits) are required:

- 101_low_shrubland
- 101_low_planted
- 101_low_DNG

The vegetation integrity score of the following vegetation zone is <15 and the vegetation represents a CEEC and therefore no offset (ecosystem credits) are required:

- 435_low_DNG

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Table 26 identifies impacts on native vegetation that require an offset (as per BAM Subsection 9.2.1(1.)). An offset is required for loss of native vegetation as the PCT is associated with threatened species habitat (as represented by ecosystem credits) and the VI score is ≥17 (refer to Figure 12).

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Table 25 Impacts that do not require offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	TEC association	Entity at risk of an SAII?	Current VI score
101_low_shrubland	PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	-	3.6	No	No	4.7
101_low_planted		-	2.85	No	No	8
101_low_DNG		-	5.45	No	No	15.3
435_low_DNG	White Box shrubby woodland of the western Liverpool Range, Warrumbungle Range and south-west Pilliga forests, Brigalow Belt South Bioregion	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	0.87	Yes	Yes	9.1

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Table 26 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
101_medium_woodland	PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	-	0.08	40	0	-40	2	2
435_medium_woodland	PCT 435 White Box shrubby woodland of the western Liverpool Range, Warrumbungle Range and south-west Pilliga forests, Brigalow Belt South Bioregion	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions	0.13	-19.8	0	-19.8	2.5	2
Total credits								4

10.1.2 Impacts on threatened species and their habitat (species credits)

There are no impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

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11. Biodiversity credit report

11.1 Ecosystem credits

Ecosystem credit class and matching credit profile is detailed in Table 27Table 27 (also refer to Appendix C).

Table 27 Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
2	PCT 101 Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	Floodplain Transition Woodlands	Grassy Woodlands	-	Brigalow Clay Plain Woodlands - ≥ 70% - <90% cleared group (including Tier 2 or higher threat status).	No	Brigalow Belt South
2	PCT 435 White Box shrubby woodland of the western Liverpool Range, Warrumbungle Range and south-west Pilliga forests, Brigalow Belt South Bioregion	North-west Slopes Dry Sclerophyll Woodlands)	Dry Sclerophyll Forests (Shrub/grass sub-formation)	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and Riverina bioregions.	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and Riverina bioregions. This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278,	No	Brigalow Belt South

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Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
					279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150		

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12. References

Department of Planning & Environment (DPE) (2022). *Koala (Phascolarctos cinereus): Biodiversity Assessment Method Survey Guide.* Department of Planning & Environment, Sydney.

Department of Planning, Industry and Environment (DPIE 2020*). Surveying threatened plants and their habitats. NSW survey guide for the Biodiversity Assessment Method 2020.* State of NSW and Department of Planning, Industry and Environment, Sydney.

NSW Office of Environment and Heritage (2020). *Biodiversity Assessment Method.* Office of Environment and Heritage, Sydney.

State Government of NSW and Department of Planning and Environment (2024). *NSW State Vegetation Type Map – Extant PCT (release vC2.0.M2.1).* [Quickview (Vector Data - Geodatabase Format) and SVTM NSW Extant PCT 5m (Raster Data - TIFF format)

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13. Figures

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Figure 1 **Site Map**

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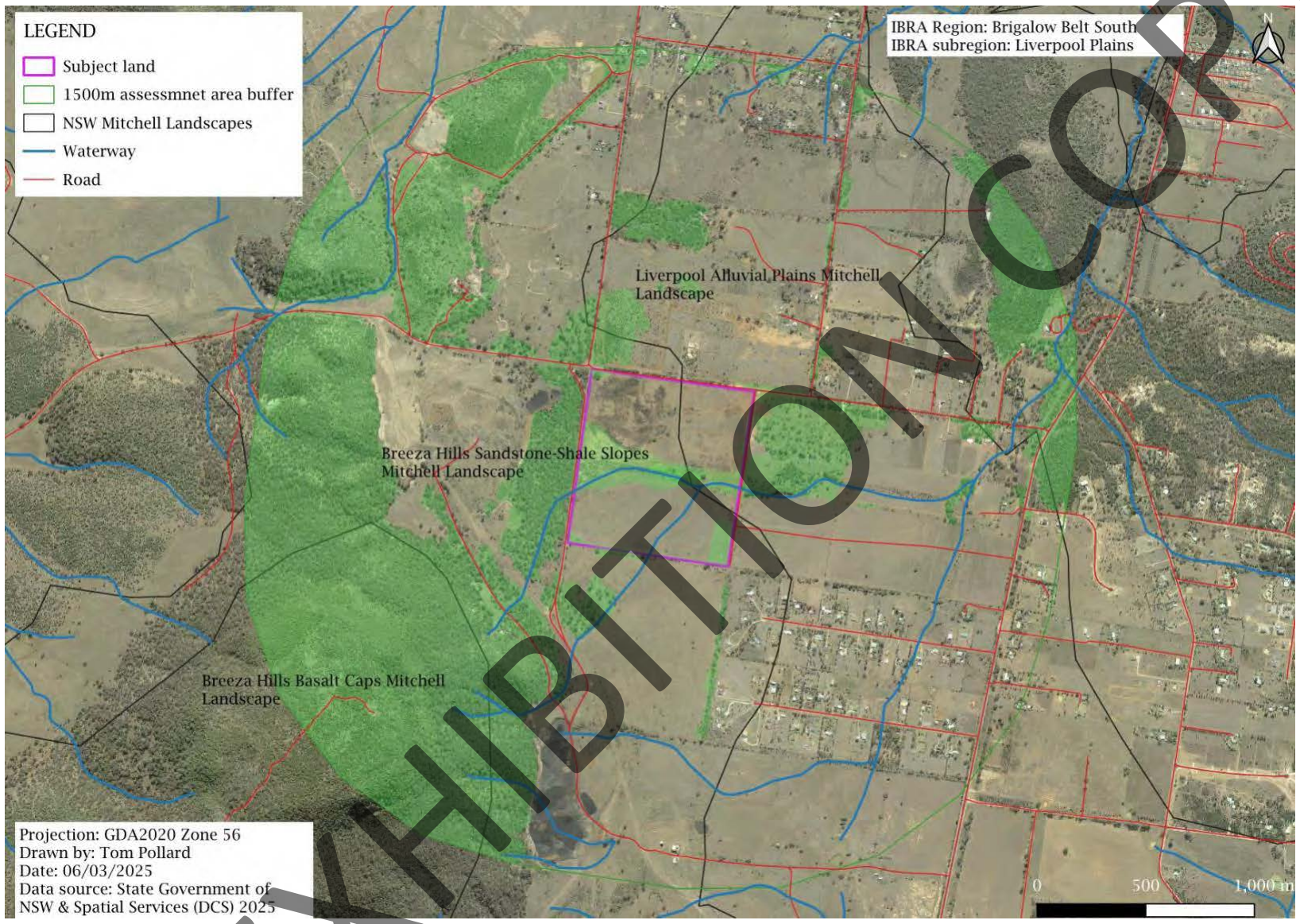

Figure 2 **Location Map**

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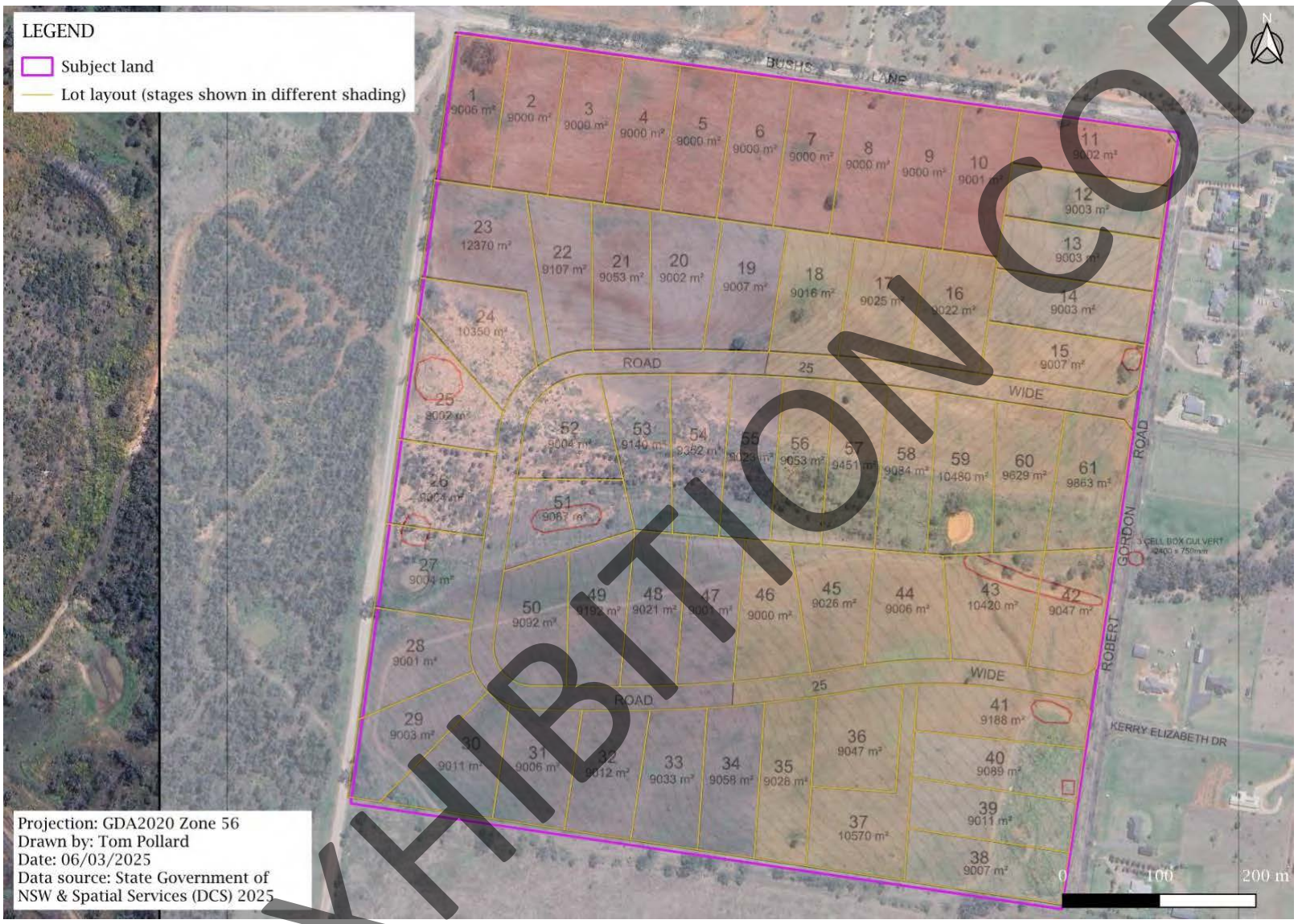

Figure 3 Development layout (Stewart Surveys 2024)

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Biodiversity Values Map

674.8 0 337.39 674.8 Metres

WGS_1984_Web_Mercator_Auxiliary_Sphere

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

06/03/2025 12:35 PM

Imagery © Airbus DS/Spot Image 2016

© NSW Department of Customer Service, Basemaps 2019

© NSW Department of Planning and Environment

The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the Biodiversity Values Map viewer for mapping updates is recommended.

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Figure 4 Biodiversity Values Map

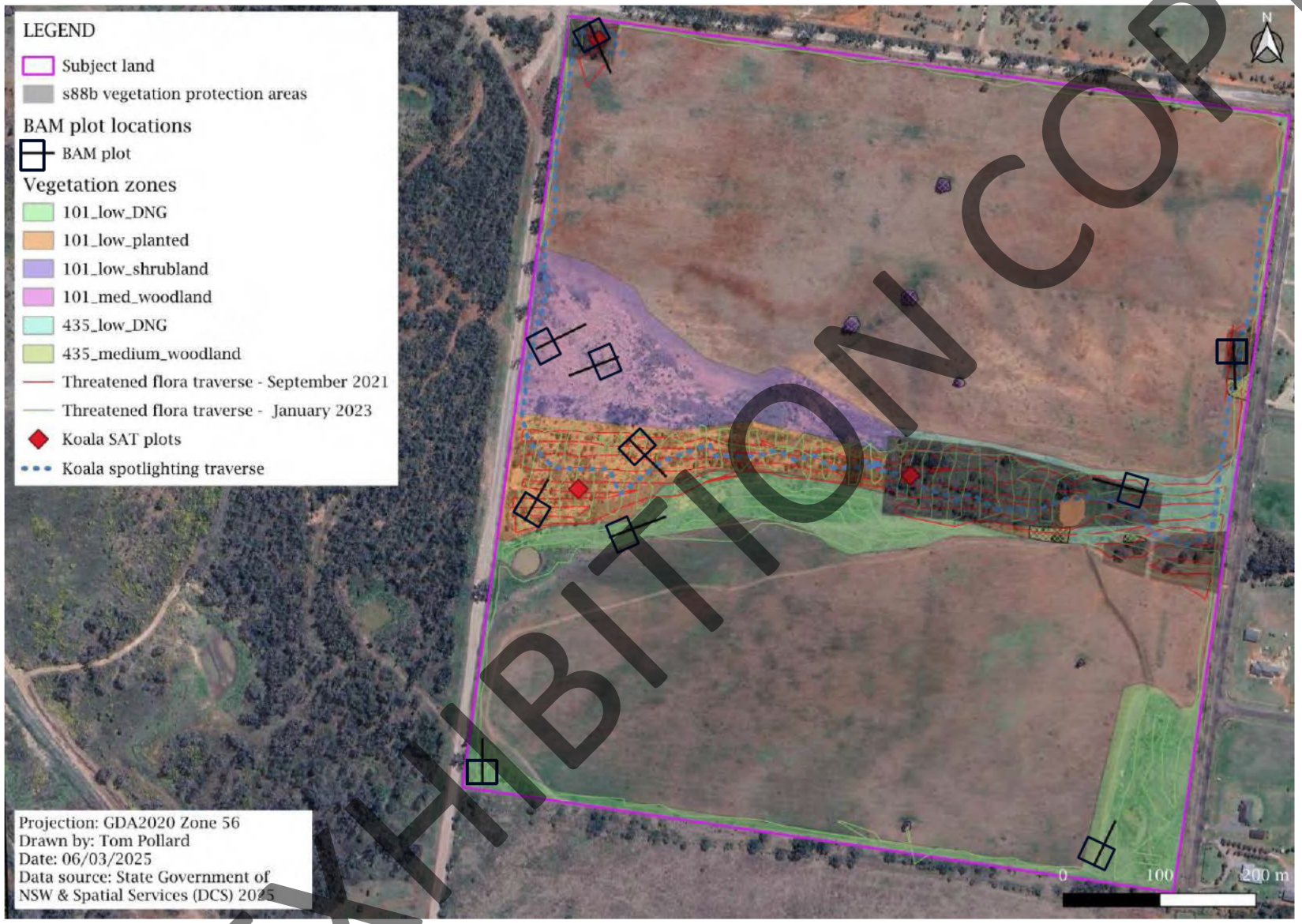

Figure 5 **Field survey locations**

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Figure 6 **Native vegetation extent**

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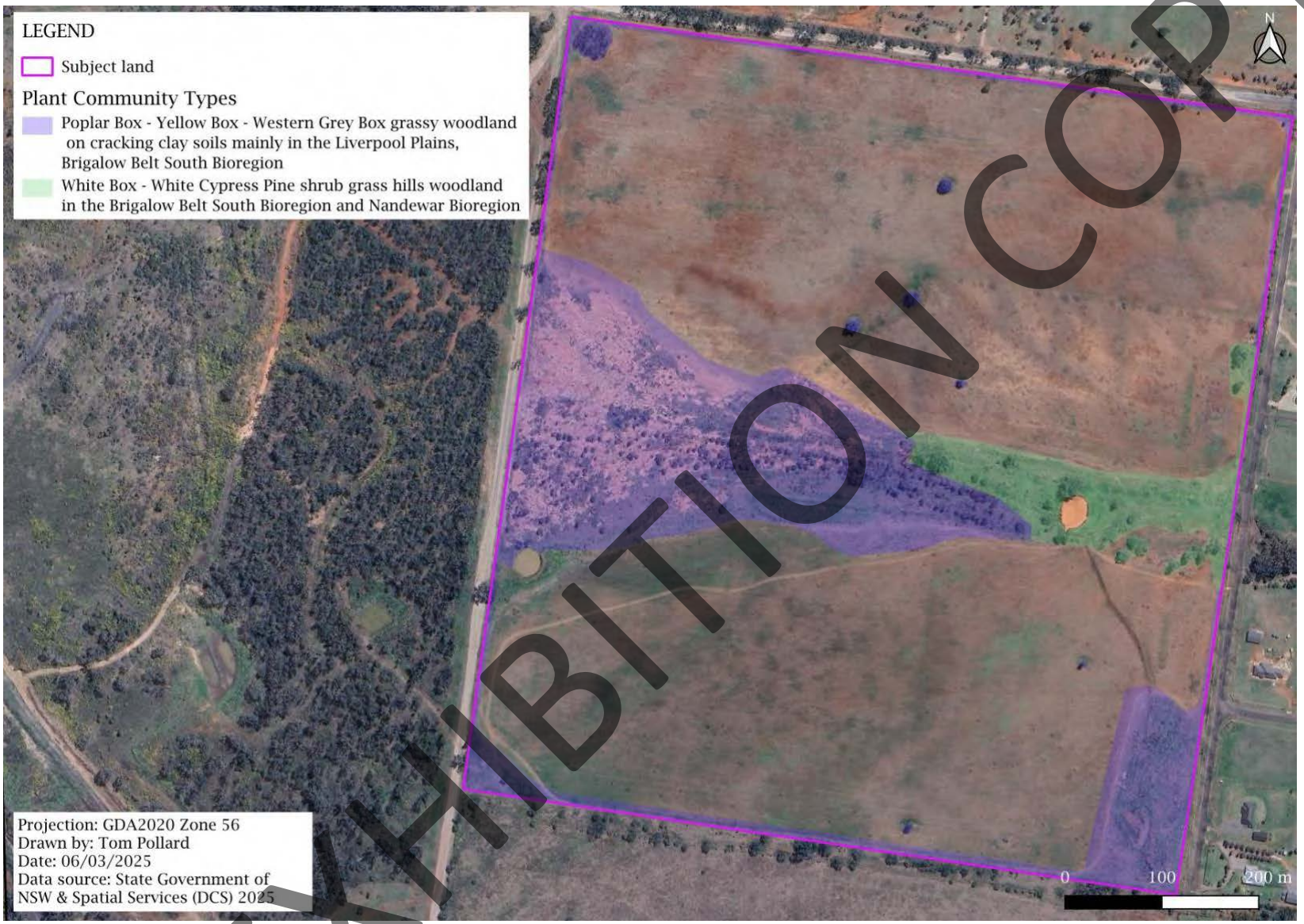

Figure 7 **Plant community types**

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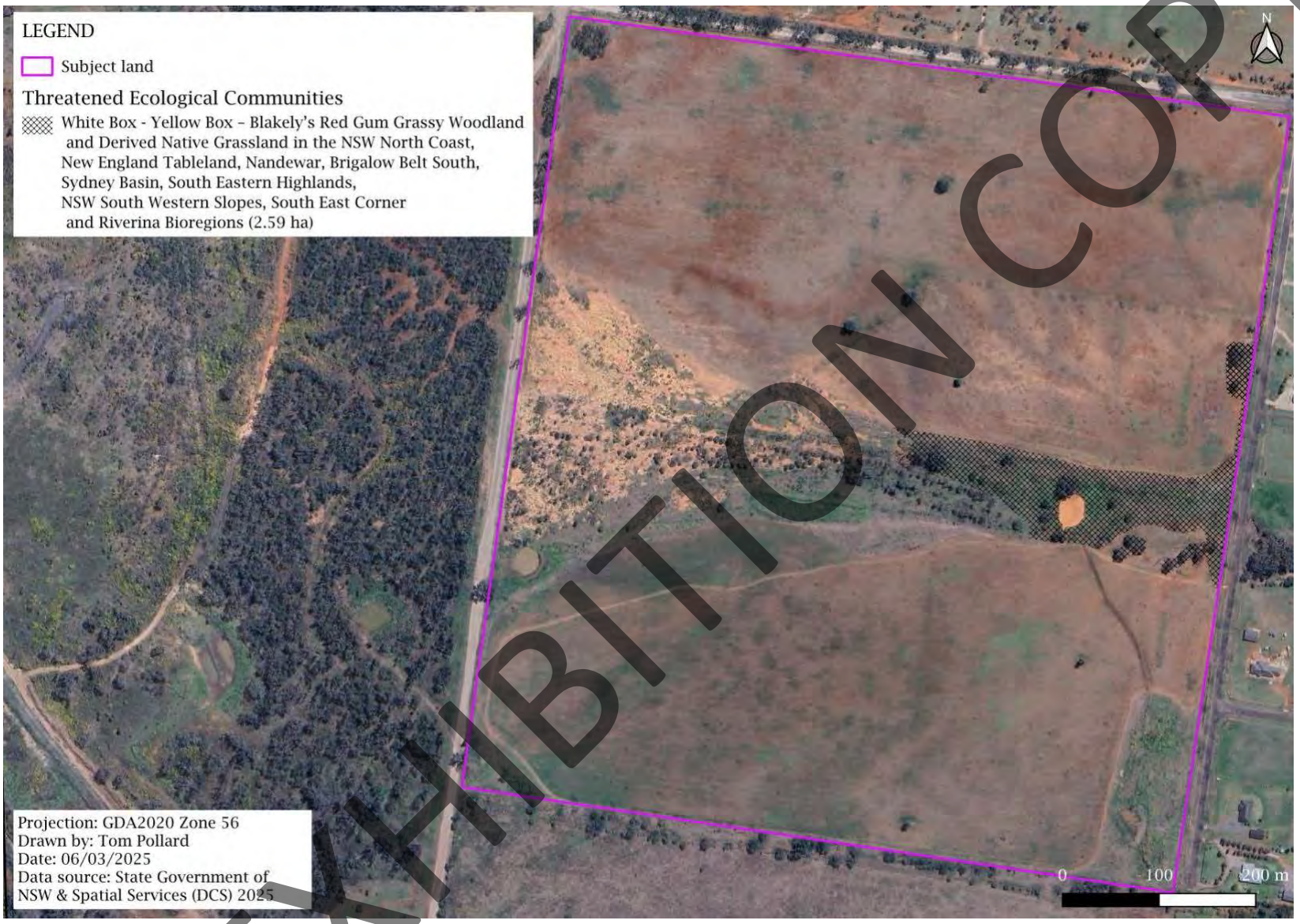

Figure 8 **Threatened Ecological Communities**

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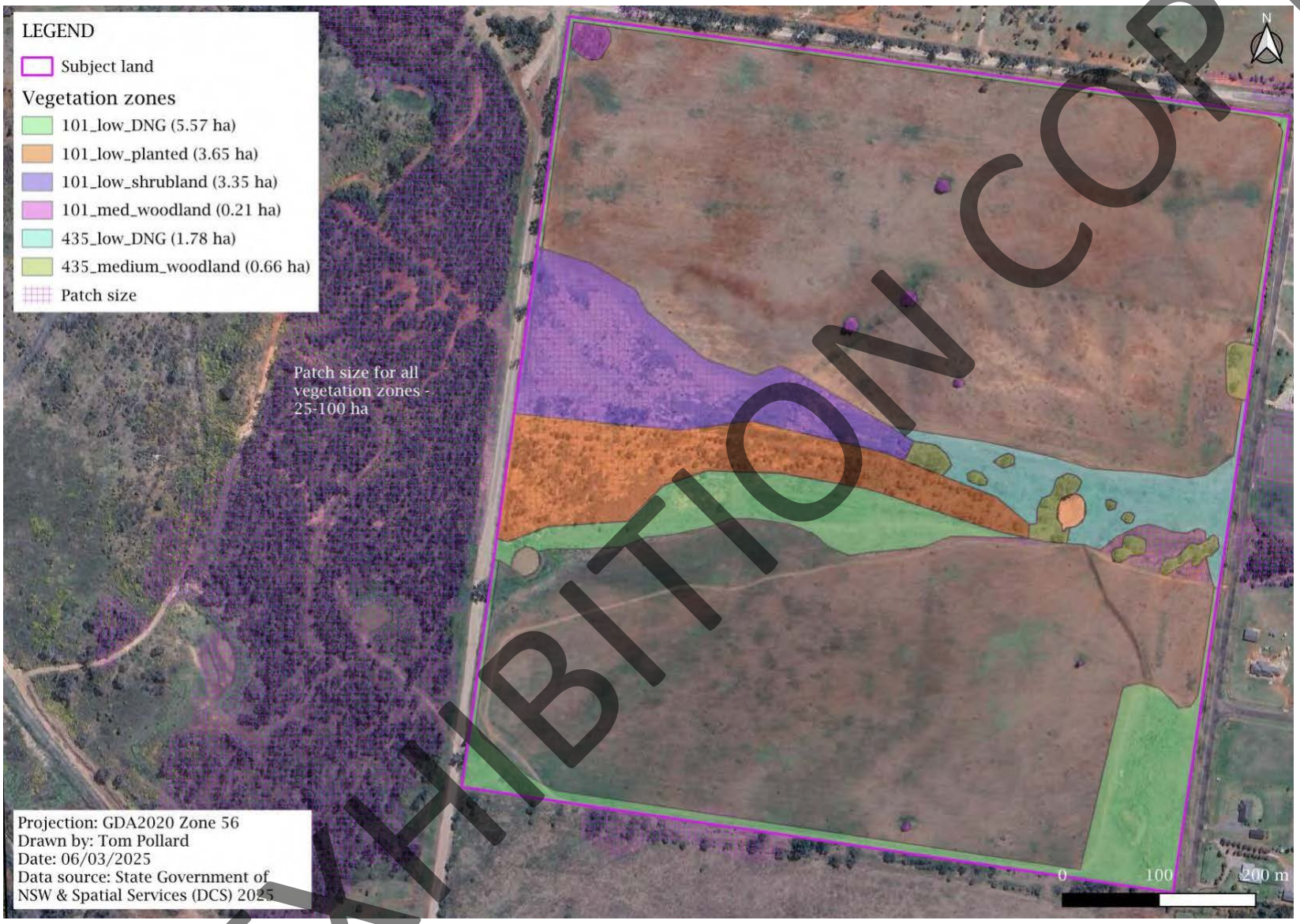

Figure 9 **Vegetation zones**

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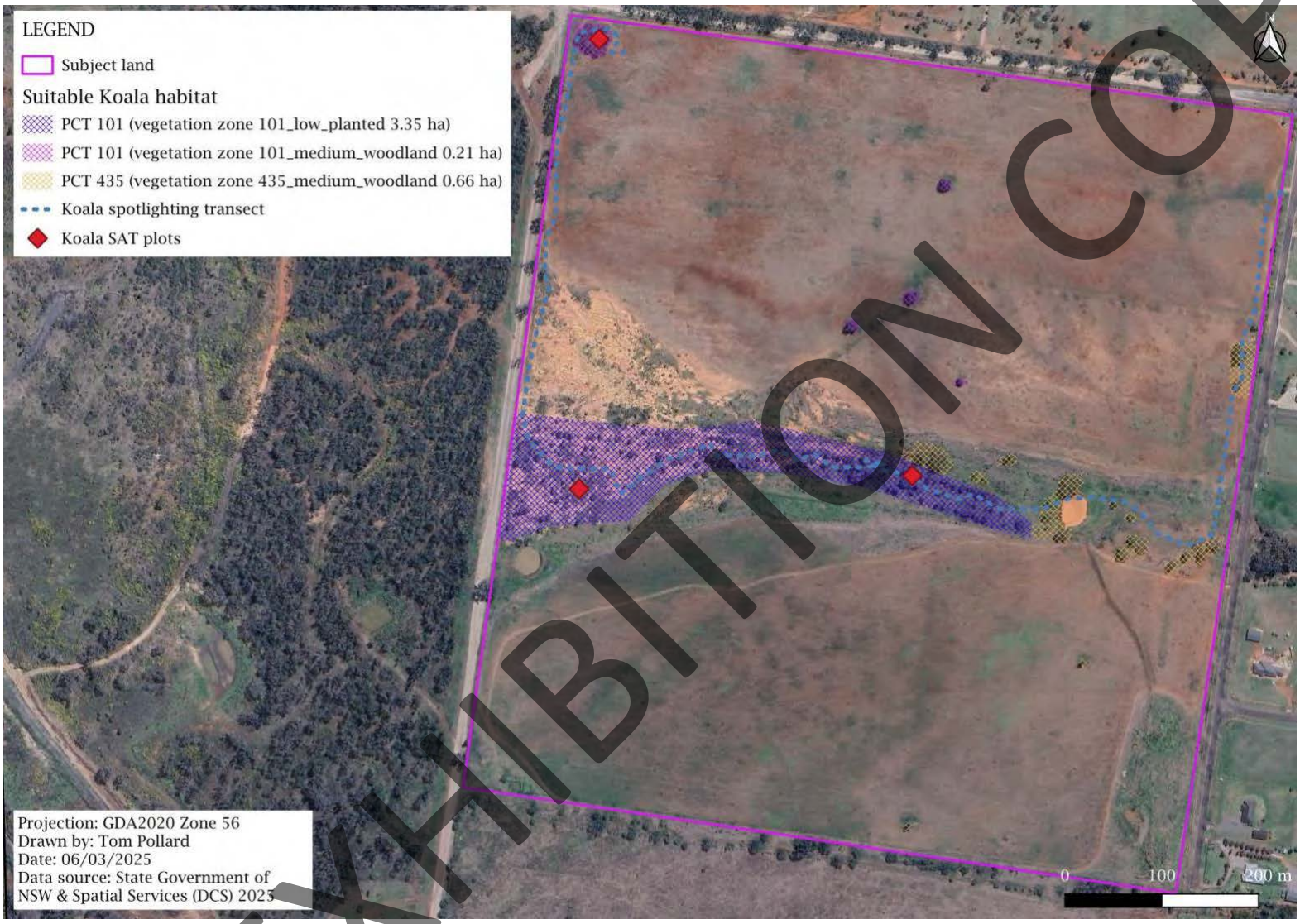

Figure 10 **Suitable Koala habitat and surveys**

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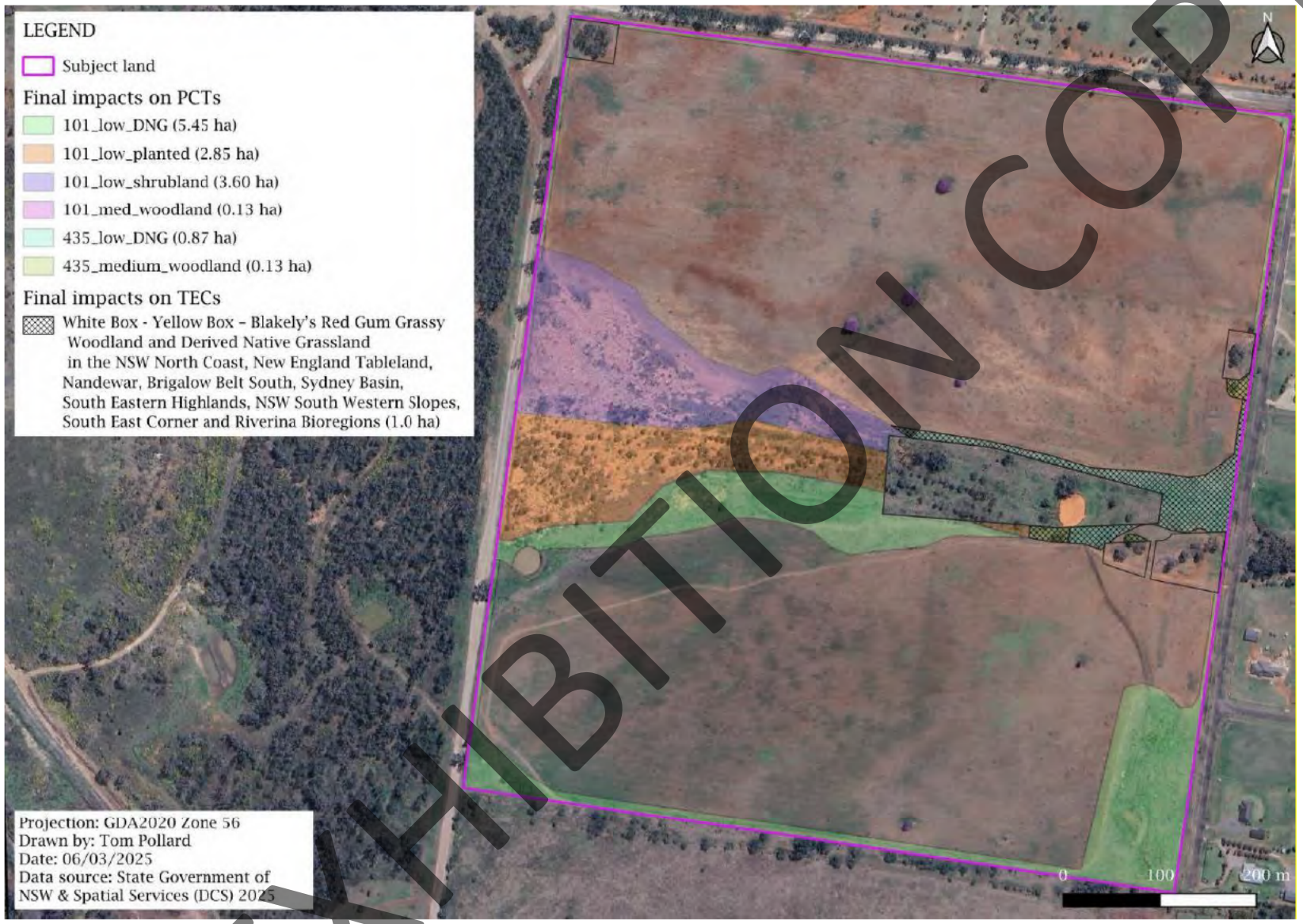

Figure 11 **Final impacts likely to occur on the subject land**

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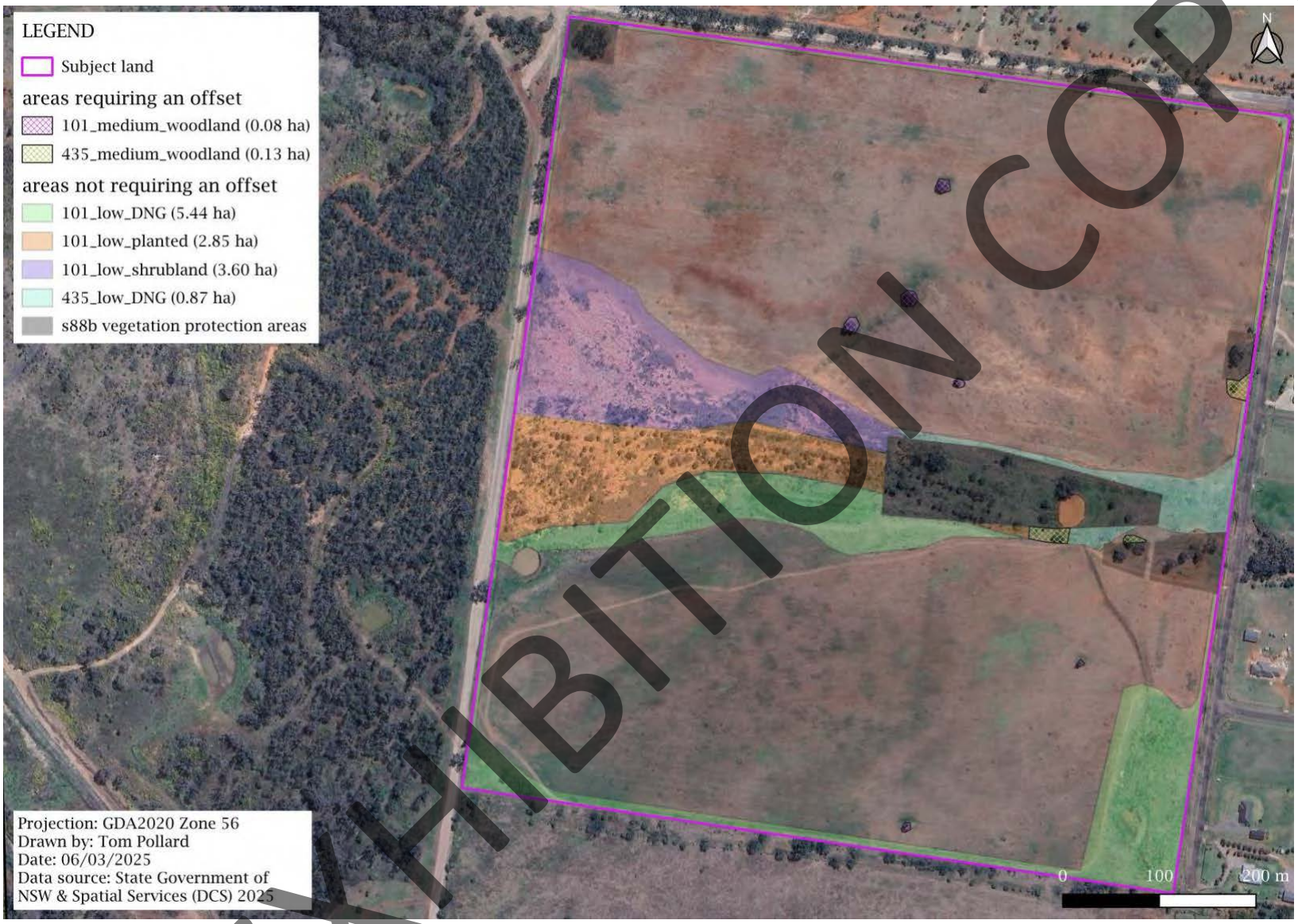

Figure 12 **Thresholds for assessing and offsetting impacts**

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Appendix A: BDAR requirements compliance

Table 28 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	<1.1.1>
		☒ identification of subject land boundary, including:	<1.1.3>
		☒ operational footprint	
		☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	
		☒ general description of the subject land	<1.1.3>
		☒ sources of information used in the assessment, including reports and spatial data	<1.4>
		☒ identification and justification for entering the BOS	<1.2>
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	<Figure 1>
Landscape	Sections 3.1 and 3.2, Appendix E	Information	
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	<1.1.3>
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	<3.3>

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	<3.2.1>
		☒ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	<3.2.2>
		☒ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	<3.2.2>
		☒ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	<3.2.3>
		☒ karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	<3.2.4>
		☒ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	<3.2.5>
		☐ any additional landscape features identified in any SEARs for the proposal	n/a
		☒ NSW (Mitchell) landscape on which the subject land occurs	<3.2.6>
		☒ details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	<2.1>
		Maps and tables	
		☒ Site Map ☒ Boundary of subject land ☒ Cadastre of subject land (including labelling of Lot and DP or section plan if relevant) ☒ Landscape features identified in BAM Subsection 3.1.3	<Figure 1>
		☐ Location Map ☒ Digital aerial photography at 1:10,000 scale or finer	<Figure 2>

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Boundary of subject land ☒ Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development) ☒ Landscape features identified in BAM Subsection 3.1.3 ☐ Additional detail (e.g. local government area boundaries) relevant at this scale	
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		☒ IBRA bioregions and subregions ☒ rivers, streams and estuaries ☐ wetlands and important wetlands ☐ connectivity of different areas of habitat ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area ☐ any additional landscape features identified in any SEARs for the proposal ☒ NSW (Mitchell) landscape on which the subject land occurs	<Figure 1 & Figure 2>
		Data	
		☒ All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		☒ subject land boundary	–
		☒ assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		☒ cadastral boundary of subject land	–
		☒ areas of native vegetation cover	–

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		☒ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	<4.1>
		☒ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	<4.1.1>
		☒ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	<2.2.2>
		☒ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	<2.2.3>
		☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	n/a
		For each PCT within the subject land, describe:	–
		☒ PCT name and ID	<4.1>
		☒ vegetation class	<4.1.1>
		☒ extent (ha) within subject land	<2.2.2>
		☒ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	<2.2.3>
		☒ plant species relied upon for identification of the PCT and relative abundance of each species	<4.2.2.3 and Appendix B>

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	<4.2.2.4 and Figure 8
		☒ estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	<4.1.1>
		Describe the vegetation integrity assessment of the subject land, including:	–
		☒ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	<4.2.1>
		☒ description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	<4.2.1>
		☒ area (ha) of each vegetation zone	<4.2.1>
		☒ assessment of patch size (as described in BAM Subsection 4.3.2)	<4.2.1>
		☒ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	<4.4.1>
		☐ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	n/a
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		☐ identify the PCT or vegetation class for which local benchmark data will be applied ☐ identify published sources of local benchmark data (if benchmarks obtained from published sources) ☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	n/a
		☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	n/a
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	n/a
		Maps and tables	

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	<Figure 6>
		☒ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	<Figure 7>
		☒ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	<Figure 9>
		☒ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	<Figure 5>
		☒ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	<Figure 8>
		☒ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	<Figure 9 & Table 6)
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		☒ composition condition score	<Table 7>
		☒ structure condition score	
		☒ function condition score	
		☒ presence of hollow bearing trees	
		Data	
		☒ All report maps as separate jpeg files	–
		☒ Plot field data (MS Excel format)	
		☒ Plot field datasheets	<Appendix B>
		Digital shape files of:	–
		☒ PCT boundaries within subject land	–
		☒ TEC boundaries within subject land	–

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ vegetation zone boundaries within subject land	–
		☒ floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		☒ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	<Table 8>
		☒ justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	<5.2.1>
		☐ justification for addition of any ecosystem credit species to the list	n/a
		Identify species credit species likely to occur on the subject land, including:	–
		☒ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	<Table 9 & Table 10>
		☒ justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	<5.2.2>
		☒ justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	<5.2.2>
		☐ justification for addition of any species credit species to the list	n/a
		From the list of candidate species credit species, identify:	–
		☐ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.))	<Table 11 & Table 12>
		☐ species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.))	
		☒ species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	–
		☒ threatened species survey (as described in BAM Section 5.2.4)	<Table 13 & Table 14>
		☒ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	n/a
		Where survey has been undertaken include detailed information on:	–
		☒ survey method and effort (as described in BAM Section 5.3)	<Table 13 & Table 14>
		☐ justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	n/a
		☒ timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	<Table 13 & 14 & 5.3>
		☒ survey personnel and relevant experience	<Declarations ii>
		☐ describe any limitations to surveys and how these were addressed/overcome	n/a
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		☐ justification of the use of an expert report ☐ identify the expert, provide evidence of their expert credentials and departmental approval of expert status ☐ all requirements of Box 3 have been addressed in the expert report	n/a
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		☐ identify relevant species	n/a

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ identify data to be amended	
		☐ identify source of information for local data, e.g. published literature, additional survey data, etc.	
		☐ justify use of local data in preference to VIS Classification or TBDC data	
		☐ provide written confirmation from the decision-maker that they support the use of local data	n/a
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		☐ the unit of measure for each species is documented	n/a
		for species assessed by area:	–
		☐ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	n/a
		☐ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	n/a
		for species assessed by counts of individuals:	–
		☐ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	n/a
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	n/a
		☐ the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	n/a
		☐ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	n/a
		Maps and tables	
		☒ Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ the ecosystem credit species removed from the list	<Table 8>
		☒ the sensitivity to gain class of each species	<Table 8>
		☒ Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	<Table 11 & Table 12>
		☒ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	<Table 11 & Table 12>
		☒ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	<Table 13 & Table 14>
		☐ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	n/a
		☐ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	n/a
		Data	
		☒ Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		☒ Survey locations including GPS coordinates of any plots, transects, grids	
		☐ Digital shape files of each species polygon including GPS coordinates of located individuals	n/a
		☐ Species polygon map in jpeg format	n/a
		☐ Expert reports and any supporting data used to support conclusions of the expert report	n/a
		☒ Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	<2.5 & 5.3>
Prescribed impacts	Chapter 6	Information	

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		☐ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☐ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☐ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☐ waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	n/a
		☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5)	n/a
		☐ where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	n/a
		☐ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	n/a
		☐ Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g. Subsection 6.1.3)	n/a
		Where the proposed development is for a wind farm:	–
		☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5)	n/a
		☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.)	n/a
		☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	n/a
		Where the proposal may result in vehicle strike:	–

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ identify a list of threatened fauna or protected fauna species that are part of a TEC and at risk of vehicle strike due to the proposal	n/a
		Maps and tables	
		☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	n/a
		☐ Map showing location of potential vehicle strike locations	n/a
		☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	n/a
		Data	
		☒ Digital shape files of prescribed impact feature locations	n/a
		☐ Prescribed impact features map in jpeg format	n/a
Avoid and minimise impacts	Chapter 7	Information	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	n/a
		☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	n/a
		☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	n/a
		☐ alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	n/a

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	<7.1.1>
		☒ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	<7>
		☐ Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g. due to site constraints)	n/a
		Maps and tables	
		☒ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	<Table 21>
		☒ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	Figure 3
		☐ Maps demonstrating indirect impact zones where applicable	n/a
		Data	
		Digital shape files of:	–
		☒ alternative and final proposal footprint	–
		☒ direct and indirect impact zones	–
		☒ Maps in jpeg format	–
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		☒ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	<Table 23>
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☒ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	<Table 19>
		☒ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	<8.1.1>
		☐ reporting any limitations or assumptions, etc. made during the assessment	n/a
		☒ identification of the threatened entities and their habitat likely to be affected	<Table 17>
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		☐ karst, caves, crevices, cliffs, rocks and other features of geological significance	n/a
		☐ human-made structures	n/a
		☐ non-native vegetation	n/a
		☐ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	n/a
		☐ movement of threatened species that maintains their life cycle	n/a
		☐ water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	n/a
		☐ assessment of the impacts of wind turbine strikes on protected animals	n/a
		☐ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	n/a
		☐ evaluate the consequences of prescribed impacts	n/a
		☐ describe impacts that are uncertain	n/a
		☐ document limitations to data, assumptions and predictions	n/a

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Maps and tables	
		☒ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	<Table 18>
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	Information	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		☒ techniques, timing, frequency and responsibility	<Table 16>
		☒ identify measures for which there is risk of failure	
		☒ evaluate the risk and consequence of any residual impacts	
		☐ document any adaptive management strategy proposed	n/a
		Identification of measures for mitigating impacts related to:	–
		☐ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	<8.4>
		☒ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))	
		☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	
		☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	n/a
		Maps and tables	
		☒ Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	<Table 21>
		Data	

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		N/A	–
Impact summary	Chapter 9	Information	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		☒ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	9.1
		☒ for each TEC, report the extent of the TEC in NSW	9.1
		☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land	n/a
		☐ for each threatened species, report the population size in NSW	n/a
		☐ documenting assumptions made and/or limitations to information	n/a
		☐ documenting all sources of data, information, references used or consulted	
		☐ clearly justifying why any criteria could not be addressed	
		☒ Identification of impacts requiring offset in accordance with BAM Section 9.2	<Table 22>
		☒ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	<Table 23>
		☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3	n/a
		Maps and tables	
		☐ Map showing the extent of TECs at risk of an SAII within the subject land	n/a
		☐ Map showing location of threatened species at risk of an SAII within the subject land	n/a
		Map showing location of:	–
		☒ impacts requiring offset	<Figure 11>
		☒ impacts not requiring offset	< Figure 11>

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ areas not requiring assessment	< Figure 12>
		Data	
		Digital shape files of:	–
		☐ extent of TECs at risk of an SAII within the subject land	n/a
		☐ location of threatened species at risk of an SAII within the subject land	n/a
		☒ boundary of impacts requiring offset	–
		☒ boundary of impacts not requiring offset	–
		☒ boundary of areas not requiring assessment	–
		☒ Maps in jpeg format	–
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		☒ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H)	<Table 18>
		☒ change in vegetation integrity score (BAM Subsection 8.1.1)	
		☒ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	
		☒ biodiversity risk weighting for each	<Table 23>
		☐ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	n/a
		Maps and tables	
		☒ Table of PCTs requiring offset and the number of ecosystem credits required	<Table 17>

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BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		☐ Table of threatened species requiring offset and the number of species credits required	n/a
		Data	
		☒ Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	Information	
		☒ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	<Table 19>
		☒ BAM credit report in pdf format	<Appendix C>
		Maps and tables	
		☒ Table of credit class and matching credit profile	<Table 24>
		Data	
		☒ BAM credit report in pdf format	<Appendix C>

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Appendix B: Vegetation survey data

Table 29 Vegetation survey data and locations

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 1 101 woodland*
PCT	*PCT 101*
Vegetation zone	*101_medium_woodland*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	20/1/2023
GPS start of transect	232973, 6565913
Midline bearing	170

Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Eucalyptus populnea	Poplar Box	Myrtaceae	25	2	TG (tree)	No	No	-	-
Acacia deanei	Green Wattle	Fabaceae	10	1	SG (shrub)	No	No	-	-
Senna artemisioides subsp. zygophylla	Silver Cassia	Fabaceae	0.1	3	SG (shrub)	No	No	-	-
Geijera parviflora	Wilga	Rutaceae	0.1	2	SG (shrub)	No	No	-	-
Myopoprum montanum	Western Boobialla	Scrophulariaceae	0.3	7	SG (shrub)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	0.2	10	GG (grass and grass-like)	No	No	-	-
Dichanthium sericeum	Bluegrass	Poaceae	0.5	20	GG (grass and grass-like)	No	No	-	-
Cynodon dactylon	Couch	Poaceae	5	200	GG (grass and grass-like)	No	No	-	-
Juncus spp.	a Rush	Poaceae	1	20	GG (grass and grass-like)	No	No	-	-
Enteropogon acicularis	Star Grass	Poaceae	0.1	1	GG (grass and grass-like)	No	No	-	-
Paspalidium constrictum	Knottybutt Grass	Poaceae	0.2	10	GG (grass and grass-like)	No	No	-	-
Aristida ramosa	Purple Wiregrass	Poaceae	0.1	2	GG (grass and grass-like)	No	No	-	-
Austrostipa verticillata	Slender Bamboo grass	Poaceae	1	20	GG (grass and grass-like)	No	No	-	-
Panicum effusum	Hairy Panic	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Abutilon oxycarpum	Flannel Weed	Malvaceae	0.2	2	FG (forb)	No	No	-	-
Sida corrugata	Variable Sida	Malvaceae	0.1	20	FG (forb)	No	No	-	-
Sida cunninghamii	Ridged Sida	Malvaceae	0.1	50	FG (forb)	No	No	-	-
Vittadinia cuneata	Fuzzweed	Asteraceae	0.5	50	FG (forb)	No	No	-	-
Glycine spp.	a Glycine	Fabaceae	0.1	5	OG (Other)	No	No	-	-
Convolvulus graminetinus	Bindweed	Convolvulaceae	0.1	1	OG (Other)	Yes	Yes	-	-

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Daucus carota	Wild Carrot	Apiaceae	0.1	1	-	Yes	No	-	-
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush	Poaceae	0.1	1	-	Yes	No	-	-
Hyparrhenia hirta	Coolatai Grass	Poaceae	0.1	1	-	Yes	Yes	-	-
Conyza spp.	Flax-leaf Fleabane	Asteraceae	0.1	20	-	Yes	No	-	-
Cirsium vulgare	Spear Thistle	Asteraceae	0.1	3	-	Yes	No	-	-

Structure (400 m2 plot)		
BAM attribute		***Sum values***
Count of native richness	*Trees*	1
	Shrubs	4
	Grasses and grass-like	9
	Forbs	4
	Ferns	0
	Other	2
Sum of cover of native vascular plans by growth form group	*Trees*	25
	Shrubs	10.5
	Grasses and grass-like	8.2
	Forbs	0.9
	Ferns	0
	Other	0.2
High Threat Weed cover		0.1

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	present (1 tree)
30-49	present
20-29	present
10-19	absent
5-9	absent
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	5	0.5	30	25	25
Average of the 5 subplots					17.1

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 1 101 shrubland*

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PCT	*PCT 101*
Vegetation zone	*101_low_shrubland*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	27/5/2021
GPS start of transect	233003, 6565567
Midline bearing	260

Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Senna artemisioides subsp. zygophylla	Silver Cassia	Fabaceae	0.5	5	SG (shrub)	No	No	-	-
Eremophila mitchellii	False Sandalwood	Scrophulariaceae	0.3	1	SG (shrub)	No	No	-	-
Acacia decora	Western Silver Wattle	Fabaceae	0.2	5	SG (shrub)	No	No	-	-
Sclerolaena birchii	Galvanised Burr	Chenopodiaceae	0.2	1	SG (shrub)	No	No	-	-
Maireana microphylla	Small-leaf Bluebush	Chenopodiaceae	0.1	2	SG (shrub)	No	No	-	-
Logania albiflora		Loganiaceae	0.2	3	SG (shrub)	No	No	-	-
Acacia deanei	Green Wattle	Fabaceae	0.3	4	SG (shrub)	No	No	-	-
Tragus australianus	Small Burrgrass	Poaceae	0.1	2	GG (Grass and grass-like)	No	No	-	-
Enteropogon acicularis	Star Grass	Poaceae	0.2	1	GG (grass and grass-like)	No	No	-	-
Aristida ramosa	Purple Wiregrass	Poaceae	0.5	30	GG (Grass and grass-like)	No	No	-	-
Panicum effusum	Hairy Panic	Poaceae	0.1	5	GG (Grass and grass-like)	No	No	-	-
Rytidosperma bipartitum	Wallaby Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Dichanthium sericeum	Queensland Bluegrass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	0.5	20	GG (Grass and grass-like)	No	No	-	-
Cymbopogon refractus	Barbwire Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Rytidosperma spp.	A Wallaby Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Oxalis perennans	Grassland Wood-sorrel	Oxalidaceae	0.1	2	FG (forb)	No	No	-	-
Leiocarpa tormentosa	Wooly Plover-daisy	Asteraceae	0.1	15	FG (forb)	No	No	-	-
Portulaca oleracea	Pigweed	Portulacaceae	0.2	1	FG (forb)	No	No	-	-
Asperula conferta	Common Woodruff	Rubiaceae	0.1	10	FG (forb)	No	No	-	-
Vittadinia cervicularis		Asteraceae	0.1	30	FG (forb)	No	No	-	-
Lycium ferocissimum	African Boxthorn	Solanaceae	0.2	1		Yes	Yes	-	-
Solanum elaeagnifolium	Silver-leaved Nightshade	Solanaceae	0.1	3		Yes	No	-	-
Sonchus oleraceus	Sow Thistle	Asteraceae	0.2	3		Yes	No	-	-
Medicago polymorpha	Burr Medic	Fabaceae	0.1	20		Yes	No	-	-
Urochloa panicoides	Liverseed Grass	Poaceae	0.1	2		Yes	No	-	-
Lysmachia arvensis	Scarlet Pimpernell	Primulaceae	0.1	5		Yes	No	-	-

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Structure (400 m2 plot)		
BAM attribute		***Sum values***
Count of native richness	*Trees*	0
	Shrubs	7
	Grasses and grass-like	9
	Forbs	5
	Ferns	0
	Other	0
Sum of cover of native vascular plans by growth form group	*Trees*	0
	Shrubs	1.7
	Grasses and grass-like	1.8
	Forbs	0.6
	Ferns	0
	Other	0
High Threat Weed cover		0.2

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	absent
5-9	absent
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	0	1	0.1	0	0
Average of the 5 subplots					0.2

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 2 101 shrubland*
PCT	*PCT 101*
Vegetation zone	*101_low_shrubland*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	27/5/2021
GPS start of transect	232966, 6565601
Midline bearing	255

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Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Senna artemisioides subsp. zygophylla	Silver Cassia	Fabaceae	1	5	SG (shrub)	No	No	-	-
Maireana microphylla	Small-leaf Bluebush	Chenopodiaceae	0.1	2	SG (shrub)	No	No	-	-
Logania albiflora		Loganiaceae	0.1	3	SG (shrub)	No	No	-	-
Eremophila mitchellii	False Sandalwood	Scrophulariaceae	0.1	1	SG (shrub)	No	No	-	-
Acacia decora	Western Silver Wattle	Fabaceae	0.2	5	SG (shrub)	No	No	-	-
Sclerolaena birchii	Galvanised Burr	Chenopodiaceae	0.1	1	SG (shrub)	No	No	-	-
Panicum effusum	Hairy Panic	Poaceae	0.1	5	GG (Grass and grass-like)	No	No	-	-
Tragus australianus	Small Burrgrass	Poaceae	0.1	2	GG (Grass and grass-like)	No	No	-	-
Chloris truncata	Windmill Grass	Poaceae	0.1	1	GG (Grass and grass-like)	No	No	-	-
Rytidosperma bipartitum	Wallaby Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Dichanthium sericeum	Queensland Bluegrass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	0.1	20	GG (Grass and grass-like)	No	No	-	-
Aristida ramosa	Purple Wiregrass	Poaceae	1	30	GG (Grass and grass-like)	No	No	-	-
Cymbopogon refractus	Barbwire Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Rytidosperma spp.	A Wallaby Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Oxalis perennans	Grassland Wood-sorrel	Oxalidaceae	0.1	2	FG (forb)	No	No	-	-
Leiocarpa tormentosa	Wooly Plover-daisy	Asteraceae	0.1	15	FG (forb)	No	No	-	-
Portulaca oleracea	Pigweed	Portulacaceae	0.1	1	FG (forb)	No	No	-	-
Asperula conferta	Common Woodruff	Rubiaceae	0.1	10	FG (forb)	No	No	-	-
Vittadinia cervicularis		Asteraceae	0.2	30	FG (forb)	No	No	-	-
Sida corrugata	Variable Sida	Malvaceae	0.1	20	FG (forb)	No	No	-	-
Jasminum lineare	Desert Jasmine	Oleaceae	0.1	2	OG (other)	No	No	-	-
Solanum elaeagnifolium	Silver-leaved Nightshade	Solanaceae	0.1	3		Yes	No	-	-
Sonchus oleraceus	Sow Thistle	Asteraceae	0.1	1		Yes	No	-	-
Lycium ferocissimum	African Boxthorn	Solanaceae	0.2	1		Yes	Yes	-	-
Medicago polymorpha	Burr Medic	Fabaceae	0.1	5		Yes	No	-	-
Urochloa panicoides	Liverseed Grass	Poaceae	0.1	2		Yes	No	-	-
Carthamus lanatus	Saffron Thistle	Asteraceae	0.1	1		Yes	No	-	-
Lysmachia arvensis	Scarlet Pimpernell	Primulaceae	0.1	5		Yes	No	-	-

Structure (400 m2 plot)	
BAM attribute	***Sum values***

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Count of native richness	*Trees*	0
	Shrubs	6
	Grasses and grass-like	9
	Forbs	5
	Ferns	0
	Other	1
Sum of cover of native vascular plans by growth form group	*Trees*	0
	Shrubs	1.6
	Grasses and grass-like	1.8
	Forbs	0.6
	Ferns	0
	Other	0.1
High Threat Weed cover		0.2

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	absent
5-9	absent
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	0	0.5	0.1	0	0.5
Average of the 5 subplots					0.2

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 1 101 planted*
PCT	*PCT 101*
Vegetation zone	*101_low_planted*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	27/5/2021
GPS start of transect	233015, 6565482
Midline bearing	145

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Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Eucalyptus populnea	Poplar Box	Myrtaceae	1	2	TG (tree)	No	No	-	-
Acacia decora	Western Silver Wattle	Fabaceae	0.1	2	SG (shrub)	No	No	-	-
Logania albiflora		Loganiaceae	0.5	20	SG (shrub)	No	No	-	-
Geijera parviflora	Wilga	Rutaceae	0.5	3	SG (shrub)	No	No	-	-
Chloris truncata	Windmill Grass	Poaceae	1	100	GG (Grass and grass-like)	No	No	-	-
Dichanthium sericeum	Bluegrass	Poaceae	3	200	GG (grass and grass-like)	No	No	-	-
Rytidosperma spp.	a Wallaby Grass	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Rytidosperma bipartitum	Wallaby Grass	Poaceae	0.1	20	GG (grass and grass-like)	No	No	-	-
Panicum effusum	Hairy Panic	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Lachnagrostis filiformis	Blown Grass	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	0.1	2	GG (grass and grass-like)	No	No	-	-
Einadia trigonos	Fishweed	Chenopodiaceae	0.1	5	FG (forb)	No	No	-	-
Dichondra repens	Kidney Weed	Convolvulaceae	0.1	1	FG (forb)	No	No	-	-
Asperula conferta	Common Woodruff	Rubiaceae	0.5	100	FG (forb)	No	No	-	-
Leiocarpa tormentosa	Wooly Plover-daisy	Asteraceae	1	50	FG (forb)	No	No	-	-
Vittadinia cervicularis		Asteraceae	0.3	100	FG (forb)	FG (forb)	No	No	-
Goodenia cycloptera		Goodeniaceae	0.1	10	FG (forb)	FG (forb)	No	No	-
Parsonsia eucalyptophylla	Gargaloo	Apocynaceae	0.1	20	OG (Other)	No	No	-	-
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	2		Yes	Yes	-	-
Salvia spp.	a Sage	Lamiaceae	0.1	5		Yes	No	-	-
Sida spinosa	Spiny Sida	Malvaceae	0.1	5		Yes	No	-	-

Structure (400 m2 plot)		
BAM attribute		***Sum values***
Count of native richness	*Trees*	1
	Shrubs	3
	Grasses and grass-like	7
	Forbs	6
	Ferns	0
	Other	1
Sum of cover of native vascular plans by growth form group	*Trees*	1
	Shrubs	1.1
	Grasses and grass-like	4.5
	Forbs	2.2
	Ferns	0
	Other	0.1
High Threat Weed cover		0.1

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Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	present
5-9	absent
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	1.5	2	1	1	3
Average of the 5 subplots	1.7				

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 2 101 planted*
PCT	*PCT 101*
Vegetation zone	*101_low_planted*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	27/5/2021
GPS start of transect	232907, 6565399
Midline bearing	35

Composition and structure (400m² plot)

Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Eucalyptus albens	White Box	Myrtaceae	1	2	TG (tree)	No	No	-	-
Callitris glaucophylla	White Cypress Pine	Cuppressaceae	0.2	1	TG (tree)	No	No	-	-
Acacia decora	Western Silver Wattle	Fabaceae	0.1	6	SG (shrub)	No	No	-	-
Eremophila longifolia	Berrigan	Scrophulariaceae	0.1	3	SG (shrub)	No	No	-	-
Senna artemisioides subsp. zygophylla	Silver Cassia	Fabaceae	0.1	10	SG (shrub)	No	No	-	-
Myopoprum montanum	Western Boobialla	Scrophulariaceae	0.5	35	SG (shrub)	No	No	-	-
Sclerolaena muricata	Black Roly-poly	Chenopodiaceae	0.1	1	SG (shrub)	No	No	-	-
Rytidosperma spp.	a Wallaby Grass	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Aristida personata	Purple Wiregrass	Poaceae	0.2	20	GG (grass and grass-like)	No	No	-	-
Dichelachne sp.	Plume Grass	Poaceae	0.1	2	GG (grass and grass-like)	No	No	-	-

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Austrostipa scabra	Rough Spear-grass	Poaceae	0.1	10	GG (grass and grass-like)	No	No	-	-
Solanum esuriale	Quena	Solanaceae	0.1	5	FG (forb)	No	No	-	-
Wahlenbergia spp.	a Bluebell	Campanulaceae	0.1	5	FG (forb)	No	No	-	-
Leiocarpa tormentosa	Wooly Plover-daisy	Asteraceae	0.1	10	FG (forb)	No	No	-	-
Vittadinia cervicularis		Asteraceae	0.1	20	FG (forb)	FG (forb)	No	No	-
Goodenia pinnatifida		Goodeniaceae	0.1	20	FG (forb)	FG (forb)	No	No	-
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	1		Yes	Yes	-	-
Centaurea meletensis	Maltese Cockspur	Asteraceae	0.1	5		Yes	No	-	-
Rapistrum rugosum	Turnip Weed	Brassicaceae	0.1	10		Yes	No	-	-
Lysmachia arvensis	Scarlet Pimpernell	Primulaceae	0.1	3		Yes	No	-	-

Structure (400 m2 plot)		
BAM attribute		***Sum values***
Count of native richness	*Trees*	2
	Shrubs	5
	Grasses and grass-like	4
	Forbs	5
	Ferns	0
	Other	0
Sum of cover of native vascular plans by growth form group	*Trees*	1.2
	Shrubs	0.9
	Grasses and grass-like	0.5
	Forbs	0.5
	Ferns	0
	Other	0
High Threat Weed cover		0.1

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	present
5-9	present
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	0	1.5	0	1	0
Average of the 5 subplots					0.5

EXHIBITION COPY

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 1 101 DNG*
PCT	*PCT 101*
Vegetation zone	*101_low_DNG*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	20/1/2023
GPS start of transect	233494, 6565042
Midline bearing	30

Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Eremophila mitchellii	False Sandalwood	Scrophulariaceae	0.1	1	SG (shrub)	No	No	-	-
Sclerolaena birchii	Galvanised Burr	Chenopodiaceae	15	20	SG (shrub)	No	No	-	-
Sclerolaena muricata	Black Roly-poly	Chenopodiaceae	0.3	20	SG (shrub)	No	No	-	-
Chloris truncata	Windmill Grass	Poaceae	0.1	10	GG (Grass and grass-like)	No	No	-	-
Rytidosperma spp.	a Wallaby Grass	Poaceae	0.1	5	GG (Grass and grass-like)	No	No	-	-
Lachnagrostis filiformis	Blown Grass	Poaceae	4	200	GG (grass and grass-like)	No	No	-	-
Tragus australianus	Small Burrgrass	Poaceae	0.5	100	GG (Grass and grass-like)	No	No	-	-
Eragrostis spp.		Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Cynodon dactylon	Couch	Poaceae	10	500	GG (grass and grass-like)	No	No	-	-
Dactyloctenium radulans	Button Grass	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	4	100	GG (grass and grass-like)	No	No	-	-
Sporobolus creber	Slender Rat's Tail Grass	Poaceae	0.1	6	GG (grass and grass-like)	No	No	-	-
Einadia nutans	Climbing Saltbush	Chenopodiaceae	2	30	FG (forb)	No	No	-	-
Portulaca oleracea	Pigweed	Portulacaceae	0.2	100	FG (forb)	No	No	-	-
Vittadinia cervicularis		Asteraceae	0.1	20	FG (forb)	No	No	-	-
Calotis lappulacea	Yellow Burr-daisy	Asteraceae	0.1	1	FG (forb)	No	No	-	-
Convolvulus graminetinus	Bindweed	Convolvulaceae	0.1	1	OG (Other)	Yes	Yes	-	-
Sida spinosa	Prickly Sida	Malvaceae	0.1	20		Yes	No	-	-
Urochloa panicoides	Liverseed Grass	Poaceae	5	200		Yes	No	-	-
Medicago polymorpha	Burr Medic	Fabaceae	0.2	30		Yes	No	-	-
Malva spp.	a Mallow	Malvaceae	0.1	20		Yes	No	-	-

Structure (400 m2 plot)	
BAM attribute	***Sum values***

EXHIBITION COPY

Count of native richness	*Trees*	0
	Shrubs	3
	Grasses and grass-like	9
	Forbs	4
	Ferns	0
	Other	1
Sum of cover of native vascular plans by growth form group	*Trees*	0
	Shrubs	15.4
	Grasses and grass-like	19
	Forbs	2.4
	Ferns	0
	Other	0.1
High Threat Weed cover		0

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	absent
5-9	absent
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	10	3	5	6	0.5
Average of the 5 subplots					4.9

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 2 101 DNG*
PCT	*PCT 101*
Vegetation zone	*101_low_DNG*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	20/1/2023
GPS start of transect	232862, 6565126
Midline bearing	357

Composition and structure (400m² plot)

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Scientific name	*Common name*	*Family*	*Cover (%)*	*Abundance*	*Growth form*	*Exotic*	*High threat weed? (yes/no)*	*NSW BC Act listing status*	*Commonwealth EPBC Act listing status*
Senna artemisioides subsp. zygophylla	Silver Cassia	Fabaceae	0.1	1	SG (shrub)	No	No	-	-
Myopoprum montanum	Western Boobialla	Scrophulariaceae	0.1	1	SG (shrub)	No	No	-	-
Sclerolaena birchii	Galvanised Burr	Chenopodiaceae	0.1	1	SG (shrub)	No	No	-	-
Sclerolaena muricata	Black Roly-poly	Chenopodiaceae	0.1	9	SG (shrub)	No	No	-	-
Cynodon dactylon	Couch	Poaceae	70	1000	GG (grass and grass-like)	No	No	-	-
Dactyloctenium radulans	Button Grass	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Sporobolus creber	Slender Rat's Tail Grass	Poaceae	0.3	10	GG (grass and grass-like)	No	No	-	-
Verbena gaudichaudii		Verbenaceaee	0.1	1	FG (forb)	No	No	-	-
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	1		Yes	Yes	-	-
Conyza spp.	Flax-leaf Fleabane	Asteraceae	1	100		No	No	-	-

Structure (400 m2 plot)		
BAM attribute		***Sum values***
Count of native richness	*Trees*	0
	Shrubs	4
	Grasses and grass-like	4
	Forbs	1
	Ferns	0
	Other	0
Sum of cover of native vascular plans by growth form group	*Trees*	0
	Shrubs	0.4
	Grasses and grass-like	70.5
	Forbs	0.1
	Ferns	0
	Other	0
High Threat Weed cover		0.1

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	absent
5-9	absent
<5 (regeneration)	absent

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Hollow tree count	0				
Length of logs (m) ≥10cm and >50cm	10				
Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	20	30	20	25	30
Average of the 5 subplots					25

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 3 101 DNG*
PCT	*PCT 101*
Vegetation zone	*101_low_DNG*
TEC	No
IBRA region	Brigalow Belt South
Recorder	Tom Pollard
Date	20/1/2023
GPS start of transect	232669, 6565380
Midline bearing	75

Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Myopoprum montanum	Western Boobialla	Scrophulariaceae	0.1	1	SG (shrub)	No	No	-	-
Austrostipa verticillata	Slender Bamboo grass	Poaceae	0.2	5	GG (grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	2	50	GG (grass and grass-like)	No	No	-	-
Aristida spp.	a Wiregrass	Poaceae	20	200	GG (Grass and grass-like)	No	No	-	-
Sporobolus creber	Slender Rat's Tail Grass	Poaceae	5	100	GG (Grass and grass-like)	No	No	-	-
Cynodon dactylon	Couch	Poaceae	1	50	GG (grass and grass-like)	No	No	-	-
Bothriochloa decipiens	Redleg Grass	Poaceae	20	200	GG (Grass and grass-like)	No	No	-	-
Dichanthium sericeum	Queensland Bluegrass	Poaceae	20	200	GG (grass and grass-like)	No	No	-	-
Carex inversa		Cyperaceae	0.1	5	GG (grass and grass-like)	No	No	-	-
Verbena gaudichaudii		Verbenaceaee	0.1	1	FG (forb)	No	No	-	-
Abutilon oxycarpum	Flannel Weed	Malvaceae	0.1	50	FG (forb)	No	No	-	-
Rumex brownii	Swamp Dock	Polygonaceae	0.1	2	FG (forb)	No	No	-	-
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	1	FG (forb)	No	No	-	-
Wahlenbergia sp.	a Bluebell	Campanulaceae	0.1	5	FG (forb)	No	No	-	-

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Conyza spp.	Flax-leaf Fleabane	Asteraceae	0.1	10		Yes	No	-	-
Daucus carota	Wild Carrot	Apiaceae	0.1	10		Yes	No	-	-

Structure (400 m2 plot)		
BAM attribute		***Sum values***
Count of native richness	*Trees*	0
	Shrubs	1
	Grasses and grass-like	8
	Forbs	5
	Ferns	0
	Other	0
Sum of cover of native vascular plans by growth form group	*Trees*	0
	Shrubs	0.1
	Grasses and grass-like	63.8
	Forbs	0.5
	Ferns	0
	Other	0
High Threat Weed cover		0

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	absent
20-29	absent
10-19	absent
5-9	absent
<5 (regeneration)	absent
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	10	20	10	0	10
Average of the 5 subplots					10

Overview	
Location	210 Bushs Lane subdivision, Gunnedah
Plot ID	*plot 1 435 woodland*
PCT	*PCT 435*
Vegetation zone	*435_medium_woodland*
TEC	No
IBRA region	Brigalow Belt South

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Recorder	Tom Pollard
Date	27/5/2021
GPS start of transect	233641, 6565583
Midline bearing	177

Composition and structure (400m² plot)									
Scientific name	***Common name***	***Family***	***Cover (%)***	***Abundance***	***Growth form***	***Exotic***	***High threat weed? (yes/no)***	***NSW BC Act listing status***	***Commonwealth EPBC Act listing status***
Eucalyptus albens	White Box	Myrtaceae	8	5	TG (tree)	No	No	-	-
Eucalyptus populnea	Poplar Box	Myrtaceae	3	1	TG (tree)	No	No	-	-
Myoporum montanum	Western Boobialla	Scrophulariaceae	0.1	7	SG (shrub)	No	No	-	-
Eremophila longifolia	Berrigan	Scrophulariaceae	0.2	20	SG (shrub)	No	No	-	-
Acacia decora	Western Silver Wattle	Fabaceae	0.1	1	SG (shrub)	No	No	-	-
Sclerolaena birchii	Galvanised Burr	Chenopodiaceae	0.2	20	SG (shrub)	No	No	-	-
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	5	FG (forb)	No	No	-	-
Cynodon dactylon	Couch	Poaceae	5	200	GG (grass and grass-like)	No	No	-	-
Rytidosperma spp.	a Wallaby Grass	Poaceae	0.2	25	GG (Grass and grass-like)	No	No	-	-
Austrostipa scabra	Rough Spear-grass	Poaceae	2	50	GG (grass and grass-like)	No	No	-	-
Vittadinia cervicularis		Asteraceae	0.1	20	FG (forb)	FG (forb)	No	No	-
Leiocarpa tormentosa	Wooly Plover-daisy	Asteraceae	0.1	10	FG (forb)	No	No	-	-
Asperula conferta	Common Woodruff	Rubiaceae	0.1	200	FG (forb)	No	No	-	-
Calotis lappulacea	Yellow Burr-daisy	Asteraceae	0.1	5	FG (forb)	No	No	-	-
Galium divaricatum	Slender Bedstraw	Rubiaceae	0.1	5	FG (forb)	No	No	-	-
Wahlenbergia communis	Tufted Bluebell	Campanulaceae	0.1	30	FG (forb)	No	No	-	-
Jasminum lineare	Desert Jasmine	Oleaceae	0.1	1	OG (other)	No	No	-	-
Lycium ferocissimum	African Boxthorn	Solanaceae	0.5	2		Yes	Yes	-	-
Lysmachia arvensis	Scarlet Pimpernell	Primulaceae	0.1	1		Yes	No	-	-
Sisymbrium orientale	Indian Hedge Mustard	Brassicaceae	0.1	1	-	Yes	No	-	-
Centaurea meletensis	Maltese Cockspur	Asteraceae	0.1	5		Yes	No	-	-
Malva spp.	a Mallow	Malvaceae	0.1	20		Yes	No	-	-
Medicago polymorpha	Burr Medic	Fabaceae	0.1	5		Yes	No	-	-

Structure (400 m2 plot)	
BAM attribute	***Sum values***

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Count of native richness	*Trees*	2
	Shrubs	5
	Grasses and grass-like	5
	Forbs	4
	Ferns	0
	Other	1
Sum of cover of native vascular plans by growth form group	*Trees*	11
	Shrubs	0.6
	Grasses and grass-like	10.3
	Forbs	0.6
	Ferns	0
	Other	0.1
High Threat Weed cover		0.5

Function (1000m² plot)	
Tree stem size classes (DBH cm)	***presence/absence (and large tree count)***
large trees (>50cm)	absent
30-49	present
20-29	present
10-19	absent
5-9	absent
<5 (regeneration)	present
Hollow tree count	0
Length of logs (m) ≥10cm and >50cm	0.5

Litter cover (%)	*subplot 1*	*subplot 2*	*subplot 3*	*subplot 4*	*subplot 5*
Subplot score (% in each of 5 plots)	1	10	1	0.5	0.5
Average of the 5 subplots					2.6

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Appendix C: Credit reports

EXHIBITION COPY

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00026070/BAAS18071/21/00026071

Proposal Name
210 Bushs Lane Gunnedah subdivision v1

BAM data last updated *
28/10/2024

Assessor Name
Tom Pollard

Assessor Number
BAAS18071

BAM Data version *
Current classification (live - default) (80)

Proponent Names

Report Created
07/03/2025

BAM Case Status
Finalised

Assessment Revision
1

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (General)

Date Finalised
07/03/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	435-White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

EXHIBITION COPY

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater
Haliaeetus leucogaster / White-bellied Sea-Eagle
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo
Anomalopus mackayi / Five-clawed Worm-skink
Petaurus australis / Yellow-bellied Glider

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

EXHIBITION COPY

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
101-Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	Not a TEC	12.0	0	2	2
435-White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	1.0	0	2	2

101-Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_low_DNG	No	0	Liverpool Plains, Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

EXHIBITION COPY

Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_low_shrubland	No	0	Liverpool Plains, Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_low_planted	No	0	Liverpool Plains, Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_medium_woodland	No	2	Liverpool Plains, Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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435-White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597,	-	435_medium_woodland	No	2	Liverpool Plains, Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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	599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281,	-	435_low_DNG	No	0	Liverpool Plains, Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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	282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					

Species Credit Summary

No Species Credit Data

EXHIBITION COPY

Credit Retirement Options

Like-for-like credit retirement options

EXHIBITION COPY

BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id

00026070/BAAS18071/21/00026071

Proposal Name

210 Bushs Lane Gunnedah subdivision v1

BAM data last updated *

28/10/2024

Assessor Name

Tom Pollard

Assessor Number

BAAS18071

BAM Data version *

Current classification (live - default) (80)

Proponent Name(s)

Report Created

07/03/2025

BAM Case Status

Finalised

Assessment Revision

1

BOS entry trigger

BOS Threshold: Area clearing threshold

Assessment Type

Part 4 Developments (General)

Date Finalised

07/03/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	435-White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion

Species
Nil

Additional Information for Approval

EXHIBITION COPY

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Grantiella picta / Painted Honeyeater
Haliaeetus leucogaster / White-bellied Sea-Eagle
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo
Anomalopus mackayi / Five-clawed Worm-skink
Petaurus australis / Yellow-bellied Glider

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
101-Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion	Not a TEC	12.0	0	2	2.00
435-White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	1.0	0	2	2.00

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101-Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_low_DNG	No	0	Liverpool Plains,Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_low_shrubland	No	0	Liverpool Plains,Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_low_planted	No	0	Liverpool Plains,Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Brigalow Clay Plain Woodlands This includes PCT's: 35	Brigalow Clay Plain Woodlands >=70% and <90%	101_medium_woodland	No	2	Liverpool Plains,Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Variation options

Formation	Trading group	Zone	HBT	Credits	IBRA region
Semi-arid Woodlands (Grassy sub-formation)	Tier 2 or higher threat status	101_low_DNG	No	0	IBRA Region: Brigalow Belt South, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Semi-arid Woodlands (Grassy sub-formation)	Tier 2 or higher threat status	101_low_shrubland	No	0	IBRA Region: Brigalow Belt South, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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	Semi-arid Woodlands (Grassy sub-formation)	Tier 2 or higher threat status	101_low_planted	No	0	IBRA Region: Brigalow Belt South, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Semi-arid Woodlands (Grassy sub-formation)	Tier 2 or higher threat status	101_medium_woodland	No	2	IBRA Region: Brigalow Belt South, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
435-White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437,	-	435_medium_woodland	No	2	Liverpool Plains,Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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	451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					
	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298,	-	435_low_DNG	No	0	Liverpool Plains,Castlereagh-Barwon, Kaputar, Liverpool Range, Northern Basalts, Northern Outwash, Peel, Pilliga and Pilliga Outwash. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

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	302, 312, 341, 342, 347, 350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like options

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APPENDIX G

SITE SERVICING STRATEGY – PREPARED BY STEWART SURVEYS DATED 21 AUGUST 2025

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DOCUMENT CONTROLS

Proponent	Mr Jarad Ewing & Mrs Pip Ewing
Document Description	Statement of Environmental Effects
File Reference	5448
Date	**21 August 2025**
Prepared for	**Client Name:** Kerry Elizabeth Pty Ltd [redacted]
Prepared by	**Kathryn Stewart** Bachelor of Landscape Architecture (UNSW) Masters of Environmental Management (UNSW) Registered Landscape Architect (#001493) **Felicity Stevens** Bachelor of Sustainability (UNE) Stewart Surveys Pty Ltd ABN: 65 002 886 508 PO Box 592, Gunnedah NSW 2380 (02) 6742 2966 Office@stewartsurveys.com
Site Particulars	**Lot Particulars:** Lots 27 & 28 in DP755474 **Address:** 210 Bush's Lane, Gunnedah **Local Government Area:** Gunnedah

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Enquiries should be addressed to Stewart Surveys Pty Ltd

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INTRODUCTION

This servicing strategy has been prepared for the proposed 61 Lot subdivision of Lots 27 and 28 in DP755474. This report follows the requirements outlined in Section 5.2 of the Gunnedah Development Control Plan 2025 (DCP), reviewing the current infrastructure surrounding the site and outlining the proposed new infrastructure as part of this development.

The proposed service locations shown in this strategy are preliminary only and subject to development approval by Gunnedah Shire Council, full survey and engineering review during the detailed design phase following development application approval.

All works are to meet Gunnedah Shire Council's standard specifications and relevant Australian Standards.

This service strategy will address the proposed extension of Stormwater, Sewer, Water Reticulation, Electricity and Telecommunications services to the new development. This report should be read in conjunction with the appended site services strategy plan.

EXISTING SERVICES

The site is located within Gunnedah Shire Council's water reticulation service area. A diagram of the existing water services is shown in **Figure 1**. There is an existing water main along the site frontage to Robert Gordon Road, this main is located on the western side of the road formation and extends the full length of the site's frontage. This main connects to a main located on Kerry Elizabeth Road and Bushs Lane. The Bushs Lane main terminates with a hydrant just west of the Robert Gordon Road intersection. There is one existing water connection in proposed Lot 11.

During the rezoning of this property, it was identified that the Gallen water reservoir which services this area did not have adequate pumping equipment to cater for the development. A Voluntary Planning Agreement (VPA) was entered by the land owner to pay for upgrades to this system to enable servicing. This VPA is titled:

170 and 210 Bush's Lane Planning Agreement under s7.4 of the Environmental Planning and Assessment Act 1979

This VPA has been registered on the certificate of title and will be enacted as a DA condition of Consent prior to issue of a construction certificate. Upgrade works covered by this VPA will be managed and carried out by Gunnedah Shire Council prior to issue of a subdivision certificate for stage 1 of the development.

The site is not located in a reticulated sewer service area with sewer managed on individual lots by onsite sewer management systems constructed at the time of house construction so they can be adequately sized and positioned for the development.

The subject site falls in an easterly direction with stormwater currently falling to an intermittent watercourse transecting the site in an easterly direction. With a three (3) cell box culvert (2400 x 750mm each) under Robert Gordon Drive, where the watercourse continues through private property into Blackjack Creek east of the subject site. **Figure 2** is a topographic map of site.

The waterway east of the site was reconstructed to as a formed channel to cater for the upstream stormwater including the subject site. The property west of the subject site is a former extractive industry (coal) and Coal Handling and Processing Plant (CHPP) due to this the site topography has been heavily modified, with a bank approximately 100m west of the boundary transecting the natural flows and directing water south of the development site. The existing character is shown in Aerial Photograph, **Figure 3**.

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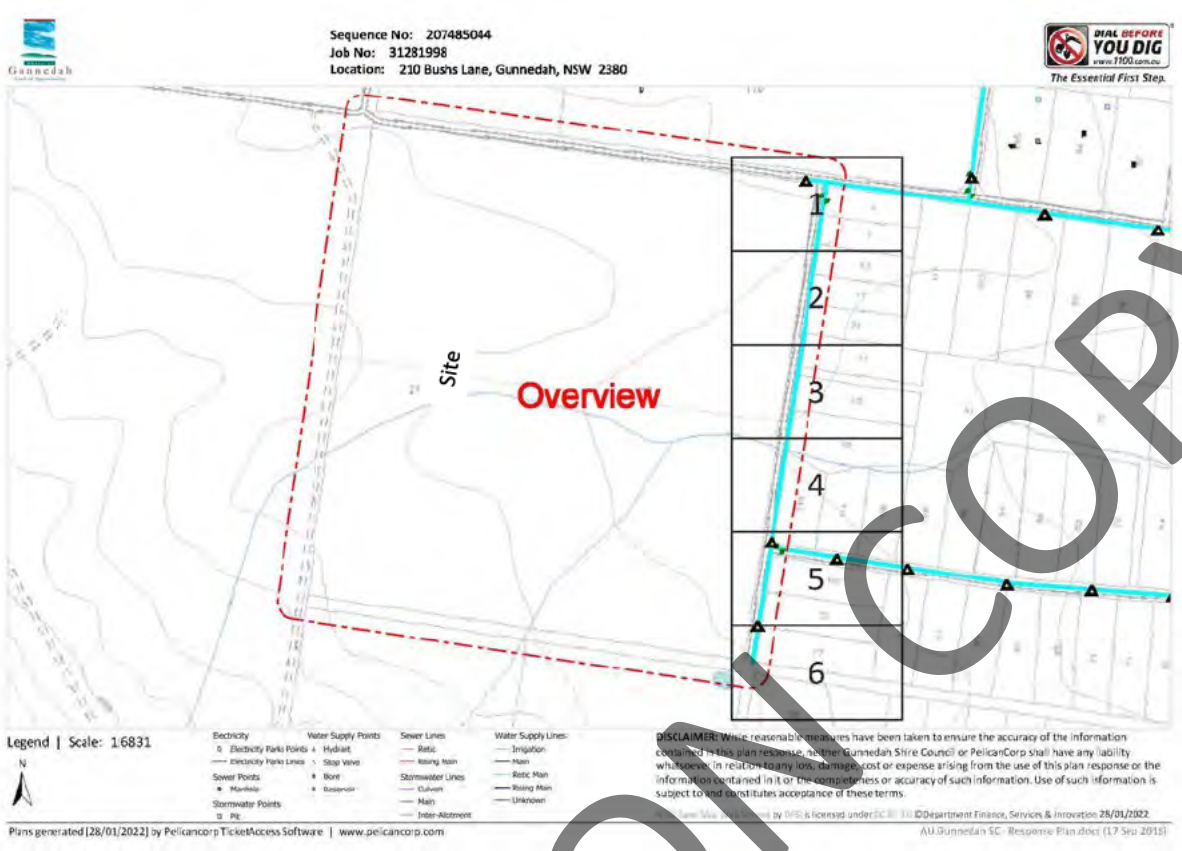

Figure 1: Existing Water Reticulation Services (Gunnedah Shire Council October 2021)

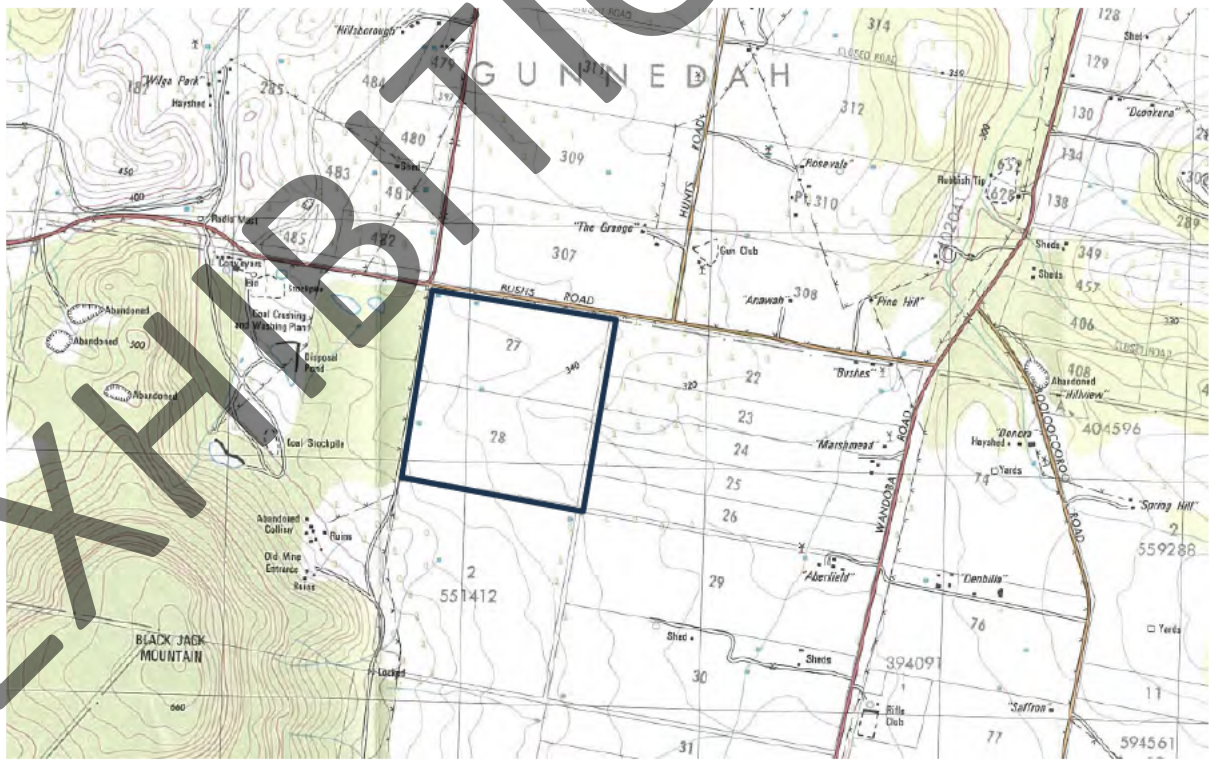

Figure 2: Topographic Map Wondoba 8935-4N, 1:25000

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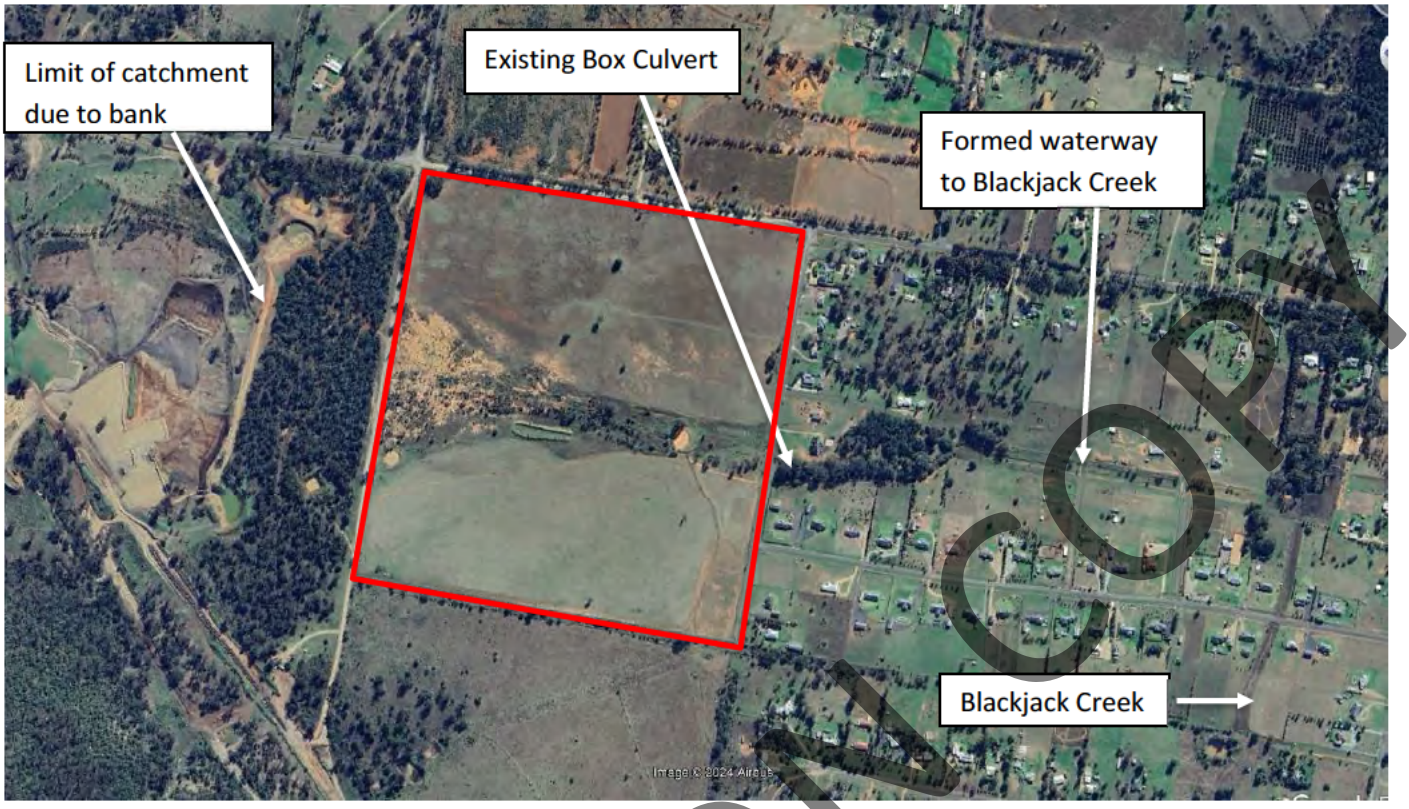

Figure 3: Aerial Photo of the subject site.

There are existing underground powerlines running along Robert Gordon Road, on the eastern side of the road formation, with power connection boxes located at each of the residential properties fronting this road. There is an overhead electrical line running along Bushs Lane on the southern side of the road formation.

There are existing underground telecommunications services along Robert Gordon Road on the eastern side of the lot formation. Telecommunications services are connected to each lot fronting this road.

PROPOSED DEVELOPMENT

The proposed development is the subdivision of Lots 27 and 28 in DP755474 into 61 Large Residential Lots, with a minimum lot size of 9,000 square metres and construction of a new looped road off Robert Gordon Road. The proposed development is staged as follows and shown in **Figure 4**.

Stage 1: 6 Lots on Robert Gordon Road and 11 Lots Bushs Lane, (Lots 1 to 14, 38, 39 and 40)

Stage 2: 19 Lots and new road construction (Lots 15 – 18, 35-37, 42-46 and 56-61)

Stage 3: 25 Lots and new road construction (Lots 19-34 and 47-55)

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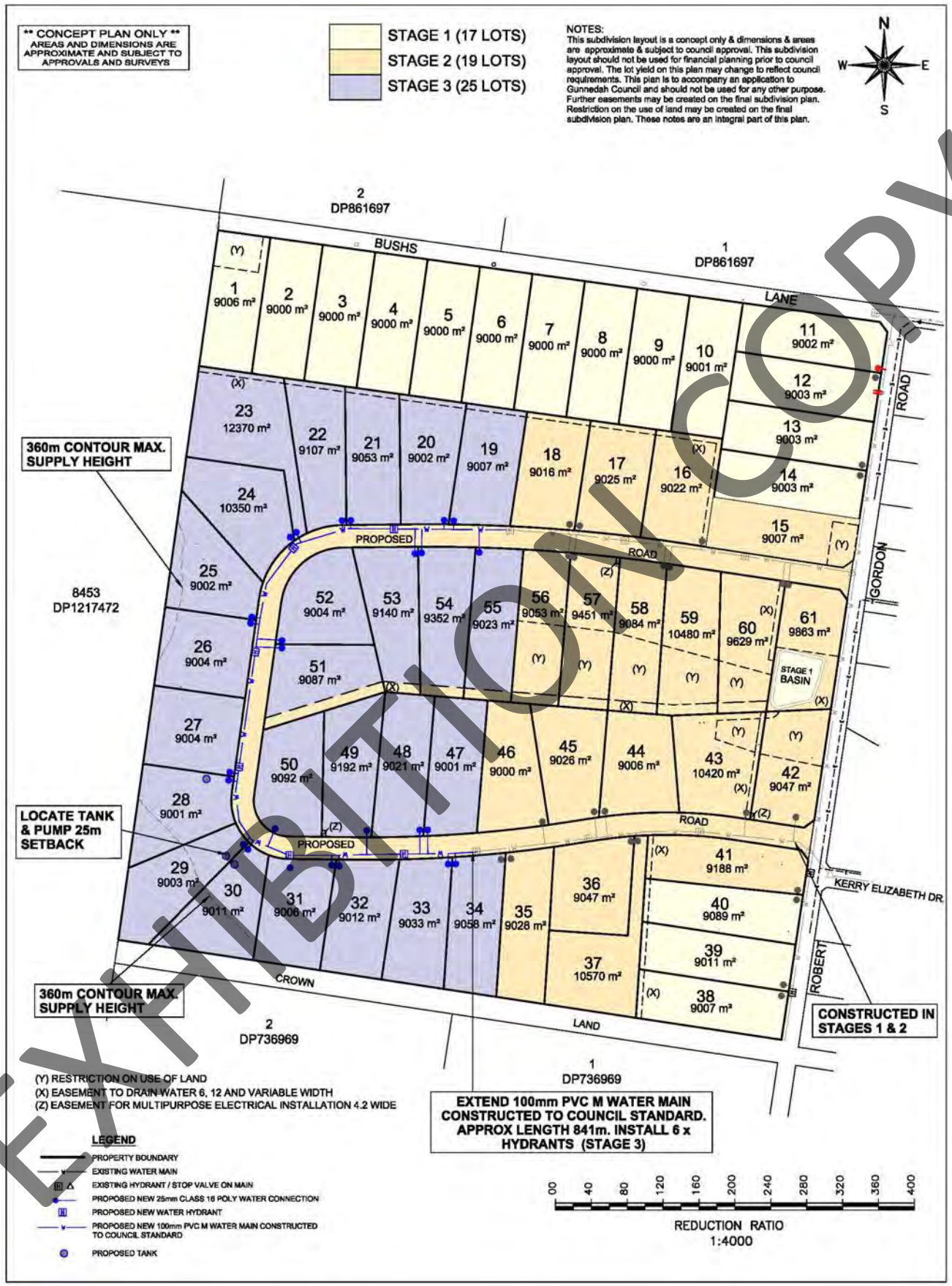

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Figure 4: Proposed Subdivision Plan

PROPOSED SERVICES

The following section of this report outlines the proposed new services as part of this development. These services align with the requirements for Large Lot Residential Development in accordance with the Gunnedah Development Control Plan, 2012, and the Gunnedah Shire Council Engineering Guidelines for Subdivision and Developments, version 2.

3.1 WATER RETICULATION

It is proposed to supply a 25mm class 16 Poly water connection to each lot in the development. In stage 1 water connections will be made into the existing main in Robert Gordon Road and a new 100mm PVC M Water Main is proposed to be constructed along from the end of the existing main on Bushs Lane to the western boundary of Lot 1, which is the full extent of the development. This main will include the construction of five (5) hydrants at a maximum interval of 150 metres. The main will be capped at the last hydrant for future extension. The applicant will apply to council to make these connections into the live main, in accordance with council's policy and engage a plumber for the new main extension.

In stage 2 a new 100mm PVC M Water Main is proposed to be constructed along the two new subdivision roads. The proposed road has a reserve width of 25 metres and the water service is proposed on the outside of the road as shown in the appended Water Service plans. The northern road proposes a 100mm main of approximately 383 metres, constructed from the intersection of the existing main on Robert Gordon Road to the western boundary of proposed Lot 18, which is the end of the proposed Stage 2. The main includes three Hydrants spaced evenly at less than 150 metre intervals and a stop valve near the tee-junction with the existing main. The service will be capped at the end hydrant for future extension in stage 3. The southern road proposes a 100mm water main of approximately 377 metres in length, constructed from the intersection of the existing main on Robert Gordon Road to the western boundary of proposed Lot 46, which is the end of proposed Stage 2. The main proposes three hydrants spaced evenly at less than 150 metre intervals, and a stop valve near the tee-junction with Robert Gordon Road. The existing connection in Lot 11 will provide a connection for the residual holding. These works will be carried out by a licenced plumber in accordance with the Gunnedah Shire Council Engineering Guidelines for Subdivision and Development.

In stage 3 the 100mm PVC Class M Water Main will be extend to connect the southern road section to the northern road section. This section is approximately 841 metres long provide a full circulatory main junctioning at each end with the Robert Gordon Road main, and fully compliant with the Gunnedah Council Engineering Guidelines for Subdivision and Development. Six additional hydrants will be constructed in the main at 150 metre maximum intervals. The existing lot connection to Lot 11 will provide connection for the residual stage 3 holding. This connection is from the existing Robert Gordon Road main and will be made by application to Gunnedah Shire Council. All other works in stage 3 will be carried out by a licenced plumber in accordance with the Gunnedah Shire Council Engineering Guidelines for Subdivision and Development.

The Gallen Reservoir can supply water to a maximum height of 360 metres AHD. We have shown this contour line on the enclosed Water Service Plans and demonstrated that a tank can be placed at the 25 metres setback line on each lot for pumping of the water to the future house. The existing ground level at the tank position on Lot 29 is at RL 358 metres AHD, on Lot 30 is at RL 357.5 and on Lot 28 is at RL 355.75m AHD. The height of tanks varies but is generally 2.2 to 2.5 metres in height. To meet the maximum supply height of 360 metres tanks pads on Lots 29 and 30 will need to be cut into the slope to ensure a maximum roof height of less than 360 metres AHD. This can be easily achieved on the two lots with minor earthworks and battering. To ensure buyers are aware of

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this height restriction a positive covenant will be registered on titles to state the maximum height of any rainwater tank is to be 360 metres AHD.

A licenced plumber will be engaged to carry out the proposed plumbing works. A layout for the proposed water service connections is shown in the proposed services plan appended to this report.

The capacity to service the development has already been assessed by Hunter H20 in the rezoning of the land. It was determined that pump upgrades to the Gallen Reservoir were required for this development and a VPA has been entered for the developer to fund these upgrades in lieu of headworks contributions up to the value of the required works. Therefore, we believe the existing water services will have the capacity to service the additional 61 lots in this development. The headworks charges applicable to the development will offset the impacts on the community infrastructure generated by the additional loading created by this development.

3.2 SEWER MAIN

The subject site is not located in a reticulated sewer area of Gunnedah.

The Gunnedah Development Control Plan (DCP) allows for onsite sewer management systems in this location, to be installed at the time of house construction. Future development will be subject to section 68 approval for an onsite sewer management system.

There are no sewer services required at the subdivision stage of this development.

3.3 STORMWATER MANAGEMENT

The Gunnedah DCP requires consideration of flows up to 1 in 100 year Average Recurrence Interval (ARI) for the existing natural flow and post development flow of the site and piped stormwater system to cater for flows up to the 1 in 5 year ARI.

High Definition Drainage have been engaged to prepare a Stormwater Management Plan for this development. This report is appended to this application and includes full engineering drains model detailing the 1 in 5 year event and 1 in 100 year event overland flow paths.

We believe the proposed stormwater management measures outlined in this report adequately addresses the requirement of the Gunnedah Shire Council Engineering and Subdivision Guidelines with water up to the 1 in 100 year ARI event adequately drained into the natural water body of Blackjack Creek east of the subject site.

3.4 ELECTRICITY

The Gunnedah area is serviced by Essential Energy. There is an existing low voltage underground line running along Robert Gordon Road, and overhead powerline along Bushs Lane as shown in **Figure 5**, a dial before you dig search plan for the site.

The proponent has consulted Level 3 electrical designer, preferred energy on the supply of power to the development. They have advised the following:

Stage 1 of the development can be supplied from the existing subdivision installed close to the two intersections on Robert Gordon Road. This installation would be a low voltage network. The existing capacity surrounding the

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site has been assessed and Lots 12 to 13 can be supplied from the existing pole substation on Bushs Lane. Lots 38 to 40 can be supplied from the existing pad mounted substation on Robert Gordon Road. Detailed electrical design will require Essential Energy approval following development consent.

Stage 2 and 3 of the development will require three (3) 315kCA pad mounted substations to supply the 44 Lots in these stages. This number of substations is required due to the length around the road and voltage losses over distance. These load calculations are based on the essential energy requirement for 7.5kVA per lot meaning that 44 Lots would utilise 330kVA of the total 945 kVA capacity in the three substations. All new electrical supply works will be underground and substations will be located within private lots with an easement of 4.2 meters wide in accordance with Essential Energy requirements.

Stage 4 can be serviced from the existing low voltage overhead powerline on Bushs Lane. A pole mounted substation will be installed on one of the existing powerpoles and from this point power will be extended underground across the lot frontage to supply each lot in accordance with essential energy requirements.

Level three electrical designers Preferred Energy will arrange the subdivision approvals from Essential Energy and all works will be installed by a suitably qualified electrical contractor.

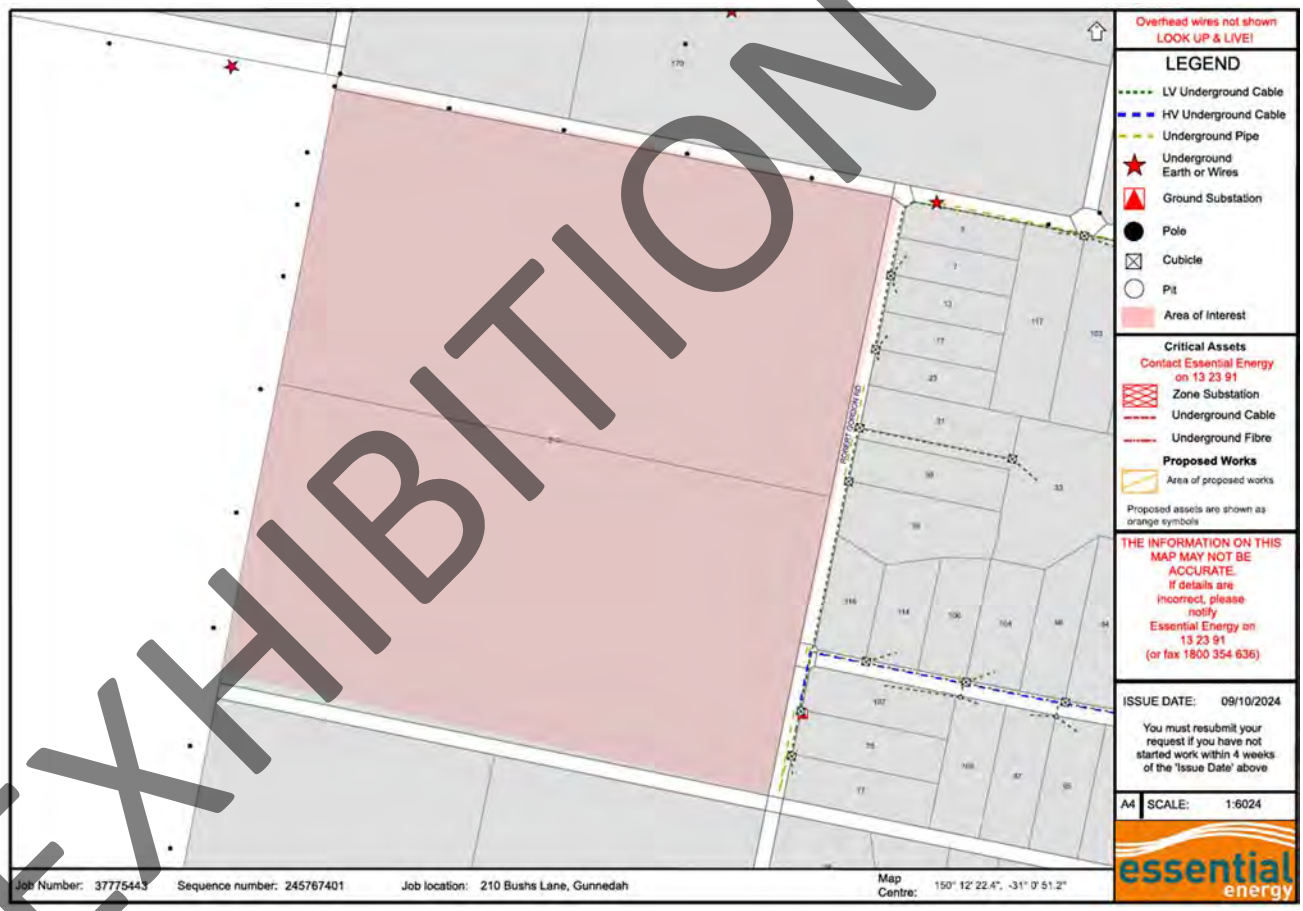

Figure 5: Electrical Services (Dial Before you Dig)

3.5 TELECOMMUNICATIONS

There are telecommunications services including telephone and fixed wireless NBN to existing residences in Robert Gordon Road.

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Telecommunications services including NBN requirements will be designed by a suitable qualified designer as part of the electrical reticulation design works. These designs will be approved by Telstra and NBN co. and installed underground to their requirements within the proposed road reserves surrounding the development. At the completion of the works the contractor will provide Council with a notice of arrangement for these services.

Figure 6 shows the NBN Co database extract for the site, confirming the property has fixed wireless NBN available for connection.

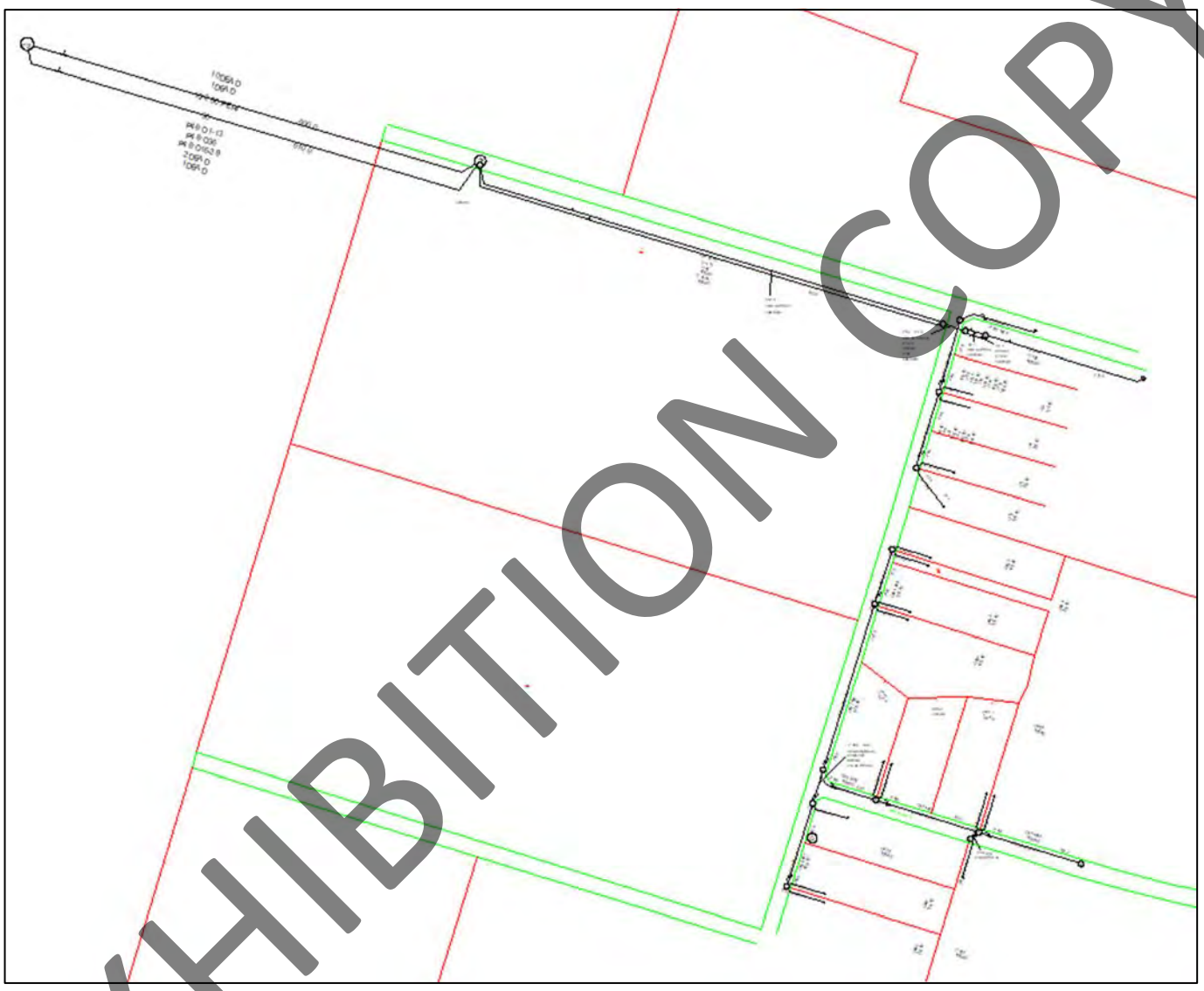

Figure 7 shows the Telstra network surrounding the development.

EXHIBITION COPY

Figure 6: NBN Co Seach of the services in this area.

EXHIBITION COPY

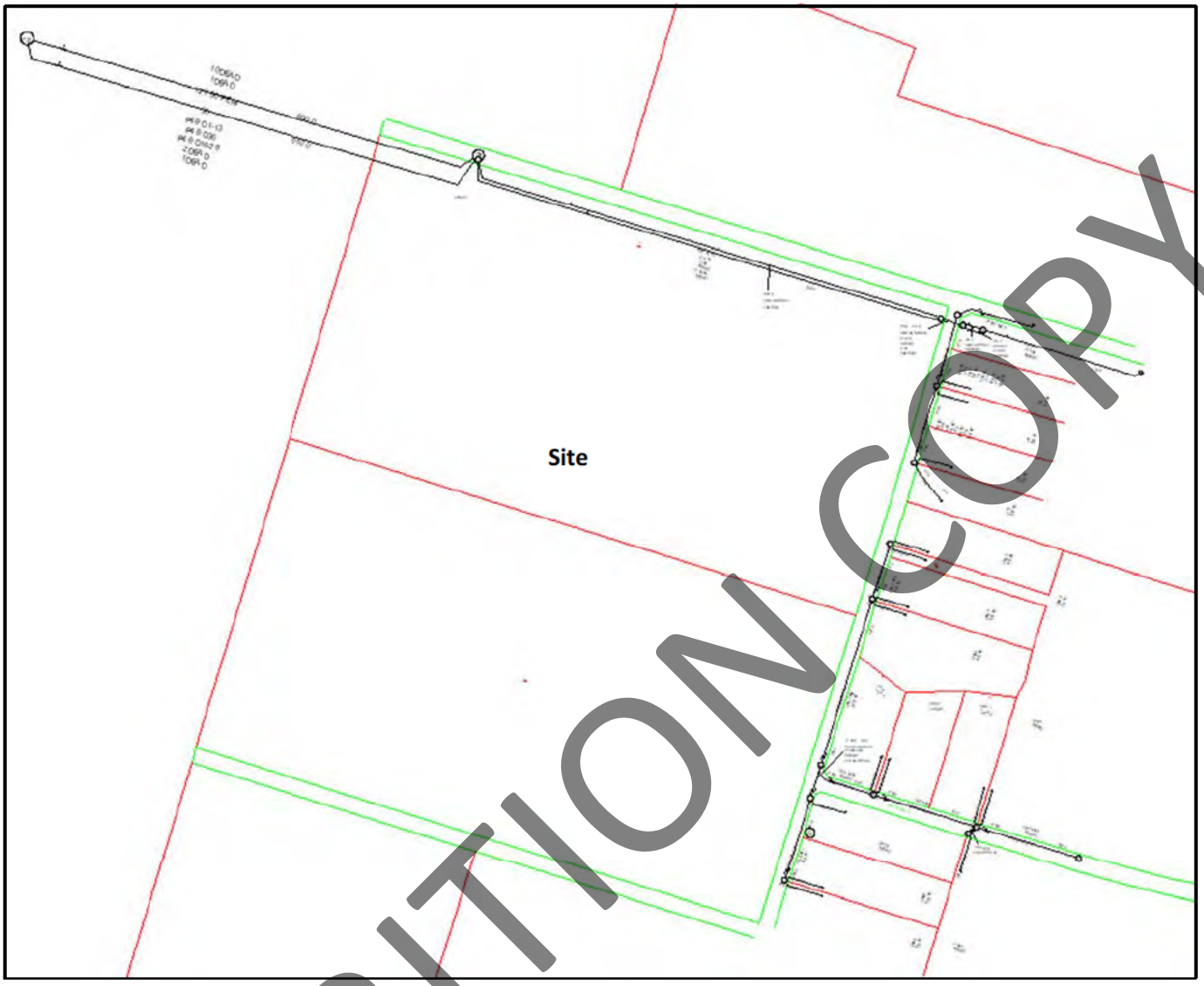

Figure 7: Telstra Dial Before You Dig Search

CONCLUSION

The subject site is located within Gunnedah's existing service network and following works outlined in this report the proposed subdivision will meet all the requirements of the Gunnedah Development Control Plan and Gunnedah Shire Council Engineering Guidelines for Subdivision and Development.

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APPENDIX A

STAGE 1 WATER SERVICE PLAN, PROPOSED SUBDIVSION OF LOTS 27 & 28 IN DP755474, 210 BUSHS LANE, GUNNEDAH. 9 JULY 2025, FILE REF: 5448, PREPARED BY STEWART SURVEYS PTY LTD.

STAGE 2 WATER SERVICE PLAN, PROPOSED SUBDIVSION OF LOTS 27 & 28 IN DP755474, 210 BUSHS LANE, GUNNEDAH. 9 JULY 2025, FILE REF: 5448, PREPARED BY STEWART SURVEYS PTY LTD.

STAGE 3 WATER SERVICE PLAN, PROPOSED SUBDIVSION OF LOTS 27 & 28 IN DP755474, 210 BUSHS LANE, GUNNEDAH. 9 JULY 2025, FILE REF: 5448, PREPARED BY STEWART SURVEYS PTY LTD.

EXHIBITION COPY

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (17 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N
W E
S

PROPOSED 25mm CLASS 16 POLY WATER CONNECTION INTO EXISTING WATER MAIN

EXISTING WATER CONNECTION TO BE USED FOR RESIDUAL LOT IN STAGE 1

2
DP861697

1
DP861697

BUSHS LANE

ROAD

GORDON ROAD

Existing Driveway

1 9006 m²
2 9000 m²
3 9000 m²
4 9000 m²
5 9000 m²
6 9000 m²
7 9000 m²
8 9000 m²
9 9000 m²
10 9001 m²
11 9002 m²
12 9003 m²
13 9003 m²
14 9003 m²
15 9007 m²
16 9022 m²
17 9025 m²
18 9016 m²
19 9007 m²
20 9002 m²
21 9053 m²
22 9107 m²
23 12370 m²
24 10350 m²
25 9002 m²
26 9004 m²
27 9004 m²
28 9001 m²
29 9003 m²
30 9011 m²
31 9006 m²
32 9012 m²
33 9033 m²
34 9058 m²
35 9028 m²
36 9047 m²
37 10570 m²
38 9007 m²
39 9011 m²
40 9089 m²
41 9188 m²
42 9047 m²
43 10420 m²
44 9006 m²
45 9026 m²
46 9000 m²
47 9001 m²
48 9021 m²
49 9192 m²
50 9092 m²
51 .9087 m²
52 9004 m²
53 9140 m²
54 9352 m²
55 9023 m²
56 9053 m²
57 9451 m²
58 9084 m²
59 10480 m²
60 9629 m²
61 9863 m²

STAGE 1 BASIN

CREATE EASEMENT TO DRAIN WATER AND FOR DETENTION BASIN

PROPOSED ROAD

KERRY ELIZABETH DR.

ROBERT ROAD

8453
DP1217472

2
DP736969

CROWN LAND

1
DP736969

PROPOSED 25mm CLASS 16 POLY WATER CONNECTION INTO EXISTING WATER MAIN

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

LEGEND

- PROPERTY BOUNDARY
- EXISTING WATER MAIN
- EXISTING HYDRANT / STOP VALVE ON MAIN
- PROPOSED NEW 25mm CLASS 16 POLY WATER CONNECTION
- PROPOSED NEW WATER HYDRANT
- PROPOSED NEW 100mm PVC M WATER MAIN CONSTRUCTED TO COUNCIL STANDARD
- EXISTING WATER CONNECTION

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

EXHIBITION COPY

Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: **STAGE 1 WATER SERVICE PLAN**
PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474
210 BUSHS LANE, GUNNEDAH

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 1

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (17 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N
W E
S

PROPOSED 100mm PVC M WATER MAIN CONSTRUCTED TO COUNCIL STANDARD. APPROX LENGTH 383m. INSTALL 3 x HYDRANTS & 1 x STOP VALVE

2
DP861697

BUSHS

1
DP861697

LANE

ROAD

GORDON

CAP FOR FUTURE EXTENSION

8453
DP1217472

CREATE EASEMENT TO DRAIN WATER 12 WIDE

CAP FOR FUTURE EXTENSION

PROPOSED ROAD

STAGE 1 BASIN

TEE JUNCTION WITH EXISTING MAIN

KERRY ELIZABETH DR.

RESIDUAL LOT CONNECTION

ROBERT

CROWN LAND

2
DP736969

RESIDUAL LOT CONNECTION

1
DP736969

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

PROPOSED 100mm PVC M WATER MAIN CONSTRUCTED TO COUNCIL STANDARD. APPROX LENGTH 377m. INSTALL 3 x HYDRANTS

LEGEND
- PROPERTY BOUNDARY
- EXISTING WATER MAIN
- EXISTING HYDRANT / STOP VALVE ON MAIN OR PREVIOUS STAGE CONSTRUCTION
- PROPOSED NEW 25mm CLASS 16 POLY WATER CONNECTION
- PROPOSED NEW WATER HYDRANT
- PROPOSED NEW 100mm PVC M WATER MAIN CONSTRUCTED TO COUNCIL STANDARD
- WATER CONNECTION IN PREVIOUS STAGE

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

EXHIBITION COPY

Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: **STAGE 2 WATER SERVICE PLAN** PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474 210 BUSHS LANE, GUNNEDAH

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 2

** CONCEPT PLAN ONLY **
AREAS AND DIMENSIONS ARE APPROXIMATE AND SUBJECT TO APPROVALS AND SURVEYS

STAGE 1 (17 LOTS)
STAGE 2 (19 LOTS)
STAGE 3 (25 LOTS)

NOTES:
This subdivision layout is a concept only & dimensions & areas are approximate & subject to council approval. This subdivision layout should not be used for financial planning prior to council approval. The lot yield on this plan may change to reflect council requirements. This plan is to accompany an application to Gunnedah Council and should not be used for any other purpose. Further easements may be created on the final subdivision plan. Restriction on the use of land may be created on the final subdivision plan. These notes are an integral part of this plan.

N
W E
S

2
DP861697

BUSHS

1
DP861697

LANE

ROAD

GORDON

KERRY ELIZABETH DR.

ROBERT

PROPOSED ROAD

PROPOSED ROAD

CROWN LAND

2
DP736969

1
DP736969

8453
DP1217472

1 9006 m² (Y)
2 9000 m²
3 9000 m²
4 9000 m²
5 9000 m²
6 9000 m²
7 9000 m²
8 9000 m²
9 9000 m²
10 9001 m²
11 9002 m²
12 9003 m²
13 9003 m²
14 9003 m²
15 9007 m² (Y)
16 9022 m² (X)
17 9025 m²
18 9016 m²
19 9007 m²
20 9002 m²
21 9053 m²
22 9107 m²
23 12370 m² (X)
24 10350 m²
25 9002 m²
26 9004 m²
27 9004 m²
28 9001 m²
29 9003 m²
30 9011 m²
31 9006 m²
32 9012 m²
33 9033 m²
34 9058 m²
35 9028 m²
36 9047 m²
37 10570 m²
38 9007 m² (X)
39 9011 m²
40 9089 m²
41 9188 m² (X)
42 9047 m²
43 10420 m² (Y) (X)
44 9006 m²
45 9026 m²
46 9000 m²
47 9001 m²
48 9021 m²
49 9192 m²
50 9092 m²
51 .9087 m² (X)
52 9004 m²
53 9140 m²
54 9352 m²
55 9023 m²
56 9053 m² (Y)
57 9451 m² (Y)
58 9084 m² (Y)
59 10480 m² (Y)
60 9629 m² (X) (Y)
61 9863 m² (X)

STAGE 1 BASIN

360m CONTOUR MAX. SUPPLY HEIGHT

LOCATE TANK & PUMP 25m SETBACK

360m CONTOUR MAX. SUPPLY HEIGHT

CONSTRUCTED IN STAGES 1 & 2

EXTEND 100mm PVC M WATER MAIN CONSTRUCTED TO COUNCIL STANDARD. APPROX LENGTH 841m. INSTALL 6 x HYDRANTS (STAGE 3)

(Y) RESTRICTION ON USE OF LAND
(X) EASEMENT TO DRAIN WATER 6, 12 AND VARIABLE WIDTH
(Z) EASEMENT FOR MULTIPURPOSE ELECTRICAL INSTALLATION 4.2 WIDE

LEGEND
- PROPERTY BOUNDARY
- EXISTING WATER MAIN
- EXISTING HYDRANT / STOP VALVE ON MAIN
- PROPOSED NEW 25mm CLASS 16 POLY WATER CONNECTION
- PROPOSED NEW WATER HYDRANT
- PROPOSED NEW 100mm PVC M WATER MAIN CONSTRUCTED TO COUNCIL STANDARD
- PROPOSED TANK

00 40 80 120 160 200 240 280 320 360 400
REDUCTION RATIO
1:4000

EXHIBITION COPY

Stewart Surveys
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966
E office@stewartsurveys.com

CLIENT: KERRY ELIZABETH PTY LTD

PROJECT: 210 BUSHS LANE, GUNNEDAH

DESCRIPTION: **STAGE 3 SERVICES PLAN**
PROPOSED SUBDIVISION OF LOTS 27 AND 28 IN DP755474
210 BUSHS LANE, GUNNEDAH

Date: 9 JULY 2025 | File Ref: 5448 | Drawn: CRS/KY | Scale: 1:4000 @ A3 | Sheet: 3

APPENDIX B

STORMWATER MANAGEMENT PLAN 210 BUSHS LANE APPLCAITION LETTER, PREPARED BY JSE DESIGN, DATED 8 AUGUST 2025

STORMWATER MANAGEMENT PLAN, 210 BUSHS LANE GUNNEDAH PREPARED BY JSE DESIGN PTY LTD, DRAWINGS DA-1 TO DA-5

STORMWATER DRAINAGE STATEGY, KERRY ELIZBAETH PTY LTD, LOT 27 & 28 DP755474, 210 BUSH'S LANE, GUNNEDAH, 3 JANUARY 2025, PREPARED BY JSE DESIGN PTY LTD, DATED 8 JULY 2025

EXHIBITION COPY

JSE DESIGN

Simon Bugeja
simon@jsedesign.com.au
0433 269 645

23-429 Peel Street,
Tamworth NSW 2340
jsedesign.com.au

8 August 2025

Kathryn Stewart
Stewart Surveyors Pty Ltd
[redacted]

Subject: Stormwater Management Plan – 210 Bush Lane Application

Dear Kathryn,

We write in response to Council's recent comment regarding the classification of the proposed detention basin within the development at 210 Bushs Lane as an online basin, and to clarify its appropriateness under current NSW regulatory guidance.

After discussions with the Department of Planning, Industry and Environment – Water (DPIE Water), the watercourse traversing the subject site has been confirmed to be a 1st order stream. This classification is critical in understanding the applicability of permissible stormwater infrastructure within the associated riparian corridor. This would be formally confirmed through GTA's from DPIe Water during the Development Assessment.

According to the DPIE publication '*Controlled Activities: Guidelines for Riparian Corridors on Waterfront Land*', Table 2 specifically permits the construction of online detention basins for 1st and 2nd order streams.

While the existing stream may be noted as a 1st order stream, this also allows for the stream to be realigned (Table 2) and overlay with the swale along the rear of proposed Lot 42-50.

The design aims for the basin to function intermittently, staying dry between storm events. It will include vegetated surfaces and stabilised inlets and outlets to reduce ecological and geomorphic disturbance. The basin is not meant to be a permanent water body or a barrier to natural flow. Its size is based on reducing post-development peak flows to pre-development levels, as outlined in Section C.5 of the Gunnedah DCP 2025.

We trust that the above information is suitable confirmation to be passed on to Gunnedah Shire Council with respect to their comments/ concerns for the above mentioned development.

Please do not hesitate to contact us should further information or discussions be required.

Yours sincerely,

Simon Bugeja
JSE Design
[redacted]

EXHIBITION COPY

PROPOSED SUBDIVISION

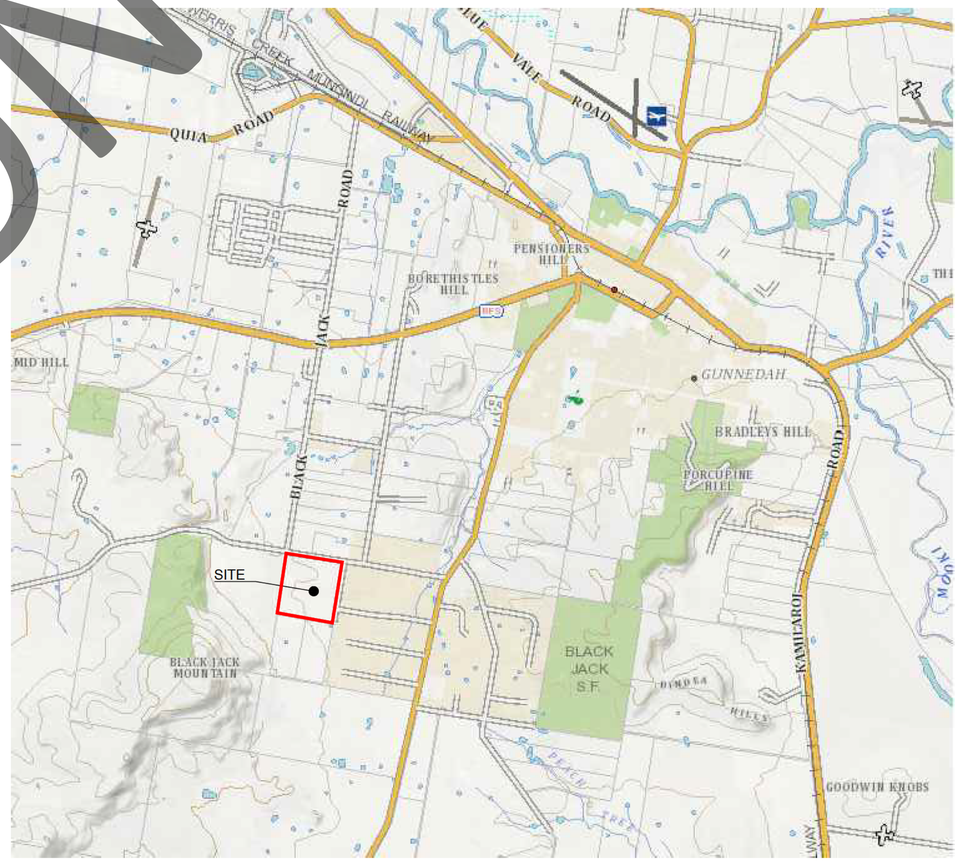
LOTS 27 AND 28 DP755474

210 BUSHS LANE, GUNNEDAH

KERRY ELIZABETH PTY LTD

DRAWING SCHEDULE JOB NUMBER JSE-2560

DATE - 12 DECEMBER 2024		
DWG No.	SHEET TITLE	REVISION
-	COVER SHEET	2
DA-1	EXISTING SITE STORMWATER	2
DA-2	PROPOSED STORMWATER LAYOUT	2
DA-3	PRE-DEVELOPMENT CATCHMENT PLAN	2
DA-4	POST-DEVELOPMENT CATCHMENT PLAN	2
DA-5	PROPOSED STAGING PLAN	2



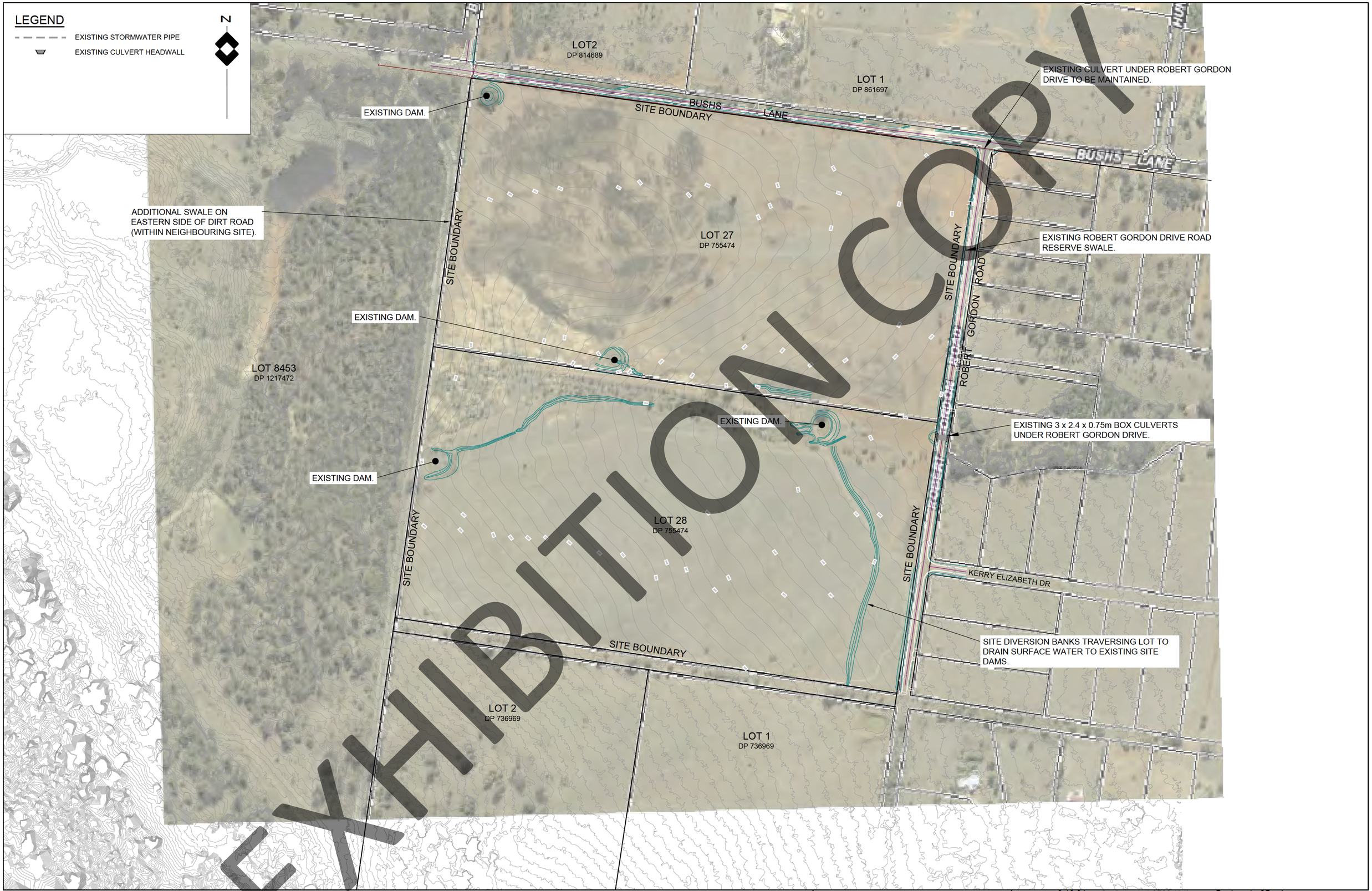
LOCATION MAP

JSE DESIGN

DA ISSUE

DA -

EXHIBITION COPY



EXHIBITION COPY

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
EXISTING SITE STORMWATER

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: 1:2500 (A1) Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No JSE-2560
Drawing No DA-1
Revision 2

LEGEND

- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER CULVERT
- PROPOSED OPEN CHANNEL
- PROPOSED RIP RAP
- PROPOSED IAD PIT
- PROPOSED CULVERT HEADWALL

N

LOT2
DP 814689

LOT 1
DP 861697

LOT 8453
DP 1217472

LOT 2
DP 736969

LOT 1
DP 736969

BUSHS LANE

ROBERT GORDON ROAD

ROAD 25 WIDE

EXISTING BUSHS LANE ROAD RESERVE SWALE TO BE CLEANED, SILT REMOVED AND REINSTATE PROPER SHAPE AND GRADE.

EXISTING CULVERT UNDER ROBERT GORDON DRIVE TO BE MAINTAINED.

EXISTING DAM TO BE RETAINED.

ADDITIONAL SWALE ON EASTERN SIDE OF DIRT ACCESS TRACL (WITHIN NEIGHBOURING SITE).

EXISTING ROBERT GORDON DRIVE ROAD RESERVE SWALE TO BE CLEANED, SILT REMOVED AND REINSTATE PROPER SHAPE AND GRADE. WORKS TO AVOID REMOVAL OF EXISTING TREES.

EXISTING DAM TO BE FILLED IN.

PROPOSED ROAD 1 (1.2 x0.9m) CULVERT AND HEADWALL.

INTERNAL SWALE TO BE A MAXIMUM OF 500mm DEEP WITH A 1.0m BASE WIDTH AND 1:5 BATTERS

PROPOSED DETENTION BASIN. 2500m3 (APPROX. 3755m2) WITH DUAL 1050Ø OUTLET PIPES WITH 2 x 750mm ORIFICE CONTROL PIT OUTLETS, 5m WIDE SPILLWAY AT RL332.700.

REFER TO CIVIL DA PLANS FOR TYPICAL ROAD CROSS CROSSINGS.

EXISTING DAM TO BE RETAINED.

EXISTING 3 x 2.4 x 0.75m BOX CULVERTS UNDER ROBERT GORDON ROAD TO BE RETAINED FOR THE DEVELOPMENT. OUTLET HEADWALL AND DOWNSTREAM SWALE TO BE ROCK LINED TO PROTECT FROM FURTHERING OF EXISTING UNMAINTAINED SCOURING. DETAILS TO BE PROVIDED IN SWC.

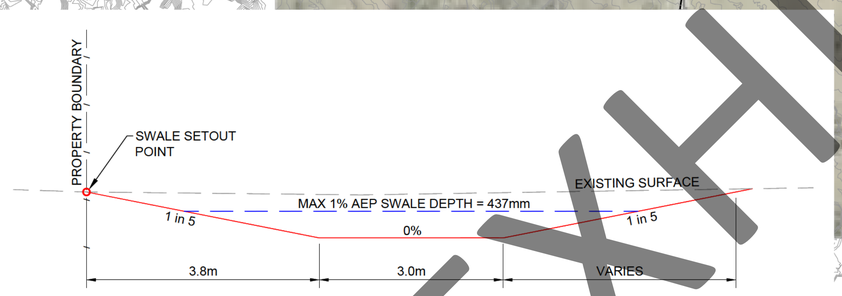
EXISTING DAM TO BE FILLED IN.

AREA BETWEEN DETENTION BASIN DISCHARGE HEADWALL AND EXISTING CULVERT UNDER ROBERT GORDON ROAD TO BE FULLY LINED WITH ROCK RIP RAP MIN d_{50} OF 400mm. ROCK CHANNEL TO EXTEND A MINIMUM OF 1.25m FROM BASE OF CHANNEL. CHANNEL TO BE SHAPED TO ACCEPT EXISTING ROBERT GORDON ROAD SWALE DISCHARGE.

DETENTION BASIN INLET SWALE TO BE FULLY ROCK LINED FROM INTERSECTION OF SWALES WITHIN LOT 43 TO INVERT OF DETENTION BASIN. ROCK RIP RAP MIN d_{50} OF 200mm. ROCK CHANNEL TO EXTEND A MINIMUM OF 1.25m FROM BASE OF CHANNEL. CHANNEL TO BE SHAPED TO ACCEPT EXISTING ROBERT GORDON ROAD SWALE DISCHARGE.

PROPOSED ROAD 1 (2 OF 1.2 x0.9m) CULVERTS AND HEADWALL.

SWALES TRAVERSING LOT TO BE FILLED IN AFTER ROAD SWALES AND DIVERSION SWALES/CHANNELS HAVE BE CONSTRUCTED. TYPICAL ACROSS THE SITE.



TYPICAL INTERALLOTMENT SWALE SECTION
1:20

EXHIBITION COPY

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
PROPOSED STORMWATER LAYOUT

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

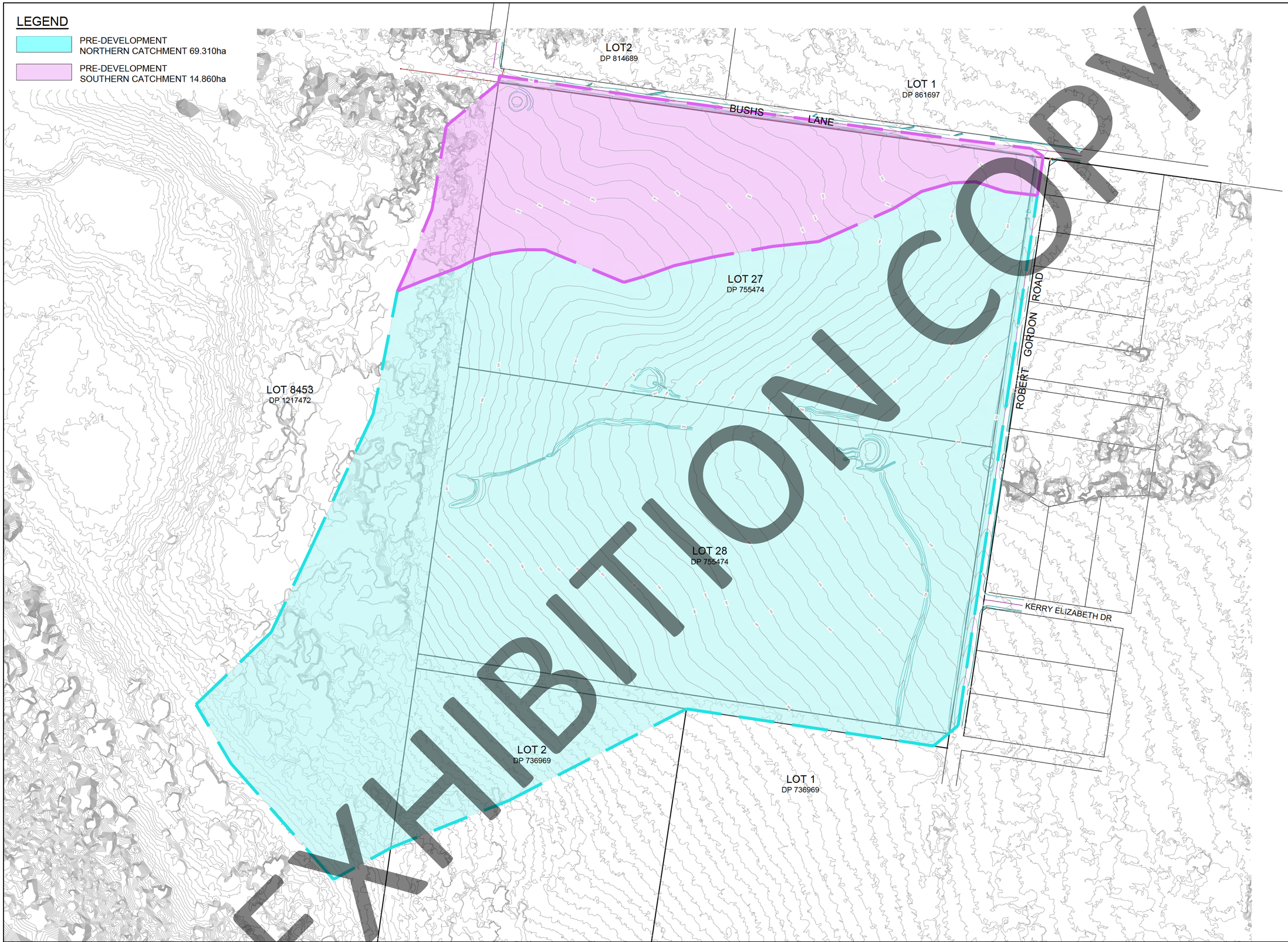
NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: AS SHOWN Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No: JSE-2560
Drawing No: DA-2
Revision: 2



EXHIBITION COPY

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
PRE-DEVELOPED CATCHMENT PLAN

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: 1:2500 (A1) Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

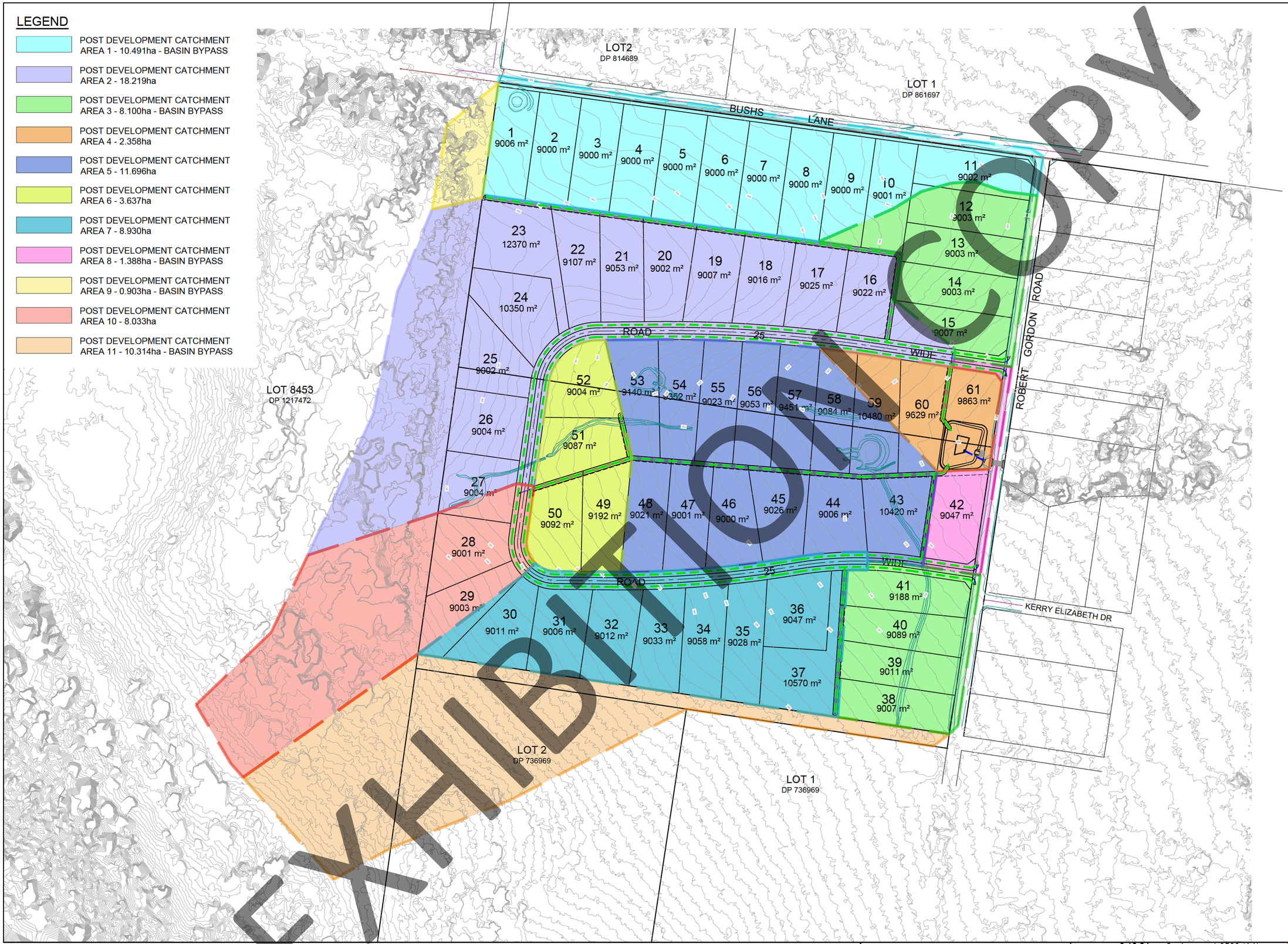
Project No
JSE-2560

Drawing No
DA-3

Revision
2

LEGEND

- POST DEVELOPMENT CATCHMENT AREA 1 - 10.491ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 2 - 18.219ha
- POST DEVELOPMENT CATCHMENT AREA 3 - 8.100ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 4 - 2.358ha
- POST DEVELOPMENT CATCHMENT AREA 5 - 11.696ha
- POST DEVELOPMENT CATCHMENT AREA 6 - 3.637ha
- POST DEVELOPMENT CATCHMENT AREA 7 - 8.930ha
- POST DEVELOPMENT CATCHMENT AREA 8 - 1.388ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 9 - 0.903ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 10 - 8.033ha
- POST DEVELOPMENT CATCHMENT AREA 11 - 10.314ha - BASIN BYPASS



COPY
EXHIBITION

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
POST-DEVELOPMENT CATCHMENT PLAN

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

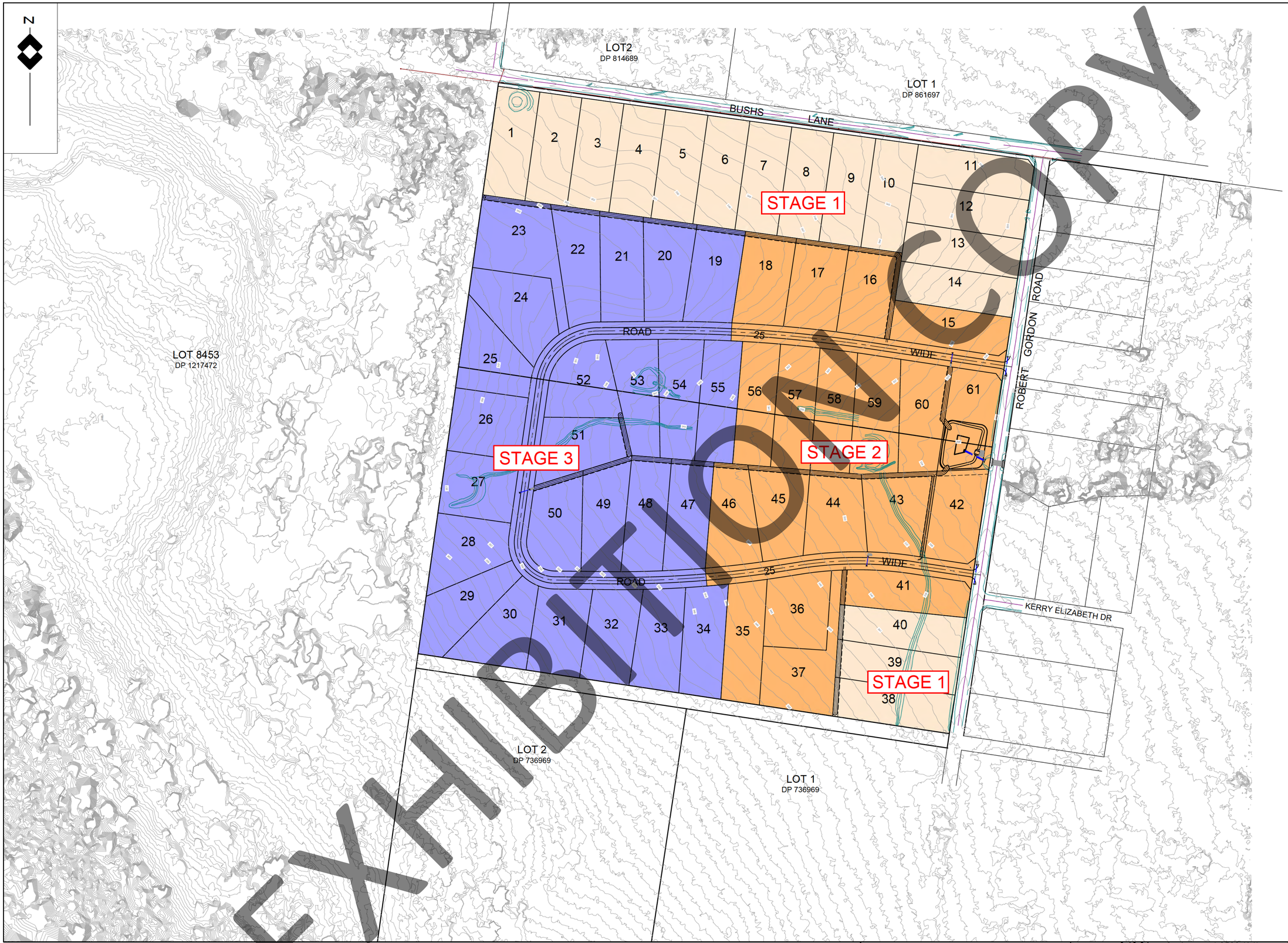
NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: 1:2500 (A1) Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No: JSE-2560
Drawing No: DA-4
Revision: 2



EXHIBITION COPY

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
PROPOSED STAGING PLAN

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: 1:2500 (A1) Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No: JSE-2560
Drawing No: DA-5
Revision: 2

JSE DESIGN

Stormwater Management Strategy

Prepared for

Kerry Elizabeth Pty Ltd

Lots 27 & 28 DP755474

210 Bushs Lane, Gunnedah NSW 2380

8th July 2025

jsedesign.com.au

EXHIBITION COPY

Prepared By:
JSE Design Pty Ltd

Prepared for:
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Client Manager: Simon Bugeja
Report Number: JSE-2560

Document Control

REVISION	DATE	REVISION DETAILS	AUTHOR	REVIEWER
1	03.01.2025	Client Review	Simon Bugeja	Simon Bugeja
2	08.07.2025	DA Submission	Luke Hagley	Simon Bugeja

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ACRONYMMS

AHD	Australian Height Datum
ARI	Average Recurrence Interval
AEP	Annual Exceedance Probability
ARQ	Australian Runoff Quality, Engineers Australia, 2006
AR&R	Australian Rainfall and Runoff, Institution of Engineers, Australia, 1987
BASIX	Building Sustainability Index
BOM	Bureau of Meteorology
CC	Construction Certificate
DA	Development Application
DLWC	Department of Land and Water Conservation
FFL	Finished Floor Level
FPL	Flood Planning Level
IFD	Intensity Frequency Duration
LGA	Local Government Area
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
RL	Reduced Level
GSC	Gunnedah Shire Council
SL	Surface Level
IL	Initial Loss
CL	Continuing Loss
t_c	Time of Concentration
f	Adopted fraction impervious

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1. INTRODUCTION

1.1 Background

JSE Design Pty Ltd was commissioned by Kerry Elizabeth Pty Ltd to prepare a Stormwater Management Plan and Drainage Strategy Report in accordance with the stormwater quantity and quality requirements of the Gunnedah Shire Council's Development Control Plan and the Engineering Guidelines for Subdivisions and Development Guidelines to support the Development Application for the proposed subdivision and detention basin within Lot 27 and 28 of DP755474 located within the Gunnedah Shire Council area, the site location is shown in Figure 1 Appendix A.

The scope of this report includes an identification of the stormwater management requirements for the proposed development and in order to devise a stormwater management strategy.

The report describes the principles and operation of the proposed stormwater system as well as the primary components of the drainage system. As the assessment and evaluation are required under general conditions of consent, the final stormwater system layout may need to be revised in the future during the application for a Subdivision Works Certificate (SWC).

The following information and documents were used in this investigation:

- Concept stormwater layout plan reference by JSE Design Pty Ltd, 210 Bushs Lane, Gunnedah DA-2 Rev 1 dated 12 December 2024.
- Gunnedah Shire Council Development Control Plan (DCP) 2011.
- Gunnedah Shire Council, Manual of Engineering Standards, adopted April 2014.
- "Australian Runoff Quality – A Guide to Water Sensitive Urban Drainage", Engineers Australia (2006).
- "Australian Rainfall and Runoff – A Guide to Flood Estimation", Institute of Engineers Australia (1987).

The increase in impervious areas and alteration of the natural topography due to land development has the potential to increase and concentrate peak storm flows. This has the potential to impact on flow regimes and cause erosion of the downstream drainage network and associated waterways.

To avoid any adverse impact on the downstream drainage systems, the site's stormwater management system must be designed to ensure the safe conveyance of flows throughout the site and within the capacity of the downstream trunk drainage systems in a healthy environmental state for Ecological Sustainable Development.

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1.2 Site Description

The current site being Lot 27 and 28 of DP755474 falls from west to east with majority of site flows being discharged though the existing culverts (3x2.4x0.75m) at the lowest point of the site under Robert Gordon Road. The developable land has a total area of approximately 60.1 hectares. The site is bounded to the north by Bushs Lane and to the east by Robert Gordon Road.

The site has average natural surface slope from west to east at approximately 3.9%, and level from RL360m AHD in west to RL 329.8m AHD at the culverts under Robert Gordon Road.

1.3 Proposed Development

The proposed site is for a rural residential subdivision, with 61 lots over the developable footprint. The concept subdivision lot layout has been prepared by JSE Design Pty Ltd and is shown in Appendix B.

The detention basin that is proposed is to currently location with the proposed lot 61. The detention basin will directly discharge upstream of the existing culverts under Robert Gordon Road with a spillway designed to flow in a similar direction for over 1% AEP storms. The basin will also be design with a 3m wide gravel access track for maintenance.

A control pit will also be utilized to control discharge rates of the smaller storm events to ensure post development flows to not exceed pre-developed flows. The concept design will be shown as a multistage discharge with a 750mm orifice at RL330.5 and another 750mm orifice at RL330.9. Top of control pit is RL331.65 with a spillway level at the 1% AEP of RL333.0

1.4 Drainage Catchment

The site generally drains towards the eastern boundary and stormwater runoff from the sites finished surface levels are proposed to flow towards the proposed detention basin via open channels and overland flows. The proposed basin currently discharges to the low point in the eastern corner and ultimately through the existing box culverts under Robert Gordon Road. The proposed development detention basin will consist of 1 post-development and 1 external pre-development catchments which will drain though the basin while another 3 smaller post development and 1 external pre-development catchments will bypass the detention basin due to either discharging directly to Bushs Lane or discharging through the existing box culverts below the detention basin inlet location.

Below is a list of post developed catchments. Catchments are also outlined on JSE sheet DA-4 within Appendix B.

- Catchment 1 – 10.49ha
- Catchment 2 – 18.219ha – Includes external catchment portion
- Catchment 3 – 8.100ha

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- Catchment 4 – 2.358ha
- Catchment 5 – 11.696ha
- Catchment 6 – 3.637ha
- Catchment 7 – 8.930ha
- Catchment 8 – 1.388ha
- Catchment 9 – 0.903ha – predominantly external catchment which drains down Bushs Lane
- Catchment 10 – 8.033ha – Includes external catchment portion
- Catchment 11 – 10.314ha – predominantly external catchment

1.5 Objective and Target of Work

This plan of work has been undertaken to provide the following information in support of the Development Application:

- Documentation of the requirements of Gunnedah Shire Council for this development site.
- Identify the impacts of this proposed residential development on existing waterways and downstream properties.
- Provide stormwater controls that ensure the proposed development does not adversely impact on the quantity of stormwater flows within, adjacent and downstream of the site.
- Provide concept dimensions of the proposed stormwater management services in accordance with the adopted approach by council.

1.6 Available Data

The following information was utilised in the preparation of this strategy:

- An indicative lot layout plan provided by JSE Design Pty Ltd. A copy of the plan is shown in Appendix B.
- Gunnedah Shire Council - Manual of Engineering Standards, 2014.
- Flood Planning Map, “Gunnedah Local Environmental Plan 2012” of Gunnedah Shire Council (referenced on 28/01/2025) shown in Appendix C.

1.7 Strategy Purposes / Criteria

1.7.1 Stormwater Runoff Quantity Criteria

Stormwater flow management and design criteria of quantity include:

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- The adoption of a major / minor flow approach to the design of the local stormwater management system.
- Delivery of major flows through the site to the stormwater system in a safe manner and to avoid impacting on the site and downstream properties.
- Limiting the discharge rates of the proposed development to pre-development discharge rates.

1.7.2 Flooding Criteria

Gunnedah Shire Council mapping indicates no significant flooding from the larger catchments of Gunnedah. However, the development addresses localized flooding issues through specific design measures. In this process, “Engineering Guidelines for Subdivision and Developments,' specifically Part 3, “Guidelines for Stormwater Drainage Design,” was referenced to establish standard subdivision requirements for safely managing minor and major flow events, either around the site or through the proposed detention basin.

Consequently, all proposed lots should be constructed at or above the 1 in 100-year flood level, and all residences must be positioned above the flood planning level with a 0.5 m freeboard, consistent with rural residential development standards.

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2. STORMWATER DRAINGE MANAGEMENT STRATEGY

The stormwater drainage management plan involves:

- Roof areas of residences will drain to rainwater tanks/harvesters within each lot for re-use. Water Tanks will overflow through a piped connection to IAD or street drainage system.
- Capture of stormwater from lot and road reserve areas by a conventional open channels and swale drainage network located either side of the proposed roads and as swales through lots as inter-allotment easements where required.
- Discharge from the catchment's outlets will be conveyed over land towards the existing waterways, or piped where required, generally similar to the discharge from the undeveloped catchments.
- A basin within the proposed subdivision, in accordance with Gunnedah Shire Council's Engineering Guidelines.

Details of the proposed local drainage system will be determined at the time of Subdivision Works Certificate application, to Council's standard requirements.

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3. METHODOLEGY

3.1 Stormwater Runoff Quantity

The hydrological modelling software has been used for flowrates estimation of the existing and post-development in order to demonstrate the magnitude of the local catchment discharge.

3.1.1 Stormwater Flow Model

The post-development release is compared to the pre-developed discharge, and if higher, detention is usually warranted in accordance with Council's standard requirements.

3.1.2 Catchment Plan and Model Data

Surface runoff flowrates from the proposed site were modelled in two differing scenarios (the pre-developed state and post-developed catchment) using the DRAINS – Urban Drainage Model.

The Horton/ILSAX model was used within the DRAINS software package for both scenarios.

For the existing state the development site was formed to be one catchment. Plans within Appendix B shows the location of the post-developed catchment boundaries, including redirection of stormwater where flow is conveyed via the developments internal road drainage system. DRAINS model data is included in Appendix D.

The methodology for stormwater quantity comprised quantitative analysis of available data to estimate existing and future flow behaviour from the development site. The analysis involved examination of surface hydrology to identify runoff characteristics from the proposed site and determination if stormwater mitigation devices are required to negate the impact of site development on existing flowrates from the site.

This involved the following steps:

- Estimate the existing peak stormwater flowrates at the downstream drainage outlets of the site using the DRAINS drainage software package.
- Revise the existing scenario in the DRAINS drainage model to include the additional impervious areas that will arise due to development of the site. This resulted in the developed DRAINS drainage model.
- The critical storm was then selected for each ARI, based on the peak discharge from the site. The hydrographs of these 'critical' storms were plotted to enable comparison of the existing state storm event to the developed state storm event.

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3.1.3 Rainfall Data

Rainfall for the 1 year, 2 year , 5year ,10 year , 20 year , 50 year and 100 year ARI design events, and storm durations from 5 minutes to 4.5 hours for each, were modelled in order to identify the critical storm duration (producing the highest peak flowrate) for each ARI from the site. The required rainfall Intensity Frequency Duration (IFD) rainfall data was obtained from the tables supplied in Australian Rainfall and Runoff, and the BOM website, and is reproduced below.

Latitude	= -30.962^0 S	
Longitude	= 150.212^0 E	
Skewness	= 0.03	
2-year ARI,	1 hour intensity	= 22.7 mm/hr
	12 hour intensity	= 4.05 mm/hr
	72 hour intensity	= 1.10 mm/hr
50-year ARI,	1 hour intensity	= 52.3 mm/hr
	12 hour intensity	= 8.83 mm/hr
	72 hour intensity	= 2.65 mm/hr

3.1.4 DRAINS Model Parameters

Table 1 summarises the catchment storage and loss parameter values adopted in the DRAINS models for both the pre-developed and post-developed models.

Table 1: Storage and loss parameter values adopted in the DRAINS hydrological models

Parameter	**Value**
Paved depression storage (mm)	2
Grassed depression storage (mm)	2
Soil type	8

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3.1.5 Model Catchment Data

Full DRAINS model Catchment data is provided in Appendix D. Catchment impervious area percentage values used in the DRAINS models are summarised in Table 2.

Table 2: Impervious area percentage values adopted in the DRAINS models

Model - type	Impervious Area Percentage
Total existing site area (Pre-development) - Table G (Natural Bushland)	35%
External catchment areas (Pre-development) - Table G (Natural Bushland)	35%
Residential Development area, including road reserve (Post-development) – Amended from Table G (Rural Residential – 60%) per Stewart Survey letter with reference to local built subdivision hardstand vs grassed areas.	40%

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4. MODEL RESULTS

4.1 Stormwater Runoff Quantity

4.1.1 DRINS Model Results

The pre and post-developed site conditions were modelled to establish the peak rate of discharge for each critical storm event from the 1 year to 100 year ARI events. The stormwater water plan is shown in Appendix B. The pre-developed flow rates were calculated using the Probabilistic Rational Method, the results are shown in Table 1 as allowable pre-developed peak discharge. The time of concentration for the pre-developed catchment was estimated using the Kinematic Wave Equation. Estimated peak rates of discharge for each pre-developed using the rational method and post-developed un-detained storm event are shown below in Table 7.

Table 3: Estimated Pre and Post-Developed Peak Discharge

ARI (years)	Allowable Pre-Developed Peak Discharge (m^3/s)	Undetained Post-Developed Peak Discharge (m^3/s)
1	2.560	2.908
2	2.890	3.313
5	5.920	6.160
10	8.660	8.800
20	11.300	11.407
50	14.800	15.142
100	17.700	17.860

The incorporation of an outlet control structure configuration will reduce post-developed flowrates to less than, or equal to the pre-developed flowrates for all storm events up to and including the 100 year ARI event. The Post Developed flows with the outlet control structure in place are shown in Table 8.

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Table 4: Estimated Pre and Post-Developed Peak Discharge

ARI (years)	Allowable Pre-Developed Peak Discharge with Bypass (m^3/s)	Post-Developed Peak Discharge (m^3/s)	Basin Top Water Level (RL)	Percentage Change Pre-Development Discharge	Basin Volume (m^3/s)
1	2.560	2.440	331.42	-4.9%	530.49
2	2.890	2.792	331.55	-3.5%	642.31
5	5.920	5.736	331.83	-3.2%	913.68
10	8.660	8.611	332.01	-0.6%	1120.60
20	11.300	11.270	332.16	-0.3%	1306.98
50	14.800	14.750	332.32	-0.3%	1533.81
100	17.700	17.170	332.45	-3.1%	1722.25

The detention basin calculations do not take into account the reduced runoff resulting from rainwater harvesting tanks. A noticeable decrease in peak runoff during larger storms (such as the 100-year ARI) is likely due to these tanks. In line with the Council's stormwater detention basin requirements, a spillway must be included within the basin embankment. The spillway must be capable of conveying the 100-year ARI flood event. Using the Manning Equation for Uniform Open Channel Flow, a spillway width of 8m with 1:5 side slopes is specified, with the basin spillway height set at 0.5m.

The water level in the basin was simulated in Drains for the 100-year ARI storm, reaching 1.95m at RL332.45m. With a spillway level at RL332.50m, the basin's maximum capacity is 1800m³. The modelled detention volume of 1722.25 m³ at RL332.45m fits within this capacity before water is released via the spillway.

The summary DRAINS output tables for the 10 and 100-year ARI are included in Appendix D. The Drains model has also been provided for additional storm simulations.

4.2 Flooding

Following the stormwater modelling process, and the inclusion of any required stormwater detention measures and/or stormwater flow conveyance structures, proposed lots are reviewed against localised 100 year ARI stormwater flood levels to confirm that the lots are at or above the 1 in 100 year flood event level, enabling all dwellings to be above the flood planning level, which is the 1 in 100 year flood level plus 500mm freeboard for residential development.

Gunnedah Shire Council's LEP 2011, Flood Planning Map, shows that the subject site is in a mapped flood zone as shown Figure 3 and 4 Appendix D. Therefore, the site is not subject to any flooding limitations.

- All lots to be 500mm above the 1 in 100 year flood

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5. SOIL AND WATER MANGEMENT DURING CONSTRUCTION

Soil and water management devices to minimise land disturbance during the subdivision construction phase are to be provided in accordance with the publication *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

A detailed erosion and sedimentation control plan are to be undertaken during the detailed design stage of the proposed development. The erosion and sedimentation control plan should generally contain the following range of management practices for effective soil and water management during a land disturbance phase:

- Minimise the area of soil disturbed and exposed to erosion by phasing works so that land disturbance is confined to minimum areas.
- Erect barrier fencing to minimise disturbance by preventing vehicular and pedestrian access to restricted areas.
- Limit access for plant etc. to current construction area to limit amount of disturbed area.
- Conserve topsoil for site rehabilitation/revegetation when site works are complete.
- Installation of sediment filters, such as silt fences, straw bales, or turf strips downstream of disturbed areas.
- Control water flow from the top of, and through the development area. In particular, divert upslope runoff around works and limit slope length to 80 metres on disturbed lands if rainfall is expected.
- Where appropriate, reduce the effects of wind erosion by controlling on-site traffic movement and watering bare soil areas.
- Provision of shaker humps / pads near construction entry and exit locations to remove excess soil materials from vehicle tyres and underbodies.
- Rehabilitate disturbed lands quickly.
- Ensure that all erosion and sediment control measures are kept in a properly functioning condition until all site disturbance works are completed and the site is rehabilitated.

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6. SUMMARY AND CONCLUSIONS

At Source Management

Stormwater Flow Management (stormwater runoff quantity and quality)

The strategy for management of stormwater runoff from the development is depicted on the civil DA plans within the Appendix, and comprises:

- Capture of stormwater from lot and road reserve areas by a conventional pit and pipe drainage network located in the street or in inter-allotment drainage easements where required.
- The detention basins will provide attenuation of developed stormwater flowrates to existing flowrate conditions for the development site.
- The bio-detention basins will provide secondary/tertiary treatment and polishing of the stormwater runoff from the development site prior to discharge downstream.
- Discharge from the major catchment outlets will be conveyed over land within the existing watercourses, or piped as required, towards the eastern side of the site towards Robert Gordon Road, which is generally similar to the discharge from the undeveloped catchments.

While bio-retention has not been modelled for this development a MUSIC model was developed for the site, and it can be assumed that approximately 100m2 bio filter 800mm deep would be required to sufficiently clean the detained stormwater volume to be within suitable limits.

Details of the proposed local drainage system will be determined at the time of an SWC application, to Council's requirements.

As illustrated in Appendix B, there is sufficient area within the site to provide stormwater drainage management measures to negate the impacts of the proposed development.

Flooding

From a review of Gunnedah Shire Council's LEP flood mapping 2012, it is considered that the subject site is not in a mapped flood zone. Therefore, the site is not subject to any flooding limitations.

The site's levels, including any site regrading that may be proposed, should be reviewed in the SWC phase of the development to confirm that developable areas are at or above the 1 in 100 year flood level, enabling future habitable dwellings to be located at or above the flood planning level.

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REFERENCES

- Gunnedah Shire Council's Manual of Engineering Standards, 2014.
- Australian Rainfall and Runoff, Institution of Engineers, Australia, 1987
- Queensland Urban Drainage Manual (QUDM) – Fourth Edition
- Australian Rainfall and Runoff 2019 (ARR 2019)
- Floodplain Risk Management Guide – Incorporating 2016 Australian Rainfall and Runoff in studies

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APPENDIX A – DRAINS SUMMARY INPUT AND RESULTS

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Drains – Input Data

PIT / NODE DETAILS			Version 15													
Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down lid	id	Part Full Shock Los	Inflow Hydrograph	
Pre-Dev	Node							0		232613.887	6565601.966		349165580		No	
Channel outlet	Node							0		233776.169	6565383.036		349347703		No	
External Node	Node					340.535		0		233583.238	6565022.563		349512160		No	
External Node	Node							0		232962.271	6565926.149		349525380		No	
N1	Node					336.509		0		233767.972	6565812.637		349558545		No	
HW1	Headwall				0.5	338		0		233688.883	6565822.849		349646909			
HW1-out	Node					337.7		0		233729.018	6565818.278		349524334		No	
HW3	Headwall				0.5	337.5		0		233610.456	6565212.960		349653142			
HW3-out	Node					335.2		0		233617.572	6565264.474		349513482		No	
HW2	Headwall				0.5	334		0		233661.985	6565552.310		349992492			
HW2-out	Node					333.3		0		233654.435	6565504.084		349519486		No	
N2	Node							0		233640.249	6565414.995		350122459		No	
N3	Node							0		233635.065	6565378.409		350123050		No	
N6	Node					347		0		233137.201	6565398.048		350644972		No	
N5	Node					352.6		0		232997.807	6565356.898		350648419		No	
N7	Node					337		0		233452.510	6565372.844		350649519		No	
N8	Node					333.5		0		233555.384	6565376.444		350650779		No	
N4	Node					339		0		233434.164	6565266.712		350653143		No	
N9	Node					335.4		0		233578.545	6565531.041		350743820		No	
EX HW	Headwall				0.5	331.1		0		233634.578	6565394.302		349785139			
EX HW-out	Node					331		0		233654.006	6565393.364		349347701		No	
Control Pit	Node					331.5		0		233614.900	6565399.141		349391956		No	
Basin out	Node					330		0		233625.453	6565395.919		349400312		No	

DETENTION BASIN DETAILS															
Name	Elev	Surf. Area	Not Used	Outlet Ty	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Lenc	id
Basin	330.5	357.4		None						233580.275	6565404.791	No			349391950
	331.5	869.25													
	332.5	1574.5													
	333.5	2453.8													

SUB-CATCHMENT DETAILS									
Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)
C-Pre-Dev	Pre-Dev	84.17	35	65	0	25	25	0	
Dev-Cat 4	Basin	2.358	40	60	0	9	14	2	
Ex-Cat 7	External Node	10.314	35	65	0	25	25	0	
Ex-Cat 5	External Node	0.903	35	65	0	9	9	2	
Dev-Cat 1	HW1	10.491	40	60	0	27	33	0	
Dev-Cat 3.2	HW3	4.042	40	60	0	10	16	2	
Dev-Cat 3.1	HW2	4.2022	40	60	0	16	22	2	
Cat803077	N6	3.6377	40	60	0	9	14	2	
Cat803076	N5	8.0331	38	62	0	28	28	2	
Cat803079	N8	11.696	35	65	0	15	19	2	
Cat803080	N4	8.931	40	60	0	15	21	2	
Cat806745	N9	18.233	40	60	0	22	28	2	
Dev-Cat 2	EX HW	1.388	40	60	0	7	9	2	

PIPE DETAILS														
Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg
Pipe1	HW1	HW1-out	27.8	337.252	337.144	0.39	Box culverts (samples)	0.9W x 0.6H		0.012	NewFixed	2	HW1-out	0
Pipe3	HW3	HW3-out	36	335.127	333.91	3.38	Box culverts (samples)	1.2W x 0.9H		0.012	NewFixed	2	HW3-out	0
Pipe2	HW2	HW2-out	30	332.917	332.296	2.07	Box culverts (samples)	1.2W x 0.9H		0.012	NewFixed	1	HW2-out	0
Ex-Culvert	EX HW	EX HW-ou	12	329.5	329.1	3.33	Box culverts (samples)	2.4W x 0.75H		0.012	NewFixed	3	EX HW-out	0
Outlet	Control Pit	Basin out	10	330.1	330	1	Concrete, not under roads,	1050	1070	0.013	New	2	Basin out	0

DETAILS of SERVICES CROSSING PIPES										
Pipe	Chg (m)	Bottom Elev (m)	Height of (m)	Chg (m)	Bottom Elev (m)	Height of (m)	Chg (m)	Bottom Elev (m)	Height of Serv (m)	etc etc

CHANNEL DETAILS											
Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Width (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS															
Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Depth Major Storms (m)	SafeDepth Minor Storms (m)	Safe DxV (sq.m/sec)	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
OF10	External Node	HW3	2				Swale with 1:4 sideslopes	0.45	0.3	1	2.1	50	349637512	340.535	335.127	206
OF1	External Node	HW1	8				Swale with 1:4 sideslopes	0.45	0.3	1	1.71	50	349635105	350	337.252	745
OF2	HW1	HW1-out	0.5	338	5	1.72	4 m wide pathway	0.3	0.15	0.6	0.72	0	349648139	338	337.8	27.8
OF3	HW1-out	N1	0.5				4 m wide pathway	0.3	0.15	0.6	1.59	100	349558915	337.144	336.509	40
OF11	HW3	HW3-out	0.3	337.5	5	1.72	4 m wide pathway	0.3	0.15	0.6	2.78	0	349653398	337.5	337	36
OF12	HW3-out	N3	1				Swale with 1:4 sideslopes	0.45	0.3	1	3.15	100	349637054	333.91	331	124
OF14	HW2	HW2-out	0.3	334	5	1.72	4 m wide pathway	0.3	0.15	0.6	1.67	100	349989067	334	332.5	30
OF15	HW2-out	N2	1.2				Swale with 1:4 sideslopes	0.45	0.3	1	1.98	100	349636315	332.296	331	116
OF16	N2	EX HW	0.1				Natural Depression	1	0.7	1	5	33	350123529	331	330.5	10
OF13	N3	EX HW	0.1				Natural Depression	1	0.7	1	3.33	33	350123308	331	330.5	15
OF5	N6	N7	1.7				Swale with 1:5 sideslopes	0.45	0.3	1	4.57	100	350655353	347	337	219
OF4	N5	N6	0.7				Swale with 1:5 sideslopes	0.45	0.3	1	5.57	100	350655100	352.6	347	100.6
OF6	N7	N8	0.5				Swale with 1:5 sideslopes	0.45	0.3	1	4.91	50	350655702	337	334	71.3
OF7	N8	Basin	0.3				Basin Inlel Swale	0.75	0.5	0.6	3.14	50	350665071	334	332.5	31.8
OF9	N4	N8	1.3				Swale with 1:5 sideslopes	0.45	0.3	1	3.59	50	350659937	339	334	153.3
OF8	N9	Basin	0.9				Swale with 1:5 sideslopes	0.45	0.3	1	3.14	50	350750357	335.4	332.5	92.5
OF20	EX HW	EX HW-ou	0.1	331.1	4	1.72	4 m wide pathway	0.3	0.15	0.6	4.17	100	349347706	331.1	330.8	12
EX-CH	EX HW-out	Channel ou	0.2				Natural Depression	1	0.7	1	3.04	100	349347704	329.1	328.8	25
OF17	Basin out	EX HW	0.1				4 m wide pathway	0.3	0.15	0.6	8.33	34	349402473	330	329.5	6

PIPE COVER DETAILS					
Name	Type	Dia (mm)	Safe Cov	Cover (m)	
Pipe1	Box culverts (s	0	0.6	-0.15	Unsafe
Pipe3	Box culverts (s	0	0.6	0.27	Unsafe
Pipe2	Box culverts (s	0	0.6	-0.02	Unsafe
Ex-Culvert	Box culverts (s	0	0.6	0.68	
Outlet	Concrete, not	1070	0.6	-1.15	Unsafe

This model has no pipes with non-return valves

EXHIBITION COPY

Drains – 5 Year Result Summary

DRAINS results prepared from Version 2025.01 9147.24925

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surfa Flow Arrivi (cu.m/s)	Max Pond Volume (cu m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
External N	340.79		0.849				
External N	350.1		0.148				
HW1	337.64		0.708		0.36	0	None
HW1-out	337.32		0				
HW3	335.55		1.152		1.95	0	None
HW3-out	334.22		0				
HW2	333.26		0.467		0.74	0	None
HW2-out	332.52		0				
N2	331.04		0.459				
N3	331.09		1.213				
N6	347.18		0.859				
N5	352.73		0.623				
N7	337.18		1.056				
N8	334.26		2.709				
N4	339.18		1.054				
N9	335.65		1.545				
EX HW	330.09		6.54		1.01	0	None
EX HW-ou	329.42		0				
Control Pit	330.73		0				
Basin out	330.31		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
C-Pre-Dev	5.918	4.083	1.836	25	25	0	20% AEP, 30 min burst, Storm 6
Dev-Cat 4	0.255	0.224	0.031	9	14	2	20% AEP, 10 min burst, Storm 7
Ex-Cat 7	0.725	0.5	0.225	25	25	0	20% AEP, 30 min burst, Storm 6
Ex-Cat 5	0.101	0.069	0.037	9	9	2	20% AEP, 15 min burst, Storm 7
Dev-Cat 1	0.74	0.58	0.16	27	33	0	20% AEP, 30 min burst, Storm 6
Dev-Cat 3.	0.419	0.346	0.087	10	16	2	20% AEP, 15 min burst, Storm 7
Dev-Cat 3.	0.373	0.301	0.081	16	22	2	20% AEP, 20 min burst, Storm 5
Cat803077	0.393	0.345	0.049	9	14	2	20% AEP, 10 min burst, Storm 9
Cat803076	0.563	0.414	0.149	28	28	2	20% AEP, 30 min burst, Storm 6
Cat803079	0.993	0.743	0.284	15	19	2	20% AEP, 20 min burst, Storm 5
Cat803080	0.797	0.651	0.146	15	21	2	20% AEP, 15 min burst, Storm 6
Cat806745	1.413	1.108	0.31	22	28	2	20% AEP, 25 min burst, Storm 2
Dev-Cat 2	0.162	0.137	0.029	7	9	2	20% AEP, 10 min burst, Storm 7

P PE DETA LS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe1	0.686	1.55	337.591	337.39	20% AEP, 45 min burst, Storm 3
Pipe3	1.022	1.37	335.55	334.22	20% AEP, 30 min burst, Storm 3
Pipe2	0.372	1.37	333.26	332.523	20% AEP, 20 min burst, Storm 5
Ex-Culvert	5.046	2.17	329.869	329.423	20% AEP, 30 min burst, Storm 6
Outlet	3.707	3.45	330.726	330.618	20% AEP, 25 min burst, Storm 4

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETA LS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
O2	0.511	0.511						20% AEP, 25 min burst, Storm 4
Spillway	0.001	-0.001						20% AEP, 5 min burst, Storm 1
Top	1.942	1.942						20% AEP, 25 min burst, Storm 4
O	1.255	1.255						20% AEP, 20 min burst, Storm 5
OF10	0.72	0.869	2.738	0.28	0.41	3.24	1.47	20% AEP, 30 min burst, Storm 6
OF1	0.136	0.389	2.471	0.209	0.22	2.68	1.15	20% AEP, 45 min burst, Storm 9
OF2	0	0	0.351	0	0	0	0	
OF3	0.686	0.686	0.521	0.176	0.18	4	1.19	20% AEP, 45 min burst, Storm 3
OF11	0	0	0.69	0	0	0	0	
OF12	1.016	1.012	2.864	0.34	0.45	3.72	1.47	20% AEP, 30 min burst, Storm 3
OF14	0	0	0.534	0	0	0	0	
OF15	0.366	0.363	2.659	0.243	0.21	2.94	1.13	20% AEP, 20 min burst, Storm 5
OF16	0.363	0.404	11.734	0.048	0.04	10.48	0.83	20% AEP, 20 min burst, Storm 5
OF13	1.012	1.039	11.99	0.095	0.1	10.95	1.05	20% AEP, 30 min burst, Storm 6
OF5	0.865	0.859	5.293	0.175	0.22	4.75	1.28	20% AEP, 30 min burst, Storm 6
OF4	0.561	0.883	5.126	0.167	0.23	4.67	1.38	20% AEP, 30 min burst, Storm 6
OF6	0.856	1.216	5.211	0.215	0.3	5.15	1.39	20% AEP, 30 min burst, Storm 6
OF7	2.444	2.543	6.74	0.262	0.41	7.41	1.57	20% AEP, 20 min burst, Storm 5
OF9	0.798	1.273	5.482	0.236	0.31	5.36	1.33	20% AEP, 20 min burst, Storm 5
OF8	1.391	1.49	5.271	0.261	0.35	5.61	1.38	20% AEP, 25 min burst, Storm 7
OF20	0	0	0.844	0	0	0	0	
EX-CH	5.046	5.046	12.016	0.323	0.44	13.23	1.57	20% AEP, 30 min burst, Storm 6
OF17	3.707	3.732	1.194	0.448	0.97	4	3.28	20% AEP, 25 min burst, Storm 4

DETENTION BAS N DETA LS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin	331.83	913.8	3.708	0	3.708

Run Log for DRA NS v2025.01.9147.24925 - HDW60 - 210 Bushs Lane - Basin Size r4.1

The maximum flow in these overflow routes is unsafe: OF3, OF17

EXHIBITION COPY

Drains – 100 Year Result Summary

DRAINS results prepared from Version 2025.01.9147.24925

PIT / NODE DETAILS

Name	Max HGL	Max Pond HGL	Max Surfa Flow Arrivi (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
External N	340.96		2.691				
External N	350.19		0.372				
HW1	338.07		1.907		-0.07	0.095	Headwall height/system capacity
HW1-out	337.49		0.271				
HW3	336		3.391		1.5	0	None
HW3-out	334.42		0				
HW2	333.58		1.155		0.42	0	None
HW2-out	332.66		0				
N2	331.12		1.152				
N3	331.19		3.531				
N6	347.3		2.29				
N5	352.83		1.885				
N7	337.31		2.793				
N8	334.47		6.756				
N4	339.31		2.497				
N9	335.82		4.511				
EX HW	331.11		17.24		-0.01	0.012	Headwall height/system capacity
EX HW-ou	329.7		1.031				
Control Pit	331.53		0				
Basin out	331.15		0				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
C-Pre-Dev	17.67	8.008	9.751	25	25	0	1% AEP, 30 min burst, Storm 5
Dev-Cat 4	0.69	0.421	0.322	9	14	2	1% AEP, 15 min burst, Storm 10
Ex-Cat 7	2.165	0.981	1.195	25	25	0	1% AEP, 30 min burst, Storm 5
Ex-Cat 5	0.321	0.127	0.194	9	9	2	1% AEP, 15 min burst, Storm 5
Dev-Cat 1	1.958	1.113	0.85	27	33	0	1% AEP, 30 min burst, Storm 5
Dev-Cat 3.	1.125	0.692	0.484	10	16	2	1% AEP, 15 min burst, Storm 10
Dev-Cat 3.	0.996	0.584	0.429	16	22	2	1% AEP, 20 min burst, Storm 10
Cat803077	1.064	0.649	0.497	9	14	2	1% AEP, 15 min burst, Storm 10
Cat803076	1.593	0.801	0.793	28	28	2	1% AEP, 30 min burst, Storm 5
Cat803079	2.893	1.454	1.497	15	19	2	1% AEP, 20 min burst, Storm 10
Cat803080	2.173	1.269	0.955	15	21	2	1% AEP, 20 min burst, Storm 10
Cat806745	3.745	2.151	1.619	22	28	2	1% AEP, 25 min burst, Storm 3
Dev-Cat 2	0.492	0.264	0.279	7	9	2	1% AEP, 15 min burst, Storm 10

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
Pipe1	1.938	2.19	337.852	337.635	1% AEP, 30 min burst, Storm 10
Pipe3	3.009	2.46	335.67	334.419	1% AEP, 30 min burst, Storm 7
Pipe2	0.994	2.28	333.329	332.66	1% AEP, 20 min burst, Storm 10
Ex-Culvert	15.129	3.49	330.25	329.702	1% AEP, 25 min burst, Storm 3
Outlet	11.203	6.23	331.528	331.154	1% AEP, 25 min burst, Storm 3

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
O2	0.573	0.573						1% AEP, 20 min burst, Storm 6
Spillway	0.002	-0.002						1% AEP, 5 min burst, Storm 1
Top	9.552	9.552						1% AEP, 25 min burst, Storm 3
O	1.29	1.29						1% AEP, 20 min burst, Storm 6
OF10	2.159	2.583	3.116	0.464	0.91	4.71	1.95	1% AEP, 30 min burst, Storm 7
OF1	0.243	1.131	3.252	0.35	0.48	3.8	1.44	1% AEP, 30 min burst, Storm 7
OF2	0.095	0.095	1.129	0.049	0.03	4	0.62	1% AEP, 45 min burst, Storm 1
OF3	2.067	2.067	1.677	0.342	0.53	4	1.72	1% AEP, 45 min burst, Storm 1
OF11	0	0	2.218	0	0	0	0	
OF12	3.006	3.008	2.854	0.542	0.99	5.34	1.95	1% AEP, 30 min burst, Storm 7
OF14	0	0	1.719	0	0	0	0	
OF15	0.986	0.981	3.159	0.377	0.44	4.02	1.4	1% AEP, 20 min burst, Storm 3
OF16	0.92	1.319	11.774	0.444	0.13	14.44	1.31	1% AEP, 15 min burst, Storm 3
OF13	2.998	3.064	11.974	0.458	0.28	14.58	1.57	1% AEP, 30 min burst, Storm 7
OF5	2.383	2.377	5.265	0.303	0.53	6.03	1.75	1% AEP, 30 min burst, Storm 7
OF4	1.589	2.401	5.132	0.288	0.54	5.88	1.88	1% AEP, 30 min burst, Storm 7
OF6	2.271	3.693	5.217	0.388	0.75	6.88	1.93	1% AEP, 25 min burst, Storm 3
OF7	7.184	7.502	7.428	0.475	1.04	9.38	2.2	1% AEP, 20 min burst, Storm 3
OF9	2.178	3.573	5.477	0.407	0.71	7.07	1.74	1% AEP, 20 min burst, Storm 3
OF8	3.717	3.992	5.559	0.435	0.77	7.35	1.77	1% AEP, 25 min burst, Storm 4
OF20	0.012	0.009	2.319	0.02	0.01	3.94	0.46	1% AEP, 30 min burst, Storm 7
EX-CH	15.128	15.129	12.041	0.602	1.18	16.02	2.12	1% AEP, 25 min burst, Storm 3
OF17	11.211	11.266	2.291	1.455	2.87	4	4.85	1% AEP, 25 min burst, Storm 3

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
Basin	332.45	1722.5	11.415	0	11.415

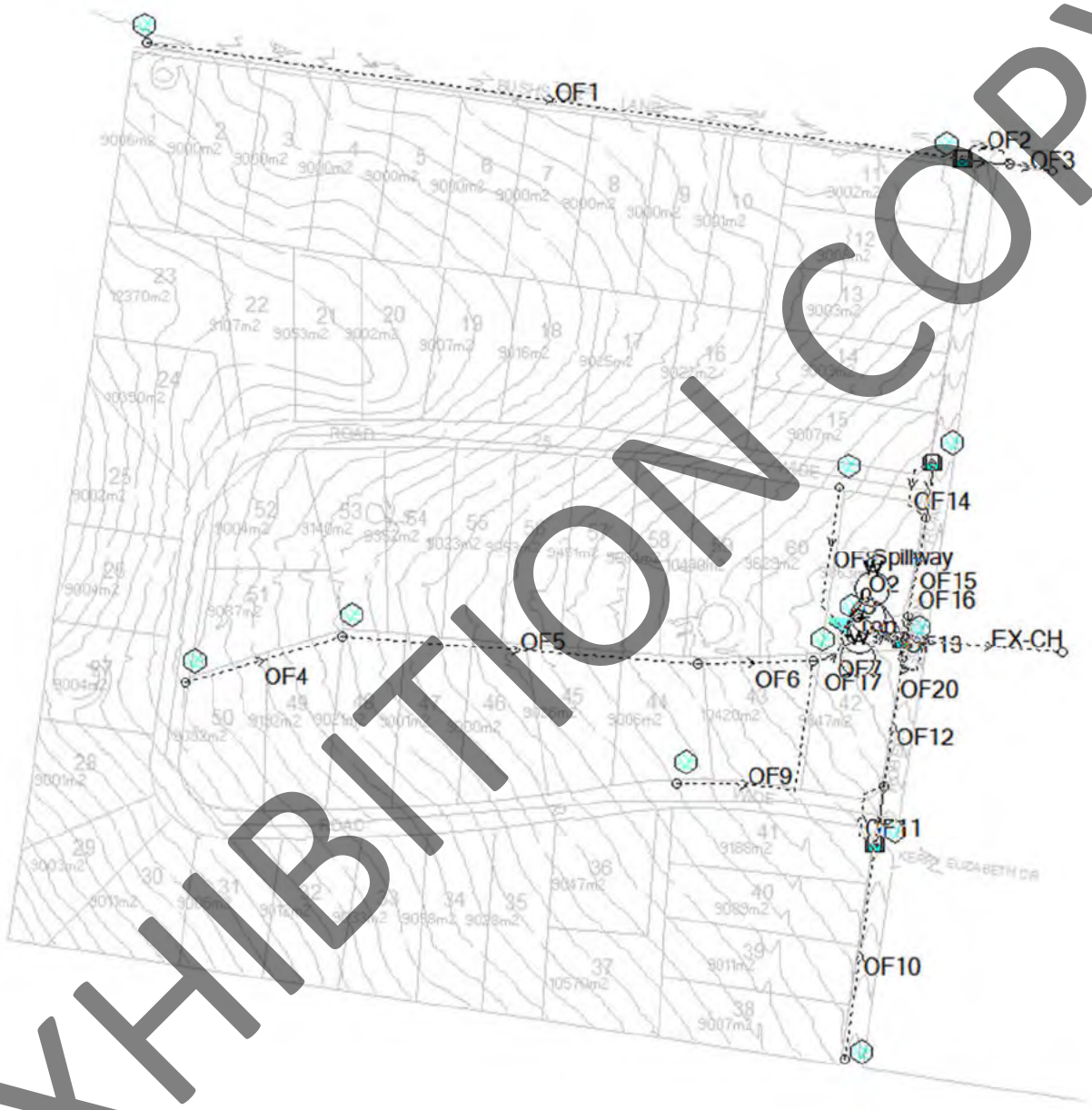
Run Log for DRAINS v2025.01.9147.24925 - HDW60 - 210 Bushs Lane - Basin Size r4.1

The maximum flow in these overflow routes is unsafe: OF7, OF3, OF17, EX-CH

EXHIBITION COPY

APPENDIX B – DRAINS LAYOUT

EXHIBITION COPY



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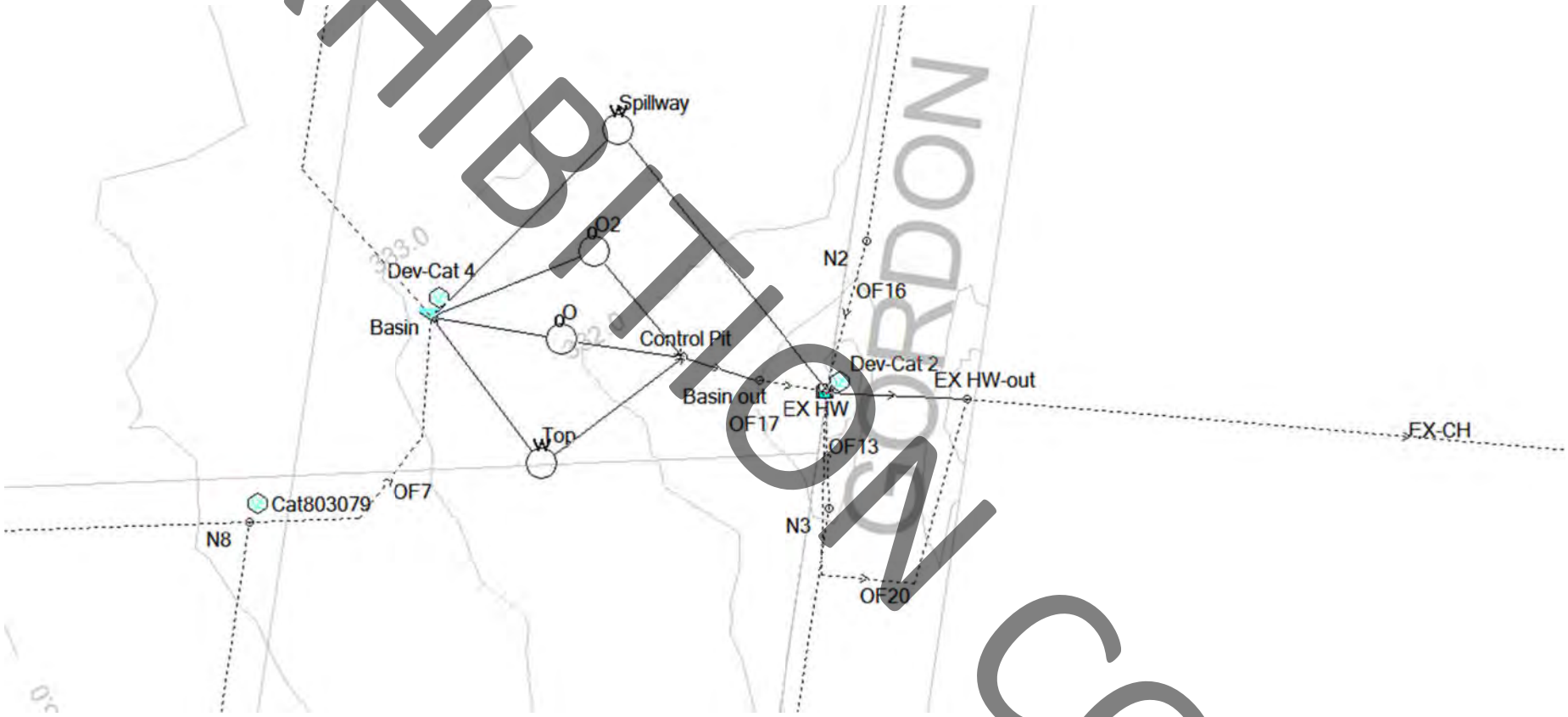
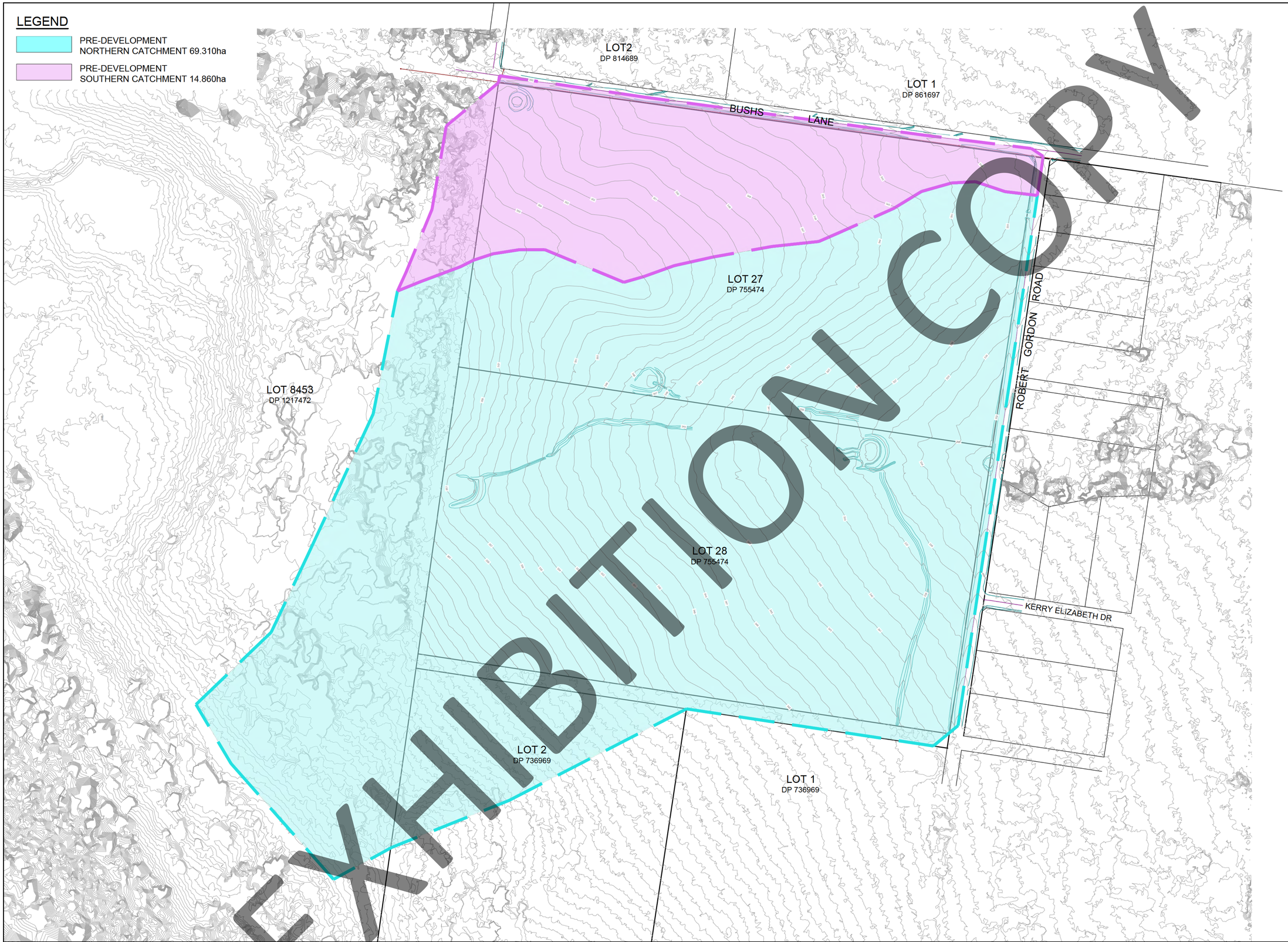


EXHIBITION COPY

JSE DESIGN

EXHIBITION COPY

APPENDIX C – PRE-DEVELOPMENT CATCHMENT PLAN



EXHIBITION COPY

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
PRE-DEVELOPED CATCHMENT PLAN

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: 1:2500 (A1) Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No
JSE-2560

Drawing No
DA-3

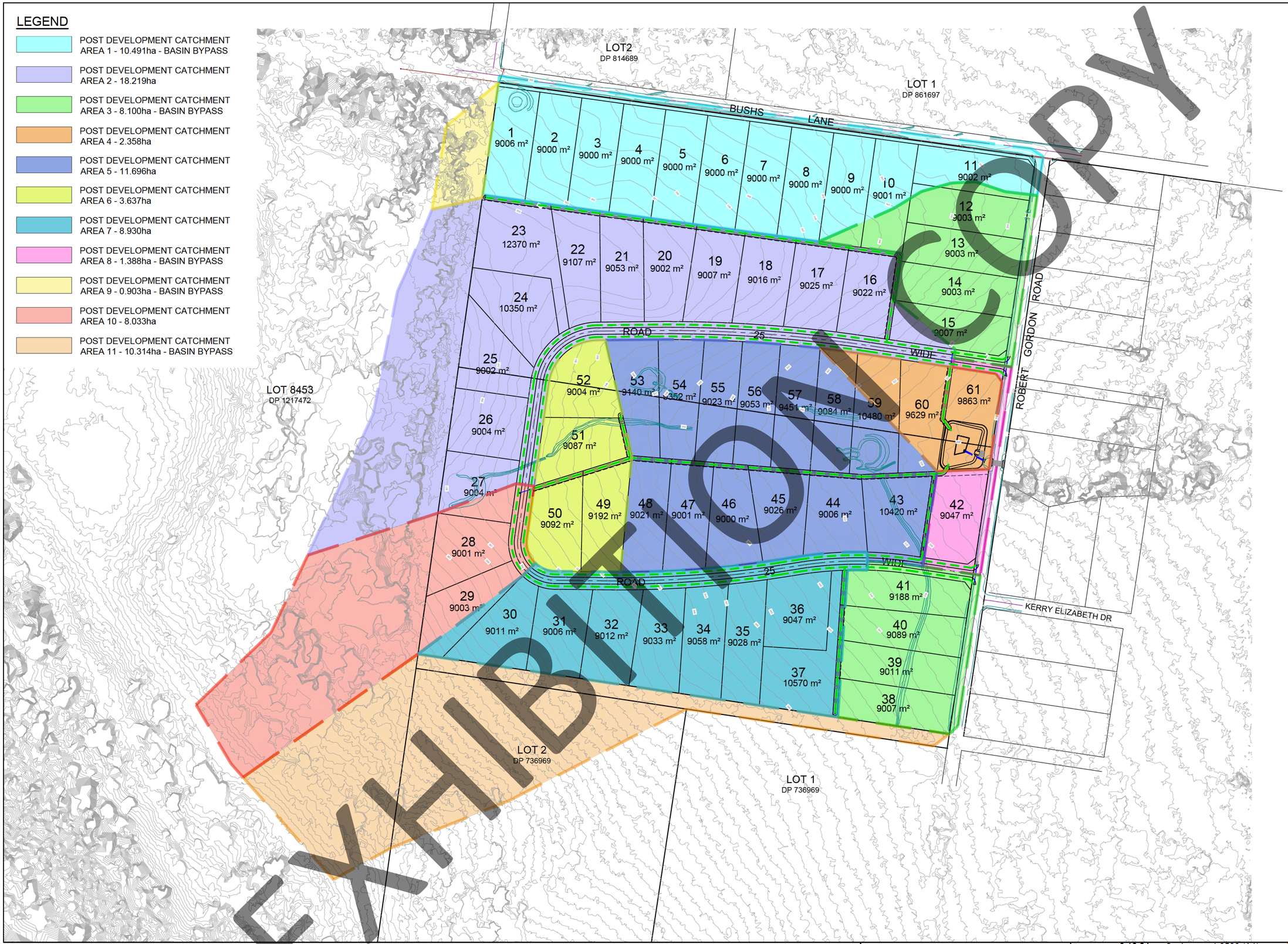
Revision
2

APPENDIX D – SUB-CATCHMENT PLAN

EXHIBITION COPY

LEGEND

- POST DEVELOPMENT CATCHMENT AREA 1 - 10.491ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 2 - 18.219ha
- POST DEVELOPMENT CATCHMENT AREA 3 - 8.100ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 4 - 2.358ha
- POST DEVELOPMENT CATCHMENT AREA 5 - 11.696ha
- POST DEVELOPMENT CATCHMENT AREA 6 - 3.637ha
- POST DEVELOPMENT CATCHMENT AREA 7 - 8.930ha
- POST DEVELOPMENT CATCHMENT AREA 8 - 1.388ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 9 - 0.903ha - BASIN BYPASS
- POST DEVELOPMENT CATCHMENT AREA 10 - 8.033ha
- POST DEVELOPMENT CATCHMENT AREA 11 - 10.314ha - BASIN BYPASS



COPY
EXHIBITION

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
POST-DEVELOPMENT CATCHMENT PLAN

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: 1:2500 (A1) Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No: JSE-2560
Drawing No: DA-4
Revision: 2

JSE DESIGN

APPENDIX E – STORMWATER SERVICING PLAN

EXHIBITION COPY

LEGEND

- EXISTING STORMWATER PIPE
- PROPOSED STORMWATER CULVERT
- PROPOSED OPEN CHANNEL
- PROPOSED RIP RAP
- PROPOSED IAD PIT
- PROPOSED CULVERT HEADWALL

N

LOT2
DP 814689

LOT 1
DP 861697

LOT 8453
DP 1217472

LOT 2
DP 736969

LOT 1
DP 736969

BUSHS LANE

ROBERT GORDON ROAD

ROAD 25 WIDE

EXISTING BUSHS LANE ROAD RESERVE SWALE TO BE CLEANED, SILT REMOVED AND REINSTATE PROPER SHAPE AND GRADE.

EXISTING CULVERT UNDER ROBERT GORDON DRIVE TO BE MAINTAINED.

EXISTING DAM TO BE RETAINED.

ADDITIONAL SWALE ON EASTERN SIDE OF DIRT ACCESS TRACL (WITHIN NEIGHBOURING SITE).

EXISTING ROBERT GORDON DRIVE ROAD RESERVE SWALE TO BE CLEANED, SILT REMOVED AND REINSTATE PROPER SHAPE AND GRADE. WORKS TO AVOID REMOVAL OF EXISTING TREES.

EXISTING DAM TO BE FILLED IN.

PROPOSED ROAD 1 (1.2 x0.9m) CULVERT AND HEADWALL.

INTERNAL SWALE TO BE A MAXIMUM OF 500mm DEEP WITH A 1.0m BASE WIDTH AND 1:5 BATTERS

PROPOSED DETENTION BASIN. 2500m3 (APPROX. 3755m2) WITH DUAL 1050Ø OUTLET PIPES WITH 2 x 750mm ORIFICE CONTROL PIT OUTLETS, 5m WIDE SPILLWAY AT RL332.700.

REFER TO CIVIL DA PLANS FOR TYPICAL ROAD CROSS CROSSINGS.

EXISTING DAM TO BE RETAINED.

EXISTING 3 x 2.4 x 0.75m BOX CULVERTS UNDER ROBERT GORDON ROAD TO BE RETAINED FOR THE DEVELOPMENT. OUTLET HEADWALL AND DOWNSTREAM SWALE TO BE ROCK LINED TO PROTECT FROM FURTHERING OF EXISTING UNMAINTAINED SCOURING. DETAILS TO BE PROVIDED IN SWC.

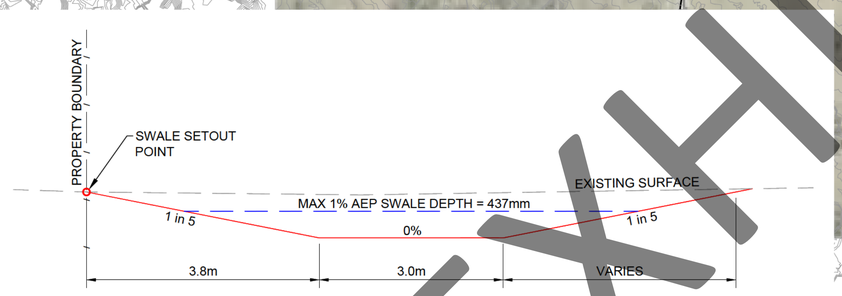
EXISTING DAM TO BE FILLED IN.

AREA BETWEEN DETENTION BASIN DISCHARGE HEADWALL AND EXISTING CULVERT UNDER ROBERT GORDON ROAD TO BE FULLY LINED WITH ROCK RIP RAP MIN d_{50} OF 400mm. ROCK CHANNEL TO EXTEND A MINIMUM OF 1.25m FROM BASE OF CHANNEL. CHANNEL TO BE SHAPED TO ACCEPT EXISTING ROBERT GORDON ROAD SWALE DISCHARGE.

DETENTION BASIN INLET SWALE TO BE FULLY ROCK LINED FROM INTERSECTION OF SWALES WITHIN LOT 43 TO INVERT OF DETENTION BASIN. ROCK RIP RAP MIN d_{50} OF 200mm. ROCK CHANNEL TO EXTEND A MINIMUM OF 1.25m FROM BASE OF CHANNEL. CHANNEL TO BE SHAPED TO ACCEPT EXISTING ROBERT GORDON ROAD SWALE DISCHARGE.

PROPOSED ROAD 1 (2 OF 1.2 x0.9m) CULVERTS AND HEADWALL.

SWALES TRAVERSING LOT TO BE FILLED IN AFTER ROAD SWALES AND DIVERSION SWALES/CHANNELS HAVE BE CONSTRUCTED. TYPICAL ACROSS THE SITE.



TYPICAL INTERALLOTMENT SWALE SECTION
1:20

EXHIBITION COPY

TITLE: PROPOSED DEVELOPMENT APPLICATION - SUBDIVISION
210 BUSHS LANE, GUNNEDAH
PROPOSED STORMWATER LAYOUT

CLIENT: KERRY ELIZABETH PTY LTD

JSE DESIGN

NOTE:
ALL EXISTING UNDERGROUND SERVICES MUST BE LOCATED AND EXPOSED PRIOR TO EARTHWORKS COMMENCING AND IT IS RESPONSIBILITY OF THOSE PERSONS USING THIS PLAN TO CONFIRM BOTH POSITION AND LEVEL OF THESE UTILITIES IN CONJUNCTION WITH THE APPROPRIATE AUTHORITY.

0 50 100 150 200 250m
1:2500

Date: 8.10.24 Scale: AS SHOWN Designed: SB
Cad Ref: JSE2560 - 210 Bushes Lane DA SW Service r2

No	Amendment	Drawn	Date
2	DEVELOPMENT APPLICATION	SB	28.07.25
1	DEVELOPMENT APPLICATION - DRAINAGE SERVICING	SB	12.12.24

Project No: JSE-2560
Drawing No: DA-2
Revision: 2

APPENDIX C

DIAL BEFORE YOU DIG SEARCH

- ESSENTIAL ENERGY
- GUNNEDAH SHIRE COUNCIL – SEWER AND WATER CONNECTION SERVICES
- TELECOMMUNICATIONS

EXHIBITION COPY

Job No 37775443

byda.com.au

Contact Details

Contact	Contact number	Company	Enquirer ID
Felicity Stevens	(02) 6742 2966	Stewart Surveys	3161185

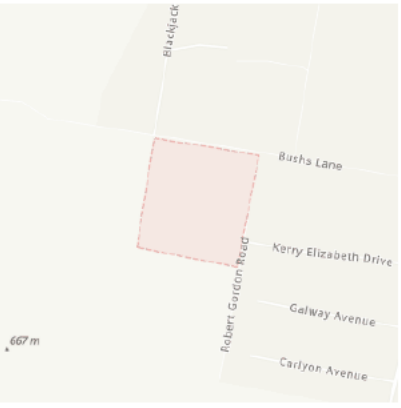
Email
[redacted]

Address
107-109 Conadilly Street
Gunnedah NSW 2380

Job Site and Enquiry Details

WARNING: The map below only displays the location of the proposed job site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.

Enquiry date	Start date	End date	On behalf of	Job purpose	Locations	Onsite activities
09/10/2024	16/10/2024	23/10/2024	Private	Excavation	Private	Manual Excavation



Check that the location of the job site is correct. If not, you must submit a new enquiry.

If the scope of works change or plan validity dates expire, you must submit a new enquiry.

Do NOT dig without plans. Safe excavation is your responsibility. If you don't understand the plans or how to proceed safely, please contact the relevant asset owners.

User Reference	Address	Notes/description
210 Bushs Lane	210 Bushs Lane Gunnedah NSW 2380	-

Your Responsibility and Duty of Care

- **Lodging an enquiry does not authorise project commencement.** Before starting work, you must obtain all necessary information from all affected asset owners.
- If you don't receive plans within 2 business days, contact the asset owner & quote their sequence number.
- Always follow the 5Ps of Safe Excavation (page 2), and locate assets before commencing work.
- Ensure you comply with State legislative requirements for Duty of Care and safe digging.
- If you damage an underground asset, you MUST advise the asset owner immediately.
- By using the BYDA service, you agree to the Privacy Policy and Term of Use.
- For more information on safe digging practices, visit www.byda.com.au

Asset Owner Details

Below is a list of asset owners with underground infrastructure in and around your job site. It is your responsibility to identify the presence of these assets. Plans issued by Members are indicative only unless specified otherwise. Note: not all asset owners are registered with BYDA. You must contact asset owners not listed here directly.

Referral ID (Seq. no)	Authority Name	Phone	Status
245767401	Essential Energy	13 23 91	NOTIFIED
245767400	Gunnedah Shire Council	(02) 6740 2130	NOTIFIED
245767402	Telstra NSW North	1800 653 935	NOTIFIED

END OF UTILITIES LIST

EXHIBITION COPY

The 5Ps of Safe Excavation

Plan
Plan your job. Use the BYDA service at least one day before your job is due to begin, and ensure you have the correct plans and information required to carry out a safe project.

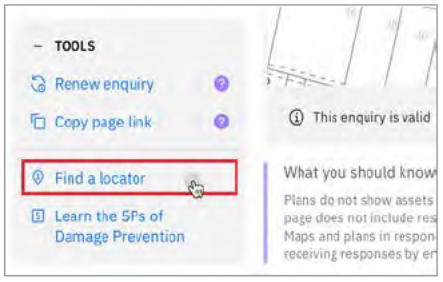
Prepare
Prepare by communicating with asset owners if you need assistance. Look for clues onsite. Engage a skilled Locator.

Pothole
Potholing is physically sighting the asset by hand digging or hydro vacuum extraction.

Protect
Protecting and supporting the exposed infrastructure is the responsibility of the excavator. Always erect safety barriers in areas of risk and enforce exclusion zones.

Proceed
Only proceed with your excavation work after planning, preparing, potholing (unless prohibited), and having protective measures in place.

Engage a skilled Locator



When you lodge an enquiry you will see skilled Locators to contact

Visit the Certified Locator website directly and search for a locator near you

dbydlocator.com/certified-locating-organisation

Book a FREE BYDA Session

BYDA offers two different sessions to suit you and your organisation's needs. The free sessions are offered in two different formats - online and face-to-face:

1. **Awareness Session:** Understand the role of BYDA, safe excavation practices, complying with asset-owner instructions, and the consequences of damages. Learn how to mitigate and avoid potential damage and harm and ensure a safe work environment.
2. **Plan Reading Session:** Develop the skills to interpret asset owners' plans, legends, and symbols effectively. Understand the complexities of plan interpretation to ensure smooth project execution.

To book a session, visit:
byda.com.au/contact/education-awareness-enquiry-form/

BOOK NOW

EXHIBITION COPY

EXHIBITION COPY

Overhead wires not shown
LOOK UP & LIVE!

LEGEND

- LV Underground Cable
- HV Underground Cable
- Underground Pipe
- Underground Earth or Wires
- Ground Substation
- Pole
- Cubicle
- Pit
- Area of Interest

Critical Assets

Contact Essential Energy on 13 23 91

- Zone Substation
- Underground Cable
- Underground Fibre

Proposed Works

- Area of proposed works

Proposed assets are shown as orange symbols

THE INFORMATION ON THIS MAP MAY NOT BE ACCURATE. If details are incorrect, please notify Essential Energy on 13 23 91 (or fax 1800 354 636)

ISSUE DATE: 09/10/2024

You must resubmit your request if you have not started work within 4 weeks of the 'Issue Date' above

A4 | SCALE: 1:6024

essential energy

Job Number: 37775443 Sequence number: 245767401 Job location: 210 Bushs Lane, Gunnedah Map Centre: 150° 12' 22.4", -31° 0' 51.2"

Gunnedah Shire Council

PO Box 63, Gunnedah
NSW 2380

www.gunnedah.nsw.gov.au

Date: 09 Oct 2024

To: Felicity Stevens

Please DO NOT SEND A REPLY to this email as it has been automatically generated and replies are not monitored.

Thank you for your BYDA enquiry (referenced below) - according to our records your enquiry impacts our infrastructure. Please ensure that you read the attached documentation, as it contains important information including essential steps that must be undertaken prior to commencing your intended activities.

SEQUENCE NO.:	245767400
JOB NO.:	37775443
LOCATION:	210 Bushs Lane Gunnedah NSW 2380

WARNING: When working in the vicinity of Gunnedah Shire Council's assets you have a legal *Duty of Care* that must be observed.

If you require further information, please contact Gunnedah Shire Council by emailing council@infogunnedah.com.au or by calling 02 6740 2100

To best manage the risk of damage and liabilitiy, we recommend that you engage the services of a BYDA Certified Locator

Important Notice

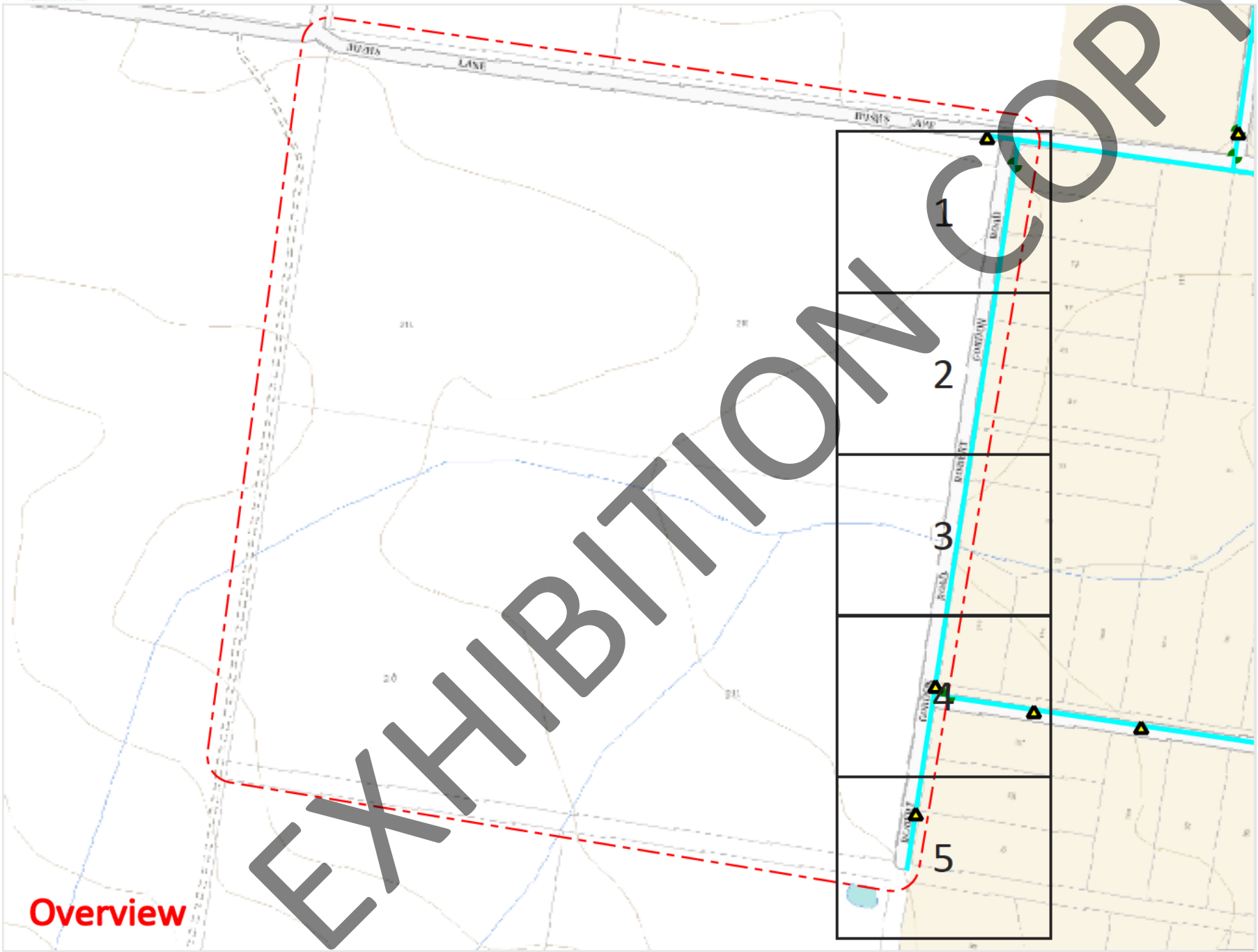
This enquiry response, including any associated documentation, has been assessed and compiled from the information detailed within the BYDA enquiry outlined above. **Please ensure that the BYDA enquiry details and this response accurately reflect your proposed works.**

This response is intended for use only by the addressee. If you have received the enquiry response in error, please let us know by telephone and delete all copies; you are advised that copying, distributing, disclosing or otherwise acting in reliance on the response is expressly prohibited.

Disclaimer: While reasonable measures have been taken to ensure the accuracy of the information contained in this plan response, neither Gunnedah Shire Council nor PelicanCorp shall have any liability whatsoever in relation to any loss, damage, cost or expense arising from the use of this plan response or the information contained in it or the completeness or accuracy of such information. Use of such information is subject to and constitutes acceptance of these terms.

EXHIBITION COPY

Sequence No: 245767400
Job No: 37775443
Location: 210 Bushs Lane, Gunnedah, NSW 2380



EXHIBITION COPY

Legend

- Electricity
  - Electricity Parks Points
  - Electricity Parks Lines
- Sewer Points
  - Manhole
- Stormwater Points
  - Pit
- Water Supply Points
  - Hydrant
  - Stop Valve
  - Bore
  - Reservoir
- Sewer Lines
  - Retic
  - Rising Main
- Stormwater Lines
  - Culvert
  - Main
  - Inter-Allotment
- Water Supply Lines
  - Irrigation
  - Main
  - Retic Main
  - Rising Main
  - Unknown

N

Scale: 1:5850
Expires: 06 Nov 2024

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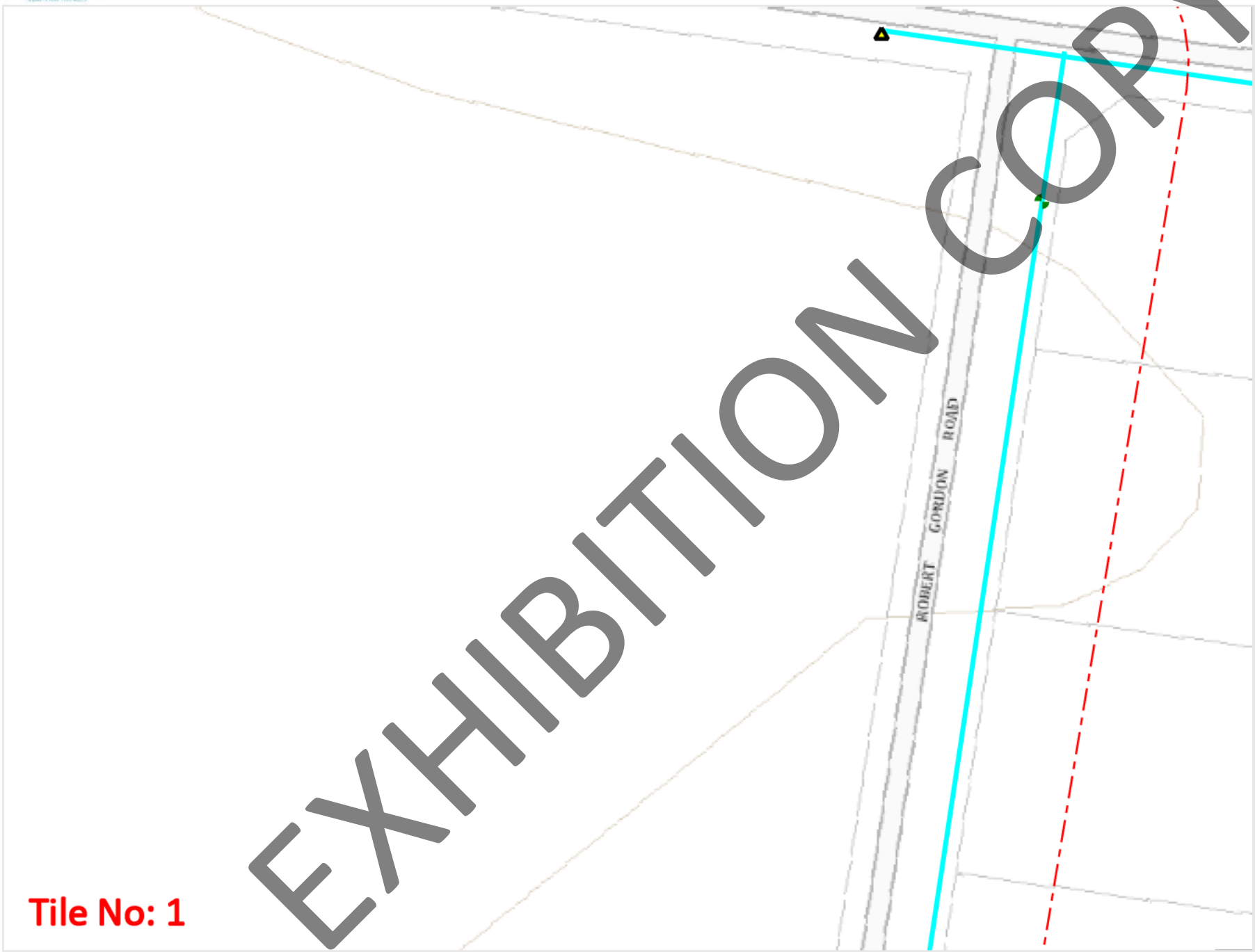
Overview

Sequence No: 245767400
Job No: 37775443
Location: 210 Bushs Lane, Gunnedah, NSW 2380



EXHIBITION COPY

Legend

- Electricity
  - Electricity Parks Points
  - Electricity Parks Lines
- Sewer Points
  - Manhole
- Stormwater Points
  - Pit
- Water Supply Points
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  - Reservoir
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- Stormwater Lines
  - Culvert
  - Main
  - Inter-Allotment
- Water Supply Lines
  - Irrigation
  - Main
  - Retic Main
  - Rising Main
  - Unknown

N

Scale: 1:1000
Expires: 06 Nov 2024

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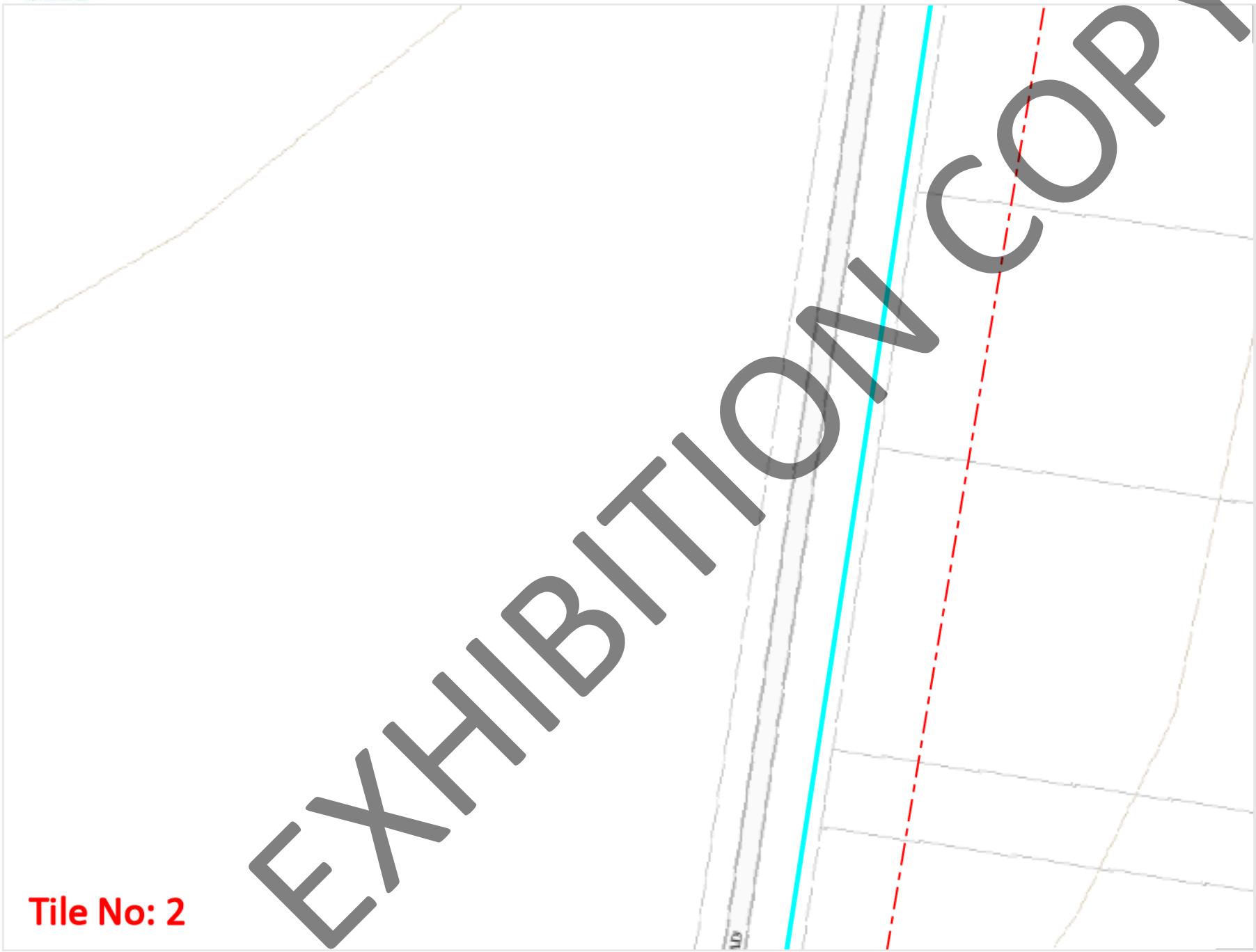
Tile No: 1

Sequence No: 245767400
Job No: 37775443
Location: 210 Bushs Lane, Gunnedah, NSW 2380



Legend

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N

Scale: 1:1000
Expires: 06 Nov 2024

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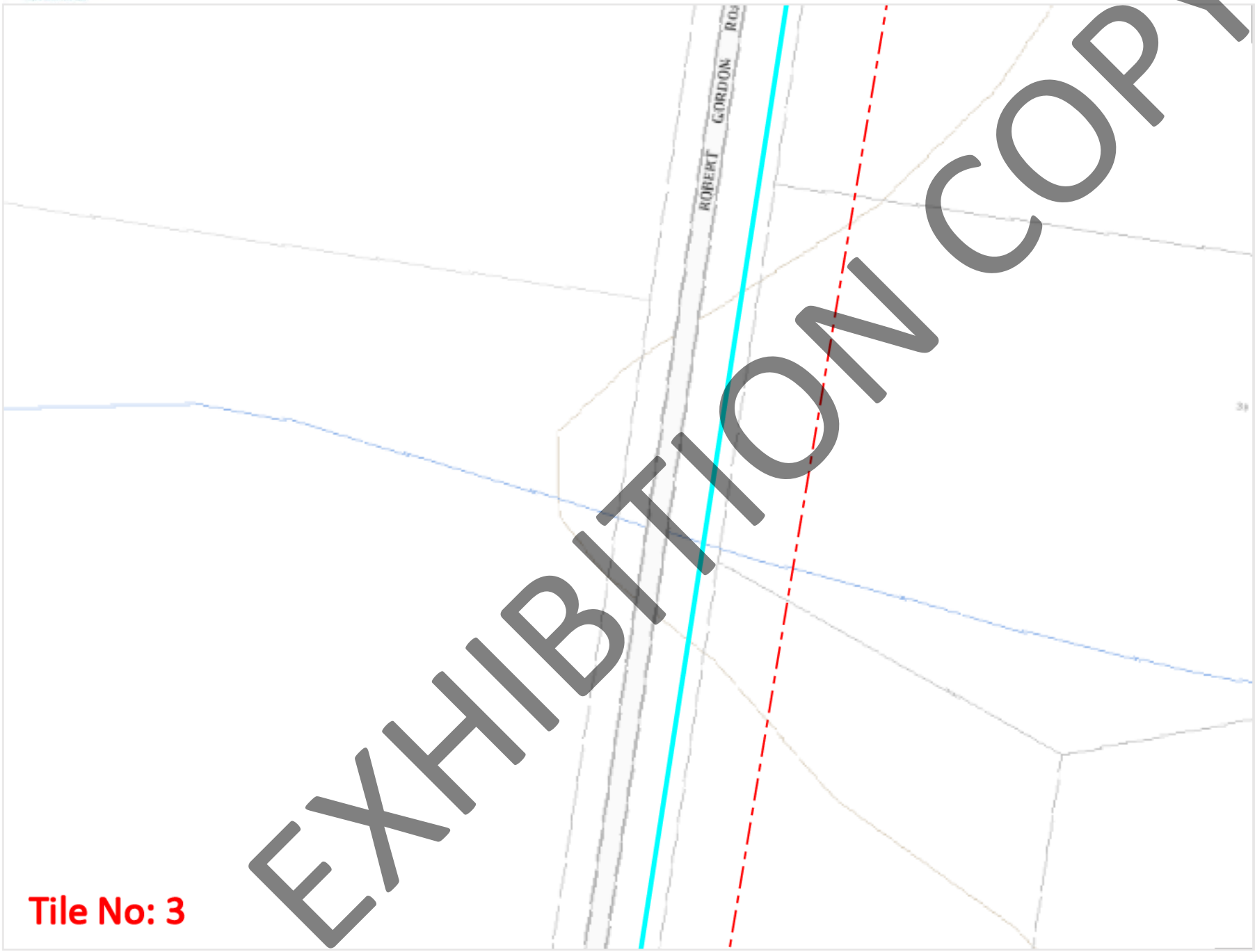
Tile No: 2

EXHIBITION COPY

Sequence No: 245767400
Job No: 37775443
Location: 210 Bushs Lane, Gunnedah, NSW 2380



EXHIBITION COPY

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N

Scale: 1:1000
Expires: 06 Nov 2024

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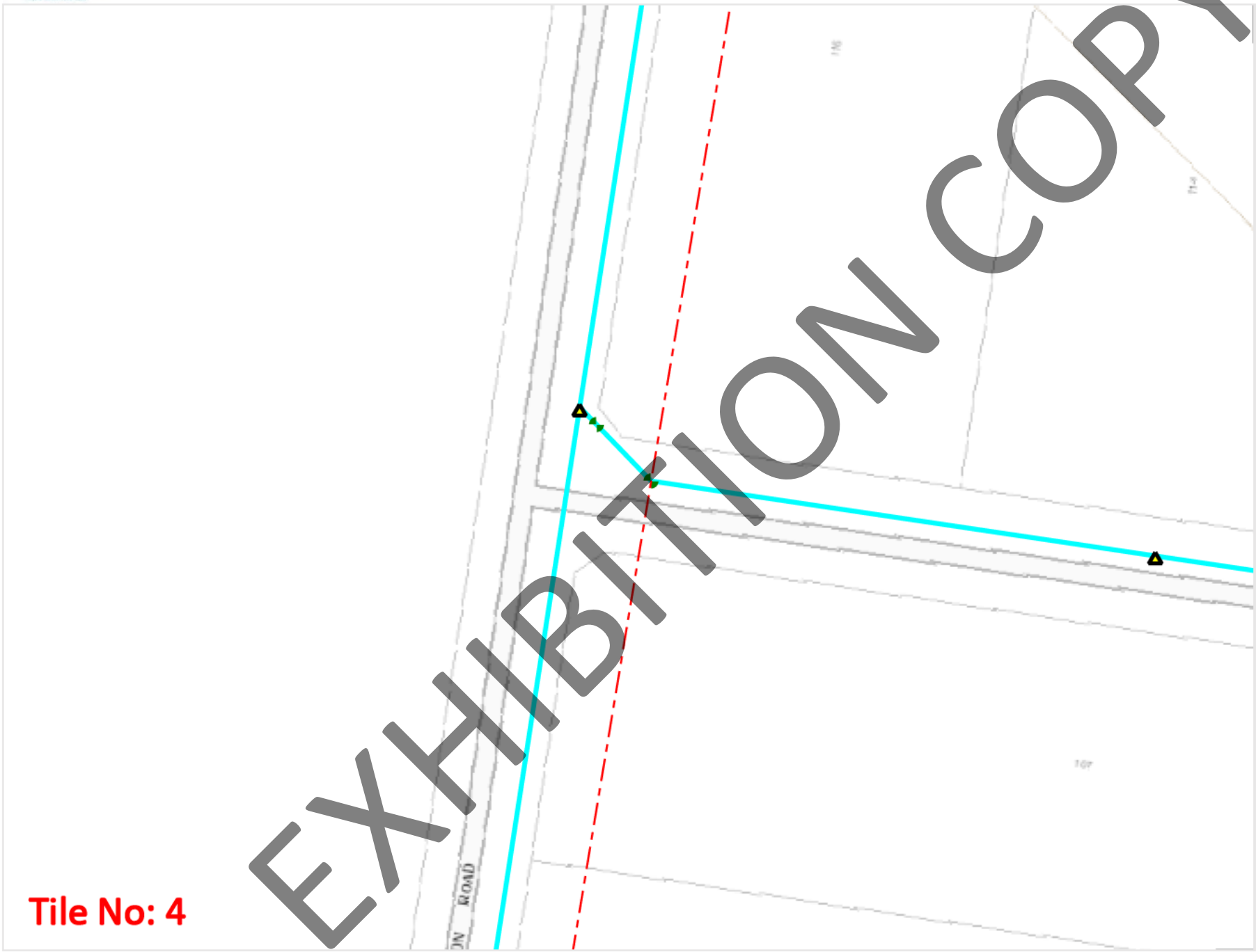
Tile No: 3

Sequence No: 245767400
Job No: 37775443
Location: 210 Bushs Lane, Gunnedah, NSW 2380



EXHIBITION COPY

Legend

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Scale: 1:1000
Expires: 06 Nov 2024

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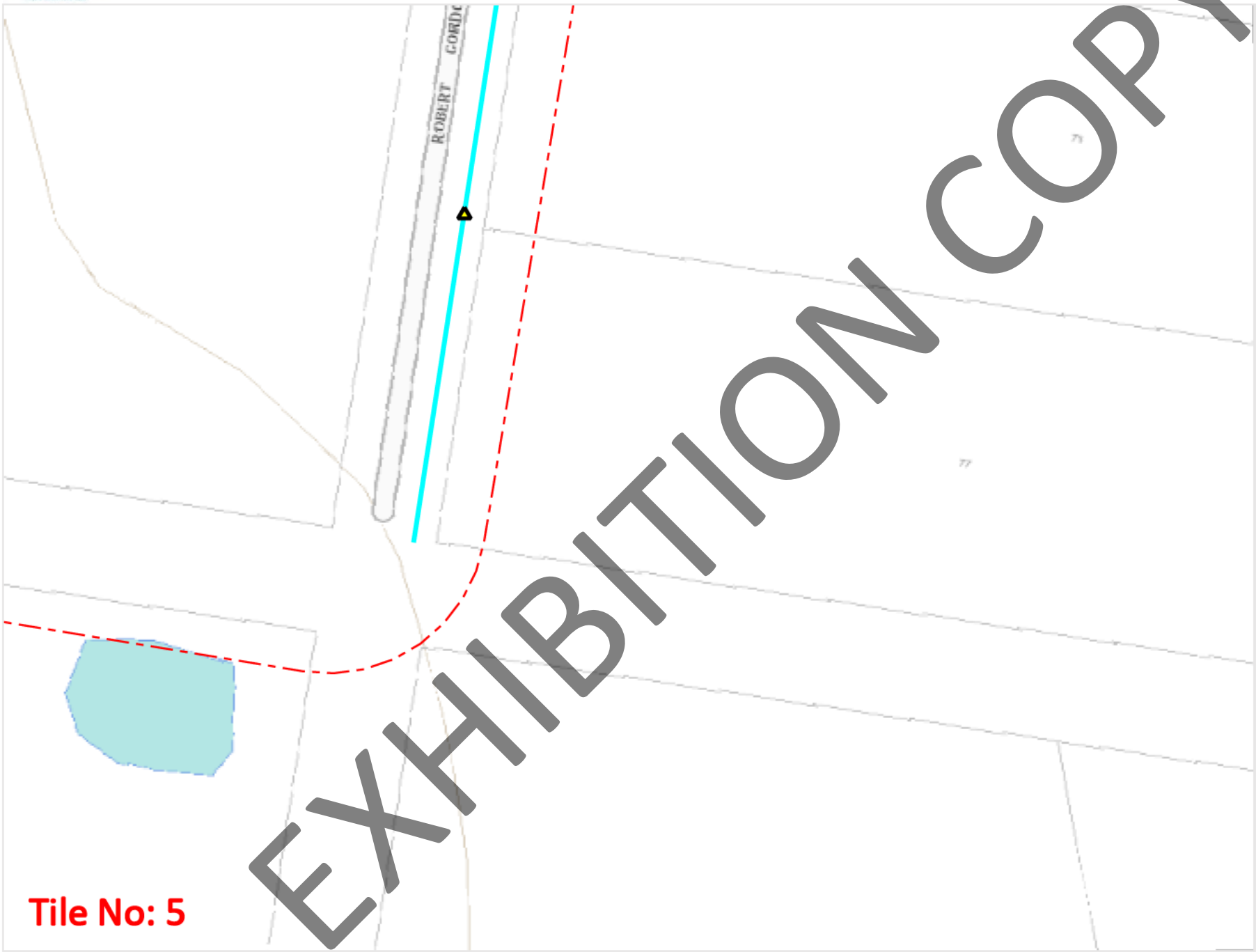
Tile No: 4

Sequence No: 245767400
Job No: 37775443
Location: 210 Bushs Lane, Gunnedah, NSW 2380



EXHIBITION COPY

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  - Unknown

N

Scale: 1:1000
Expires: 06 Nov 2024

Tile No: 5

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ADVICE ABOUT PLANS AND ASSET PROTECTION

1. The attached plans are illustrative only and must be verified before carrying out any work. Whilst due care has been taken in their preparation, Gunnedah Shire Council (GSC) does not accept any liability whatsoever for their accuracy or completeness.

2. Physical checks including potholing should be undertaken to verify the exact location, depth and other asset details.

3. The attached plans are valid for two months from the date of issue; assets are replaced and renewed so the location of the asset may have changed. It is essential that any plan used is current at the time of excavation. Where plans are more than two months old they should not be used; a new plan must be requested.

4. If the scope of work changes another enquiry should be made to ensure you have up to date plans

5. If works are proposed in close proximity to GSC critical assets Councils Infrastructure Services **MUST** be contacted prior to commencement of works.

6. The person undertaking the work is responsible for ensuring the GSC assets are protected from damage.

7. If any GSC assets are damaged please immediately call GSC on **02 6740 2100**. Note that GSC will recover the cost to repair any damage together with administrative and supervision charges.

8. No one may work on or interfere with GSC assets unless they are an approved by GSC or GSC authorised contractor.

9. GSC reminds you of regulations and guidelines that specify safe working practices and the penalties for carrying out unauthorised work. These include:
   - Health and Safety at Work Act 2015
   - Local Government Act 2002 and 2009
   - The Utilities Access Act 2010 and its related Code of Practice
   - Department of Labour "*Guide for Safety with Underground Services*"

If you require assistance or have any further queries, please contact GSC on **02 6740 2100**.

63 Elgin Street, PO Box 63, Gunnedah NSW 2380, Australia
Phone: 02-6740 2100, Fax: 02 6740 2119, Email: council@infogunnedah.com.au

EXHIBITION COPY

APPENDIX D

PLANNING AGREEMENT

170 & 210 BUSH'S LANE PLANNING AGREEMENT, DEED, GUNNEDAH SHIRE COUNCIL 2728 PTY LTD

EXHIBITION COPY

lindsaytaylorlawyers
planning • environment • local government

Deed

170 and 210 Bush's Lane Planning Agreement

Planning Agreement

Under s7.4 of the *Environmental Planning and Assessment Act 1979*

Gunnedah Shire Council

2728 Pty Ltd

Ryan Peter Pryde and Nancy Fay Margaret Williams

Date:

© Lindsay Taylor Lawyers

EXHIBITION COPY

lindsaytaylorlawyers
Level 9, Suite 3, 420 George Street, Sydney NSW 2000, Australia
T 02 8235 9700 • **W** www.lindsaytaylorlawyers.com.au • **E** mail@lindsaytaylorlawyers.com.au
LTL Pty Ltd trading as **Lindsay Taylor Lawyers** • **ABN** 78 607 889 887
Liability limited by a scheme approved under Professional Standards Legislation

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Regulatory Compliance Tables

Table 1 – Provisions of Act

Act Provision	Requirement	Compliance
S.7.4(1)	**'Planning Authority'**	Council
	'Developer'	Developer
	Person associated with Developer	N/A
	Development Application / Modification Application	See definitions of '*Development Application*' and '*Modification Application*' in clause 1.1 and Item 4.a and 4.b of the VPA Particulars
	Development Contributions	See Part 2 and Development Contributions Table
S.7.4(1), (2)	**Public Purpose**	See Column 2 of the Development Contributions Table
S.7.4(3)(a)	**Land**	See Definition of '*Land*' in clause 1.1 and Item 1 of the VPA Particulars
S.7.4(3)(b)(i)	**Instrument Change**	See definition of '*Instrument Change*' in clause 1.1 and Item 3 of the VPA Particulars
S.7.4(3)(b)(ii)	**Development**	See definition of '*Development*' in clause 1.1 and Item 2 of the VPA Particulars
S.7.4(3)(c)	**Details of Developer's Provision**	See Development Contributions Table
S.7.4(3)(d)	**Whether s7.11, s7.12 and s7.24 of the Act Apply to the Development**	See clauses 8.1, 8.3 and 8.3 and Item 7.a, 7.c and 7.d of the VPA Particulars
S.7.4(3)(e)	**Whether benefits under Deed are or are not to be taken into consideration in determining a Development Contribution under s7.11**	See clause 8.2 and Item 7.b of the VPA Particulars

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S.7.4(3)(f)	**Mechanism for the Resolution of Disputes**	See Part 3
S.7.4(3)(g)	**Enforcement of the Agreement by a Suitable Means in the Event of Breach by the Developer**	See Part 4 and Items 15–19 of the VPA Particulars
S.7.4 (10)	**Conformity of Agreement with Act, Environmental Planning Instruments, & Development Consents Applying to the Land**	Yes
S.7.5	**Public Notice & Public Inspection of Draft Agreement**	Yes
S.7.6	**Registration**	See Part 5
S.6.15(1)(d)	**If the Development involves the subdivision of land, does this Agreement impose requirements that are required to be complied with before a subdivision certificate is issued?**	No

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Table 2 – Provisions of Regulation

Regulation Provision	Requirement	Compliance
S.203(1)	**Form & Subject-Matter**	Yes
S.203(7)	**Secretary's Practice Note**	Yes
S.204	**Public Notice & Public Inspection of Draft Agreement**	Yes
S.205	**Explanatory Note**	See Appendix
Ss.21, 34 **Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021**	**If the Development involves building work or subdivision work, does the Agreement specify requirements that are required to be complied with before a construction certificate or subdivision works certificate for the work is issued?**	Yes, see: • See Schedule 2, Item A1

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Parties

Council **Gunnedah Shire Council** ABN 80 183 655 793of 63 Elgin Street, Gunnedah NSW 2380

Developer

2728 Pty Ltd of [redacted]

Ryan Peter Pryde and Nancy Fay Margaret Williams [redacted]

(together the Developer)

Background

[redacted]

C The Developer seeks the Instrument Change to facilitate the Development.

D The Developer has agreed to make Development Contributions towards the early augmentation by the Council of the Gallen Reservoir water supply pumping infrastructure so as to facilitate satisfaction of clause 6.5 of the *Gunnedah Local Environmental Plan, 2012* with respect to the Development.

Operative provisions

Part 1 - Preliminary

1 Definitions & Interpretation

Definitions

1.1 In this Deed, the words and phrases appearing in Column 1 of the following table have the meaning set out in Column 2 of that table corresponding to those words or phrases except in so far as the context or subject-matter otherwise indicates or requires:

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Table

Column 1 Word or phrase	Column 2 Meaning
Act	means the *Environmental Planning and Assessment Act 1979* (NSW).
Applicable Contributions Plan	means the contributions plan (within the meaning of the Act) specified in Item 6.a) of the VPA Particulars as amended or substituted from time to time.
Applicable DSP	means the DSP specified in Item 6.b of the VPA Particulars as amended or substituted from time to time.
Approval	includes approval, consent, licence, permission or the like.
Approved Person	means a person reasonably approved by the Council to undertake design, construction, supervision, inspection, testing or certification of the Developer Works because of the suitability of their qualifications, skills and experience in the Council's reasonable opinion.
Authority	means the Commonwealth or New South Wales government, a Minister of the Crown, a government department, a public authority established by or under any Act, a council or county council constituted under the *Local Government Act 1993* (NSW), or a person or body exercising functions under any Act including a commission, panel, court, tribunal and the like.
Background Intellectual Property	means Intellectual Property that: (a) relates to the Developer Works, (b) exists at the date of this Deed or is later created but not as a result of performing this Deed, (c) does not belong to a third party.
Bank Guarantee	means an irrevocable and unconditional undertaking without any expiry or end date in favour of the Council to pay an amount or amounts of money to the Council on demand issued by: (a) one of the following trading banks:

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(i) Australia and New Zealand Banking Group Limited,

(ii) Commonwealth Bank of Australia,

(iii) Macquarie Bank Limited,

(iv) National Australia Bank Limited,

(v) St George Bank Limited,

(vi) Westpac Banking Corporation, or

(b) any other financial institution approved by the Council in its absolute discretion.

Charge	means the charge referred to in clause 0.
Charge Land	means the land specified or described in Item 15 of the VPA Particulars.
Claim	includes a claim, demand, remedy, suit, injury, damage, loss, Cost, liability, action, proceeding or right of action.
Clearance Certificate	means a clearance certificate issued by the Commissioner for Taxation under paragraph 14-220 of Schedule 1 of the *Taxation Administration Act 1953* (Cth).
CLM Act	means the *Contaminated Land Management Act 1997* (NSW).
Construction Certificate	has the same meaning as in the Act.
Construction Contract	means a contract or arrangement entered into between the Developer as principal and another person under which the other person undertakes to provide Work required by this Deed, or to supply related goods and services, for the Developer.
Contamination	has the same meaning as in the CLM Act.
Contractor	means the contractor under the Construction Contract.
Contribution Value	in relation to an Item specified in the Development Contributions Table means the $ amount specified in Column 4 of that Table corresponding to the Item.
Cost	means a cost, charge, expense, outgoing, payment, fee and other expenditure of any nature.

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Council Developer Works Contribution Amount	means the $ amount or amounts specified in Item 9 of the VPA Particulars in relation to all or specified Developer Works.
Council Land Dedication Contribution Amount	means the $ amount specified in Item 8 of the VPA Particulars in relation to all or specified Dedication Land.
CPI	means the '*Consumer Price Index – Sydney All Groups*' published by the Australian Bureau of Statistics.
Dedication Land	means land that is required to be dedicated to the Council free of cost under this Deed irrespective of whether the dedication gives rise to or is otherwise is taken into consideration in determining the Development Contribution Surplus Credit.
Dedication Land Plan	means the plan contained in Schedule 3 showing the location of the Dedication Land.
Deed	means this Deed and includes any schedules, annexures and appendices to this Deed.
Defect	means anything that adversely affects, or is likely to adversely affect, the appearance, structural integrity, functionality or use or enjoyment of a Work or any part of a Work.
Defects Liability Period	means, in relation to the whole or any specified part of the Developer Works, the period specified in Item 13 of the VPA Particulars commencing on the day immediately after Practical Completion is issued by the Council.
Defects Liability Security	means the $ amount of Security specified in Item 17 of the VPA Particulars indexed in accordance with the Indexation Method.
Developer Works	means Works that the Developer is required to provide under this Deed.
Developer Works Location Plan	means the plan contained in Schedule 4 showing the location of the Developer Works.
Developer Works Plans & Drawings	means the detailed plans and drawings for the Developer Works approved by the Council referred to in Schedule 5.

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Developer Works Provisions	means the provisions contained in Schedule 6.
Development	means the development specified or described in Item 2 of the VPA Particulars.
Development Application	means the development application within the meaning of the Act specified or described in Item 4.a of the VPA Particulars.
Applicable Development Consent	means the development consent specified or described in Item 5 of the VPA Particulars or granted in respect of the Development.
Development Contribution	means the dedication of land free of cost, a monetary contribution, the provision of any other material public benefit including but not limited to the provision of Works, or any combination of them.
Development Contribution Credit	means the $ amount specified in Item 10 of the VPA Particulars
Development Contribution Surplus Credit	means the $ amount specified in Item 11 of the VPA Particulars.
Development Contributions Table	means the table contained in Schedule 2.
Development Servicing Plan (DSP)	means a 'DSP document' within the meaning of the '*2016 Developer Charges Guidelines for Water Supply, Sewerage and Stormwater*' issued by the Minister for Lands and Water pursuant to section 306(3)(c) of the *Water Management Act 2000* (NSW).
Development Servicing Contribution	means a requirement to pay a specified amount to the Council as required by way of precondition to the using of a certificate of compliance under s306 of the *Water Management Act 2000* or otherwise any fee for service in respect of development servicing works that may be imposed in respect of development.
Dispute	means a dispute or difference between the Parties under or in relation to this Deed.

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ELNO	has the meaning given to that term in the Participation Rules.
Equipment	means any equipment, apparatus, vehicle or other equipment or thing to be used by or on behalf of the Developer in connection with the performance of its obligations under this Deed.
Final Completion Certificate	means a certificate in writing issued by the Council to the Developer to effect that, in the reasonable opinion of the Council, the Developer Works to which the certificate relates have been completed by the Developer in accordance with this Deed.
Final Lot	means a lot created in the Development for separate residential occupation and disposition or a lot of a kind or created for a purpose that is otherwise agreed by the Parties, not being a lot created by a subdivision of the Land: (a) that is to be dedicated or otherwise transferred to the Council, or (b) on which is situated a dwelling-house that was in existence on the date of this Deed.
Force Majeure Event	means an earthquake, cyclone, fire, riot or serious civil commotion, sabotage, act of a public enemy, act of God (excluding storms), war, revolution, radioactive contamination or flood, the effects of which cannot be prevented by taking those steps a prudent and competent person would take.
Foreign Resident Capital Gains Withholding Amount	mean the amount a purchaser is required to pay to the Commissioner for Taxation under paragraph 14-200 of the *Taxation Administration Act 1953 (Cth).*
General Security	means a Bank Guarantee or a bond or other form of security on terms reasonably satisfactory to the Council in the amount specified in Item 16.a of the VPA Particulars indexed in accordance with the method of indexation specified in 16.b of the VPA Particulars.
GST	has the same meaning as in the GST Law.
GST Law	has the same meaning as in *A New Tax System (Goods and Services Tax) Act 1999* (Cth) and any other Act or regulation relating to the imposition or administration of the GST.

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Instrument Change	means the change to the environmental planning instrument specified or described in Item 3 of the VPA Particulars.
Insurances	means the insurances specified in Item 20 of the VPA Particulars and such other insurances required by law in relation to the Developer Works.
Intellectual Property	means all copyright (including moral rights), patents, trademarks, designs, confidential information, circuit layouts, data and any other rights from intellectual activity in the industrial, scientific, literary and artistic fields recognised in domestic law anywhere in the world.
Item	means a numbered item appearing in the VPA Particulars or the Development Contributions Table.
Just Terms Act	means the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW).
Land	means the land specified or described in Item 1 of the VPA Particulars.
Maintain	in relation to Developer Works, means keep in a good state of repair and working order, and includes repair of any damage to the Works.
Maintenance Period	in relation to Developer Works means the period specified in Item 14 of the VPA Particulars commencing on the date the Council issues a Transfer of Ownership Notice.
Maintenance Security	means the $ amount of Security specified in Item 18 of the VPA Particulars indexed in accordance with the Indexation Method.
Modification Application	means the application to modify the Applicable Development Consent specified or described in Item 4.b of the VPA Particulars.
N/A	means Not Applicable
Occupation Certificate	has the same meaning as in the Act.
Other Land	means land owned or occupied by a person other than the Developer or the Council to which entry and access is needed by the Developer to perform this Deed.

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Participation Rules	means the participation rules as determined by the *Electronic Conveyancing National Law* as set out in the *Electronic Conveyancing (Adoption of National Law) Act 2012* (NSW).
Party	means a party to this Deed.
PEXA	means Property Exchange Australia Ltd.
Practical Completion	in relation to the Developer Works or a specified part of the Developer Works occurs when the Council has issued a Practical Completion Certificate for the Developer Works or the part.
Practical Completion Certificate	means a certificate issued by the Council to the Developer to the effect that, in the reasonable opinion of the Council, the Developer Works or a specified part of the Developer Works are substantially complete and any incomplete part or Defect is of a minor nature.
Practical Completion Date	means: (a) the date specified in Item 12 of the VPA Particulars in relation to all of the Developer Works, or (b) the dates specified in Item 12 of the VPA Particulars in relation to the Developer Works in a particular Stage or particular Developer Works.
Principal Contractor	means the Person defined in as the Principal Contractor under the *Work Health and Safety Act 2011* (NSW) or *Work Health and Safety Regulation 2011* (NSW) or an equivalent under Commonwealth work health and safety laws.
Rectification Notice	means a notice in writing: (a) identifying the nature and extent of a Defect or incomplete Work, and (b) specifying the works or actions that are required to Rectify the Defect or incomplete Work, and (c) specifying the date by which or the period within which the Defect or incomplete Work is to be rectified, which date or period must not be unreasonable having regard to the nature of the Defect or incomplete Work.
Rectify	means rectify, remedy or correct.

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Regulation	means the *Environmental Planning and Assessment Regulation 2021* (NSW).
Review Period	means the period specified in Item 23 of the VPA Particulars.
Section 7.11 Contribution	means a monetary contribution payable to the Council under s7.11 of the Act pursuant to the Applicable Development Consent.
Development Contribution Credit	means the $ amount or amounts specified in Item 10 of the VPA Particulars
Site Audit Report	has the same meaning as in the CLM Act.
Site Audit Statement	has the same meaning as in the CLM Act.
Stage	means a stage of the Development approved by the Applicable Development Consent or otherwise approved in writing by the Council for the purposes of this Deed.
Subdivision Certificate	has the same meaning as in the Act.
Subdivision Works Certificate	has the same meaning as in the Act.
Technical Data	means all technical know-how and information in material form, including manuals, designs, standards, specifications, reports, models, plans, drawings, calculations, software, source code and test results.
Third Party Intellectual Property	means Intellectual Property relating to the Developer Works that is owned by a person other than the Council or the Developer.
Transfer of Ownership Notice	means a notice issued by the Council to the Developer stating that Developer Works the subject of a Practical Completion Certificate vest in the Council on a specified date being not sooner than 14 days after the notice is issued.
VPA Particulars	means the information contained in Schedule 1.
WHS	means work health and safety.

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WHS Law	means the *Work Health and Safety Act 2011* (NSW) and *Work Health and Safety Regulation 2011* (NSW).
Work	means the physical result of carrying out work in, on, over or under land.
Works-As-Executed Plan	means detailed plans and specifications of Developer Works carried out by the Developer.

Interpretation

1.2 In the interpretation of this Deed, the following provisions apply unless the context otherwise requires:

1.2.1 Headings are inserted for convenience only and do not affect the interpretation of this Deed.

1.2.2 A reference in this Deed to a business day means a day other than a Saturday or Sunday or a public holiday on which banks are open for business generally in Sydney.

1.2.3 If the day on which any act, matter or thing is to be done under this Deed is not a business day, the act, matter or thing must be done on the next business day.

1.2.4 A reference in this Deed to dollars or $ means Australian dollars and all amounts payable under this Deed are payable in Australian dollars.

1.2.5 A reference in this Deed to a $ value relating to a Development Contribution is a reference to the value exclusive of GST.

1.2.6 A reference in this Deed to any law, legislation or legislative provision includes any statutory modification, amendment or re-enactment, and any subordinate legislation or regulations issued under that legislation or legislative provision.

1.2.7 A reference in this Deed to any agreement, deed or document is to that agreement, deed or document as amended, novated, supplemented or replaced.

1.2.8 A reference to a clause, part, schedule or attachment is a reference to a clause, part, schedule or attachment of or to this Deed.

1.2.9 An expression importing a natural person includes any company, trust, partnership, joint venture, association, body corporate or governmental agency.

1.2.10 Where a word or phrase is given a defined meaning, another part of speech or other grammatical form in respect of that word or phrase has a corresponding meaning.

1.2.11 A word which denotes the singular denotes the plural, a word which denotes the plural denotes the singular, and a reference to any gender denotes the other genders.

1.2.12 References to the word 'include' or 'including' are to be construed without limitation.

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1.2.13 A reference to this Deed includes the agreement recorded in this Deed.

1.2.14 A reference to a Party to this Deed includes a reference to the employees, agents and contractors of the Party, the Party's successors and assigns.

1.2.15 A reference to 'dedicate' or 'dedication' in relation to land is a reference to dedicate or dedication free of cost.

1.2.16 Any schedules, appendices and attachments form part of this Deed.

1.2.17 Notes appearing in this Deed are operative provisions of this Deed.

2 Status of this Deed

2.1 This Deed is a planning agreement within the meaning of s7.4(1) of the Act.

3 Commencement

3.1 This Deed commences and has force and effect on and from the date when the Parties have:

3.1.1 both executed the same copy of this Deed, or

3.1.2 each executed separate counterparts of this Deed and exchanged the counterparts.

3.2 The Parties are to insert the date when this Deed commences on the front page and on the execution page.

4 Application of this Deed

4.1 This Deed applies to the Land and to the Development.

4.2 The Developer acknowledges and agrees that the Applicable Development Consent may be granted subject to a condition requiring this Deed to be complied with in connection with the carrying out of the Development and the Developer is not to object to, or seek a review of, of or appeal against the imposition of such a condition.

5 Warranties

5.1 The Parties warrant to each other that they:

5.1.1 have full capacity to enter into this Deed, and

5.1.2 are able to fully comply with their obligations under this Deed.

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6 Further agreements

6.1 The Parties may, at any time and from time to time, enter into agreements relating to the subject-matter of this Deed that are not inconsistent with this Deed for the purpose of implementing this Deed.

7 Surrender of right of appeal, etc.

7.1 The Developer is not to commence or maintain, or to cause or procure the commencement or maintenance, of any proceedings in any court or tribunal or similar body appealing against, or questioning the validity of this Deed, or an Approval relating to the Development in so far as the subject-matter of the proceedings relates to this Deed.

8 Application of s7.11, s7.12 and s7.24 of the Act to the Development

Section 7.11 of the Act

8.1 Item 7.a of the VPA Particulars states whether this Deed excludes (wholly or in part) the application of section 7.11 of the Act to the Development.

8.2 If Item 7.a of the VPA Particulars states that this Deed does not wholly exclude the application of section 7.11 of the Act to the Development, Item 7.b of the VPA Particulars states whether the benefits provided by the Developer under this Deed are to be taken into consideration when determining a Development Contribution under section 7.11 relating to the Development.

Section 7.12 of the Act

8.3 Item 7.c of the VPA Particulars states whether this Deed excludes (wholly or in part) the application of section 7.11 of the Act to the Development.

Section 7.24 of the Act

8.4 Item 7.d of the VPA Particulars states whether this Deed excludes (wholly or in part) the application of s7.24 to the Development.

Part 2 – Development Contributions

9 Provision of Development Contributions

Development Contributions

9.1 The Developer is to make Development Contributions to the Council in accordance with the Development Contributions Table and any other

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provision of this Deed requiring the Developer to make Development Contributions.

Effect of modification of Applicable Development Consent

9.2 If:

9.2.1 Part A of the Development Contributions Table specifies that monetary Development Contributions are payable in respect of the Development per dwelling or per Final Lot or for a specified number of dwellings or Final Lots, and

9.2.2 After this Deed is entered into the Applicable Development Consent is modified under the Act to allow for additional dwellings or Final Lots (or both),

the Developer is to pay monetary Development Contributions to the Council for the additional dwellings or Final Lots (or both) not later than 14 days after the Applicable Development Consent has been modified or such later time as may be agreed in writing between the Parties.

Contribution Values

9.3 The Parties acknowledge and agree that a Contribution Value:

9.3.1 constitutes the agreed value of the public benefit of a Development Contribution required to be made under this Deed irrespective of the cost to the Developer of making the Development Contribution, and

9.3.2 does not serve to define the monetary extent of the Developer's obligation to make the Development Contribution to which the Contribution Value relates.

Application of Development Contributions

9.4 The Council is to apply each Development Contribution made by the Developer under this Deed towards the public purpose for which it is made and otherwise in accordance with this Deed.

Flexibility in application of Development Contributions

9.5 Deleted

Application of Monetary Development Contribution towards Development Servicing Contribution and Repayment of Surplus

9.6 Once the Developer has made the monetary Development Contributions required by this Deed, the Council agrees:

9.6.1 to waive the Developer's liability to make, or not impose, Development Servicing Contributions for water supply in respect of the Development up to the amount of the contribution;

9.6.2 if the amount of the monetary Development Contribution exceeds the liability to make such Development Servicing Contributions for water supply in respect of the Development but for the waiver or non-imposition (**Surplus**), the Council is to pay to the Developer (or their

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nominee) each subsequent Development Servicing Contribution it receives towards water supply in respect of other development, as and when received, until the amount paid to Developer (or nominee) and the amount waived equal the amount of the Development Contribution as indexed under clause 9.6.3.

9.6.3 The balance of the Surplus held by the Council from time to time is to be indexed in accordance with the indexation method contained in the Applicable DSP.

9.6.4 No prior representation by any person obliges the Council to make any payment to the Developer in respect of the Development Contribution other than as required and as specified in this clause.

10 Payment of monetary Development Contributions

10.1 A monetary Development Contribution is made for the purposes of this Deed when the Council receives the full amount of the contribution payable under this Deed in cash or by unendorsed bank cheque or by the deposit by means of electronic funds transfer of cleared funds into a bank account nominated by the Council.

11 Dedication of land

When dedication of land made

11.1 A Development Contribution comprising Dedication Land is dedicated for the purposes of this Deed when:

11.1.1 the Council is given:

(a) a Clearance Certificate that is valid at the time of dedication of the Dedication Land, or

(b) the Foreign Resident Capital Gains Withholding Amount in respect of the Dedication Land, and

11.1.2 One of the following has occurred:

(a) a deposited plan is registered in the register of plans held with the Registrar-General that dedicates the Dedication Land as a public road (including a temporary public road) under the *Roads Act 1993* (NSW) or creates a public reserve or drainage reserve under the *Local Government Act 1993* (NSW), or

(b) the Council is given evidence that a transfer of the Dedication Land to the Council has been effected by means of electronic lodgement and registration through PEXA or another ELNO.

Developer to facilitate dedication

11.2 The Developer is to do all things reasonably necessary to enable registration of the instrument of transfer to occur.

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Dedicated Land to be free of encumbrances

11.3 The Developer is to ensure that Dedication Land is free of all encumbrances and affectations (whether registered or unregistered and including without limitation any charge or liability for rates, taxes and charges) except as otherwise agreed in writing by the Council.

Request by Developer

11.4 If, having used all reasonable endeavours, the Developer cannot ensure that Dedication Land is free from all encumbrances and affectations, the Developer may request that Council agree to accept the land subject to those encumbrances and affectations, but the Council may withhold its agreement in its absolute discretion.

Site Audit Report & Site Audit Statement

11.5 Before dedicating the Dedication Land to the Council, the Developer, at its cost, is to obtain and provide to the Council a Site Audit Report and Site Audit Statement stating that the Dedication Land is suitable for the purpose for which the Dedication Land is required to be dedicated under this Deed without being subject to compliance with an environmental management plan.

Indemnity

11.6 The Developer indemnifies and agrees to keep indemnified the Council against all Claims made against the Council as a result of any Contamination on or emanating from the Dedication Land but only in relation to Contamination that existed on or before the date that the Dedication Land is transferred or dedicated to Council or compulsorily acquired by Council pursuant to this Deed.

Responsibility for Cost of Land Dedication

11.7 The Developer is responsible for meeting all Costs of and incidental to the dedication of the Dedication Land to the Council unless one of both of the following applies:

11.7.1 Item 8 of the VPA Particulars specifies a Council Land Dedication Contribution Amount towards the Cost of all or specified Dedication Land, or

11.7.2 this Deed otherwise expressly provides for a Dedication Land Cost to be met that is not required to be met by the Developer.

Contribution by Council towards Cost of Dedication Land

11.8 If Item 8 of the VPA Particulars specifies a Council Land Dedication Contribution Amount, the Council is to pay that amount to the Developer in accordance with any requirements specified in that Item or otherwise in accordance with a written agreement entered into between the Council and the Developer.

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Caveat by Council

11.9 The Developer acknowledges that the Council has an equitable estate or interest in the Dedication Land entitling the Council, pursuant to section 74F of the *Real Property Act 1900* (NSW), to lodge with the Registrar-General a caveat prohibiting the recording of any dealing affecting the Council's estate or interest in that land.

12 Application of Developer Works Provisions

Application of Developer Works Provisions

12.1 The Developer Works Provisions apply to and in respect of Developer Works required by this Deed if any.

13 Cost of Developer Works

Responsibility for Cost of Developer Works

13.1 The Developer is responsible for meeting all Costs of and incidental to the Developer Works required to be provided under this Deed unless one of both of the following applies:

13.1.1 Item 9 of the VPA Particulars specifies a Council Developer Works Contribution Amount towards the Cost of all or specified Developer Works, or

13.1.2 this Deed otherwise expressly provides for a Developer Works Cost that is not required to be met by the Developer.

Contribution by Council towards Cost of Developer Works

13.2 If Item 9 of the VPA Particulars specifies a Council Developer Works Contribution Amount, the Council is to pay that amount to the Developer in relation to the Developer Works within 14 days after both of the following have occurred:

13.2.1 all of the Developer Works have vested in the Council, and

13.2.2 all land on which the Developer Works have been carried out that is not owned, occupied or otherwise controlled by the Council has been transferred to the Council.

14 Development Contribution Credit

Application of clause

14.1 This clause 14 applies if a Development Contribution Credit is specified in Item 10 of the VPA Particulars.

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Application of Development Contribution Credit

14.2 Pursuant to s7.11(5)(b) of the Act, in consideration of the Developer carrying out the Developer Works and otherwise performing all of its obligations under this Deed, the Section 7.11 Contribution payable by the Developer is to be reduced by the Development Contribution Credit.

15 Development Contribution Surplus Credit

Application of Development Contribution Surplus Credit

15.1 If a Development Contribution Surplus Credit is specified in Item 11 of the VPA Particulars:

15.1.1 the Council is to apply the Development Contribution Surplus Credit, towards the satisfaction of any monetary contributions the Developer is required to pay to the Council under s7.11 of the Act in relation to any development (other than the Development) for which development consent is granted under the Act after this Deed commences, and

15.1.2 the Developer may assign the Development Contribution Surplus Credit or any part of it to any person if the Developer:

(a) obtains the written consent of the Council, which may not be unreasonably withheld, and

(b) enters into a deed with the Council and the transferee of the Monetary Contribution Surplus Credit on terms reasonably satisfactory to the Council.

Indexation of Development Contribution Surplus Credit

15.2 The Development Contribution Surplus Credit is to be indexed from the date of this Deed until the date it is applied in accordance with clause 15.1 in accordance with the indexation method contained in the Applicable Contributions Plan.

Part 3 – Dispute Resolution

16 Dispute Resolution – mediation

Application of clause

16.1 This clause 16 applies to any Dispute arising in connection with this Deed other than a dispute to which clause 17 applies.

When Dispute arises

16.2 Such a Dispute is taken to arise if one Party gives another Party a notice in writing specifying particulars of the Dispute.

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Meeting between Parties

16.3 If a notice is given under clause 16.2, the Parties are to meet within 14 days of the notice in an attempt to resolve the Dispute.

Meditation of Dispute

16.4 If the Dispute is not resolved within a further 28 days, the Parties are to mediate the Dispute in accordance with the Mediation Rules of the Law Society of New South Wales published from time to time and are to request the President of the Law Society to select a mediator.

Exercise of legal rights

16.5 If the Dispute is not resolved by mediation within a further 28 days, or such longer period as may be necessary to allow any mediation process which has been commenced to be completed, then the Parties may exercise their legal rights in relation to the Dispute, including by the commencement of legal proceedings in a court of competent jurisdiction in New South Wales.

Costs

16.6 Each Party is to bear its own costs arising from or in connection with the appointment of a mediator and the mediation.

16.7 The Parties are to share equally the costs of the President, the mediator, and the mediation.

17 Dispute resolution – expert determination

Application of clause

17.1 This clause 17 applies to a Dispute arising in connection with this Deed if:

17.1.1 the Parties agree that the Dispute can be appropriately determined by Expert Determination, or

17.1.2 the Chief Executive Officer (or equivalent) of the professional body that represents persons who appear to have the relevant expertise to determine the Dispute gives a written opinion at the joint request of the Parties that the Dispute can be determined by a member of that body.

When Dispute arises

17.2 A Dispute to which this clause applies is taken to arise if one Party gives another Party a notice in writing specifying particulars of the Dispute.

Meeting between Parties

17.3 If a notice is given under clause 17.2, the Parties are to meet within 14 days of the notice in an attempt to resolve the Dispute.

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Expert determination

17.4 If the Dispute is not resolved within a further 28 days, the Dispute is to be referred to the President of the NSW Law Society to appoint an expert for expert determination.

Expert determination binding

17.5 The expert determination is binding on the Parties except in the case of fraud or misfeasance by the expert.

Costs of Parties

17.6 Each Party is to bear its own costs arising from or in connection with the appointment of the expert and the expert determination.

Costs of Expert

17.7 The Parties are to share equally the costs of the President, the expert, and the expert determination.

Part 4 - Enforcement

18 General Security

Application of this clause

18.1 This clause 18 applies if Item 16.a of the VPA Particulars specified an amount of General Security.

Composition of General Security

18.2 For the avoidance of doubt, the General Security includes the Defects Liability Security and the Maintenance Security.

Provision of General Security

18.3 The Developer is to provide the General Security to the Council:

18.3.1 before the Developer obtains a Construction Certificate for any part of the Development or before the Developer commences any part of the Developer Works, whichever occurs first, or

18.3.2 at such other time agreed in writing by the Council.

Apportionment of General Security

18.4 If agreed in writing by the Council, the General Security may be apportioned to different Stages or different Developer Works, in which case the Developer is to provide the portion of the General Security relating to a particular Stage or particular Developer Works to the Council before the Developer obtains a

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Construction Certificate for the particular Stage or the Developer commences the particular Developer Works.

Purpose of General Security

18.5 The Council is to hold the General Security as security for the Developer performing its obligations under this Deed relating to the Developer Works and other material public benefits (other than the payment of monetary Development Contributions and the dedication of Dedication Land).

Indexation of General Security

18.6 The Developer is to ensure that the amount of the General Security provided to the Council at any time is indexed in accordance with Item 16.b of the Particulars.

Call-up of General Security

18.7 Subject to clause 21.2, if the Developer breaches any its obligations under this Deed relating to the purpose for which the General Security is required to be provided, the Council may, without further notice to the Developer and notwithstanding any other remedy it may have under this Deed, under any Act or otherwise at law or in equity, call-up the General Security, the Defects Liability Security or the Maintenance Security, as appropriate, and apply it to remedy the Developer's breach and the Council's costs specified in clause 21.5 of so doing.

Release & return of General Security

18.8 Subject to clause 18.10, the Council is to release and return the General Security or any unused part of it to the Developer within 14 days of issuing a Practical Completion for the Developer Works.

18.9 Despite clause 18.8 but subject to clause 18.10, if the Developer has provided the Council with a portion of the General Security relating to a particular Stage or particular Developer Works, the Council is to release and return the portion or any unused part of it to the Developer within 14 days of issuing a *Practical Completion Certificate for all of the Developer Works in the particular Stage or the particular Developer Works.

18.10 The amount of the General Security released and returned by the Council under clause 18.8 or 18.9 must not exceed the amount of the General Security minus the percentages of that amount allocated to the Defects Liability Security and the Maintenance Security.

18.11 The Council is to release and return the Defects Liability Security, or any remaining part, to the Developer within 28 days after the end of the Defects Liability Period if, at that time, the Developer is not in breach of an obligation under this Deed to which the Defects Liability Security relates.

18.12 The Council is to release and return the Maintenance Security, or any remaining part, to the Developer within 28 days after the end of the Maintenance Period if, at that time, the Developer is not in breach of an obligation under this Deed to which the Maintenance Security relates.

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Replacement General Security

18.13 The Developer may provide the Council with a replacement General Security at any time.

18.14 On receipt of a replacement General Security, the Council is to release and return the replaced the General Security to the Developer.

18.15 If the Council calls-up the General Security or any portion of it, the Council may give the Developer a written notice requiring the Developer to provide a further or replacement General Security to ensure that the amount of General Security held by the Council equals the amount the Council is entitled to hold under this Deed.

Restriction on entering Council land

18.16 Despite any other provision of this Deed, the Council, in its absolute discretion, may refuse to allow the Developer to enter, occupy or use any land owned or controlled by the Council or refuse to provide the Developer with any plant, equipment, facilities or assistance relating to the carrying out the Development if the Developer has not provided the General Security to the Council in accordance with this Deed.

19 Charge on Dedication Land

Application of this clause

19.1 This clause applies if Item 15 of the VPA Particulars specifies land for the purposes of the definition of 'Charge Land' in clause 1.1 of this Deed.

Grant of charge

19.2 On the date of execution of this Deed, the Developer grants to the Council a fixed and specific charge over the Developer's right, title and interest in the Charge Land, to secure:

19.2.1 the performance of the Developer's obligation to make monetary Development Contributions under this Deed, and

19.2.2 any damages that may be payable to the Council, or any costs which may be incurred by the Council in the event of a breach of this Deed by the Developer relating to making monetary Development Contributions.

Exercise of rights under Charge

19.3 Subject to clause 21.2, the Council may exercise its rights under the Charge if the Developer does not make monetary contributions in accordance with this Deed.

Registration

19.4 Upon the execution of this Deed, the Developer is to give to the Council an instrument in registrable form under the *Real Property Act 1900* (NSW) duly

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executed by the registered proprietor of the Charge Land that is effective to register the Charge on the title to the Charge Land.

19.5 If the Charge Land does not form the whole of a lot in a deposited plan at the time that the instrument referred to in clause 19.4 is required to be given:

19.5.1 the Developer is to give the Council an instrument that charges the whole of the lot containing the Charge Land, and

19.5.2 a reference in this Deed to the Charge Land is taken to be a reference to the whole of that lot.

19.6 The Developer is to do all other things necessary, including executing all other documents, to enable lodgement and registration of the Charge to occur electronically through PEXA or another ELNO.

Caveat and discharge

19.7 The Developer acknowledges that the Council has an equitable estate or interest in the Charge Land entitling the Council, pursuant to section 74F of the *Real Property Act 1900* (NSW), to lodge with the Registrar-General a caveat prohibiting the recording of any dealing affecting the Council's estate or interest in that land.

19.8 The Developer agrees that:

19.8.1 the Council may lodge a caveat on the title of the Charge Land,

19.8.2 the Council is to release the caveat from any part of the Charge Land once that part is contained in a separate lot to the remainder of the Charge Land, and

19.8.3 the Council cannot be required to have the caveat removed from the title to the Charge Land other than in accordance with clause 19.9.

19.9 In order to enable Final Lots to be sold, the Council is to release the Charge and withdraw the caveat from the title to any Final Lot on satisfaction by the Developer of its obligations under this Deed to make Development Contributions in respect of the creation of the lot.

19.10 For the purposes of clause 19.2, the Council is to use its reasonable endeavours to provide any documentation necessary to enable the release of the Charge and withdrawal of the caveat from the title of a Final Lot on or immediately prior to the date for settlement of the sale of that lot.

Subdivision of charge land not precluded

19.11 Nothing in this Deed prevents the registration of a plan of subdivision in respect of the Charge Land nor the creation of a Final Lot from the Charge Land.

Priority

19.12 The Developer is not to create any mortgage or charge over the Charge Land or grant any other interest in the Charge Land ranking in priority equal with or ahead of the Charge created under this Deed without the prior written approval of the Council.

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20 Acquisition of Dedication Land

Compulsory acquisition of Dedication Land

20.1 Subject to clause 20.2 and 21.2, if the Developer does not dedicate the Dedication Land at the time at which it is required to be dedicated, the Developer consents to the Council compulsorily acquiring the land for compensation in the amount of $1 without having to follow the pre-acquisition procedure under the Just Terms Act.

20.2 The Council is to only acquire land pursuant to clause 20.1 if it considers it reasonable to do so having regard to the circumstances surrounding the failure by the Developer to dedicate the land required to be dedicated under this Deed.

Pre-acquisition agreement

20.3 Clause 20.1 constitutes an agreement for the purposes of s30 of the Just Terms Act.

Re-imbursement of Council for third party compensation

20.4 If, as a result of the acquisition referred to in clause 20.1, the Council is required to pay compensation to any person other than the Developer, the Developer is to reimburse the Council that amount, upon a written request being made by the Council, or the Council can call on the General Security.

Indemnity

20.5 The Developer indemnifies and keeps indemnified the Council against all Claims made against the Council as a result of any acquisition by the Council of the whole or any part of the Dedication Land except if, and to the extent that, the Claim arises because of the Council's negligence or default.

20.6 The Developer is to promptly do all things necessary, and consents to the Council doing all things necessary, to give effect to this clause 20, including without limitation:

20.6.1 signing any documents or forms,

20.6.2 giving land owner's consent for lodgement of any Development Application,

20.6.3 producing certificates of title to the Registrar-General under the *Real Property Act 1900* (NSW), and

20.6.4 paying the Council's costs arising under this clause 20.

21 Breach of obligations

Notice of breach

21.1 If the Council reasonably considers that the Developer is in breach of any obligation under this Deed, it may give a written notice to the Developer:

21.1.1 specifying the nature and extent of the breach,

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21.1.2 requiring the Developer to:

(a) Rectify the breach if it reasonably considers it is capable of rectification, or

(b) pay compensation to the reasonable satisfaction of the Council in lieu of rectifying the breach if it reasonably considers the breach is not capable of rectification,

21.1.3 specifying the period within which the breach is to be rectified or compensation paid, being a period that is reasonable in the circumstances.

Notice of breach pre-requisite to exercise of rights

21.2 The Council may not exercise its rights under clause 18.7, 19.3 or 20.1 unless it has first given the Developer a notice under clause 21.1 and the Developer has failed to comply with the Notice.

Step-in right relating to Developer Works

21.3 If the Developer fails to comply with a notice given under clause 21.1 relating to the provision of Developer Works, the Council may, notwithstanding any other remedy it may have under this Deed, under any Act or otherwise at law or in equity, step-in and remedy the breach and may enter, occupy and use any land owned or controlled by the Developer and any Equipment on such land for that purpose.

Recovery of costs by Council as debt due

21.4 Despite any other provision of this Deed, any costs incurred by the Council in remedying a breach of this Deed may be recovered by the Council as a debt due in a court of competent jurisdiction.

21.5 For the purpose of clause 21.4, the Council's costs of remedying a breach the subject of a notice given under clause 21.1 include, but are not limited to:

21.5.1 the costs of the Council's employees, agents and contractors reasonably incurred for that purpose,

21.5.2 all fees and charges necessarily or reasonably incurred by the Council in remedying the breach, and

21.5.3 all legal costs and expenses reasonably incurred by the Council, by reason of the breach.

Exercise of Council's rights at law or in equity

21.6 Nothing in this clause 21 prevents the Council from exercising any rights it may have at law or in equity in relation to a breach of this Deed by the Developer, including but not limited to seeking relief in an appropriate court.

22 Enforcement in a court of competent jurisdiction

22.1 Without limiting any other provision of this Deed, the Parties may enforce this Deed in any court of competent jurisdiction.

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22.2 For the avoidance of doubt, nothing in this Deed prevents:

22.2.1 a Party from bringing proceedings in the Land and Environment Court to enforce any aspect of this Deed or any matter to which this Deed relates, or

22.2.2 the Council from exercising any function under the Act or any other Act or law relating to the enforcement of any aspect of this Deed or any matter to which this Deed relates.

Part 5 – Registration & Restriction on Dealings

23 Registration of this Deed

Application of clause

23.1 This clause 23 applies if Item 19 of the VPA Particulars states that this Deed is to be registered for the purposes of s7.6(1) of the Act.

Documents for registration

23.2 Upon the commencement of this Deed, the Developer is to deliver to the Council:

23.2.1 an instrument in registrable form requesting registration of this Deed on the title to the Land duly executed by the registered proprietor of the Land, and

23.2.2 the written irrevocable consent of the registered proprietor and each person referred to in s7.6(1) of the Act to that registration.

23.3 The Developer is to do such other things as are reasonably necessary to enable lodgement and registration of this Deed to occur electronically through PEXA or another ELNO.

Removing notation from title

23.4 The Parties are to do such things as are reasonably necessary to remove any notation relating to this Deed from the title to the Land:

23.4.1 in so far as the part of the Land concerned is a Final Lot,

23.4.2 in relation to any other part of the Land, once the Developer has completed its obligations under this Deed to the reasonable satisfaction of the Council or this Deed is terminated or otherwise comes to an end for any other reason.

24 Restriction on dealings

Restriction

24.1 The Developer is not to:

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24.1.1 sell or transfer the Land, other than a Final Lot, or

24.1.2 assign the Developer's rights or obligations under this Deed, or novate this Deed,

to any person unless:

24.1.3 the Developer has, at no cost to the Council, first procured the execution by the person to whom the Land or part is to be sold or transferred or the Developer's rights or obligations under this Deed are to be assigned or novated, of a deed in favour of the Council on terms reasonably satisfactory to the Council, and

24.1.4 the Council has given written notice to the Developer stating that it reasonably considers that the purchaser, transferee, assignee or novatee, is reasonably capable of performing its obligations under this Deed, and

24.1.5 the Developer is not in breach of this Deed, and

24.1.6 the Council otherwise consents to the transfer, assignment or novation, such consent not to be unreasonably withheld.

Continued performance of obligations by Developer

24.2 Subject to clause 24.3, the Developer acknowledges and agrees that it remains liable to fully perform its obligations under this Deed unless and until it has complied with its obligations under clause 24.1.

Exclusion from restriction

24.3 Clause 24.1 does not apply in relation to any sale or transfer of the Land if this Deed is registered on the title to the Land at the time of the sale.

Part 6 – Indemnities & Insurance

25 Risk

25.1 The Developer performs this Deed at its own risk and its own cost.

26 Release

26.1 The Developer releases the Council from any Claim it may have against the Council arising in connection with the performance of the Developer's obligations under this Deed except if, and to the extent that, the Claim arises because of the Council's negligence or default.

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27 Indemnity

27.1 The Developer indemnifies the Council from and against all Claims that may be sustained, suffered, recovered or made against the Council arising in connection with the performance of the Developer's obligations under this Deed except if, and to the extent that, the Claim arises because of the Council's negligence or default.

28 Insurance

Requirement for Developer insurances

28.1 The Developer is to take out and keep current to the satisfaction of the Council the Insurances in relation to the Developer Works until the Developer Works are completed in accordance with this Deed.

Failure to comply with requirement

28.2 If the Developer fails to comply with clause 28.1, the Council may effect and keep in force such insurances and pay such premiums as may be necessary for that purpose and the amount so paid shall be a debt due from the Developer to the Council and may be recovered by the Council as it deems appropriate including:

28.2.1 by calling upon the General Security provided by the Developer to the Council under this Deed, or

28.2.2 recovery as a debt due in a court of competent jurisdiction.

28.3 The Developer is not to commence to provide any Developer Works unless it has first provided to the Council satisfactory written evidence of all of the insurances specified in clause 28.1.

Part 7 – Other Provisions

29 Annual report by Developer

Requirement for Developer to provide report

29.1 The Developer is to provide to the Council by not later than each anniversary of the date on which this Deed commences a report ('**Annual Performance Report**') detailing the performance of its obligations under this Deed in the previous 12 month period ('**Reporting Period**').

Form and content of report

29.2 The Annual Performance Report is to be in such a form and to address such matters as is reasonably required by the Council from time to time but must at a minimum detail the following:

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29.2.1 all Approved Persons during the Reporting Period and any changes to Approved Persons during that period,

29.2.2 all Development Contributions made by the Developer pursuant to this Deed during the Reporting Period and the dates on which the contributions were made,

29.2.3 all Development Contributions due to be made by the Developer pursuant to this Deed in the next 12 month period,

29.2.4 all Developers Works that had been commenced prior to the Reporting Period or were commenced during the Reporting Period but were not completed in that period,

29.2.5 all Developers Works due to be commenced or completed within the next 12 month period,

29.2.6 all Securities provided by the Developer to the Council under this Deed and held by the Council during the Reporting Period and the current value of each such Security.

Strict requirement

29.3 The Developer acknowledges and agrees that the provision of the Annual Performance Report each year in accordance with this clause 29 is a strict requirement of this Deed.

30 Review of Deed

Obligation to review Deed

30.1 The Parties agree to review this Deed by the end of each Review Period, and otherwise if either Party is of the opinion that any change of circumstance has occurred, or is imminent, that materially affects the operation of this Deed.

Review triggers

30.2 For the purposes of clause 30.1, the relevant changes include (but are not limited to) any change to a law that restricts or prohibits or enables the Council or any other planning authority to restrict or prohibit any aspect of the Development.

Duty of Parties

30.3 For the purposes of addressing any matter arising from a review of this Deed referred to in clause 30.1, the Parties are to use all reasonable endeavours to agree on and implement appropriate amendments to this Deed.

Where change of law occurs

30.4 If this Deed becomes illegal, unenforceable or invalid as a result of any change to a law, the Parties agree to do all things necessary to ensure that an enforceable agreement of the same or similar effect to this Deed is entered into.

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No Dispute

30.5 A failure by a Party to agree to take action requested by the other Party as a consequence of a review referred to in clause 30.1 (but not 30.4) is not a Dispute for the purposes of this Deed and is not a breach of this Deed.

31 Notices

31.1 Any notice, consent, information, application or request that is to or may be given or made to a Party under this Deed is only given or made if it is in writing and sent in one of the following ways:

31.1.1 delivered or posted to that Party at its address set out in Item 21 or 22 of the VPA Particulars, or

31.1.2 emailed to that Party at its email address set out in Item 21 or 22 of the VPA Particulars.

31.2 If a Party gives the other Party 3 business days' notice of a change of its address or email, any notice, consent, information, application or request is only given or made by that other Party if it is delivered, posted or emailed to the latest address.

31.3 Any notice, consent, information, application or request is to be treated as given or made if it is:

31.3.1 delivered, when it is left at the relevant address,

31.3.2 sent by post, 2 business days after it is posted, or

31.3.3 sent by email and the sender does not receive a delivery failure message from the sender's internet service provider within a period of 24 hours of the email being sent.

31.4 If any notice, consent, information, application or request is delivered, or an error free transmission report in relation to it is received, on a day that is not a business day, or if on a business day, after 5pm on that day in the place of the Party to whom it is sent, it is to be treated as having been given or made at the beginning of the next business day.

32 Approvals and Consent

32.1 Except as otherwise set out in this Deed, and subject to any statutory obligations, a Party may give or withhold an approval or consent to be given under this Deed in that Party's absolute discretion and subject to any conditions determined by the Party.

32.2 A Party is not obliged to give its reasons for giving or withholding consent or for giving consent subject to conditions.

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33 Costs of this Deed

Costs of Deed

33.1 The Developer is to pay to the Council the Council's costs not exceeding the amount specified in Item 24 of the VPA Particulars in relation to preparing, negotiating, executing and stamping this Deed, and any document related to this Deed within 7 days of a written demand by the Council for such payment.

Enforcement costs

33.2 The Council may serve a notice in writing on the Developer ('**Enforcement Cost Notice**') requiring the Developer to pay all or any reasonable costs and expenses incurred by the Council in connection with:

33.2.1 investigating a non-compliance by the Developer with this Deed, and

33.2.2 enforcing compliance by the Developer with this Deed.

33.3 For the avoidance of doubt, the costs and expenses referred to in clause 33.2 may include the costs or expenses incurred by the Council relating to the preparation or serving of the Enforcement Cost Notice.

33.4 An Enforcement Cost Notice is to specify the amount required to be paid to the Council by the Developer and the date by which the amount is to be paid.

33.5 The Council may recover any unpaid costs and expenses specified in an Enforcement Cost Notice as a debt in a court of competent jurisdiction.

No dispute

33.6 Part 3 of this Deed does not apply anything done by the Council and any requirement imposed on the Developer by the Council in accordance with this clause 33.

34 Entire Deed

34.1 This Deed contains everything to which the Parties have agreed in relation to the matters it deals with.

34.2 No Party can rely on an earlier document, or anything said or done by another Party, or by a director, officer, agent or employee of that Party, before this Deed was executed, except as permitted by law.

35 Further Acts

35.1 Each Party must promptly execute all documents and do all things that another Party from time to time reasonably requests to effect, perfect or complete this Deed and all transactions incidental to it.

36 Governing Law and Jurisdiction

36.1 This Deed is governed by the law of New South Wales.

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36.2 The Parties submit to the non-exclusive jurisdiction of its courts and courts of appeal from them.

36.3 The Parties are not to object to the exercise of jurisdiction by those courts on any basis.

37 Joint and Individual Liability and Benefits

37.1 Except as otherwise set out in this Deed:

37.1.1 any agreement, covenant, representation or warranty under this Deed by 2 or more persons binds them jointly and each of them individually, and

37.1.2 any benefit in favour of 2 or more persons is for the benefit of them jointly and each of them individually.

38 No Fetter

38.1 Nothing in this Deed shall be construed as requiring Council to do anything that would cause it to be in breach of any of its obligations at law, and without limitation, nothing shall be construed as limiting or fettering in any way the exercise of any statutory discretion or duty.

39 Illegality

39.1 If this Deed or any part of it becomes illegal, unenforceable or invalid as a result of any change to a law, the Parties are to co-operate and do all things necessary to ensure that an enforceable agreement of the same or similar effect to this Deed is entered into.

40 Severability

40.1 If a clause or part of a clause of this Deed can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way.

40.2 If any clause or part of a clause is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Deed, but the rest of this Deed is not affected.

41 Amendment

41.1 No amendment of this Deed will be of any force or effect unless it is in writing and signed by the Parties to this Deed in accordance with section 203 of the Regulation.

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42 Waiver

42.1 The fact that a Party fails to do, or delays in doing, something the Party is entitled to do under this Deed, does not amount to a waiver of any obligation of, or breach of obligation by, another Party.

42.2 A waiver by a Party is only effective if it:

42.2.1 is in writing,

42.2.2 is addressed to the Party whose obligation or breach of obligation is the subject of the waiver,

42.2.3 specifies the obligation or breach of obligation the subject of the waiver and the conditions, if any, of the waiver,

42.2.4 is signed and dated by the Party giving the waiver.

42.3 Without limitation, a waiver may be expressed to be conditional on the happening of an event, including the doing of a thing by the Party to whom the waiver is given.

42.4 A waiver by a Party is only effective in relation to the particular obligation or breach in respect of which it is given, and is not to be taken as an implied waiver of any other obligation or breach or as an implied waiver of that obligation or breach in relation to any other occasion.

42.5 For the purposes of this Deed, an obligation or breach of obligation the subject of a waiver is taken not to have been imposed on, or required to be complied with by, the Party to whom the waiver is given.

43 GST

43.1 In this clause:

Adjustment Note, **Consideration**, **GST**, **GST Group**, **Margin Scheme**, **Money**, **Supply** and **Tax Invoice** have the meaning given by the GST Law.

GST Amount means in relation to a Taxable Supply the amount of GST payable in respect of the Taxable Supply.

GST Law has the meaning given by the *A New Tax System (Goods and Services Tax) Act 1999* (Cth).

Input Tax Credit has the meaning given by the GST Law and a reference to an Input Tax Credit entitlement of a party includes an Input Tax Credit for an acquisition made by that party but to which another member of the same GST Group is entitled under the GST Law.

Taxable Supply has the meaning given by the GST Law excluding (except where expressly agreed otherwise) a supply in respect of which the supplier chooses to apply the Margin Scheme in working out the amount of GST on that supply.

43.2 Subject to clause 43.4, if GST is payable on a Taxable Supply made under, by reference to or in connection with this Deed, the Party providing the Consideration for that Taxable Supply must also pay the GST Amount as additional Consideration.

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43.3 Clause 43.2 does not apply to the extent that the Consideration for the Taxable Supply is expressly stated in this Deed to be GST inclusive.

43.4 No additional amount shall be payable by the Council under clause 43.2 unless, and only to the extent that, the Council (acting reasonably and in accordance with the GST Law) determines that it is entitled to an Input Tax Credit for its acquisition of the Taxable Supply giving rise to the liability to pay GST.

43.5 If there are Supplies for Consideration which is not Consideration expressed as an amount of Money under this Deed by one Party to the other Party that are not subject to Division 82 of the *A New Tax System (Goods and Services Tax) Act 1999*, the Parties agree:

43.5.1 to negotiate in good faith to agree the GST inclusive market value of those Supplies prior to issuing Tax Invoices in respect of those Supplies;

43.5.2 that any amounts payable by the Parties in accordance with clause 43.2 (as limited by clause 43.4) to each other in respect of those Supplies will be set off against each other to the extent that they are equivalent in amount.

43.6 No payment of any amount pursuant to this clause 43, and no payment of the GST Amount where the Consideration for the Taxable Supply is expressly agreed to be GST inclusive, is required until the supplier has provided a Tax Invoice or Adjustment Note as the case may be to the recipient.

43.7 Any reference in the calculation of Consideration or of any indemnity, reimbursement or similar amount to a cost, expense or other liability incurred by a party, must exclude the amount of any Input Tax Credit entitlement of that party in relation to the relevant cost, expense or other liability.

43.8 This clause continues to apply after expiration or termination of this Deed.

44 Explanatory Note

44.1 The Appendix contains the Explanatory Note relating to this Deed required by section 205 of the Regulation.

44.2 Pursuant to section 205 of the Regulation, the Parties agree that the Explanatory Note is not to be used to assist in construing this Deed.

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Schedule 1: VPA Particulars

(Clause 1.1)

Item	Details
1. **Land**	170 Bushs Lane Gunnedah (Lot 1 DP 861697) (**Lot 1**) 210 Bushs Lane Gunnedah (Lots 27 and 28 DP 755474) (**Lot 27 and Lot 28**)
2. **Development**	Development of the Land facilitated by the Instrument Change, including, but without limiting the generality of same, a subdivision of the Land or any part of it into allotments with a minimum lot size of 1.2ha (Lot 1) and 9,000sqm (Lots 27 and 28).
3. **Instrument Change**	Lot 1 DP861697 - The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-81 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 1.2ha Lots 27 and 28 DP 755474- The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-383 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 9,000sqm
4. **Application:** **a. Development Application** **b. Modification Application**	 A development application for any part of the Development. A modification of Any Applicable Development Consent for any part of the Development.
5. **Applicable Development Consent**	A development consent granted in respect of a Development Application.
6. **Applicable Plan:** **a. Applicable Contributions Plan** **b. Applicable DSP**	 N/A *Gunnedah Development Servicing Plan for Gunnedah Shire Council Water Supply June 2016*
7. **Application of the following provisions of the Act to the Development:**	

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a. Section 7.11	Does not exclude.
b. Consideration of benefits	Not to be considered
c. Section 7.12	Does not exclude.
d. Section 7.24	Not excluded
8. **Council Land Dedication Contribution Amount**	N/A
9. **Council Developer Works Contribution Amount**	$250,000.00
10. **Development Contribution Credit**	N/A
11. **Development Contribution Surplus Credit**	N/A
12. **Practical Completion Date**	N/A
13. **Defects Liability Period**	N/A
14. **Maintenance Period**	N/A
15. **Charge Land**	N/A
16. **General Security:**	
a. General Security	$N/A
b. Indexation of General Security	N/A
17. **Defects Liability Security**	N/A % of General Security
18. **Maintenance Security**	N/A % of General Security
19. **Registration of this Deed**	Yes
20. **Insurances**	
a. Contract Works Insurance	For the full replacement value of the Works (including the cost of demolition and removal of debris, consultants' fees and authorities' fees), to cover the Developer's liability in respect of damage to or destruction of the Works.
b. Public Liability	For at least $20,000,000.00 for a single occurrence, which covers the Council, the Developer and any

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	subcontractor of the Developer, for liability to any third party.
c. Professional Indemnity Insurance	N/A
d. Workers Compensation Insurance	As required by law.
e. Other insurance	As required by law.
21. **Council Contact for Notices**	**Postal Address**: 63 Elgin Street, Gunnedah NSW 2380] **Email**: council@infogunnedah.com.au **Telephone**: 02 6740 2100 **Representative**: The General Manager
22. **Developer Contact for Notices**	**Postal Address**: [redacted] **Email**: **Telephone**: **Representative**: Jarad Ewing
23. **Review Period**	Each period of 3 years commencing on the commencement of this Deed.
24. **Costs of Deed**	$5,000.

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Schedule 2: Development Contributions Table

COLUMN 1 Item No / Details	COLUMN 2 Public Purpose	COLUMN 3 Timing	COLUMN 4 Contribution Value $
A. Monetary Contributions			
1. Gallen Reservoir Water Supply Pump Augmentation	Water Supply	Prior to the issuing of the first subdivision works certificate in respect of any part of the Development.	$250,000.00
2.			
3.			
B. Dedication Land			
1.			
2.			
3.			
C. Developer Works			
1.			
2.			
3.			
D. Other material public benefits			
1.			
2.			

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3.			

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Schedule 3: Dedication Land Plan

N/A

Schedule 4: Developer Works Location Plan

N/A

Schedule 5: Developer Works Plans and Drawings

N/A

Schedule 6: Developer Works Provisions

Deed not Construction Contract

1 The Parties acknowledge and agree that this Deed is not a Construction Contract between the Council and the Developer.

Developer Works before execution of Deed

2 This Deed applies to any Developer Works that occurred before the Deed was executed.

Approved persons

3 The Developer is to design, construct, supervise, and test the Developer Works using Approved Persons.

4 Where the Developer proposes to substitute or add an Approved Person, the Developer must notify the Council in writing, and provide details of the new Approved Person who is to be engaged from in relation to the Developer Works.

5 The Council may, in its reasonable discretion, notify the Developer that a new Approved Person notified under clause 4 is not to be engaged in relation to the Developer Works, and the Developer must promptly take such action as is necessary to ensure that the person does not continue to be engaged in relation to the Developer Works.

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Developer to procure compliance

6 The Developer is to provide every Approved Person engaged by it in relation to the Developer Works with a copy of this Deed executed by both Parties and procure their compliance with the relevant requirements of this Deed.

Requirement for Construction Contract

7 The Developer must enter into a Construction Contract with its Contractor for the construction of the Developer Works before any construction work occurs.

8 The Developer must provide the Council with a copy of the Construction Contract upon receipt of a written request by the Council.

9 The Developer must obtain the approval of the Council to any change to the Contractor, which approval the Council may not unreasonably withhold.

General obligations relating to Developer Works

10 The Developer is to provide the Developer Works:

10.1 in the location or locations shown on the Developer Works Location Plan,

10.2 in accordance with the Developer Works Plans and Drawings,

10.3 by the Practical Completion Date, and

10.4 otherwise in accordance with this Deed.

11 The Developer is to provide and complete the Developer Works in a good and workmanlike manner having regard to the intended purpose of the Developer Works and in accordance with:

11.1 all applicable laws,

11.2 any Approval required by any law relating to the provision of the Developer Works, and

11.3 the lawful requirements of any Authority.

12 The Developer is to ensure that anything necessary for the proper performance of its obligations under this Deed relating to the provision of the Developer Works is supplied or made available for that purpose.

Warranties relating to Developer Works

13 The Developer warrants to the Council that:

13.1 it has obtained all Approvals and has complied with all laws and applicable industry standards in relation to the Developer Works,

13.2 it accepts that, if any aspect of the Developer Works do not comply this Deed, the Council is entitled to require the Developer to cease the Developer Works and to pursue its rights and remedies relating to the non-compliance under this Deed and, subject to this Deed, at law or in equity,

13.3 the Developer Works, when completed, are to be fit for purpose,

13.4 only Approved Persons are to be engaged in relation to the Developer Works.

14 The Developer is to procure in favour of the Council from the appropriate Approved Person engaged in relation to the Developer Works, any warranty reasonably

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required by the Council relating to the design, construction, supervision, inspection, testing or certification of the Developer Works.

Ownership & care of Developer Works

15 The Developer owns, and is responsible for care of the Developer Works, and bears all risk and liability in connection with the Developer Works, until the Council gives the Developer a Transfer of Ownership Notice in relation to the Developer Works.

Work health & safety

16 The Developer acknowledges that it is the Principal Contractor under WHS Law for the Developer Works unless and until such time that:

16.1 the Developer engages the Contractor to construct the Developer Works, or

16.2 engages another person to be the Principal Contractor for the Developer Works,

and authorises the person to have management or control of the workplace relating to the Developer Works and to discharge the duties of a Principal Contractor under WHS Law.

17 For the purpose of the Developer's compliance with its obligations under clause 16, the Council:

17.1 acknowledges that the Developer (or the Contractor, where appropriate) is the person with management and control of the relevant works area for the purpose of Part 2 of the *Work Health and Safety Act 2011* (NSW); and

17.2 authorises the Developer (or the Contractor, where appropriate) to exercise authority of the Council necessary to enable the Developer to discharge its obligations under clause 16.

18 If the Developer at any time terminates the engagement of the Contractor, or terminates its authority for the Contractor or other person referred to in clause 16 to be the Principal Contractor for the Developer Works, the Developer becomes the Principal Contractor until such time as a new person is appointed as Contractor or to otherwise be the Principal Contractor for the Developer Works.

19 The Developer is to use its best endeavours to ensure that all persons involved in the Developer Works comply with relevant WHS Law and procedures, including but not limited to:

19.1 following published government and industry WHS guidelines,

19.2 providing WHS induction training,

19.3 keeping and regularly updating WHS records,

19.4 preparing and maintaining an WHS management plan,

19.5 preparing a Project Safety Plan that details safety strategies, including how persons must act to comply with WHS Law,

19.6 providing safe work method statements for all tasks and ensuring they are complied with,

19.7 directing staff to take corrective action or stop work if they are not complying with the method statements or WHS Law,

19.8 identifying hazards and assessing risks using due diligence,

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19.9 eliminating or controlling risks in line with WorkCover requirements using due diligence,

19.10 reviewing risk assessments and controlling measures,

19.11 providing information to employers and contractors about WHS,

19.12 documenting site-specific safety procedures.

20 The Developer is to use its best endeavours to ensure that:

20.1 the Council can audit, inspect and test the Developer Works without breaching WHS Law, and

20.2 the Council can access and use the Developer Works without breaching WHS Law.

21 The Developer is to promptly inform the Council of any incident occurring in relation to the Developer Works where a person is injured or otherwise exposed to a risk to his or her health or safety, including, but not limited to, an incident which is required to be reported to WorkCover.

Accidents & dangerous occurrences

22 The Developer is to notify WorkCover and the Council, as soon as it becomes aware of any serious accident or dangerous occurrence relating to the Developer Works.

23 Within a further 7 days, the Developer must formally notify or procure the notification of WorkCover of the accident or occurrence in accordance with the WHS Law, using any prescribed form.

24 The Developer must give to the Council a copy of all information and documents that have been provided to WorkCover relating to the accident or occurrence.

25 The Developer must also give to the Council, if requested by the Council, a written report relating to the accident or occurrence in the form specified by the Council.

26 The Developer must cooperate with WorkCover and the Council if the accident or occurrence is investigated by Work Cover or the Council.

27 The Developer must immediately give the Council a copy of any improvement or prohibition notices that WorkCover issues in relation to the Developer Works.

Design of Developer Works

28 Clauses 28 - 35 apply if and to the extent that Schedule 5 does not contain Developer Works Plans and Drawings for the Developer Works or any part.

29 The Developer may not commence construction of the Developer Works unless the Developer Works are designed and approved in accordance with this Deed.

30 Before commencing the design of the Developer Works, the Developer is to request the Council to provide the Developer with the Council's design requirements for the works.

31 Upon receipt of the Developer's request, the Council may:

31.1 initially request the Developer to provide a written proposal concerning the design of the Developer Works, including preliminary concept designs, to assist Council in determining and notifying the Developer of its requirements, and subsequently request the Developer to submit the plans and drawings of the Developer Works to the Council for approval, or

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31.2 request the Developer to submit the plans and drawings of the works to the Council for approval.

32 The Council may reasonably require the Developer to make any change to the plans and drawings of the Developer Works that it reasonably considers necessary or desirable as a precondition to approving the plans and drawings, and the Developer is to make any such change.

33 The Council is to inform the Developer in writing when it approves the plans and drawings of the Developer Works.

34 The Parties are to ensure that the reference to the plans and drawings approved by the Council under are included in Schedule 5 without delay after that approval is given.

35 The Developer is not to make any application for any Approval relating to the Developer Works unless the Council approved the plans and drawings of the Developer Works under this Deed.

Variations to approved Developer Works & Costs

36 The Developer Works may be varied by agreement in writing between the Parties, acting reasonably, without the necessity for an amendment to this Deed.

37 The Party seeking the variation is to make a written request to the other Party accompanied by such information and supporting documents as is reasonably necessary to enable the other Party to properly consider the request.

38 The Party to whom the request is made is not to unreasonably delay, or withhold its Approval to, the request.

39 The Party who seeks the variation of the Developer Works must meet the costs of the variation, unless the other Party otherwise agrees.

Developer's obligations before construction commencement

40 Not less than 10 business days before the Developer commences construction of any of the Developer Works specified in Part C of Schedule 2 of this Deed, the Developer is to give the Council written notice of its intention to do so accompanied by:

40.1 a copy of all approved plans and drawings for the Developer Works so specified in electronic and paper format, and

40.2 a list of all Approved Persons and their contact details.

41 The Developer is to organise and conduct a pre-start meeting with Council personnel before starting the construction of a Developer Work specified in Part C of Schedule 2 of this Deed.

Protection of people, property & utilities

42 The Developer is to use all reasonable endeavours to ensure that, in providing the Developer Works:

42.1 all necessary measures are taken to protect people and property,

42.2 unnecessary interference with the passage of people and vehicles is avoided, and

42.3 nuisances and unreasonable noise and disturbances are prevented.

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43 The Developer is not to obstruct, interfere with, impair or damage any public road, public footpath, public cycleway or other public thoroughfare, or any pipe, conduit, drain, watercourse or other public utility or service on any land in connection with the Developer Works unless authorised in writing by the Council or any relevant Authority.

Damage to assets & property

44 The Developer must immediately notify the Council in writing of any loss or damage that occurs in respect of a Council asset of which it becomes aware while performing the Developer Works.

45 The Developer must replace or fix any Council asset the Developer loses or damages while performing the Developer Works in accordance with any reasonable requirements of the Council.

46 If an audit, inspection or test of the Developer Works shows that:

46.1 the Developer Works do not conform to the location, design, specifications, materials or finishes approved by the Council under this Deed, or

46.2 damage has occurred to a Council asset or the property of another person in connection with the Developer Works,

the Council may give the Developer a notice in writing requiring it to take corrective action to bring the Developer Works into conformity or repair the damage, as the case requires.

47 Without limiting any other remedies available to the Council under this Deed, if the Developer does not comply with the Council's requirements under clauses 46-52, the Council may take the action required of the Developer and recover the Council's costs of so doing from the Developer.

Entry onto Land

48 The Developer is responsible for obtaining all necessary rights to lawfully enter, occupy, and provide the Developer Works on Other Land.

49 Upon receiving reasonable prior written notice from the Developer, the Council is to allow the Developer and the Approved Persons, to enter, occupy, and use Council owned or controlled land specified in the notice at any reasonable time if the occupation or use of the land by the Developer and the Approved Persons is reasonably necessary for the Developer Works.

50 The Council is not required to allow the Developer to enter, occupy and use any Council owned land that is used for public purposes unless and until the Developer has paid any applicable fee or rent, as approved by the Council, for that purpose,

51 Upon receiving reasonable prior notice from the Council, the Developer is to provide the Council with safe and unhindered access at any reasonable time to any land on which the Developer Works are being, or have been, provided.

52 The Council must comply with the Developer's reasonable safety requirements while on any land on which the Developer Works are being provided.

Audit, inspection, testing of Developer Works

53 The Council may undertake an audit, inspection or test of the Developer Works at any reasonable time for any purpose related to this Deed upon giving reasonable prior notice to the Developer.

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54 The Developer is to provide the Council with any assistance that is reasonably required by the Council to enable the Council to undertake any audit, inspection or test of the Developer Works.

55 If an audit, inspection or test reasonably shows that particular action must be taken in relation to the Developer Works, the Developer is to:

55.1 take the action in the manner, and within the time, the Council reasonably requires, and

55.2 provide evidence to the Council that the action has been taken.

56 If an audit, inspection or test shows that the Developer Works have not been provided in accordance with this Deed, the Developer is to pay any Costs incurred by the Council in connection with the audit, inspection or test.

57 If the Council reasonably decides that a further and more detailed audit, inspection or test of the Developer Works is required, the Council may determine an approved fee in that regard and the Developer is to pay to the Council the fee so approved.

Access to information & records

58 The Council may make a written request to the Developer:

58.1 to provide information to the Council concerning the Developer Works,

58.2 to allow the Council to inspect the Developer's records concerning the Developer Works, including by giving the Council access to premises owned, occupied or controlled by the Developer for that purpose.

59 The Developer is to comply with any such request made by the Council not later than 15 business days after the Council makes the request.

Practical Completion of Developer Works

60 The Developer is to use all reasonable endeavours to ensure that the whole of the Developer Works is the subject of one or more Practical Completion Certificates by not later than the Practical Completion Date.

61 The Developer may make a written request ('**Developer's Request**') to the Council to issue a Practical Completion Certificate for the Developer Works or any part of the Developer Works by not later than the Practical Completion Date or such later date agreed in writing between the Parties.

62 The Developer's Request is to be accompanied by the following information:

62.1 a Works-as-Executed Plan of the Developer's Works to which the Developer's Request relates, and

62.2 all technical data relating to those Works, including but not limited to, geotechnical testing, structural certificates, CCTV footage and material certifications.

63 Upon receipt of the Developer's Request, the Council is to inspect the relevant Developer Works in the presence of a representative of the Developer at a time reasonably agreed between the Parties that is not later than 14 days after the Council receives the request.

64 As a precondition to issuing a Practical Completion Certificate, the Council may direct the Developer in writing to complete, Rectify or repair any specified part of the Developer Works the subject of the Developer's Request within a period specified in

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the direction in order to bring the Developer Works into conformity with this Deed or any Approval.

65 The Developer is to promptly comply with any such direction given by the Council.

66 The Council may undertake more than one inspection and issue more than one direction to the Developer in order to be satisfied that a Practical Completion Certificate may be issued for the Developer Works the subject of the Developer's Request.

67 The Council is to promptly issue a Practical Completion Certificate for the Developer Works the subject of the Developer's Request when it is reasonably satisfied that no aspect of the relevant Developer Works reasonably requires completion, rectification or repair.

Maintenance of Developer Works

68 The Developer is to Maintain the Developer Works during the Maintenance Period.

69 The Council is to permit the Developer to enter any land owned or controlled by the Council to enable the Developer to Maintain the Developer Works during the Maintenance Period.

Rectification of Defects

70 The Council may give the Developer a Rectification Notice during the Defects Liability Period.

71 The Developer is to comply with a Rectification Notice according to the terms of the Rectification Notice and to the reasonable satisfaction of the Council.

72 The Council is to do such things as are reasonably necessary to enable the Developer to comply with a Rectification Notice given by the Council.

Final Completion of Developer Works

73 The Developer is to use all reasonable endeavours to ensure that the whole of the Developer Works is the subject of one or more Final Completion Certificates at the end of Defects Liability Period.

74 The Developer may make a written request ('**Developer's Request**') to the Council to issue a Final Completion Certificate for the Developer Works or any part of the Developer Works at the end of Defects Liability Period.

75 The Developer's Request is to be accompanied by a full Works-As-Executed-Plan for the Developer Works for which the Final Completion Certificate is sought in a format agreed to by the Council.

76 Upon receipt of the Developer's Request, the Council is to inspect the relevant Developer Works in the presence of a representative of the Developer at a time reasonably agreed between the Parties that is not later than 14 days after the Council receives the request.

77 As a precondition to issuing a Final Completion Certificate, the Council may direct the Developer in writing to complete, Rectify, repair or Maintain any specified part of the Developer Works the subject of the Developer's Request within a period specified in the direction in order to bring the Developer Works into conformity with this Deed or any Approval.

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78 The Developer is to promptly comply with any such direction given by the Council.

79 The Council may undertake more than one inspection and issue more than one direction to the Developer in order to be satisfied that a Final Completion Certificate may be issued for the Developer Works the subject of the Developer's Request.

80 The Council is to promptly issue a Final Completion Certificate for the Developer Works the subject of the Developer's Request when it is reasonably satisfied that no aspect of the relevant Developer Works reasonably requires completion, rectification or repair.

Copyright in Works-As-Executed Plan

81 The Developer, being the copyright owner in the Works-As-Executed Plan, assigns the copyright in the Works-As-Executed Plan to the Council free of Cost to the Council.

82 If the Developer is not the copyright owner of the Work-As-Executed Plan, the Developer is to promptly procure the assignment of the copyright of the Works-As-Executed Plan to the Council free of cost to the Council.

Transfer of Ownership of Developer Works

83 At any time after the Council issues a Practical Completion Certificate for Developer Works to the Developer, the Council may issue a Transfer of Ownership Notice to the Developer for those Developer Works.

84 The Developer Works the subject of a Transfer of Ownership Notice vest in the Council on the vesting date stated in the Transfer of Ownership Notice.

Transfer of land on which Developer Works Constructed

85 Unless otherwise specified in this Deed or agreed in writing between the Parties:

85.1 the Developer is to do all things necessary to dedicate or procure the dedication to the Council of the land on which Developer Works the subject of a Transfer of Ownership Notice are constructed,

85.2 the dedication is to occur by not later than the vesting date stated in the Transfer of Ownership Notice,

85.3 the dedication is to be free of cost to the Council.

86 Land on which Developer Works the subject of a Transfer of Ownership Notice are constructed that is required to be dedicated to the Council under clause 85 is Dedication Land for the purposes of this Deed.

Easements, covenants, etc.

86.1 The Developer must create, or procure the creation of, any easement or covenant or any other instrument benefitting the Council that is reasonably required by the Council in relation to the Developer Works.

86.2 The Developer is to ensure that any such easement, covenant or other instrument is registered on the title to the relevant land before the vesting date specified in a Transfer of Ownership Notice for such Works.

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86.3 The Costs required to be incurred by the Developer in doing so include, unless otherwise agreed in writing between the Parties, the payment of compensation to any person.

Removal of structures & Equipment

87 When providing the Developer Works on any Council owned or controlled land is completed for the purposes of this Deed, the Developer, without delay, is to:

87.1 remove from the land any structure not comprising or required in connection with the completed Developer Works and make good any damage or disturbance to the land as a result of that removal,

87.2 remove from the land any Equipment and make good any damage or disturbance to the land as a result of that removal, and

87.3 leave the land in a neat and tidy state, clean and free of rubbish.

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Execution

Executed as a Deed

Dated:
10/8/23

Executed by the COUNCIL:

General Manager

Witness

Paige Nies

Name

Executed by 2728 Pty Ltd in accordance with s127(1) of the Corporations Act (Cth) 2001

Director

~~Director~~ / Secretary

Jarad Ewing

Name

Jarad Ewing

Name

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Executed by Ryan Peter Pryde

Ryan Peter Pryde

Witness

KATHRYN STEWART

Witness Name

Executed by Nancy Fay Margaret Williams

Nancy Fay Margaret Williams

Witness

Felicity Stevens

Witness Name

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Appendix: Explanatory Note

(Clause 44)

Environmental Planning and Assessment Regulation 2021

(Section 205)

Draft Planning Agreement

Under s7.4 of the *Environmental Planning and Assessment Act 1979*

Parties

Council **Gunnedah Shire Council** ABN 80 183 655 793 of 63 Elgin Street, Gunnedah NSW 2380

Developer

2728 Pty Ltd of [redacted]
NSW 2380

Ryan Peter Pryde and Nancy Fay Margaret Williams of [redacted]

(together the Developer)

Description of the Land to which the Draft Planning Agreement Applies

170 Bushs Lane Gunnedah (Lot 1 DP 861697) (Lot 1)

210 Bushs Lane Gunnedah (Lots 27 and 28 DP 755474) (Lot 27 and Lot 28)

Description of Proposed Development/Instrument Change

Lot 1 DP861697 - The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-81 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 1.2ha

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Lots 27 and 28 DP 755474- The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-383 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 9,000sqm

Development of the Land facilitated by the Instrument Change, including, but without limiting the generality of same, a subdivision of the Land or any part of it into allotments with a minimum lot size of 1.2ha (Lot 1) and 9,000sqm (Lots 27 and 28).

Description of Development Contributions

Monetary Development Contribution of $250,000 for Gallen Reservoir Water Supply Pump Augmentation.

Summary of Objectives, Nature and Effect of the Draft Planning Agreement

Objectives of Draft Planning Agreement

To provide for forward funding of the Gallen Reservoir Water Supply Pump Augmentation to service the Development

Nature of Draft Planning Agreement

The Draft Planning Agreement is a planning agreement under s7.4 of the *Environmental Planning and Assessment Act 1979*. The Draft Planning Agreement is a voluntary agreement under which Development Contributions (as defined in clause 1.1 of the Draft Planning Agreement) are made by the Developer for various public purposes (as defined in s7.4(3) of the Act)

Effect of the Draft Planning Agreement

The primary effect of the Draft Planning Agreement is to require the payment of the monetary Development Contribution of $250,000 prior to the issuing of the first subdivision works certificate in respect of any part of the Development.

The Draft Planning Agreement also includes provisions to the effect of the following:

- relates to the carrying out of the Development
- does not exclude the application of s7.11, s7.12 or s7.24 of the Act to the Development,
- is to be registered on the title of the Land until the contribution is paid but may be progressively removed from Final Lots,
- imposes restrictions on the Developer transferring any part of the Land other than a Final Lot (unless the Deed is registered on the title of the Land) or assignment the Developer's rights or obligations under the Deed, or novating the Deed,
- otherwise provides for enforcement of the agreement whereby the Developer's interest in the land to be dedicated may be compulsorily acquired

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for $1 if the land to be dedicated is not dedicated as required by the agreement;

- provides two dispute resolution methods for a dispute under the agreement, being expert determination and mediation,
- provides that the agreement is governed by the law of New South Wales, and
- provides that the A New Tax System (Goods and Services Tax) Act 1999 (Cth) applies to the agreement;
- provides for the Council's costs of entering in the agreement and enforcing the agreement are met by the Developer.

Assessment of the Merits of the Draft Planning Agreement

The Planning Purposes Served by the Draft Planning Agreement

To enable the servicing of the Development where such works would not otherwise be able to funded in the short term.

How the Draft Planning Agreement Promotes the Public Interest

Facilitates the orderly and economic development of the Land.

Assessment of the positive or negative impact of the Draft Planning Agreement on the public or relevant section of the public

The impact of the VPA on the public is positive in so far as the Development promotes the public interest and no negative impacts are identified.

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APPENDIX D

PLANNING AGREEMENT

170 & 210 BUSH'S LANE PLANNING AGREEMENT, DEED, GUNNEDAH SHIRE COUNCIL 2728 PTY LTD

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lindsaytaylorlawyers
planning • environment • local government

Deed

170 and 210 Bush's Lane Planning Agreement

Planning Agreement

Under s7.4 of the *Environmental Planning and Assessment Act 1979*

Gunnedah Shire Council

2728 Pty Ltd

Ryan Peter Pryde and Nancy Fay Margaret Williams

Date:

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Regulatory Compliance Tables

Table 1 – Provisions of Act

Act Provision	Requirement	Compliance
S.7.4(1)	**'Planning Authority'**	Council
	'Developer'	Developer
	Person associated with Developer	N/A
	Development Application / Modification Application	See definitions of '*Development Application*' and '*Modification Application*' in clause 1.1 and Item 4.a and 4.b of the VPA Particulars
	Development Contributions	See Part 2 and Development Contributions Table
S.7.4(1), (2)	**Public Purpose**	See Column 2 of the Development Contributions Table
S.7.4(3)(a)	**Land**	See Definition of '*Land*' in clause 1.1 and Item 1 of the VPA Particulars
S.7.4(3)(b)(i)	**Instrument Change**	See definition of '*Instrument Change*' in clause 1.1 and Item 3 of the VPA Particulars
S.7.4(3)(b)(ii)	**Development**	See definition of '*Development*' in clause 1.1 and Item 2 of the VPA Particulars
S.7.4(3)(c)	**Details of Developer's Provision**	See Development Contributions Table
S.7.4(3)(d)	**Whether s7.11, s7.12 and s7.24 of the Act Apply to the Development**	See clauses 8.1, 8.3 and 8.3 and Item 7.a, 7.c and 7.d of the VPA Particulars
S.7.4(3)(e)	**Whether benefits under Deed are or are not to be taken into consideration in determining a Development Contribution under s7.11**	See clause 8.2 and Item 7.b of the VPA Particulars

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S.7.4(3)(f)	**Mechanism for the Resolution of Disputes**	See Part 3
S.7.4(3)(g)	**Enforcement of the Agreement by a Suitable Means in the Event of Breach by the Developer**	See Part 4 and Items 15–19 of the VPA Particulars
S.7.4 (10)	**Conformity of Agreement with Act, Environmental Planning Instruments, & Development Consents Applying to the Land**	Yes
S.7.5	**Public Notice & Public Inspection of Draft Agreement**	Yes
S.7.6	**Registration**	See Part 5
S.6.15(1)(d)	**If the Development involves the subdivision of land, does this Agreement impose requirements that are required to be complied with before a subdivision certificate is issued?**	No

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Table 2 – Provisions of Regulation

Regulation Provision	Requirement	Compliance
S.203(1)	**Form & Subject-Matter**	Yes
S.203(7)	**Secretary's Practice Note**	Yes
S.204	**Public Notice & Public Inspection of Draft Agreement**	Yes
S.205	**Explanatory Note**	See Appendix
Ss.21, 34 **Environmental Planning and Assessment (Development Certification and Fire Safety) Regulation 2021**	**If the Development involves building work or subdivision work, does the Agreement specify requirements that are required to be complied with before a construction certificate or subdivision works certificate for the work is issued?**	Yes, see: • See Schedule 2, Item A1

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Parties

Council **Gunnedah Shire Council** ABN 80 183 655 793of 63 Elgin Street, Gunnedah NSW 2380

Developer

2728 Pty Ltd of [redacted]

Ryan Peter Pryde and Nancy Fay Margaret Williams [redacted]

(together the Developer)

Background

[redacted]

C The Developer seeks the Instrument Change to facilitate the Development.

D The Developer has agreed to make Development Contributions towards the early augmentation by the Council of the Gallen Reservoir water supply pumping infrastructure so as to facilitate satisfaction of clause 6.5 of the *Gunnedah Local Environmental Plan, 2012* with respect to the Development.

Operative provisions

Part 1 - Preliminary

1 Definitions & Interpretation

Definitions

1.1 In this Deed, the words and phrases appearing in Column 1 of the following table have the meaning set out in Column 2 of that table corresponding to those words or phrases except in so far as the context or subject-matter otherwise indicates or requires:

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Table

Column 1 Word or phrase	Column 2 Meaning
Act	means the *Environmental Planning and Assessment Act 1979* (NSW).
Applicable Contributions Plan	means the contributions plan (within the meaning of the Act) specified in Item 6.a) of the VPA Particulars as amended or substituted from time to time.
Applicable DSP	means the DSP specified in Item 6.b of the VPA Particulars as amended or substituted from time to time.
Approval	includes approval, consent, licence, permission or the like.
Approved Person	means a person reasonably approved by the Council to undertake design, construction, supervision, inspection, testing or certification of the Developer Works because of the suitability of their qualifications, skills and experience in the Council's reasonable opinion.
Authority	means the Commonwealth or New South Wales government, a Minister of the Crown, a government department, a public authority established by or under any Act, a council or county council constituted under the *Local Government Act 1993* (NSW), or a person or body exercising functions under any Act including a commission, panel, court, tribunal and the like.
Background Intellectual Property	means Intellectual Property that: (a) relates to the Developer Works, (b) exists at the date of this Deed or is later created but not as a result of performing this Deed, (c) does not belong to a third party.
Bank Guarantee	means an irrevocable and unconditional undertaking without any expiry or end date in favour of the Council to pay an amount or amounts of money to the Council on demand issued by: (a) one of the following trading banks:

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(i) Australia and New Zealand Banking Group Limited,

(ii) Commonwealth Bank of Australia,

(iii) Macquarie Bank Limited,

(iv) National Australia Bank Limited,

(v) St George Bank Limited,

(vi) Westpac Banking Corporation, or

(b) any other financial institution approved by the Council in its absolute discretion.

Charge	means the charge referred to in clause 0.
Charge Land	means the land specified or described in Item 15 of the VPA Particulars.
Claim	includes a claim, demand, remedy, suit, injury, damage, loss, Cost, liability, action, proceeding or right of action.
Clearance Certificate	means a clearance certificate issued by the Commissioner for Taxation under paragraph 14-220 of Schedule 1 of the *Taxation Administration Act 1953* (Cth).
CLM Act	means the *Contaminated Land Management Act 1997* (NSW).
Construction Certificate	has the same meaning as in the Act.
Construction Contract	means a contract or arrangement entered into between the Developer as principal and another person under which the other person undertakes to provide Work required by this Deed, or to supply related goods and services, for the Developer.
Contamination	has the same meaning as in the CLM Act.
Contractor	means the contractor under the Construction Contract.
Contribution Value	in relation to an Item specified in the Development Contributions Table means the $ amount specified in Column 4 of that Table corresponding to the Item.
Cost	means a cost, charge, expense, outgoing, payment, fee and other expenditure of any nature.

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Council Developer Works Contribution Amount	means the $ amount or amounts specified in Item 9 of the VPA Particulars in relation to all or specified Developer Works.
Council Land Dedication Contribution Amount	means the $ amount specified in Item 8 of the VPA Particulars in relation to all or specified Dedication Land.
CPI	means the '*Consumer Price Index – Sydney All Groups*' published by the Australian Bureau of Statistics.
Dedication Land	means land that is required to be dedicated to the Council free of cost under this Deed irrespective of whether the dedication gives rise to or is otherwise is taken into consideration in determining the Development Contribution Surplus Credit.
Dedication Land Plan	means the plan contained in Schedule 3 showing the location of the Dedication Land.
Deed	means this Deed and includes any schedules, annexures and appendices to this Deed.
Defect	means anything that adversely affects, or is likely to adversely affect, the appearance, structural integrity, functionality or use or enjoyment of a Work or any part of a Work.
Defects Liability Period	means, in relation to the whole or any specified part of the Developer Works, the period specified in Item 13 of the VPA Particulars commencing on the day immediately after Practical Completion is issued by the Council.
Defects Liability Security	means the $ amount of Security specified in Item 17 of the VPA Particulars indexed in accordance with the Indexation Method.
Developer Works	means Works that the Developer is required to provide under this Deed.
Developer Works Location Plan	means the plan contained in Schedule 4 showing the location of the Developer Works.
Developer Works Plans & Drawings	means the detailed plans and drawings for the Developer Works approved by the Council referred to in Schedule 5.

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Developer Works Provisions	means the provisions contained in Schedule 6.
Development	means the development specified or described in Item 2 of the VPA Particulars.
Development Application	means the development application within the meaning of the Act specified or described in Item 4.a of the VPA Particulars.
Applicable Development Consent	means the development consent specified or described in Item 5 of the VPA Particulars or granted in respect of the Development.
Development Contribution	means the dedication of land free of cost, a monetary contribution, the provision of any other material public benefit including but not limited to the provision of Works, or any combination of them.
Development Contribution Credit	means the $ amount specified in Item 10 of the VPA Particulars
Development Contribution Surplus Credit	means the $ amount specified in Item 11 of the VPA Particulars.
Development Contributions Table	means the table contained in Schedule 2.
Development Servicing Plan (DSP)	means a 'DSP document' within the meaning of the '*2016 Developer Charges Guidelines for Water Supply, Sewerage and Stormwater*' issued by the Minister for Lands and Water pursuant to section 306(3)(c) of the *Water Management Act 2000* (NSW).
Development Servicing Contribution	means a requirement to pay a specified amount to the Council as required by way of precondition to the using of a certificate of compliance under s306 of the *Water Management Act 2000* or otherwise any fee for service in respect of development servicing works that may be imposed in respect of development.
Dispute	means a dispute or difference between the Parties under or in relation to this Deed.

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ELNO	has the meaning given to that term in the Participation Rules.
Equipment	means any equipment, apparatus, vehicle or other equipment or thing to be used by or on behalf of the Developer in connection with the performance of its obligations under this Deed.
Final Completion Certificate	means a certificate in writing issued by the Council to the Developer to effect that, in the reasonable opinion of the Council, the Developer Works to which the certificate relates have been completed by the Developer in accordance with this Deed.
Final Lot	means a lot created in the Development for separate residential occupation and disposition or a lot of a kind or created for a purpose that is otherwise agreed by the Parties, not being a lot created by a subdivision of the Land: (a) that is to be dedicated or otherwise transferred to the Council, or (b) on which is situated a dwelling-house that was in existence on the date of this Deed.
Force Majeure Event	means an earthquake, cyclone, fire, riot or serious civil commotion, sabotage, act of a public enemy, act of God (excluding storms), war, revolution, radioactive contamination or flood, the effects of which cannot be prevented by taking those steps a prudent and competent person would take.
Foreign Resident Capital Gains Withholding Amount	mean the amount a purchaser is required to pay to the Commissioner for Taxation under paragraph 14-200 of the *Taxation Administration Act 1953 (Cth).*
General Security	means a Bank Guarantee or a bond or other form of security on terms reasonably satisfactory to the Council in the amount specified in Item 16.a of the VPA Particulars indexed in accordance with the method of indexation specified in 16.b of the VPA Particulars.
GST	has the same meaning as in the GST Law.
GST Law	has the same meaning as in *A New Tax System (Goods and Services Tax) Act 1999* (Cth) and any other Act or regulation relating to the imposition or administration of the GST.

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Instrument Change	means the change to the environmental planning instrument specified or described in Item 3 of the VPA Particulars.
Insurances	means the insurances specified in Item 20 of the VPA Particulars and such other insurances required by law in relation to the Developer Works.
Intellectual Property	means all copyright (including moral rights), patents, trademarks, designs, confidential information, circuit layouts, data and any other rights from intellectual activity in the industrial, scientific, literary and artistic fields recognised in domestic law anywhere in the world.
Item	means a numbered item appearing in the VPA Particulars or the Development Contributions Table.
Just Terms Act	means the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW).
Land	means the land specified or described in Item 1 of the VPA Particulars.
Maintain	in relation to Developer Works, means keep in a good state of repair and working order, and includes repair of any damage to the Works.
Maintenance Period	in relation to Developer Works means the period specified in Item 14 of the VPA Particulars commencing on the date the Council issues a Transfer of Ownership Notice.
Maintenance Security	means the $ amount of Security specified in Item 18 of the VPA Particulars indexed in accordance with the Indexation Method.
Modification Application	means the application to modify the Applicable Development Consent specified or described in Item 4.b of the VPA Particulars.
N/A	means Not Applicable
Occupation Certificate	has the same meaning as in the Act.
Other Land	means land owned or occupied by a person other than the Developer or the Council to which entry and access is needed by the Developer to perform this Deed.

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Participation Rules	means the participation rules as determined by the *Electronic Conveyancing National Law* as set out in the *Electronic Conveyancing (Adoption of National Law) Act 2012* (NSW).
Party	means a party to this Deed.
PEXA	means Property Exchange Australia Ltd.
Practical Completion	in relation to the Developer Works or a specified part of the Developer Works occurs when the Council has issued a Practical Completion Certificate for the Developer Works or the part.
Practical Completion Certificate	means a certificate issued by the Council to the Developer to the effect that, in the reasonable opinion of the Council, the Developer Works or a specified part of the Developer Works are substantially complete and any incomplete part or Defect is of a minor nature.
Practical Completion Date	means: (a) the date specified in Item 12 of the VPA Particulars in relation to all of the Developer Works, or (b) the dates specified in Item 12 of the VPA Particulars in relation to the Developer Works in a particular Stage or particular Developer Works.
Principal Contractor	means the Person defined in as the Principal Contractor under the *Work Health and Safety Act 2011* (NSW) or *Work Health and Safety Regulation 2011* (NSW) or an equivalent under Commonwealth work health and safety laws.
Rectification Notice	means a notice in writing: (a) identifying the nature and extent of a Defect or incomplete Work, and (b) specifying the works or actions that are required to Rectify the Defect or incomplete Work, and (c) specifying the date by which or the period within which the Defect or incomplete Work is to be rectified, which date or period must not be unreasonable having regard to the nature of the Defect or incomplete Work.
Rectify	means rectify, remedy or correct.

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Regulation	means the *Environmental Planning and Assessment Regulation 2021* (NSW).
Review Period	means the period specified in Item 23 of the VPA Particulars.
Section 7.11 Contribution	means a monetary contribution payable to the Council under s7.11 of the Act pursuant to the Applicable Development Consent.
Development Contribution Credit	means the $ amount or amounts specified in Item 10 of the VPA Particulars
Site Audit Report	has the same meaning as in the CLM Act.
Site Audit Statement	has the same meaning as in the CLM Act.
Stage	means a stage of the Development approved by the Applicable Development Consent or otherwise approved in writing by the Council for the purposes of this Deed.
Subdivision Certificate	has the same meaning as in the Act.
Subdivision Works Certificate	has the same meaning as in the Act.
Technical Data	means all technical know-how and information in material form, including manuals, designs, standards, specifications, reports, models, plans, drawings, calculations, software, source code and test results.
Third Party Intellectual Property	means Intellectual Property relating to the Developer Works that is owned by a person other than the Council or the Developer.
Transfer of Ownership Notice	means a notice issued by the Council to the Developer stating that Developer Works the subject of a Practical Completion Certificate vest in the Council on a specified date being not sooner than 14 days after the notice is issued.
VPA Particulars	means the information contained in Schedule 1.
WHS	means work health and safety.

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WHS Law	means the *Work Health and Safety Act 2011* (NSW) and *Work Health and Safety Regulation 2011* (NSW).
Work	means the physical result of carrying out work in, on, over or under land.
Works-As-Executed Plan	means detailed plans and specifications of Developer Works carried out by the Developer.

Interpretation

1.2 In the interpretation of this Deed, the following provisions apply unless the context otherwise requires:

1.2.1 Headings are inserted for convenience only and do not affect the interpretation of this Deed.

1.2.2 A reference in this Deed to a business day means a day other than a Saturday or Sunday or a public holiday on which banks are open for business generally in Sydney.

1.2.3 If the day on which any act, matter or thing is to be done under this Deed is not a business day, the act, matter or thing must be done on the next business day.

1.2.4 A reference in this Deed to dollars or $ means Australian dollars and all amounts payable under this Deed are payable in Australian dollars.

1.2.5 A reference in this Deed to a $ value relating to a Development Contribution is a reference to the value exclusive of GST.

1.2.6 A reference in this Deed to any law, legislation or legislative provision includes any statutory modification, amendment or re-enactment, and any subordinate legislation or regulations issued under that legislation or legislative provision.

1.2.7 A reference in this Deed to any agreement, deed or document is to that agreement, deed or document as amended, novated, supplemented or replaced.

1.2.8 A reference to a clause, part, schedule or attachment is a reference to a clause, part, schedule or attachment of or to this Deed.

1.2.9 An expression importing a natural person includes any company, trust, partnership, joint venture, association, body corporate or governmental agency.

1.2.10 Where a word or phrase is given a defined meaning, another part of speech or other grammatical form in respect of that word or phrase has a corresponding meaning.

1.2.11 A word which denotes the singular denotes the plural, a word which denotes the plural denotes the singular, and a reference to any gender denotes the other genders.

1.2.12 References to the word 'include' or 'including' are to be construed without limitation.

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1.2.13 A reference to this Deed includes the agreement recorded in this Deed.

1.2.14 A reference to a Party to this Deed includes a reference to the employees, agents and contractors of the Party, the Party's successors and assigns.

1.2.15 A reference to 'dedicate' or 'dedication' in relation to land is a reference to dedicate or dedication free of cost.

1.2.16 Any schedules, appendices and attachments form part of this Deed.

1.2.17 Notes appearing in this Deed are operative provisions of this Deed.

2 Status of this Deed

2.1 This Deed is a planning agreement within the meaning of s7.4(1) of the Act.

3 Commencement

3.1 This Deed commences and has force and effect on and from the date when the Parties have:

3.1.1 both executed the same copy of this Deed, or

3.1.2 each executed separate counterparts of this Deed and exchanged the counterparts.

3.2 The Parties are to insert the date when this Deed commences on the front page and on the execution page.

4 Application of this Deed

4.1 This Deed applies to the Land and to the Development.

4.2 The Developer acknowledges and agrees that the Applicable Development Consent may be granted subject to a condition requiring this Deed to be complied with in connection with the carrying out of the Development and the Developer is not to object to, or seek a review of, of or appeal against the imposition of such a condition.

5 Warranties

5.1 The Parties warrant to each other that they:

5.1.1 have full capacity to enter into this Deed, and

5.1.2 are able to fully comply with their obligations under this Deed.

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6 Further agreements

6.1 The Parties may, at any time and from time to time, enter into agreements relating to the subject-matter of this Deed that are not inconsistent with this Deed for the purpose of implementing this Deed.

7 Surrender of right of appeal, etc.

7.1 The Developer is not to commence or maintain, or to cause or procure the commencement or maintenance, of any proceedings in any court or tribunal or similar body appealing against, or questioning the validity of this Deed, or an Approval relating to the Development in so far as the subject-matter of the proceedings relates to this Deed.

8 Application of s7.11, s7.12 and s7.24 of the Act to the Development

Section 7.11 of the Act

8.1 Item 7.a of the VPA Particulars states whether this Deed excludes (wholly or in part) the application of section 7.11 of the Act to the Development.

8.2 If Item 7.a of the VPA Particulars states that this Deed does not wholly exclude the application of section 7.11 of the Act to the Development, Item 7.b of the VPA Particulars states whether the benefits provided by the Developer under this Deed are to be taken into consideration when determining a Development Contribution under section 7.11 relating to the Development.

Section 7.12 of the Act

8.3 Item 7.c of the VPA Particulars states whether this Deed excludes (wholly or in part) the application of section 7.11 of the Act to the Development.

Section 7.24 of the Act

8.4 Item 7.d of the VPA Particulars states whether this Deed excludes (wholly or in part) the application of s7.24 to the Development.

Part 2 – Development Contributions

9 Provision of Development Contributions

Development Contributions

9.1 The Developer is to make Development Contributions to the Council in accordance with the Development Contributions Table and any other

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provision of this Deed requiring the Developer to make Development Contributions.

Effect of modification of Applicable Development Consent

9.2 If:

9.2.1 Part A of the Development Contributions Table specifies that monetary Development Contributions are payable in respect of the Development per dwelling or per Final Lot or for a specified number of dwellings or Final Lots, and

9.2.2 After this Deed is entered into the Applicable Development Consent is modified under the Act to allow for additional dwellings or Final Lots (or both),

the Developer is to pay monetary Development Contributions to the Council for the additional dwellings or Final Lots (or both) not later than 14 days after the Applicable Development Consent has been modified or such later time as may be agreed in writing between the Parties.

Contribution Values

9.3 The Parties acknowledge and agree that a Contribution Value:

9.3.1 constitutes the agreed value of the public benefit of a Development Contribution required to be made under this Deed irrespective of the cost to the Developer of making the Development Contribution, and

9.3.2 does not serve to define the monetary extent of the Developer's obligation to make the Development Contribution to which the Contribution Value relates.

Application of Development Contributions

9.4 The Council is to apply each Development Contribution made by the Developer under this Deed towards the public purpose for which it is made and otherwise in accordance with this Deed.

Flexibility in application of Development Contributions

9.5 Deleted

Application of Monetary Development Contribution towards Development Servicing Contribution and Repayment of Surplus

9.6 Once the Developer has made the monetary Development Contributions required by this Deed, the Council agrees:

9.6.1 to waive the Developer's liability to make, or not impose, Development Servicing Contributions for water supply in respect of the Development up to the amount of the contribution;

9.6.2 if the amount of the monetary Development Contribution exceeds the liability to make such Development Servicing Contributions for water supply in respect of the Development but for the waiver or non-imposition (**Surplus**), the Council is to pay to the Developer (or their

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nominee) each subsequent Development Servicing Contribution it receives towards water supply in respect of other development, as and when received, until the amount paid to Developer (or nominee) and the amount waived equal the amount of the Development Contribution as indexed under clause 9.6.3.

9.6.3 The balance of the Surplus held by the Council from time to time is to be indexed in accordance with the indexation method contained in the Applicable DSP.

9.6.4 No prior representation by any person obliges the Council to make any payment to the Developer in respect of the Development Contribution other than as required and as specified in this clause.

10 Payment of monetary Development Contributions

10.1 A monetary Development Contribution is made for the purposes of this Deed when the Council receives the full amount of the contribution payable under this Deed in cash or by unendorsed bank cheque or by the deposit by means of electronic funds transfer of cleared funds into a bank account nominated by the Council.

11 Dedication of land

When dedication of land made

11.1 A Development Contribution comprising Dedication Land is dedicated for the purposes of this Deed when:

11.1.1 the Council is given:

(a) a Clearance Certificate that is valid at the time of dedication of the Dedication Land, or

(b) the Foreign Resident Capital Gains Withholding Amount in respect of the Dedication Land, and

11.1.2 One of the following has occurred:

(a) a deposited plan is registered in the register of plans held with the Registrar-General that dedicates the Dedication Land as a public road (including a temporary public road) under the *Roads Act 1993* (NSW) or creates a public reserve or drainage reserve under the *Local Government Act 1993* (NSW), or

(b) the Council is given evidence that a transfer of the Dedication Land to the Council has been effected by means of electronic lodgement and registration through PEXA or another ELNO.

Developer to facilitate dedication

11.2 The Developer is to do all things reasonably necessary to enable registration of the instrument of transfer to occur.

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Dedicated Land to be free of encumbrances

11.3 The Developer is to ensure that Dedication Land is free of all encumbrances and affectations (whether registered or unregistered and including without limitation any charge or liability for rates, taxes and charges) except as otherwise agreed in writing by the Council.

Request by Developer

11.4 If, having used all reasonable endeavours, the Developer cannot ensure that Dedication Land is free from all encumbrances and affectations, the Developer may request that Council agree to accept the land subject to those encumbrances and affectations, but the Council may withhold its agreement in its absolute discretion.

Site Audit Report & Site Audit Statement

11.5 Before dedicating the Dedication Land to the Council, the Developer, at its cost, is to obtain and provide to the Council a Site Audit Report and Site Audit Statement stating that the Dedication Land is suitable for the purpose for which the Dedication Land is required to be dedicated under this Deed without being subject to compliance with an environmental management plan.

Indemnity

11.6 The Developer indemnifies and agrees to keep indemnified the Council against all Claims made against the Council as a result of any Contamination on or emanating from the Dedication Land but only in relation to Contamination that existed on or before the date that the Dedication Land is transferred or dedicated to Council or compulsorily acquired by Council pursuant to this Deed.

Responsibility for Cost of Land Dedication

11.7 The Developer is responsible for meeting all Costs of and incidental to the dedication of the Dedication Land to the Council unless one of both of the following applies:

11.7.1 Item 8 of the VPA Particulars specifies a Council Land Dedication Contribution Amount towards the Cost of all or specified Dedication Land, or

11.7.2 this Deed otherwise expressly provides for a Dedication Land Cost to be met that is not required to be met by the Developer.

Contribution by Council towards Cost of Dedication Land

11.8 If Item 8 of the VPA Particulars specifies a Council Land Dedication Contribution Amount, the Council is to pay that amount to the Developer in accordance with any requirements specified in that Item or otherwise in accordance with a written agreement entered into between the Council and the Developer.

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Caveat by Council

11.9 The Developer acknowledges that the Council has an equitable estate or interest in the Dedication Land entitling the Council, pursuant to section 74F of the *Real Property Act 1900* (NSW), to lodge with the Registrar-General a caveat prohibiting the recording of any dealing affecting the Council's estate or interest in that land.

12 Application of Developer Works Provisions

Application of Developer Works Provisions

12.1 The Developer Works Provisions apply to and in respect of Developer Works required by this Deed if any.

13 Cost of Developer Works

Responsibility for Cost of Developer Works

13.1 The Developer is responsible for meeting all Costs of and incidental to the Developer Works required to be provided under this Deed unless one of both of the following applies:

13.1.1 Item 9 of the VPA Particulars specifies a Council Developer Works Contribution Amount towards the Cost of all or specified Developer Works, or

13.1.2 this Deed otherwise expressly provides for a Developer Works Cost that is not required to be met by the Developer.

Contribution by Council towards Cost of Developer Works

13.2 If Item 9 of the VPA Particulars specifies a Council Developer Works Contribution Amount, the Council is to pay that amount to the Developer in relation to the Developer Works within 14 days after both of the following have occurred:

13.2.1 all of the Developer Works have vested in the Council, and

13.2.2 all land on which the Developer Works have been carried out that is not owned, occupied or otherwise controlled by the Council has been transferred to the Council.

14 Development Contribution Credit

Application of clause

14.1 This clause 14 applies if a Development Contribution Credit is specified in Item 10 of the VPA Particulars.

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Application of Development Contribution Credit

14.2 Pursuant to s7.11(5)(b) of the Act, in consideration of the Developer carrying out the Developer Works and otherwise performing all of its obligations under this Deed, the Section 7.11 Contribution payable by the Developer is to be reduced by the Development Contribution Credit.

15 Development Contribution Surplus Credit

Application of Development Contribution Surplus Credit

15.1 If a Development Contribution Surplus Credit is specified in Item 11 of the VPA Particulars:

15.1.1 the Council is to apply the Development Contribution Surplus Credit, towards the satisfaction of any monetary contributions the Developer is required to pay to the Council under s7.11 of the Act in relation to any development (other than the Development) for which development consent is granted under the Act after this Deed commences, and

15.1.2 the Developer may assign the Development Contribution Surplus Credit or any part of it to any person if the Developer:

(a) obtains the written consent of the Council, which may not be unreasonably withheld, and

(b) enters into a deed with the Council and the transferee of the Monetary Contribution Surplus Credit on terms reasonably satisfactory to the Council.

Indexation of Development Contribution Surplus Credit

15.2 The Development Contribution Surplus Credit is to be indexed from the date of this Deed until the date it is applied in accordance with clause 15.1 in accordance with the indexation method contained in the Applicable Contributions Plan.

Part 3 – Dispute Resolution

16 Dispute Resolution – mediation

Application of clause

16.1 This clause 16 applies to any Dispute arising in connection with this Deed other than a dispute to which clause 17 applies.

When Dispute arises

16.2 Such a Dispute is taken to arise if one Party gives another Party a notice in writing specifying particulars of the Dispute.

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Meeting between Parties

16.3 If a notice is given under clause 16.2, the Parties are to meet within 14 days of the notice in an attempt to resolve the Dispute.

Meditation of Dispute

16.4 If the Dispute is not resolved within a further 28 days, the Parties are to mediate the Dispute in accordance with the Mediation Rules of the Law Society of New South Wales published from time to time and are to request the President of the Law Society to select a mediator.

Exercise of legal rights

16.5 If the Dispute is not resolved by mediation within a further 28 days, or such longer period as may be necessary to allow any mediation process which has been commenced to be completed, then the Parties may exercise their legal rights in relation to the Dispute, including by the commencement of legal proceedings in a court of competent jurisdiction in New South Wales.

Costs

16.6 Each Party is to bear its own costs arising from or in connection with the appointment of a mediator and the mediation.

16.7 The Parties are to share equally the costs of the President, the mediator, and the mediation.

17 Dispute resolution – expert determination

Application of clause

17.1 This clause 17 applies to a Dispute arising in connection with this Deed if:

17.1.1 the Parties agree that the Dispute can be appropriately determined by Expert Determination, or

17.1.2 the Chief Executive Officer (or equivalent) of the professional body that represents persons who appear to have the relevant expertise to determine the Dispute gives a written opinion at the joint request of the Parties that the Dispute can be determined by a member of that body.

When Dispute arises

17.2 A Dispute to which this clause applies is taken to arise if one Party gives another Party a notice in writing specifying particulars of the Dispute.

Meeting between Parties

17.3 If a notice is given under clause 17.2, the Parties are to meet within 14 days of the notice in an attempt to resolve the Dispute.

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Expert determination

17.4 If the Dispute is not resolved within a further 28 days, the Dispute is to be referred to the President of the NSW Law Society to appoint an expert for expert determination.

Expert determination binding

17.5 The expert determination is binding on the Parties except in the case of fraud or misfeasance by the expert.

Costs of Parties

17.6 Each Party is to bear its own costs arising from or in connection with the appointment of the expert and the expert determination.

Costs of Expert

17.7 The Parties are to share equally the costs of the President, the expert, and the expert determination.

Part 4 - Enforcement

18 General Security

Application of this clause

18.1 This clause 18 applies if Item 16.a of the VPA Particulars specified an amount of General Security.

Composition of General Security

18.2 For the avoidance of doubt, the General Security includes the Defects Liability Security and the Maintenance Security.

Provision of General Security

18.3 The Developer is to provide the General Security to the Council:

18.3.1 before the Developer obtains a Construction Certificate for any part of the Development or before the Developer commences any part of the Developer Works, whichever occurs first, or

18.3.2 at such other time agreed in writing by the Council.

Apportionment of General Security

18.4 If agreed in writing by the Council, the General Security may be apportioned to different Stages or different Developer Works, in which case the Developer is to provide the portion of the General Security relating to a particular Stage or particular Developer Works to the Council before the Developer obtains a

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Construction Certificate for the particular Stage or the Developer commences the particular Developer Works.

Purpose of General Security

18.5 The Council is to hold the General Security as security for the Developer performing its obligations under this Deed relating to the Developer Works and other material public benefits (other than the payment of monetary Development Contributions and the dedication of Dedication Land).

Indexation of General Security

18.6 The Developer is to ensure that the amount of the General Security provided to the Council at any time is indexed in accordance with Item 16.b of the Particulars.

Call-up of General Security

18.7 Subject to clause 21.2, if the Developer breaches any its obligations under this Deed relating to the purpose for which the General Security is required to be provided, the Council may, without further notice to the Developer and notwithstanding any other remedy it may have under this Deed, under any Act or otherwise at law or in equity, call-up the General Security, the Defects Liability Security or the Maintenance Security, as appropriate, and apply it to remedy the Developer's breach and the Council's costs specified in clause 21.5 of so doing.

Release & return of General Security

18.8 Subject to clause 18.10, the Council is to release and return the General Security or any unused part of it to the Developer within 14 days of issuing a Practical Completion for the Developer Works.

18.9 Despite clause 18.8 but subject to clause 18.10, if the Developer has provided the Council with a portion of the General Security relating to a particular Stage or particular Developer Works, the Council is to release and return the portion or any unused part of it to the Developer within 14 days of issuing a *Practical Completion Certificate for all of the Developer Works in the particular Stage or the particular Developer Works.

18.10 The amount of the General Security released and returned by the Council under clause 18.8 or 18.9 must not exceed the amount of the General Security minus the percentages of that amount allocated to the Defects Liability Security and the Maintenance Security.

18.11 The Council is to release and return the Defects Liability Security, or any remaining part, to the Developer within 28 days after the end of the Defects Liability Period if, at that time, the Developer is not in breach of an obligation under this Deed to which the Defects Liability Security relates.

18.12 The Council is to release and return the Maintenance Security, or any remaining part, to the Developer within 28 days after the end of the Maintenance Period if, at that time, the Developer is not in breach of an obligation under this Deed to which the Maintenance Security relates.

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Replacement General Security

18.13 The Developer may provide the Council with a replacement General Security at any time.

18.14 On receipt of a replacement General Security, the Council is to release and return the replaced the General Security to the Developer.

18.15 If the Council calls-up the General Security or any portion of it, the Council may give the Developer a written notice requiring the Developer to provide a further or replacement General Security to ensure that the amount of General Security held by the Council equals the amount the Council is entitled to hold under this Deed.

Restriction on entering Council land

18.16 Despite any other provision of this Deed, the Council, in its absolute discretion, may refuse to allow the Developer to enter, occupy or use any land owned or controlled by the Council or refuse to provide the Developer with any plant, equipment, facilities or assistance relating to the carrying out the Development if the Developer has not provided the General Security to the Council in accordance with this Deed.

19 Charge on Dedication Land

Application of this clause

19.1 This clause applies if Item 15 of the VPA Particulars specifies land for the purposes of the definition of 'Charge Land' in clause 1.1 of this Deed.

Grant of charge

19.2 On the date of execution of this Deed, the Developer grants to the Council a fixed and specific charge over the Developer's right, title and interest in the Charge Land, to secure:

19.2.1 the performance of the Developer's obligation to make monetary Development Contributions under this Deed, and

19.2.2 any damages that may be payable to the Council, or any costs which may be incurred by the Council in the event of a breach of this Deed by the Developer relating to making monetary Development Contributions.

Exercise of rights under Charge

19.3 Subject to clause 21.2, the Council may exercise its rights under the Charge if the Developer does not make monetary contributions in accordance with this Deed.

Registration

19.4 Upon the execution of this Deed, the Developer is to give to the Council an instrument in registrable form under the *Real Property Act 1900* (NSW) duly

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executed by the registered proprietor of the Charge Land that is effective to register the Charge on the title to the Charge Land.

19.5 If the Charge Land does not form the whole of a lot in a deposited plan at the time that the instrument referred to in clause 19.4 is required to be given:

19.5.1 the Developer is to give the Council an instrument that charges the whole of the lot containing the Charge Land, and

19.5.2 a reference in this Deed to the Charge Land is taken to be a reference to the whole of that lot.

19.6 The Developer is to do all other things necessary, including executing all other documents, to enable lodgement and registration of the Charge to occur electronically through PEXA or another ELNO.

Caveat and discharge

19.7 The Developer acknowledges that the Council has an equitable estate or interest in the Charge Land entitling the Council, pursuant to section 74F of the *Real Property Act 1900* (NSW), to lodge with the Registrar-General a caveat prohibiting the recording of any dealing affecting the Council's estate or interest in that land.

19.8 The Developer agrees that:

19.8.1 the Council may lodge a caveat on the title of the Charge Land,

19.8.2 the Council is to release the caveat from any part of the Charge Land once that part is contained in a separate lot to the remainder of the Charge Land, and

19.8.3 the Council cannot be required to have the caveat removed from the title to the Charge Land other than in accordance with clause 19.9.

19.9 In order to enable Final Lots to be sold, the Council is to release the Charge and withdraw the caveat from the title to any Final Lot on satisfaction by the Developer of its obligations under this Deed to make Development Contributions in respect of the creation of the lot.

19.10 For the purposes of clause 19.2, the Council is to use its reasonable endeavours to provide any documentation necessary to enable the release of the Charge and withdrawal of the caveat from the title of a Final Lot on or immediately prior to the date for settlement of the sale of that lot.

Subdivision of charge land not precluded

19.11 Nothing in this Deed prevents the registration of a plan of subdivision in respect of the Charge Land nor the creation of a Final Lot from the Charge Land.

Priority

19.12 The Developer is not to create any mortgage or charge over the Charge Land or grant any other interest in the Charge Land ranking in priority equal with or ahead of the Charge created under this Deed without the prior written approval of the Council.

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20 Acquisition of Dedication Land

Compulsory acquisition of Dedication Land

20.1 Subject to clause 20.2 and 21.2, if the Developer does not dedicate the Dedication Land at the time at which it is required to be dedicated, the Developer consents to the Council compulsorily acquiring the land for compensation in the amount of $1 without having to follow the pre-acquisition procedure under the Just Terms Act.

20.2 The Council is to only acquire land pursuant to clause 20.1 if it considers it reasonable to do so having regard to the circumstances surrounding the failure by the Developer to dedicate the land required to be dedicated under this Deed.

Pre-acquisition agreement

20.3 Clause 20.1 constitutes an agreement for the purposes of s30 of the Just Terms Act.

Re-imbursement of Council for third party compensation

20.4 If, as a result of the acquisition referred to in clause 20.1, the Council is required to pay compensation to any person other than the Developer, the Developer is to reimburse the Council that amount, upon a written request being made by the Council, or the Council can call on the General Security.

Indemnity

20.5 The Developer indemnifies and keeps indemnified the Council against all Claims made against the Council as a result of any acquisition by the Council of the whole or any part of the Dedication Land except if, and to the extent that, the Claim arises because of the Council's negligence or default.

20.6 The Developer is to promptly do all things necessary, and consents to the Council doing all things necessary, to give effect to this clause 20, including without limitation:

20.6.1 signing any documents or forms,

20.6.2 giving land owner's consent for lodgement of any Development Application,

20.6.3 producing certificates of title to the Registrar-General under the *Real Property Act 1900* (NSW), and

20.6.4 paying the Council's costs arising under this clause 20.

21 Breach of obligations

Notice of breach

21.1 If the Council reasonably considers that the Developer is in breach of any obligation under this Deed, it may give a written notice to the Developer:

21.1.1 specifying the nature and extent of the breach,

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21.1.2 requiring the Developer to:

(a) Rectify the breach if it reasonably considers it is capable of rectification, or

(b) pay compensation to the reasonable satisfaction of the Council in lieu of rectifying the breach if it reasonably considers the breach is not capable of rectification,

21.1.3 specifying the period within which the breach is to be rectified or compensation paid, being a period that is reasonable in the circumstances.

Notice of breach pre-requisite to exercise of rights

21.2 The Council may not exercise its rights under clause 18.7, 19.3 or 20.1 unless it has first given the Developer a notice under clause 21.1 and the Developer has failed to comply with the Notice.

Step-in right relating to Developer Works

21.3 If the Developer fails to comply with a notice given under clause 21.1 relating to the provision of Developer Works, the Council may, notwithstanding any other remedy it may have under this Deed, under any Act or otherwise at law or in equity, step-in and remedy the breach and may enter, occupy and use any land owned or controlled by the Developer and any Equipment on such land for that purpose.

Recovery of costs by Council as debt due

21.4 Despite any other provision of this Deed, any costs incurred by the Council in remedying a breach of this Deed may be recovered by the Council as a debt due in a court of competent jurisdiction.

21.5 For the purpose of clause 21.4, the Council's costs of remedying a breach the subject of a notice given under clause 21.1 include, but are not limited to:

21.5.1 the costs of the Council's employees, agents and contractors reasonably incurred for that purpose,

21.5.2 all fees and charges necessarily or reasonably incurred by the Council in remedying the breach, and

21.5.3 all legal costs and expenses reasonably incurred by the Council, by reason of the breach.

Exercise of Council's rights at law or in equity

21.6 Nothing in this clause 21 prevents the Council from exercising any rights it may have at law or in equity in relation to a breach of this Deed by the Developer, including but not limited to seeking relief in an appropriate court.

22 Enforcement in a court of competent jurisdiction

22.1 Without limiting any other provision of this Deed, the Parties may enforce this Deed in any court of competent jurisdiction.

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22.2 For the avoidance of doubt, nothing in this Deed prevents:

22.2.1 a Party from bringing proceedings in the Land and Environment Court to enforce any aspect of this Deed or any matter to which this Deed relates, or

22.2.2 the Council from exercising any function under the Act or any other Act or law relating to the enforcement of any aspect of this Deed or any matter to which this Deed relates.

Part 5 – Registration & Restriction on Dealings

23 Registration of this Deed

Application of clause

23.1 This clause 23 applies if Item 19 of the VPA Particulars states that this Deed is to be registered for the purposes of s7.6(1) of the Act.

Documents for registration

23.2 Upon the commencement of this Deed, the Developer is to deliver to the Council:

23.2.1 an instrument in registrable form requesting registration of this Deed on the title to the Land duly executed by the registered proprietor of the Land, and

23.2.2 the written irrevocable consent of the registered proprietor and each person referred to in s7.6(1) of the Act to that registration.

23.3 The Developer is to do such other things as are reasonably necessary to enable lodgement and registration of this Deed to occur electronically through PEXA or another ELNO.

Removing notation from title

23.4 The Parties are to do such things as are reasonably necessary to remove any notation relating to this Deed from the title to the Land:

23.4.1 in so far as the part of the Land concerned is a Final Lot,

23.4.2 in relation to any other part of the Land, once the Developer has completed its obligations under this Deed to the reasonable satisfaction of the Council or this Deed is terminated or otherwise comes to an end for any other reason.

24 Restriction on dealings

Restriction

24.1 The Developer is not to:

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24.1.1 sell or transfer the Land, other than a Final Lot, or

24.1.2 assign the Developer's rights or obligations under this Deed, or novate this Deed,

to any person unless:

24.1.3 the Developer has, at no cost to the Council, first procured the execution by the person to whom the Land or part is to be sold or transferred or the Developer's rights or obligations under this Deed are to be assigned or novated, of a deed in favour of the Council on terms reasonably satisfactory to the Council, and

24.1.4 the Council has given written notice to the Developer stating that it reasonably considers that the purchaser, transferee, assignee or novatee, is reasonably capable of performing its obligations under this Deed, and

24.1.5 the Developer is not in breach of this Deed, and

24.1.6 the Council otherwise consents to the transfer, assignment or novation, such consent not to be unreasonably withheld.

Continued performance of obligations by Developer

24.2 Subject to clause 24.3, the Developer acknowledges and agrees that it remains liable to fully perform its obligations under this Deed unless and until it has complied with its obligations under clause 24.1.

Exclusion from restriction

24.3 Clause 24.1 does not apply in relation to any sale or transfer of the Land if this Deed is registered on the title to the Land at the time of the sale.

Part 6 – Indemnities & Insurance

25 Risk

25.1 The Developer performs this Deed at its own risk and its own cost.

26 Release

26.1 The Developer releases the Council from any Claim it may have against the Council arising in connection with the performance of the Developer's obligations under this Deed except if, and to the extent that, the Claim arises because of the Council's negligence or default.

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27 Indemnity

27.1 The Developer indemnifies the Council from and against all Claims that may be sustained, suffered, recovered or made against the Council arising in connection with the performance of the Developer's obligations under this Deed except if, and to the extent that, the Claim arises because of the Council's negligence or default.

28 Insurance

Requirement for Developer insurances

28.1 The Developer is to take out and keep current to the satisfaction of the Council the Insurances in relation to the Developer Works until the Developer Works are completed in accordance with this Deed.

Failure to comply with requirement

28.2 If the Developer fails to comply with clause 28.1, the Council may effect and keep in force such insurances and pay such premiums as may be necessary for that purpose and the amount so paid shall be a debt due from the Developer to the Council and may be recovered by the Council as it deems appropriate including:

28.2.1 by calling upon the General Security provided by the Developer to the Council under this Deed, or

28.2.2 recovery as a debt due in a court of competent jurisdiction.

28.3 The Developer is not to commence to provide any Developer Works unless it has first provided to the Council satisfactory written evidence of all of the insurances specified in clause 28.1.

Part 7 – Other Provisions

29 Annual report by Developer

Requirement for Developer to provide report

29.1 The Developer is to provide to the Council by not later than each anniversary of the date on which this Deed commences a report ('**Annual Performance Report**') detailing the performance of its obligations under this Deed in the previous 12 month period ('**Reporting Period**').

Form and content of report

29.2 The Annual Performance Report is to be in such a form and to address such matters as is reasonably required by the Council from time to time but must at a minimum detail the following:

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29.2.1 all Approved Persons during the Reporting Period and any changes to Approved Persons during that period,

29.2.2 all Development Contributions made by the Developer pursuant to this Deed during the Reporting Period and the dates on which the contributions were made,

29.2.3 all Development Contributions due to be made by the Developer pursuant to this Deed in the next 12 month period,

29.2.4 all Developers Works that had been commenced prior to the Reporting Period or were commenced during the Reporting Period but were not completed in that period,

29.2.5 all Developers Works due to be commenced or completed within the next 12 month period,

29.2.6 all Securities provided by the Developer to the Council under this Deed and held by the Council during the Reporting Period and the current value of each such Security.

Strict requirement

29.3 The Developer acknowledges and agrees that the provision of the Annual Performance Report each year in accordance with this clause 29 is a strict requirement of this Deed.

30 Review of Deed

Obligation to review Deed

30.1 The Parties agree to review this Deed by the end of each Review Period, and otherwise if either Party is of the opinion that any change of circumstance has occurred, or is imminent, that materially affects the operation of this Deed.

Review triggers

30.2 For the purposes of clause 30.1, the relevant changes include (but are not limited to) any change to a law that restricts or prohibits or enables the Council or any other planning authority to restrict or prohibit any aspect of the Development.

Duty of Parties

30.3 For the purposes of addressing any matter arising from a review of this Deed referred to in clause 30.1, the Parties are to use all reasonable endeavours to agree on and implement appropriate amendments to this Deed.

Where change of law occurs

30.4 If this Deed becomes illegal, unenforceable or invalid as a result of any change to a law, the Parties agree to do all things necessary to ensure that an enforceable agreement of the same or similar effect to this Deed is entered into.

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No Dispute

30.5 A failure by a Party to agree to take action requested by the other Party as a consequence of a review referred to in clause 30.1 (but not 30.4) is not a Dispute for the purposes of this Deed and is not a breach of this Deed.

31 Notices

31.1 Any notice, consent, information, application or request that is to or may be given or made to a Party under this Deed is only given or made if it is in writing and sent in one of the following ways:

31.1.1 delivered or posted to that Party at its address set out in Item 21 or 22 of the VPA Particulars, or

31.1.2 emailed to that Party at its email address set out in Item 21 or 22 of the VPA Particulars.

31.2 If a Party gives the other Party 3 business days' notice of a change of its address or email, any notice, consent, information, application or request is only given or made by that other Party if it is delivered, posted or emailed to the latest address.

31.3 Any notice, consent, information, application or request is to be treated as given or made if it is:

31.3.1 delivered, when it is left at the relevant address,

31.3.2 sent by post, 2 business days after it is posted, or

31.3.3 sent by email and the sender does not receive a delivery failure message from the sender's internet service provider within a period of 24 hours of the email being sent.

31.4 If any notice, consent, information, application or request is delivered, or an error free transmission report in relation to it is received, on a day that is not a business day, or if on a business day, after 5pm on that day in the place of the Party to whom it is sent, it is to be treated as having been given or made at the beginning of the next business day.

32 Approvals and Consent

32.1 Except as otherwise set out in this Deed, and subject to any statutory obligations, a Party may give or withhold an approval or consent to be given under this Deed in that Party's absolute discretion and subject to any conditions determined by the Party.

32.2 A Party is not obliged to give its reasons for giving or withholding consent or for giving consent subject to conditions.

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33 Costs of this Deed

Costs of Deed

33.1 The Developer is to pay to the Council the Council's costs not exceeding the amount specified in Item 24 of the VPA Particulars in relation to preparing, negotiating, executing and stamping this Deed, and any document related to this Deed within 7 days of a written demand by the Council for such payment.

Enforcement costs

33.2 The Council may serve a notice in writing on the Developer ('**Enforcement Cost Notice**') requiring the Developer to pay all or any reasonable costs and expenses incurred by the Council in connection with:

33.2.1 investigating a non-compliance by the Developer with this Deed, and

33.2.2 enforcing compliance by the Developer with this Deed.

33.3 For the avoidance of doubt, the costs and expenses referred to in clause 33.2 may include the costs or expenses incurred by the Council relating to the preparation or serving of the Enforcement Cost Notice.

33.4 An Enforcement Cost Notice is to specify the amount required to be paid to the Council by the Developer and the date by which the amount is to be paid.

33.5 The Council may recover any unpaid costs and expenses specified in an Enforcement Cost Notice as a debt in a court of competent jurisdiction.

No dispute

33.6 Part 3 of this Deed does not apply anything done by the Council and any requirement imposed on the Developer by the Council in accordance with this clause 33.

34 Entire Deed

34.1 This Deed contains everything to which the Parties have agreed in relation to the matters it deals with.

34.2 No Party can rely on an earlier document, or anything said or done by another Party, or by a director, officer, agent or employee of that Party, before this Deed was executed, except as permitted by law.

35 Further Acts

35.1 Each Party must promptly execute all documents and do all things that another Party from time to time reasonably requests to effect, perfect or complete this Deed and all transactions incidental to it.

36 Governing Law and Jurisdiction

36.1 This Deed is governed by the law of New South Wales.

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36.2 The Parties submit to the non-exclusive jurisdiction of its courts and courts of appeal from them.

36.3 The Parties are not to object to the exercise of jurisdiction by those courts on any basis.

37 Joint and Individual Liability and Benefits

37.1 Except as otherwise set out in this Deed:

37.1.1 any agreement, covenant, representation or warranty under this Deed by 2 or more persons binds them jointly and each of them individually, and

37.1.2 any benefit in favour of 2 or more persons is for the benefit of them jointly and each of them individually.

38 No Fetter

38.1 Nothing in this Deed shall be construed as requiring Council to do anything that would cause it to be in breach of any of its obligations at law, and without limitation, nothing shall be construed as limiting or fettering in any way the exercise of any statutory discretion or duty.

39 Illegality

39.1 If this Deed or any part of it becomes illegal, unenforceable or invalid as a result of any change to a law, the Parties are to co-operate and do all things necessary to ensure that an enforceable agreement of the same or similar effect to this Deed is entered into.

40 Severability

40.1 If a clause or part of a clause of this Deed can be read in a way that makes it illegal, unenforceable or invalid, but can also be read in a way that makes it legal, enforceable and valid, it must be read in the latter way.

40.2 If any clause or part of a clause is illegal, unenforceable or invalid, that clause or part is to be treated as removed from this Deed, but the rest of this Deed is not affected.

41 Amendment

41.1 No amendment of this Deed will be of any force or effect unless it is in writing and signed by the Parties to this Deed in accordance with section 203 of the Regulation.

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42 Waiver

42.1 The fact that a Party fails to do, or delays in doing, something the Party is entitled to do under this Deed, does not amount to a waiver of any obligation of, or breach of obligation by, another Party.

42.2 A waiver by a Party is only effective if it:

42.2.1 is in writing,

42.2.2 is addressed to the Party whose obligation or breach of obligation is the subject of the waiver,

42.2.3 specifies the obligation or breach of obligation the subject of the waiver and the conditions, if any, of the waiver,

42.2.4 is signed and dated by the Party giving the waiver.

42.3 Without limitation, a waiver may be expressed to be conditional on the happening of an event, including the doing of a thing by the Party to whom the waiver is given.

42.4 A waiver by a Party is only effective in relation to the particular obligation or breach in respect of which it is given, and is not to be taken as an implied waiver of any other obligation or breach or as an implied waiver of that obligation or breach in relation to any other occasion.

42.5 For the purposes of this Deed, an obligation or breach of obligation the subject of a waiver is taken not to have been imposed on, or required to be complied with by, the Party to whom the waiver is given.

43 GST

43.1 In this clause:

Adjustment Note, **Consideration**, **GST**, **GST Group**, **Margin Scheme**, **Money**, **Supply** and **Tax Invoice** have the meaning given by the GST Law.

GST Amount means in relation to a Taxable Supply the amount of GST payable in respect of the Taxable Supply.

GST Law has the meaning given by the *A New Tax System (Goods and Services Tax) Act 1999* (Cth).

Input Tax Credit has the meaning given by the GST Law and a reference to an Input Tax Credit entitlement of a party includes an Input Tax Credit for an acquisition made by that party but to which another member of the same GST Group is entitled under the GST Law.

Taxable Supply has the meaning given by the GST Law excluding (except where expressly agreed otherwise) a supply in respect of which the supplier chooses to apply the Margin Scheme in working out the amount of GST on that supply.

43.2 Subject to clause 43.4, if GST is payable on a Taxable Supply made under, by reference to or in connection with this Deed, the Party providing the Consideration for that Taxable Supply must also pay the GST Amount as additional Consideration.

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43.3 Clause 43.2 does not apply to the extent that the Consideration for the Taxable Supply is expressly stated in this Deed to be GST inclusive.

43.4 No additional amount shall be payable by the Council under clause 43.2 unless, and only to the extent that, the Council (acting reasonably and in accordance with the GST Law) determines that it is entitled to an Input Tax Credit for its acquisition of the Taxable Supply giving rise to the liability to pay GST.

43.5 If there are Supplies for Consideration which is not Consideration expressed as an amount of Money under this Deed by one Party to the other Party that are not subject to Division 82 of the *A New Tax System (Goods and Services Tax) Act 1999*, the Parties agree:

43.5.1 to negotiate in good faith to agree the GST inclusive market value of those Supplies prior to issuing Tax Invoices in respect of those Supplies;

43.5.2 that any amounts payable by the Parties in accordance with clause 43.2 (as limited by clause 43.4) to each other in respect of those Supplies will be set off against each other to the extent that they are equivalent in amount.

43.6 No payment of any amount pursuant to this clause 43, and no payment of the GST Amount where the Consideration for the Taxable Supply is expressly agreed to be GST inclusive, is required until the supplier has provided a Tax Invoice or Adjustment Note as the case may be to the recipient.

43.7 Any reference in the calculation of Consideration or of any indemnity, reimbursement or similar amount to a cost, expense or other liability incurred by a party, must exclude the amount of any Input Tax Credit entitlement of that party in relation to the relevant cost, expense or other liability.

43.8 This clause continues to apply after expiration or termination of this Deed.

44 Explanatory Note

44.1 The Appendix contains the Explanatory Note relating to this Deed required by section 205 of the Regulation.

44.2 Pursuant to section 205 of the Regulation, the Parties agree that the Explanatory Note is not to be used to assist in construing this Deed.

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Schedule 1: VPA Particulars

(Clause 1.1)

Item	Details
1. **Land**	170 Bushs Lane Gunnedah (Lot 1 DP 861697) (**Lot 1**) 210 Bushs Lane Gunnedah (Lots 27 and 28 DP 755474) (**Lot 27 and Lot 28**)
2. **Development**	Development of the Land facilitated by the Instrument Change, including, but without limiting the generality of same, a subdivision of the Land or any part of it into allotments with a minimum lot size of 1.2ha (Lot 1) and 9,000sqm (Lots 27 and 28).
3. **Instrument Change**	Lot 1 DP861697 - The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-81 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 1.2ha Lots 27 and 28 DP 755474- The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-383 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 9,000sqm
4. **Application:** **a. Development Application** **b. Modification Application**	 A development application for any part of the Development. A modification of Any Applicable Development Consent for any part of the Development.
5. **Applicable Development Consent**	A development consent granted in respect of a Development Application.
6. **Applicable Plan:** **a. Applicable Contributions Plan** **b. Applicable DSP**	 N/A *Gunnedah Development Servicing Plan for Gunnedah Shire Council Water Supply June 2016*
7. **Application of the following provisions of the Act to the Development:**	

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a. Section 7.11	Does not exclude.
b. Consideration of benefits	Not to be considered
c. Section 7.12	Does not exclude.
d. Section 7.24	Not excluded
8. **Council Land Dedication Contribution Amount**	N/A
9. **Council Developer Works Contribution Amount**	$250,000.00
10. **Development Contribution Credit**	N/A
11. **Development Contribution Surplus Credit**	N/A
12. **Practical Completion Date**	N/A
13. **Defects Liability Period**	N/A
14. **Maintenance Period**	N/A
15. **Charge Land**	N/A
16. **General Security:**	
a. General Security	$N/A
b. Indexation of General Security	N/A
17. **Defects Liability Security**	N/A % of General Security
18. **Maintenance Security**	N/A % of General Security
19. **Registration of this Deed**	Yes
20. **Insurances**	
a. Contract Works Insurance	For the full replacement value of the Works (including the cost of demolition and removal of debris, consultants' fees and authorities' fees), to cover the Developer's liability in respect of damage to or destruction of the Works.
b. Public Liability	For at least $20,000,000.00 for a single occurrence, which covers the Council, the Developer and any

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	subcontractor of the Developer, for liability to any third party.
c. Professional Indemnity Insurance	N/A
d. Workers Compensation Insurance	As required by law.
e. Other insurance	As required by law.
21. **Council Contact for Notices**	**Postal Address**: 63 Elgin Street, Gunnedah NSW 2380] **Email**: council@infogunnedah.com.au **Telephone**: 02 6740 2100 **Representative**: The General Manager
22. **Developer Contact for Notices**	**Postal Address**: [redacted] **Email**: **Telephone**: **Representative**: Jarad Ewing
23. **Review Period**	Each period of 3 years commencing on the commencement of this Deed.
24. **Costs of Deed**	$5,000.

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Schedule 2: Development Contributions Table

COLUMN 1 Item No / Details	COLUMN 2 Public Purpose	COLUMN 3 Timing	COLUMN 4 Contribution Value $
A. Monetary Contributions			
1. Gallen Reservoir Water Supply Pump Augmentation	Water Supply	Prior to the issuing of the first subdivision works certificate in respect of any part of the Development.	$250,000.00
2.			
3.			
B. Dedication Land			
1.			
2.			
3.			
C. Developer Works			
1.			
2.			
3.			
D. Other material public benefits			
1.			
2.			

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3.			

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Schedule 3: Dedication Land Plan

N/A

Schedule 4: Developer Works Location Plan

N/A

Schedule 5: Developer Works Plans and Drawings

N/A

Schedule 6: Developer Works Provisions

Deed not Construction Contract

1 The Parties acknowledge and agree that this Deed is not a Construction Contract between the Council and the Developer.

Developer Works before execution of Deed

2 This Deed applies to any Developer Works that occurred before the Deed was executed.

Approved persons

3 The Developer is to design, construct, supervise, and test the Developer Works using Approved Persons.

4 Where the Developer proposes to substitute or add an Approved Person, the Developer must notify the Council in writing, and provide details of the new Approved Person who is to be engaged from in relation to the Developer Works.

5 The Council may, in its reasonable discretion, notify the Developer that a new Approved Person notified under clause 4 is not to be engaged in relation to the Developer Works, and the Developer must promptly take such action as is necessary to ensure that the person does not continue to be engaged in relation to the Developer Works.

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Developer to procure compliance

6 The Developer is to provide every Approved Person engaged by it in relation to the Developer Works with a copy of this Deed executed by both Parties and procure their compliance with the relevant requirements of this Deed.

Requirement for Construction Contract

7 The Developer must enter into a Construction Contract with its Contractor for the construction of the Developer Works before any construction work occurs.

8 The Developer must provide the Council with a copy of the Construction Contract upon receipt of a written request by the Council.

9 The Developer must obtain the approval of the Council to any change to the Contractor, which approval the Council may not unreasonably withhold.

General obligations relating to Developer Works

10 The Developer is to provide the Developer Works:

10.1 in the location or locations shown on the Developer Works Location Plan,

10.2 in accordance with the Developer Works Plans and Drawings,

10.3 by the Practical Completion Date, and

10.4 otherwise in accordance with this Deed.

11 The Developer is to provide and complete the Developer Works in a good and workmanlike manner having regard to the intended purpose of the Developer Works and in accordance with:

11.1 all applicable laws,

11.2 any Approval required by any law relating to the provision of the Developer Works, and

11.3 the lawful requirements of any Authority.

12 The Developer is to ensure that anything necessary for the proper performance of its obligations under this Deed relating to the provision of the Developer Works is supplied or made available for that purpose.

Warranties relating to Developer Works

13 The Developer warrants to the Council that:

13.1 it has obtained all Approvals and has complied with all laws and applicable industry standards in relation to the Developer Works,

13.2 it accepts that, if any aspect of the Developer Works do not comply this Deed, the Council is entitled to require the Developer to cease the Developer Works and to pursue its rights and remedies relating to the non-compliance under this Deed and, subject to this Deed, at law or in equity,

13.3 the Developer Works, when completed, are to be fit for purpose,

13.4 only Approved Persons are to be engaged in relation to the Developer Works.

14 The Developer is to procure in favour of the Council from the appropriate Approved Person engaged in relation to the Developer Works, any warranty reasonably

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required by the Council relating to the design, construction, supervision, inspection, testing or certification of the Developer Works.

Ownership & care of Developer Works

15 The Developer owns, and is responsible for care of the Developer Works, and bears all risk and liability in connection with the Developer Works, until the Council gives the Developer a Transfer of Ownership Notice in relation to the Developer Works.

Work health & safety

16 The Developer acknowledges that it is the Principal Contractor under WHS Law for the Developer Works unless and until such time that:

16.1 the Developer engages the Contractor to construct the Developer Works, or

16.2 engages another person to be the Principal Contractor for the Developer Works,

and authorises the person to have management or control of the workplace relating to the Developer Works and to discharge the duties of a Principal Contractor under WHS Law.

17 For the purpose of the Developer's compliance with its obligations under clause 16, the Council:

17.1 acknowledges that the Developer (or the Contractor, where appropriate) is the person with management and control of the relevant works area for the purpose of Part 2 of the *Work Health and Safety Act 2011* (NSW); and

17.2 authorises the Developer (or the Contractor, where appropriate) to exercise authority of the Council necessary to enable the Developer to discharge its obligations under clause 16.

18 If the Developer at any time terminates the engagement of the Contractor, or terminates its authority for the Contractor or other person referred to in clause 16 to be the Principal Contractor for the Developer Works, the Developer becomes the Principal Contractor until such time as a new person is appointed as Contractor or to otherwise be the Principal Contractor for the Developer Works.

19 The Developer is to use its best endeavours to ensure that all persons involved in the Developer Works comply with relevant WHS Law and procedures, including but not limited to:

19.1 following published government and industry WHS guidelines,

19.2 providing WHS induction training,

19.3 keeping and regularly updating WHS records,

19.4 preparing and maintaining an WHS management plan,

19.5 preparing a Project Safety Plan that details safety strategies, including how persons must act to comply with WHS Law,

19.6 providing safe work method statements for all tasks and ensuring they are complied with,

19.7 directing staff to take corrective action or stop work if they are not complying with the method statements or WHS Law,

19.8 identifying hazards and assessing risks using due diligence,

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19.9 eliminating or controlling risks in line with WorkCover requirements using due diligence,

19.10 reviewing risk assessments and controlling measures,

19.11 providing information to employers and contractors about WHS,

19.12 documenting site-specific safety procedures.

20 The Developer is to use its best endeavours to ensure that:

20.1 the Council can audit, inspect and test the Developer Works without breaching WHS Law, and

20.2 the Council can access and use the Developer Works without breaching WHS Law.

21 The Developer is to promptly inform the Council of any incident occurring in relation to the Developer Works where a person is injured or otherwise exposed to a risk to his or her health or safety, including, but not limited to, an incident which is required to be reported to WorkCover.

Accidents & dangerous occurrences

22 The Developer is to notify WorkCover and the Council, as soon as it becomes aware of any serious accident or dangerous occurrence relating to the Developer Works.

23 Within a further 7 days, the Developer must formally notify or procure the notification of WorkCover of the accident or occurrence in accordance with the WHS Law, using any prescribed form.

24 The Developer must give to the Council a copy of all information and documents that have been provided to WorkCover relating to the accident or occurrence.

25 The Developer must also give to the Council, if requested by the Council, a written report relating to the accident or occurrence in the form specified by the Council.

26 The Developer must cooperate with WorkCover and the Council if the accident or occurrence is investigated by Work Cover or the Council.

27 The Developer must immediately give the Council a copy of any improvement or prohibition notices that WorkCover issues in relation to the Developer Works.

Design of Developer Works

28 Clauses 28 - 35 apply if and to the extent that Schedule 5 does not contain Developer Works Plans and Drawings for the Developer Works or any part.

29 The Developer may not commence construction of the Developer Works unless the Developer Works are designed and approved in accordance with this Deed.

30 Before commencing the design of the Developer Works, the Developer is to request the Council to provide the Developer with the Council's design requirements for the works.

31 Upon receipt of the Developer's request, the Council may:

31.1 initially request the Developer to provide a written proposal concerning the design of the Developer Works, including preliminary concept designs, to assist Council in determining and notifying the Developer of its requirements, and subsequently request the Developer to submit the plans and drawings of the Developer Works to the Council for approval, or

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31.2 request the Developer to submit the plans and drawings of the works to the Council for approval.

32 The Council may reasonably require the Developer to make any change to the plans and drawings of the Developer Works that it reasonably considers necessary or desirable as a precondition to approving the plans and drawings, and the Developer is to make any such change.

33 The Council is to inform the Developer in writing when it approves the plans and drawings of the Developer Works.

34 The Parties are to ensure that the reference to the plans and drawings approved by the Council under are included in Schedule 5 without delay after that approval is given.

35 The Developer is not to make any application for any Approval relating to the Developer Works unless the Council approved the plans and drawings of the Developer Works under this Deed.

Variations to approved Developer Works & Costs

36 The Developer Works may be varied by agreement in writing between the Parties, acting reasonably, without the necessity for an amendment to this Deed.

37 The Party seeking the variation is to make a written request to the other Party accompanied by such information and supporting documents as is reasonably necessary to enable the other Party to properly consider the request.

38 The Party to whom the request is made is not to unreasonably delay, or withhold its Approval to, the request.

39 The Party who seeks the variation of the Developer Works must meet the costs of the variation, unless the other Party otherwise agrees.

Developer's obligations before construction commencement

40 Not less than 10 business days before the Developer commences construction of any of the Developer Works specified in Part C of Schedule 2 of this Deed, the Developer is to give the Council written notice of its intention to do so accompanied by:

40.1 a copy of all approved plans and drawings for the Developer Works so specified in electronic and paper format, and

40.2 a list of all Approved Persons and their contact details.

41 The Developer is to organise and conduct a pre-start meeting with Council personnel before starting the construction of a Developer Work specified in Part C of Schedule 2 of this Deed.

Protection of people, property & utilities

42 The Developer is to use all reasonable endeavours to ensure that, in providing the Developer Works:

42.1 all necessary measures are taken to protect people and property,

42.2 unnecessary interference with the passage of people and vehicles is avoided, and

42.3 nuisances and unreasonable noise and disturbances are prevented.

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43 The Developer is not to obstruct, interfere with, impair or damage any public road, public footpath, public cycleway or other public thoroughfare, or any pipe, conduit, drain, watercourse or other public utility or service on any land in connection with the Developer Works unless authorised in writing by the Council or any relevant Authority.

Damage to assets & property

44 The Developer must immediately notify the Council in writing of any loss or damage that occurs in respect of a Council asset of which it becomes aware while performing the Developer Works.

45 The Developer must replace or fix any Council asset the Developer loses or damages while performing the Developer Works in accordance with any reasonable requirements of the Council.

46 If an audit, inspection or test of the Developer Works shows that:

46.1 the Developer Works do not conform to the location, design, specifications, materials or finishes approved by the Council under this Deed, or

46.2 damage has occurred to a Council asset or the property of another person in connection with the Developer Works,

the Council may give the Developer a notice in writing requiring it to take corrective action to bring the Developer Works into conformity or repair the damage, as the case requires.

47 Without limiting any other remedies available to the Council under this Deed, if the Developer does not comply with the Council's requirements under clauses 46-52, the Council may take the action required of the Developer and recover the Council's costs of so doing from the Developer.

Entry onto Land

48 The Developer is responsible for obtaining all necessary rights to lawfully enter, occupy, and provide the Developer Works on Other Land.

49 Upon receiving reasonable prior written notice from the Developer, the Council is to allow the Developer and the Approved Persons, to enter, occupy, and use Council owned or controlled land specified in the notice at any reasonable time if the occupation or use of the land by the Developer and the Approved Persons is reasonably necessary for the Developer Works.

50 The Council is not required to allow the Developer to enter, occupy and use any Council owned land that is used for public purposes unless and until the Developer has paid any applicable fee or rent, as approved by the Council, for that purpose,

51 Upon receiving reasonable prior notice from the Council, the Developer is to provide the Council with safe and unhindered access at any reasonable time to any land on which the Developer Works are being, or have been, provided.

52 The Council must comply with the Developer's reasonable safety requirements while on any land on which the Developer Works are being provided.

Audit, inspection, testing of Developer Works

53 The Council may undertake an audit, inspection or test of the Developer Works at any reasonable time for any purpose related to this Deed upon giving reasonable prior notice to the Developer.

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54 The Developer is to provide the Council with any assistance that is reasonably required by the Council to enable the Council to undertake any audit, inspection or test of the Developer Works.

55 If an audit, inspection or test reasonably shows that particular action must be taken in relation to the Developer Works, the Developer is to:

55.1 take the action in the manner, and within the time, the Council reasonably requires, and

55.2 provide evidence to the Council that the action has been taken.

56 If an audit, inspection or test shows that the Developer Works have not been provided in accordance with this Deed, the Developer is to pay any Costs incurred by the Council in connection with the audit, inspection or test.

57 If the Council reasonably decides that a further and more detailed audit, inspection or test of the Developer Works is required, the Council may determine an approved fee in that regard and the Developer is to pay to the Council the fee so approved.

Access to information & records

58 The Council may make a written request to the Developer:

58.1 to provide information to the Council concerning the Developer Works,

58.2 to allow the Council to inspect the Developer's records concerning the Developer Works, including by giving the Council access to premises owned, occupied or controlled by the Developer for that purpose.

59 The Developer is to comply with any such request made by the Council not later than 15 business days after the Council makes the request.

Practical Completion of Developer Works

60 The Developer is to use all reasonable endeavours to ensure that the whole of the Developer Works is the subject of one or more Practical Completion Certificates by not later than the Practical Completion Date.

61 The Developer may make a written request ('**Developer's Request**') to the Council to issue a Practical Completion Certificate for the Developer Works or any part of the Developer Works by not later than the Practical Completion Date or such later date agreed in writing between the Parties.

62 The Developer's Request is to be accompanied by the following information:

62.1 a Works-as-Executed Plan of the Developer's Works to which the Developer's Request relates, and

62.2 all technical data relating to those Works, including but not limited to, geotechnical testing, structural certificates, CCTV footage and material certifications.

63 Upon receipt of the Developer's Request, the Council is to inspect the relevant Developer Works in the presence of a representative of the Developer at a time reasonably agreed between the Parties that is not later than 14 days after the Council receives the request.

64 As a precondition to issuing a Practical Completion Certificate, the Council may direct the Developer in writing to complete, Rectify or repair any specified part of the Developer Works the subject of the Developer's Request within a period specified in

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the direction in order to bring the Developer Works into conformity with this Deed or any Approval.

65 The Developer is to promptly comply with any such direction given by the Council.

66 The Council may undertake more than one inspection and issue more than one direction to the Developer in order to be satisfied that a Practical Completion Certificate may be issued for the Developer Works the subject of the Developer's Request.

67 The Council is to promptly issue a Practical Completion Certificate for the Developer Works the subject of the Developer's Request when it is reasonably satisfied that no aspect of the relevant Developer Works reasonably requires completion, rectification or repair.

Maintenance of Developer Works

68 The Developer is to Maintain the Developer Works during the Maintenance Period.

69 The Council is to permit the Developer to enter any land owned or controlled by the Council to enable the Developer to Maintain the Developer Works during the Maintenance Period.

Rectification of Defects

70 The Council may give the Developer a Rectification Notice during the Defects Liability Period.

71 The Developer is to comply with a Rectification Notice according to the terms of the Rectification Notice and to the reasonable satisfaction of the Council.

72 The Council is to do such things as are reasonably necessary to enable the Developer to comply with a Rectification Notice given by the Council.

Final Completion of Developer Works

73 The Developer is to use all reasonable endeavours to ensure that the whole of the Developer Works is the subject of one or more Final Completion Certificates at the end of Defects Liability Period.

74 The Developer may make a written request ('**Developer's Request**') to the Council to issue a Final Completion Certificate for the Developer Works or any part of the Developer Works at the end of Defects Liability Period.

75 The Developer's Request is to be accompanied by a full Works-As-Executed-Plan for the Developer Works for which the Final Completion Certificate is sought in a format agreed to by the Council.

76 Upon receipt of the Developer's Request, the Council is to inspect the relevant Developer Works in the presence of a representative of the Developer at a time reasonably agreed between the Parties that is not later than 14 days after the Council receives the request.

77 As a precondition to issuing a Final Completion Certificate, the Council may direct the Developer in writing to complete, Rectify, repair or Maintain any specified part of the Developer Works the subject of the Developer's Request within a period specified in the direction in order to bring the Developer Works into conformity with this Deed or any Approval.

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78 The Developer is to promptly comply with any such direction given by the Council.

79 The Council may undertake more than one inspection and issue more than one direction to the Developer in order to be satisfied that a Final Completion Certificate may be issued for the Developer Works the subject of the Developer's Request.

80 The Council is to promptly issue a Final Completion Certificate for the Developer Works the subject of the Developer's Request when it is reasonably satisfied that no aspect of the relevant Developer Works reasonably requires completion, rectification or repair.

Copyright in Works-As-Executed Plan

81 The Developer, being the copyright owner in the Works-As-Executed Plan, assigns the copyright in the Works-As-Executed Plan to the Council free of Cost to the Council.

82 If the Developer is not the copyright owner of the Work-As-Executed Plan, the Developer is to promptly procure the assignment of the copyright of the Works-As-Executed Plan to the Council free of cost to the Council.

Transfer of Ownership of Developer Works

83 At any time after the Council issues a Practical Completion Certificate for Developer Works to the Developer, the Council may issue a Transfer of Ownership Notice to the Developer for those Developer Works.

84 The Developer Works the subject of a Transfer of Ownership Notice vest in the Council on the vesting date stated in the Transfer of Ownership Notice.

Transfer of land on which Developer Works Constructed

85 Unless otherwise specified in this Deed or agreed in writing between the Parties:

85.1 the Developer is to do all things necessary to dedicate or procure the dedication to the Council of the land on which Developer Works the subject of a Transfer of Ownership Notice are constructed,

85.2 the dedication is to occur by not later than the vesting date stated in the Transfer of Ownership Notice,

85.3 the dedication is to be free of cost to the Council.

86 Land on which Developer Works the subject of a Transfer of Ownership Notice are constructed that is required to be dedicated to the Council under clause 85 is Dedication Land for the purposes of this Deed.

Easements, covenants, etc.

86.1 The Developer must create, or procure the creation of, any easement or covenant or any other instrument benefitting the Council that is reasonably required by the Council in relation to the Developer Works.

86.2 The Developer is to ensure that any such easement, covenant or other instrument is registered on the title to the relevant land before the vesting date specified in a Transfer of Ownership Notice for such Works.

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86.3 The Costs required to be incurred by the Developer in doing so include, unless otherwise agreed in writing between the Parties, the payment of compensation to any person.

Removal of structures & Equipment

87 When providing the Developer Works on any Council owned or controlled land is completed for the purposes of this Deed, the Developer, without delay, is to:

87.1 remove from the land any structure not comprising or required in connection with the completed Developer Works and make good any damage or disturbance to the land as a result of that removal,

87.2 remove from the land any Equipment and make good any damage or disturbance to the land as a result of that removal, and

87.3 leave the land in a neat and tidy state, clean and free of rubbish.

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Execution

Executed as a Deed

Dated:
10/8/23

Executed by the COUNCIL:

General Manager

Witness

Paige Nies

Name

Executed by 2728 Pty Ltd in accordance with s127(1) of the Corporations Act (Cth) 2001

Director

~~Director~~ / Secretary

Jarad Ewing

Name

Jarad Ewing

Name

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Executed by Ryan Peter Pryde

Ryan Peter Pryde

Witness

KATHRYN STEWART

Witness Name

Executed by Nancy Fay Margaret Williams

Nancy Fay Margaret Williams

Witness

Felicity Stevens

Witness Name

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Appendix: Explanatory Note

(Clause 44)

Environmental Planning and Assessment Regulation 2021

(Section 205)

Draft Planning Agreement

Under s7.4 of the *Environmental Planning and Assessment Act 1979*

Parties

Council **Gunnedah Shire Council** ABN 80 183 655 793 of 63 Elgin Street, Gunnedah NSW 2380

Developer

2728 Pty Ltd of [redacted]
NSW 2380

Ryan Peter Pryde and Nancy Fay Margaret Williams of [redacted]

(together the Developer)

Description of the Land to which the Draft Planning Agreement Applies

170 Bushs Lane Gunnedah (Lot 1 DP 861697) (Lot 1)

210 Bushs Lane Gunnedah (Lots 27 and 28 DP 755474) (Lot 27 and Lot 28)

Description of Proposed Development/Instrument Change

Lot 1 DP861697 - The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-81 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 1.2ha

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Lots 27 and 28 DP 755474- The amendment of Gunnedah Local Environmental Plan 2012 in terms of the Planning Proposal PP-2022-383 as amended to rezone that Land from RU4 Primary Production Small Lots to R5 Large Lot Residential with a minimum lot size of 9,000sqm

Development of the Land facilitated by the Instrument Change, including, but without limiting the generality of same, a subdivision of the Land or any part of it into allotments with a minimum lot size of 1.2ha (Lot 1) and 9,000sqm (Lots 27 and 28).

Description of Development Contributions

Monetary Development Contribution of $250,000 for Gallen Reservoir Water Supply Pump Augmentation.

Summary of Objectives, Nature and Effect of the Draft Planning Agreement

Objectives of Draft Planning Agreement

To provide for forward funding of the Gallen Reservoir Water Supply Pump Augmentation to service the Development

Nature of Draft Planning Agreement

The Draft Planning Agreement is a planning agreement under s7.4 of the *Environmental Planning and Assessment Act 1979*. The Draft Planning Agreement is a voluntary agreement under which Development Contributions (as defined in clause 1.1 of the Draft Planning Agreement) are made by the Developer for various public purposes (as defined in s7.4(3) of the Act)

Effect of the Draft Planning Agreement

The primary effect of the Draft Planning Agreement is to require the payment of the monetary Development Contribution of $250,000 prior to the issuing of the first subdivision works certificate in respect of any part of the Development.

The Draft Planning Agreement also includes provisions to the effect of the following:

- relates to the carrying out of the Development
- does not exclude the application of s7.11, s7.12 or s7.24 of the Act to the Development,
- is to be registered on the title of the Land until the contribution is paid but may be progressively removed from Final Lots,
- imposes restrictions on the Developer transferring any part of the Land other than a Final Lot (unless the Deed is registered on the title of the Land) or assignment the Developer's rights or obligations under the Deed, or novating the Deed,
- otherwise provides for enforcement of the agreement whereby the Developer's interest in the land to be dedicated may be compulsorily acquired

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for $1 if the land to be dedicated is not dedicated as required by the agreement;

- provides two dispute resolution methods for a dispute under the agreement, being expert determination and mediation,
- provides that the agreement is governed by the law of New South Wales, and
- provides that the A New Tax System (Goods and Services Tax) Act 1999 (Cth) applies to the agreement;
- provides for the Council's costs of entering in the agreement and enforcing the agreement are met by the Developer.

Assessment of the Merits of the Draft Planning Agreement

The Planning Purposes Served by the Draft Planning Agreement

To enable the servicing of the Development where such works would not otherwise be able to funded in the short term.

How the Draft Planning Agreement Promotes the Public Interest

Facilitates the orderly and economic development of the Land.

Assessment of the positive or negative impact of the Draft Planning Agreement on the public or relevant section of the public

The impact of the VPA on the public is positive in so far as the Development promotes the public interest and no negative impacts are identified.

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APPENDIX H

LAND USE CONFLICT ASSESSMENT REPORT, PREPARED BY STEWART SURVEYS PTY LTD, 28 FEBRUARY 2024, REF 5448

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PROPOSED REZONING OF LOTS 27 & 28 IN DP755474
210 BUSHS LANE, GUNNEDAH

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LAND USE CONFLICT RISK ASSESSMENT

DATE: FEBRUARY 2024

PREPARED FOR: JARAD EWING

PREPARED BY:
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This Land Use Conflict Risk Assessment has been prepared by our office to accompany a planning proposal rezoning application. To the best of our knowledge, the content of this statement is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

SITE PARTICULARS

Lot Particulars:	**Lots 27 & 28 in DP755474**
Address:	**210 Bushs Lane Gunnedah**
Property Owner:	**Kerry Elizabeth Pty Limited**
Applicant:	**Jarad Ewing**
Local Government Area:	**Gunnedah Shire Council**
Date:	**28 February 2024**

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INTRODUCTION & SCOPE OF WORKS

This Land Use Conflict Assessment has been prepared for Jarad Ewing by Stewart Surveys Pty Ltd. The report is to accompany a rezoning application for Lots 27 and 28 in DP755474. This holding is hereby referred to in this report as the subject site.

The purpose of this assessment is to identify and evaluate the potential risk of land use conflict issues arising from the proposed development, or neighbouring land uses, before they occur. This report is in reference to the proposal to rezone the subject site from Rural to Residential. It is likely that following the rezoning of the land residential occupation will occur on the subject site.

This report has been prepared in accordance with the following guidelines:

- NSW Department of Primary Industries Land Use Conflict Risk Assessment Guide, first edition, published in October 2011. (hereby referred to as "The Guideline")
- NSW Department of Primary Industries Living and Working in Rural Areas: A handbook for managing land us conflict issues on the NSW North Coast, published in 2007. (Hereby referred to as "the handbook".)

The structure of this report has been derived from the guideline and can be described in four key steps:

1. Gather Information about proposed land use change and associated activities;
2. Evaluate the risk level of each activity;
3. Identify risk reduction management strategies; and
4. Records Land Use Conflict Risk Assessment (LUCRA) results.

The subject site is a vacant primary production small lot holding with stock yards in the south western corner. The holding has historically been stocked with cows and the majority of site is cultivated with oats planted. Lot 27 has a total area of 30.35 hectares and Lot 28 has a total area of 30.15 hectares

The current zoning under the Gunnedah Local Environmental Plan, 2012 of Lots 27 and 28 in DP755474 is RU4 - Primary Production Small Lots. It is proposed to rezone the subject site to R5 – Large Lot Residential.

The current minimum lot size under the Gunnedah Local Environmental Plan, 2012 for the subject site is 10 hectares. It is proposed to rezone the land to a 9000 square metre minimum lot size.

Following the rezoning of the land the property will be capable of large lot residential development.

SUBJECT LAND / SITE DESCRIPTION

The subject site is located at 210 Bushs Lane Gunnedah in an established rural residential area, approximately 8 km southwest of Gunnedah.

The site is rectangular in shape with a 750 metre frontage to Bush's Lane and 810 metre frontage to Robert Gordon Road. Along the southern boundary of the site is an unformed crown road reserve.

The aerial photograph and site photos in **Figure 1** to **Figure 5** show the existing site character, vegetation and access.

Surrounding the subject site are established large Lot residential holdings along Robert Gordon Drive, Rural land to the south and north west and a large holding owned by the State of NSW along the western boundary. Historically, this holding was mined by Whitehaven Coal and known as the Melville Pit with a small coal handling plant located on the site. The land has since been rehabilitated.

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Figure 1: Aerial View of 210 Bushs Lane

Figure 2: View across property from the intersection of Bushs Lane and Robert Gordon Road

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Figure 3: Existing access to the property from Robert Gordon Road

Figure 4: Site Photo from Robert Gordon Drive looking north across the property towards Bushs Lane

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Figure 5: Site Photo from Robert Gordon Drive looking west along the drainage corridor on the site.

The subject site is located on the fringe of the rural residential land use in Gunnedah and is utilised for agricultural pursuits of a hobby nature. Recent uses include cultivation for pasture/oats and cattle grazing. The topography of the subject site is evenly graded, falling to a natural water course in the centre of the site which descends to the east to Robert Gordon Drive. The soils at the site are mapped as the Fulwoods Road Soil Landscape which is red-brown earth commonly found around the township of Gunnedah. This soil is described as having moderate fertility and generally low foundation hazard and limitations. **Figure 6** shows the distribution of this soil landscape and we have attached the Fulwoods Road Soil Landscape Profile to this assessment, refer to Appendix D.

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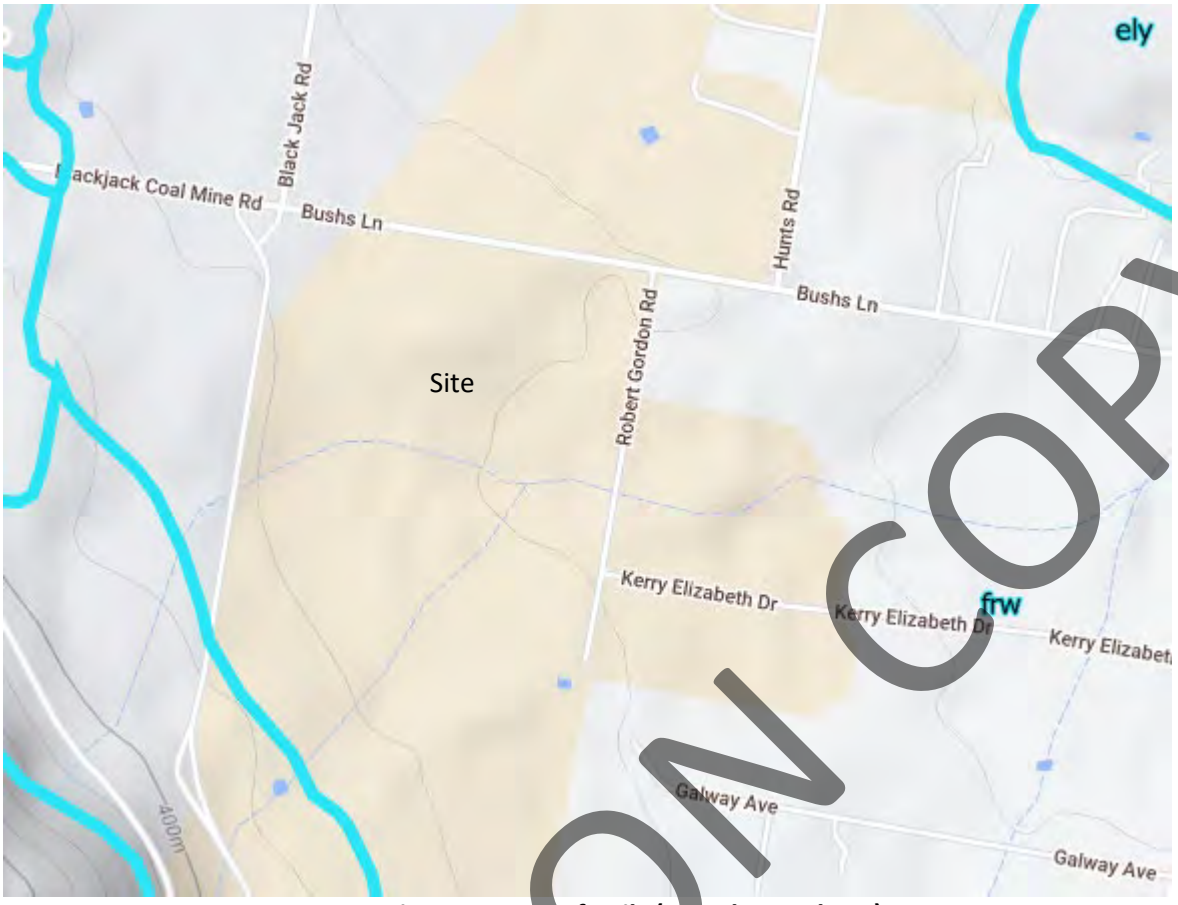

Figure 6: Map of Soils (eSpade Database)

A search of the NSW SEED portal vegetation communities has been conducted for the site. **Figure 7** below shows the extract from this database of the site. The majority of the site is mapped as either PCT 0 which is non-native vegetation or PCT 1 which is Candidate Native Grasslands. There is a small area of PCT 433 *White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion* towards the centre of the site.

A preliminary site investigation (PSI) report for potential contamination at the site has been undertaken by East West Enviro Ag. This report reviewed the site history and noted that the site was currently used for rural purposes and had been for a long time. The PSI report concludes that the risk of contamination of the site from previous use is considered to be low for the proposed residential development land use.

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Figure 7: Map of Vegetation Communities (SEED Database)

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SITE INSPECTION OUTCOMES

The subject site was inspected on 28th November 2023. At this time, it was devoid of stock and the majority of the property was cultivated and under crop with oats. The land was fully fenced at the time of inspection. There are no structures on the property.

The property adjoining the site to the west is Lot 8453 in DP1217472. This holding is owned by the State of New South Wales. It is zoned RU1 Primary Production and C3 Environmental Management with a minimum Lot size of 200 hectares. This property is located at the foot slopes of Blackjack Mountain, also a Crown Land reserve. The holding has formerly been used for extractive industries with a small open cut coal mine, entries to an underground pit and a small coal handling and washing plant. This site was one of the first areas where coal was discovered in the Gunnedah Basin in the late 1870's. The Gunnedah Colliery operations immediately joining the subject site commenced in 1978 and ceased operations in 2002. The open cut Melville pit was used for reject emplacement. The Coal washing facility was de-commissioned when the currently utilized Whitehaven Coal Handling and Processing Plant (CHPP) was established on the Kamilaroi Highway, west of Gunnedah. This site is currently being rehabilitated with the objective of re-establishing a woodland vegetation community. The CCL701 Rehabilitation Plan outlines that in 2023 the following works were completed: demolition, decommissioning, waste removal, borehole sealing, earthworks, rehabilitation and revegetation. In 2024, earthworks and subsidence repairs will be undertaken as well as rehabilitation and revegetation. The site then moves into monitoring and maintenance for three years until vegetation is self-sustaining. **Figure 8** is an aerial photo of this property. The subject site has not been mined and the site is not included in the Mine Subsidence district of Curlewis map. As this property is entering the final stages of rehabilitation and into monitoring and maintenance, the land use activities at the site are considered compatible with this adjoining land use.

Figure 8: Aerial Photo of Crown Holding.

The site is bound to the south by an unformed Crown Road, 20.115 metres wide, then two vacant rural primary production holdings, known as Lot 1 and Lot 2 in DP736969. Lot 1 in DP736969 is a 28.82 hectare vacant lot. This property is held by David Waghorn and used for cattle grazing. Lot 2 in DP736969 is 112.8 hectares in size and owned by Luke Howard along with "Deriwee" which joins Lot 2 in DP736969 to the east and Wandobah Road. This full holding is known as 648 Wandobah Road, Gunnedah. **Figure 9** shows the holdings on the Aerial Photograph.

Luke Howard is currently selling Lot 2 in DP736969 and it is being marketed as a separate holding to the balance of "Derriwee" due to the different land zoning. The property is zoned RU1 Primary Production with a minimum lot size of 200 hectares. As the holding does not meet this size it does not have a building entitlement and is being marketed as a rural grazing block. The balance of "Derriwee" is zoned RU4 Primary Production small lots and is earmarked for future R5 Residential Large Lot rezoning. The Howard holding was formerly part of the Whitehaven Coal operations which were located on the crown land adjacent. As described above, this holding is also currently being remediated. There is a mine office located near the eastern boundary of the holding and some shed infrastructure. The land not currently utilized for primary production purposes.

Lot 1 in DP736969 is currently vacant land. The land owner has advised that it is capable of running 20 steers during an optimal season. The holding is fully fenced and accessed from the end of Robert Gordon Drive.

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Figure 9: Lots 1 and 2 in DP736969 Aerial Photo

The subject site is bound along the northern boundary by Bushes Lane, which has a 20.115 metre road reserve. There are two properties on the opposite side of the road, Lot 1 in DP861697, known as 170 Bushs Lane, Gunnedah and Lot 2 in DP814689, known as "MooGully Farm" 262 Hunts Road, Gunnedah. These properties are zoned RU4 Primary Production Small Lots with a minimum lot size of 10 hectares. However, 170 Bushs Lane, Gunnedah is in the final stages of rezoning to R5 Large Lot Residential land with a minimum lot size of 9000 square metres, the same as this subject site. It is expected that this rezoning will be gazetted in March 2024.

The holding falls evenly to the north-east. No runoff from this property enters the subject site. **Figure 10** shows an aerial photo of the holding demonstrating the landscape character. As the property is being approved for rezoning to R5 Large Lot Residential, we have considered it as residential and there is no land use conflict for the development of this property.

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Figure 10: 170 Bushs Lane Gunnedah Aerial Photo

Moo Gully has an area of 24.53 hectares with frontage to both Hunts Road in the east and Blackjack Road in the west. The southern section of the property, fronting Hunts Road, contains the dwelling and a number of outbuildings. The property is currently used to stock 40 miniature ponies, which are bred by the landowners and 25 sheep graze the western section. The western half of the property has been approved (DA2020/035) for a 5MW Electricity Generating Works (Solar Farm). No construction had been undertaken towards this development at the time of inspection. **Figure 11** shows the aerial of the property and the solar farm approval area. **Figure 12** and **Figure 13** are site photographs of "MooGully Farm" from each road frontage.

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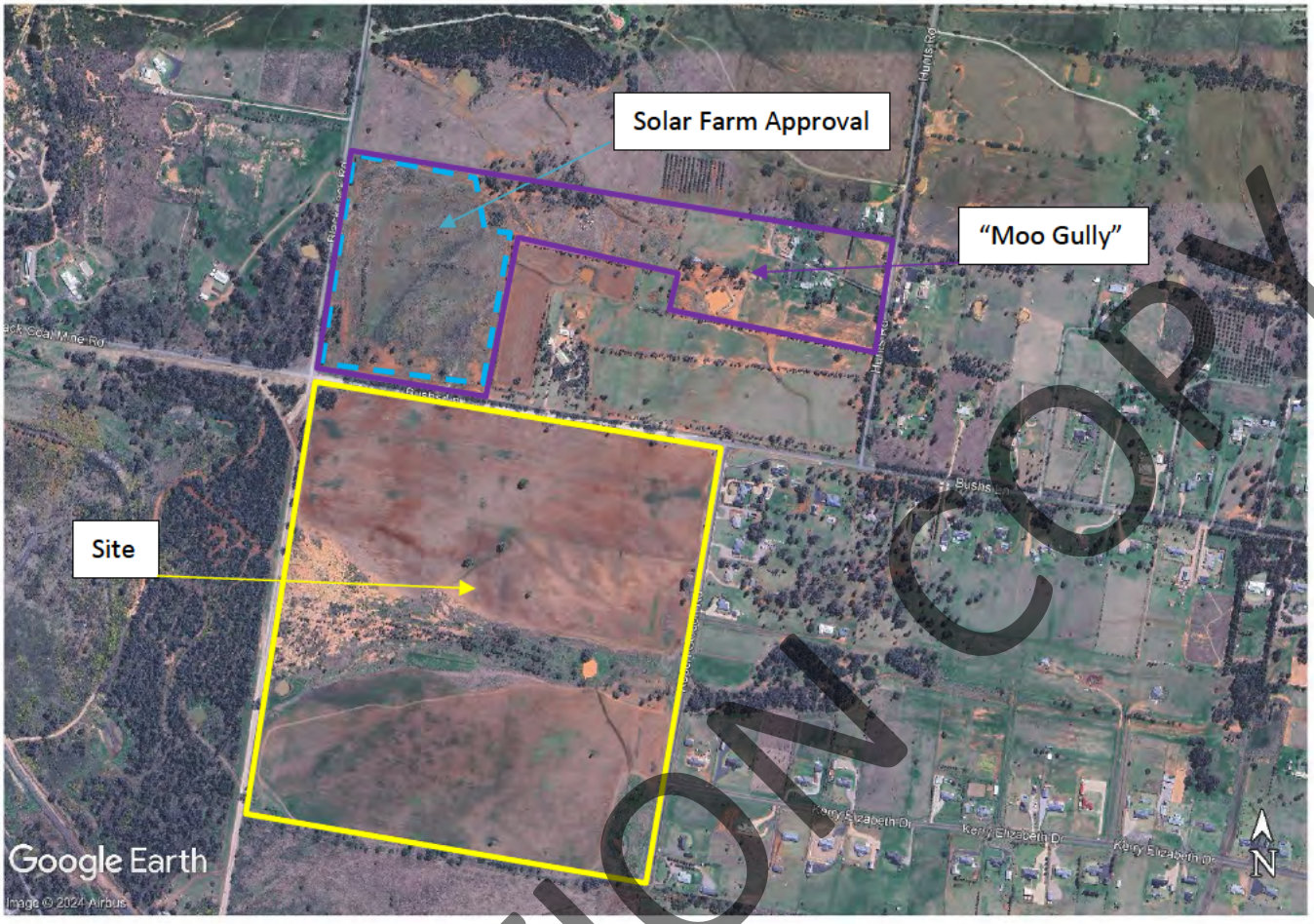

Figure 11: MooGully Aerial Photo

Figure 12: "MooGully" Farm from Hunts Road showing horse grazing

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Figure 13: "MooGully Farm" from Blackjack Road where Solar Farm is approved, currently grazing sheep

Land joining the property to the east is all zoned R5 Large Lot Residential and therefore does not present any land use conflicts with the proposal to rezone the subject site the same. **Figure 14** is an extract from the GLEP, 2012 showing the land zoning surrounding the subject site.

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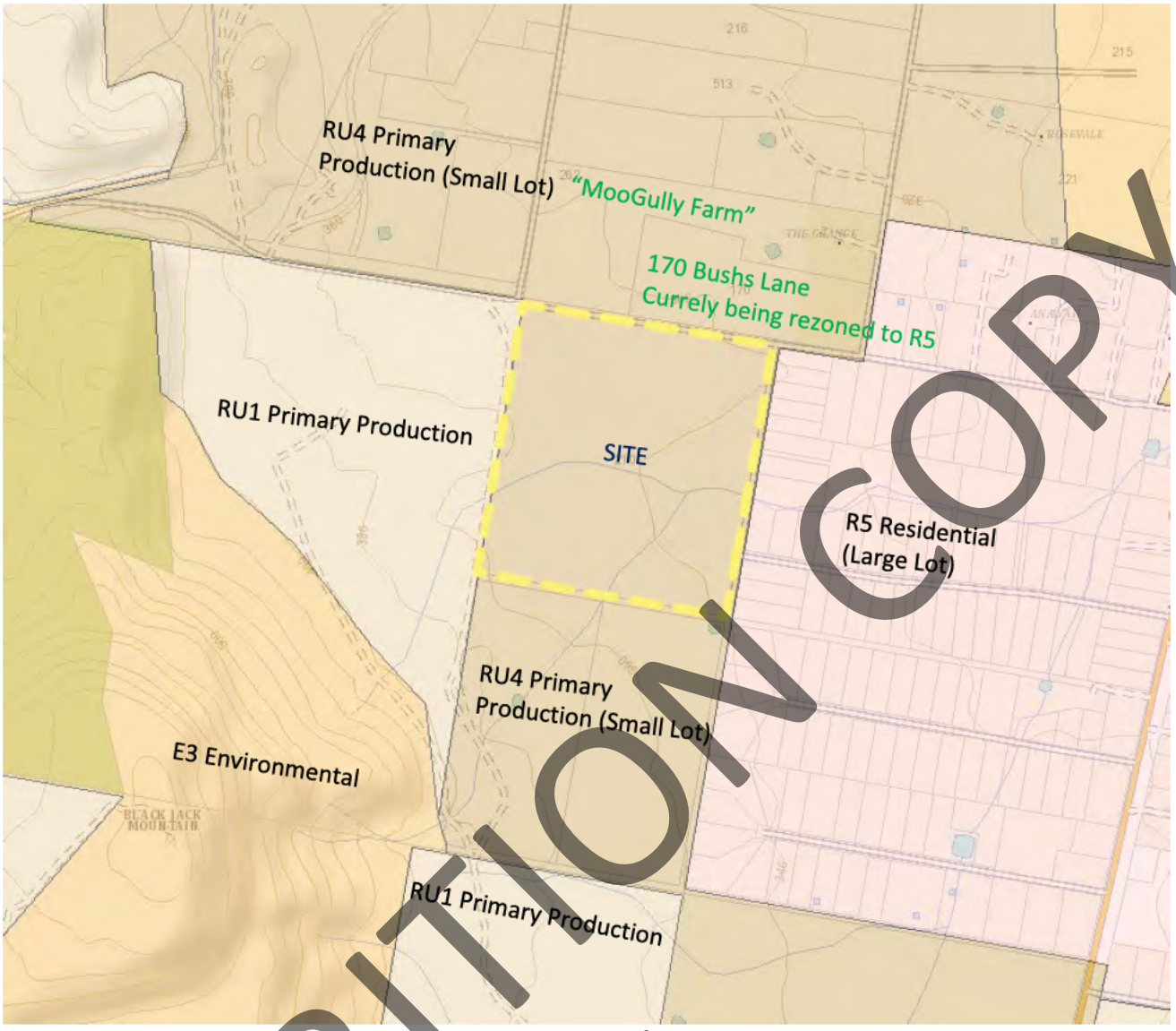

Figure 14: GLEP, 2012 Land Zoning Map LNZ_005A

INITIAL RISK ASSESSMENT

The guideline requires an initial risk assessment of the surrounding land uses and activities in relation to the proposed rezoning for incompatibility and conflicts. The existing land uses on the site and four rural properties surrounding the site are considered to be low intensity agricultural grazing land uses. This includes consideration of the approved five megawatt solar generating development adjoining the site to the north, which has not been constructed yet. As outlined above, we have not considered 170 Bushs Lane Gunnedah as it is in the final stages of being rezoned to residential.

The rural primary production land uses are not considered high risk, being adjacent to large lot residential holdings. We have reviewed the Gunnedah Local Environmental Plan, 2012 land use matrix for land uses which are permitted either with or without consent in the RU4 zone. This list is appended to this report, refer **Appendix C. Table 1** outlines the initial risk evaluation. The risk ranking is in accordance with the measure of consequence table from the guidelines. Refer to **Appendix A** for full details Level 1 is severe and level 5 is negligible.

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Table 1: Initial Risk Evaluation

Activity	Identified Potential Conflict	Risk Ranking
Livestock Grazing (Cattle, Sheep & Horses)	Noise from Livestock and Machinery	4
	Smell from Livestock Manure	4
	Flies from Cattle/Horse dung	4
	Noise from cattle/sheep loading trucks	4
	Stock damaging fences and trespassing	3
Cultivation and cropping	Dust from fields	3
	Nosie from machinery planting and harvesting	3
Weed Control Spraying	Chemical drift	4
	Dust from fields	4
Residential Development	Domestic animals aggravating/chasing livestock	4
	Noise from domestic animals	3
	Pedestrians walking along roads	4
	Weeds escaping from gardens in farms	4
	Earthworks preventing natural stormwater flows	3
Electricity Generating Development	Construction Noise	4
	Increased vehicles during construction	4

The initial risk assessment has not identified any Major or Severe consequences or incompatibilities to the surrounding rural land uses as a result of this proposed development.

CONSULTATION

The following land owners were contacted via letter, refer **Appendix E** on 20 November 2023, and follow-up phone call on 27th November 2023 to confirm any potential risks or consequences for the surrounding land owners to undertake permitted rural activities on their property or any negative consequences of the rezoning on their rural land uses.

[redacted]

[redacted]

[redacted]

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[redacted]

LAND USE CONFLICT RISK ASSESSMENT

The risks of the rezoning are identified in **Table 1: Initial Risk Evaluation.** This section of the report details the risk ranking based on consequence and probability. The levels and rankings have been based on the guideline.

1.1 RISK RANKING MATRIX

The risk ranking matrix **Table 3**, is used to rank the potential land use conflicts. The risk ranking matrix assesses the environmental, public health and amenity impacts according to both the probability of occurrence and the consequence of the impact. There are five (5) levels of probability as outlined in **Table 2,** which is taken from the guideline. The consequence ranking is outlined in the table in **Appendix A** and is also taken from the Guideline. The level of probability and consequence are used to determine Risk Ranking in accordance with **Table 3**. Risk Rankings over 10 are considered unacceptable.

Table 2: Probability Table

Level	Descriptor	Description
A	Almost Certain	Common or repeating occurrence
B	Likely	Known to occur, or 'it has happened'
C	Possible	Could occur, or 'I've heard of it happening'
D	Unlikely	Could occur in some circumstances, but not likely to occur
E	Rare	Practically Impossible

Table 3: Risk Ranking Matrix

Probability Consequence	A	B	C	D	E
1	25	24	22	19	15
2	23	21	18	14	10
3	20	17	13	9	6
4	16	12	8	5	3
5	11	7	4	2	1

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Table 4: Development Risk Ranking and Management Strategy

Activity	Identified Potential Conflict	Probability Level	Consequence Level	Risk Ranking
Livestock Grazing (Cattle, Sheep, Horses)	Noise from Cattle and Machinery	C	4	8
	Smell from cattle manure	D	4	5
	Flies from cattle dung	C	4	8
	Noise from cattle loading truck	C	4	8
	Stock damaging fences and trespassing	D	3	9
Cultivation and cropping	Dust from fields	C	3	13
	Noise from machinery planting and harvesting	D	3	9
Weed Control Spraying	Chemical Drift	D	4	5
	Dust from fields	C	3	13
Residential Development	Domestic Dogs Chasing Cattle	C	4	8
	Weeds Escaping from Gardens onto farms	D	4	5
	Noise from domestic dogs	C	4	13
	Pedestrians walking along roads	C	4	13
	Construction works impede natural stormwater flows	C	3	13
Electricity Generating Development	Construction Noise	C	4	8
	Increased vehicles during construction	C	4	8

The development risk ranking has resulted in a risk ranking ranging from 5 to 13, with severe risks ranked 25. There are five (5) activities which exceed the acceptable risk rating of 10 as highlighted in **Table 3**.

RISK REDUCTION CONTROLS / MANAGEMENT STRATEGIES

The process of risk reduction aims to identify management strategies that affect the probability of an event occurring, such as the implementation of certain procedures. Future residential development on the subject site will be required to meet the minimum setbacks outlined in the Gunnedah Development Control Plan, 2012. These are 25 metres from Hunts Road or Bushs Lane and 10 metres from the side and rear boundaries.

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7.1 LIVESTOCK GRAZING AND RESIDENTIAL DEVELOPMENT

The traditional approach to conflicts between livestock grazing and residential development is separation. This can be achieved by fencing, buffer distances and screening. There are also merits in reducing conflicts through education, information and behavioural change.

The agricultural land surrounding the development is not considered to be state or regionally significant farming land. The properties are small in scale and carry out low intensity agricultural land uses. The Department of Primary Industries (DPI) handbook recommends a 50 metre buffer between grazing land and rural dwellings or urban development. It also recommends 200 metres as a buffer to stockyards. There are no stockyards on any land immediately adjoining the subject site.

Livestock grazing occurs on the property to the south and north of the subject site. These boundaries are joined by a 20.115 metre wide road reserve on each side providing separation to the subject site. Future urban development is low intensity with a minimum lot size of 9000 square metres blocks will have a depth of approximately 200 metres.

To the North is it proposed to widen Bushes Lane to 25 metres in accordance with the Gunnedah Development Control Plan Road Width Requirements. The setback on the subject site and the adjoining property to the north, 170 Bushs Lane Gunnedah, is 25 metres. If 170 Bushs Lane Gunnedah is not redeveloped as residential land and grazing continues, new houses on 210 Bushs Lane, Gunnedah will be required to be setback 25 metres from the northern boundary providing 50 metres separation to the southern boundary of 170 Bushs Lane, Gunnedah. This separation meets the recommendation for separation between grazing land use and residential development.
To the south, the residential properties are separated from the potential future grazing land uses on Lots 1 and 2 in DP736969 by the 20.115 metre wide road reserve. Future housing will have a 10 metre setback or potentially 25 metres if council deems the road at future road reserve. Assuming a 10 metre setback, it is recommended that an additional 20 metre buffer is established with the subject site along the full southern boundary to render the separation between future houses and potential grazing land to be 50 metres in accordance with the guidelines.

Boundary fencing between the properties and future residential development will provide physical barrier between livestock and residential development. There is existing tree planting in the road reserve along the southern boundary, which provides a 20 metre wide vegetated buffer and physical and visual separation to livestock grazing on adjoining properties. As future land owners will have large lots exceeding 9000 square metres in size, we believe there is ample opportunity for dwelling positioning to provide separation between property boundaries.

7.2 CULTIVATION/CROPPING AND RESIDENTIAL DEVELOPMENT

The traditional approach to conflicts between cropping and residential land is separation. The DPI handbook recommends a 200 metre buffer between sugar cane, cropping and horticulture and rural dwellings. The only cultivation surrounding the development site is on the subject site and on the adjoining property, 170 Bushs Lane Gunnedah (which is also being rezoned to residential) and the landowner has advised he does not intend to continue cropping or cultivating the land once rezoned. Therefore, this land use is not considered to be a continuing land use conflict for the rezoning on the subject site. No management strategies will be required as there will not be any cropping on or surrounding the site.

7.3 WEED CONTROL AND RESIDENTIAL DEVELOPMENT

The Pesticides Act 1999 regulates the use of pesticides in NSW and is designed to reduce the likelihood of injury or harm to people or non-target plants or animals. Under the regulations you must only use pesticides as prescribed by the manufacturer on the label. This includes the use, storage and disposal of pesticides. Only accredited farm chemical applicators can apply chemicals on rural land. This minimises the incorrect use of pesticides and protects neighbouring industries. The minimum 10 metre setback for residential dwellings under the Gunnedah Development

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Control Plan will provide separation and mitigates any potential weed control activity impacts. The regulations also ensure that pesticides are only applied by experienced and educated persons resulting in a reduction in inappropriate applications.

7.4 ELECTRICTY GENERATION AND RESIDENTIAL DEVELOPMENT

There is no recommended separation between electricity generating development and residential development and, generally, the two land uses are considered compatible. We do not believe any management strategies are required to avoid potential land use conflicts.

7.4 REHABILITATION SITES AND RESIDENTIAL DEVELOPMENT

There is no recommended separation between rehabilitation sites and residential development. As the property to the west is being rehabilitated to establish woodland vegetation the land use is considered compatible with residential land. As this land is owned by the State of NSW and is mapped as a mine subsidence area, we do not believe it will be utilised for any primary production land uses into the future. We do not believe any management strategies are required to avoid potential land use conflicts.

Table 5 below outlines the identified potential conflict, management strategy proposed and revised risk ranking. The performance target is a management strategy to measure the success of the mitigation measures proposed.

Table 5: Management Strategy

Identified Potential Conflict	Management Strategy	Revised Risk Ranking	Performance Target
Noise from Cattle and Machinery	50 metre buffer with existing onsite vegetation maintained.	5	No noise complaints to farmer or council
Smell from cattle manure	50 metre buffer with existing onsite vegetation maintained.	5	No complaints to farmer or council
Flies from cattle dung	50 metre buffer with existing onsite vegetation maintained.	5	No complaints to farmer or council
Noise from cattle loading truck	50 metre buffer with existing onsite vegetation maintained.	5	No complaints to farmer or council
Stock damaging fences and trespassing	Maintain Boundary fences in good order	5	Farmer confirms zero fence damage or trespass incidents
Dust from fields	No management strategy needed as cultivated land use not continuing.	1	No complaints to farmer or council
Noise from machinery planting and harvesting	No management strategy needed as cultivated land use not continuing.	1	No complaints to farmer or council
Chemical Drift	Good Farming practices in place.	5	No complaints to farmer or council
Domestic Dogs Chasing Cattle	Maintain Boundary fences in good order	8	Farmer confirms zero dog incidents
Weeds Escaping from Gardens onto farms	Maintain Boundary fences in good order	5	Farmer confirms zero weed dumping incidents
Noise from domestic dogs	50 metre buffer Dogs should be yarded at night on residential land	8	No complaints to farmer or council
Pedestrians walking along roads	Education/Signage	8	No incidents reported to

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			council or road authority
Construction works impede natural stormwater flows	50 metre buffer and education on obligations to maintain natural stormwater flows.	8	No complaints to residents or council
Construction Noise	50 metre buffer with existing onsite vegetation maintained.	8	Noise impact no greater than 5 dBA above background
Increased vehicles during construction	Education/Signage	8	No incidents reported to council or road authority

The resulting revised risk rankings are generally below 8 with the implementation of the management strategies proposed. In accordance with the guideline risk rankings of less than 10 are considered acceptable.

CONCLUSIONS AND RECOMMENDATIONS

The subject site, Lots 27 and 28 in DP755474 fronts rural, primary production zoned land, which could present conflict with rural residential to the north, west and south. One of the properties to the north is currently being rezoned to Rural Residential and therefore, will no longer present any land use conflicts. The property to the west is a former extractive industry under rehabilitation and is unlikely to be used for primary production purposes in the future, given the rehabilitation goal to return the land to woodland vegetation. The property is owned by the State of New South Wales, therefore we do not believe this property will present any land use conflicts. The remaining properties are utilised for low intensity primary production with horse and cattle grazing and a future electricity generating solar farm proposed.

The proposed rural residential development is also low density with a minimum lot size of 9000 square metres. This equates to a rectangular size of 210 metres deep by 42.85 metres wide. It is assumed that future landowners will construct their residence close to the 25 metres road setback line on Bushs Lane or the proposed cul-de-sac, as this is where the services including water supply and power connection are located. Situating a dwelling in this vicinity would provide a substantial buffer between the future dwelling and the southern boundary which joins Lots 1 and 2 in DP736969. The road reserves surrounding the site on three boundaries provide separation for the future residents on the subject site. The establishment of a 30 metre buffer is recommended along the southern boundary of the property to provide 50 metres separation to grazing land uses. This buffer, in combination with fencing, existing tree lines, good farming practices and education should ensure the risks at the site can be reduced in probability and consequence.

The review of the proposed management strategies outlined in Table 5 demonstrate a revised risk rating of less than 8 in all potential conflicts identified. As this risk rating is less than 10 it is considered acceptable under the guidelines. The management strategies are represented visually in **Appendix B.**

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Learmonth, R., Whitehead, R., Boyd, B., Flechter, S., Centre for Coastal Agricultural Landscapes in partnership with Northern Rivers Catchment Management Authority, 2007, *Living and working in Rural Areas: A handbook for managing land use conflict issue on the NSW North Coast*, published by NSW DPI. Available at: [https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0010/234001/Living-and-working-in-rural-areas-complete.pdf]

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APPENDIX A

Measure of Consequence Table

(Source: Land Use Conflict Risk Assessment Guide)

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cstewart@stewartsurveys.com

Level: 1	Descriptor: Severe
Description	• Severe and / or permanenet damage to the environment • Irriversible • Severe Impact on the community • Neighbours are in prolonged dispute and legal action involved
Example / Implication	• Harm or death to animals, fish, birds or plants • Long term damage to soil or water • Odours so offensive some people may be evacuated or leave voluntarily • Many public complaints and serious damage to Council's reputation • Contravenes Protection of the Environment and Operations Act and the conditions of Council's licences and permits. Almost certain procestion unde the POEO Act.
Level: 2	**Descriptor: Major**
Description	• Serious and / or long term impact to the environment • Long term managament implications • Serious impact on the community • Neighbours are in serious dispute
Example / Implication	• Water, soil or air impacted, possibly in the long term • Harm to animals, fish or birds or plants • Public complaints. Neighbour disputes occur. Impacts pass quickly • Contravenes the conditions of Council's licences, permits and the POEO Act • Likely prosecution

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Level: 3	Descriptor: Moderate
Description	• Moderate and / or medium-term impact to the environment and community • Some ongoing management implications • Neighbour disputes occur
Example / Implication	• Water, soil or air known to be affcted, probably in the short term • No serious harm to animals, fish, birds or plants • Public largely unaware and few complaints to Council • May contravene the conditions of Council's licences an the POEO Act • Unlikely to result in prosecution
Level: 4	**Descriptor: Minor**
Description	• Minor and / or short term impact to the environment and community • Can be effectively managed as part of normal operations • Infrequent disputes between neighbours
Example / Implication	• Theoretically could affect the environment or people but no impacts noticed • No complaints to Council • Does not affect the legal complicane status of Council
Level: 5	**Descriptor: Negligible**
Description	• Very minor impact to the environment and community • Can be effectively managed as part of normal operations • Neighbour disputes
Example / Implication	• No measurable or identificable impact on the enviroment • No measurable impact on the community or impact is generally acceptable

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APPENDIX B

LAND USE CONFLICT RISK ASSESSMENT RECOMMENDATIONS

210 BUSHS LANE, GUNNEDAH

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Stewart Surveys Pty Ltd
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LGA OF GUNNEDAH
PARISH OF BLACK JACK
COUNTY OF POTTINGER

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LEGEND

- PROPERTY BOUNDARY
- SETBACK LINE
- 50m BUFFER

00 40 80 120 160 200 240 280 320 360 400

REDUCTION RATIO
1:4000

Stewart Surveys
Local people
Local knowledge

CLIENT: JARAD EWING		DESCRIPTION: LAND USE CONFLICT RISK ASSESSMENT PLAN FOR PROPOSED REZONING OF LOTS 27 & 28 IN DP755474 210 BUSHS LANE, GUNNEDAH	
PROJECT: REZONING APPLICATION			
Date: 28 FEBRUARY 2024	File Ref: 5448	Drawn: JA/KJS	Scale: 1:4000 @ A3 Sheet:

APPENDIX C

GUNNEDAH LOCAL ENVIRONMENTAL PLAN, 2012 LAND USE MATRIX

RU4 PRIMARY PRODUCTION (SMALL LOT)
LAND USES PERMITTED WITH AND WITHOUT CONSENT

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Land Use	Permitted with Consent	Permitted without Consent	Not Appropriate for the site.
Aquaculture	X		X
Extensive Agriculture		X	
Bee Keeping		X	
Dairy (Pasture Based)		X	
Intensive Plant Agriculture	X		
Horticulture	X		
Turf Farming	X		
Viticulture	X		
Farm Buildings	X		
Dual Occupancies (attached)	X		
Dwelling House	X		
Home Business	X		
Bed and Breakfast Accommodation	X		
Farm stay Accommodation	X		
Cellar Door Premises	X		
Plant Nurseries	X		
Roadside Stalls	X		
Veterinary Hospitals	X		
Home Industry	X		
Boat Building & Repair Facilities	X		
Sewerage Systems	X		X
Waste or Resource Management Facilities	X		X
Resource Recovery Facilities	X		
Waste Disposal Facilities	X		
Waste or Resource Transfer Station	X		
Water Supply Systems	X		
Water Reticulation Systems	X		
Water Storage Facilities	X		
Water Treatment Facilities	X		
Heliport	X		X
Information & Education Facilities	X		
Building Identification Sign	X		
Business Identification Sign	X		
Boat Launching Ramps	X		X
Boat Sheds	X		X
Charter & Tourism Boating Facilities	X		X
Environmental Facilities	X		
Jetties	X		X
Marinas	X		X
Mooring		X	X
Mooring pens	X		X
Recreation areas	X		
Recreation Facilities (indoor)	X		
Recreation Facilities (outdoor)	X		
Water Recreation Structures	X		
Cemetery	X		
Environmental Protection Works		X	
Extractive Industries	X		

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APPENDIX D

FULWOOD ROAD (FWR) SOIL LANDSCAPE PROFILE

ESPADE PORTAL

EXHIBITION COPY

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cstewart@stewartsurveys.com

frw	FULLWOODS ROAD	Transferral

Landscape— Extremely long (400 - 2,500 m) pediment footslopes comprised of coalescing alluvial fans below Permian and Triassic lithic sandstone hills. Slopes 2 - 8%, local relief <80 m, elevation 290 - 400 m. Mostly cleared open woodland.

Soils— Mostly degraded very deep to giant, moderately well-drained Red and Brown Chromosols (Red-brown Earths) with deep to very deep, well-drained Red Kandosols (Red Earths) common on upper footslopes.

Qualities and limitations— moderate soil fertility, localised foundation hazard, localised dieback, widespread recharge zone, localised discharge zone, localised salinity hazard, localised gully erosion hazard, localised sheet erosion hazard, widespread high run-on, localised permanently high watertables.

LOCATION AND SIGNIFICANCE

Long pediment footslopes and alluvial fans derived from Permian and Triassic sandstone hills in the Curlewis Hills. Type location is E end of Fullwoods Rd, 8 km SE of Curlewis and 17 km NW of Breeza (MGA grid reference 242500E, 6548900N, grid zone 56).

Variants

None.

Included landscapes

None.

LANDSCAPE

Landform

Coalescing alluvial fan systems on long (400 - 2,500 m) pediment footslopes below Permian and Triassic sandstone hills, with slopes between 2 - 8%, local relief <80 m and elevation ranging from 290 - 400 m. Upper slopes are steeper with gradients up to 8% and incised drainage lines, whilst lower slopes are dominated by sheetflow with a few gullies.

EXHIBITION COPY

Localised saline outbreaks are found in the floors of deep gullies and along lower footslopes, particularly where subsurface drainage may be impeded, e.g., by roads.

Geology

Quaternary alluvial/colluvial complex derived from Permian and Triassic sandstones and conglomerates deposited as a complex of interlocking fans. Depth to bedrock is generally >6 m. Most of the fan material overlies Permian sandstones and conglomerates.

Vegetation

Open woodland mostly cleared originally for agriculture. Dominant species which occur in remnant patches of vegetation and in regrowth areas include Eucalyptus albens (white box), E. melliodora (yellow box), E. populnea (bimble box), E. pilligaensis (pilliga box), Casuarina cristata (belah), Brachychiton populneus (kurrajong), Geijera parviflora (wilga), Heterodendron oleifolium (rosewood), Eremophila mitchellii (budda), Acacia deanei ssp. deanei (Deane's wattle), A. aneura (mulga), and A. harpophylla (brigalow).

Ground cover species include Stipa spp. (spear grasses), Aristida spp. (wire grasses), Bothriochloa ambigua (red grass), Dicanthium sericeum (blue grass), Eragrostis spp. (love grasses) and Panicum spp. (panics).

Climate

Estimated average annual rainfall ranges from 560 - 640 mm/year.

Hydrology

Not recorded.

Land use

Most of this soil landscape was originally cleared for cultivation, though grazing of cattle and sheep on improved pastures is now the dominant land use. Cropping is generally carried out in rotation with pasture phases, although some continuous cropping may still be found.

Land degradation

Severe gully erosion is associated with previously intensive cropping, and most gullies are relatively stable. Severe sheet and rill erosion is common in some areas. Structural decline from previous continuous cropping systems is evident in the form of plough pans, and where continuous cultivation is still carried out the remaining topsoil has become a dense compacted mass. Saline outbreaks are found on lower footslopes and fans and in association with structural controls such as roads.

Erosion hazard

Land use	Non-concentrated flows	Concentrated flows	Wind
cultivation	moderate	high	moderate
grazing	low	moderate	low

SOILS

Soil Variation and Distribution

Upper footslopes are dominated by deep to very deep, well-drained Red Kandosols (Red Earths), with total soil depth <2 m. Mid to lower footslopes are generally dominated by very deep to giant, moderately well-drained Red and Brown Chromosols (Red-brown Earths), with total soil depth often >5 m.

QUALITIES AND LIMITATIONS

Capabilities

Land and Soil Capability	5	**Urban Capability**	A
Soil Regolith Class	R4 (R3)		

Limitations to Land Use

Grazing	low	**Cultivation**	moderate to high
Urban	low to moderate		

Landscape

Steep slopes	not observed	**Mass movement hazard**	not observed
Rock outcrop	not observed	**Rockfall hazard**	not observed

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Foundation hazard	localised	**Woody weeds**	not observed
Complex terrain	not observed	**Productive arable land**	not observed
Soils			
Shallow soils	not observed	**Poor moisture availability**	not observed
Non-cohesive soils	not observed	**Soil fertility**	moderate
Hydrology			
High run-on	widespread	**Poor drainage**	not observed
Permanently high watertables	localised	**Permanent waterlogging**	not observed
Seasonal waterlogging	not observed	**Flood hazard**	not observed
Erosion			
Wind erosion hazard	not observed	**Wave erosion hazard**	not observed
Gully erosion hazard	localised	**Sheet erosion hazard**	localised
Streambank erosion hazard	not observed		
Salinity			
Recharge zone	widespread	**Discharge zone**	localised
Salinity hazard	localised	**Seepage scalds**	localised

FACETS

frw(1)— Upper footslopes

Soils	Deep to very deep, well-drained Red Kandosols (Red Earths).
Type Profile	Soil Landscapes of the Curlewis 1:100 000 Sheet (1000212), profile 27.

frw(2)— Mid to lower footslopes

Soils	Very deep to giant, moderately well-drained Red Chromosols and Sodosols (Red-brown Earths and Solodic soils).
Type Profile	Soil Landscapes of the Curlewis 1:100 000 Sheet (1000212), profile 53.

LAND MANAGEMENT RECOMMENDATIONS

Contour banks and strip cropping is necessary to control sheetflow, especially in cropping systems but also beneficial on steeper upper footslopes in grazing systems. Cropping should be in rotation with pasture, with a maximum of 3 years under crop and a minimum of 3 years in continuous pasture. Tree cover of >10% in stands should be retained or promoted by planting or regeneration.

A buffer strip of native vegetation (planted or regenerated trees or pasture) should be maintained along the plain-footslope/fan boundary to lower locally high watertables and thereby reduce dryland salinity hazard.

Subsoil materials are generally unsuitable for earthworks, as some are susceptible to tunnelling or piping whilst others are highly expansive. Likewise some subsoils may provide difficulties in designing and constructing buildings, footings and drainage systems.

NOTES

(1) This report describes soil landscape information mapped at 1:100,000 scale and does not negate the need for site assessment at a scale suitable to the land use or development under consideration.

(2) 'Not observed' means unlikely to be found. 'Localised' means observed to a level considered significant for land management. 'Widespread' means prevalent and significant over most of the landscape. 'None recorded' means no

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occurrence has been recorded. 'Not assessed' means no result has been recorded for this attribute and it may or may not be present in the soil landscape.

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Stewart Surveys, Pty Ltd

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APPENDIX I

BUSHFIRE PRONE LAND SEARCH RESULTS

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Stewart Surveys Pty Ltd
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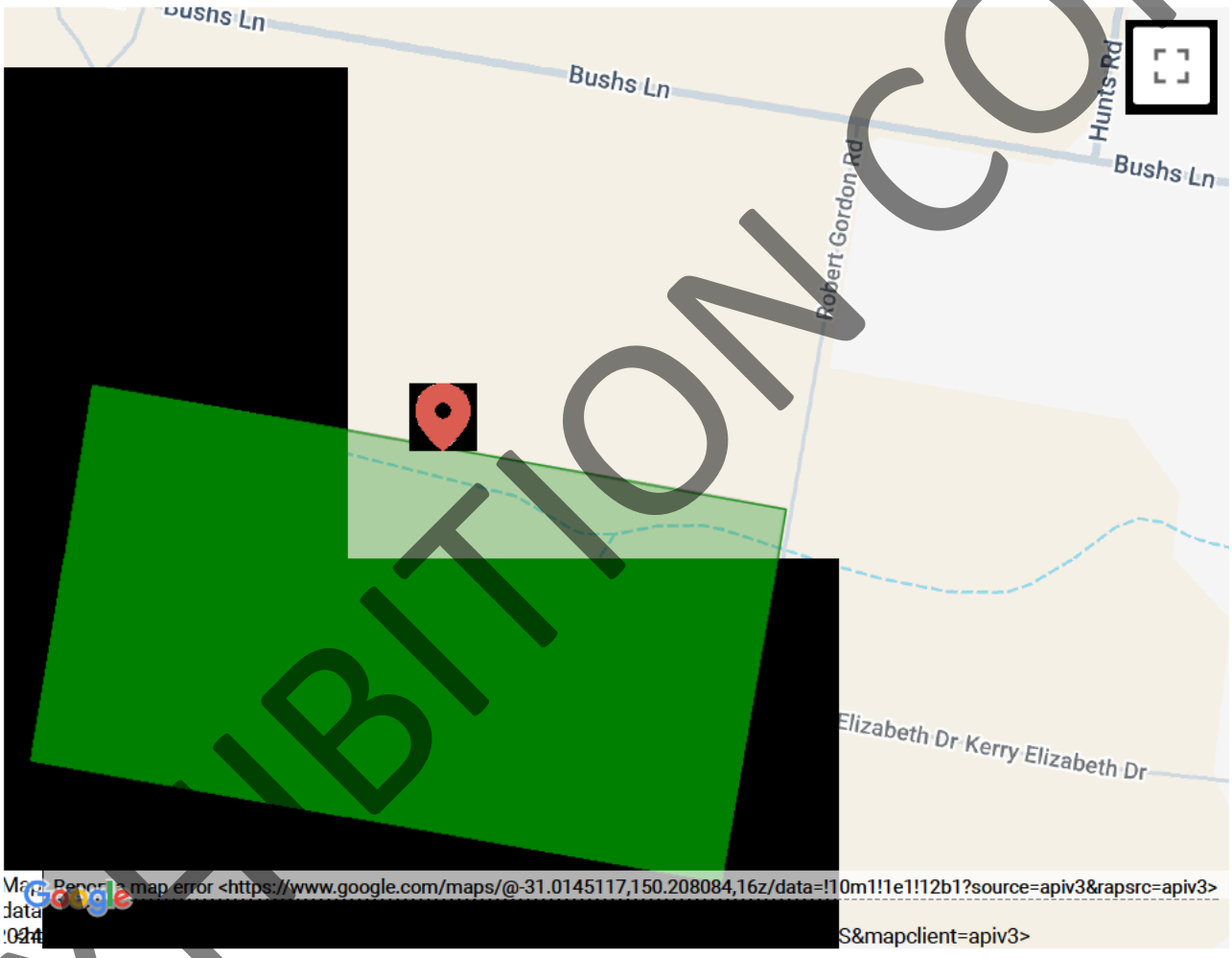
www.stewartsurveys.com

NSW RURAL FIRE SERVICE

Check if you're in bush fire prone land

This tool is best viewed on a desktop web browser.

Your Property



Your search result

You have conducted a search of the online bush fire prone land tool for the land in the map above. This search result is valid for the date the search was conducted. If you have any questions about the Bush Fire Prone Land Tool please contact bushfireprone.mapping@rfs.nsw.gov.au

The parcel of land selected is not identified as bush fire prone however you could still be affected by a bush fire.

Think about where you work, travel or holiday. These areas may be at risk of a bush fire.

Remember, discuss with your family about what to do if a bush fire were to happen near you. It may save your life, your

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community and your family.

For more information on making a plan for bush fire check out our guide to making your bush fire survival plan <https://www.rfs.nsw.gov.au/plan-and-prepare/bush-fire-survival-plan> .

The NSW RFS provides extensive information and resources to assist people interested in preparing their homes and families against the risk of bush fires. Try some of the useful links below for more information:

- Download a guide to making your bush fire survival plan
- Download the Bush Fire and Your Home fact sheet
- Download the Prepare. Act. Survive fact sheet
- Visit our Farm Fire Safety page

New Search Print

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APPENDIX J

SOIL LANDSCAPE PROFILE

-FULWOODS ROAD

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www.stewartsurveys.com

frw	FULLWOODS ROAD	Transferral

Landscape— Extremely long (400 - 2,500 m) pediment footslopes comprised of coalescing alluvial fans below Permian and Triassic lithic sandstone hills. Slopes 2 - 8%, local relief <80 m, elevation 290 - 400 m. Mostly cleared open woodland.

Soils— Mostly degraded very deep to giant, moderately well-drained Red and Brown Chromosols (Red-brown Earths) with deep to very deep, well-drained Red Kandosols (Red Earths) common on upper footslopes.

Qualities and limitations— moderate soil fertility, localised foundation hazard, localised dieback, widespread recharge zone, localised discharge zone, localised salinity hazard, localised gully erosion hazard, localised sheet erosion hazard, widespread high run-on, localised permanently high watertables.

LOCATION AND SIGNIFICANCE

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Variants

None.

Included landscapes

None.

LANDSCAPE

Landform

Coalescing alluvial fan systems on long (400 - 2,500 m) pediment footslopes below Permian and Triassic sandstone hills, with slopes between 2 - 8%, local relief <80 m and elevation ranging from 290 - 400 m. Upper slopes are steeper with gradients up to 8% and incised drainage lines, whilst lower slopes are dominated by sheetflow with a few gullies.

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Localised saline outbreaks are found in the floors of deep gullies and along lower footslopes, particularly where subsurface drainage may be impeded, e.g., by roads.

Geology

Quaternary alluvial/colluvial complex derived from Permian and Triassic sandstones and conglomerates deposited as a complex of interlocking fans. Depth to bedrock is generally >6 m. Most of the fan material overlies Permian sandstones and conglomerates.

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Ground cover species include Stipa spp. (spear grasses), Aristida spp. (wire grasses), Bothriochloa ambigua (red grass), Dicanthium sericeum (blue grass), Eragrostis spp. (love grasses) and Panicum spp. (panics).

Climate

Estimated average annual rainfall ranges from 560 - 640 mm/year.

Hydrology

Not recorded.

Land use

Most of this soil landscape was originally cleared for cultivation, though grazing of cattle and sheep on improved pastures is now the dominant land use. Cropping is generally carried out in rotation with pasture phases, although some continuous cropping may still be found.

Land degradation

Severe gully erosion is associated with previously intensive cropping, and most gullies are relatively stable. Severe sheet and rill erosion is common in some areas. Structural decline from previous continuous cropping systems is evident in the form of plough pans, and where continuous cultivation is still carried out the remaining topsoil has become a dense compacted mass. Saline outbreaks are found on lower footslopes and fans and in association with structural controls such as roads.

Erosion hazard

Land use	Non-concentrated flows	Concentrated flows	Wind
cultivation	moderate	high	moderate
grazing	low	moderate	low

SOILS

Soil Variation and Distribution

Upper footslopes are dominated by deep to very deep, well-drained Red Kandosols (Red Earths), with total soil depth <2 m. Mid to lower footslopes are generally dominated by very deep to giant, moderately well-drained Red and Brown Chromosols (Red-brown Earths), with total soil depth often >5 m.

QUALITIES AND LIMITATIONS

Capabilities

Land and Soil Capability	5	**Urban Capability**	A
Soil Regolith Class	R4 (R3)		

Limitations to Land Use

Grazing	low	**Cultivation**	moderate to high
Urban	low to moderate		

Landscape

Steep slopes	not observed	**Mass movement hazard**	not observed
Rock outcrop	not observed	**Rockfall hazard**	not observed

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Foundation hazard	localised	**Woody weeds**	not observed
Complex terrain	not observed	**Productive arable land**	not observed
Soils			
Shallow soils	not observed	**Poor moisture availability**	not observed
Non-cohesive soils	not observed	**Soil fertility**	moderate
Hydrology			
High run-on	widespread	**Poor drainage**	not observed
Permanently high watertables	localised	**Permanent waterlogging**	not observed
Seasonal waterlogging	not observed	**Flood hazard**	not observed
Erosion			
Wind erosion hazard	not observed	**Wave erosion hazard**	not observed
Gully erosion hazard	localised	**Sheet erosion hazard**	localised
Streambank erosion hazard	not observed		
Salinity			
Recharge zone	widespread	**Discharge zone**	localised
Salinity hazard	localised	**Seepage scalds**	localised

FACETS

frw(1)— Upper footslopes

Soils	Deep to very deep, well-drained Red Kandosols (Red Earths).
Type Profile	Soil Landscapes of the Curlewis 1:100 000 Sheet (1000212), profile 27.

frw(2)— Mid to lower footslopes

Soils	Very deep to giant, moderately well-drained Red Chromosols and Sodosols (Red-brown Earths and Solodic soils).
Type Profile	Soil Landscapes of the Curlewis 1:100 000 Sheet (1000212), profile 53.

LAND MANAGEMENT RECOMMENDATIONS

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NOTES

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occurrence has been recorded. 'Not assessed' means no result has been recorded for this attribute and it may or may not be present in the soil landscape.

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APPENDIX K

STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY CONSERVATION) 2021 REPORT, 210 BUSHS LANE GUNNEDAH, PREPARED BY STEWART SURVEYS PTY LTD, REF. 5448

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Reference: 5448

Stewart Surveys

Development Application

State Environmental Planning Policy (BIODIVERSITY & CONSERVATION) 2021 ASSESSMENT

Subdivision of Lot 27 & 28 in DP75574

210 Bush's Lane, Gunnedah

Date: March 17, 2025

Prepared For: Kerry Elizabeth Pty Ltd

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Stewart Surveys Pty Ltd

107-109 Conadilly Street Gunnedah, PO Box 592 Gunnedah, NSW, 2380 office@stewartsurveys.com

DOCUMENT CONTROLS

Proponent	**Mr Jarad Ewing & Mrs Pip Ewing**
Document Description	SEPP (Biodiversity and Conservation) 2021 Assessment
File Reference	5448
Date	**17 March 2025**
Prepared for	**Client Name:** Kerry Elizabeth Pty Ltd [redacted]
Prepared by	**Kathryn Stewart** Bachelor of Landscape Architecture (UNSW) Masters of Environmental Management (UNSW) Registered Landscape Architect (#001493) **Felicity Stevens** Bachelor of Sustainability (UNE) Stewart Surveys Pty Ltd ABN: 65 002 886 508 PO Box 592, Gunnedah NSW 2380 (02) 6742 2966 Office@stewartsurveys.com
Site Particulars	**Lot Particulars:** Lot 27 & 28 in DP755474 **Address:** 210 Bush's Lane, Gunnedah **Local Government Area:** Gunnedah

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Enquiries should be addressed to Stewart Surveys Pty Ltd

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STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY CONSERVATION) 2021 ASSESSMENT

Kathryn Stewart of Stewart Surveys has been engaged by Kerry Elizabeth Pty Ltd to conduct a report under State Environmental Planning Policy (Biodiversity Conservation) 2021, (herby referred to as SEPP) to accompany a development application for staged subdivision on the property known as Lots 27 & 28 in DP 755474, 210 Bush's Lane, Gunnedah.

This assessment covered the application of State Environmental Planning Policy (Biodiversity Conservation) 2021 (herby referred to as SEPP) Chapters 1 to 12 to the development site.

This assessment has been carried out to review the proposed development for a staged sixty one (61) lot subdivision on Lot 27 & 28 in DP 755474, 210 Bush's Lane, Gunnedah.

This assessment is based on the information shown in the plans:

- Plan of Proposed Subdivision of Lots 27 and 28 in DP755474, 210 Bushs Lane Gunnedah Concept and Staging Plan, prepared by Stewart Surveys Pty Ltd, dated 3rd September 2024, Ref. 5448.

CHAPTER 2 – VEGETATION IN NON-RURAL AREAS

This chapter applies to any clearing of vegetation in a non-rural area, which covered land zoned R5 Large Lot Residential. The proposed development necessitates the removal of some native vegetation to construct the proposed new road and waterway through the development.

Gunnedah Shire Council does not have a tree preservation order.

Clause 2.6 (3) states that a permit is not required for the clearing of vegetation if the land is biodiversity certified land under the Biodiversity Conservation Act, Part 8. Therefore, the approval of the BDAR report for this development will enable the removal of the vegetation necessitated by the development, without triggering any approval requirements under the SEPP.

Gunnedah Shire Council does not have any Tree Preservation Orders or protected trees under the Gunnedah Development Control Plan.

As the development is entering the Biodiversity Offset Scheme there are not requirements under Chapter 2 of the SEPP for this development application.

CHAPTER 3 – KOALA HABITAT PROTECTION 2020

This chapter applies to land, which is zoned RU1 Primary Production, RU2 Rural Landscape or RU3 Forestry. As the subject site is zoned R5 Large Lot Residential this chapter does not apply to this application.

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CHAPTER 4 – KOALA HABITAT PROTECTION 2021

The subject site is zoned R5 and therefore falls under the requirements of State Environmental Planning Policy (Biodiversity Conservation) 2021 – Chapter 4.

This policy defines are Koala assessment Report as:

Koala assessment report, for development, means a report prepared by a suitably qualified and experienced person about the likely and potential impacts of the development on koalas or koala habitat and the proposed management of those impacts.

Gunnedah Shire Council is listed as containing Koala habitat under the SEPP. This policy states that for all land greater than 1 hectare in size, before Council may grant consent to an application to carry out development on land it must determine the level of impact a development is likely to have on Koalas or their Habitat.

There is no approved Koala Plan of Management on this site and therefore clause 4.9 of the SEPP applies to this development.

In order to determine if the site was core Koala habitat, Kathryn Stewart of Stewart Surveys conducted a site inspection in June 2024 and Ecologist Dr Tom Pollard conducted targeted Koala Surveys as part of the BDAR field assessment in 2022. Both Ms Stewart and Mr Pollard meet the suitably qualified person requirements of the SEPP Guideline.

The SEPP defines core Koala habitat as:

core koala habitat means—

an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or

an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

The subject site has an area of 60.5 hectares and is vacant land, zoned as R5 (Large Lot Residential) under the Gunnedah Local Environment Plan, 2012. The lot is predominately grasslands, and established trees along an intermittent watercourse running centrally through the site.

Figure 1 is an aerial photo of the holding and site photos in Figure 2 to Figure 4 illustrate the site character.

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Figure 1: Aerial Photograph (Source: Google Earth.)

Figure 2: Site Photo Looking South West Across the Site

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Figure 3: Site photo looking north along the eastern boundary at Robert Gordon Road

Figure 4: Photo of site Vegetation looking west from Robert Gordon Road

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Ecologist Dr Tom Pollard has noted the following in his vegetation assessment

Site vegetation consists of:

- *cropped land (non-native vegetation) (the majority of the site*
- *PCT101 - Poplar Box - Yellow Box - Western Grey Box grassy woodland on cracking clay soils mainly in the Liverpool Plains, Brigalow Belt South Bioregion (occurs as planted vegetation and derived grassland)*
- *PCT435 – 'White box – yellow box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.*

Most native vegetation at the site is present in a very low condition (vegetation integrity scores of <15), with only small areas of low to moderate condition vegetation present (vegetation integrity scores of between 30-40).

Areas of PCT435 at the site are broadly consistent with the BC Act threatened ecological community 'White Box Yellow Box Blakely's Red Gum Woodland'.

Targeted threatened flora searches undertaken within areas of suitable habitat at the site did not locate any individuals.

Habitat values for threatened fauna at the site are minimal with key habitat features such as hollow-bearing trees virtually absent. However, some foraging habitat for several threatened microbats and birds could potentially occur. Targeted searches for koalas (scat searches and spotlighting) did not record any evidence of usage of areas of suitable habitat at the site.

The proposal would remove areas of PCT435 woodland that would require ecosystem credits. All other areas of vegetation to be removed have low condition below the threshold for which ecosystem credits are required. No species credits would be required. Generally, the lots are adequately sized to accommodate a driveway and building envelope without clearing of PCT435 woodland areas. However, the small size of retained areas of PCT435 within individual lots and potential future direct and indirect impacts mean that they would be considered as 100% loss in the BAM calculator and therefore require offsets.

Gunnedah falls into the Northwest Slopes Koala Management Area under the SEPP. Schedule two of the SEPP outlines koala use tree species for this management area. These tree species are listed in **Table 1**.

Table 1: Northwest Slopes Koala Management Area Tree Species

Scientific Name	Common Name
Angophora floribunda	Rough-barked Apple
Callitris glaucophylla	White Cypress Pine
Casuarina cristata	Belah
Eucalyptus albens	White Box
Eucalyptus blakelyi	Blakely's Red Gum

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Eucalyptus bridgesiana	Apple Box
Eucalyptus caleyi	Drooping Ironbark
Eucalyptus caliginosa	Broad-leaved Stringybark
Eucalyptus camaldulensis	River Red Gum
Eucalyptus canaliculata	Large-fruited Grey Gum
Eucalyptus chloroclada	Dirty Gum
Eucalyptus conica	Fuzzy Box
Eucalyptus coolabah	Coolibah
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus dalrympleana	Mountain Gum
Eucalyptus dealbata	Tumbledown Red Gum
Eucalyptus dwyeri	Dwyer's Red Gum
Eucalyptus exserta	Peppermint
Eucalyptus fibrosa	Broad-leaved Red Ironbark
Eucalyptus goniocalyx	Bundy
Eucalyptus laevopinea	Silver-top Stringybark
Eucalyptus largiflorens	Black Box
Eucalyptus macrorhyncha	Red Stringybark
Eucalyptus mannifera	Brittle Gum
Eucalyptus melanophloia	Silver-leaved Ironbark
Eucalyptus melliodora	Yellow Box
Eucalyptus microcarpa	Western Grey Box
Eucalyptus moluccana	Grey Box
Eucalyptus nobilis	Forest Ribbon Gum
Eucalyptus parramattensis	Parramatta Red Gum
Eucalyptus pauciflora	White Sally, Snow Gum
Eucalyptus pilligaensis	Narrow-leaved Grey Box
Eucalyptus polyanthemos	Red Box
Eucalyptus populnea	Bimble Box/Poplar Box
Eucalyptus prava	Orange Gum
Eucalyptus punctata	Grey Gum
Eucalyptus quadrangulata	White-topped Box
Eucalyptus sideroxylon	Mugga Ironbark
Eucalyptus viminalis	Ribbon Gum

The PCT 101 and 434 include the following Koala Habitat species, listed in **Table 1**. Eucalyptus albens, Eucalyptus populnea, Callitris glaucophylla, Eucalyptus melliodora, Eucalyptus mircrocarpa, Eucalyptus melanophloia, Eucalyptus pilligaensis, and Casuarina cristata.

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The vegetated area were inspected for Koala or evidence of Koala activity by means of scats at the base or scratch markings on the trunk. There were no Koalas observed on site and no evidence of past koala activity observed on the stie during the inspections.

Desktop Review of Koala habitat

Further to the site investigations a desktop review of the Gunnedah Koala Strategy and Bionet record of koala sightings in the last 18 years was undertaken.

The subject site forms part of the Gunnedah Koala Strategy endorsed by Gunnedah Shire Council on 21 October 2015. The subject site is located in the Gunnedah focus area and mapped in figure 4.1 of the strategy prepared by Greenloaning Biostudies. **Figure 5** shows the site on this map.

Generally, the vegetation on the site is not mapped as Koala habitat, there is a small area of vegetation on the eastern boundary of the site, mapped as 2B secondary (class B) Koala habitat. This type of vegetation is able to support koala populations in low density.

The subject site is not identified as being in an area of high Koala activity in the Greenloaning report.

Figure 5: Site on Figure 4.1 of the Koala Strategy Gunnedah Focus Area

A search of the NSW Office of Environment and Heritage Bionet Atlas of NSW Wildlife records 1,478 koala sightings in the Gunnedah LGA. A search of the area surrounding the site shows there no sightings recorded on Lot 27 & 28 in DP 755474, however there were other sightings in close vicinity to the site. **Figure 6** shows an extract from this search showing the site and associated sightings.

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Table 2: Koala Sightings on Bionet Database

Easting	Northing	Date of Record	Location
233458	656712	24 August 2021	Approx. 1.7km from site (Lot 2 DP1228419
233850	6567157	30.06.2006	Approx. 1.3km from site (Lot 18 DP263040)
233732	6567097	08.11.2014	Approx. 1.2km from site (Lot 17 DP263040)
233723	6567088	11.12.2013	Approx. 1.3km from site (Lot 17 DP236040)
233898	6567053	30.06.2006	Approx. 1.3km from site (Lot 2 DP857643)
233967	6567028	30.06.2004	Approx. 1.2km from site (Lot 1 DP857643)
233415	6566354	30.06.2006	Approx. 600m from site (Lot 11 DP833716)
234163	6567265	01.11.2013	Approx. 1.6km from site on Hunts Road
234146	6567195	08.11.2014	Approx. 1.6km from site on Hunts Road
234645	6567177	30.06.2006	Approx. 1.7km from site (Lot 314 DP755503)
234505	6566389	31.12.1986	Approx. 1km from site (Lot 310 DP660676)

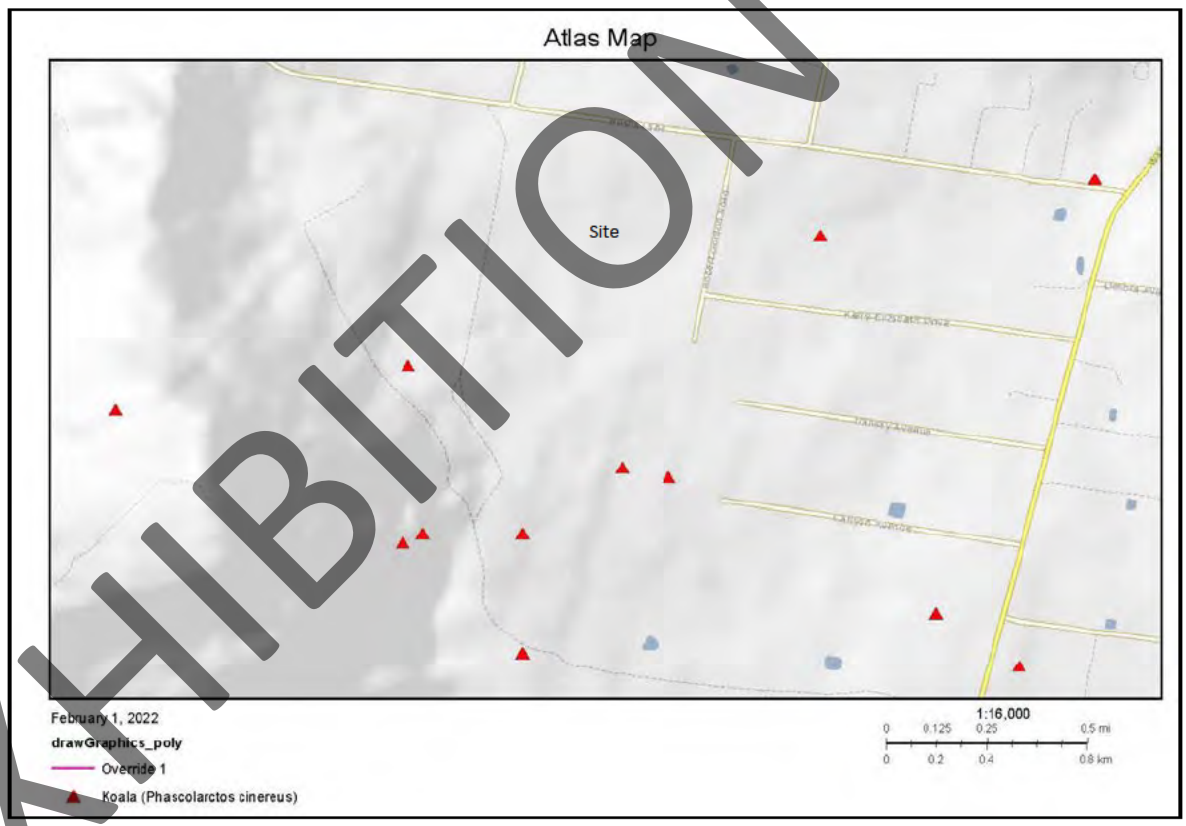

Figure 6: Bionet Atlas Map showing Koala sightings in the area (BIONET)

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Application of Core Koala Habitat

The subject site has been assessed by Kathryn Stewart of Stewart Surveys as being highly suitable Koala Habitat due to the high presence of Koala Habitat Trees on the site. Both a site inspection conducted in 2024 and 2022 and a review of historical records of Koala sightings did not show Koalas being present on this site or over the last 18 years. Therefore, the subject site does not meet the definition of Core Koala Habitat under SEPP (Koala Habitat Protection), 2021. On this basis the proposed development is expected to have a low impact on Koala Habitat.

Further, we refer to the Biodiversity Development Assessment Report (BDAR) for this development section 8.2 which also concludes the site is not classified as core koala habitat.

Clause 4.9 (3) of the policy states that if council are satisfied that the development is likely to have a low or no impact on koalas or koala habitat, the council may grant consent to the development application.

CHAPTER 5 - RIVER MURRAY LANDS

This chapter does not apply to land in the Gunnedah Shire.

CHAPTER 6 – BUSHLAND IN URBAN AREAS

This chapter does not apply to land in the Gunnedah Shire.

CHAPTER 7 TO 12 – REPEALED

CHAPTER 13 –STRATEGIC CONSERVATION PLANNING

This chapter primarily applies to the Sydney and Hawkesbury region and does not apply to land in the Gunnedah Shire.

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CONCLUSION

We have conducted a full State Environmental Planning Policy (Biodiversity Conservation) 2021 assessment for the proposed development application. The only chapters which applies to this development is Chapter 2 – Vegetation in non-rural areas and Chapter 4 – Koala Habitat Protection 2021. Our assessment concludes that there are no known impacts of proposed development which prohibit council from supporting this application.

This SEPP (Biodiversity and Conservation) 2021 Assessment report has been prepared by our office to accompany a council application. To the best of our knowledge, the content of this statement is true in all material particulars and does not, by its presentation or omission of information, materially mislead.

EXHIBITION COPY

REFERENCES

Department of Lands, *Spatial Information Exchange,* Available at [https://six.maps.nsw.gov.au/wps/portal/]. Abbreviated as DL SIX

New South Wales Government, *Gunnedah Local Environmental Plan 2012,* Available at [http://www.legislation.nsw.gov.au]

New South Wales Government Legislation, State Environmental Planning Policy (Koala Habitat Protection) 2021, Available at [https://legacy.legislation.nsw.gov.au/EPIs/2021-115.pdf]

Phillips, S. S. (2000) Tree species preferences of the Koala Phascolarctos cinereus as a basis for the delineation of management areas for recovery planning in New South Wales. Unpub. report to NSW National Parks and Wildlife Service/Koala Recovery Plan.

Department of Environment and Climate Change NSW (DECC) 2008. The Approved Recovery Plan for the Koala.

EXHIBITION COPY

APPENDIX L

DEPOSITED PLAN PORTION 27 & 28

LAND REGISTRY SERVICES TITLE SEARCH
- LOT 27 & 28 DP 755474

ASIC SEARCH RESULTS – KERRY ELIZABETH PTY LTD

EXHIBITION COPY

Req:E203339 /Doc:CP 4159-1781 /Rev:15-Sep-2008 /Sts:OK.OK /Prt:12-Jul-2011 08:57 /Pgs:ALL /Seq:1 of 1
Ref:3910 /Src:M

+9°33'

1900/5444 ENCLOSURE LANDS OFFICE TAMWORTH

PLAN OF PORTION 27

County of Pottinger Parish of Black Jack

Land District of Gunnedah Land Board District of Tamworth

Resumed Area N°. Pastoral Holding Central Division

Applied for under the Section of the Crown Lands Act of 188 by.

Within the Population Area of Gunnedah Proc.d 26th Sept.r 88 / Revoked 14th 28 January 1905

Within H.S. Area 734, notif.d 6th March 01.

H.S. 01/18 of 6th June by Robert Patrick Corcoran / Confirmed 2nd July 01 – Forf.d 18th Feb.y 03

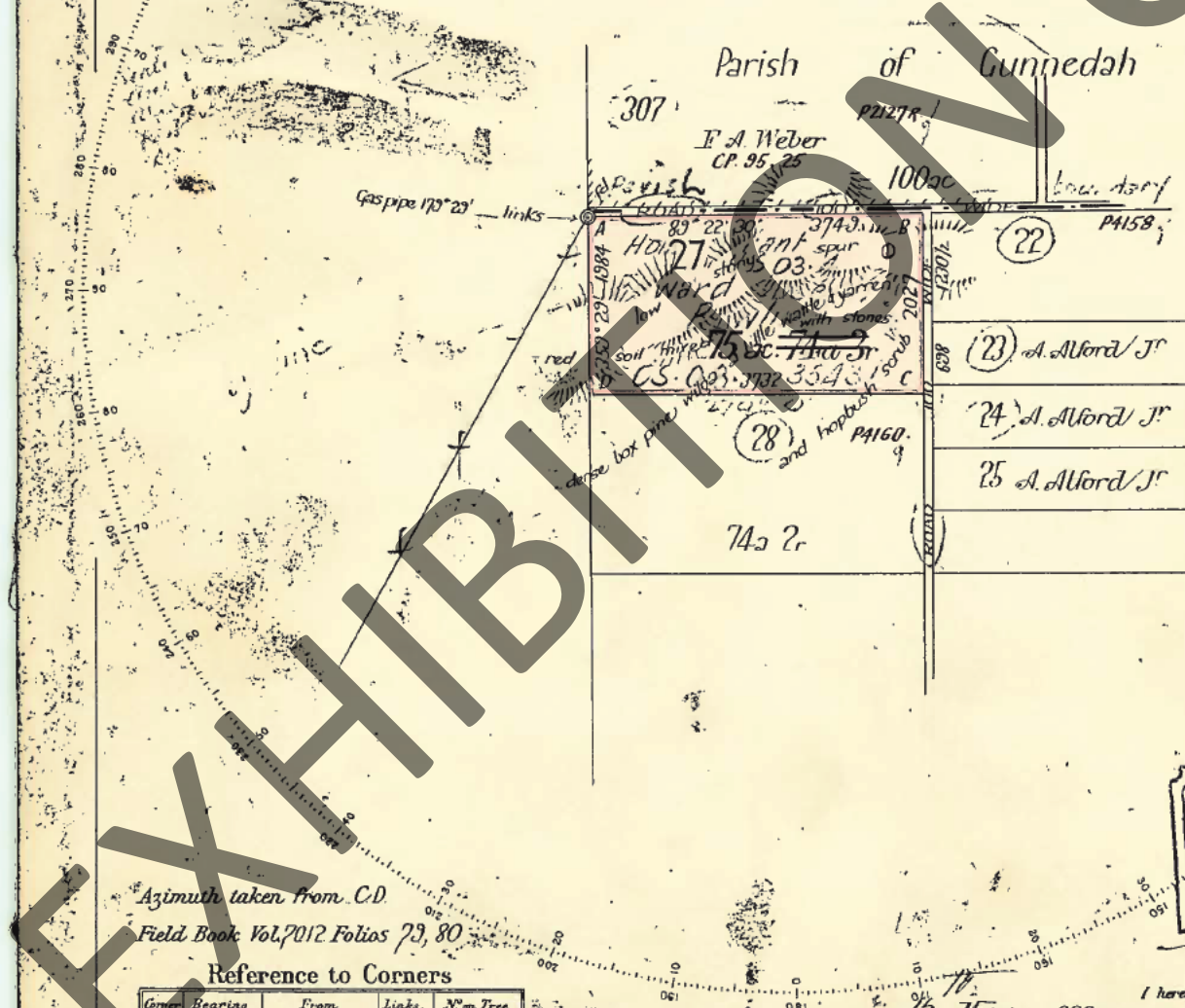
H.S. 03/4 of 11th June by Edward J. Bowting Conf.d 15th Sept. 03. Now Hom. Grant Vide C.508. 354 31 Grant surrendered

① C.P. 22.17 (Conv.d Nov. 14th) Robert Mitchell Walker Now Rural Bank of New South Wales Sale Completed Sales 49-135-27

+9°31'

PLAN MICROFILMED

NO ADDITIONS OR AMENDMENTS TO BE MADE



PLAN APPROVED. 31 AUG 00 per 27 of 7 Sac

Azimuth taken from C.D.

Field Book Vol. 2012 Folios 73, 80

Reference to Corners

Corner	Bearing	From	Links.	N°on Tree
A	167° 50'	Box	36	27
B	241° 50'	Pine	51½	27
C	312° 35'	Box	49½	27 28
D	10° 52'	Box	22½	27 28

Reference to Traverse

Line	Bearing	Distance

I hereby certify that I in person made and on the 5 May 1900 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

Licensed Surveyor

Transmitted to the District Surveyor with my letter of 21 June N° 00/32

Voucher N°00/31 Passed £ 5.12.1 Edwd Bagot 5/7/00

Calculation Book N° 2051 Folio 76

Checked and Quarted R. P. Smith 2/7/00

Examined Edwd Bagot 11 August 1900

Plan approved

Certified copy to Head Office 7.10.00

Value of Improvements Nil

Traced for helio 2.10.00

Scale 20 Chains to an Inch

P4159.1781

4159-1781

EXHIBIT
COPY

Req:E203340 /Doc:CP 4160-1781 /Rev:15-Sep-2008 /Sts:OK.OK /Prt:12-Jul-2011 08:57 /Pgs:ALL /Seq:1 of 1
Ref:3910 /Src:M

+9°33'

1900/5447
...OSURE.
...D OFFICE TAMWORTH

PLAN OF PORTION 28

County of Pottinger Parish of Black Jack

Land District of Gunnedah Land Board District of Tamworth

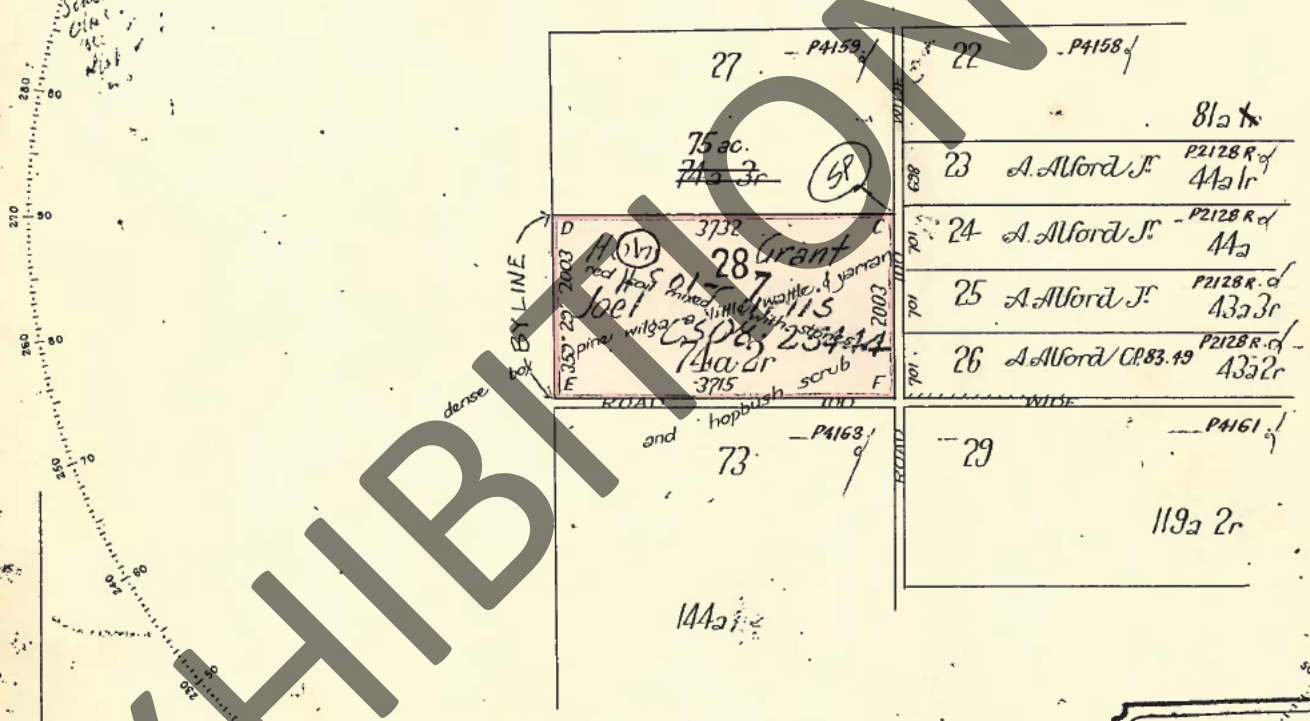
Resumed Area No. Pastoral Holding, Central Division.

Applied for under the Section of the Crown Lands Act of 188 by

Within the Population Area of Gunnedah Proc.d 26th Sept.r 88 / Revoked 14th January 1905
Within H.S. Area 734, notif.d 6th March 01.
H.S. 01-7 of 11th April by Joel Curtis Confirmed 22nd April 01 Now Hom Grant Vide CS08.25444
① Now C.P. 1911-85 of 28th July 1911. Eliza Baxter (Section 3. Act 1908) conversion
Now Rural Bank of New South Wales Sale completed Sales 40.248

+9°31'40"

PLAN MICROFILMED
NO ADDITIONS OR AMENDMENTS TO BE MADE



PLAN APPROVED.
31 AUG. 00
R. Shelton
DC

Azimuth taken from por. 73
Field Book Vol. 7012 Folios 79, 80

Reference to Corners

Corner	Bearing	From	Links.	No. on Tree
C	312° 35'	Box	49½	27 28
D	10 52	Box	22½	27 28
E	294 10	Box	21½	28
F	308 0	Box	42	28

Value of Improvements Nil

Reference to Traverse

Line	Bearing	Distance

I hereby certify that I in person made and on the 13th May 1900 completed the survey represented on this plan on which are written the bearings and lengths of the lines measured by me and I declare that the survey has been executed in accordance with the regulations published for the guidance of Licensed Surveyors and the practice of the Department of Lands.

George Soder Licensed Surveyor

Transmitted to the District Surveyor with my letter of 21 June No. 00/33

Voucher No. 00/32 Passed £ 4 " 3. 9. [illegible] 29/8/00
Calculation Book No. 2051 Folio 77
Checked and Charted R. R. Smith 3/7/00
Examined [illegible] 29 August 1900

Plan approved

Certified copy to
Head Office 17. 10. 00

Traced for Helio 3 10 00

Scale 20 Chains to an Inch.

P4160. 1781

4160-1781

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LAND REGISTRY SERVICES

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 27/755474

SEARCH DATE	TIME	EDITION NO	DATE
10/10/2024	10:55 AM	5	26/6/2024

LAND

LOT 27 IN DEPOSITED PLAN 755474
LOCAL GOVERNMENT AREA GUNNEDAH
PARISH OF BLACK JACK COUNTY OF POTTINGER
(FORMERLY KNOWN AS PORTION 27)
TITLE DIAGRAM CROWN PLAN 4159.1781

FIRST SCHEDULE

KERRY ELIZABETH PTY LTD (T AT453052)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 AT453053 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
3 AU165864 PLANNING AGREEMENT PURSUANT TO SECTION 7.6 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Stewart Surveys Pty Ltd PRINTED ON 10/10/2024

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title.
Warning: the information appearing under notations has not been formally recorded in the Register.

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Note: Information contained in this document is provided by DYE & DURHAM TERRAIN PTY LTD (ABN 35 164 894 517), https://dyedurhamterrain.com/ an approved NSW Information Broker

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D&D Terrain

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 28/755474

SEARCH DATE	TIME	EDITION NO	DATE
10/10/2024	10:58 AM	5	26/6/2024

LAND

LOT 28 IN DEPOSITED PLAN 755474
LOCAL GOVERNMENT AREA GUNNEDAH
PARISH OF BLACK JACK COUNTY OF POTTINGER
(FORMERLY KNOWN AS PORTION 28)
TITLE DIAGRAM CROWN PLAN 4160.1781

FIRST SCHEDULE

KERRY ELIZABETH PTY LTD (T AT453052)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 AT453053 MORTGAGE TO COMMONWEALTH BANK OF AUSTRALIA
3 AU165864 PLANNING AGREEMENT PURSUANT TO SECTION 7.6 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Stewart Surveys Pty Ltd PRINTED ON 10/10/2024

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