

Riparian Assessment Report

Planning Proposal to Rezone Land within the South West Growth Area,
Catherine Field Precinct, Catherine Field, NSW



Prepared for: Springfield Rd Pty Ltd

C/- Urbanco

15 March 2022

AEP Ref: 2438

Revision: 01

Document Control

Document Name	Riparian Assessment Report for Planning Proposal to Rezone Land within the South West Growth Area, Catherine Field Precinct, Catherine Field, NSW
Project Number	2438
Client Name	Springfield Rd Pty Ltd C/- Urbanco
AEP Project Team	Simon Purcell Jeremy Burrill Stevie Kay Natalie Black

Revision

Revision	Date	Author	Reviewed	Approved
00	23/02/2022	Jeremy Burrill	Natalie Black	Simon Purcell
01	15/03/2022	Jeremy Burrill	Natalie Black	Simon Purcell

Distribution

Revision	Date	Name	Organisation
00	23/02/2022	Guy Evans	Urbanco
01	15/03/2022	Guy Evans	Urbanco

Contents

1.0	Introduction	1
2.0	Site Particulars	1
3.0	Methodology	5
3.1	Information Sources	5
3.2	Desktop Assessment	5
3.3	Field Survey	5
4.0	Riparian Assessment Results	8
5.0	Conclusion	17
6.0	References	18

Tables

Table 1 – Site Details	1
Table 2 – Field Survey Results Survey ID 1	8
Table 3 – Field Survey Results Survey ID 2	9
Table 4 – Field Survey Results Survey ID 3	10
Table 5 – Field Survey Results Survey ID 4	11
Table 6 – Field Survey Results Survey ID 5	12
Table 7 – Field Survey Results Survey ID 6	13
Table 8 – Field Survey Results Survey ID 7	14
Table 9 – Field Survey Results Survey ID 8	15
Table 10 – Riparian Corridor Matrix	17

Figures

Figure 1 – Site Location	3
Figure 2 – Hydroline and Hydroarea	4
Figure 3 – Site Assessment	7
Figure 4 – Survey Effort	16

Appendices

- Appendix A – NRAR Hydroline Spatial Data
- Appendix B – Indicative Structure Plan
- Appendix C – Author CVs

1.0 Introduction

Anderson Environment & Planning was commissioned by Springfield Rd Pty Ltd (the client) to undertake a Riparian Assessment Report (RAR) to inform a Planning Proposal to Rezone Land within the South West Growth Area, Catherine Field Precinct, Catherine Field NSW, refer **Figure 1**.

For the purposes of referencing, this document should be referred to as:

Anderson Environment & Planning (2022). *Riparian Assessment Report for Planning Proposal to Rezone Land within the South West Growth Area, Catherine Field Precinct, Catherine Field NSW*. Unpublished report for Springfield Rd Pty Ltd. March 2022.

2.0 Site Particulars


Table 1 – Site Details

Detail	Comments
Client	Springfield Rd Pty Ltd
Address	Charlesworth Close, Springfield Road, Camden Valley Way & Catherine Field Road in Catherine Field NSW, Catherine Field, NSW
Precinct	'Catherine Field Precinct' within the South West Growth Area
Lot Assessed During Field Assessment	Springfield Road Lots 3 – 4 DP215520, Charlesworth Close Lot 302 DP716446, Lots 10 – 11, DP618175, Lots 204 – 206 DP249147 and lots contained within Precinct 1, identified within the land adjacent to Springfield Road, Camden Valley Way and Catherine Fields Rd, Catherine Field, NSW. Numerous other lots are included in the rezoning application (as identified within the Subject Site), however, they were not assessed as part of the field survey due to access constraints.
Subject Site	The Subject Site covers approximately 104ha and includes the entirety of the lots within the Subject Site boundary (refer Figure 1).
LGA	Camden
Zoning	As per Camden LEP 2010, the Subject Site is predominately zoned RU4 – Primary Production Small Lots, with the exception of lots in the northern part zones R5 – Large Lot Residential.
Current Land Use	The Subject Site comprises rural dwellings consisting of cattle paddocks, farming dams and equipment, industrial waste and croplands. (Refer Figure 2).
Surrounding Land Use	The Subject Site is bounded by Camden Valley Way to the east, Springfield Road to the south, Catherine Fields Road to the north and lots zoned R5 and RU4.

Detail	Comments
Proposed Development	<p>The Catherine Field Planning Proposal is a Proponent-led proposal that seeks to rezone approximately 104 hectares of land within the Catherine Field Precinct to enable urban development for new housing, open space and recreation, riparian protection, major roads and stormwater management. The site is located wholly within the Camden Local Government Area and is approximately 42 kilometres south-west of the Sydney CBD.</p> <p>The draft Indicative Structure Plan delivers approximately 2080 dwellings and a population of around 5,800 people. There will be a range of housing types at varying densities throughout the site. The site is identified for low and medium density residential development with single dwellings on lots ranging in size up from 250 square metres and averaging around 350 square metres and attached and semi-attached housing, typical of recently developed urban growth areas in other parts of Sydney.</p> <p>The Proposal will provide a range of social infrastructure, including open space, recreation and community facilities for the future community, and deliver road and utilities infrastructure to service the broader South West Growth Area.</p>

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

 Proposed Subject Site

 Cadastre



AEP

Title: Figure 1 - Site Location

Date: March 2022

Location: Charlesworth Close, Springfield Road, Camden Valley Way & Catherine Field Road, Catherine Field NSW

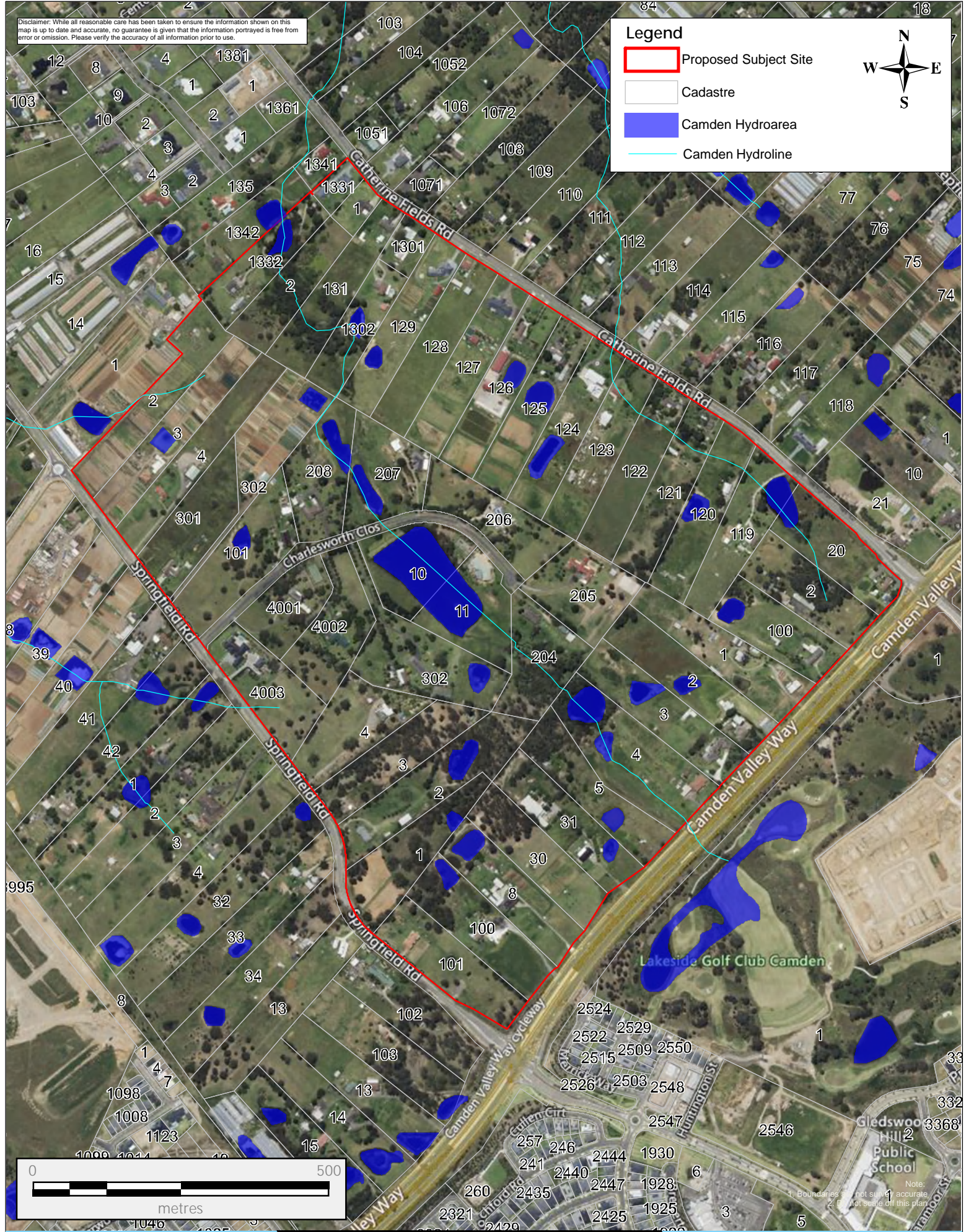
Client: Springfield Rd Pty Ltd

AEP Ref: 2438

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Proposed Subject Site
- Cadastre
- Camden Hydroarea
- Camden Hydroline



AEP

Title: Figure 2 - Hydroline and Hydroarea

Date: March 2022

Location: Charlesworth Close, Springfield Road, Camden Valley Way & Catherine Field Road, Catherine Field NSW

Client: Springfield Rd Pty Ltd

AEP Ref: 2438

3.0 Methodology

The field surveys for determining the status of waterfront land occurring within the Subject Site have been prepared and performed as per the Natural Resources Access Regulator, 2020, *Waterfront Land Tool*. The tool identifies waterfront land based on three key factors:

- The presence of defined bed and banks;
- Evidence of flow and geomorphic features (whether water is present or not); and
- The presence of aquatic/riparian vegetation.

3.1 Information Sources

Information and spatial data provided within this RAR has been compiled from various sources including:

- Aerial Photograph Interpretation (API) of the site and surrounding locality;
- NSW Government, 2018, Determining stream order Fact Sheet;
- Water Management (General) Regulation 2018 Hydroline spatial data, 2021;
- Regional vegetation mapping prepared by Tozer et al. (2010) for native vegetation of southeast NSW; and
- Collective knowledge gained from previous ecological survey and assessment in the area over the past 25 years.

3.2 Desktop Assessment

The following desktop analysis was conducted for the Subject Site:

- Stream orders were determined using the Strahler system using both API and Water Management (General) Regulation 2018 Hydroline spatial data, 2021 program (refer **Appendix A**);
- Regional vegetation mapping executed under the Remnant Vegetation of the Tozer et al, Native vegetation of southeast NSW, NSW Department of Environment & Climate Change, Scientific Services Division, was utilised to identify vegetation communities occurring within the Subject Site.
- Add survey identification numbers on potential watercourses (Survey ID), refer **Figure 3**.
- Investigations for streams outside of the Subject Site will consist of broad roadside visual inspections and further desktop analysis.

3.3 Field Survey

Field surveys were completed on 9 and 10 September 2021, within Lots 3 – 4 DP215520, Charlesworth Close Lot 302 DP716446, Lots 10 – 11, DP618175, Lots 204 – 206 DP249147 to assess stream orders within the Lots. Additional surveys from Springfield Road, Camden Valley Way and Catherine Fields Road were also undertaken to assess potential stream orders on site for Lot 1 DP51847, Lot 4003 DP1121133, Lot 4 DP203127, Lot 135 DP27602.

General observations from Springfield Road, Camden Valley Way and Catherine Fields Road were also undertaken to assess the broader site where access to lots within the broader Subject Site were not available.

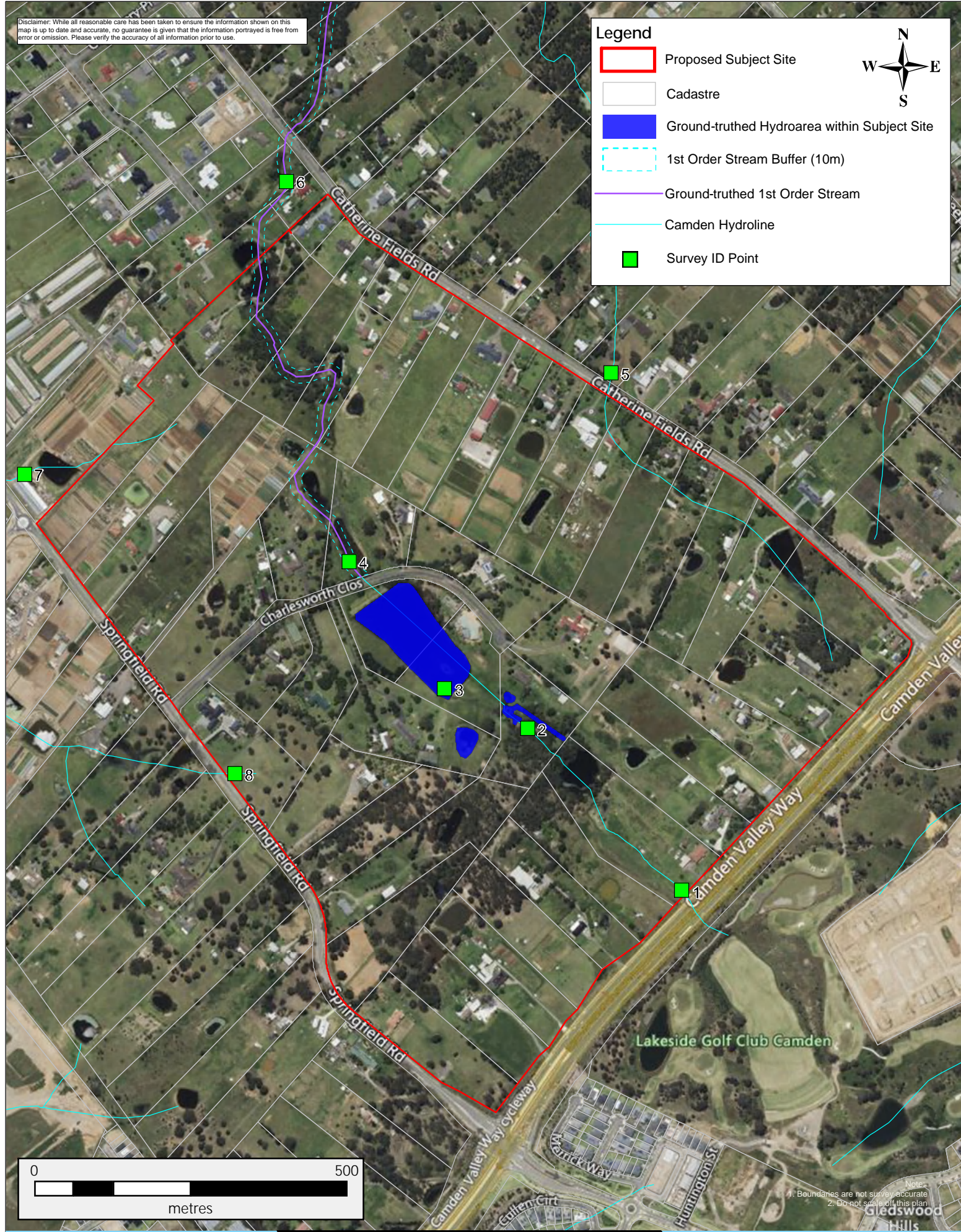
At the sites that were inspected the following data was collected to ground-truth the data collected at the desktop level:

- Assessing each potential watercourse to determine if defined bed and banks (including locating high bank) are present;
- Identifying what type of watercourse is present (in accordance with NARA Guide – Watercourse types);
- Determine and notate watercourse features;
- Determine presence of any Lakes or Wetlands; and
- Determine and notate any changes in vegetation communities.

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

Legend

- Proposed Subject Site
- Cadastre
- Ground-truthed Hydroarea within Subject Site
- 1st Order Stream Buffer (10m)
- Ground-truthed 1st Order Stream
- Camden Hydroline
- Survey ID Point



0 500
metres

Note:
1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 3 - Site Assessment

Date: March 2022

Location: Charlesworth Close, Springfield Road, Camden Valley Way & Catherine Field Road, Catherine Field NSW

Client: Springfield Rd Pty Ltd

AEP Ref: 2438

4.0 Riparian Assessment Results

Fieldwork was conducted in September 2021 to ground-truth the stream order of the watercourses within the Subject Site. Investigations revealed 1st order streams occur within the Subject Site. Other possible watercourses have been assessed and don't correspond to such characteristics. (Refer **Tables 2 to 9** and **Figure 3**).

Table 2 – Field Survey Results Survey ID 1



Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	No	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	None	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	None	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	None	
High Bank (Appendix 8 NRAR Guide)	No	
Ground-truthed stream order	0	3
Controlled Activity Approval required (Y / N)	No	
Vegetation Riparian Zone Required (m)	None	
Comments	Area is fenced off as a watercourse and potentially connects to farm dam further to the west. Vegetation within the area is quite dense, however, there is no flow of water. Not considered a stream.	
		
Plate 1: Survey ID 1 No defined bed and banks.	Plate 2: Survey ID 1 Dense vegetation with no flow.	

Table 3 – Field Survey Results Survey ID 2



Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	No	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	None	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	None	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	None	
High Bank (Appendix 8 NRAR Guide)	None	
Ground-truthed stream order	0	3
Controlled Activity Approval required (Y / N)	Yes	
Vegetation Riparian Zone Required (m)	None	
Comments	<p>Manmade farm dams that contain stagnant water. There is a pipe joining the watercourse from the east, however this is for overflow. There is no connection between the small dams and the much larger dam to the west.</p> <p>Not considered a stream.</p>	
		
Plate 3: Survey ID 2 Agricultural pipe for overflow.		Plate 4: Survey ID 2 Stagnant farm dams.

Table 4 – Field Survey Results Survey ID 3



Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	No	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	None	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	No	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	No	
High Bank (Appendix 8 NRAR Guide)	None	
Ground-truthed stream order	0	3
Controlled Activity Approval required (Y / N)	No	
Vegetation Riparian Zone Required (m)	None	
Comments	<p>The edge of the large dam in the site. Grass around the edge was soggy due to the slope of the landscape creating a drainage basin. No movement of water from the dam.</p> <p>Not considered a stream.</p>	
		
Plate 5: Survey ID 3 drainage area.	Plate 6: Survey ID 3 Grass banks.	

Table 5 – Field Survey Results Survey ID 4



Table 3 – Field Survey Results Survey ID 4		
Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	Yes	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	Type 4	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	Pool, Erosion	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	No	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	No	
High Bank (Appendix 8 NRAR Guide)	None	
Ground-truthed stream order	1	3
Controlled Activity Approval required (Y / N)	Yes	
Vegetation Riparian Zone Required (m)	10m	
Comments	Banks are sloped initially, however, become more defined upstream. The river bed is a natural channel and riparian vegetation is present further up the stream. Small movement of water but not stagnant. Culvert underneath the road. Stream order 1.	
		
Plate 7: Survey ID 4 Eroded banks.	Plate 8: Survey ID 4 Riparian vegetation.	

Table 6 – Field Survey Results Survey ID 5


Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	No	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	None	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	No	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	No	
High Bank (Appendix 8 NRAR Guide)	No	
Ground-truthed stream order	0	3
Controlled Activity Approval required (Y / N)	No	
Vegetation Riparian Zone Required (m)	0	
Comments	Area was visually inspected from the roadside and desktop analysis confirmed that this hydro line was not present. Not considered a stream.	
		
Plate 9: Survey ID 5 No Hydroline present.		

Table 7 – Field Survey Results Survey ID 6



Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	Yes	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	Type 4	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	No	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	No	
High Bank (Appendix 8 NRAR Guide)	No	
Ground-truthed stream order	1	3
Controlled Activity Approval required (Y / N)	Yes	
Vegetation Riparian Zone Required (m)	10	
Comments	Upstream of Survey ID 4. Banks and riparian area are densely vegetated. Flat and widespread channel with a broad area of submerged stream vegetation. Culvert goes under road. Stream Order 1	
		
Plate 10: Survey ID 6 Flat and widespread channel.	Plate 11: Survey ID 6 Culvert under the road.	

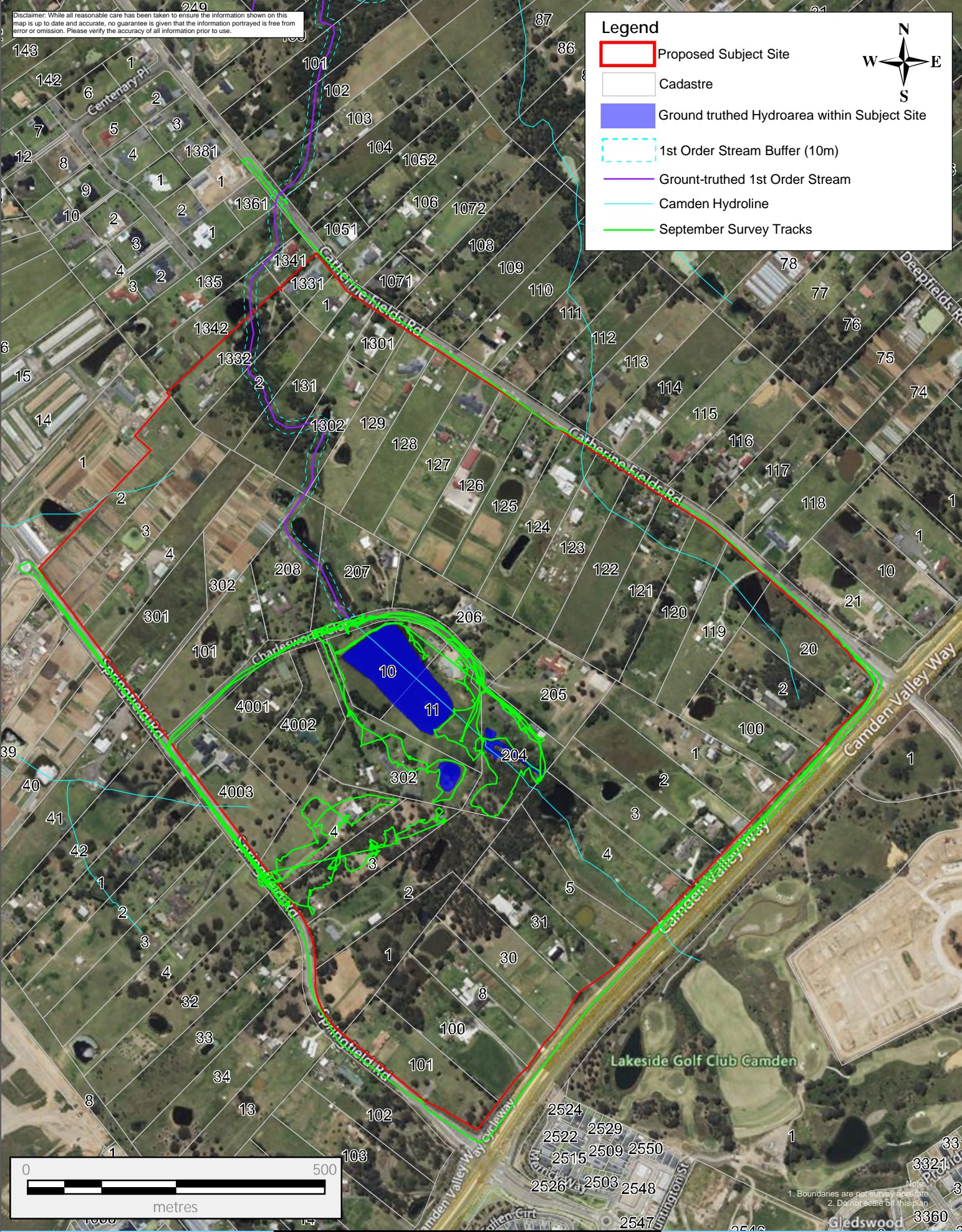
Table 8 – Field Survey Results Survey ID 7

Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	No	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	None	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	No	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	No	
High Bank (Appendix 8 NRAR Guide)	No	
Ground-truthed stream order	0	3
Controlled Activity Approval required (Y / N)	No	
Vegetation Riparian Zone Required (m)	0	
Comments	<p>Area was visually inspected from the roadside and desktop analysis confirmed that this hydro line was not present.</p> <p>Not considered a stream.</p>	

Table 9 – Field Survey Results Survey ID 8

Watercourse Characteristics	Assessment	Figures
Desktop - Strahler System Order	0	2
Define Bed and Banks (Yes / No)	No	
Type of Watercourse (Type 1, Type 2, Type 3a, Type 3b, Type 3c, Type 4, Type 5, Type 6, Type 7, None Appendix 5 NRAR Guide)	None	
Watercourse Feature Present (Pool, Riffle, Erosion and Disposition, None)	None	
Lakes or Wetlands (Appendix 3 – NRAR Guides)	No	
Vegetation Present to indicate Wetlands (Appendix 7 - NRAR Guide)	No	
High Bank (Appendix 8 NRAR Guide)	No	
Ground-truthed stream order	0	3
Controlled Activity Approval required (Y / N)	No	
Vegetation Riparian Zone Required (m)	0	
Comments	Area was visually inspected from the roadside and desktop analysis confirmed that these hydro lines were not present. Not considered a stream.	

Disclaimer: While all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.



1. Boundaries are not survey accurate
2. Do not scale off this plan



AEP

Title: Figure 4 - Survey Effort
Location: Charlesworth Close, Springfield Road, Camden Valley Way & Catherine Field Road, Catherine Field NSW
Client: Springfield Rd

Date: February 2022
AEP Ref: 2438

5.0 Conclusion

The desktop and field investigations showed that hydro lines Survey ID # 1, 2, 3, 5, 7 and 8 did not show key features of watercourses. Hydrolines Survey ID # 4 and 6 are stream order (one) 1 as they have clearly defined bed and banks, erosion and pools requiring a VRZ of 10m (either side of the creek) (refer **Table 10**).

It is evident, that there is overland water flow with the presence of numerous dams across the site. Planning and engineering need to consider treatment of stormwater run-off and containment within the proposed development area.

Note that there is potential to negotiate with NRAR to remove First Order Streams in exchange for larger VRZ on other retained streams. The standard permissible riparian activities are outlined below.

Table 10 – Riparian Corridor Matrix

Watercourse Type	VRZ width (each side of watercourse)	Total RC width	Cycleways and pathways	Detention basins		Stormwater outlet structures and essential services	Stream realignment	Road crossings		
				Only within 50% outer VRZ	Online			Any	Culvert	Bridge
1st order	10m	20m + channel width	Yes	Yes	Yes	Yes	Yes	Yes	-	-
2nd order	20m	40m + channel width	Yes	Yes	Yes	Yes	-	Yes	-	-
3rd order	30m	60m + channel width	Yes	Yes	-	Yes	-	-	Yes	Yes
4th order or greater	40m	80m + channel width	Yes	Yes	-	Yes	-	-	Yes	Yes

Note: Where a watercourse does not exhibit the features of a defined channel with bed and banks, the NRAR may determine that the watercourse is not waterfront land for the purpose of the WM Act.

6.0 References

Department of Planning, Industry and Environment (2020), *Natural Resources Access Regulator Waterfront land tool* <https://www.dpie.nsw.gov.au/nrar/how-to-apply/controlled-activities/tools> accessed September 2021.

Department of Primary Industries Office of Water (2012) *Guideline for Riparian Corridors on Waterfront Lands*,
https://www.industry.nsw.gov.au/_data/assets/pdf_file/0003/160464/licensing_approvals_controlled_activities_riparian_corridors.pdf, accessed September 2021.

NSW Government (2018) *Determining Stream Order Fact Sheet*; https://www.industry.nsw.gov.au/_data/assets/pdf_file/0020/172091/Determining-Strahler-stream-order-fact-sheet.pdf accessed September 2021.

NSW Government (2021) *Water Management (General) Regulation 2018 Hydroline spatial data*,
<https://trade.maps.arcgis.com/apps/webappviewer/index.html?id=07b967fd0bdc4b0099fc5be45b6d1392> accessed September 2021.

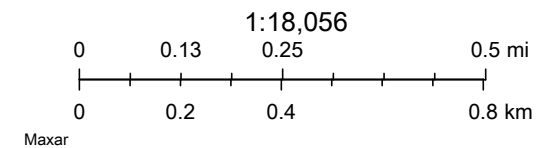
Tozer. M.G, Turner. K, Keith. D.A., Tindall. D, Pennay. C, Simpson. C, MacKenzie. B, Beukers. B, & Cox. S (2010) *Native Vegetation of Southeast NSW: a Revised Classification and Map for the Coast and Eastern Tablelands*, vol 11, edn. 3, pp. 359 – 406, NSW Department of Environment & Climate Change, Scientific Services Division.

Appendix A – NRAR Hydroline Spatial Data

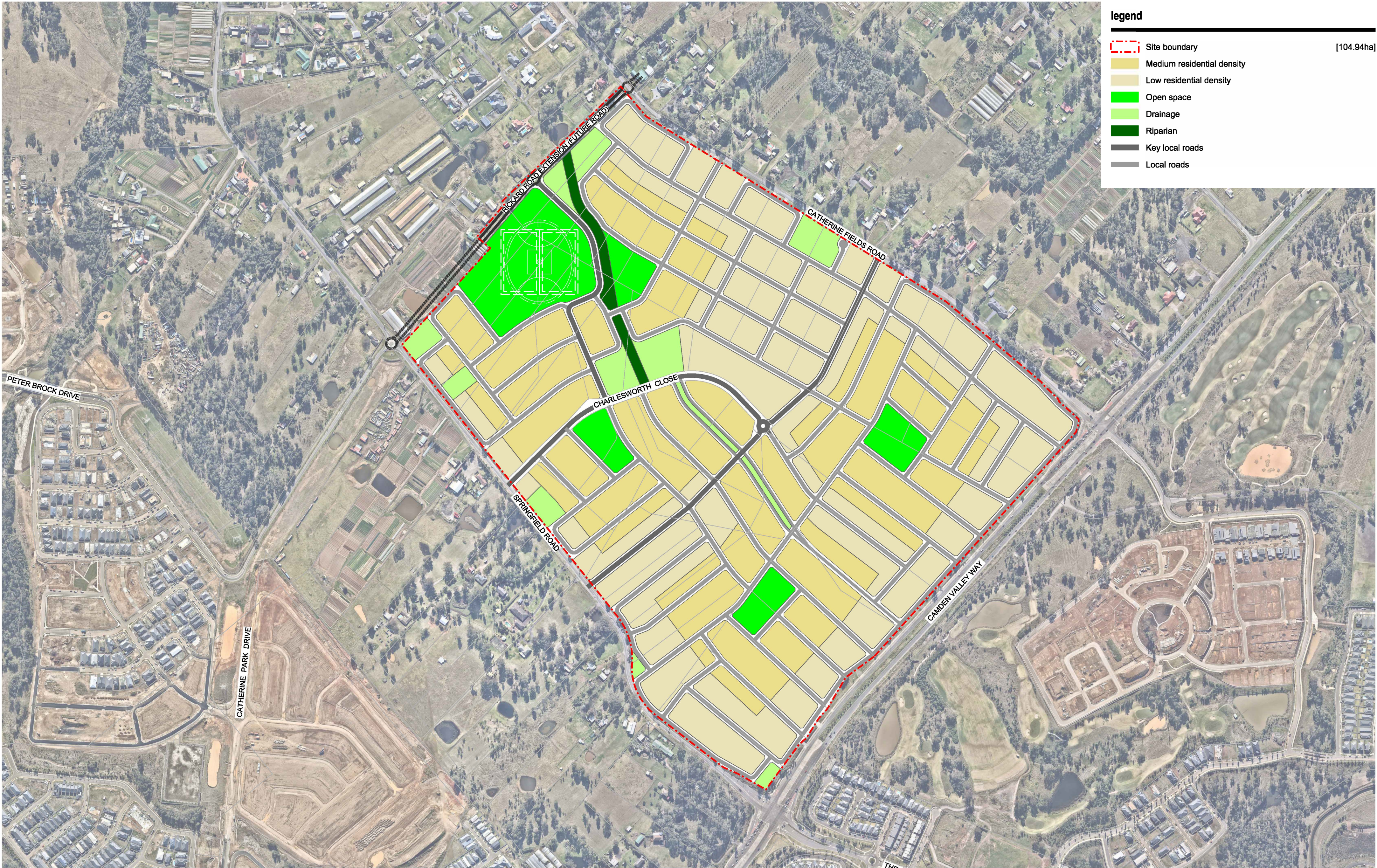
2018 Hydroline spatial data 1.0



9/23/2021, 12:11:08 PM



Appendix B – Indicative Structure Plan



legend

- Site boundary [104.94ha]
- Medium residential density
- Low residential density
- Open space
- Drainage
- Riparian
- Key local roads
- Local roads

Indicative Structure Plan
Springfield Road, Catherine Field

DRAFT

0 75 150m
scale:
1:5000@A2 | 1:2500@A0

plan:
074.CF.004
date:
02/02/2022
aerial:
nearmap

revision:
05
proj:
MGA94-56
drawn:
BR

urbanco
hello@urbanco.com.au | www.urbanco.com.au
© COPYRIGHT URBANCO. ALL RIGHTS RESERVED.
Suite 3.03 55 Miller Street PYRMONT NSW 2009
PO Box 548 PYRMONT NSW 2009 02 9051 9333

Appendix C – Author CVs

JEREMY BURRILL

Curriculum Vitae

Jeremy works with AEP in the role of Ecologist. He is a graduate of environmental science and management, and has experience in voluntary roles in environmental fields, involving fauna and flora surveying, consultancy projects and natural resource management. His background in environmental fields with his growing ecological knowledge is utilised in a diverse array of applications in his current role.

Qualifications

- Bachelor of Environmental Science (Environmental Management and Sustainability) Deakin University (2020)

Further Education & Training

- Victorian Driver's License
- Work Health & Safety General Construction Induction
- Work Safely at Heights

Fields of Competence

- Ecological field surveys
- Fauna surveys and trapping
- Natural resource management

Volunteer Experience

- Overseas University Volunteer Placement (New Zealand, 2018)
- Industry Placement (Parks Victoria, 2019)

Relevant Employment History

Oct 2020 – Present

Junior Ecologist

Anderson Environmental and Planning, Newcastle

Currently employed by Anderson Environment & Planning to assist in the provision of consulting services to land, property, legal and government sectors. Covering ecological, project management, environmental, bushfire, planning services, advices, strategy and representation.

Natalie Black

Curriculum Vitae

Natalie works with AEP in the role of Senior Environmental Manager. She has extensive knowledge in environmental management, environmental planning, and report writing and assessment. With a detail understanding of planning, catchment management, coastal management and rehabilitation. Natalie has had a successful career with both state and local government in conservation, planning and field investigation roles. Natalie has also gained extensive communication skills and project management through her previous career in lecturing. Her background and experience in the ecological and planning fields is utilised in a diverse array of application in her current role.

Qualifications

- B.Sc (Hons), University of Newcastle, 2002 Sustainable Resource Management and Marine Science.
- Master Planning, University of Technology Sydney 2007.
- Certificate IV Training and Assessment at NSW TAFE 2012.
- BAM Assessor; accreditation number: BAAS19076.

Certification

- Evidence Gathering and Legal Process (Australian Institute of Environmental Health).
- Conflict Resolution Course (LGSA).
- Report Writing Course (LGSA).
- Powerful Presentation (LGSA).
- NSW Rural Fire Services Bush Fire Assessment
- Relocation of Threatened Species (Botanical Gardens Sydney).
- Sustainable Home Assessment Reduction Revolution.
- Flora and Fauna Survey Assessments Niche Environment and Heritage.
- First Aid TAFE.

Fields of Special Competence

- Environmental Planning
- Environmental Management and rehabilitation of catchments coastal waterways. Statement of Environmental Effects (preparation and assessing).
- Fish Passage
- Marine ecosystems including; mangroves, seagrasses, algae, Fauna and habitat assessment.
- vegetation.
- Communicating with a wide range of stakeholders.
- Development Application.
- Education in both Environmental and Planning industries.
- Koala Plans of Management.
- Policy Development.

Employment History

2019 to present AEP Senior Environmental Manager

2010 to 2019

Natalie Black is the Principal Environmental Planner for Black EARTH Environmental. Working a range of projects, Bush Fire Assessments, Landscaping, Development Applications, Statements of Environmental Effect's, Environmental Management Plans, Sustainability Assessment of both private and businesses, sustainable gardens, environmental assessments for proposed projects and environmental advice and volunteering for local Sustainable Community Group and Landcare. During this time Natalie also lectured at Hunter TAFE teaching a range of environmental units both face to face and on-line to a varying range of qualification and levels.

2003 to 2010

Natalie was the Natural Resource Manager and Development Assessment Officer at Lismore City Council working with diverse range of professions such as engineers, town planners, environmental health officer, accountants, building surveyors, arborists, councillors. During this time the main projects were grants application, restoration projects, flora and fauna assessments, environmental legal adviser, bush fire assessments, strategic work, development application assessment (ranging from sheds to Designated Developments) and council development application team for internal projects, Council's for climate change, water wise programs and others. During 2006 -2007 Natalie was the lead Environmental Officer and Development Planner for the development of Council Plans of Management (POM). The POMs were for each parcel of land owned and managed lands, by Council. The parcels of land ranged from easements, parks and recreation areas to urban bushland, each POM provided clear guidelines and procedures for all works including civil, maintenance and regeneration etc.

2002 to 2003 was a step into the Policy unit within DPI where Natalie was part of the team working on the Jervis Bay Indigenous Fishing Strategy, and the closure of Port Botany. Dealing with many stakeholders and running workshops with Ministers and community. During 2003 with Natalie was the North Coast Fish Passage Officer. Managing an Environmental Trust Grant of \$1 million to remove 50 structures that block fish passage within the catchments of the North Coast. This project had all 50 sites contracted by the end of the 12 months with 70% of these projects commenced. This role allowed for the development of field assessments, independent work and communication with a range of stakeholders.

2000 saw the commencement of Natalie's career with NSW Department of Primary Industries (Fisheries Unit) in the Office of Conservation in Sydney. Natalie was part of the Conservation team that reviewed integrated development applications in the Sydney Region, with a focus on the seagrasses present within the estuaries. The assessments ranged from jetties to the Lane Cove Tunnel, North West T-Way and the expansion of the M7 and fish ladders.

BSc Honours Project was research paper into the variations of *Zostera capricorni* wrack located within the Tuggerah Lakes system in comparison to Brisbane Waters and Lake Macquarie.

Simon Purcell

Curriculum Vitae

Simon works with AEP in the role of Senior Ecologist. Simon has over 7 years of professional experience managing projects in the fields of terrestrial ecology, mining and mine rehabilitation and environmental management.

Qualifications

- Bachelor of Applied Science, Major Wildlife Science, University of Queensland Gatton 2013
- Certificate III in Animal Care and Management, Companion Animal Services (2008)

Further Education & Training (select summary)

- Current NSW Class C Driver's Licence. Experienced 4WD operator.
- 2019 First AID, CPR and Remote First AID
- 2019 HLTAID001 Provide Cardiopulmonary Resuscitation
- 2019 HLTAID005 Provide First Aid in Remote Situations
- 2018 Bioacoustic Processing Workshop run by Ted Pedersen- Automated Signal Detection and Acoustic Remote Sensing
- 2017 Venomous Snake Handling
- 2015 Venomous Snake and Fauna Handling – Geckoes Wildlife

Fields of Special Competence

- Terrestrial Ecology field survey, covering terrestrial flora and fauna
- Project Management

Relevant Employment History

2020 (November) -present Senior Ecologist
Anderson Environment & Planning, Newcastle

- Currently employed by Anderson Environment & Planning to assist in the provision of consulting services to land, property, mining industry, legal and government sectors. Covering ecological, project management, environmental, planning services, advices, strategy and representation.

2018-2019 Team Leader / Ecologist
Ecotone Flora Fauna Consultants, Weipa, QLD

- Conducted client liaison meetings, providing ecological advice and recommendations for flora, fauna and land management, complying with Queensland state and Commonwealth environmental legislation.
- Wrote proposal and executed surveys for Prefeasibility studies and EIS on Western Cape York for multi-national mining company complying with Commonwealth environmental legislation.

- Negotiated increases to budget and survey requirements with the client in relation to ongoing changes and project requirements
- Led high level discussions with the client to provide new services.
- Developed wide scale camera monitoring program to assess presence /absence of EVNT fauna within the survey site.
- Complex logistical planning for remote work
- Co-developed and implemented new safety system within the business
- Mentored project managers through training, and leadership guidance to ensure quality and standards of business were met
- Managed human relation matters within the business
- Digitally transformed infield data collection through roll out of ArcGIS Collector, leading to the reduction in the use of paper in the field.

2014-2018 Team Leader / Ecologist
Ecotone Flora Fauna Consultants, Weipa, QLD

- Lead project manager (6 years) for all aspects of mine / drill preclearing environmental surveys across three different mine sites and exploratory sites, including during the construction phase of a new mine in the Weipa region.
- Project managed and participated in numerous annual EVNT projects that led to cultural and process practices changing within a multinational mining company.
- Played a critical role in maintaining client and stakeholder relationships and built stability with onsite leadership to further grow business opportunities.
- Maintained client confidentiality on sensitive and impactful projects.
- Ensured all projects complied with Queensland state and Commonwealth environmental legislation and clients Environmental Authority.
- Assisted in the development of growth and innovation projects such as cloud-based document storage solution to support multi-site users.

2013-2014 Field Technician / Ecologist
Ecotone Flora Fauna Consultants, Weipa, QLD

- Pre-clear flora and fauna mining and drilling programs
- Baseline fauna surveys of future mining areas
- Sensitive vegetation ground truthing
- EVNT flora and fauna surveys
- Seed Processing (storing, drying management of inventory)
- Mixing of seed in preparation for annual rehabilitation season

2010-2012 Mine Operator and Trainer
Rio Tinto, Weipa, QLD

- Acted as Crew Leader to manage 30 mine operators, production targets and minimising environmental impacts
- Skilled Caterpillar 992G, 993K & Komatsu WA900 Loader and 776D, 777F and 785C Caterpillar haul truck operator
- Crew Trainer/Assessor - completed five certificate IV modules to Training and Assessing.

2009 - 2010 Parks and Garden Maintainer
Spotless Group, Weipa, QLD

- Attained six competencies towards Certificate III Forest Growing and Management.
- Maintained local green spaces and houses.

2009-2009 Vet Nurse
Tableland Veterinary Service, Weipa, QLD

- Prepared surgery for surgeries including use of autoclave to sterilise implements
- Administered sedation via injections in the muscle and intravenously
- Prepared and monitored animals before, during and after surgeries
- Monitored animal and anaesthetic during surgery focussing on breath rate, colour of gum and pupil movements
- Took blood samples from veins and prepared samples of foreign bodies for analysis
- Successfully directed and carried out on-call emergency cases with vet assistance over the phone

2003 – 2009 Manager
The Pet Centre, Sydney, NSW

2001 – 2003 Sales Assistant
The Pet Centre, Sydney, NSW

- Implemented standard procedures for staff to follow
- Focussed on achieving a high level of OHS standards within the store
- Responsible for daily takings up to five thousand dollars per day
- Accountable for people management including rosters, recruitment and managing employee issues
- Responsible for management of store inventory
- Developed skills in handling a range of domestic animals
- Maintained animal's health and welfare in store and complied with state laws and regulations
- Analysed store's and customer's aquarium water quality
- Developed sound knowledge of animals including their origin, identification and general requirements

Relevant Volunteer Experience

2012 Fauna Spotter / Field Assistant
Humble Bee Films

- Volunteered as a fauna spotter/field assistant with Dr Brad Purcell and Humble Bee Films in a ten day research camp, during the production of the natural history documentary "Dingo".

2012 **Volunteer Ecological Field Assistant**
Rio Tinto, Weipa, QLD

- Participated in an ethno-botanical workshop with Rio Tinto Alcan Land and Rehabilitation team.
- Participated as a field technician during pre-mining survey work. The work included assessing flora and the land formations to identify buffer zones for natural drainage systems and sensitive areas in the Andoom mine site Weipa.

2012 **Fauna Technician**
Brad Purcell PhD, Greater Blue Mountains World Heritage Area

- Field technician for Brad Purcell during his doctoral research project on dingoes in the Greater Blue Mountains World Heritage Area. Developed skills in use of VHF radio tracking to retrieve collars, triangulation method to determine positioning of dingoes or deployed collars and traversing bushland.

Stevie Kay

Curriculum Vitae

Stevie works with AEP in the role of Ecologist. Whilst studying at the University of Newcastle he conducted ecological field studies as a requirement of his degree courses. Working for NSW Department of Primary Industries (NSW DPI) at Port Stephens Fisheries Institute he gained further experience in ecological field surveys as a field technician and project officer. He has experience in targeted fauna and flora surveys, Koala Spot Assessment Technique (SAT) surveys and tree surveys.

Qualifications

- Bachelor of Science (Marine Science), University of Newcastle (2003)

Licences/Certificates

- Senior First Aid
- Class C NSW Drivers Licence
- Work at Heights
- 4WD Safe Driving
- Construction White Card

Field Survey Experience

- Aquatic vegetation and fish survey
- Terrestrial fauna survey, including koala SAT surveys and spotlighting

Volunteer Experience

- Bush Regeneration Volunteer, Hunter Indigenous Plants
- Permaculture Design, various locations

Employment History

Feb 2020 – Current	Ecologist Anderson Environment & Planning, Newcastle
Nov 2016 – May 2017	Observer NSW DPI Fisheries
Jan 2002 – Feb 2009	Technician/Project Officer NSW DPI Fisheries
Sept 2010 – Feb 2020	Facilitator Pinnacle Team Events