



Regional  
NSW

# Richmond Valley Regional Jobs Precinct

Technical Report - Soils, Geology and  
Contamination

21 November 2022

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## Signature Page

21 November 2022

# Richmond Valley Regional Jobs Precinct

## Technical Report - Soils, Geology and Contamination

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*This report has been prepared to inform the master planning process for Richmond Valley RJP. The findings and recommendations have been developed where possible in collaboration with other disciplines. It is acknowledged that some of the recommendations in this report may not be included in the Master Plan, such as where they are out of scope for the RJP, conflict with other elements of the project or are proposed to be managed via an alternate mechanism.*

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## Acronyms and Abbreviations

Name	Description
ACM	Asbestos Containing Material
AHD	Australian Height Datum
AMG	Australian Map Grid
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure
ASS	Acid Sulfate Soils
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
CLM	<i>Contaminated Land Management Act 1997 (NSW)</i>
CoPC	Contaminant of Potential Concern
CSM	Conceptual Site Model
DP	Deposited Plan
DPI	Department of Primary Industries
DSI	Detailed Site Investigation
EPL	Environment Protection License
ESA	Environmental Site Assessment
m	Metre
m AHD	Metres Above Australian Height Datum
m bgl	Metres Below Ground Level
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
NSW EPA	New South Wales Environment Protection Authority
OCP	Organochlorine Pesticides
OPP	Organophosphorus Pesticides
PACM	Potential Asbestos Containing Material
PAH	Polycyclic Aromatic Hydrocarbons
PFAS	Per and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
POEO Act	<i>Protection of the Environment Operations Act 1997(NSW)</i>
PSI	Preliminary Site Investigation
RAP	Remedial Action Plan
SAQP	Sampling and Analysis Quality Plan
Site	This is the focus of investigation for the Richmond Valley RJP.
SVOC	Semi-volatile Organic Compounds
TRH	Total Recoverable Hydrocarbons
VOC	Volatile Organic Compounds

## EXECUTIVE SUMMARY

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by the New South Wales (NSW) Government to prepare a Soils, Geology and Contamination Assessment Report for the proposed Richmond Valley Regional Job Precinct (RJP). The report aims to establish the relevant specifications and requirements to assist in the development of the Master Plan.

ERM has prepared this technical report based on a desktop review of background information relating to soil salinity, acid sulfate soils and potential for contamination based on existing and historic landuse. The key findings of the assessment were:

### Salinity

Based on regional soil mapping no salinity hazard was identified for the soil landscapes within the RJP boundary. The salinity, sodicity and aggressivity soil conditions are unlikely to represent a significant constraint on the proposed Master Plan.

The application of the principles of Water Sensitive Urban Design should be considered in the proposed development areas to mitigate potential changes to soil water levels and salinity conditions in the catchment. The impact of the extraction of groundwater for beneficial re-use on catchment level salinity conditions should also be considered..

### Acid Sulfate Soils

Based on regional soil mapping there is an extremely low probability for acid sulfate soils occurring. The potential risk of acid sulfate soils is unlikely to represent a significant constraint on the proposed Master Plan.

### Potential for Contamination

Potential for contamination was identified based on a detailed desktop review at specific sites which have been identified as currently (or formerly) potentially contaminating industries and/or activities, including:

- Nammoona Waste & Recycling Depot (Area 1);
- Northern Rivers Livestock Exchange (Area 1);
- DTM Timber Yard (Area 1);
- Wastewater treatment plant (Area 3a);
- Riverina Stock Feeds (including poultry sheds);
- Northern Co- operative meat company Ltd (Abattoir); and
- Rural industry (general uses).

The proposed Master Plan and associated zoning generally represents to a similar or less sensitive land-use from a contamination perspective. This means that:

- Where the land is currently used for potentially contaminating activities at the specific industrial sites (as listed above), and no change is proposed under the Master Plan, these sites would continue to be managed under their existing approvals / licences; or
- Where the land is currently used for potentially contaminating activities at the specific industrial sites (as listed above), and change is proposed under the Master Plan to a similar or less sensitive land-use, further assessment may not be triggered under the SEPP, but it is noted that due diligence is advised and consideration should be given to the overarching principles of the SEPP as part of any future development application on these sites.



The potential for educational use has been suggested and may be located within the 'Opportunity Sites' currently mapped within Area 2. The development of land for educational use, depending on the location selected (currently zoned R1 General Residential and IN1 General Industrial), may trigger the need for further Detailed Site Investigation of potential contamination as set out in Clause 4.6(4) of the SEPP. This would be identified as part of the planning framework and would be triggered at the development application stage.

An existing park is located in Area 1 on land currently zoned industrial. We note that the current use as a park is not typical for industrial zoned land. As there is no proposed change in use under the Master Plan, we have not provided any specific recommendations in relation to the park.

In addition to the above, it is important to note that there is a broad potential for contamination on all land across the RJP associated with hazardous building materials, small scale chemical storage and use and uncontrolled waste dumping, which should be assessed further as part of any future development application in individual sites to prevent potential exposure to contamination hazards.

## 1. INTRODUCTION

Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by the New South Wales (NSW) Government to prepare a Soils, Geology and Contamination Assessment Report for the proposed Richmond Valley Regional Job Precinct (RJP). The report aims to establish the relevant specifications and requirements to assist in the development of the Master Plan.

### 1.1 Project Description

The NSW Government's Regional Job Precincts (RJP) will provide planning support to drive growth, investment and development opportunities within regional NSW. Four locations have been chosen for the first round of this initiative: Albury, Richmond Valley, South Jerrabomberra and Namoi.

The Richmond Valley RJP will investigate the Casino area to unlock new industrial lands and create more jobs for the region in agriculture, cold storage, manufacturing and renewable energy sectors. The precinct will assist with business diversification by identifying value-adding opportunities for existing industries and local producers. The intention of the Richmond Valley RJP is to encourage private investment and generate jobs. To attract investors, the NSW Government is seeking to create a place-based planning framework that streamlines the approval process removing statutory barriers, and enhancing investment certainty.

By reducing delays and simplifying planning processes, the precinct will attract investment and diversify business opportunities, creating jobs for the young and a skilled and growing local workforce in Casino.

### 1.2 Richmond Valley Investigation Area

The Richmond Valley RJP is centred on Casino, approximately 717km north of Sydney and 228km south of Brisbane. The precinct is located at the intersection of the Bruxner Highway and Summerland Way. These major roads serve as the east-west link between the Northern Rivers coast to the Northern Tablelands (via Bruxner Highway) and a north-south link between Grafton and the Queensland border (via Summerland Way). It is also connected to key coastal centres and markets by the North Coast railway line.

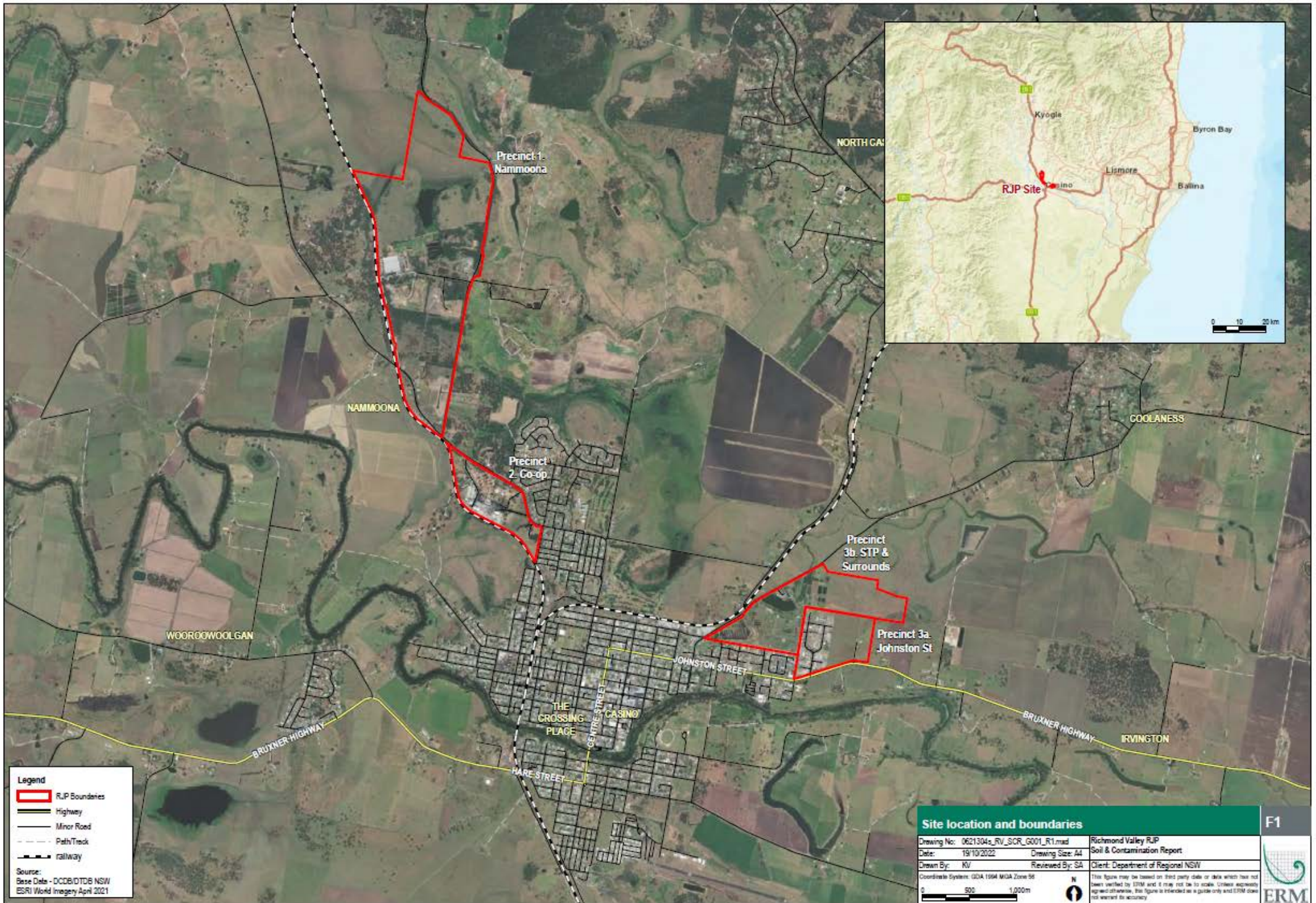
The Richmond Valley RJP will aim to activate several locations within a specialised industry cluster in Casino. It includes land that is already developed or approved for development, including:

- Area 1: Nammoona Industrial Area;
- Area 2: Casino Food Co-op Complex (formerly Northern Co-op Meat Company); and
- Area 3: Richmond Valley Sewage Treatment Plant and surrounds; and
- Area 3b: Johnston Street Industrial Area.

The Nammoona Industrial Area sits to the north west of the township and is accessed via Reynolds Road. Existing industrial activities are currently focused within the central portion of the area including Council-owned assets (Northern Rivers Livestock Exchange and Richmond Valley Waste Management Centre) as well as several privately operated industries. This area also has direct heavy rail frontage to the North Coast Railway line.

The Casino Food Co-op (formerly the Northern Co-op Meat Company) Complex is the largest employment centre in Casino. Several different activities are undertaken within the complex, with cattle yards and cold storage facilities supporting an abattoir and tannery.





**Legend**

- RJP Boundaries
- Highway
- Minor Road
- Path/Track
- Railway

Source:  
 Base Data - DCDB/DTOB NSW  
 ESRI World Imagery April 2021



Site location and boundaries		F1
Drawing No: 0621304s_RV_SCR_G001_R1.mxd	Richmond Valley RJP	
Date: 19/10/2022	Drawing Size: A4	Soil & Contamination Report
Drawn By: KV	Reviewed By: SA	Client: Department of Regional NSW
Coordinate System: GDA 1994 MGA Zone 58		
<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>		





**Legend**

- RJP Boundaries
- Highway
- Minor Road
- Path/Track
- Railway

Source:  
Base Data - DCCB/DTDB NSW  
ESRI World Imagery April 2021

Site Layout		F2	
Drawing No: 0621304a_RV_SCR_G002_R1.mxd	Richmond Valley RJP		
Date: 19/10/2022	Drawing Size: A4		Soil & Contamination Report
Drawn By: KV	Reviewed By: SA		Client: Department of Regional NSW
Coordinate System: GDA 1994 MGA Zone 58			This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.

The Richmond Valley Sewage Treatment Plant (STP) and surrounds has been identified within the Richmond Valley RJP as they may assist with managing land use conflict as part of the Master Planning process for the Richmond Valley RJP. Uses within this area will also need to be managed to maintain amenity within the Rail Trail, and as the entry point to the town. Future projects in this area may include innovation associated with the STP, which could benefit businesses within the broader precinct.

The Johnston St Industrial Area is a mixed-use and mixed-user site offering a variety of industrial lot sizes and currently accommodates over 40 businesses. A focus for the Richmond Valley RJP project will be the retention of these industries, including considerations for their ability to expand/diversify within the Richmond Valley RJP.



## 2. ENVIRONMENT AND PLANNING LEGISLATION

In order to facilitate an assessment of any potential soils / contamination issues or constraints on the RJP planning process and in the context of some recent changes to the planning framework within NSW, the following sections provide a brief overview of the relevant legislative framework that are relevant to the development of the proposed Master Plan.

### 2.1 *Environmental Planning and Assessment Act 1979 (NSW)*

The *Environmental Planning and Assessment Act* (EP&A) 1979 is the primary instrument under which planning and development is carried out in NSW. The EP&A Act sets out a framework under which the three statutory environmental planning instruments - State Environmental Planning Policies (SEPPs), Regional Environmental Plans (REPs) and Local Environmental Plans (LEPs) are made. The EP&A Act is also the overarching instrument that assigns responsibility for the regulation of contaminated land that is not considered to be contaminated significantly enough to warrant regulation by EPA.

### 2.2 *SEPP (Resilience and Hazards) 2021 – replacement of SEPP55*

State Environmental Planning Policy (Resilience and Hazards) 2021 (which incorporates, as Chapter 4, guidance formerly included in SEPP No. 55 *Remediation of Land*) is one of the key statutory planning instruments used to regulate contaminated land under the EP&A Act. Specifically, Clause 4.6 of the SEPP (Resilience and Hazards) prohibits a consent authority from approving development on land unless it has discharged its responsibilities with regard to assessing the contamination status of that land.

Importantly, in the context of this report, Clause 4.6 (4) sets out the specific circumstances / lands which would trigger a requirement for further assessment of potential contamination as being:

- (a) *land that is within an investigation area,*
- (b) *land on which development for a purpose referred to in Table 1 to the contaminated land planning guidelines is being, or is known to have been, carried out,*
- (c) *to the extent to which it is proposed to carry out development on it for residential, educational, recreational or child care purposes, or for the purposes of a hospital—land—*
  - (i) *in relation to which there is no knowledge (or incomplete knowledge) as to whether development for a purpose referred to in Table 1 to the contaminated land planning guidelines has been carried out, and*
  - (ii) *on which it would have been lawful to carry out such development during any period in respect of which there is no knowledge (or incomplete knowledge).*

### 2.3 *Contaminated Land Management Act*

The *Contaminated Land Management Act* (CLM) 1997 is the legislative instrument in NSW which defines “contamination” as follows:

*The presence in, on or under the land of a substance at a concentration above the concentration at which the substance is normally present in, on or under (respectively) land in the same locality, being a presence that presents a risk of harm to human health or any other aspect of the environment.*

The stated objective of the CLM Act is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated significantly enough to require regulation. Sites at which the contamination is considered “significant enough to warrant regulation” are therefore regulated by the EPA under the CLM Act whilst contamination at other sites (i.e. those where contamination is not considered significant enough to warrant regulation by the EPA) are managed via the land use planning process (normally by the local council). The CLM Act provides the EPA with various responsibilities and powers to enable it to effectively regulate and manage significantly contaminated sites in NSW in order to meet the stated objectives of the Act.

### 3. SITE BACKGROUND REVIEW

#### 3.1 Site identification

The site identification information is presented within the table below:

Item	Description	
<b>Site Address</b>	■ Casino, Richmond Valley, NSW, 2470	
<b>Legal Description</b>		
■ Lot 3 DP859772	■ Lot 12 DP618887	■ Lot 1 DP1068179
■ Lot 13 DP258862	■ Lot 2 DP617768	■ Lot 43 DP832870
■ Lot 27 DP624112	■ Lot 2 DP859772	■ Lot 34 DP732079
■ Lot 21 DP260501	■ Lot 5 DP258862	■ Lot 533 DP1047352
■ Lot 261 DP785306	■ Lot 24 DP748513	■ Lot 8 DP258862
■ Lot 7 DP258862	■ Lot 1 DP1127894	■ Lot 491 DP836464
■ Lot 1 DP1194099	■ Lot 1 DP859772	■ Lot 50 DP845660
■ Lot 2 DP1194099	■ Lot 48 DP755727	■ Lot 49 DP755727
■ Lot 10 DP618887	■ Lot 1 DP617768	■ Lot 23 DP260501
■ Lot 1 DP1169291	■ Lot 1 DP255885	■ Lot 3 DP255885
■ Lot 25 DP748513	■ Lot 318 DP755727	■ Lot 47 DP832870
■ Lot 44 DP832870	■ Lot 7025 DP1068879	■ Lot 5 DP729444
■ Lot 4 DP729444	■ Lot 7024 DP1068879	■ Lot 1 DP529321
■ Lot 2 DP549417	■ Lot 1 DP118483	■ Lot 35A DP938611
■ Lot A DP405777	■ Lot 1 DP518029	■ Lot 1 DP529320
■ Lot 13 DP755727	■ Lot 9 DP585234	■ Lot 244 DP755727
■ Lot 2 DP570138	■ Lot 2 DP547143	■ Lot 101 DP860152
■ Lot 9 DP755727	■ Lot 12 DP755727	■ Lot 8 DP577269
■ Lot 2 DP1091888	■ Lot 1 DP1091888	■ Lot 2 DP1106028
■ Lot 1 DP1106028	■ Lot 1 DP1174111	■ Lot 1 DP1164153
■ Lot 22 DP1172525	■ Lot 21 DP1172525	■ Lot 1 DP1240949
■ Lot 7402 DP1180560	■ Lot 1 DP741369	■ Lot 6 DP976660
■ Lot 3 DP783330	■ Lot 5 DP976660	■ Lot 14 DP976660
■ Lot 18 DP976660	■ Lot 19 DP976660	■ Lot 12 DP976660
■ Lot 20 DP976660	■ Lot 19 DP976660	■ Lot 4 DP783330     Lot 20 DP976660
■ Lot 1 DP783330	■ Lot 5 DP783330	■ Lot 8 DP976660
■ Lot 245 DP755727	■ Lot 11 DP976660	■ Lot 4 DP976660
■ Lot 2 DP783387	■ Lot 1 DP976660	■ Lot 3 DP976660
■	■ Lot 15 DP260501	■ Lot 22 DP260501
■ Lot 30 DP732079	■ Lot 35 DP732079	■ Lot 32 DP732079
■ Lot 2 DP255885	■ Lot 18 DP976660	■ Lot 46 DP832870

Item	Description		
Site Address	■ Casino, Richmond Valley, NSW, 2470		
<b>Legal Description</b>			
■ Lot 101 DP828533	■ Lot 3 DP1127894	■ Lot 3 DP1195847	
■ Lot 1 DP1195847	■ Lot 2 DP1195847	■ Lot 29 DP732079	
■ Lot 17 DP260501	■ Lot 4 DP255885	■ Lot 77 DP755727	
■ Lot 11 DP618887	■ Lot 262 DP785306	■ Lot 14 DP258862	
■ Lot 6 DP258862	■ Lot 51 DP845660	■ Lot 45 DP832870	
■ Lot 18 DP260501	■ Lot 33 DP732079	■ Lot 492 DP843629	
■ Lot 530 DP873346	■ Lot 1 DP976660	■ Lot 2 DP218608	
■ Lot 2 DP215499	■ Lot 1 DP118537	■ Lot 7007 DP92844	
■ Lot 7006 DP92844	■ Lot 336 DP821985	■ Lot 1 DP861450	
■ Lot 1 DP943962	■ Lot 1 DP772608	■ Lot 3 DP1164153	
■ Lot 1 DP218608	■ Lot 2 DP729431	■ Lot 28 DP732079	
■ Lot SP94236	■ Lot 1 DP1235712	■ Lot 7304 DP1138123	
■ Lot 24 DP755727	■ Lot 9 DP976660	■ Lot 16 DP976660	
■ Lot 6 DP783330	■ Lot 7 DP976660	■ Lot 1 DP633101	
■ Lot 2 DP772606	■ Lot 1 DP772606	■ Lot 10 DP976660	
■ Lot 7 DP783330	■ Lot 6 DP976660	■ Lot 4 DP976660	
■ Lot 2 DP783330	■ Lot 17 DP976660	■ Lot 15 DP976660	
■ Lot 7 DP976660	■ Lot 2 DP976660	■ Lot 3 DP976660	
■ Lot 1 DP783387	■ Lot 3 DP783387	■ Lot 320 DP755727	
■ Lot 5 DP976660	■ Lot 2 DP976660	■ Lot 3 DP706664	

### 3.2 Site Setting

The following sections summarise the information obtained during the site background and history desktop review. Copies of all database search results are provided in **Appendix A**.

Item	Description
Site area	Approximately 500 hectares (ha).
Current land use	<ul style="list-style-type: none"> <li>■ IN1 General Industrial</li> <li>■ W1 Natural Waterways</li> <li>■ E2 Environmental Conservation</li> <li>■ R1 General residential; and</li> <li>■ RU1 Primary Production</li> </ul>
Surrounding Land use	<p>The land uses surrounding the Site include:</p> <ul style="list-style-type: none"> <li>■ Area 1: The North Coast Railway (including Nampoona Railway Station) and Reynolds Road are located directly adjacent to the western and eastern boundaries of Area 1, respectively. Summerland Way passes through the south western corner of the Area. Agricultural lands are located across the road and railway and surround the northern, western and southern sides of area 1. The Casino Lawn Cemetery is located to the east of the southern portion of Area 1, across Reynolds Road. To the South of Area 1 is Mary Madden Park. Agricultural land located to the east of Area 1 has at times been</li> </ul>



Item	Description
	<p>irrigated with primary and secondary treated wastewater effluent from the Casino Food Corp (based on information provided by Richmond Valley Council);</p> <ul style="list-style-type: none"> <li>■ Area 2: Summerland Way creates the eastern / north eastern boundary of Area 2 with the Casino water treatment plant beyond Summerland Way along the western part of the northern boundary and low density residential lands with two parks Summerland Reserve and McCracken Park) adjoining Summerland Way along the north eastern side of Area 2. To the east lies Hotham Street with low density residential properties beyond. The North Coast Railway is located immediately adjacent to the south and south western boundary of Area 2 and agricultural and farming lands are located across the railway.</li> <li>■ Area 3a: Spring Grove Road creates the north west boundary of the area and beyond that there are agricultural and farming lands with Naughtons Gap Road/ Casino-Murwillimbah Railway running parallel to Spring Grove Road. South east of the area is surrounded with agricultural/farming lands. The south east of the site is mainly industrial/commercial area and it is part of northern portion of area 3b. Low density residential land and a park (Warren Park) are surrounding the south-west of the area; and</li> <li>■ Area 3b: To the north east of the area is agricultural land and part of Area 3a. North west side of Area 3b has farming/agricultural land on the top (half portion) and low density residential on the bottom half. The Richmond River is located on the southern boundary of the area and agricultural/farming lands lie beyond that.</li> </ul>
<b>Site Elevation</b>	<p>Area 1: 30 -50 m relative to Australian Height Datum (AHD)                      Area 2: 60 – 40 m AHD                      Area 3a: 10 -20 m AHD                      Area 3b: ~20 m AHD</p>

### 3.3 Topography

As presented in Map 1.5 of Annex B, the topography of the area generally features low hills and slopes and alluvial floodplains of the Richmond River. The topography of the individual areas can be described as follows:

- Area 1: The northern part of Area 1 feature a slight slope from north to south down to the flat alluvial floodplain before rising again toward low hills along both the eastern and western boundaries in the central and southern parts of the Area.
- Area 2: The topography of Area 2 is dominated by a low hill within the central portion with the land sloping down radially from this central point with a steeper slope to the south west toward the Richmond River floodplain.
- Area 3a: Sits on the floodplain of the Richmond River and is flat with the exception of a steep and narrow slope down to the Richmond River which forms the Southern Boundary of the Area.
- Area 3b: Sits on the floodplain of the Richmond River and is flat and relatively low lying.

### 3.4 Hydrology

The nearest natural surface water bodies to the Site and surrounding area were identified as:

- The very upper reaches of Barlings Creek begin within the southern portion of Area 1 and it flows in an east south easterly direction passing approximately 625 m (at its nearest point) to the north of Area 3b. There are also minor tributaries of Barlings Creek which flow from just east and west of the northernmost point of Area 3b;
- The Richmond River adjoins the southern boundary of Area 3a and it is located to the south / south west of Areas 1 and 2; and
- A review of aerial imagery and topographic mapping also indicates the presence of several ephemeral drainage lines and farm dams located within the Site boundary.

### 3.5 Geology

Geology mapping from the Geological Survey of NSW Warwick Tweed Heads 1:250,000 Metallogenic Sheet indicates that the Site is underlain by the following geological units:

- Ungrouped Clarence-Moreton basin unites sandstone comprising of medium to coarse grained quartzes sandstone with a strongly developed clay matrix. Contains minor amounts of carbonaceous material, col clasts, mudstone, bands, and garnet-rich sandy beds from the upper Jurassic age.
- Ungrouped clarence-Moreton basin unites sandstone comprising of interbedded sandstone, siltstone and claystone from the upper Jurassic age.

Geology mapping from *NSW Coastal Quaternary Geology North & South* identified seven geological units of:

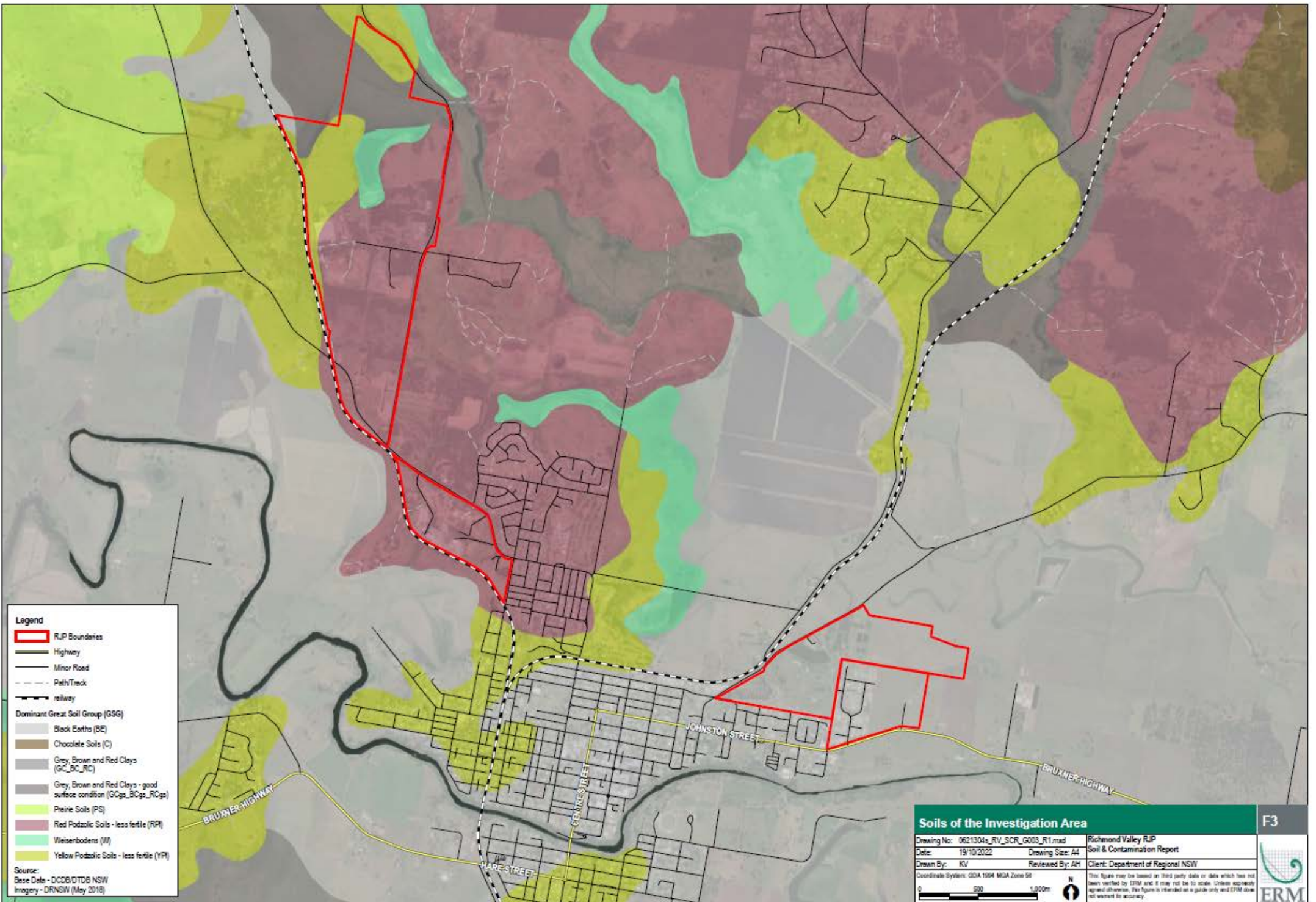
- Alluvial clastic sediment deposits from Quaternary age and comprising of
  - Fluvially deposited sand, gravel, silt, clay;
  - Silt, very fine to medium grained lithic to quartz-rich sand, clay;
  - Fluvially deposited fine to medium grained lithic to quartz-rich sand, clay;
  - Silt, clay, (fluvially deposited) lithic to quartz-lithic sand gravel;
  - Fluvially deposited quartz-lithic sand gravel, clay;

- Alluvial clastic sediment deposits comprising of Silt, very fine to medium grained lithic to quartz-rich sand, clay from Holocene age; and
- Alluvial gravel deposits from Quaternary age and comprising of poorly sorted gravels, clayey sand and variably magnetic pisoliths.

### 3.6 Hydrogeology

Information provided by NSW Department of Primary Industries – Office of Water indicated the following:

- Groundwater aquifers on the Site and within the surrounding buffer area (2 km) were described as porous, extensive highly productive aquifers, fractured or fissured, extensive aquifers of low to moderate productivity.
- A search of registered groundwater bores identified 135 bores within the 2 km search radius. Standing water levels were measured between 0.9 m bgl to 60 m bgl. The registered bores are reported to be used for a mix of irrigated agriculture, water supply for household, water supply for livestock, household, domestic, stock, recreation, monitoring, exploration or research and unknown purposes.
- A search of registered groundwater bores identified 12 bores within the RJP boundary of which the following uses were registered; 2 for irrigated agriculture, 2 water supply for livestock, 1 household, 7 monitoring bores. Standing water levels for bores within the RJP were measured between 1.9 m bgl and 33.5 m bgl.



**Legend**

- R/P Boundaries
- Highway
- Minor Road
- Path/Treack
- railway

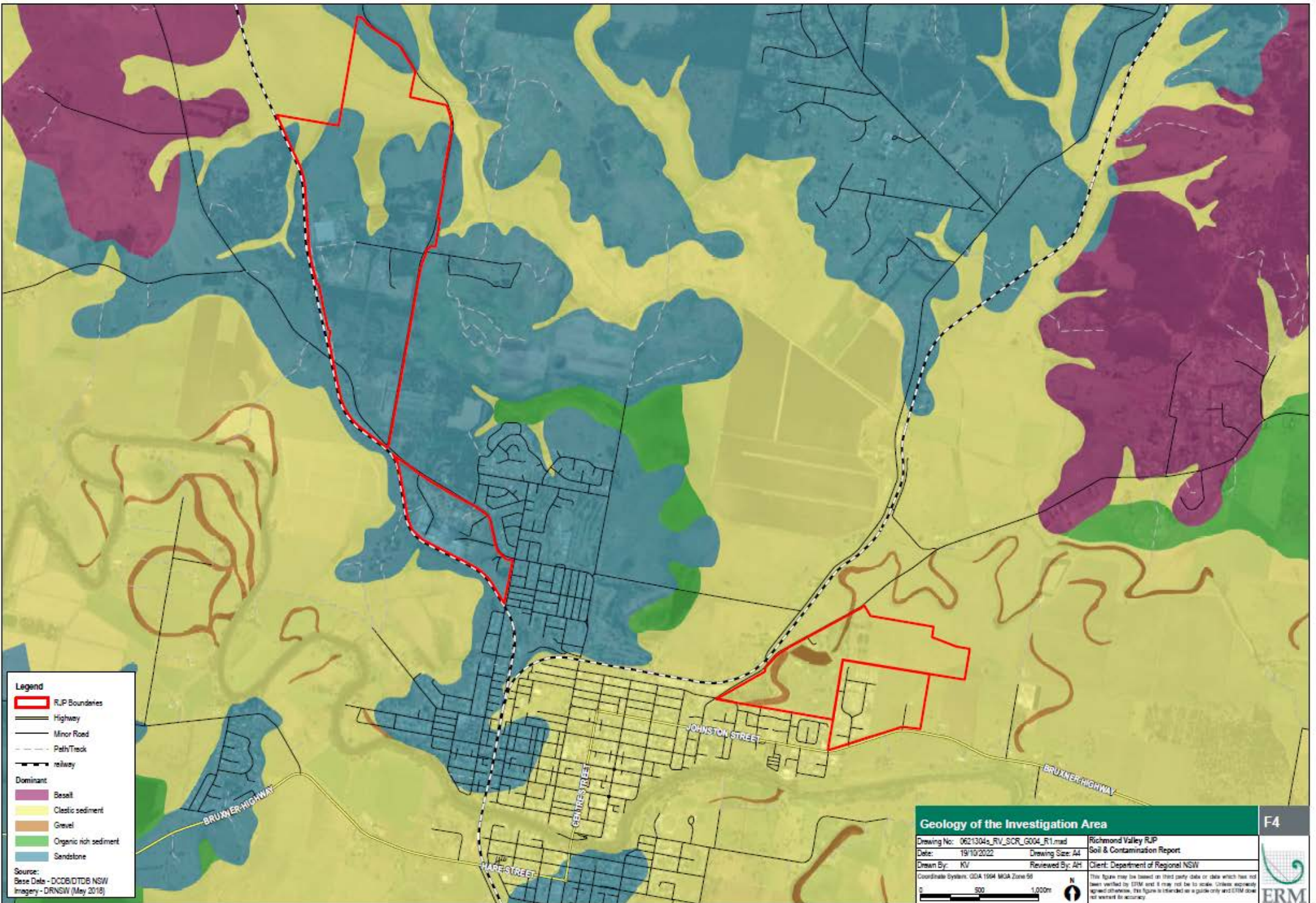
**Dominant Great Soil Group (GSG)**

- Black Earths (BE)
- Chocolate Soils (C)
- Grey, Brown and Red Clays (GC<sub>BC</sub>RC)
- Grey, Brown and Red Clays - good surface condition (GC<sub>gs</sub>BC<sub>gs</sub>RC<sub>gs</sub>)
- Prairie Soils (PS)
- Red Podzolic Soils - less fertile (RP)
- Weissenboders (W)
- Yellow Podzolic Soils - less fertile (YP)

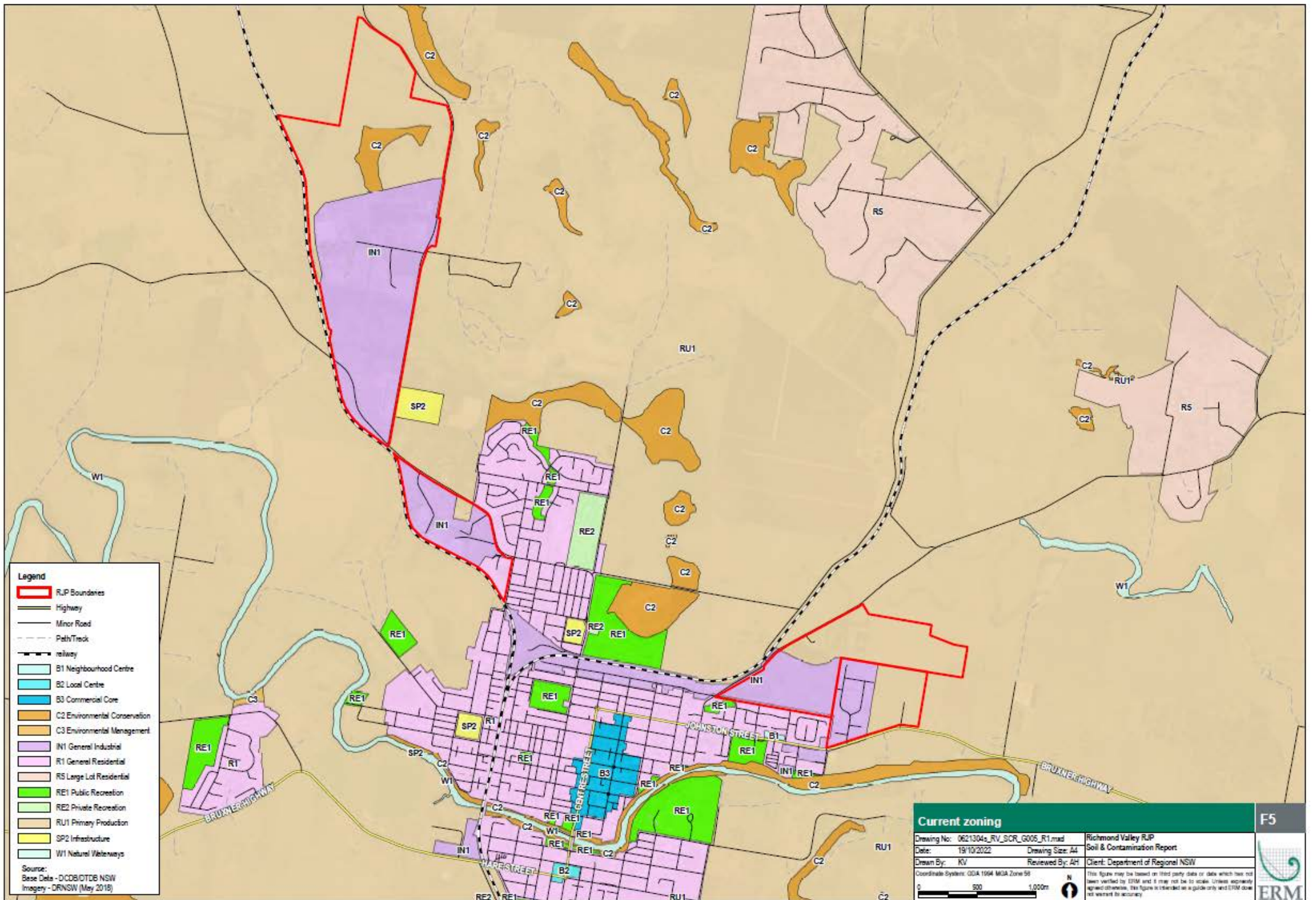
**Source:**  
 Base Data - DCDB/DTDB NSW  
 Imagery - DRNSW (May 2016)

Soils of the Investigation Area		F3
Drawing No: 0621304a_RV_SCR_G003_R1.mxd	Richmond Valley R/P	
Date: 19/10/2022	Drawing Size: A4	Soil & Contamination Report
Drawn By: KV	Reviewed By: AH	Client: Department of Regional NSW
Coordinate System: GDA 1994 MGA Zone 58		
0 500 1,000m	N	This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.





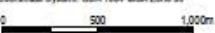






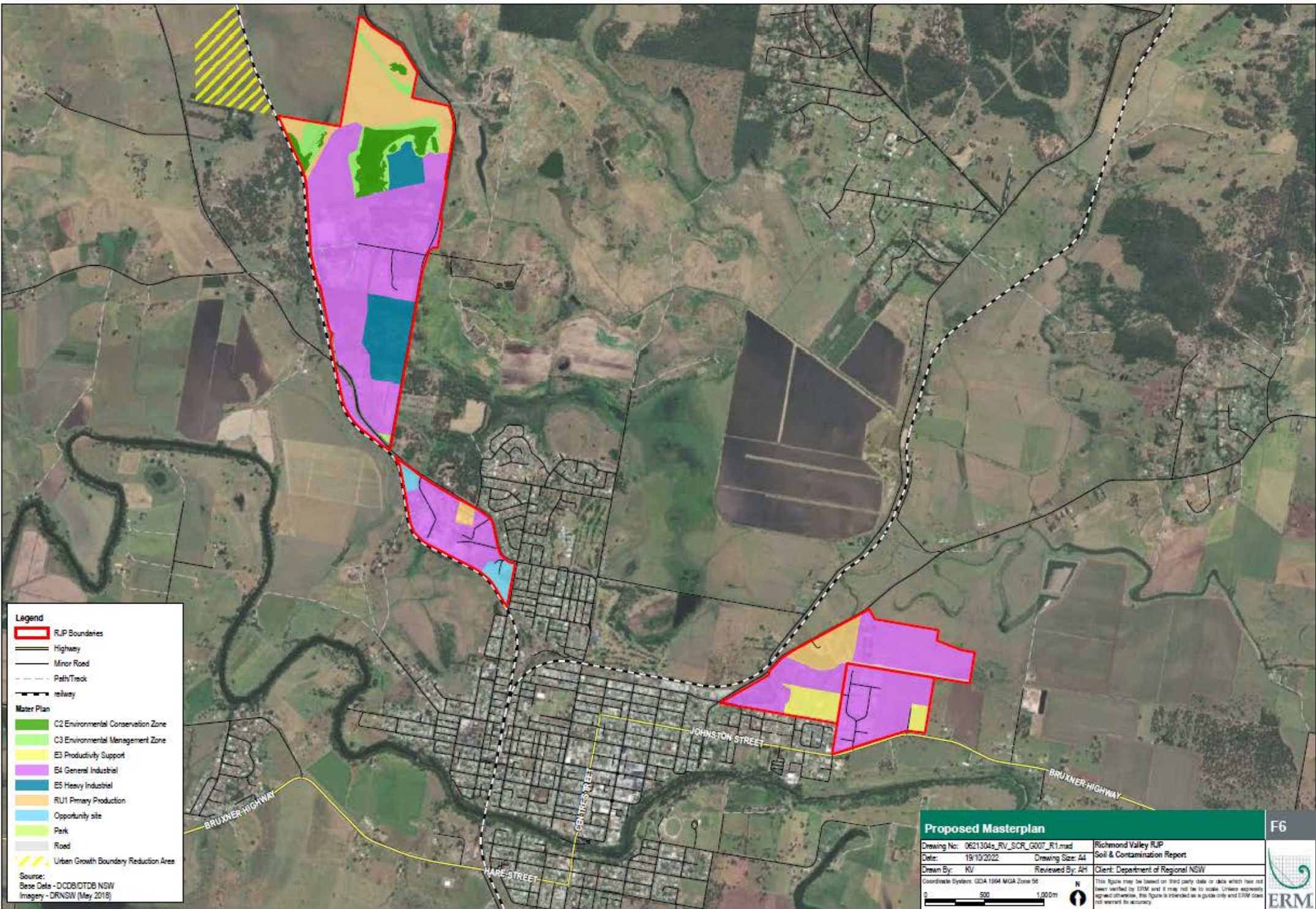
**Legend**

- RJP Boundaries
- Highway
- Minor Road
- Path/Treck
- railway
- B1 Neighbourhood Centre
- B2 Local Centre
- B3 Commercial Core
- C2 Environmental Conservation
- C3 Environmental Management
- IN1 General Industrial
- R1 General Residential
- R5 Large Lot Residential
- RE1 Public Recreation
- RE2 Private Recreation
- RU1 Primary Production
- SP2 Infrastructure
- W1 Natural Waterways

Source:  
 Base Data - DCDOB/OTOB NSW  
 Imagery - DRNSW (May 2018)

<b>Current zoning</b>		<b>F5</b>
Drawing No: 0621304s_RV_SCR_G005_R1.mxd	Richmond Valley RJP	
Date: 19/10/2022	Drawing Size: A4	Soil & Contamination Report
Drawn By: KV	Reviewed By: AH	Client: Department of Regional NSW
Coordinate Systems: GDA 1994 MGA Zone 58		
		This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.
		





**Legend**

- RJP Boundaries
- Highway
- Minor Road
- Path/Track
- railway

**Water Plan**

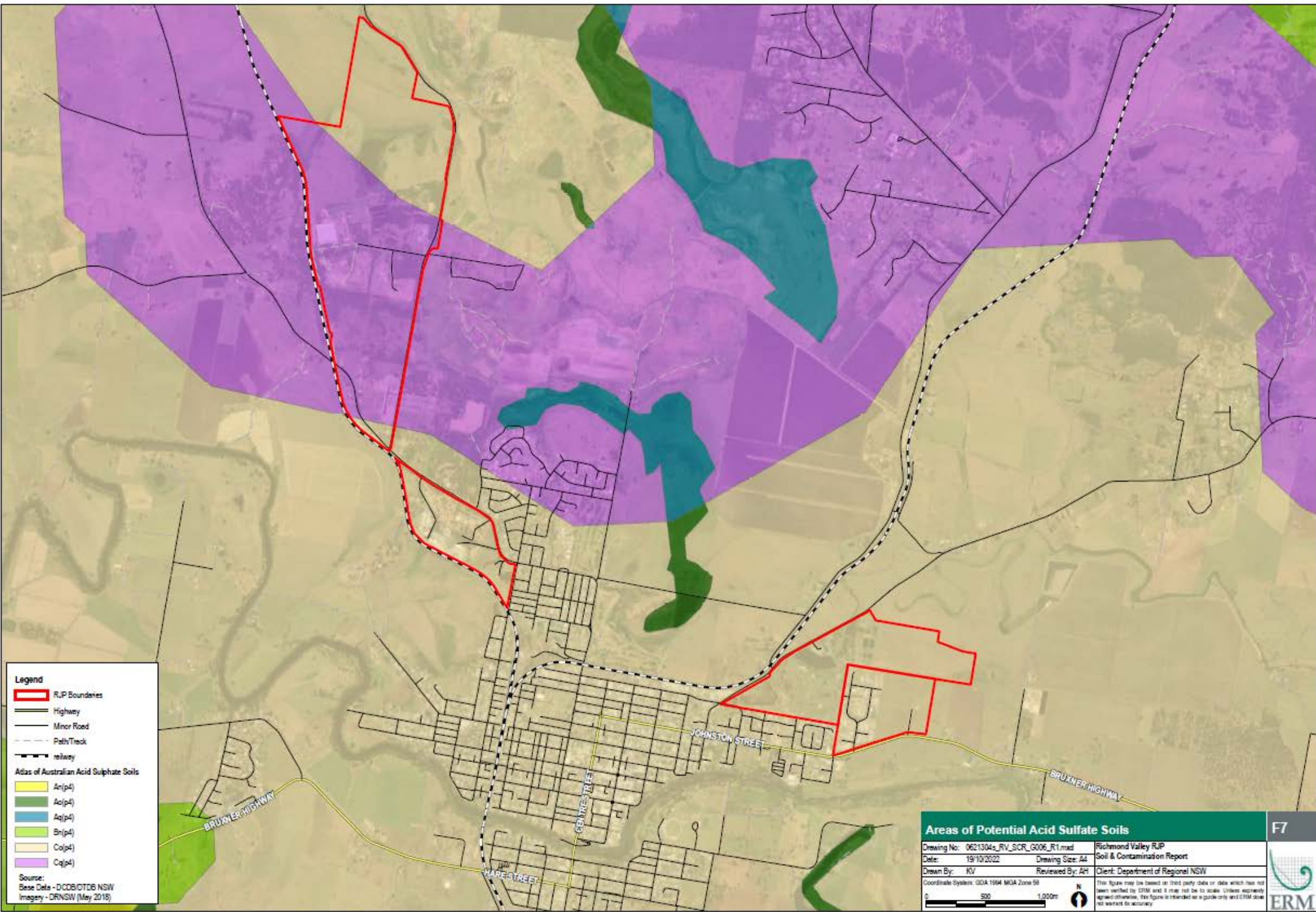
- C2 Environmental Conservation Zone
- C3 Environmental Management Zone
- E3 Productivity Support
- E4 General Industrial
- E5 Heavy Industrial
- RU1 Primary Production
- Opportunity site
- Park
- Road
- Urban Growth Boundary Reduction Area

Source:  
Base Data - DCDB/OTDB NSW  
Imagery - DRNSW (May 2018)

Proposed Masterplan		F6
Drawing No: 0621304s_RV_SCR_G007_R1.mxd	Richmond Valley RJP	<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant for accuracy.</small>
Date: 19/10/2022	Soil & Contamination Report	
Drawn By: KV	Reviewed By: AH	
Client: Department of Regional NSW		
Coordinate System: GDA 1984 MGA Zone 56		







**Legend**

- RJP Boundaries
- Highway
- Minor Road
- Path/Treck
- railway

**Atlas of Australian Acid Sulphate Soils**

- An(p4)
- Ac(p4)
- Aq(p4)
- Bn(p4)
- Co(p4)
- Cq(p4)

Source:  
Base Data - DCDB/OTDB NSW  
Imagery - DRNSW (May 2018)

Areas of Potential Acid Sulfate Soils		F7
Drawing No: 0621304s_RV_SCR_G006_R1.mxd	Richmond Valley RJP	<div style="display: flex; align-items: center;">            ERM         </div>
Date: 19/10/2022	Soil & Contamination Report	
Drawn By: KV	Reviewed By: AH	
Client: Department of Regional NSW	<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>	
Coordinate System: GDA 1994 MGA Zone 58		<div style="display: flex; align-items: center;"> <div style="margin-right: 5px;"> <span style="font-size: 8px;">0</span> <span style="font-size: 8px; margin: 0 5px;">500</span> <span style="font-size: 8px;">1,000m</span> </div> </div>



## 4. PREVIOUS INVESTIGATIONS

At the time of preparation of this Report, limited existing reports in relation to soils and contamination were available. ERM was provided with the following previous contamination report which relates to one portion of the RJP and this has been summarised below:

*Tim Fitzroy & Associates (August 2019) Preliminary Site Investigation –Planning Proposal Industrial Rezoning for land located at Lot 1 DP 783330, Lots 1 to 12 DP 976660 & Lots 14 to 20 DP 97660 Bruxner Highway Casino ref: 48/2017\_psi, dated 12 August 2019*

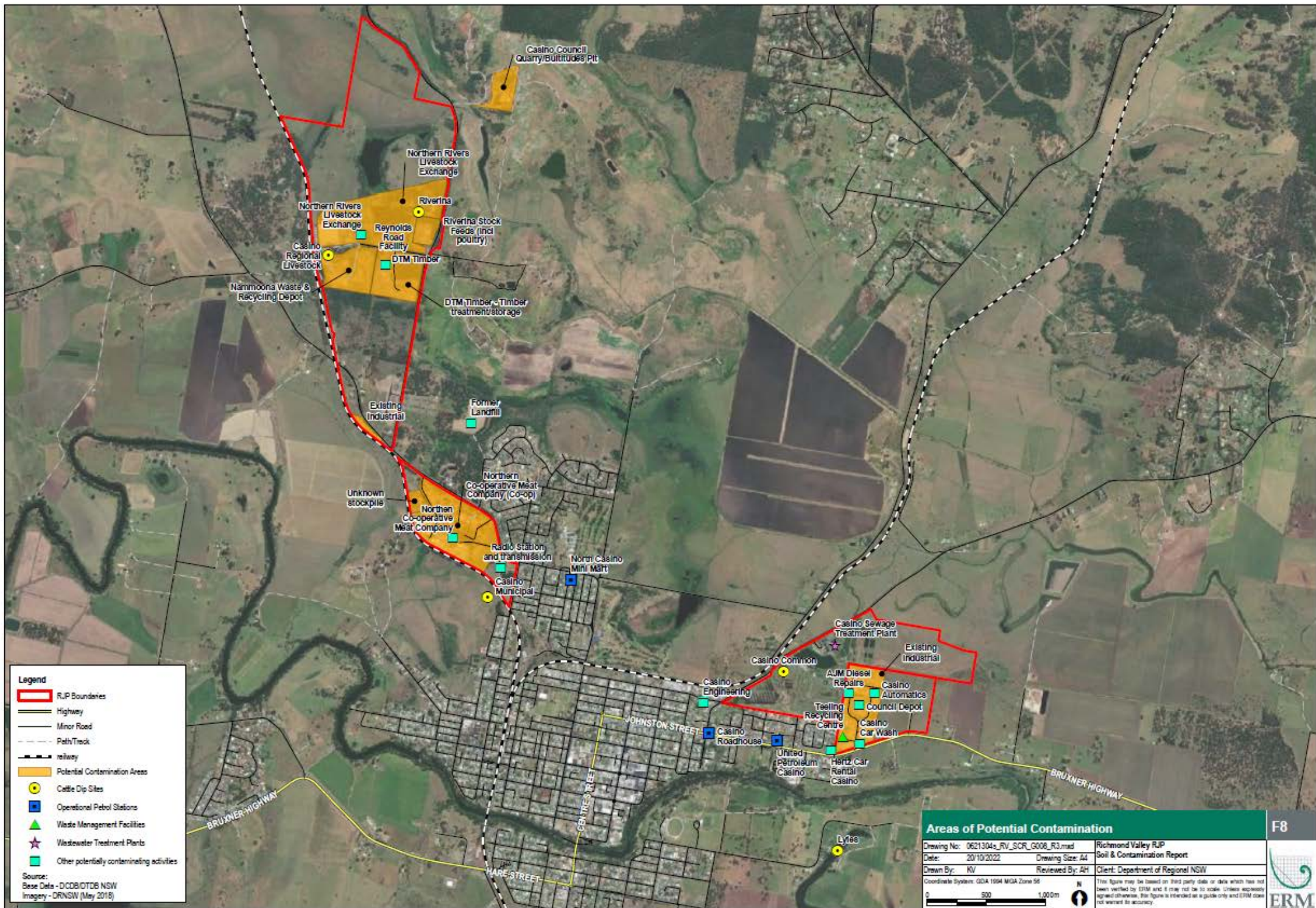
A Preliminary Site Investigation was prepared by Tim Fitzroy & Associates on behalf of the Site owner (Mr Jeff Imeson) for the purpose of supporting a Planning Proposal to permit industrial rezoning. The scope of work included a desktop review of publicly available information (historical records, EPA records, geology, hydrogeology, historical aerial photograph review), a site inspection and interview with the Site owner. The site was not listed on the EPA contaminated land record. The PSI (2019) report did not identify known contamination at the site and the past or current activities conducted at the site were largely agricultural in nature (cattle grazing). There were no built structures at the site, no hazardous materials stored at the site, no indications of waste disposal areas. The adjoining land to the north, east and south is similarly used for agricultural purposes, dominantly beef cattle grazing. The adjoining land to the west comprises an industrial estate which includes activities such as junk yard, smash repair workshop, auto electrician, sand and landscape supplies, stock feed depot.

ERM was not provided, nor made aware of, any previous contamination reports for the remainder of the RJP.

## 5. SITE INSPECTION

Site inspections were undertaken by ERM's environmental consultants concurrent with preliminary biodiversity and heritage survey works in December 2021 and April 2022. This inspection identified an area of what appeared to be illegally dumped waste in the vicinity of the Northern Rivers Livestock Exchange (Area 1). A large stockpile of unknown materials, likely to be waste materials and/or soils is located within the grounds of the Co-op, as shown on **Figure 8**.





**Legend**

- R/P Boundaries
- Highway
- Minor Road
- Path/Trecks
- railway
- Potential Contamination Areas
- Cattle Dip Sites
- Operational Petrol Stations
- Waste Management Facilities
- ★ Wastewater Treatment Plants
- Other potentially contaminating activities

Source:  
Base Data - DCOB/OTDS NSW  
Imagery - DRNSW (May 2018)

Areas of Potential Contamination	
Drawing No: 06213045_RV_SCR_G008_R3.mxd	Richmond Valley R/UP
Date: 20/10/2022	Soil & Contamination Report
Drawing Size: A4	Client: Department of Regional NSW
Drawn By: KV	Reviewed By: AH
Coordinate System: GDA 1994 MGA Zone 56	
<div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> </div> <div style="text-align: center;"> <span style="font-size: 0.8em;">N</span>  <span style="font-size: 0.8em;">0 500 1,000m</span> </div> </div>	
<small>This figure may be based on third party data or data which has not been verified by ERM and it may not be to scale. Unless expressly agreed otherwise, this figure is intended as a guide only and ERM does not warrant its accuracy.</small>	

F8



## 6. PRELIMINARY SOIL ASSESSMENT

### 6.1 Soil Landscapes

Soils in Area 1 and Area 2 are classified as Podzolic with predominantly vertosols present within Areas 3a and 3b. Available mapping from the NSW DPIE eSPADE tool (eSPADE v2.1 (nsw.gov.au)) indicates that a total of five different soil landscapes are present across the Site (refer **Figure 3**) as follows:

- Leycester;
- Nammoona;
- Yorklea Variant A;
- North Casino; and
- Disputed Plain

A detailed description of the identified soil landscapes within the Investigation Area is presented below and graphically in **Figure 3**.

Soil Landscape	Description
Leycester	<ul style="list-style-type: none"> <li>■ <b>Landscape</b>—level to gently undulating broad to extensive (500→1 500 m) alluvial plains of extremely low relief, draining the MacKellar Hills. Extensively cleared closed- and open-forest.</li> <li>■ <b>Soils</b>—deep (&gt;200 cm), poorly to moderately well drained alluvial Black Earths (Ug5.15, Ug5.17) and Structured Clays (Uf6.42) occur throughout the floodplains. Wetter areas, such as ox-bow floors, have deep (&gt;200 cm), poorly drained Weisenboden (Ug5.15, Ug5.17). Deep (&gt;200 cm), well-drained Earthy Sands (Uc5.21) line channels.</li> <li>■ <b>Limitations</b>—moderately erodible, moderately plastic soils with low wet bearing strength, moderate shrink-swell and localised waterlogging. Flooding, stream bank erosion.</li> </ul>
Nammoona	<ul style="list-style-type: none"> <li>■ <b>Landscape</b>—low hills on Grafton Formation sediments. Relief is 30–50 m, slopes 10–18%. Partially to extensively cleared tall open eucalypt woodland.</li> <li>■ <b>Soils</b>—deep (100–150 cm), well-drained Red Earths and Red Podzolic Soils (Gn2.11) and moderately deep (70–100 cm), moderately well-drained brownish Red Podzolic Soils (Db3.11, Db4.11) on crests and slopes. Shallow to moderately deep (&lt;100 m), imperfectly drained Yellow Podzolic Soils (Dy3.11, Dy3.21), Soloths (Db4.11, Db4.21) and some Lateritic Podzolic Soils (Dy3.84, Dy5.84) in lower relief areas.</li> <li>■ <b>Limitations</b>—hardsetting, highly erodible and moderately dispersible soils of low fertility with localised shallow occurrences. Localised high mass movement hazard (generally at basalt boundaries) and steep slopes.</li> </ul>
North Casino	<ul style="list-style-type: none"> <li>■ <b>Landscape</b>—drainage depressions forming swamps and intermittent swamps associated with the Richmond River Alluvial Plain. Relief is Relief is &lt;2 m and slopes are &lt;2%. Elevation is 10–30 m. Closed sod grassland and open-rushland with stands of open paperbark forest.</li> <li>■ <b>Landscape Variant—nca</b>—areas seasonally inundated.</li> <li>■ <b>Soils</b>—deep (&gt;100 cm), poorly drained Weisenboden (Ug5.17) and Brown Clays (Ug5.35).</li> <li>■ <b>Limitations</b>—low wet bearing strength, high shrink, swell, highly plastic soils, flooding, permanently high water tables, waterlogging/seasonal water-logging.</li> </ul>
Yorklea	<ul style="list-style-type: none"> <li>■ <b>Landscape</b>—very low undulating rises on Grafton Formation sediments and Tertiary gravels. Relief is 20–30 m, slopes 2–10%. Slopes are simple and convex, crests are moderately broad. Extensively cleared tall eucalypt woodland with banksia woodland on sands and gravels.</li> <li>■ <b>Landscape Variant—yoa</b>—extremely to very low relief (2–10 m), slopes 2–5%. Generally, grades into Tatham (ta) soil landscape. Soils—moderately deep (100–150 cm), moderately well-drained Red and Yellow Earths (Uf6) on crests. Moderately deep (100–150 cm), poorly drained Red Podzolic Soils (Dr5.21), Yellow Podzolic Soils (Dy4.11,</li> </ul>

Soil Landscape	Description
	<p>Dy3.51), Soloths (Db1.11, Db2.11, Dy3.21) with occasional Lateritic Podzolic Soils (Dy3.84, Dy5.84) on slopes.</p> <ul style="list-style-type: none"> <li>■ <b>Soil Variant—yob</b>—deep, moderately well-drained Red Earths (Uf5.11, Gn2.41, Ks-Gn2) on Tertiary gravels.</li> <li>■ <b>Limitations</b>—highly erodible, hardsetting, dispersible, slowly permeable, seasonally waterlogged soils of low fertility. Localised salinity.</li> </ul>
Disputed Plain	<ul style="list-style-type: none"> <li>■ <b>Landscape</b>—basalt derived valley in-fills and alluvial fans forming gently inclined slopes. Relief 10–30 m, slopes 1–3%. In cross-section fans have a gentle convex appearance. Partly active and/or stable gullies are common. Closed sod grassland and open-sedge land on possibly naturally treeless areas.</li> <li>■ <b>Soils</b>—deep (&gt;200 cm), poorly drained Black Earths (Ug5.15, Ug5.17), Black Earth/Weisenboden intergrades (Ug5.15, Ug5.17) and Dense Clays (Uf6.61). Yellow Podzolic Soils and Soloths (Dy3.11, Dy3.21) in landscape variant dpa.</li> <li>■ <b>Limitations</b>—highly plastic soils of low permeability, low wet bearing strength and high surface movement potential with localised stoniness and waterlogging. Permanently high water tables.</li> </ul>

## 6.2 Salinity and Soil Aggressivity

### 6.2.1 Desktop Review

Based on regional soil mapping no salinity hazard was identified for the soil landscapes within the investigation area (as per Map 1.4a provided in **Appendix A**).

### 6.2.2 Soil Sampling and Analysis

On this basis, no preliminary soil sampling or laboratory analysis was undertaken for salinity or soil aggressivity.

## 6.3 Acid Sulfate Soils

### 6.3.1 Desktop Review

No significant risk of acid sulfate soil was identified within the Site nor within a 200 m buffer zone based on the available Acid Sulfate Soil risk maps. The Atlas of Australian Acid Sulfate Soil indicates that there is an extremely low probability for acid sulfate soils occurring within the Site (as shown on **Figure 7**, for both Co(p4) and Cq(p4)).

### 6.3.2 Soil Sampling and Analysis

Based on the above assessment, no preliminary soil sampling or laboratory analysis was undertaken for potential acid sulfate soils.

## 7. PRELIMINARY CONTAMINATION ASSESSMENT

### 7.1 Site History

#### 7.1.1 Aerial Photographs

Historical aerial photographs (**Appendix A**) were reviewed to assess potential historical land use practices undertaken within and surrounding the site. A summary of information obtained from the review is presented within the table below.

Year	Description
1958 – Black & White	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> The site consists of agricultural land and undeveloped land. A railway line is present along the western boundary of area 1 and area 2. The presence of the Casino Wastewater Treatment Plant can be observed in Area 3a</li> <li>■ <b>Surrounding Area:</b> The surrounding area is primarily comprised of agricultural land and undeveloped land. Low density residential developments were present to the south and south east of Area 2. The North Coast and Casino / Murwillumbah Railways are present in their current locations.</li> </ul>
1967– Black & White	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> In Area 2, Northern Co-Operative Meat Company Abattoir Casino can be observed in the western/central part with minor commercial development visible in the southern corner of this area. No observable changes have been made in Areas 1, 3a and 3b. The majority of the Site remains agricultural / undeveloped land.</li> <li>■ <b>Surrounding Area:</b> No significant changes were observed for the land surrounding the site since the previous aerial photography.</li> </ul>
1971– Black & White	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> No significant changes were observed within the Site since previous aerial photography.</li> <li>■ <b>Surrounding Area:</b> A few new houses have been developed on the eastern side of Area 2 and a “turkeys nest” style dam / pond has been created to the east of the central part of Area 1 with no significant changes observed within other surrounding areas.</li> </ul>
1979– Black & White	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> Commercial/industrial development has extended to the northern portion of the area 2the. New building, most probably commercial/industrial, can be observed in the western part of Area 3b, north of Johnston St (Bruxner Highway).</li> <li>■ <b>Surrounding Area:</b> More housing development can be observed in east and west side of area 2 and area 3b, respectively. A new farming house and farming development appears to the east side of area 1.</li> </ul>
1987– Black & White	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> The Nammoon Waste and Recycling facility can be observed in Area 1 extending from west to east, more building development, likely commercial / industrial has occurred in area 3b with no significant changes to the other areas.</li> <li>■ <b>Surrounding Area:</b> development of residential area is continuing in east and west side of area 2 and area 3b, respectively.</li> </ul>
1991 – Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> New development can be observed in the western part of Area 3a, with minor development in Area 3b and no significant changes to the other areas.</li> <li>■ <b>Surrounding Area:</b> No significant changes were observed for the land surrounding the Site since the previous aerial photography.</li> </ul>
1997 – Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> No significant changes were observed within the Site since the previous aerial photography.</li> <li>■ <b>Surrounding Area:</b> More residential development was observed on the western side of Area 3a and Area 3b.</li> </ul>
2004– Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> No significant changes were observed within the Site since the previous aerial photography.</li> <li>■ <b>Surrounding Area:</b> No significant changes were observed within the surrounding area since the previous aerial photography</li> </ul>
2009– Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> The western corner of area 3a is planted with trees. The remainder of the Site is generally consistent with previous aerial imagery.</li> </ul>

Year	Description
	<ul style="list-style-type: none"> <li>■ <b>Surrounding Area:</b> No significant changes were observed within the surrounding area since the previous aerial photography.</li> </ul>
2014 – Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> No significant changes were observed within the Site since the previous aerial photography.</li> <li>■ <b>Surrounding Area:</b> The residential development along the western side of Areas 3a and 3b has been extended to the western boundary of these areas. More residential development can also be observed on the eastern side of Area 2.</li> </ul>
2018 – Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> No significant changes were observed within the Site since the previous aerial photography.</li> <li>■ <b>Surrounding Area:</b> No significant changes were observed within the surrounding area since the previous aerial photography.</li> </ul>
2021 – Colour	<ul style="list-style-type: none"> <li>■ <b>Site Area:</b> No significant changes were observed within the Site since the previous aerial photography.</li> <li>■ <b>Surrounding Area:</b> No significant changes were observed within the surrounding area since the previous aerial photography.</li> </ul>

### 7.1.2 Historical Business Records

A search of historical business records and land titles for the site and surrounding area (200 m radius) was undertaken from the 1920s to date. The results of these searches are summarised below:

Period	Registered Business Types
1930's	<ul style="list-style-type: none"> <li>■ No Records</li> </ul>
1940's	<ul style="list-style-type: none"> <li>■ No Records</li> </ul>
1950's	<ul style="list-style-type: none"> <li>■ No Records</li> </ul>
1965	<ul style="list-style-type: none"> <li>■ Textile mills</li> <li>■ Steel merchant</li> <li>■ Washers</li> <li>■ Dental &amp; dentistry laboratory</li> </ul>
1970s	<ul style="list-style-type: none"> <li>■ No Records</li> </ul>
1980s	<ul style="list-style-type: none"> <li>■ No Records</li> </ul>
1990s	<ul style="list-style-type: none"> <li>■ Hairdressers' supplies</li> </ul>
2005	<ul style="list-style-type: none"> <li>■ Electrical Contractors / Engineers/ consultants</li> <li>■ Car &amp; truck cleaning products and equipment</li> <li>■ Cars-used</li> <li>■ Driving school</li> <li>■ Electric motor &amp; generator repairs &amp; services</li> <li>■ Electrical appliances &amp; products-service repair</li> <li>■ Engineers-motor &amp; repair</li> <li>■ Foundation garments &amp; accessories-retailers &amp; repairers</li> <li>■ Hairdressers' supplies</li> <li>■ Kitchen renovation &amp; equipment new</li> <li>■ Panel beaters &amp; automotive painting</li> <li>■ Radio station- AM/FM</li> <li>■ Roof constructions specialists</li> <li>■ Tilers-wall &amp; floor</li> <li>■ Transmissions-car</li> <li>■ Graziers</li> <li>■ Monument &amp; memorial masons</li> </ul>

Period	Registered Business Types
	<ul style="list-style-type: none"> <li>■ Fertilisers supplier</li> <li>■ Towing services</li> <li>■ Garage builders&amp; pre-Fab garages/ sheds</li> <li>■ Engineers/general</li> <li>■ Transit centre</li> <li>■ Hairdressers;</li> <li>■ Concrete ready-mix</li> <li>■ Food Processors;</li> <li>■ Livestock feeds&amp; supplements</li> <li>■ Sawmills</li> </ul>
<b>2010</b>	<ul style="list-style-type: none"> <li>■ Abrasive blasting services</li> <li>■ Boring drilling&amp; excavation services</li> <li>■ Engineers-motor&amp; repairs</li> <li>■ Glass merchants&amp; installation</li> <li>■ Kitchen renovation&amp; equipment new</li> <li>■ Landscape gardening services &amp; supplies</li> <li>■ Panel beaters&amp; automotive painting</li> <li>■ Recyclers</li> <li>■ Roof construction specialist</li> <li>■ Roofing materials&amp; supplies</li> <li>■ Tanks equipment/factory construction&amp; installation</li> <li>■ Upholsterers &amp; re- upholstery</li> <li>■ Cars-new</li> <li>■ nurseries-retail</li> <li>■ Garage builders</li> <li>■ Lawn&amp; motor mowers-sales&amp; services</li> <li>■ Engineers-general</li> <li>■ Concrete ready mix</li> <li>■ Food Processors;</li> <li>■ Sawmills</li> </ul>
<b>2015</b>	<ul style="list-style-type: none"> <li>■ Air conditioning-car automotive</li> <li>■ Building contractors general</li> <li>■ Building maintenance-commercial &amp; industrial services</li> <li>■ Car wreckers used recycled part</li> <li>■ Concrete-form ties formwork&amp; accessories</li> <li>■ Engineers-general</li> <li>■ Engineers motor&amp; repairs</li> <li>■ Fencing contractor</li> <li>■ Garage builders</li> <li>■ Glass merchants&amp; installation services</li> <li>■ Hair dressers &amp; hair salons</li> <li>■ Kitchen renovation&amp; equipment new</li> <li>■ Landscape gardening services &amp; supplies</li> <li>■ Panel beaters&amp; automotive painting</li> <li>■ Recyclers</li> <li>■ Roof construction specialist</li> <li>■ Roofing materials&amp; supplies</li> <li>■ Security doors&amp; windows equipment &amp; installation</li> <li>■ Shed industrial&amp; rural</li> <li>■ Solar energy equipment&amp; machinery</li> </ul>



Period	Registered Business Types
	<ul style="list-style-type: none"> <li>■ Spring manufactures &amp; wholesalers</li> <li>■ Tanks equipment/factory construction&amp; installation</li> <li>■ Timber-retailer/ trader</li> <li>■ Trailers design manufacture &amp; equipment</li> <li>■ Upholsterers &amp; re- upholstery</li> <li>■ Cars-new</li> <li>■ Graziers</li> <li>■ Medical clinics</li> <li>■ Lawn&amp; motor mowers-sales&amp; services</li> <li>■ Crane &amp; travel tower hire or services</li> <li>■ Concrete ready-mix</li> <li>■ Sawmills</li> <li>■ School-state</li> </ul>

## 7.2 Past and Present Potentially Contaminating Activities

A search of past and present potentially contaminating activities are detailed within the following sections. Figures illustrating the location of identified activities are detailed within **Appendix A**.

### 7.2.1 NSW EPA Contaminated Land Search

A search of the NSW EPA contaminated land database under the CLM Act 1997 undertaken for the site and a 1 km buffer area indicated the following have been notified to NSW EPA:

Site Name	Address	Activity that caused Contamination	EPA Site Management Class	Distance (m)	Direction
Former Gasworks	134-136 North, Street Casino	Gas Works	Regulation under CLM Act not required	550.0	South-west
Caltex Service Station and Depot Casino	28& 32 Dyraaba street Casino	Service Station	Regulation under CLM Act not required	725.0	South-east
Casino Roadhouse	86 Johnston Street, Casino	Service Station	Contamination currently regulated under CLM Act	251.0	South-west
18 Beith Street, Casino	18 Beith Street, Casino	Unclassified	Regulation under CLM Act not required	515	East

In addition to the above, further information was provided by Richmond Valley Council in relation to 18 Beith Street, Casino. It is understood that a house fire occurred which resulted in contamination from lead paint and asbestos, and that this has been remediated and new housing erected at the site. On this basis, the site at 18 Beith Street, Casino would not be considered a potentially contaminated site, as this has been remediated.

### 7.2.2 NSW EPA Contaminated Lands Records of Notice

A search of the NSW EPA Contaminated Land Records of Notice database for the site and 1 km buffer indicates the existence of Contaminated Land Records of Notice for the following site.

Site Name	Area n°	Address	Notices	Distance (m)	Direction
Casino Roadhouse	3447	86 Johnston Street, Casino	Notices relating to this site (2 current)	251.0	South-west

### 7.2.3 NSW EPA PFAS Investigation Program

A search of the NSW EPA PFAS investigation program database indicated that no PFAS investigations had been or were being undertaken at the site or within the 2 km report buffer area.

### 7.2.4 National Pollutant Inventory Industrial Facilities

A search of the National Pollutant Inventory (NPI) register indicated the following sites to be located within the 2000 m search buffer area:

Facility Name	Address	Primary ANZSIC Class	Latest Report	Distance from Site (m)	Direction
Casino Waste Water Treatment Work	Spring Grove Road	Sewage and Drainage Services	2018/2019	0.0	Onsite
Casino Hide Traders	Hillcrest Lane	Leather tanning, fur dressing and leather products manufacturing	2018/2019	0.0	Onsite
Northern co-operative meat company abattoir casino	10615 Summerland Way	Meat Processing	2018/2019	0.0	Onsite
Mobile casino airport depot	Light street	Petroleum product wholesaling	2005/2006	174.0	South
Caltex casino depot	32 Dyraaba Street	Petroleum product wholesaling	2018/2019	728.1	South-east

### 7.2.5 Licencing under the POEO Act 1997

A search of the NSW EPA record of licensed activities under the *Protection of the Environment Operations Act 1997* undertaken for the site and a 500 m buffer area identified the following sites:

Licence Holder	EPL Number	Location Name	Premise Address	Fee Based Activity	Distance to Site	Direction
Riverine (Australia) Pty Ltd	5848	Lot 101 Reynolds road	Lot 101 Reynolds road, Casino	General agricultural processing	0.0	Onsite
Northern Co-operative meat company Ltd	1461	10615 Summerland Way	10615 Summerland Way, Casino	Rendering or fact extraction slaughtering or processing animals tanneries or fellmongeries	0.0	Onsite

Licence Holder	EPL Number	Location Name	Premise Address	Fee Based Activity	Distance to Site	Direction
Richmond Valley Council	585	Spring Grove Road	Spring Grove Road, casino	Sewage treatment processing by small plants	0.0	Onsite
Fast Freeze international limited	1693	Dyraaba street	Dyraaba street, Casino	Dairy processing	207.0	West
Richmond Valley council	3878	Dargaville Drive	Dargaville Drive, Casino	Animal accommodation	0.0	Onsite
Richmond Valley council	5872	87 Dargaville Drive	87 Dargaville Drive, Casino	Recovery of general waste, waste disposal by application to land waste storage-other types of waste	0.0	Onsite

### 7.2.6 Delicensed Premises Still Regulated by EPA, Licences Surrendered, Clean Up and Penalty Notices

A search of the NSW EPA record of licensed activities under the *Protection of the Environment Operations Act 1997* undertaken for the site and a 1 km buffer area identified the following sites:

Licence No	Licence Holder	Location Name	Premise Address	Fee Based Activity	Status	Distance (m)	Direction
5375	Cemex Australia Pty Ltd	Casino Concrete	12-14 Tomki Drive, Casino	Concrete work	Delicensed	0.0	Onsite
2476	Richmond Valley Council	Casino Water treatment plant	Summerland Way, Casino, NSW 2470	Miscellaneous Licensed discharge to waters (at any time)	Surrendered	27.6	North-east
4536	Boral Cement Limited	Dyraaba street, casino, NSW 2470	Dyraaba street, casino, NSW 2470	Cement or lime handling	Surrendered	5.6	South
3957	Forestry Corporation Of New South Wales	Lower north east region (L.N.E.R) Mans state forests and crown timber lands (ex. Plantations)	Within the L.N.E.R to the NSW. L.N.E.R forest agreement granted on the 5 march 1999 Kempsey, NSW 2440	Logging operations	No longer in force	Not mapped	Not mapped

### 7.2.7 Clean up and Penalty Notices

A search for sites issued with clean up or penalty notices within the Site and surrounding area 500m buffer area identified the following:

Location ID	Notice Type	Notice Number	Licence Holder	Location Name	Distance (m)	Direction
1013	Penalty Notice	1512244	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Penalty Notice	1512245	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Penalty Notice	1512247	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Penalty Notice	-	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Penalty Notice	-	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Penalty Notice	1566080	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Penalty Notice	1566081	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean Up notice	1024530	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean Up notice	1024598	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean-up Notice	1028085	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean Up Notice	1051696	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean Up notice	1087543	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean Up notice	1090202	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped
1013	Clean Up notice	1543465	Forestry corporation of NSW	Lower north east region (L.N.E.R) Means State Forests and Crown Timber Lands (ex. Plantations)	Not mapped	Not mapped

## 7.2.8 Defence / UXO Sites

A search of Department of Defence Australian Government databases identified the following Defence or UXO impacted sites within the Site or surrounding 2000m buffer area.

Site Name	Type	Detail	Distance (m)	Direction
Casino	Unexploded Ordnance (Category Other – see below for more detail)	Potential presence of UXO Other Records indicate that large number of troops camped and trained in the vicinity of casino during WWII.	0.0	Onsite
Casino Gres Depot	Regional Contamination Investigation Program	Former Casino Army Reserve Depot. Reserve unit located at the Site has located to Lismore. Department of Defence divested the property in October 2015	184.0	South-west

The Department of Defence public record of areas affected, or suspected of being affected, by Unexploded Ordnance (UXO) that may influence the nature of land use (source: [www.wherisuxo.org.au](http://www.wherisuxo.org.au)) identifies an area around the main CBD and surrounds of Casino as category “Other” which is defined as follows (source: <https://defence.gov.au/UXO/Where/Categories.asp>):

*“Defence records confirm that the area was used for military training but do not confirm that the site was used for live firing. UXO or explosive ordnance fragments / components have not been recovered from the site. Defence opinion is that it would be inappropriate to assess as either slight, substantial or remote.*

*Advice: These sites have been included for general information purposes only. Defence makes no recommendations in regards to this category.”*

A map showing the extent of the area categorised as “Other” in the public record (source: [www.wherisuxo.org.au](http://www.wherisuxo.org.au)) is presented in **Appendix B**.

## 7.2.9 Former Gasworks Sites

Site Name	Detail	Distance (m)	Direction
Former Gasworks	Gasworks identified via historic aerial photography (1958). Main Gasholder and ancillary facilities appear to have been removed by 1979. Ancillary gas storage infrastructure is present up until 1991 where a singular commercial/industrial building is present adjacent the western boundary	530.0	South-west

### 7.2.10 Derelict mines and quarries

A search for derelict mines and quarries undertaken for the site and 500 m buffer area identified the following sites:

Site Name	Description	Distance (m)	Direction
Reynolds road facility	Proposed soil extraction site	0.0	Onsite
Council quarry/ Bultitudes pit	Large, active council pit: yields stabilising sand from loam and friable quartzose sandstone of kangaroo creek type. Material too soft for subbase by itself; needs harder material added as a minor component. Formerly, yellow	235.0	East

In addition to the above, it is noted that the Bultitudes Quarry was previously operated by Richmond River Shire Council and is now privately operated.

### 7.2.11 Historical and Current Landfills

A search for former and current potentially contaminating activities relating to waste management undertaken for the site and 500 m buffer area identified the following sites:

Site Name	Description	Distance (m)	Direction
Nammoona Waste and Resource Recovery Facility	Richmond Valley Council operates a Waste and Resource Recovery Facility at Casino (Nammoona), as well as transfer stations at Evans Head, Bora Ridge and Rappville	0.0	Onsite

### 7.2.12 Search of Potentially Contaminating Activities

A search for potentially contaminating activities undertaken for the site and 500 m buffer area identified the following sites:



Site Name	Category	Location	Status	Distance (m)	Direction
Casino Common	Cattle dip	Casino Dr, Casino NSW 2470	Operational	0.0	Onsite
Casino Municipal	Cattle dip	Casino Dr, Casino NSW 2470	Operational	40.0	South east
Casino Regional Livestock	Cattle dip	Casino Dr, Casino NSW 2470	Operational	0.0	Onsite
Lyles	Cattle dip	Casino Dr, Casino NSW 2470	Operational	260.0	south
Riverina	Cattle dip	Reynolds road, Casino NSW 2470	Operational	0.0	Onsite
United Petroleum Casino	Petrol station	136-144 Johnston St, Casino NSW 2470	Operational	220.0	South
Casino Roadhouse	Petrol station	86 John St, Casino NSW 2470	Operational	345.0	South
North Casino Caltex Mini Mart	Petrol station	99 Queensland Rd, Casino NSW 2470	Operational	485.0	East
Dargaville Dr, Casino	Nammoona Waste Facility	Nammoona Waste Facility Dargaville Dr, Casino NSW 2470	Operational	0.0	Onsite
Teeling Recycling Centre	Recycling centre	3 First Ave, Casino NSW 2470	Operational	0.0	Onsite
Casino	Sewage treatment plant	Spring Grove Rd, Casino NSW 2470	Operational	0.0	Onsite
Railway corridor and associated railway property	Railway	Various	Operational	Various	Adjacent to RJP boundary

### 7.2.13 Other Current Potentially Contaminating Activities

A search of other current potentially contaminating activities undertaken for the site and 200 m buffer area identified the following sites:

Site Name	Category	Location	Status	Distance (m)	Direction
Riverina	Mill	Reynolds road, Casino NSW 2470	Operational	0.0	Onsite
Nammoona Waste and Resource Recovery Facility	recycling centre	Nammoona Waste Facility, Dargaville Dr, Casino NSW 2470	Operational	0.0	Onsite
Northern Rivers Livestock exchange	Livestock auction house	Dargaville Dr, Casino NSW 2470	Operational	0.0	Onsite
Northern Co-Operative Meat Company Ltd. (NCOMC)	Meat processor	10615 Summerland Way, Casino NSW 2470	Operational	0.0	Onsite
Teeling Recycling Centre	Recycling centre	3 First Ave, Casino NSW 2470	Operational	0.0	Onsite
Hertz Rental Casino	Truck Rental Agency	182/ 186 Johnston St, Casino, NSW 2470	Operational	0.0	Onsite

Site Name	Category	Location	Status	Distance (m)	Direction
Casino Automatics	Mechanic	18 Tomki Dr, Casino NSW 2470	Operational	0.0	Onsite
Ajm Diesel Repairs	Mechanic	24 Casino Dr, Casino NSW 2470	Operational	0.0	Onsite
Casino Engineering	Crane hire company	125 Dyraaba St, Casino NSW 2470	Operational	195.0	West

### 7.3 Summary of Desktop Review

The results of the investigation indicated the following:

- The site is located in an area comprising primarily industrial agricultural land uses with the town of Casino located south of Area 1 and 2 and east of Areas 3a and 3b.
- Desktop search results identified number of sensitive human and ecological receptors that may require further consideration during any potential future operational expansion planning.
- The site is underlain by seven alluvial geological formations from the Quaternary (6) and Holocene (1) periods. Soil landscapes within the Site were described as including Leycester, Nammoona, Yorklea Variant A, North Casino and Disputed Plain.
- No significant risks associated with acid sulfate soils, salinity or soil aggressivity were identified within the available soils mapping reviewed.
- Groundwater within the site and surrounding area was measures to be present within underlying aquifers at depths ranging from -0.3 – 20 m bgl. Groundwater bores within the Site and surrounding area were identified to be utilised for a range of uses including monitoring, exploration, household, irrigate agriculture and domestic water supply.
- Surface water receptors consisted of Barlings Creek and Richmond River and few water dams throughout the Site. During periods of rainfall it is the opinion of ERM that surface waters would infiltrate the site surface or flow via overland flow paths / ephemeral drainage lines to onsite dams and / or adjacent surface water receiving bodies located on western and southern boundary of the Site
- The site and surrounding area has been primarily agricultural land since the earliest aerial photography records (1958). ERM notes that a range of commercial / industrial land uses have been undertaken within the site and surrounding area.
- Records indicate that large number of troops camped and trained in the vicinity of casino during WWII (as shown on map in **Appendix B**). The Department of Defence public record indicated that *“Defence records confirm that the area was used for military training but do not confirm that the site was used for live firing. UXO or explosive ordnance fragments / components have not been recovered from the site. Defence opinion is that it would be inappropriate to assess as either slight, substantial or remote. Advice: These sites have been included for general information purposes only. Defence makes no recommendations in regards to this category.”*

### 7.4 RJP Conceptual Site Model

The following summary of the CSM for the Richmond Valley RJP has been prepared based on the desktop assessment, site inspection and preliminary sampling as discussed in the above sections. The location of the potential sources of contamination area illustrated in **Figure 8**.

### 7.4.1 Potential Sources of Contamination

Based on the site history and background data reviewed and ERMs professional experience, the Contaminants of Potential Concern (CoPC) associated with current and historical land uses undertaken in the general area are considered to include the following:

Potential Source	CoPC	Comment
<b>AEC – 1 Nammoona Waste &amp; Recycling Depot (Area 1)</b>	<ul style="list-style-type: none"> <li>■ Polychlorinated biphenyls</li> <li>■ Alkanes</li> <li>■ Sulfides</li> <li>■ Metals</li> <li>■ Asbestos</li> <li>■ Organic acids</li> <li>■ Nutrients (e.g. nitrogen, phosphorus)</li> <li>■ Petroleum hydrocarbons</li> <li>■ Polycyclic aromatic hydrocarbons (PAHs) (e.g. benzo(a)pyrene)</li> <li>■ Monocyclic aromatic hydrocarbons MAH s (e.g. benzene, toluene ethylbenzene &amp; xylenes (BTEX))</li> <li>■ Ammonia</li> <li>■ Landfill gases (e.g. methane)</li> <li>■ Total Dissolved Solids (TDS)</li> <li>■ Phenols</li> <li>■ semi-volatile organic compounds (SVOCs),</li> <li>■ Volatile Organic Compounds (VOCs),</li> <li>■ Organochlorine Pesticides (OCP)</li> <li>■ Organophosphorus Pesticides (OPP)</li> </ul>	<ul style="list-style-type: none"> <li>■ Possibility of presence of all type of contamination</li> <li>■ Potential for leachate of toxicant to groundwater and release of greenhouse gases</li> <li>■ Possibility for onsite fuel and chemical storage</li> <li>■ Leaks and spills of fuels / chemicals associated with refuelling and maintenance</li> <li>■ Hazardous materials associated with degrading building structures.</li> </ul>
<b>AEC – 2 Northern Rivers Livestock Exchange (Area 1)</b>	<ul style="list-style-type: none"> <li>■ Metals (e.g. arsenic)</li> <li>■ Carbamates</li> <li>■ OCP/OPP</li> <li>■ Herbicides</li> <li>■ Synthetic pyrethroids</li> </ul>	<ul style="list-style-type: none"> <li>■ Cattle dip sites</li> <li>■ Potential for leachate of toxicant to groundwater and release of greenhouse gases</li> <li>■ Possibility for onsite fuel and chemical storage</li> <li>■ Leaks and spills of fuels / chemicals associated with refuelling and maintenance</li> <li>■ Hazardous materials associated with degrading building structures.</li> </ul>
<b>AEC – 3 DTM Timber Yard (Area 1)</b>	<ul style="list-style-type: none"> <li>■ Metals (e.g. copper, chromium, arsenic from CCA timber treatment)</li> <li>■ Petroleum hydrocarbons (TRH and BTEXN)</li> <li>■ PAHs (in particular benzo(a)pyrene)</li> <li>■ Phenols</li> <li>■ Asbestos.</li> <li>■ SVOCs and VOCs</li> <li>■ Pesticides (OCP and OPP)</li> <li>■ PCBs</li> <li>■ PFAS</li> </ul>	<ul style="list-style-type: none"> <li>■ Timber yard - storage and treatment of timber with CCA and/or PAHs.</li> <li>■ Potential for leachate of toxicant to groundwater</li> <li>■ Possibility for onsite fuel and chemical storage</li> <li>■ Leaks and spills of fuels / chemicals associated with refuelling and maintenance</li> <li>■ Possibility of presence of other types of contamination associated with industrial uses</li> </ul>

Potential Source	CoPC	Comment
		<ul style="list-style-type: none"> <li>■ Hazardous materials associated with degrading building structures.</li> <li>■ Potential storage of firefighting foams due to flammable liquids storage</li> </ul>
<b>AEC – 4 Wastewater treatment plant (Area 3a)</b>	<ul style="list-style-type: none"> <li>■ TCE</li> <li>■ PAH &amp; BTEX</li> <li>■ OCP/OPP</li> <li>■ Metals</li> <li>■ Ammonia</li> <li>■ Cresols</li> <li>■ Asbestos</li> <li>■ TRH</li> <li>■ VOCs &amp; SVOCs</li> <li>■ phenols,</li> <li>■ TDS</li> <li>■ PFAS</li> <li>■ Pathogens; and</li> <li>■ Nutrients (Phosphorus, Nitrates, Nitrogen )</li> </ul>	<ul style="list-style-type: none"> <li>■ Potential leaks from current and former sewer lines / septic tanks within the site</li> <li>■ Onsite fuel and chemical storage</li> <li>■ Leaks and spills of fuels / chemicals associated with refuelling and maintenance</li> <li>■ Hazardous materials associated with degrading building structures.</li> </ul>
<b>AEC – 5a Mixed On-site Commercial / Industrial Land Uses</b>  <b>AEC – 5b - Riverina Stock Feeds (including poultry sheds)</b>  <b>AEC – 5c - Northern Co- operative meat company Ltd (Abattoir)</b>	<ul style="list-style-type: none"> <li>■ TRH,</li> <li>■ BTEX,</li> <li>■ Solvents,</li> <li>■ Chlorinated Hydrocarbons (CHC),</li> <li>■ PAH,</li> <li>■ Heavy Metals,</li> <li>■ PFAS,</li> <li>■ Pathogens;</li> <li>■ Nutrients (Phosphorus, Nitrates, Nitrogen );</li> <li>■ PCBs; and</li> <li>■ Asbestos.</li> <li>■</li> </ul>	<ul style="list-style-type: none"> <li>■ A range of other commercial / industrial sites are located within the Site such as: Riverina Stock Feeds, Abattoir (Area 2 ) etc.</li> <li>■ Onsite fuel and chemical storage</li> <li>■ Leaks and spills of fuels / chemicals associated with refuelling and maintenance</li> <li>■ Hazardous materials associated with degrading building structures.</li> <li>■ Potential storage of firefighting foams due to flammable liquids storage</li> <li>■ Potential contamination associated with silo fires at Riverina Stock Feeds (e.g. PFAS) and/or spills of products such as tallow</li> <li>■ Poultry sheds (Riverina Stockfeeds) and abattoir</li> </ul>
<b>AEC – 7 Sewer / Septic Lines and Tanks</b>	<ul style="list-style-type: none"> <li>■ Pathogens (E Coli and Enterococci)</li> <li>■ Nutrients, Phosphorus, Nitrates, Nitrogen and Heavy Metals.</li> </ul>	<ul style="list-style-type: none"> <li>■ Potential leaks from current and former sewer lines / septic tanks within the site</li> </ul>
<b>AEC – 8 Surrounding Agricultural and Commercial Industrial Land Uses</b>	<ul style="list-style-type: none"> <li>■ TRH, BTEX, Solvents, Chlorinated Hydrocarbons (CHC), PAHs, Phenols</li> <li>■ Heavy Metals, PFAS, PCBs, OCPs, OPPS, Asbestos, Ammonia, and PFAS</li> </ul>	<ul style="list-style-type: none"> <li>■ General use of the site prior to current operational uses and agricultural land uses undertaken within the surrounding area.</li> </ul>



### **7.4.2 Potential Pathways**

The primary potential exposure pathways of concern at the site are:

- Inhalation of vapour (from soil and/or groundwater) and contaminated dust (from soils).
- Dermal contact and / or incidental ingestion with contaminated surface water and soils / sediments.
- Transport of contamination through surface water flows.
- Transport of contamination to underlying groundwater aquifers.
- Transport of contaminants through mechanical transport (i.e. excavation, tracking during vehicle movement etc.).

### **7.4.3 Potential Receptors**

Key receptors have been identified as:

- Current site users (agricultural, residential and commercial / industrial).
- Future site users (agricultural, residential and commercial / industrial).
- Potential future users of groundwater (identified use of groundwater for a range of purposes).
- Workers carrying out construction, installation or maintenance works within the site.
- Groundwater beneath the site.
- Adjacent sensitive receptors e.g. adjacent residents, cattle (or other grazing animals) and sensitive ecological receptors.

### 7.4.4 Preliminary Conceptual Site Model

Based on the results of the desktop assessment, site inspection and the potential sources, pathways and receptors identified above ERM developed the below Conceptual Site Model (CSM). ERM notes that the CSM will be updated following completion of the Site walkover where further site specific information on the potential nature and distribution of contamination is obtained.

Potential Sources	Pathways	Potential Receptors	Risk of Potentially Complete Pollutant Linkage	Comment		
<b>AEC – 1 Nammoona Waste &amp; Recycling Depot (Area 1)</b>	<ul style="list-style-type: none"> <li>■ Dermal contact, inhalation, and / or incidental ingestion with contaminated surface waters / soils.</li> <li>■ Transport of contamination through surface water flows.</li> <li>■ Transport of contamination to underlying groundwater aquifers</li> <li>■ Transport of contaminants through mechanical transport</li> </ul>	<ul style="list-style-type: none"> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	■ High	<ul style="list-style-type: none"> <li>■ The specific industrial activities on these sites (waste facility, timber treatment, water treatment) are associated with a range of potential contaminants of concern</li> <li>■ Potential for the storage, handling and use of a range of chemicals within operational processes</li> <li>■ Potential historical land uses including stockpiling of waste soils, general vehicle maintenance etc. may have been undertaken within the Site</li> </ul>		
<b>AEC – 2 Northern Rivers Livestock Exchange (Area 1)</b>						
<b>AEC – 3 DTM Timber Yard (Area 1)</b>		<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors;</li> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	■ High			
<b>AEC – 4 Wastewater treatment plant (Area 3a)</b>					<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors; and</li> <li>■ Future potential on-site users of groundwater.</li> </ul>	■ High

Potential Sources	Pathways	Potential Receptors	Risk of Potentially Complete Pollutant Linkage	Comment
<b>AEC – 5 Mixed On-site Commercial / Industrial Land Uses</b>	<ul style="list-style-type: none"> <li>■ Dermal contact, inhalation, and / or incidental ingestion with contaminated surface waters / soils.</li> </ul>	<ul style="list-style-type: none"> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ High</li> </ul>	<ul style="list-style-type: none"> <li>■ A review of aerial imagery indicates a number of commercial / industrial properties located throughout the Site.</li> <li>■ Different industrial and commercial activities have occurred within the Site areas that may result in the presence of broad range of potential contaminants.</li> <li>■ Potential for the storage, handling and use of a range of chemicals within operational processes.</li> </ul>
	<ul style="list-style-type: none"> <li>■ Transport of contamination through surface water flows.</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors;</li> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ High</li> </ul>	
	<ul style="list-style-type: none"> <li>■ Transport of contamination to underlying groundwater aquifers</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors; and</li> <li>■ Future potential on-site users of groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>■ High</li> </ul>	
	<ul style="list-style-type: none"> <li>■ Transport of contaminants through mechanical transport</li> </ul>	<ul style="list-style-type: none"> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ High</li> </ul>	
<b>AEC – 6 Hazardous Materials Associated with Current and Former Structures / Service Conduits etc.</b>	<ul style="list-style-type: none"> <li>■ Dermal contact, inhalation, and / or incidental ingestion with contaminated surface waters / soils.</li> </ul>	<ul style="list-style-type: none"> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ Low</li> </ul>	<ul style="list-style-type: none"> <li>■ Potential for hazardous materials to be present within onsite service conduits.</li> <li>■ A detailed assessment / survey of onsite services would be required to assess the extent of onsite service conduits and the potential for hazardous materials to be present within pits / conduits etc.</li> </ul>
	<ul style="list-style-type: none"> <li>■ Transport of contamination through surface water flows.</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors;</li> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ Low</li> </ul>	

Potential Sources	Pathways	Potential Receptors	Risk of Potentially Complete Pollutant Linkage	Comment
	<ul style="list-style-type: none"> <li>Transport of contamination to underlying groundwater aquifers</li> </ul>	<ul style="list-style-type: none"> <li>Adjacent sensitive receptors; and</li> <li>Future potential on-site users of groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Low – Moderate</li> </ul>	
	<ul style="list-style-type: none"> <li>Transport of contaminants through mechanical transport</li> </ul>	<ul style="list-style-type: none"> <li>Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	
<b>AEC – 7 Sewer / Septic Lines and Tanks</b>	<ul style="list-style-type: none"> <li>Dermal contact, inhalation, and / or incidental ingestion with contaminated surface waters / soils.</li> </ul>	<ul style="list-style-type: none"> <li>Current and future site users; and</li> <li>Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Low</li> </ul>	<ul style="list-style-type: none"> <li>A number of sewer lines to are likely to be present and bisecting the site.</li> <li>Due to the age of the Site there is also the potential for septic tanks to be present.</li> </ul>
	<ul style="list-style-type: none"> <li>Transport of contamination through surface water flows.</li> </ul>	<ul style="list-style-type: none"> <li>Adjacent sensitive receptors;</li> <li>Current and future site users; and</li> <li>Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Low</li> </ul>	
	<ul style="list-style-type: none"> <li>Transport of contamination to underlying groundwater aquifers</li> </ul>	<ul style="list-style-type: none"> <li>Adjacent sensitive receptors; and</li> <li>Future potential on-site users of groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>Low – Moderate</li> </ul>	
	<ul style="list-style-type: none"> <li>Transport of contaminants through mechanical transport</li> </ul>	<ul style="list-style-type: none"> <li>Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate</li> </ul>	



Potential Sources	Pathways	Potential Receptors	Risk of Potentially Complete Pollutant Linkage	Comment
<b>AEC – 8 Surrounding Agricultural and Commercial Industrial Land Uses</b>	<ul style="list-style-type: none"> <li>■ Dermal contact, inhalation, and / or incidental ingestion with contaminated surface waters / soils.</li> </ul>	<ul style="list-style-type: none"> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ Moderate-High</li> </ul>	<ul style="list-style-type: none"> <li>■ Current and historical uses of the surrounding area for agricultural and commercial / industrial purpose.</li> </ul>
	<ul style="list-style-type: none"> <li>■ Transport of contamination through surface water flows.</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors;</li> <li>■ Current and future site users; and</li> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ Moderate - High</li> </ul>	
	<ul style="list-style-type: none"> <li>■ Transport of contamination to underlying groundwater aquifers</li> </ul>	<ul style="list-style-type: none"> <li>■ Adjacent sensitive receptors; and</li> <li>■ Future potential on-site users of groundwater.</li> </ul>	<ul style="list-style-type: none"> <li>■ Moderate</li> </ul>	
	<ul style="list-style-type: none"> <li>■ Transport of contaminants through mechanical transport</li> </ul>	<ul style="list-style-type: none"> <li>■ Workers carrying out development, installation or maintenance works within the site.</li> </ul>	<ul style="list-style-type: none"> <li>■ Moderate</li> </ul>	

## 8. REVIEW OF MASTER PLAN

### 8.1 Review of Master Plan and Potential Constraints

The following section outlines the potential constraints identified in the review of the proposed Master Plan (dated October 2022) in light of the preliminary assessment of soil and contamination presented above in this report.

The current land-uses are represented in **Figure 5** and the proposed land-uses are represented in **Figure 6**.

### 8.2 Salinity

Based on regional soil mapping no salinity hazard was identified for the soil landscapes within the investigation area. The salinity, sodicity and aggressivity soil conditions are unlikely to represent a significant constraint on the proposed Master Plan.

In addition to the above, it is noted that salinity conditions are dependent on several variables, which include surface water infiltration to soil and groundwater levels which may be modified by development in the area. The application of the principles of Water Sensitive Urban Design should be considered in the proposed development areas to mitigate potential changes to soil water levels and salinity conditions in the catchment. The impact of the extraction of groundwater for beneficial re-use on catchment level salinity conditions should also be considered, and groundwater monitoring for salinity should be considered as part of a hydrogeological assessment for beneficial re-use.

### 8.3 Acid Sulfate Soils Potential Constraints

No significant risk of acid sulfate soil was identified within the Site nor within a 200 m buffer zone based on the available Acid Sulfate Soil risk maps. The Atlas of Australian Acid Sulfate Soil indicates that there is an extremely low probability for acid sulfate soils occurring within the Site. The potential risk of acid sulfate soils is unlikely to represent a significant constraint on the proposed Master Plan.

### 8.4 Contamination Potential Constraints

#### 8.4.1 Potential for Contamination

Based on the findings of the desktop review, there is potential for contamination in the following areas of the Richmond Valley RJP:

- Specific sites which are currently or formerly operated potentially contaminating industries and/or activities (as listed in Appendix 1 of the Land Contamination Planning Guidelines (Draft)), have the potential for contamination to be present:
  - Nammoona Waste & Recycling Depot (Area 1)
  - Northern Rivers Livestock Exchange (Area 1)
  - DTM Timber Yard (Area 1)
  - Wastewater treatment plant (Area 3a)
  - Riverina Stock Feeds (including poultry sheds)
  - Northern Co- operative meat company Ltd (Abattoir)
  - Rural industry (general uses).
- The remaining land has the broad potential for contamination associated with:

- Built structures and/or infrastructure (current), which may include hazardous building materials (such as asbestos, lead paints, PCBs) that may pose a risk if demolished in an uncontrolled manner;
- General rural use sites which may currently or formerly had chemical storage and use including but not limited to underground or above-ground chemical storage tanks; and
- Remains of built structures and/or infrastructure which have been demolished in an uncontrolled manner, which may include hazardous building materials (such as asbestos);
- Uncontrolled waste dumping.

### 8.4.2 Review of the Master Plan

The NSW Government (2018) Contaminated Land Planning Guidelines (Draft) provide further detail on the application of contamination assessments at the strategic planning and rezoning stage, including the general guidance on when a planning proposal to rezone land must be accompanied by a preliminary site investigation or detailed site investigation. The following table summarises the key aspects which the contaminated land planning guidelines (draft) recommends should be considered when preparing a planning proposal to rezone land:

**Table 8-1 Strategic Planning and Rezoning Considerations**

Contaminated Land Planning Guidelines	Applicability to RJP:
Land is significantly contaminated land within the meaning of the CLM Act	No sites within the RJP has been identified as significantly contaminated within the meaning of the CLM Act.
An activity listed in the SEPP (as reproduced in Table 1 in Appendix 1) is being carried out on the land and is potentially causing contamination	Some activities that may cause contamination include: <ul style="list-style-type: none"> <li>■ agricultural/horticultural activities;</li> <li>■ landfills;</li> <li>■ fuel storage;</li> <li>■ wood preservation; and</li> <li>■ waste storage and treatment</li> </ul>
Records show that a potentially contaminating activity has been carried out on the land	Potentially contaminating activities were identified as described in Section 7.2 and summarised in Section 7.4.1.
There are incomplete records about the use of the land and during the periods not covered by those records, it would have been lawful to carry out a potentially contaminating activity	Available records have been reviewed.
The proposed rezoning, or proposed change to planning controls, would allow the land to be used for residential, educational, recreational or childcare purposes, or for the purposes of a hospital.	The Masterplan proposes some changes to land-use, in most instances these changes are predominantly a change to a similar or less sensitive land-use from a contamination perspective. The exceptions to this is a potential education facility proposed in the "Opportunity Sites". The proposed changes to more sensitive land-uses are discussed further below and summarised in Table 8.2.

A high-level assessment of the potential for contamination and the proposed land-use changes in the RJP Masterplan has been undertaken to inform the planning process. Based on the information in the preliminary site investigation, if further assessment is required, this can be undertaken by the proponent at the individual site level during the development application stage. Contamination assessments should be undertaken by suitably qualified and experienced consultants. In some circumstances, a statutory Site Audit may be required (refer to the draft Contaminated Land Planning Guidelines for further information on when a statutory Site Audit is required). The use of suitably qualified and experienced consultants (for further guidance refer to NSW EPA, January 2022, *Contaminated Land Consultant Certification Policy Version 3*) should be considered where a statutory Site Audit is not required and a non-statutory audit may be onerous on the proponent.

The draft Contaminated Land Planning Guidelines also advise the planning authority to consider whether appropriate provisions may be needed within the relevant environmental planning instrument or development control plan, where potentially contaminated land is suspected, to further investigate before land use changes occur.

The Master Plan (dated October 2022) generally proposes industrial land-uses (RU1 primary production, E4 General Industrial, E5 Heavy industrial, E3 Productivity support) or conservation areas (, C2 Environmental conservation zone, C3 Environmental management zone), with two areas marked as “opportunity sites” for which a zoning has not yet been specified.

The information provided on the intended land-use of the “opportunity sites” is:

- Essential Energy, Council, and Department of Education’s sites ‘ Opportunity sites’ (Specialist user that can’t be accommodated elsewhere/unsolicited proposals)
- Department of Education site potential catalyst site (e.g. vocational training or specialised facility complementary to Co-op)

On this basis, it is premature to provide specific findings in relation to the triggers under the SEPP for the land marked as “Opportunity Sites”, as the intended land-use has not yet been confirmed.

Overall these changes are predominantly a change to a similar or less sensitive land-use from a contamination perspective, however as noted previously, the potential for educational use on the “Opportunity Sites” has been suggested but not confirmed on the Master Plan (October 2022). The development of land for educational use, depending on the location selected (currently zoned R1 General Residential and IN1 General Industrial), will likely trigger the need for further assessment of potential contamination as set out in Clause 4.6(4) of the SEPP.

The triggers for further assessment of potential contamination are set out in Clause 4.6(4) of the SEPP. Generally, the triggers for further contamination assessment under Clause 4.6(4) of the SEPP would only be met where the proposed changes to zoning under the Master Plan for the RJP are (i) for residential, educational, recreational or child care purposes or for the purpose of a hospital; AND (ii) the land is currently or formerly used for potentially contaminating activities (as listed in Table 1 to the contaminated land planning guidelines).

A high-level summary of the proposed changes under the Master Plan and the triggers under the SEPP is detailed in Table 8-2 overpage, which identifies the following key decision points:

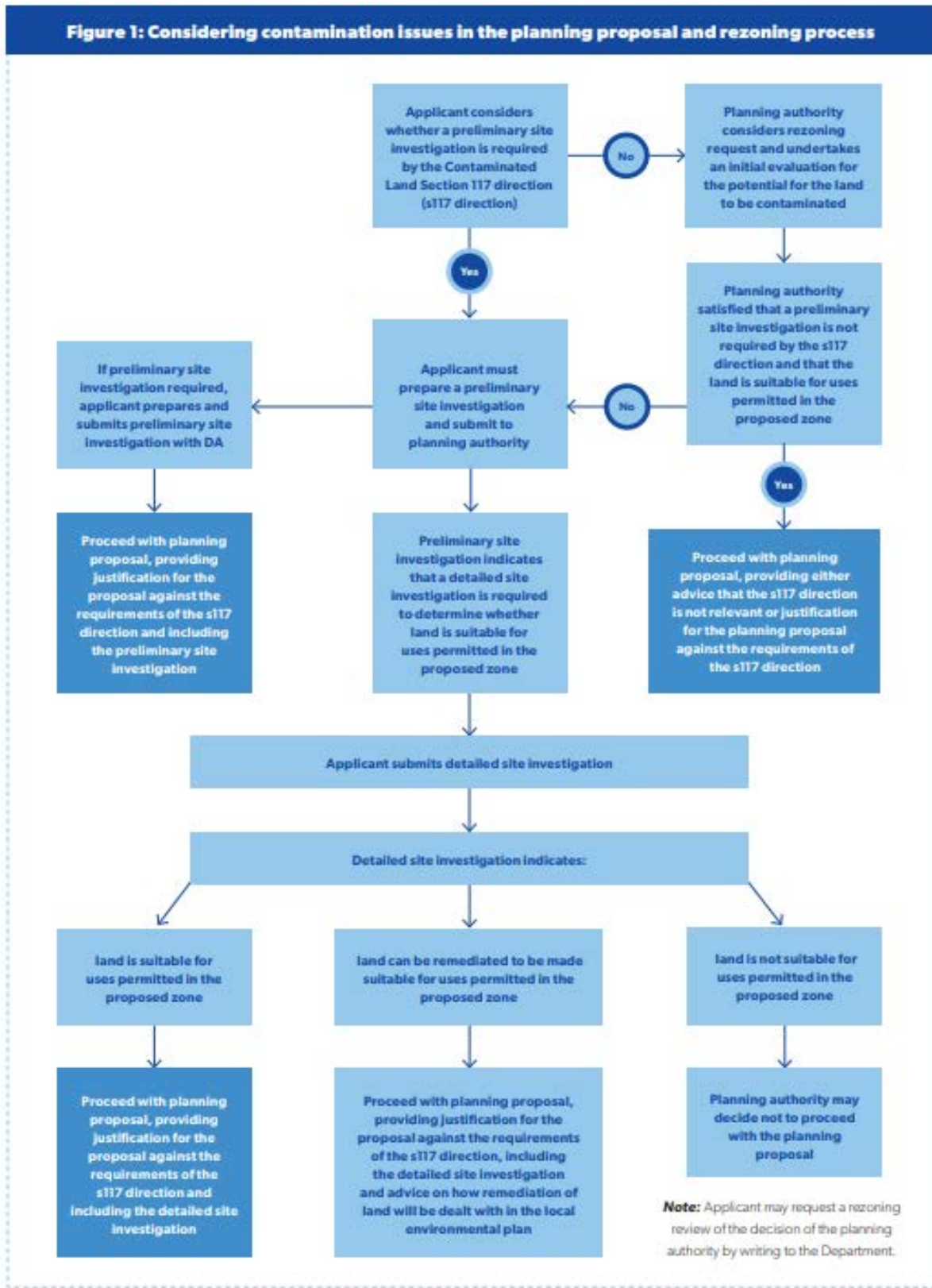
- Where the land is proposed for sensitive land-uses such as the ‘Opportunity Sites’ (which may include an education facility) further assessment is required including a Detailed Site Investigation.
- An existing park is located in Area 1 on land currently zoned industrial. We note that the current use as a park is not typical for industrial zoned land. As there is no proposed change in use under the Master Plan, we have not provided any specific recommendations in relation to the park.
- Where the land is currently used for potentially contaminating activities at the specific industrial sites (as listed above), and no change is proposed under the Master Plan, these sites would continue to be managed under their existing approvals and licences.



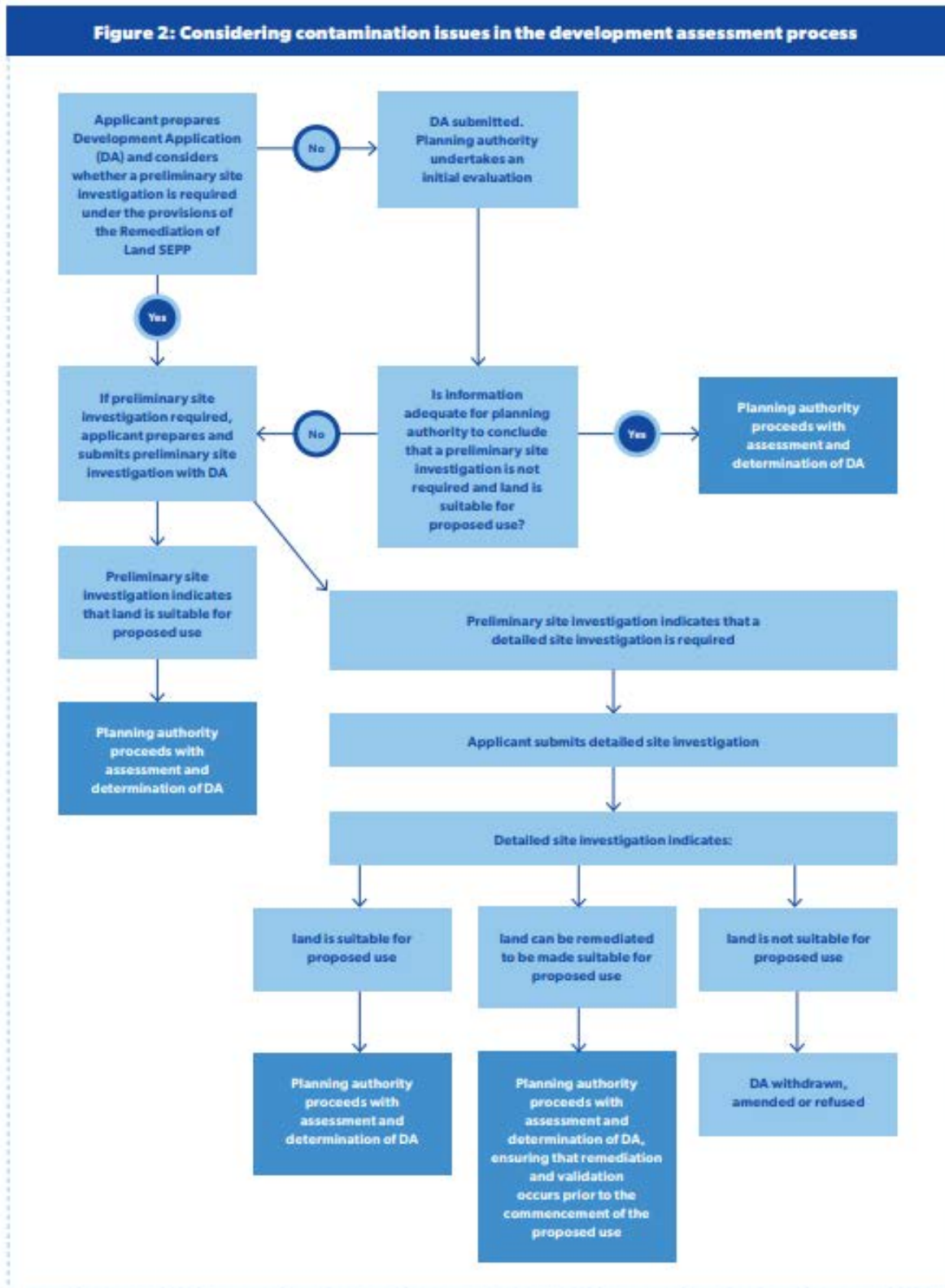
- Where the land is currently used for potentially contaminating activities at the specific industrial sites (as listed above), and change is proposed under the Master Plan to a similar or less sensitive land-use further assessment may not be triggered under the SEPP, but due diligence is advised and consideration should be given to the overarching principles of the SEPP.

In addition to the above it is important to note that there is broad potential for contamination on all land across the RJP associated with hazardous building materials, small scale chemical storage and use and uncontrolled waste dumping. The potential for contamination should be assessed further prior to approval of development to prevent potential exposure to contamination hazards. The guidance provided in Land Contamination Planning Guidelines (Draft) should be considered in relation to the application of due diligence by the planning authority in consideration of a process for assessment of potential for hazardous building materials (e.g. asbestos) and/or uncontrolled waste dumping (e.g. oil drums, asbestos) prior to development commencement. A clear framework for management of these risks is needed for public safety and to mitigate the potential for substantial cost and time delays. Given the staging of the works over several years, investigations would be best undertaken as the development/planning progresses to accommodate the likely changes to land that will occur over that time (i.e. ongoing activities may generate further change in contamination potential / status thus necessitating rework).

As the planning process for the RJP is ongoing, assessment of potential for contamination should be considered at the relevant stages of the process with consideration of the guidance in the contaminated land planning guidelines, including the considerations for decision making in the planning proposal and rezoning process (**Figure 1**) and the development assessment process (**Figure 2**).



Source: NSW Government (2018) Contaminated Land Planning Guidelines (Draft)



Source: NSW Government (2018) Contaminated Land Planning Guidelines (Draft)

**Table 8-2 Summary of Proposed Master Plan and Contamination Assessment Triggers in SEPP (Resilience and Hazards)**

Potential for Contamination	Potential Sources of Contamination from CSM	Current Zoning	Master Plan Proposed Changes to Land Use	Does the Master Plan Trigger Contamination Assessment in accordance with SEPP (Resilience and Hazards)?
Specific activities	AEC 1 Nammoona Waste & Recycling Depot (Area 1)	IN1	E4 General Industrial	No change to primary land-use proposed
	AEC 2 Northern Rivers Livestock Exchange (Area 1)	IN1	E4 General Industrial	No change to primary land-use proposed
	AEC 3 DTM Timber Yard (Area 1)	IN1	E4 General Industrial	No change to primary land-use proposed
	AEC 4 Wastewater treatment plant (Area 3a)	RU1	RU1 Primary Production	No change to primary land-use proposed
	AEC 5b - Riverina Stock Feeds (including poultry sheds)	IN1	E4 General Industrial	No change to primary land-use proposed
	AEC 5c - Northern Co-operative meat company Ltd (Abattoir)	IN1	E4 General Industrial	No change to primary land-use proposed
Non-specific (general) Industrial Uses	<b>AEC 5a - Mixed On-site Commercial / Industrial Land Uses</b>	IN1	E3 Productivity Support E4 General Industrial E5 Heavy Industrial	No – ongoing industrial uses of similar or less sensitive use
		IN1	“Park”	Current existing use is as a park although zoned for industrial use.
		IN1	General Industrial	No Apply principles of SEPP (Resilience and Hazards) Due diligence to be used to establish a process for assessment of potential for hazardous building materials (e.g. asbestos) prior to development commencement.



Potential for Contamination	Potential Sources of Contamination from CSM	Current Zoning	Master Plan Proposed Changes to Land Use	Does the Master Plan Trigger Contamination Assessment in accordance with SEPP (Resilience and Hazards)?
		IN1	Light Industrial/commercial	No Apply principles of SEPP (Resilience and Hazards). Further assessment may be required where there is redevelopment on industrial land with built infrastructure (e.g. asbestos, tanks, chemical storage).
Built structures & infrastructure (General Rural Uses)	AEC – 6 Hazardous Materials Associated with Current and Former Structures / Service Conduits etc. AEC – 7 Sewer / Septic Lines	RU1	C3 Environmental Management Zone	Yes. Apply principles of SEPP (Resilience and Hazards). Further assessment may be required where publicly accessible.
			C2 Environmental Conservation Zone	
			RU1 Primary Production	A change to industrial unlikely to trigger the need for further assessment under the SEPP. Apply principles of SEPP (Resilience and Hazards). Further assessment may be required where there is redevelopment on industrial land with built infrastructure (e.g. asbestos, tanks, chemical storage).
			E4 General Industrial	
			E5 Heavy Industrial	
Other	Residential	R1 General Residential (occupied by a radio tower/ broadcast station)	Opportunity Sites	At this stage we understand that there is no proposal to change the zoning in these areas. We note that if educational uses are proposed that this is likely to warrant further assessment of potential for contamination. In addition we note that there are known contaminating activities that were identified in the preliminary assessment. The site appears to be in use currently as a radio station (building with antenna), which is not a known potentially contaminating use, however, further assessment should be considered give the potential for underground petroleum storage associated with backup generators for uninterrupted power supply.
		IN1		

### 8.4.2.1 Intermodal Boundary

The proposed intermodal terminal and rail route are subject to separate development processes which consider the potential for contamination.

The proposed Northern Intermodal Terminal (shown as Casino Rail Freight Terminal) will be developed under a specific development consent, and any specific contamination matters should be considered as part of this consent process. The rail route and the Southern Intermodal are concept only and not within the scope of this assessment.

### 8.4.2.2 Excluded areas

The current version of the Master Plan (October 2022) includes reference to the following matters which are outside of the boundary of the RJP and have not been included within the scope of this assessment:

- North-coast railway/rail access
- Northern Rivers Rail Trail
- Summerland Way share path
- Residential Planning Proposal

We note that future proposals for recreational/open-space uses and residential uses should include assessment of potential for contamination, however these are excluded from this assessment.

### 8.4.3 Where Further Contamination Assessment is Required

Where further contamination assessment is required, the draft Contaminated Land Planning Guidelines (Draft) provides detailed guidance for the planning proposal and rezoning process in accordance with SEPP (Resilience and Hazards). If further assessment is triggered under the SEPP, this may include the following assessments which can be undertaken by the proponent at the individual site level:

- Preliminary Site Investigation;
- Detailed Site Investigation;
- Remediation Action Plan;
- Validation Report; and/or
- Site Audit Report & Statement.

Contamination assessments should be undertaken by suitably qualified and experienced consultants. In some circumstances, a statutory Site Audit may be required (refer to the draft Contaminated Land Planning Guidelines for further information on when a statutory Site Audit is required).

For planning decision making the use of suitably qualified and experienced consultants in conducting third-party formal independent review where a statutory Site Audit is not required and a non-statutory audit may be onerous on the proponent. The Contaminated Land Planning Guidelines (draft) refer to the following certifications which are currently recognised by NSW EPA:

- Environment Institute of Australia and New Zealand - Certified Environmental Practitioner (Site Contamination) (CEnvP (SC))
- Soil Science Australia - Certified Professional Soil Scientist Contaminated Site Assessment and Management (CPSS CSAM)

#### 8.4.4 Mitigation of Future Contamination Risk

Where new industrial development is proposed, the planning authority should consider the following key principles from the *Land Contamination Planning Guidelines* (Draft) for proactive measures to prevent future contamination from occurring:

- “Development applications for new or expanding developments should include information on the potential for the activity to contaminate including details about the type of chemicals to be used or stored on the land, particularly for uses listed in Appendix 1;
- In assessing development applications for uses or activities which could be a source of contamination, planning authorities should ensure that the technical and management controls are adequate to prevent contamination and use appropriate conditions of consent or approval (such as a requirement for monitoring and EMPs) to ensure that such controls are applied. Plant design should aim to reduce waste production and minimise or eliminate the release of waste into the environment by, for example, appropriate primary and secondary containment and good work practices;
- Periodic environmental audits should be conducted and the use of clean, alternative technologies promoted; and
- Improved technologies, waste management practices and environmental management practices should be identified and promoted.”

## 9. CONCLUSIONS AND RECOMMENDATIONS

The following should be considered as part of the development for the Richmond Valley RJP (the Site) in response to the Master Plan:

- Based on regional soil mapping no salinity hazard was identified for the soil landscapes within the investigation area. The salinity, sodicity and aggressivity soil conditions are unlikely to represent a significant constraint on the proposed Master Plan.
- Based on regional soil mapping there is an extremely low probability for acid sulfate soils occurring. The potential risk of acid sulfate soils is unlikely to represent a significant constraint on the proposed Master Plan.
- Potential for contamination was identified based on the desktop review (no sampling was undertaken) at specific sites which are currently (or formerly) operated potentially contaminating industries and/or activities, including:
  - Nammoona Waste & Recycling Depot (Area 1)
  - Northern Rivers Livestock Exchange (Area 1)
  - DTM Timber Yard (Area 1)
  - Wastewater treatment plant (Area 3a)
  - Riverina Stock Feeds (including poultry sheds)
  - Northern Co- operative meat company Ltd (Abattoir)
  - Rural industry (general uses).
- The remaining land has the broad potential for contamination associated with hazardous building materials (such as asbestos) associated with built structures and/or infrastructure (current or former), chemical storage and use including but not limited to underground or above-ground chemical storage tanks, uncontrolled waste dumping.

The following recommendations should be considered during the appropriate phases of the planning process:

- The application of the principles of Water Sensitive Urban Design should be considered in the proposed development areas to mitigate potential changes to soil water levels and salinity conditions in the catchment. The impact of the extraction of groundwater for beneficial re-use on catchment level salinity conditions should also be considered, and groundwater monitoring for salinity should be considered as part of the hydrogeology assessment.
- The Master Plan (dated October 2022) generally proposes industrial land-uses (RU1 primary production, E4 General Industrial, E5 Heavy industrial, E3 Productivity support) or conservation areas ( C2 Environmental conservation zone, C3 Environmental management zone), with two areas marked as “opportunity sites” for which no changes to zoning are currently proposed.
- Overall these changes are predominantly a change to a similar or less sensitive land-use from a contamination perspective, however it is noted that the potential for educational use has been suggested in documents provided but not confirmed on the Master Plan (October 2022). The development of land for educational use, depending on the location selected (currently zoned R1 General Residential and IN1 General Industrial), may trigger the need for further assessment of potential contamination as set out in Clause 4.6(4) of the SEPP.
- The Master Plan (October 2022) proposes key changes to zoning which may trigger the following key decision points:
  - An existing park is located in Area 1 on land currently zoned industrial. We note that the current use as a park is not typical for industrial zoned land. As there is no proposed change



in use under the Master Plan, we have not provided any specific recommendations in relation to the park.

- Where the land is currently used for potentially contaminating activities at the specific industrial sites (as listed above), and no change is proposed under the Master Plan, these sites would continue to be managed under their existing approvals and licences.
  - Where the land is currently used for potentially contaminating activities at the specific industrial sites (as listed above), and change is proposed under the Master Plan to a similar or less sensitive land-use further assessment may not be triggered under the SEPP, but we note that due diligence is advised and consideration should be given to the overarching principles of the SEPP.
- In addition to the above it is important to note that there is broad potential for contamination on all land across the RJP associated with hazardous building materials, small scale chemical storage and use and uncontrolled waste dumping. This potential contamination should be assessed further prior to approval of development to prevent potential exposure to contamination hazards. The guidance provided in Land Contamination Planning Guidelines (Draft) should be considered in relation to the application of due diligence by planning authority in consideration of a process for assessment of potential for hazardous building materials (e.g. asbestos) and/or uncontrolled waste dumping (e.g. oil drums, asbestos) prior to development commencement. A clear framework for management of these risk is needed for public safety and to mitigate the potential for substantial cost and time delays.
  - If further assessment is triggered under the SEPP, this can be undertaken by the proponent at the individual site level during the development application stage. Contamination assessments should be undertaken by suitably qualified and experienced consultants. In some circumstances, a statutory Site Audit may be required (refer to the draft Contaminated Land Planning Guidelines for further information on when a statutory Site Audit is required). The use of suitably qualified and experienced consultants (certified by a scheme currently recognised by NSW EPA) in conducting third-party formal independent review should be considered where a statutory Site Audit is not required and a non-statutory audit may be onerous on the proponent.

The below table summarises the key aspects identified in this report and suggested wording for actions to be undertaken prior to development commencement, which should be included in the relevant planning instruments for management of contamination risks:

Sites	Suggested wording for inclusion in relevant Planning Instrument (e.g. Development Control Plan, LEP, other)
<p>Precinct wide – broadly agricultural and industrial land has the broad potential for contamination associated with:</p> <ul style="list-style-type: none"> <li>- Built structures and/or infrastructure (current), which may include hazardous building materials (such as asbestos, lead paints, PCBs) that may pose a risk if demolished in an uncontrolled manner;</li> <li>- General rural use sites which may currently or formerly had chemical storage and use including but not limited to underground or above-ground chemical storage tanks; and</li> <li>- Remains of built structures and/or infrastructure which have been demolished in an uncontrolled manner, which may include hazardous building materials (such as asbestos);</li> <li>- Uncontrolled waste dumping.</li> </ul>	<ul style="list-style-type: none"> <li>■ Demolition and removal of built structures and infrastructure such as underground pipes, conduits or tanks must be removed by an appropriately licenced professional in accordance with Australian Standards and NSW EPA endorsed guidelines and disposed of off-site at a facility licenced to accept that waste.</li> <li>■ An inspection should be undertaken prior to commencement of development to identify potential hazardous materials in buildings or waste stored on-site, the presence of waste materials (such as contaminated soil or asbestos containing materials) or waste burial, and/or the presence of chemicals and fuels (including underground or above-ground storage tanks by an appropriately licenced professional. An appropriately licenced professional may include a consultant certified in accordance with NSW EPA (January 2022) <i>Contaminated Land Consultant Certification Policy – Version 3</i>. These materials should be removed from the site by an appropriately licenced professional in accordance with Australian Standards and NSW EPA endorsed guidelines and disposed of at a facility licenced to accept that waste.</li> </ul>
<p>Existing industrial sites that have been identified as potentially contaminated based on current licenced activities including:</p> <ul style="list-style-type: none"> <li>■ Nammoona Waste &amp; Recycling Depot</li> </ul>	<p>If new development is proposed on existing industrial sites further investigation should be undertaken to determine that the site is suitable for ongoing industrial use consistent with the development proposal:</p>

Sites	Suggested wording for inclusion in relevant Planning Instrument (e.g. Development Control Plan, LEP, other)
<ul style="list-style-type: none"> <li>■ Northern Rivers Livestock Exchange</li> <li>■ DTM Timber Yard</li> <li>■ Riverina Stock Feeds (including poultry sheds)</li> <li>■ Northern Co- operative meat company Ltd (Abattoir) including area with unknown stockpile shown on <b>Figure 8</b></li> <li>■ Wastewater treatment plant</li> <li>■ Industrial area in Area 3a which includes a Council depot, automotive businesses and other industrial uses</li> </ul>	<ul style="list-style-type: none"> <li>■ A Detailed Site Investigation must be conducted to determine the nature and extent of potential contamination. The detailed site investigation/s must be undertaken, and the subsequent report(s), must be prepared in accordance with relevant guidelines made or approved by the EPA under section 105 of the CLM Act. If the Detailed Site Investigation determines that remediation is required to ensure the site is suitable for the proposed use, a Remediation Action Plan must be developed.</li> <li>■ Prior to granting development consent, the Consent Authority must be satisfied that the site is suitable, or can be made suitable, for the proposed use. Remediation works identified in the Remediation Action Plan may require consent prior to commencing works.</li> <li>■ All reports submitted as part of the planning application must be prepared, or reviewed and approved, by a consultant certified in accordance with NSW EPA (January 2022) <i>Contaminated Land Consultant Certification Policy – Version 3</i>.</li> </ul> <p>Where remediation works have been undertaken, Council must require the applicant to submit a Section A1 Site Audit Statement - or a Section A2 Site Audit Statement accompanied by an Environmental Management Plan. The Site Audit Statement (and accompanying Site Audit Report) is to be prepared by a NSW EPA accredited Site Auditor and must confirm that the site is suitable for the proposed use.</p>
<p>Agricultural land proposed for recreation and conservation areas that are publicly accessible</p>	<p>In addition to the above, the SEPP does not specifically require assessment of land to be zoned for conservation, however we note that this would also be a more sensitive use, and consideration to be given to assessment of potential contamination in proposed conservation or recreational areas where publicly accessible (for example, potential asbestos or waste stockpiles). The potential for any such risks would require consideration and assessment on a case-by-case basis to evaluate the potential risks to relevant human health and / or environmental receptors. Where relevant advice should be sought from a consultant certified in accordance with NSW EPA (January 2022) <i>Contaminated Land Consultant Certification Policy – Version</i>.</p>

## IMPORTANT LIMITATIONS AND CONTEXT

1. This report is based solely on the scope of work described in *RJP Package B – Environmental Assessment at Richmond Valley, Albury and South Jerrabomberra Procurement Registration Number P21-3009 dated 20<sup>th</sup> September 2021 (Scope of Work)* and performed by Environmental Resources Management Australia Pty Ltd (**ERM**) for The Crown in right of the State of New South Wales acting through Regional NSW (ABN 19 948 325 463) (the **Client**). The Scope of Work was governed by a contract between ERM and the Client (**Contract**).
2. No limitation, qualification or caveat set out below is intended to derogate from the rights and obligations of ERM and the Client under the Contract.
3. The findings of this report are solely based on, and the information provided in this report is strictly limited to that required by, the Scope of Work. Except to the extent stated otherwise, in preparing this report ERM has not considered any question, nor provides any information, beyond that required by the Scope of Work.
4. This report was prepared between 13 October 2021 and 1 April 2022 and is based on conditions encountered and information reviewed at the time of preparation. The report does not, and cannot, take into account changes in law, factual circumstances, applicable regulatory instruments or any other future matter. ERM does not, and will not, provide any on-going advice on the impact of any future matters unless it has agreed with the Client to amend the Scope of Work or has entered into a new engagement to provide a further report.
5. Unless this report expressly states to the contrary, ERM's Scope of Work was limited strictly to identifying typical environmental conditions associated with the subject site(s) and does not evaluate the condition of any structure on the subject site nor any other issues. Although normal standards of professional practice have been applied, the absence of any identified hazardous or toxic materials or any identified impacted soil or groundwater on the site(s) should not be interpreted as a guarantee that such materials or impacts do not exist.
6. This report is based on one or more site inspections conducted by ERM personnel, the sampling and analyses described in the report, and information provided by the Client or third parties (including regulatory agencies). All conclusions and recommendations made in the report are the professional opinions of the ERM personnel involved. Whilst normal checking of data accuracy was undertaken, except to the extent expressly set out in this report ERM:
  - a) did not, nor was able to, make further enquiries to assess the reliability of the information or independently verify information provided by;
  - b) assumes no responsibility or liability for errors in data obtained from,  
the Client, any third parties or external sources (including regulatory agencies).
7. Although the data that has been used in compiling this report is generally based on actual circumstances, if the report refers to hypothetical examples those examples may, or may not, represent actual existing circumstances.
8. Only the environmental conditions and or potential contaminants specifically referred to in this report have been considered. To the extent permitted by law and except as is specifically stated in this report, ERM makes no warranty or representation about:
  - a) the suitability of the site(s) for any purpose or the permissibility of any use;
  - b) the presence, absence or otherwise of any environmental conditions or contaminants at the site(s) or elsewhere; or



- c) the presence, absence or otherwise of asbestos, asbestos containing materials or any hazardous materials on the site(s).
9. Use of the site for any purpose may require planning and other approvals and, in some cases, environmental regulator and accredited site auditor approvals. ERM offers no opinion as to the likelihood of obtaining any such approvals, or the conditions and obligations which such approvals may impose, which may include the requirement for additional environment works.
  10. The ongoing use of the site or use of the site for a different purpose may require the management of or remediation of site conditions, such as contamination and other conditions, including but not limited to conditions referred to in this report.
  11. This report should be read in full and no excerpts are to be taken as representative of the whole report. To ensure its contextual integrity, the report is not to be copied, distributed or referred to in part only. No responsibility or liability is accepted by ERM for use of any part of this report in any other context.
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    - a) has been prepared and is intended only for the exclusive use of the Client;
    - b) must not to be relied upon or used by any other party;
    - c) has not been prepared nor is intended for the purpose of advertising, sales, promoting or endorsing any Client interests including raising investment capital, recommending investment decisions, or other publicity purposes;
    - d) does not purport to recommend or induce a decision to make (or not make) any purchase, disposal, investment, divestment, financial commitment or otherwise in or in relation to the site(s); and
    - e) does not purport to provide, nor should be construed as, legal advice.

## **APPENDIX A    DESKTOP SEARCH RESULTS**

## **APPENDIX B      DEPARTMENT OF DEFENCE UXO RECORDS**



# Australian Government

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## Defence

### Categories for Unexploded (UXO) Ordnance Potential – Categorisation Criteria, Warnings and Advice

#### Background

The Department of Defence identifies and maintains a record of areas affected, or suspected of being affected, by Unexploded Ordnance (UXO) that may influence the nature of land use.



In order to assist those with interests in land and those performing land management activities, Defence categorises the potential presence of UXO as follows:

- Substantial
- Slight
- Remote
- Other
- Sea Dumping Area

A sixth category, Information, is included where records indicate that the area was used for Defence purposes of a type not associated with producing UXO.

Where ocean areas have been used for military activities, they are categorised in accordance with the abovementioned categories. Ocean areas that have been used for historical sea-dumping of waste material which may include explosive ordnance are categorised separately as sea-dumping areas. Further information on UXO in the Marine Environment can be found in the [UXO in the Marine Environment](#) page.

#### Important Note

These categories help highlight where there is a potential for UXO to exist. They do not describe the potential hazards associated with UXO as different types of UXO have different potential hazards associated with them. These categories are based on historical research and do not take into account the intended usage of the land. Therefore, these categories are not in themselves a risk rating, and in order to fully understand the risk that the potential presence of UXO creates, a full UXO Risk Assessment will be necessary.

Defence provides information and advice about the potential presence of UXO to the appropriate State/Territory and/or Local authorities and recommends that they take action to:

1. Notify affected landowners that their property is in a potential UXO affected area and ensure that they receive the relevant UXO warning and advice as issued by Defence as appropriate.
2. Publicise the relevant authority's requirements for UXO investigation and remediation, in respect to land use and development.

Land parcels within categorised areas retain the categorisation unless they have been appropriately investigated or remediated. Whilst Defence endeavours to keep the information as accurate as possible, it is not possible for Defence to record changes relating to remediation at the individual Lot/Plan level. Advice as to the current conditions and local requirements should be referred to the appropriate State/Territory and/or Local authorities.

#### Standard UXO Warning

Commonwealth and Allied Defence Forces used many areas throughout Australia, during and after World War II, for encampments, field training, live firing of weapons and other military activities. A possibility exists that dangerous items of UXO may still be found on this site. If you should find a suspicious item that may be a UXO, do not touch or disturb it. The potential for injury is dramatically increased if UXO is disturbed. Contact the police and they will arrange for military experts to attend and appropriately dispose of the item.

#### Substantial

Sites categorised as being Substantial will have a confirmed history of military activities that often results in numerous residual hazardous munitions, components or constituents. There will be a history of numerous UXO finds or heavy residual evidence such as fragmentation.

Areas likely to be assessed as Substantial include high explosive impact areas, target areas within wider manoeuvre training areas, areas of heavy explosive ordnance disposal and burials.



**Advice:** Whilst current land usage may continue without specific UXO search or remediation, Defence recommends that specialist advice is obtained. A detailed UXO Risk Assessment and UXO Management Plan should be developed as necessary.

Defence recommends that any development, land usage re-zoning proposals or other significant changes in proposed activities for land parcels classified as Substantial should only proceed once an appropriate UXO Risk Assessment has been conducted by a suitable specialist and mitigations implemented to address the risks identified. Such mitigations could typically include one or more of the following as identified in the UXO Risk Assessment:

Field investigations to refine hazard areas.

Remediation to remove or neutralise hazards (remediation provides the highest level of confidence that potential risks have been reduced to tolerable levels); and/or

- A formal UXO Management Plan and/or UXO risks included in the construction site safety management plans.

## Slight

Sites categorised as being Slight will have a confirmed history of military activities that often results in numerous residual hazardous munitions, components or constituents; but where confirmed UXO affected areas cannot be defined. Alternatively, sites categorised as Slight may have a confirmed history of military activities of a type that sometimes results in occasional residual UXO. UXO or explosive ordnance fragments / components may have occasionally been recovered from the site.

Sites likely to be assessed as Slight include identified buffer zones around impact areas, field firing areas used for manoeuvre training, ranges used for non-high explosive practices and areas where historical disposal and burial activities may have occurred.

**Advice:** Whilst current land use may continue without further UXO investigation or remediation, Defence recommends that consideration is given to obtaining specialist advice and undertaking a detailed UXO Risk Assessment and developing a UXO Management Plan as necessary.

Defence recommends that any development, land usage re-zoning proposals or other significant changes in proposed activities for land parcels classified as Slight are preceded by an appropriate UXO Risk Assessment. A project- or activity-specific UXO Management Plan may be considered for ongoing activities and the possibility of encountering munitions should be adequately addressed in activity plans (e.g. construction site safety management plans).

## Remote

Sites categorised as Remote may have records which confirm that the area was used for military purposes, however the activity is of a nature that makes it unlikely that UXO would exist. UXO or explosive ordnance fragments / components have not been recovered from the site. Alternatively, areas that have been subject to Defence validated UXO remediation may also be categorised as Remote.

**Advice:** All land usage and development, within these areas, may continue without further UXO investigation or remediation. If at any time UXO or related material is identified, consideration should be given to seeking specialist advice.

## Other

Defence records confirm that the area was used for military training but do not confirm that the site was used for live firing. UXO or explosive ordnance fragments / components have not been recovered from the site. Defence opinion is that it would be inappropriate to assess as either slight, substantial or remote.

**Advice:** These sites have been included for general information purposes only. Defence makes no recommendations in regards to this category.

## Information

Defence records confirm that the area was used for routine military activity, but of a type not associated with producing UXO. Defence assessment is that it would be inappropriate to assess as having UXO potential.

**Advice:** These sites have been included for general information purposes only. Defence makes no recommendations in regards to this category.

## Sea Dumping Area

These areas have been identified as having been used for historical sea-dumping of waste material which may include explosive ordnance. These sites are generally marked on charts and published in Notice to Mariners along with the appropriate advice.

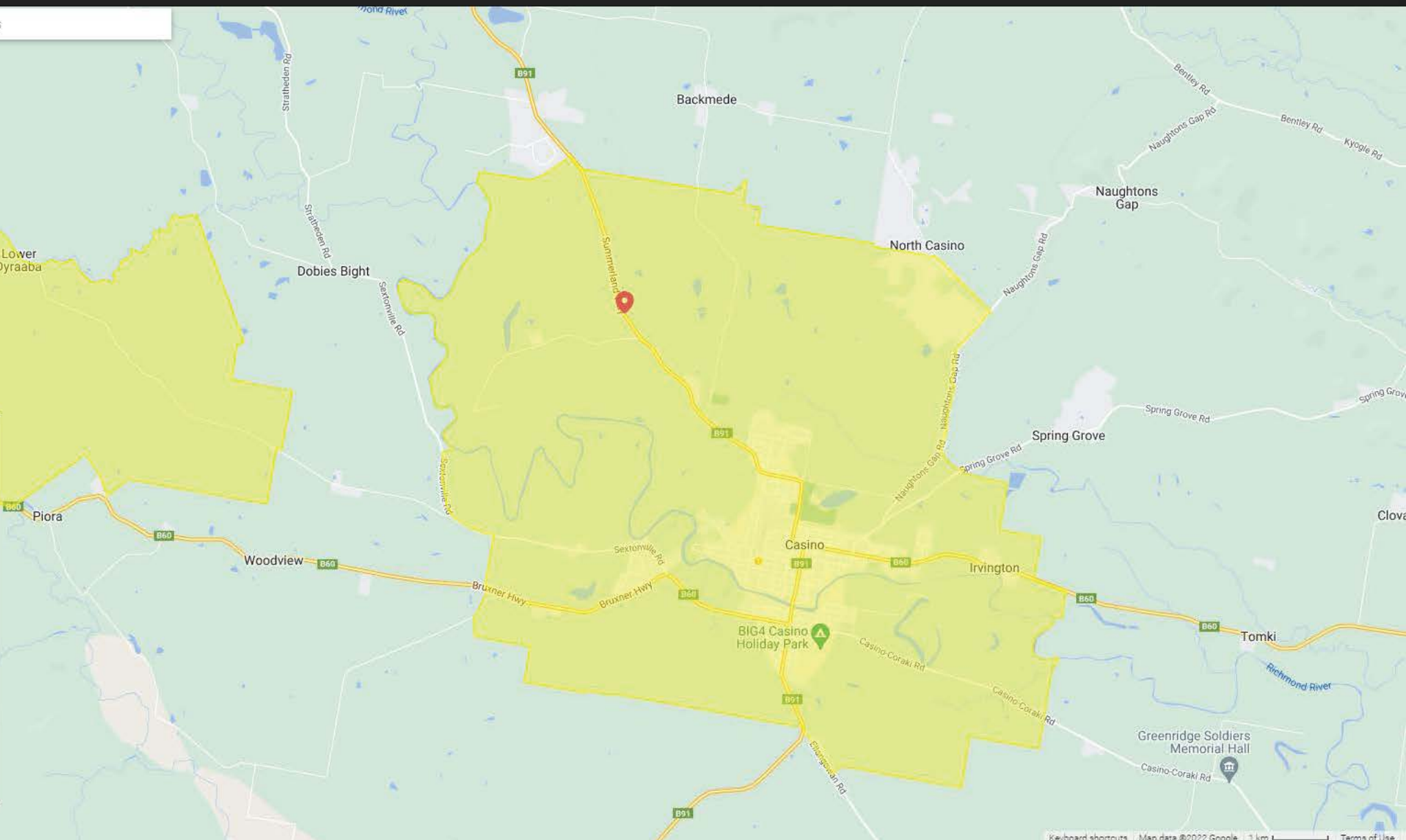
**Advice:** There are no restrictions to surface maritime activities in these areas. Any activity that will disturb the seabed such as anchoring, trawling and dredging are prohibited in these areas.

Map Satellite Search Address

**Legend**

Lat: -28.8342, Lng: 152.8509  
● Decimal Degrees (latitude, longitude)  
○ Degrees Minutes Seconds  
○ MGA

- Substantial Potential
- Slight Potential
- Remote Potential
- Information
- Other
- Sea Dumping of Depth Charges
- Other Sea Dumping Sites
- Defence Controlled Area
- Property Cadastral Area



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