RMCG

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Agricultural Impact Assessment – Watta Wella Renewable Energy Project

Final Report

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1 Introduction

1.1 THE PROJECT

The Watta Wella Renewable Energy Project (the Project) involves a renewable energy facility comprising a wind farm, battery energy storage system (BESS), new transmission lines and associated infrastructure located in western Victoria (Figure 1-1).

The Project will occur on farmland over an area of approximately 4,850 hectares (ha). The Project Area is adjacent to the Wimmera River, around 16 kilometres northeast of the township of Stawell, the nearest significant regional centre, with a population of approximately 6,000.

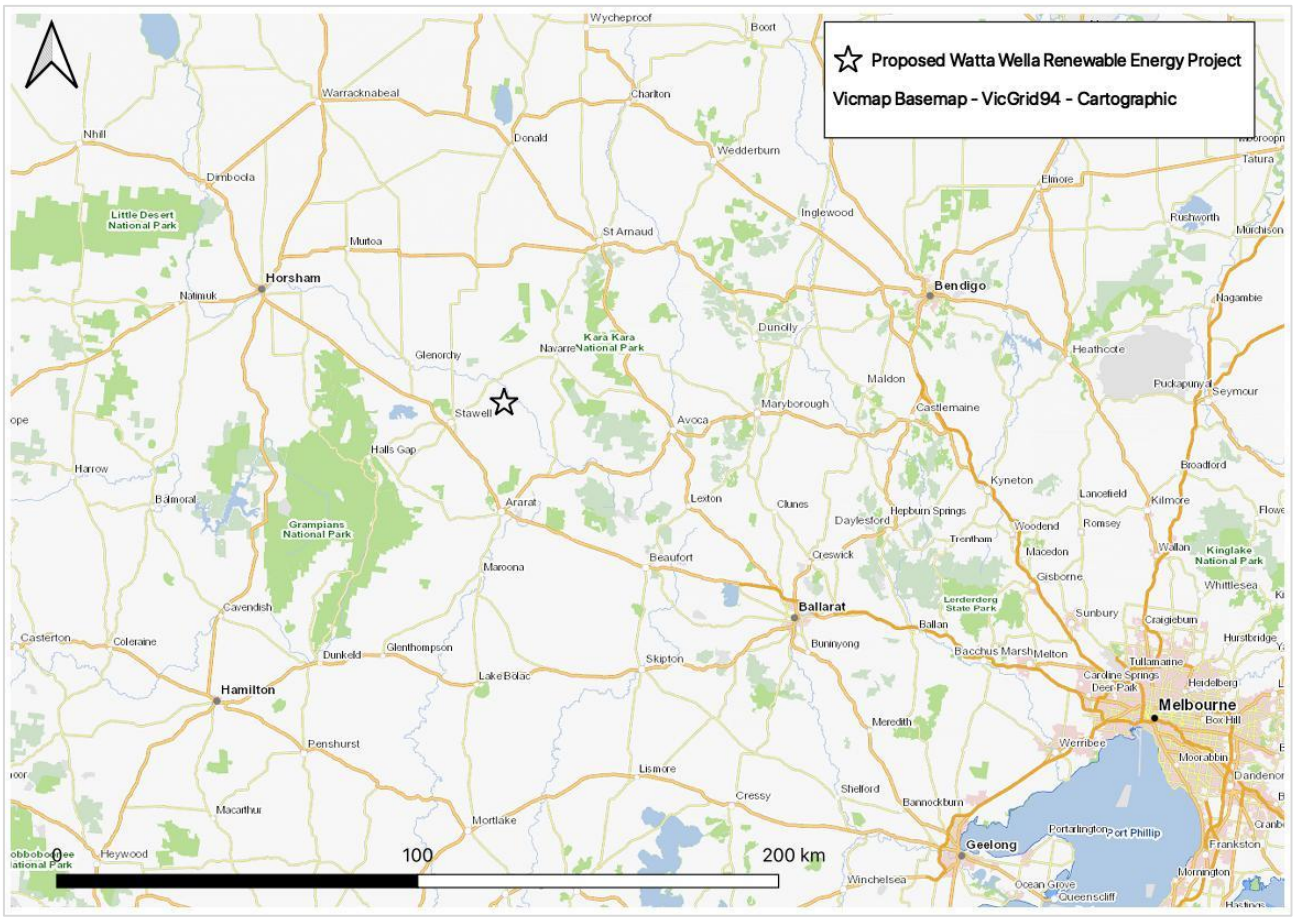


Figure 1-1: Project Area location

The Project includes wind turbines, overhead transmission lines and a BESS, along with ancillary infrastructure to support the Project including access tracks, operations and maintenance facilities, construction compound areas, underground and above ground cabling, switchyards, substations, laydown areas, concrete batching plant, and permanent meteorological monitoring masts. A summary of the key project components is outlined in Table 1-1.

Table 1-1: Summary of key project components

TECHNOLOGY	CAPACITY	FOOTPRINT
Wind	45 turbines, 360 MW total capacity	0.5 ha permanent hardstand per turbine. 0.5 ha temporary hardstand per turbine. Access tracks to each turbine, total 48 km length, and include erosion and sediment controls. Approximately 370 km of underground cabling (33 kV) connecting the wind turbines to the main electrical substation. A large portion of the reticulation cabling is to be constructed in parallel trenches.
Battery (BESS)	400 MW / 1600 MWh	12 ha including battery storage (approximately 400 containers approximately 12 m in length) substation and operations and maintenance facilities.
Overhead transmission lines	220 kV	3.7 km total in length, overhead connection from the wind farm and BESS to the existing Bulgana Terminal Station. Transmission towers would be between 30 m and 60 m high and span approximately 350 m to 550 m.

To aid the reader's understanding of the existing agriculture and the potential impacts of the proposal, the extent of the Project is shown on a series of maps contained in Appendix A, that show various base information such as road names, feature names, aerial imagery, contours, geology, town planning, land use and the Project Area.

ACKNOWLEDGEMENT OF COUNTRY

We acknowledge the Traditional Owners of the Country that we work on throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past, present and emerging and the Elders of other Aboriginal and Torres Strait Islander communities. Moreover, we express gratitude for the knowledge and insight that Traditional Owners and other Aboriginal and Torres Strait Islander people contribute to our shared work.

1.2 THIS REPORT

The purpose of the agricultural impact assessment is to determine the existing agricultural uses and their value of production at the Project Area and surrounds, and estimate the potential impacts of the Project during construction and operation on these agricultural activities and production.

Because the Project comprises different technologies (turbine towers and blades, battery units, transmission lines) and associated works (such as access tracks and cabling), and these technologies impact differently on farming practices, this agricultural impact assessment considers these impacts separately. The predicted impacts are also presented as a whole.

This agricultural impact assessment will support the planning permit application (PPA) to the Department of Transport and Planning (DTP) contributing to the planning assessment and rationale of the Project.

This agricultural impact assessment addresses the requirements outlined in DTP's policy and planning guidelines for the development of wind energy facilities[1].

The scope of this agricultural impact assessment is limited to aspects of the Project relating to the agricultural value of the Project Area and impacts on production. Therefore, this impact assessment includes:

- Site features relevant to agricultural production, such as existing infrastructure, soil types, climate and water availability
- Surrounding land uses
- Impacts on agricultural production
- Agricultural commodities and production levels
- Relative agricultural value to the region and state.

The findings of the agricultural impact assessment are outlined in Section 5.

[1] Planning guidelines for development of wind energy facilities, September 2023. The State of Victoria Department of Transport and Planning.

2 Development guidelines and policy

2.1 INTRODUCTION

This section describes relevant local and state policy and guidelines.

2.2 WIND ENERGY FACILITIES

The Planning Guidelines for Development of Wind Energy facilities last updated by DTP in September 2023 (subsequently referred to as the Guidelines), provides guidance to proponents on preparing a planning permit application. Clause 52.32 of the Victorian Planning Provisions (VPP) and Section 4.2.3 Prepare the site analysis of the Guidelines outlines information requirements to inform an assessment of the subject site and its surrounds. The Guidelines state that:

> *If the land is also to be used for other purposes, such as agriculture, the site analysis should include information about this.*

This agricultural impact assessment accurately describes the agricultural land use of the Project Area and surrounding area.

2.3 BATTERY ENERGY STORAGE SYSTEMS (BESS)

Battery Energy Storage Systems (BESS) are defined as 'utility installations' as per Clause 73.03 of all Victorian Planning Schemes. Therefore, the use and development of a BESS is to be assessed as a 'utility installation' against the State Planning Policy Framework, Municipal Planning Strategy, farming zone and any applicable overlays decision guidelines in the applicable Planning Scheme.

2.4 STATE AND LOCAL PLANNING POLICY

Within the Victorian Planning Provisions *VPP Clause 14.01-01S Protection of agricultural land*, policy objectives and strategies are set out to manage and protect agricultural land.

The objective is:

> *To protect the state's agricultural base by preserving productive farmland.*

Relevant strategies cover avoiding permanent removal of productive agricultural land from the state's agricultural base without consideration of the economic importance of the land and protecting agricultural land that is of strategic significance in the local or regional context.

This agricultural impact assessment covers the extent of any permanent and temporary impacts on agricultural land and confirms that the land within the Project Area is not of strategic significance in either a local or regional context.

The Project is located within the Northern Grampians Shire local government area.

Agriculture is the dominant land use in the Northern Grampians Shire and the local planning scheme's strategic direction aims to ensure that agricultural land is protected for its productive use and to protect strategically important agricultural and primary production land from incompatible uses[2].

[2] Northern Grampians Planning Scheme, Clause 02.03-4 Natural resource management p. 8; Clause 14.01-1S Protection of agricultural land p. 86.

The location of the Project Area is not identified as high quality or strategically important agricultural land by the Northern Grampians Planning Scheme (the Planning Scheme).

A large majority of land within the Project Area is Farming Zone (Clause 35.07) under the Planning Scheme. A wind energy facility is a permitted use, subject to a permit and meeting the requirements of Clause 52.32 (Wind Energy Facility).

Of relevance to this agricultural impact assessment, Clause 53.13 (Renewable Energy Facility (other than wind energy)) of the Planning Scheme includes Clause 53.13-3 (Decision guidelines), where the responsible authority must consider:

> *The impact of the proposal on strategically important land, particularly declared irrigation districts.*

The Project Area is not within a designated or declared Victorian irrigation district and has no connection to modernised irrigation infrastructure.

The Planning Scheme also supports renewable energy. Clause 19.01-2S (Renewable energy) details the objectives and strategies for the provision of renewable energy, stating the strategies are to:

- *Facilitate renewable energy development in appropriate locations*
- *Protect energy infrastructure against competing and incompatible uses*
- *Develop appropriate infrastructure to meet community demand for energy services. Set aside suitable land for future energy infrastructure*
- *Consider the economic and environmental benefits to the broader community of renewable energy generation while also considering the need to minimise the effects of a proposal on the local community and environment*
- *Recognise that economically viable wind energy facilities are dependent on locations with consistently strong winds over the year.*

Also, Clause 19.01-2R (Renewable energy – Wimmera Southern Mallee) supports the development of locally generated renewable energy, including bioenergy clusters as part of the Renewable energy - Wimmera Southern Mallee Strategy.

Clause 52.32 (Wind Energy Facility) facilitates the establishment and expansion of wind energy facilities, in appropriate locations, with minimal impact on the amenity of the area.

3 Site and context analysis

3.1 SITE DETAILS

The Project Area is approximately 4,850 ha covering parts of 11 separately owned and operated farm properties in the Northern Grampians Shire Council area.

On 9 June 2021, Jencie McRobert and Duncan Wallis visited the Project Area, to meet with three landowners and observed the general land uses in the vicinity of the Project and in the general locality. They held discussions with landowners on farming systems and production, and made observations on the land use, landform, soil types and agricultural productive capacity. Agricultural land use has not changed in the Project Area since 2021.

To accurately describe the Project Area, this agricultural impact assessment also relies on interpretation of spatial data sources, which have been accessed and evaluated. A series of maps has been prepared to inform the agricultural impact assessment and are attached in Appendix A. The maps are:

- A1 – Cartographic Locality
- A2 – Google Satellite
- A3 – Works Footprint
- A4 – Planning Scheme Zones
- A5 – Planning Scheme Overlays
- A6 – Geology and Soils
- A7 – Land Use
- A8 – Relief.

3.2 LAND USE

The Project Area is currently used for dryland mixed farming, predominantly sheep for wool and meat (estimated to be 30% wool: 70% prime lamb), and cropping; mostly cereals for grain and hay. Some cattle grazing and cropping growing oil seeds, vetch and pasture seed also occurs.

The Victorian Land Use Information System (VLUIS) indicates that the Project Area and surrounding land is all classified as “Mixed Farming and Grazing”, as shown in Appendix A7.

Grazing by livestock is predominantly on a mix of annual and perennial improved pastures comprising annual subclover and rye, and perennials including lucerne on the alluvial flats and tall fescue, phalaris and cocksfoot on the rises. The quality of the pasture ranges from moderate to poor depending on soils, slope and level of improvement. Pastures on the steepest slopes with shallower soil, tend to be annual grasses with a higher level of weediness whereas better quality pastures occur on the lower slopes and alluvial soils in the creek lines and other drainage depressions.

Farm sizes within the Project Area range between 1,000 and 3,000 ha. The average area of holding of farm businesses across the wider district is 780 ha[3].

The photographs presented in Figure 3-1 illustrate the main farming uses in the Project Area.

[3] ABS Agricultural Census 2020/21, Stawell statistical area level SA2.

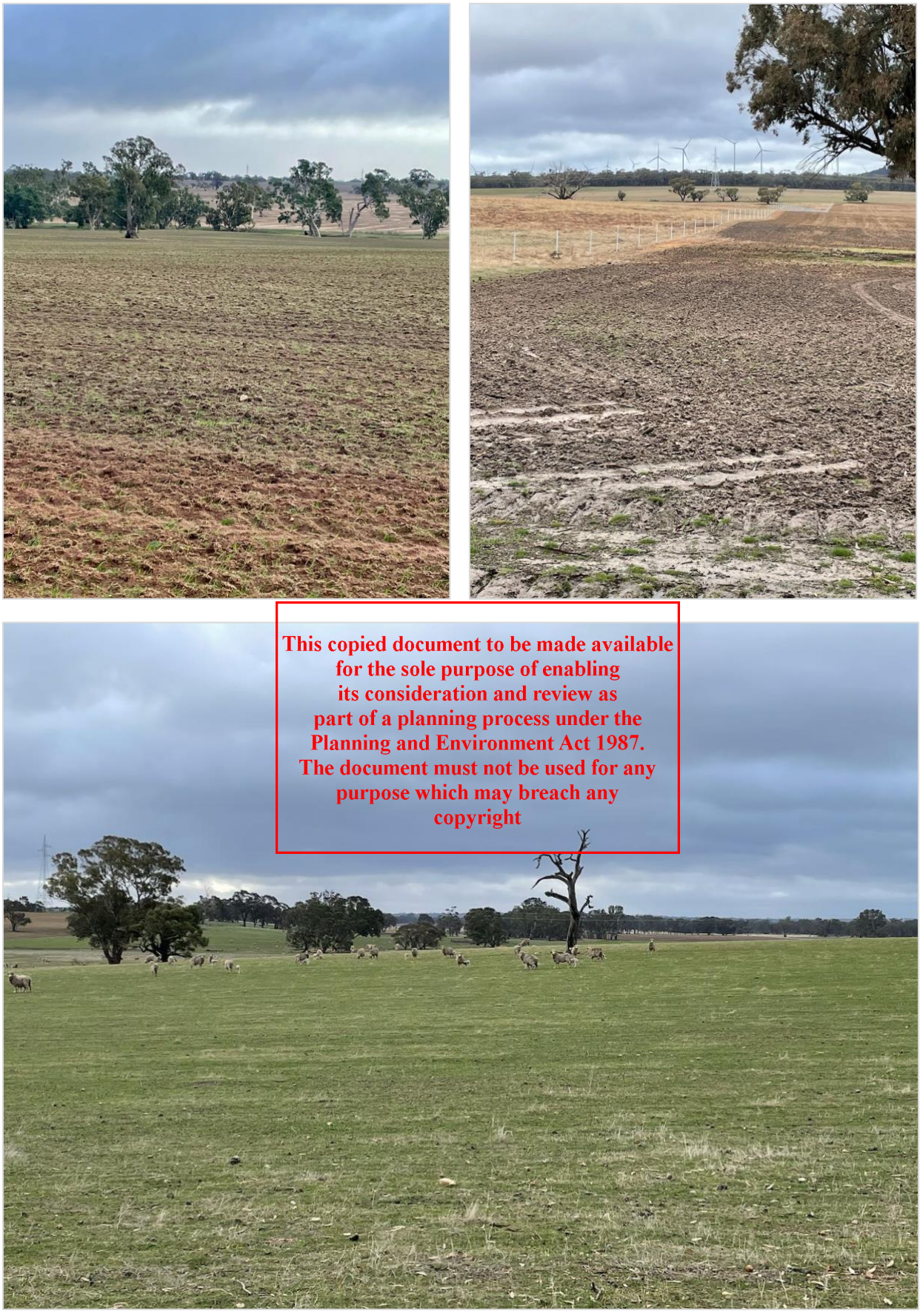


Figure 3-1: Typical cropping and grazing land uses in Project Area

3.3 SOILS AND LANDFORMS

The Project is located on the foot slopes, terraces and rises of the Wimmera River valley[4]. It's a deeply weathered landscape of undulating low hills and rises of sedimentary (Ordovician and Tertiary) origin rising above the alluvial (Quaternary) sediments in the drainage depressions and higher terrace.

A generalised geology map outlining the main landform types is shown in Appendix A6.

The physical relief across the site using one metre contours is shown in Appendix A8. This shows that the proposed wind turbines are generally positioned away from the flattest areas but appear also to have been sited to avoid the steepest land. The proposed batteries are located on relatively low relief land.

Texture contrast or duplex soil are dominant and tend to be yellow, brown or grey Sodosols (with often sodic sub soils) and sometimes Chromosols.

The soils in the alluvial drainage depression or creek line areas tend to have sandier surface soils (dark grey/brown) overlying medium to heavy mottled grey clays.

The higher terrace alluvial soils are predominately loamy sands overlying yellow medium to heavy clays.

In summary, the weathered tertiary and sedimentary rises are predominately yellowish or greyish brown duplex soils (i.e., sandy loam or clay loam topsoils with a bleached hard setting layer overlying yellow/brown medium and heavy clay sub soils – both layers are slightly acidic). The medium clay subsoils are mottled indicating poor drainage[5].

3.4 CLIMATE

Data from the Bureau of Meteorology was used to gather climate statistics, as shown in Table 3-1.

Table 3-1: Climate data[6]

FACTOR	VALUE
Rainfall	Long term mean = 525 millimetres (mm) per year
Temperature	Mean maximum monthly temperature = 20.7 ^{0}C Mean minimum monthly temperature = 8.5 ^{0}C

Most rainfall occurs during May and October. When episodic high rainfall occurs over the summer months, this can cause considerable erosion if ground cover is inadequate.

Mean daily and monthly temperature affects plant growth and is an important determinant of evaporative losses in the catchment. Evaporation values are in excess of 6mm/day in the summer months and annual evaporation is far in excess of annual rainfall.

[4] Wimmera Land Resource Assessment, 2005 Department of Primary industries, Victoria.

[5] Land Inventory of the Wimmera System and Rocklands Water Supply Catchments – a reconnaissance survey 1985, Department of Conservation, Forests and Lands, Victoria.

[6] Bureau of Meteorology data sources: rainfall from Navarre (station 079037), temperature from Stawell aerodrome (station 079105)

3.5 WATER SOURCES – SURFACE WATER AND GROUNDWATER

The Project Area is positioned between the Wimmera River and Seven Mile Creek as shown on Map A8. Surface flows are suitable for stock and domestic water supply. Farm businesses rely both on catchment dams and groundwater bores. Surface water resources can be limited when dry seasons prevail or during drought conditions. Landowners confirmed that during these times farms rely on groundwater for livestock water.

Dryland salinity is evident in the Project Area, with local groundwater flows mostly discharging at the break of slope or into drainage depressions. Stream salinities and groundwater salinities vary but landowners confirmed that both surface and groundwater will usually be suitable for livestock purposes.

3.6 VEGETATION

The dominant vegetation communities across the Project Area include Heathy Woodland and Box Ironbark Forest on the rises and Plains Grassy and Sedge Woodland in the depressions[7].

The landscape has been intensively modified for farming, now comprising largely a mix of exotic annual and perennial pasture and weed species.

There are remnants of former forest and woodland, in particular along the creek lines (red gum and yellow box) and mid to lower slopes (grey box and red box), and yellow gum and ironbark on the shallowest soils on the steepest slopes.

3.7 INFRASTRUCTURE

The following on-farm infrastructure was observed during the site visit:

- Livestock – yards, shearing sheds
- Fencing – internal and boundary fencing: generally plain wire or 5–7 line ‘cyclone’ or standard ‘sheep proof’ fencing
- Other farm sheds
- Water supply – catchment dams, bores and water troughs
- Access – farm tracks, gateways, and some fenced livestock laneway systems.

Figure 3-2 shows a shearing shed located near the BESS site, typical of the types of built infrastructure on mixed farms operating in the Project Area.

[7] Wimmera Land Resource Assessment, 2005 Department of Primary industries, Victoria.

Figure 3-2: Shearing shed located near the BESS site

3.8 CONCLUSION

Based on discussions with farming landowners, observations made during the site visit, and a desktop review of available information, the agricultural land use in the surrounding area is consistent with that mapped by the Victorian Land Use Information System (refer Appendix A7). The whole of the farming area within ten kilometres of the Project Area is considered to be “mixed farming and grazing”.

4 Agricultural impact assessment

4.1 METHOD

To understand the relative agronomic importance of the Project Area in a local, regional and state context, the agricultural attributes were investigated. The wind facility guidelines also reference the importance of a project site's land and economic attributes in determining its strategic agricultural significance. An analysis of the agricultural capability, relative value and district level and state significance of the Project Area has been conducted.

The approach taken involved:

- Desktop review of available information sources
- Field visit on 9 June 2021 to make observations on the land use, landform, soil types and agricultural productive capacity. Three farm properties were visited, and associated landholders were interviewed to confirm:
  - Type of farming operation (size, enterprise mix)
  - Livestock carrying capacity and crop yields
  - Potential impacts of the Project on both.

4.2 AGRICULTURAL CAPABILITY

OVERALL

Agricultural capability is determined primarily according to the land's ability to sustainably support a particular type and intensity of use. A system of land classification based on integrating data on climate, landform, geological materials, soils, native vegetation and land use provides a framework for assessing agricultural capability[8]. Agricultural capability class criteria have been developed as a means of classifying land types according to their susceptibility to land degradation. These are shown in Table 4-1.

Table 4-1: Agricultural capability class criteria[9]

CRITERIA	HIGH	MEDIUM	LOW
Climate-rainfall (mm)	500–1,200	500–1,200	<500 or >1,200
Landscape slope (%)	0–5%	5–10%	>10%
Soil characteristics:			
Topsoil depth	>20 cm	10–20 cm	<10 cm
Surface (topsoil) texture	Loams, Sandy Loams, Silty Loams, Sandy Clay Loams, Clay Loam	Clay Loam, Fine Sandy Loams, Light Clays	Heavy Clays, Sands
Subsoil Texture	Light – Medium Clay & lighter	Medium – Heavy Clay & lighter	All
Subsoil colour	Red, brown	Brown, grey, yellow	Brown, grey, yellow
Topsoil pH	> 6	> 4 to < 6	< 5
Sub soil pH	5.5 to 7	5 to 5.5	< 5 or > 7

[8] Early work undertaken by: Land Protection Division, Conservation, Forests & Lands, 1987.
[9] Adapted from DNRE 2002, Land resource assessment for the North East CMA Region, Department of Natural Resources & Environment, Vic.

Based on the annual rainfall, and slope and soil characteristics, the majority of farmland has been assessed as having 'medium' agricultural capability. This includes the alluvial creek flats and higher terraces and low sedimentary rises forming the broad valley south of the Wimmera River. The steeper sedimentary landforms with shallower soils form only a minor part of the Project Area, and these have medium to low capability.

The Project Area is best suited to relatively low-to-medium value agricultural enterprises such as dryland livestock grazing or cropping for cereals and hay production (i.e., the production value is low when compared to irrigated cropping, dairy or horticultural enterprises conducted elsewhere in Victoria, for example).

SOIL TYPES

Soil classification is useful for understanding the range of primary production that will prosper. Although topsoil can be improved or modified to some extent, the soil classifications are an inherent characteristic of the site. Therefore, the agricultural capability of the Project Area is predominantly determined by rainfall in conjunction with soil type and group classification.

In summary, the description of the soils and geology according to the available reference material indicates that the Project Area can support moderate pasture growth and relatively low yielding winter crops. As outlined in Section 3.3, most of the Project Area comprises of sandy or clay loams overlying medium clay subsoils.

The soils on the gentle rises, generally have poorer drained soils that, depending on seasons, can be impacted by water logging leading to reduced pasture and crop growth. These rises also have dispersive clay subsoils that when disturbed are susceptible to erosion and tend to have lower pH (between 4 and 5) that require liming to adjust when undertaking pasture improvement.

It is noted that the geological landform and soil maps do not provide the detail to a paddock level and that the resolution of the maps do not capture the specific characteristics of the Project Area. The site inspection and discussions with the farm business owners, however, confirm that the generalised soil types mapped for the district are also typical of their farms.

RAINFALL

Rainfall is another inherent characteristic used to inform the agricultural capability of a site. Mean annual rainfall is in the order of 525 mm, based on all available data.

Annual rainfall is sufficient for dryland agriculture and well suited to mixed farming with a dominant enterprise of livestock grazing (primarily sheep) on improved pasture and some winter season cereal and other crops. Rainfall is not sufficient for a wider range of enterprises including summer cropping, dairy or horticulture, without access to additional water sources for irrigation. Cattle grazing enterprises at this rainfall tend to be smaller or conservative operations where cattle are habitually sold when seasons turn dry.

DRAINAGE

Drainage and flooding can impact on a site's agricultural productivity. That is, if a site has poor drainage and is within a flood or inundation overlay area, it's agricultural productivity could be negatively affected. As shown in Appendix A5, the three major drainage lines (Wimmera River, Six Mile Creek and Seven Mile Creek) have been mapped and are subject to Flood Overlay – Schedule 1 and Land Subject to Inundation Overlay – Schedule 1 under the Planning Scheme. The turbines and BESS have been located away from the flood prone areas, but some of the access tracks and underground cabling will interact with the floodways and require specific design and/or construction.

The proposed construction methods for the Project include horizontal directional drilling (HDD) where cables are required to cross Seven Mile Creek, whilst any crossings of access tracks over waterways will be appropriately designed pre-construction to inform the Works on Waterways permit for agreement with and approval by the Catchment Management Authority. Any electrical equipment such as for the substation and BESS will also be designed with appropriate finished floor levels above the 1 in 100 year flood event level.

Parts of the dominant landforms across this landscape are subject to waterlogging and this restricts its stock carrying capacity and crop production potential. This is largely due to the relatively poor internal drainage capacity of the subsoils dominant in the sedimentary rises, evidenced by their clayey texture and yellow/grey colour.

4.3 PRODUCTION LEVELS

BESS SITE

The BESS site is approximately 12 ha and the proposed location is on part of a mixed farm producing prime lambs, as shown in Figure 4-1 and Figure 4-2.

Figure 4-1: Overview of grazing land in close proximity to the proposed BESS site

Figure 4-2: Sheep grazing on lucerne pasture

An interview with the farm business owner provided the following information that has been used to assess typical agricultural production levels from this land. The main characteristics of the farming system at this site are summarised in Table 4-2.

Table 4-2: Characteristics of farming system within and surrounding the BESS site

#	FEATURE	DESCRIPTION
1	Main enterprise	Mixed dryland farm.
		Sheep (meat) (90% of land): 4,000 cross bred ewes. Set stocking grazing predominantly improved pasture and cereals. Purchase of ewe lambs rather than self-replacing flock. Stocking rate ~ 9 DSE/ha.
		Winter cropping (160 ha/year 10% land) – grazed cereals and cereals harvested mainly for hay and grain used for supplementary feeding sheep.
2	Total grazing area	1,500 ha.
3	Proposed BESS site	Approximately 12 ha or 1% of farming property area.

The BESS site agricultural capability was assessed as "medium" (previous Section 4.2). Its main agricultural use – prime lamb production – is an appropriate use for the site and optimises the potential agricultural production.

The total production potential, based on current livestock numbers and discussions with the farmer has been estimated and the results shown in Table 4-3.

The average stocking rate for the property owner interviewed has been assessed at approximately 9 dry sheep equivalents (DSE[10]) per hectare. This is comparable to average stocking rates in regions with similar agricultural capability (and soils and rainfall) of between 8 and 12 DSE/ha[11].

Table 4-3: Carrying capacity and prime lamb production potential gross income[12]

#	ENTERPRISE	DSE VALUE[13]	NO. HEAD	TOTAL DSE	STOCKING RATE
1	Crossbred ewes	3.5	4,000	14,000	9 DSE/ha

#	COMMODITY	NO. HEAD	PRICE: $/KG CARCASS WEIGHT	CARCASS WEIGHT KG	TOTAL GROSS VALUE/ANNUM
2	Prime lambs	6,000[14]	$8.10[15]	23	$1,117,800

#	COMMODITY	NO. HEAD	PRICE: $/KG CLEAN	FLEECE WEIGHT KG	TOTAL GROSS VALUE/ANNUM
3	Crossbred wool	4,000	$6.10[16] @ 65% yield	3.5	$55,000 approx.

The total gross farm income has been assessed at approximately $1.2M per annum or $800/ha.

[10] DSE is value based on energy requirements of a 2-year-old 50kg Merino wether.
[11] Livestock Farm Monitor Project Victoria – 2020-21.
[12] The lamb and wool prices are 2020/21 prices so the relative gross value can be compared with the 2020/21 regional and statewide ABS Agricultural Census data.
[13] Prograze Manual 2017 Ninth Edition, Meat and livestock Australia and NSW Department of Primary Industries.
[14] Lambing rate reported as 1.5.
[15] MLA Over the Hook (OTH) lamb indicator 2020/21, 810 cents/kg carcass weight.
[16] Historical wool prices accessed 22 July'23 https://tradingeconomics.com/commodity/wool.

WIND FARM SITE

Interviews with three farm business owners (associated landholders) provided information on their enterprises. This has been used to assess typical agricultural production levels from this land. The main characteristics of the farming systems (including an estimated gross income per hectare) across the proposed wind turbine site are summarised in Table 4-4.

Table 4-4: Characteristics of farming system on wind farm site

FEATURE	DESCRIPTION	ESTIMATED GROSS INCOME $/HA
Main enterprises	Mixed dryland farms	
70%	Sheep (meat:wool) (70:30%): Set stocking grazing predominantly improved pasture Stocking rate ~ 9 DSE/ha	Sheep (meat) $800 (70%) Sheep (wool) $470 (30%)
30%	Winter cropping – mainly cereals (wheat, barley, oats) and some oilseeds (canola) and legumes (vetch) Wheat yields = 3.8 t/ha (district average)	$1330
	Est. Gross income $/ha **Assumptions:** **49% sheep meat, 21% sheep wool** **30% cropping (wheat)**	**$890/ha**

The mixed farming system across the wind farm site has been generalised as 70% sheep (comprising 70% meat: 30% wool) and 30% winter cropping (cereals/wheat). Stocking rates of 9 DSE/ha are assumed to be at similar levels to the proposed BESS site.

The dryland cropping system was reported to be primarily cereals (wheat, barley and oats) and some oil seeds (canola) or legumes (vetch). In the absence of farm records, the average yield from the cropping area is based on Australian Bureau of Statistics (ABS) 2020-21 data (Stawell statistical area level, SA2), which had an average wheat yield of 3.8 tonnes/ha[17]. A generalised estimate of gross income from cropping (wheat crop) is $1,330/ha. This is based on a January 2021 wheat price of $350/t.

The assessment has used 2020/21 commodity prices to allow a comparison with available district level and Statewide ABS Agricultural Census data collected in 2020-21. ABS 2020-21 statistic data is the only available data set that covers the data requirements at an appropriate scale. While there have been more recent releases (2022-23 and 2023-24) of statistical data for some broadacre commodities (e.g. winter crops), more recent data for all relevant commodities are not offered at a useable geographical scale to support the analysis.

Changes in production and commodity price from year to year are inevitable, but the 2021 prices are an appropriate comparison for assessing regional impact.

TRANSMISSION LINE PROJECT SITE

The proposed transmission line routes have similar land use and capability (medium) to the BESS site.

[17] Australian Bureau of Statistics 2020-21. AGCDCASGS202021 Agricultural Commodities, released 26 July 2022. Statistical Area Level 2 (SA2s) are functional areas that represent a community that interacts together socially and economically. This is the smallest granularity that Agricultural Census data is available publicly. There are 462 SA2 regions in Victoria. See Link here

5 Impact on production

5.1 INTRODUCTION

This agricultural impact assessment assesses the direct impact on agriculture from the whole Project Area footprint. The footprint is made up of three main components (BESS, wind farm and transmission line) combined with associated works (such as cabling, tracks, substations, laydown and concrete batching areas, etc).

Losses of grazing and cropping potential are expected due to the direct works footprint. However, generalised losses across the balance of the Project Area (beyond the works footprint) are expected to be negligible because there is not expected to be any impact on the wider operations of the balance of those farms.

RMCG is unaware of any potential impacts that the batteries and wind turbines could have on the neighbouring land uses. Providing road access is not inhibited, we find no reason for the agricultural activities of the neighbouring properties to be impacted by construction or operation of the proposed Project. The works can co-locate with the existing agricultural activity in the immediate and surrounding areas. There is no evidence to suggest that the existing wind turbines (Bulgana Wind Farm) south of the site have caused any impact on neighbouring farms since their operation.

The assessments below are based on RMCG's knowledge of the various industries and published statistics, which were verified for this locality through discussion on site with a selected sample of farmers.

5.2 BESS

The proposed BESS will have a direct impact on agricultural production at this site both during construction and on-going, due to the intensity of infrastructure required. It is apparent that approximately 12 ha will be removed from 'normal' or usual sheep grazing production.

Using the data presented in Section 4.3, the calculated maximum direct loss in gross farm income generated from the proposed BESS is estimated to be approx. $9,600/annum i.e. 12 ha of production at an estimated gross income of $800/ha as summarised in Table 5-1.

Table 5-1: Maximum direct loss in farm income for batteries

PROJECT COMPONENT	AREA LOST (HA)	GROSS INCOME LOSS ($/ANNUM)
BESS	12	$9,600

5.3 WIND FARM

Impacts of the proposed wind farm on agricultural production will occur during construction and ongoing operations.

Loss of income from not being able to graze sheep on the relatively small areas hosting wind turbine infrastructure will be the main direct impact. Table 5-2 summarises the estimated loss of mixed farming (grazing and some cropping) land related to the operation of the wind turbine project.

RMCG understands that this impact is expected to be offset by construction disruption payments as well as ongoing lease payments which have been negotiated with landowners.

Table 5-2: Loss of agricultural land for the various elements of wind farm works

ELEMENT OF PROJECT	LOSS OF AGRICULTURAL LAND DURING CONSTRUCTION	LOSS OF AGRICULTURAL LAND DURING ONGOING OPERATION
Turbine foundations and surrounding hardstands and drainage	80.5 Ha	20.0 Ha
Access tracks + Underground cabling (combined)	93.7 Ha	25.7 Ha
Substation	5.3 Ha	4.8 Ha
Operation & Maintenance	2.2 Ha	2.0 Ha
Laydown areas (3x)	5.6 Ha	4.8 Ha
Concrete batching areas (3x)	6.1 Ha	5.3 Ha
Meteorological mast (footprint for 1 met mast)	7.9 Ha	0.8 Ha
Construction compound area	4.0 Ha	3.6 Ha
TOTAL	**205.2 Ha**	**67.0 Ha**

The value of the direct annual loss in agricultural production is estimated to be:

- 205 ha during construction at $890/ha, or $182,450 gross income per annum
- 67 ha ongoing operation at $890/ha, or $59,630 gross income per annum

5.4 OVERHEAD TRANSMISSION LINES

RMCG understands that dryland broadacre cropping and livestock grazing are permitted agricultural farming activities under overhead transmission lines. The land use in the Project area is predominantly livestock with some winter cropping, mostly to renovate pastures and grow fodder for livestock, so usual farming activities will be able to proceed beneath and in close proximity to this infrastructure.

The tower structures themselves (approximately twelve towers) will be permanent obstacles on the land, but the area lost to grazing and broad acre cropping is expected to be very small (assuming maximum footprint of 17m x 17m per tower, 12 towers = 0.3 ha).

It is therefore expected that there would be some temporary (but relatively minor) impact on farming activities during construction and impacts on agricultural production during the ongoing operation of the transmission lines are also estimated to be minor due to the very small area of land that will be removed from agricultural production.

Based on our experience with agricultural impact assessments of transmission lines (several projects in Victoria), there will be very little disruption to mixed farming activities once the transmission lines are built.

5.5 MITIGATION AND MANAGEMENT MEASURES

Mitigation and management measures have been developed to minimise impacts on agriculture (Table 5-3) These were identified through consideration of potential impact pathways and impacts on agriculture, and through direct discussions with landowners. Implementation of these mitigations should result in the Project's impacts on agricultural production and seasonal farming activities being minor.

Table 5-3: Summary of agricultural impact mitigation and management measures

MITIGATION OR MANAGEMENT MEASURE	IMPACTS ADDRESSED	TIMING
Minor design modifications – to minimise impacts of land disturbance and disruption to farm activities	Through further discussion with landholders, options to reduce impacts should be explored. Examples include (but should not be limited to the following): • Maximising the use of existing tracks and thereby minimising new disturbance areas to minimise potential erosion • Attention to associated drainage design for all new access tracks to minimise erosion and sedimentation (highly dispersive clay subsoils are present) • Fencing off construction areas to separate construction activities from farming activities • Potential micro-siting of wind turbines to minimise disturbance, particularly in and around existing farm infrastructure (yards, sheds, dams, troughs etc).	Prior to final design, prior to construction
Property management and communications plan – to minimise poor communication that could lead to increased production losses, operational costs or conflict with landowners	Develop and agree a tailored property plan between contractors and individual landowners. The plan to include the establishment of respectful communication and behaviour protocols for entry to properties, and a process for landowner queries or complaints management. Incorporate procedures for advance communication with landowners regarding construction activity, to enable livestock movement and seasonal or annual crop activities. In consultation with landowners, capitalise on opportunities to utilise existing farm tracks and to retain useful tracks for farm access. Examples of property entry protocols include (but should not be limited to the following): • Maintenance crews to provide a minimum seven-day notice period before entering properties • Scheduled maintenance should avoid lambing season • All visitors must follow colour coded gateway opening and closing protocol to avoid mixing mobs of sheep • Regular review of paddock protocols to ensure these are up-to-date and align with farming operations.	Develop and agree prior to construction. Implement throughout life of project.
Project schedule – to allow landowners to plan and avoid potential land management conflicts	Contractors to develop the project schedule(s) for each phase in consultation with landowners to minimise impacts on sensitive receptors and in sensitive times (e.g., lambing paddocks during lambing season, pasture and crop spraying), and to enable landholders to plan their seasonal farm management activities to avoid traffic or access conflict. Regularly update landholders on changes to schedule.	Construction Operation
Biosecurity plan – to prevent introduction and spread of weeds, pests and pathogens and diseases	Contractors to develop a comprehensive biosecurity management plan for all properties and all stages of the Project. This would include the requirement for contractors to follow strict biosecurity protocols, such as vehicle and footwear hygiene practices, and to follow colour coded gateway opening and closing protocols to avoid mobs of sheep leaving properties via boundary gates.	Develop and agree prior to construction. Implement throughout life of project

5.6 SUMMARY

Mitigations to minimise disruption to agricultural activities, both during construction and on-going, will be effective in addressing impacts at an individual property or business level. Biosecurity is the most substantive type of risk and, with proper planning processes and protocols, this risk would be able to be managed to an acceptable level.

Therefore it is concluded that any disruption to farming activities during the construction and ongoing operation of the Project would be temporary and / or manageable.

The estimated potential ongoing impact on agricultural production of the Project is outlined in Table 5-3.

Table 5-3: Estimated potential ongoing impact on agricultural production value

PROJECT COMPONENT	ESTIMATED AREA OF AGRICULTURAL LAND LOST (HA)	TOTAL GROSS VALUE PER ANNUM (2020/21 PRICES)
BESS	12	$9,600
Wind Farm	67	$59,630
Transmission lines	Negligible	-
Project	**79**	**$69,230**

The estimated area of land removed from agricultural use is 79 ha which leads to an annual loss in gross agricultural value of $69,230.

6 Relative value and impact – region and state

To put the agricultural value of the site into a regional perspective, the value of production calculated in Section 5 can be compared to that of the local area. ABS 2020/21 Agricultural data for the Stawell statistical area level (SA2) is shown in Appendix B. This statistical area is highly representative of the agricultural production value of the site and represents approximately 50% of the land area in the Northern Grampians Shire. The total gross agricultural value for the Stawell SA2 area[18] was in the order of $108 million. The relative share of the main groupings of agricultural commodities (by gross value) is shown in Figure 6-1 and Figure 6-2. Sheep meat and wool are the main agricultural enterprises representing just over 50% of gross value followed by cereals for grain and non-cereal crops.

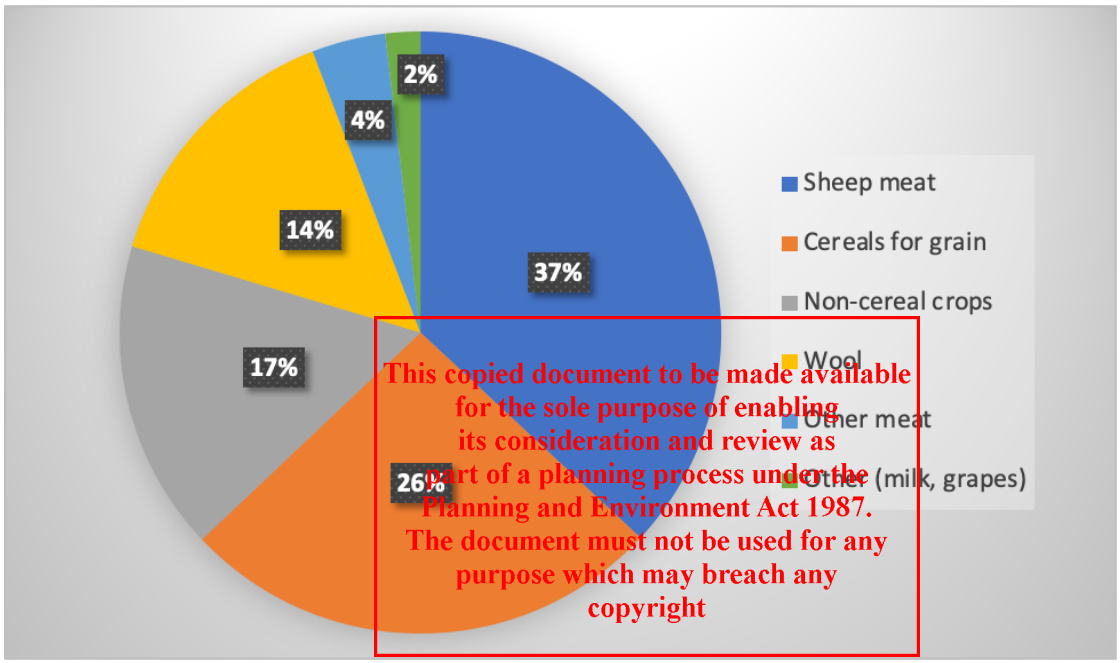
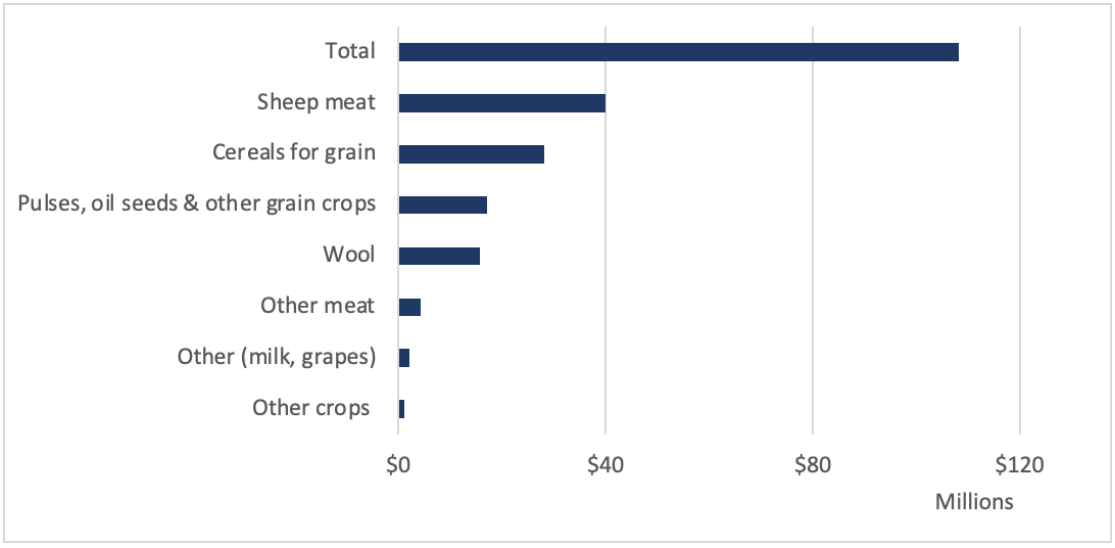


Figure 6-1: Proportion of each agricultural commodity: Stawell SA2, 2020/21



[18] The Stawell SA2 area approximates the southern 50% of the Northern Grampians Shire Council area and is highly representative of faming activity in the project site.

Figure 6-2: Gross value of each agricultural commodity: Stawell SA2, 2020/21[19]

A summary of the impact of the Project in terms of potential loss in agricultural production (in the Project Area) is provided in Table 6-1. To put this value into a regional perspective, the gross value of production can be compared to that of the Stawell SA2 area or district. The estimated loss in value of agricultural production from the site represents approximately 0.1% of the district agricultural value.

Table 6-1: Relative value of potentially forgone agricultural production

IMPACT LEVEL	TOTAL GROSS VALUE 2020-21 PER ANNUM	CONTRIBUTION TO REGIONAL GROSS VALUE
Stawell (SA2) district	$108,064,000	100%
Watta Wella Renewable Energy Facility	$69,230	0.1%

For further comparison, ABS data indicates that the area of land that will potentially be removed from agriculture represents 0.1% of the district's agricultural land i.e., 79 ha out of a total area of farm holdings of 116,000 ha.

At a state level, the economic output from this land represents a minute fraction of the state's agricultural value of output ($17.5 billion[20]).

In conclusion, the expected forgone agricultural output from the site is not considered to be significant at either a district or state level.

19 http://www.agriculture.gov.au/abares/data/agricultural-census-visualisations#gross-value-of-production.

20 Source: ABS Agricultural Census - VACPDCASGS202021 - Value of Agricultural Commodities Produced ASGS regions, Australia, 2020-21

7 Conclusion

RMCG has inspected the Project Area, spoken to several of the key landowners and conducted a desktop review of production data and other spatial information relating to agricultural value and potential impacts. The findings are presented in earlier chapters.

A summary of RMCG's agricultural impact assessment of the strategic or other significance of the proposed project site follows:

- **Soils and landscape** – as outlined in Section 4.2, the agricultural capability and soil attributes of the site are not considered to be high quality, nor are they niche or versatile. The Project Area is capable of supporting moderate pasture growth and crop yields.
- **Water and climate** – as outlined in Section 3.3, the site does not have access to an irrigation water resource or infrastructure and has only moderate rainfall. The Project Area is not considered to be relatively more resilient to the impacts of climate change than other agricultural areas in Victoria.
- **Fragmentation and regional productivity** – the proposed change in land use will not substantially impact local or regional productivity and output. The Project will take approximately 79 ha of land out of agricultural production and replace it with energy production. This is a small fraction of the land used for mixed farming regionally and across the state. The Project can co-locate with existing agricultural activity and diversify farm business income with only a minimal impact on productivity; evidence provided in Sections 5 and 6.
- **Structural reform or modernisation** – the Project Area is not considered to have any structural attributes that would make it of strategic significance.
- **Local planning scheme –** the location of the Project Area is not identified as high quality or strategically important agricultural land by the Northern Grampians Planning Scheme.

Based on the large area of land available in the surrounding area and across regional Victoria for prime lamb production and cropping, and the relatively small area of land that will be removed from agricultural production, we have determined that the impact of the proposed Project on agricultural activity in the district is relatively minor.

Based on the agricultural impact assessment of the site, it is concluded that:

- The Project is not located on agriculturally significant land
- Potential agricultural production losses from the Project during construction and operation will be minor at both a regional and state-wide level
- Any disruption to farming activities during the construction and operation of the Project will be manageable and temporary with the implementation of appropriate mitigation and management measures
- If landowners chose to reinvest some or all of the income generated from hosting wind turbines into improvements to their operation (modern farm equipment and stock handling infrastructure, or pasture improvement, for example), annual agricultural production losses could be more than offset.

Once the Project reaches its design life and following decommissioning, the relatively small area of land could be returned to agricultural production. If the infrastructure was removed and the land condition reinstated, we understand that the properties would be able revert to current or comparable carrying capacity and production levels, pre-development.

Appendix A: Map series

A1 – Cartographic Locality

A2 – Google Satellite

A3 – Works Footprint

A4 – Planning Scheme Zones

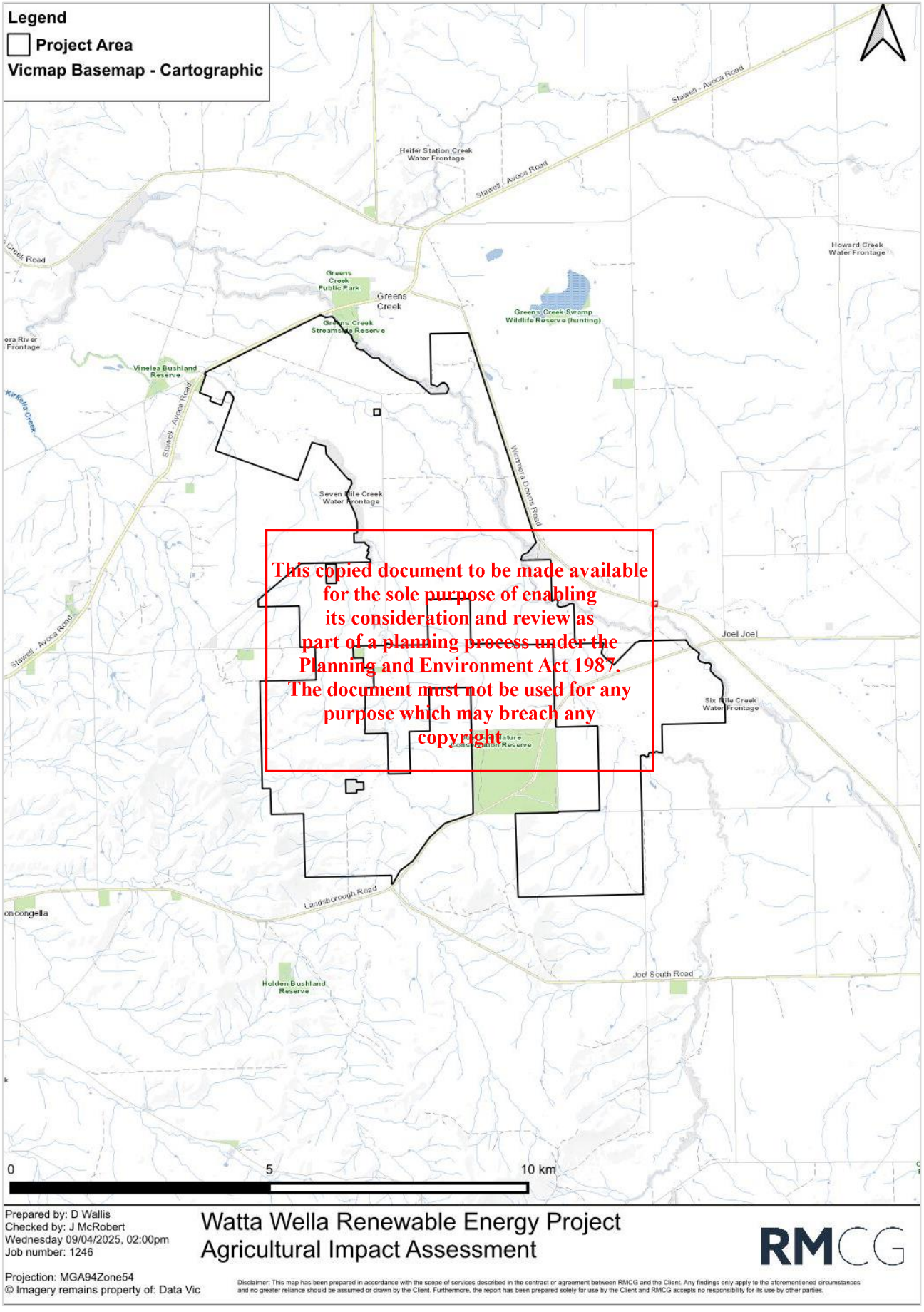
A5 – Planning Scheme Overlays

A6 – Geology and Soils

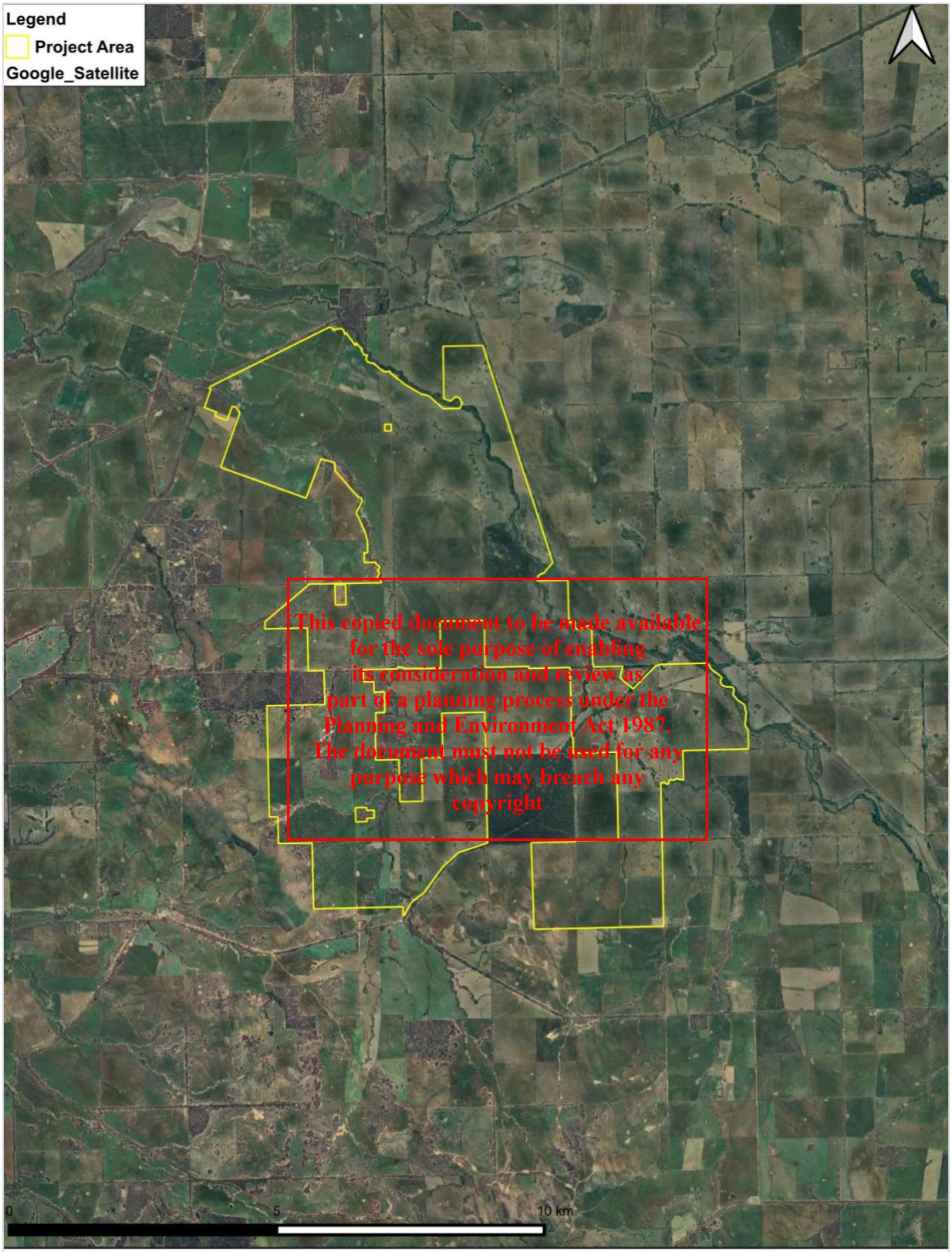
A7 – Land Use

A8 – Relief.

A1 – CARTOGRAPHIC LOCALITY



A2 – GOOGLE SATELLITE



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Checked by: J McRobert
Wednesday 09/04/2025, 02:23pm
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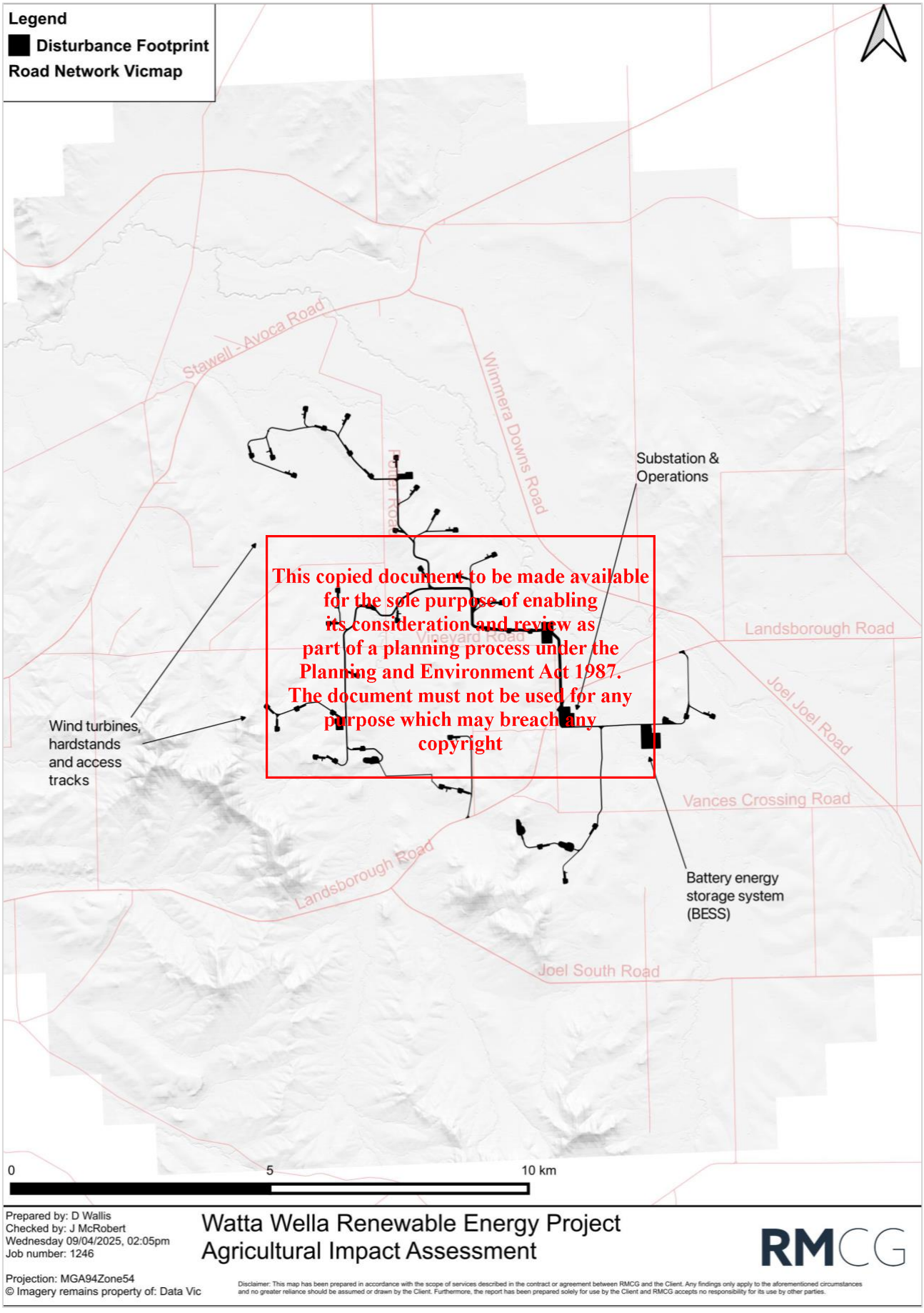
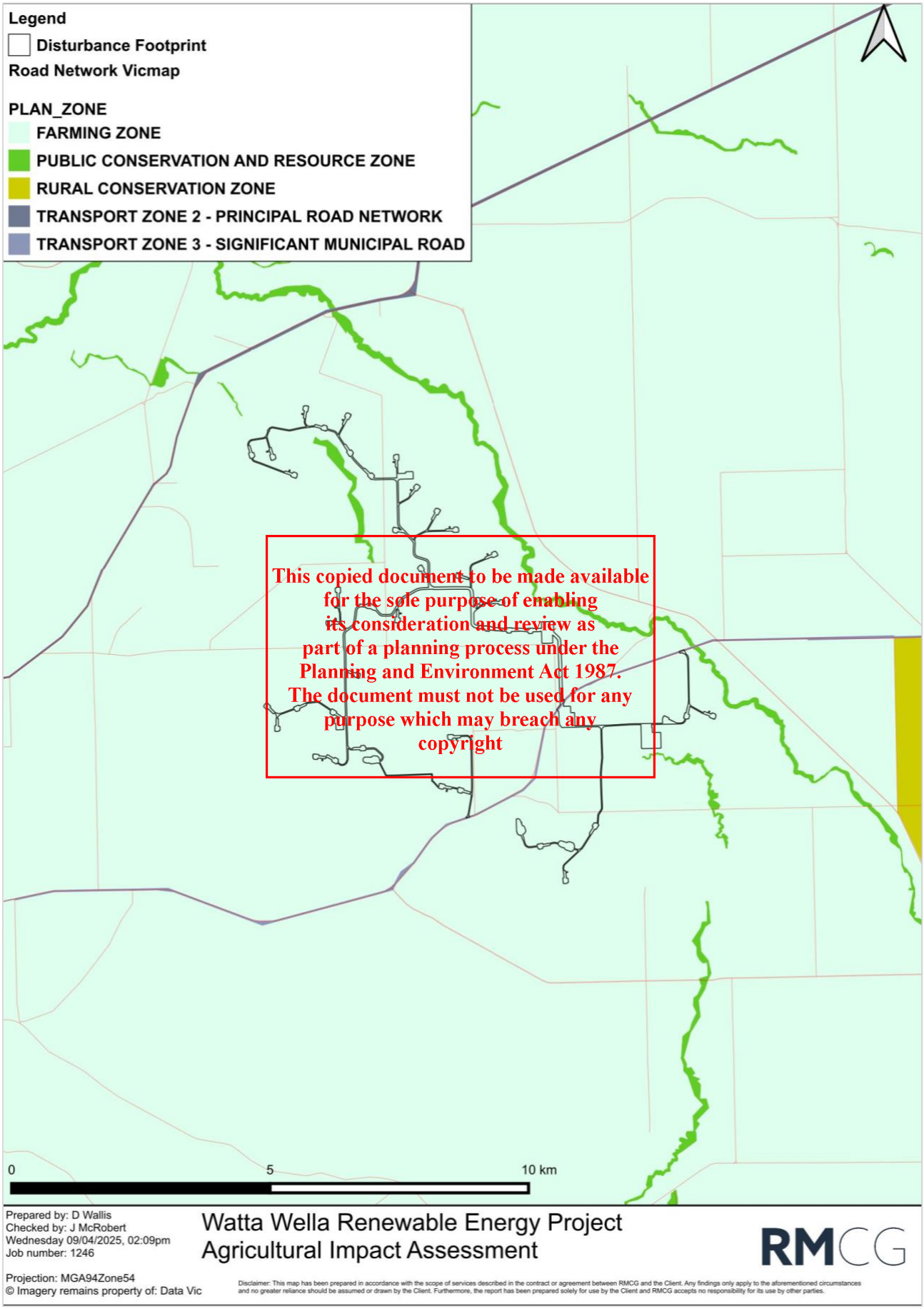
Watta Wella Renewable Energy Project
Agricultural Impact Assessment

RMCG

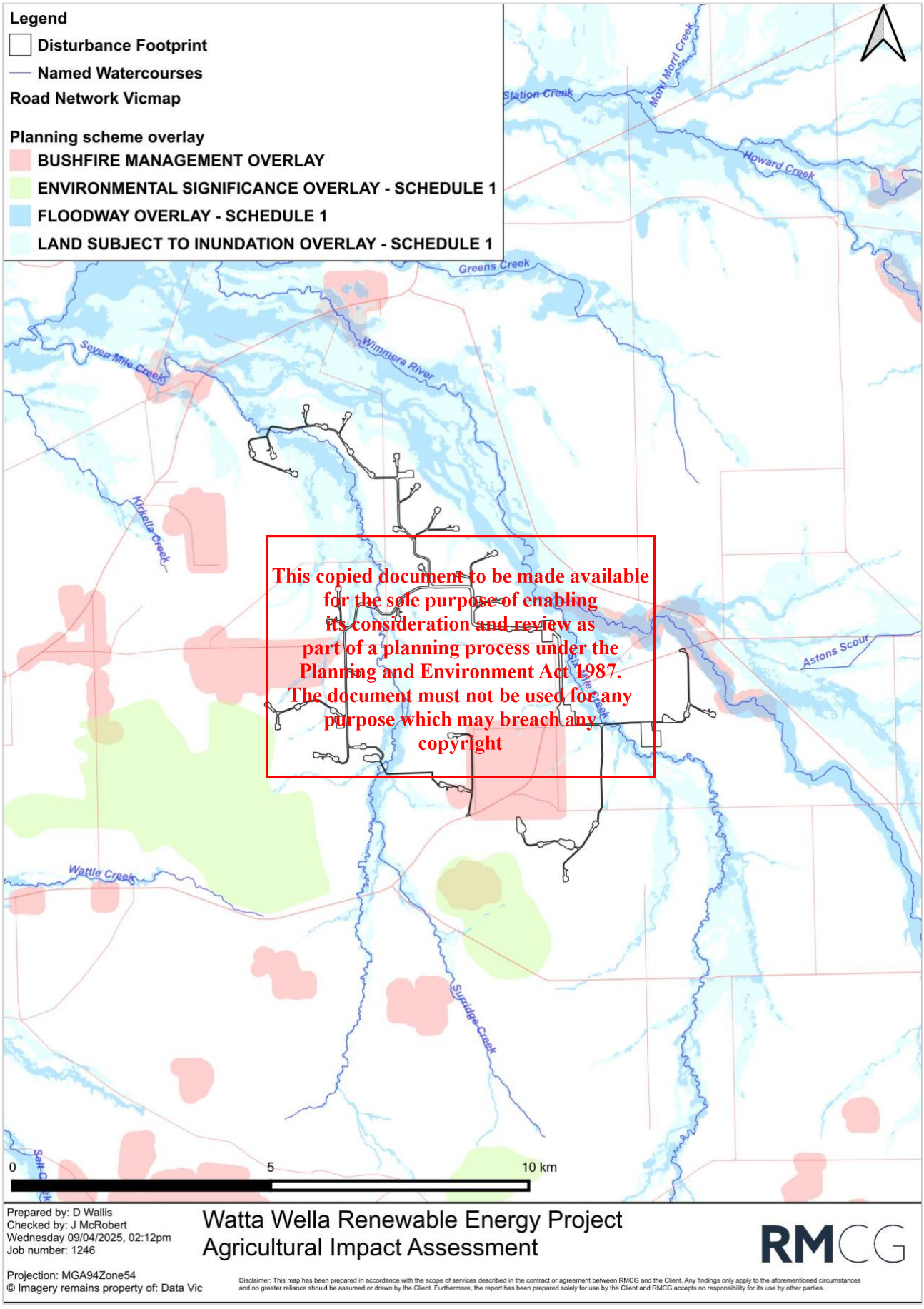
A3 – WORKS FOOTPRINT



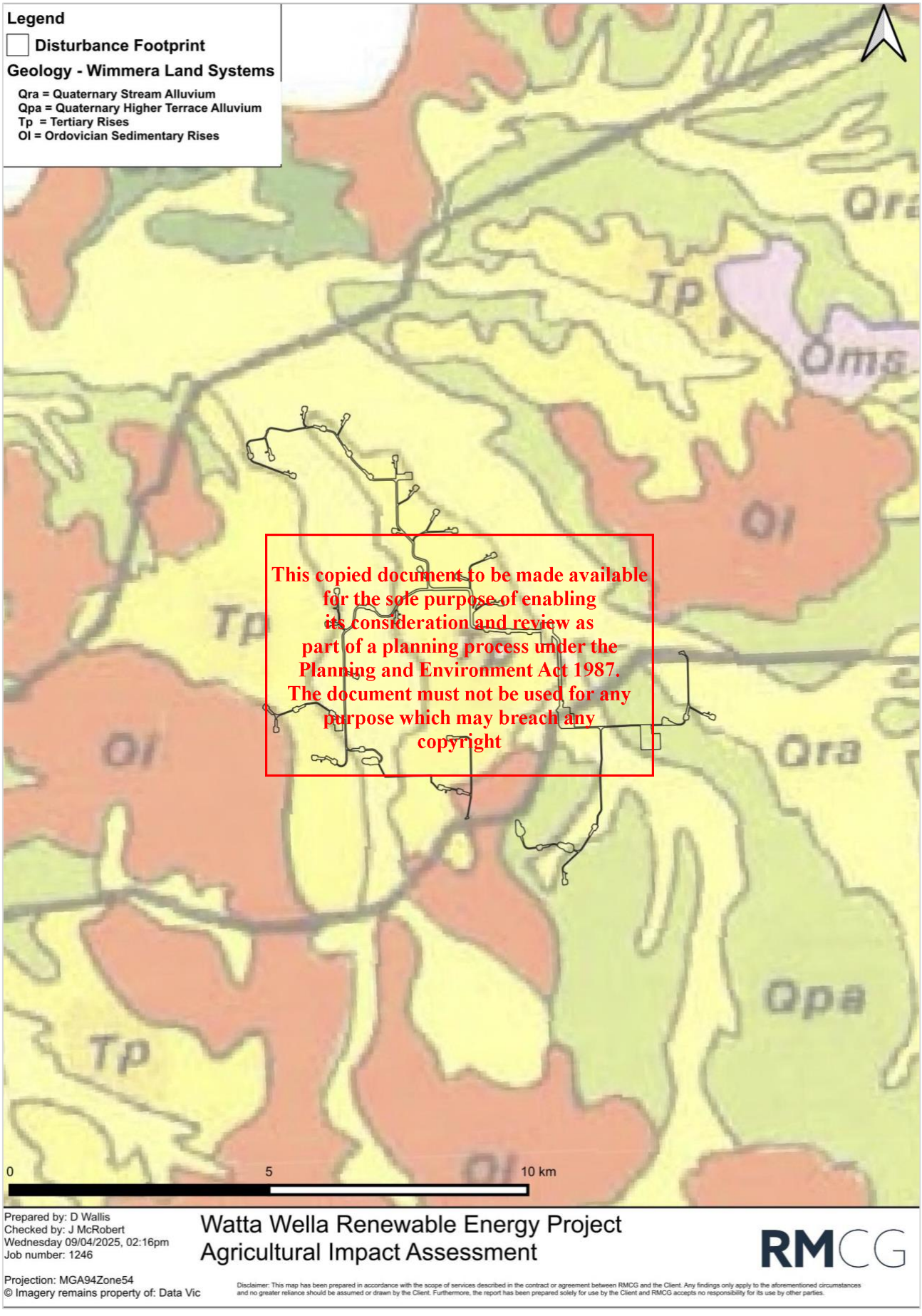
A4 – PLANNING SCHEME ZONES



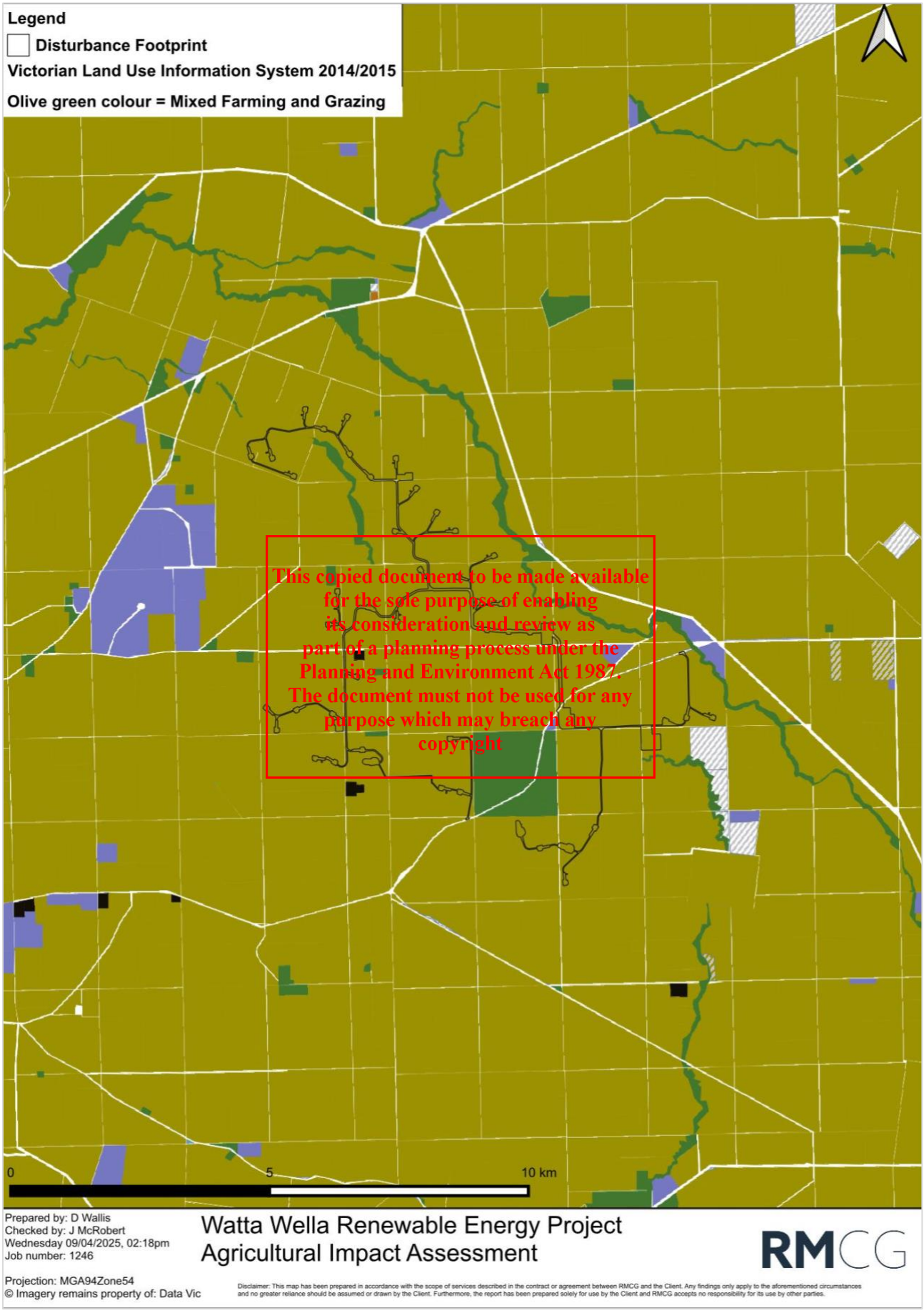
A5 – PLANNING SCHEME OVERLAYS



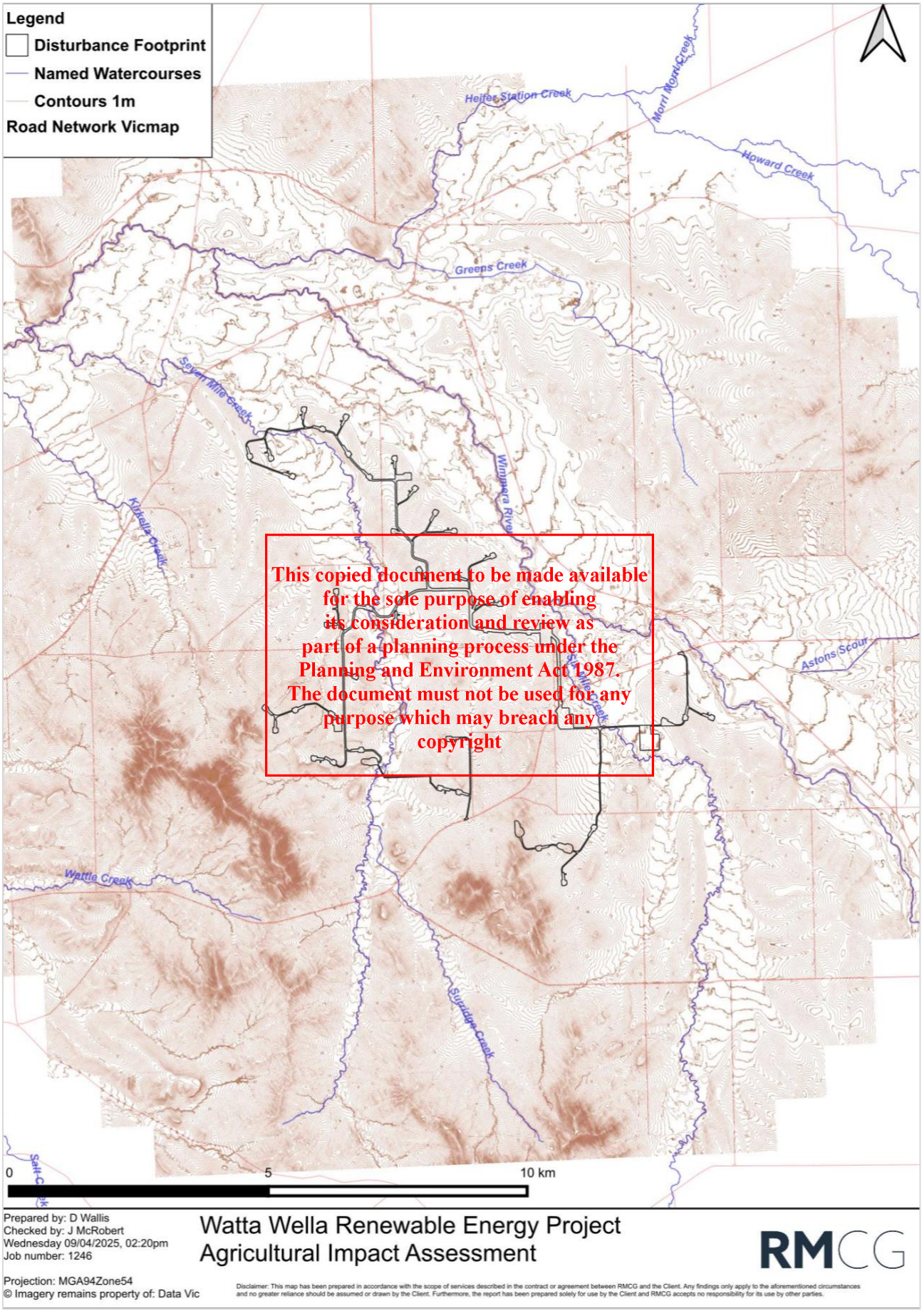
A6 – GEOLOGY AND SOILS



A7 – LAND USE



A8 – LAND RELIEF



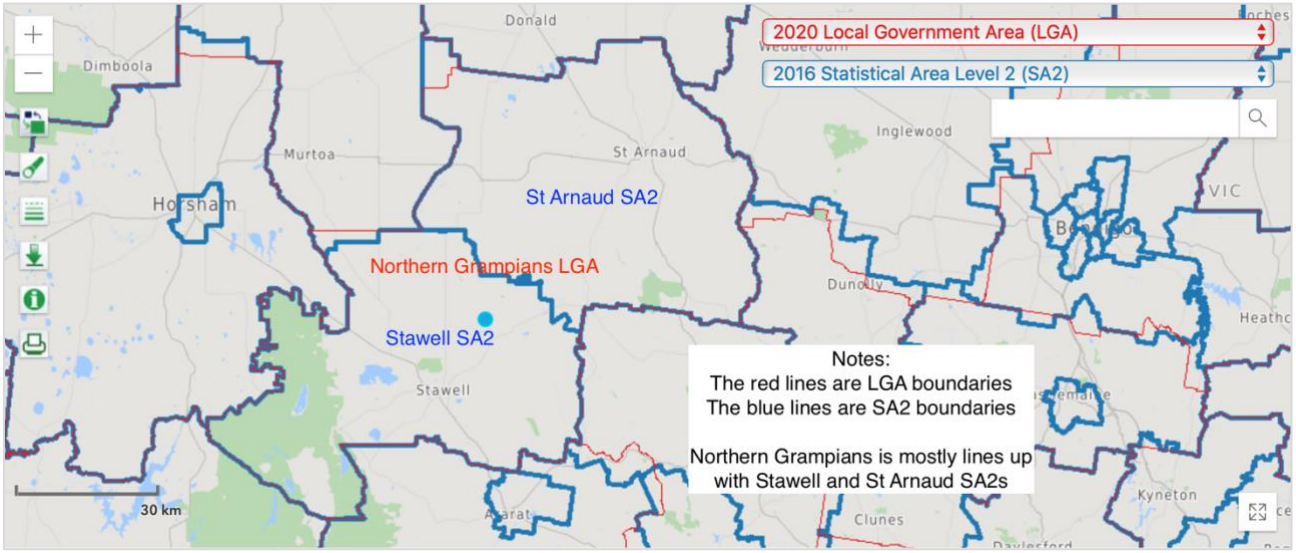
Appendix B: Regional gross agricultural value

Table AB-1: Regional gross agricultural value

Stawell SA2 2020/21					
Sector	**Industry**	**Commodity**	**Gross value ($)**	**Sector total value ($)**	**Sector %**
Broadacre crops	Cereal crops	Wheat for grain	$15,757,219	$46,126,002	42.7%
		Oats for grain	$5,381,435		
		Barley for grain	$6,909,791		
		All other cereals for grain or seed	$41,893		
	Non cereal crops	Canola	$13,767,119		
		Lentils	$167,740		
		Lupins	$268,159		
		Other pulses	$2,753,781		
	All other crops	All other crops	$1,078,867		
Fruit and nuts	Grapes	Wine production	$1,771,557	$1,946,061	1.8%
		All other uses	$174,504		
Livestock products	Wool	Wool	$15,711,942	$15,786,086	14.6%
	Milk	Milk	$74,144		
Livestock slaughtered	Sheep and lambs	Sheep and lambs	$39,919,897	$44,206,021	40.9%
	Cattle and calves	Cattle and calves	$2,549,596		
	Pigs	Pigs	$603,406		
	Other	Other	$1,133,122		
Total				**$108,064,171**	**100.0%**

Source: ABS Agricultural Census - VACPDCASGS202021 - Value of Agricultural Commodities Produced ASGS regions, Australia, 2020-21

BOUNDARIES OF STAWELL STATISTICAL AREA LEVEL SA2



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