habitat

Town Planning Report

Barnawartha North Solar Farm

Renewable Energy Facility & Battery Energy Storage System

Murray Valley Highway, Barnawartha North

JUNE 2023

Submitted to Minister for Planning
On behalf of **BE Pro BWN Pty Ltd**

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Contents

List of Figures

List of Tables

1. Introduction

1.1. Overview

This report has been prepared by Habitat Planning on behalf of BE Pro BWN Pty Ltd in support of a planning permit application for the use and development of a renewable energy facility (solar), associated utility installations and the removal of native vegetation. The subject site is described as Crown Allotment 10, Section 29 in the Parish of Barnawartha North, and is addressed along the Murray Valley Highway, Barnawartha North. The proposal also includes an access track through the adjoining Crown Allotment 6, Section 30 in the Parish of Barnawartha North, with access to be provided from Old Barnawartha Road.

The subject land is zoned Farming Zone ("FZ") pursuant to the Wodonga Planning Scheme ("the planning scheme") and is not subject to any overlays.

A permit is required to:

- use land for a renewable energy facility and utility installation in the FZ, pursuant to Clause 35.07-1;
- construct buildings and carry out works associated with a renewable energy facility and utility installation in the FZ, pursuant to Clause 35.07-4;
- remove native vegetation from the land, pursuant to clause 52.17.

This report and accompanying information is provided in accordance with the requirements of the *Planning and Environment Act 1987* and the planning scheme. It provides a detailed description of the site and its context, an assessment against the relevant planning policies and matters for consideration within the planning scheme and other relevant documentation. This report is also accompanied by specialist technical reports as required.

1.2. The Applicant

BE Pro BWN Pty Ltd is a subsidiary of Bison Energy, a leading international company specialising in renewable energy. The company has many years of experience in developing, building and operating solar power projects in different countries, such as Germany, Italy, Spain, UK, and Japan, and has been operating in Australia since 2017, with regional offices in Albury. The applicant is currently establishing a series of solar farms across NSW and Victoria.

1.3. Background

Bison Energy intends to deliver additional renewable energy inputs into the local electrical network via a micro scale facility. The decision to adopt a micro scale facility was informed by a desire to establish a site responsive development outcome that responded to its existing context and minimised its impact on the potential productivity of the land for agricultural purposes through the isolation of the facility to a smaller footprint. .

As a result, the proposed 'micro solar farm' results in a more efficient use of the land and minimising a range of potential impacts on surrounding land uses. Notwithstanding the reduction in land occupation of the facility, the use of leading PV panel technology enables the facility to generate maximum energy output.

The physical characteristics of the site by way of orientation and relative absence of vegetation make it an ideal candidate to accommodate the desired facility.

A preliminary assessment of the land determined that the site is not subject to potential aboriginal cultural heritage sensitivity and is not of significant biodiversity value.

The land containing the solar facility will be available for small scale animal grazing, which will contribute to the maintenance of the land, as well as ensure surface grasses are kept low in response to bushfire management.

This development ensures that impacts will be reduced through a number of measures, including:

- Siting the development proximate to a 22kV power line to enable a direct connection;
- Establishing a micro scale network which occupies a small surface area of land and contributes a reasonable extent of renewable energy into the network;
- Utilising the highest performing PV panels to generate greater electricity per panel and reduce the extent of land needed;
- Utilising pile driven panel mounts in the construction of the facility minimising extensive soil disturbance and excavation;
- Enabling the land surrounding the site to continue to be farmed for cropping and grazing enterprises during the life of the facility;
- Retaining of agricultural opportunities within the solar facility;
- Minimising visual impacts to adjoining land holders by isolating the facility within a smaller footprint and accommodating large setbacks from the public realm and nearby dwellings not in common ownership; and
- Implementing generous landscape planting areas along sensitive interfaces of the site.

1.4. Consultation

A pre-lodgement meeting was held with relevant stakeholders at the Department of Environment Land Water and Planning ('DELWP') in August 2022 in which the preliminary scheme was presented and initial feedback sought. The key matters discussed at this meeting included the following high level commentary:

- Consider impacts on agricultural land, and how much land may be lost from production and the associated implications on agricultural production within the LGA;
- Consider glint and glare impacts given the partially elevated position of the land;
- Consider impacts on adjoining agricultural production;
- Consider impacts on adjoining residential properties given the proximity;
- Consider interface treatments to road frontages and any long range views;
- Confirm whether based on the scale of the development that run-off flows and rates won't be significantly altered;
- Consider bush fire risks and mitigation measures in the application, however formal management documents can be prepared following planning approval.

In August 2022, the applicant and landowner undertook preliminary public consultation with the immediately surrounding landowners. This was initially conducted by visiting each of the surrounding occupied properties and seeking an opportunity to discuss with the landowner. For landowners not able to meet and discuss, an information sheet was left at the premises with contact details.

Ongoing communication has been held with interested landowners following the initial consultation period and will continue following this assessment phase.

1.5. Supporting Plans and Documentation

This application is accompanied by:

- Title information
- Proposed Plans of Development prepared by Habitat Planning

- Visual Impact Assessment prepared by Yonder Studio
- Landscape Concept Plans prepared by Yonder Studio
- Glint and Glare Assessment prepared by Habitat Planning
- Traffic Impact Assessment Report prepared by Trafficworks
- Agricultural Impact Assessment Report prepared by GHD
- Native Vegetation Assessment Report prepared by Red Gum Consulting
- Noise Impact Assessment Report prepared by Acoustic Dynamics
- Stormwater Management Plan prepared by SJE

2. Site Analysis

2.1. Site Location and Context

The subject site ('the site') is described as Crown Allotment 10, Section 29 in the Parish of Barnawartha North, and is addressed along the Murray Valley Highway, Barnawartha North. Vehicular access to the proposed facility is provided via an access track through the adjoining Crown Allotment 6, Section 30 in the Parish of Barnawartha North, from Old Barnawartha Road.

The subject site is located in Barnawartha North on the western outskirts of the Wodonga Local Government Area and is approximately 1 kilometre north of the Logic Precinct.

A copy of the certificate of title and title plan is attached within this application. There are no covenants or Section 173 agreements registered on the title.

Figure 1 below indicates the subject land in context to the surrounds.

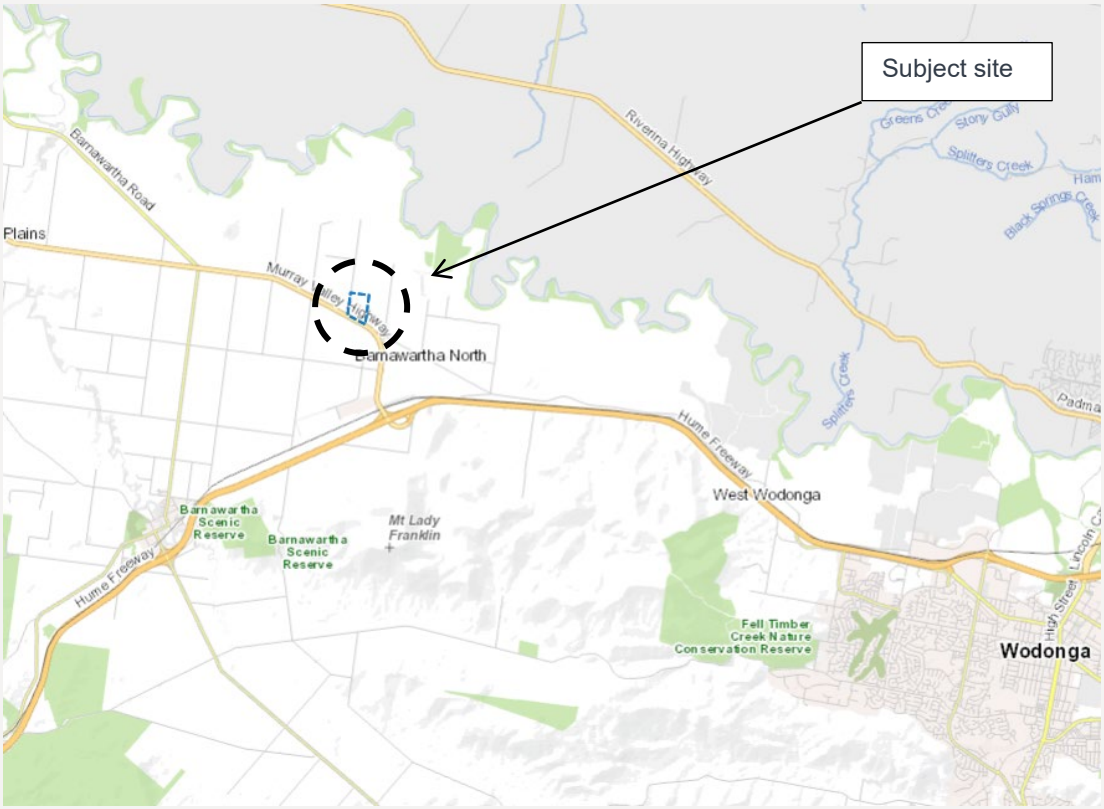

Figure 1 – Context Map

2.2. Site Description

The subject site forms two rectangular parcels. Allotment 10~29\PP2076 has a width of 399 metres and a depth of 630 metres with a total area of 22.08 hectares. The parcel is located on the corner of the Murray Valley Highway to the south and Margery's Road to the west. Allotment 6~30\PP2076 has a width of 496 metres and a depth of 785 metres with a total area of 28.75 hectares. The Murray Valley Highway and Old Barnawartha Road intersect along the southern boundary of this parcel, and Richardsons Road is located along the eastern boundary.

The site is part of a rural property and is vacant of development with the exception of a small rural shed on the northern boundary. The site otherwise consists of managed rural pastures actively used for cattle grazing.

A drainage depression with a dam traverses the site diagonally from the northeast corner of Allotment 10, to the southwest. Some native scattered trees are sparsely distributed along this drainage line, with another patch located towards the western boundary. More trees are spread in linear strips along part of the western, northern and eastern boundaries.

Access is available to Allotment 10 from a rural accessway from Margerys Road. Similar arrangements are provided to Allotment 6 via Richardsons Road. The site does not have access to reticulated water or potable water.

The existing conditions of the property are illustrated by the images at the figures below.

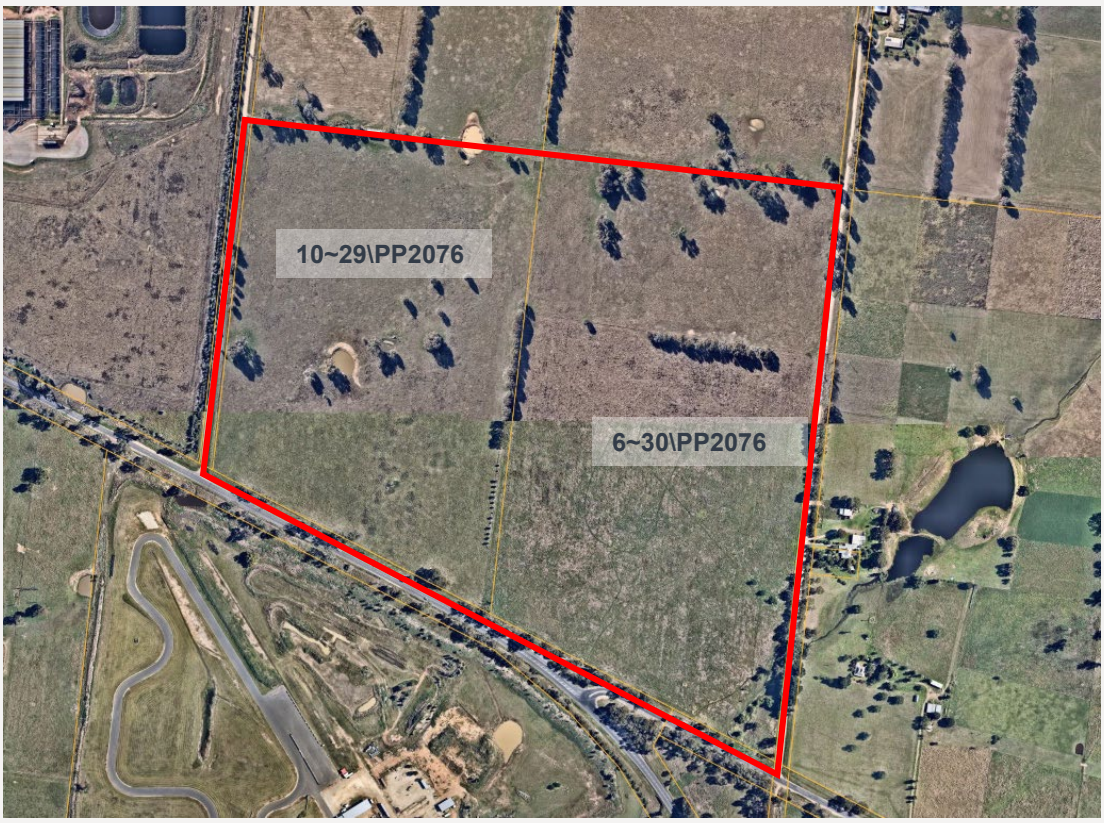

Figure 2 – Aerial view of site

Figure 3 – View facing northeast from the corner of the Murray Valley Highway and Margerys Road

Figure 4 – View facing northwest from the proposed access at Old Barnawartha Road

2.3. Surrounding Development

The surrounding context is predominantly rural, being located on the western fringe of the Wodonga LGA.

Land to the north includes more rural parcels associated with grazing activities. Further north towards the Murray River, land is generally use for agricultural purposes with improvements generally limited to rural dwellings.

Land to the east includes mostly farming properties that extend from along Old Barnawartha Road. Similar development extends along this roadway and the Hume Highway into the outer urban development of West Wodonga, approximately 12 kilometres from the site.

Land to the south includes a motorsport training complex which includes a track and associated facilities. The Logic precinct is located approximately 1 kilometre from the land, that includes a service station and large industrial distribution centres and railway line extending along the Hume Highway.

Land to the west includes the Northern Victoria Livestock Exchange, which is a saleyards facility . Land beyond this facility consists of other rural parcels extending from along the Murray Valley Highway.

Figure 5 – View away from the site at the corner of the Murray Valley Highway and Margerys Road

Figure 6 – View facing west away from the site at the corner of the Murray Valley Highway and Margerys Road

Figure 7 - View along the southern boundary of the site facing east along the Murray Valley Highway from the Margerys Road intersection

3. Description of Proposal

3.1. Overview

The proposal seeks to use and develop the site for the purpose of a solar renewable energy facility with capacity of up to 4.95MW to generate renewable electricity and a 5MW/10MWh Battery Energy Storage System ("BESS"). The facility is proposed to be connected into the 22kV electricity network via a new connection point across Margerys Road into existing power line infrastructure.

To establish the facility, the proposal also requires the removal of native vegetation from the site to allow for the placement of PV panels and associated infrastructure. A new driveway access is to be provided from Old Barnawartha Road via a new rural property access crossover.

The site is located adjacent to a 22kV transmission line on the opposite side of Margerys Road. A new connection point to this network will be achieved via an existing power pole, with overhead lines to be provided across this roadway from new utility installations on the subject site. The connection configuration can be achieved without any reconfiguration of the supply network in this area or across adjoining properties.

The proposed facility is expected to take approximately 6 months to complete construction. It will operate for a period of up to 30 years, after which it may be subject to further operation, with further upgrades, or decommissioned.

3.2. Project details

Specifically, the proposal involves the following primary components:

- Ground mounted solar PV panel array in a single portrait orientation and a single axis tracker system
- 1 x Power Station Unit (SG4950HV-MV or similar) configured in a containerised format incorporating inverters, control room, low voltage and medium voltage switch rooms
- 4 x 5MW/10MWh Battery Energy Storage System (BESS) (ST3584KWH or similar) in a custom pre-configured containerised format adjacent to the Power Station Unit
- 1 x Power Conversion Unit in a custom pre-configured containerised form adjacent to the BESS and Power Station;
- 1 x shed building comprising operations and maintenance functions;
- Internal operational parking area
- 1 x 25,000 litre water tank for fire fighting water supply;
- Hardstand construction laydown/parking area
- New 2.4 metre high security fence comprising steel posts, transparent mesh panels, 1 x 6.0 metre wide facility access gate and 1 x 6.0 metre wide emergency access/egress gate;
- New access crossover and internal unsealed access driveway from Old Barnawartha Road along the southern site boundary to the facility
- Perimeter landscaping (to be located immediately outside new security fence)
- Underground cabling within the facility and from the proposed facility to a new underground connection cable from the facility infrastructure to a new point of connection power pole within the subject site;
- Overhead powerline cable from the proposed on-site point of connection across the Murray Valley Highway to existing power pole and 22kV network

The proposed site plan of the development is attached and reproduced below.

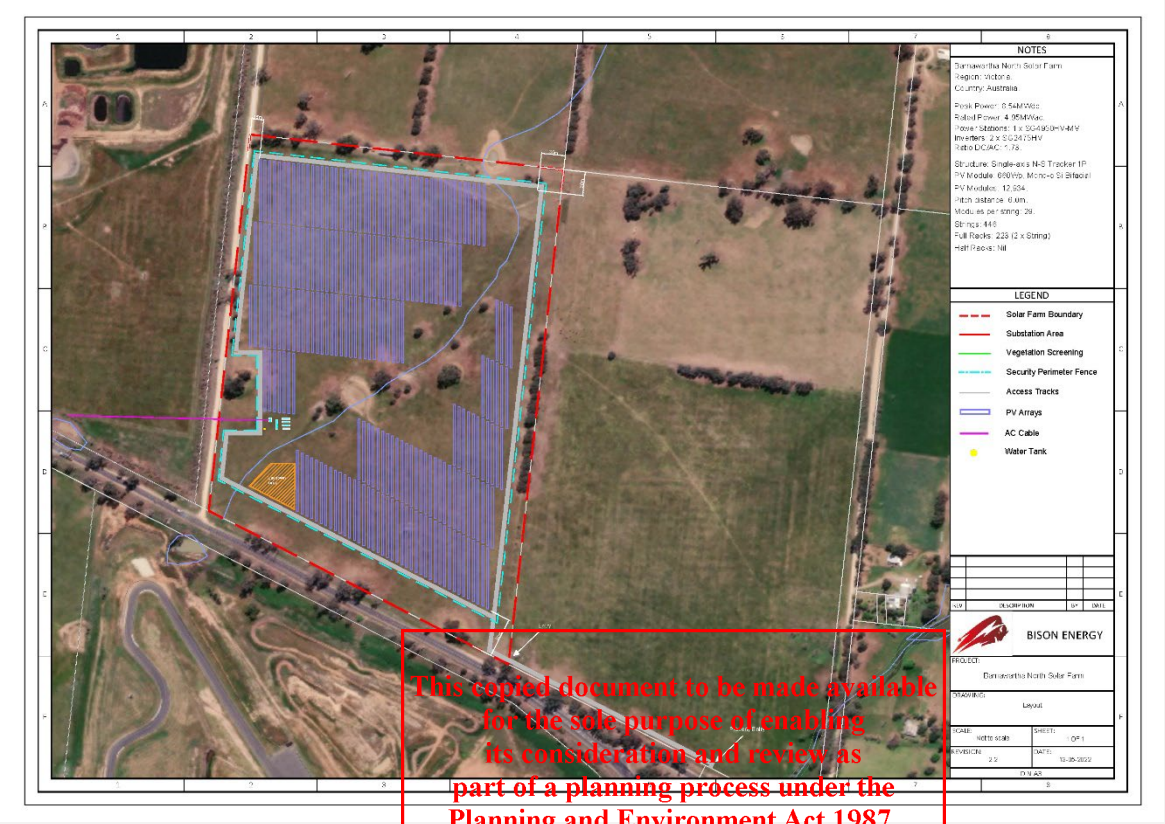

Figure 8 – Proposed site plan for development

3.3. PV Panel Arrays and Single Axis Tracker System

It is proposed to install a total of 12,934 PV Panels in 55 arrays across the property. The proposed PV Panel area will comprise a total area of approximately 12.5 hectares of the subject site, arranged to be split into two parts to avoid the central drainage line.

The solar panels primary function is to absorb the sunlight received and convert this into electricity so the panels are designed to reflect as little light as possible. The panels also absorb the majority of sunlight received (approximately 80-90%) and only reflect a small amount (approximately 2%), resulting in a rate of reflection that is less than other common rural surfaces.

The proposed PV panels are to be installed on a single axis ground mounted tracker system to follow the sun from east to west and obtain the maximum solar exposure. The panels are proposed to tilt in a single axis for 60 degrees beyond horizontal in either direction. The structure will be fixed in placed by pile driven posts at the end of each 'string' being approximately 20 metres.

Each 'string' will consist of 29 modules, and across 446 strings this will total to 12,934 panels across the site.

Proposed PV Panels will be arranged in 'single portrait' orientation (i.e. end to end). Each proposed PV panel type used in the facility will be approximately 2.1 metres x 1 metre and will be mounted onto the steel tracking structure.

The final height of the structure, including panels (when at full 60 degree tilt) and allowing for a ground clearance of at least 0.5 metres, will be approximately 2.6 metres above natural ground level. This final height is dependent on the final clearance needed beneath the panels.

The tracking of the panels are highly programmable and can be set to the desired resting angle once the panels are outside of effective range of the sun. In this instance, the panels will be programmed to remain in their evening position of 60 degrees (i.e. will not backtrack). The intent of this is to reduce the

chance for the panels reflecting glare towards receptors in the surrounds. The tracking of the panels will be set to only rotate towards the morning before sunrise as required, to similarly ensure there will be no potential glare during the morning period. The programmable nature of these panels and the tracking system will ensure that the solar panels will not backtrack to a resting angle of less than 45 degrees.

Figure 9 – Example of a typical single axis tracker system with PV modules mounted in single panel portrait orientation (1P configuration)

3.4. Power Station

The proposal will provide 1 x Power Station Unit (SG4950HV-MV or similar) at the centre of the PV Panel array area. This will contain two inverter units and a LV/MV transformer within a single 'container format' for placement on the site.

The power station will measure approximately 12m x 3m x 2.5m and is proposed to comprise a muted natural colour to blend into the surrounding landscape.

The electricity generated by the proposed panel arrays are directed to inverters via cabling to be constructed throughout the site. The inverters are used to convert the low voltage DC power into low voltage AC power which can then be transformed to higher voltages. This allows for a step up of the voltage from the solar panels and conversion so that it can be connected to the grid.

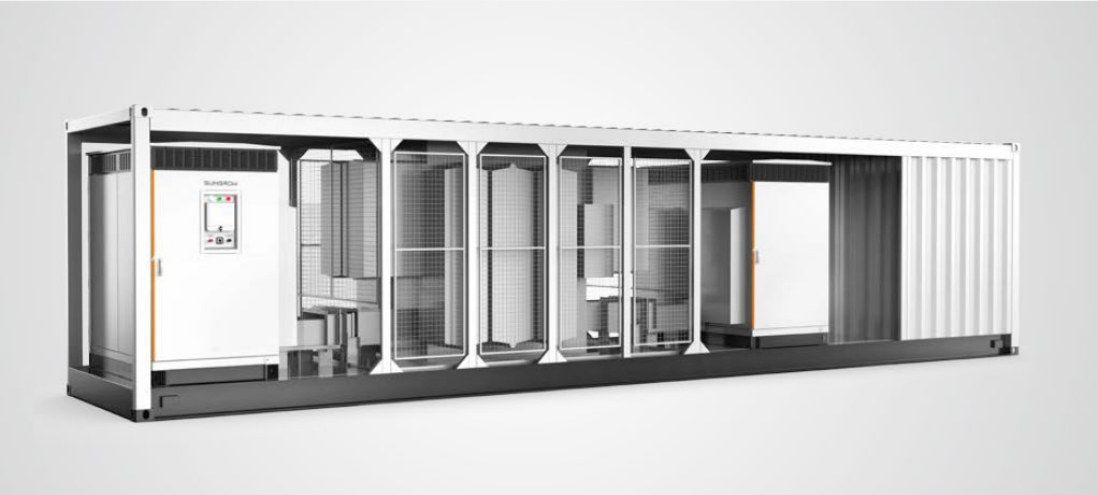

Figure 10 – Typical Power Station Unit to be installed on site (SG4950HV-MV) (Source: Sungrow)

3.5. Battery Energy Storage System

The BESS will consist of four (4) units placed adjacent to one another and the power station. Like the power station unit, the BESS units will take the form of a prefabricated container unit delivered and placed on site.

Each BESS unit will have dimensions of 12.2 metres x 2.5 metres (width) x 2.9 metres (height). The units will each have a battery capacity of 3,584 kWh and a voltage range of 1,080-1,440 V. Each unit will also include heating, ventilation and air conditioning, and will be fitted with a Novec1230 fire suppression system.

During operation, electricity flows from the solar farm power conversion unit via underground electrical cabling to each battery container. The power flow is controlled and directed through the individual battery terminals, charging the internal battery storage cells. During discharge from the battery, the process is reversed with power flows from the battery cells back through an electrical cable connection to the power conversion unit.

Figure 11 – Typical BESS unit to be installed within the facility

3.5.1. Electrical Infrastructure

Supporting the PV panels will be a range of other associated electrical infrastructure components. These facilities will be contained within a dedicated area towards the centre of the PV panel arrays and accessible by the internal driveway access.

The proposed Power Station and BESS units will be located adjacent to one another, with cabling from the arrays provided to the Power Station via underground trenching. New underground cabling will then be constructed through the facility and the southern part of the subject land to provide connection back to the 22kV network.

The substation yard is to comprise a levelled and compacted area of land for movement of vehicles and personnel between proposed parking areas and the facilities.

3.5.2. Cabling

The proposal will comprise a network of aboveground and underground cabling throughout the development. This will consist of DC cabling extending from the solar arrays to the inverters and AC cabling from the inverters to the substation.

Underground cabling will be installed between 0.5-1.0 metres below the ground surface and will be provided by trenching, installing cabling and conduit and backfilling. The disturbed area will be compacted to match the adjacent ground level.

The substation infrastructure will be connected to the nearby 22kV power line across Margerys Road to the immediate west of the subject site. To connect to this network it is proposed to erect a new power pole within the land connecting electrical cables to an existing power pole within this adjoining land. It is noted that this land is part of the adjoining saleyards and is a Council owned property.

Figure 12 – Aerial of the southwest corner of the subject site with the pole to provide

3.6. Access and Movement

Primary access to the site for both construction and operational is to be provided from a new connection to Old Barnawartha Road. This access will comprise a new rural entry in accordance with the Council's Infrastructure Design Manual (IDM) standard drawing for a Rural Entrance Drawing No. SD255. The access point will be an all-weather access rural standard crossover, capable of accommodating all construction and post-construction vehicles to the site.

A new all-weather driveway will be established through Allotment 6~30\PP2076 and into the subject site. This access track will extend along the southern boundary of Allotment 6 and integrate into a proposed internal movement network. This network will form a perimeter road around the PV arrays and provide access to the centrally located substation yard, which will allow suitable access to all areas of the development without substantial disturbance to the site area.

A secondary emergency egress location is proposed at the northwest corner of the site area, which will allow emergency access to Margerys Road. This access point will be available for use in the event of emergency as a secondary access location and is not proposed to be used on a day-to-day basis.

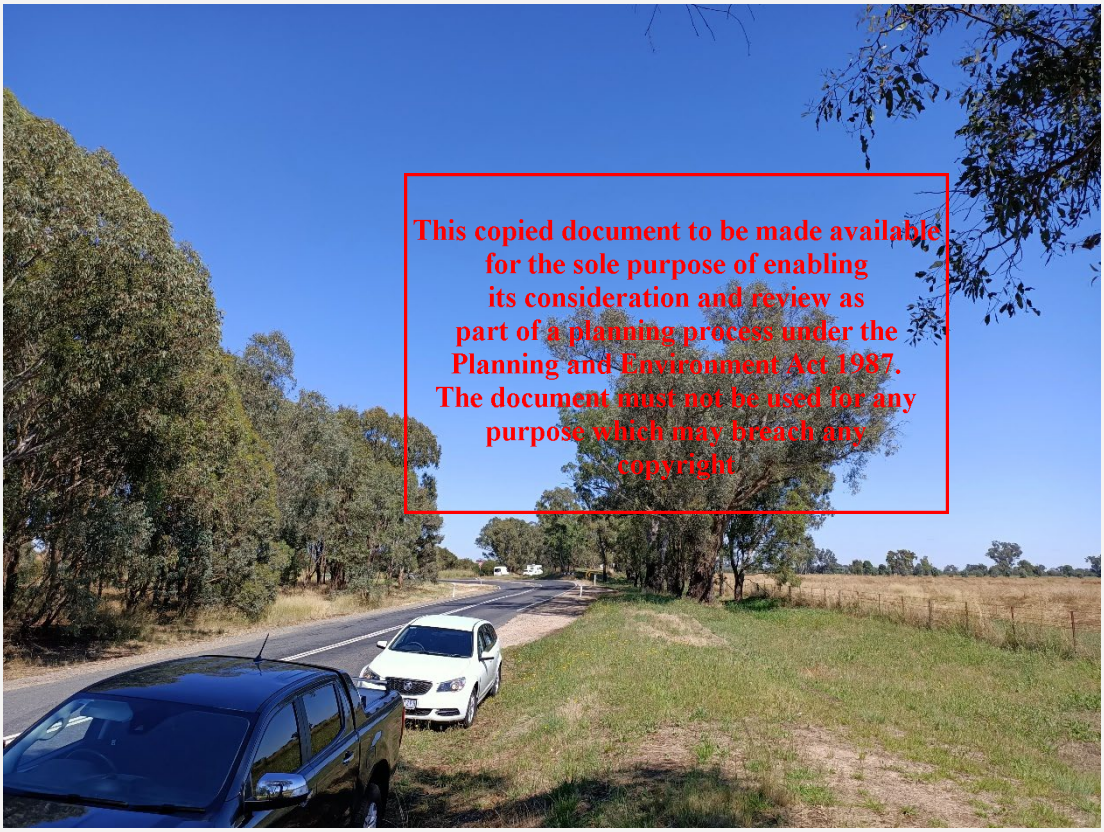

Figure 13 – View of the proposed primary access crossover location, facing west

3.7. Maintenance

Once operational, the facility will involve daily monitoring of plant and all associated infrastructure. Staff will access the site as necessary for monitoring and management of equipment.

Where required, minor repairs and maintenance of components of the facility will be undertaken by either staff or contractors. Other occasional maintenance tasks will include washing panels, controlling grass and weeds on site, maintaining internal access tracks, general waste collection and disposal.

Regular inspections of the site will be carried out to ensure that grassland is managed to reduce the risk of bushfire to surrounding land and to control weeds. Mowing or slashing between rows of PV panels and in the area immediately surrounding the arrays would be carried out as required.

3.8. Landscaping

The proposal includes a 3-metre-wide landscape buffer along the southern boundary, part of the western boundary, and part of the north-eastern boundary of the site. The other areas of the site are not proposed to include a landscape buffer due to the existing established vegetation and/or lack of interface with any sensitive uses. As such, treatments to these interfaces have been considered in relation to the particular interface, the nature of development beyond the site and screening needs for each interface.

The proposed landscaping outcome is intended to be a long term addition, being that it will contribute to the long term linkages within the area and serve as a useful boundary definition for ongoing agricultural operation. The identification of landscaping on boundaries has also had regard for the long term function of the land, such as need to ensure connection between the full parcel of land after any solar proposal has been decommissioned.

The proposed landscape response is detailed in the attached plans.

3.9. Stormwater and Drainage

The development will include new internal access tracks with swale drainage able to be provided subject to final design. The extent of these tracks are unlikely to generate significant additional movements, with the final design able to ensure that the internal swales will accommodate enough capacity for the likely runoff and ensuring that it will continue to be directed to natural overland flow paths established on the site.

The runoff from the increased imperviousness of the solar panels is insignificant. As the entire solar array is not a continuous impervious surface, most of this runoff will infiltrate into the soil as per current conditions.

3.10. Security

Security of the solar facility will be critical to operations and ensuring safety of the public. A new 2.4 metre-high security fence is to be established inside the lease area and set behind the proposed landscape buffers, to enclose the proposed solar panel arrays.

No security lighting will be installed for the facility.

3.11. Vegetation Removal

The proposed works will require the removal of native vegetation including two (2) standing dead trees (SDT), one (1) Scattered tree along the roadside, one (1) patch of native grasses and one (1) patch of regenerating yellow box (E. melliodora) trees with a predominantly native (yet disturbed) understorey in the roadside adjoining the site (which are to be removed to facilitate site access).

Vegetation removal is further detailed in Section 7 of this report.

3.12. Decommissioning

The facility is intended to remain in operation for a period of up to 30 years and may be continued for a further period of 10 years of more beyond this period subject to landowner and operator agreement. This period of time represents the useable life of a solar facility, after which the infrastructure and components would need to be upgraded to the latest technologies for ongoing efficient operation.

If the facility ceases operations at this point, all infrastructure, panels, mounting frames including footings, inverters, cabling and other sub-surface materials would be disassembled and removed from the site to enable the site to be re-cultivated for cropping or grazing purposes.

3.13. Operational Summary

The operational phase of the facility is expected to be up to 30 years from the completion of construction. The operational matters of the facility is summarised in the following table.

Component	
Hours of operation	The facility will generate power during daylight hours, with all infrastructure being operational at all times. Staff will only generally access the site during daytime periods. In emergency events, staff may be required to access the property.
Operations & Management	Daily inspection and monitoring of the facility by full-time employed staff. Maintenance and operational checks daily/weekly/monthly as per on-site operational guidelines Off-site maintenance crews and contractors to be employed as required to undertake repairs.
Workforce	2 persons are to be employed for ongoing operation of the site. Not all personnel will be on-site at any one time.
Traffic	The rate of traffic expected would be 4 vehicles entering in the morning peak period and 4 vehicles departing in the afternoon peak period. Truck movements would include 2 to 3 heavy vehicles per day in the first month of construction, reducing to 1 heavy vehicle movement per day in months two to three. Infrequent deliveries may be necessary to the site by large vehicles delivering parts, plant or equipment. Access will be required from time to time by the power authority to the substation on site, with access to be provided from Barnawartha Road.
Car parking	A parking area is to be established adjacent to the proposed substation and will be accessible from the main entry via the internal access track.
Maintenance	Cleaning of PV Panels will be undertaken with water, to be sourced from water trucks brought to site. Any repairs to panels or other equipment or infrastructure will be undertaken on an as needs basis either by employed staff or contractors.

Component	
Security	Perimeter security fencing to the area containing the proposed panel array. The facility may utilise CCTV monitoring of access points and substation areas. Security patrols of the property may also be carried out by private contractors.
Lighting	No lighting to be proposed.
Noise sources	Operation of inverters and infrastructure associated with the facility during daylight hours when electricity is being generated.
Storage	There will be no storage of hazardous or dangerous goods or materials on site during the operation of the facility.
Waste	Minimal waste is to be generated during operation and will be limited to: • General waste from site office, including paper, plastic and glass and putrescible waste including food waste, bottles, cans and paper; • Waste resulting from maintenance work, including packaging, and decommissioned/removed equipment. • All waste will be stored in bin or otherwise stockpile areas, which will divide waste into landfill and recycling streams. These waste materials will then be taken to off-site waste management facilities. A detailed Waste Management Plan (WMP) will be prepared and endorsed prior to works commencing on site, which will include management of any waste generated during operation.

4. Statutory Planning Framework

4.1. Planning Policy Framework (PPF)

The PPF seeks to ensure that the objectives of planning in Victoria (as set out in Section 4 of the *Planning and Environment Act 1987*) are fostered through appropriate land use and development policies and practices. It informs the preparation and implementation of local planning policy objectives and the introduction of zone and overlay controls, and seeks to integrate relevant environmental, cultural, social and economic factors in the interest of net community benefit and sustainable development.

The following clauses from the PPF are relevant to this application:

- **Clause 12 (Environmental and Landscape Values)** which refers to the protection of values including biodiversity and any potential impacts the amenity of the landscape.
- **Clause 12.01-1S (Protection of Biodiversity)** seeks to protect and enhance Victoria's Biodiversity.
- **Clause 12.01-2S (Native Vegetation Management)** seeks to ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation.
- **Clause 12.03-1S (River And Riparian Corridors, Waterways, Lakes, Wetlands And Billabongs)** seeks to protect and enhance waterway systems including river and riparian corridors, waterways, lakes, wetlands and billabongs.
- **Clause 13.01-1S (Natural Hazards and Climate Change)** seeks to minimise the impacts of natural hazards and adapt to the impacts of climate change through risk-based planning.
- **Clause 13.02-1S (Bushfire)** seeks to strengthen the resilience of settlements and communities to bushfire through risk-based planning that prioritises the protection of human life.
- **Clause 13.04-2S (Erosion and Landslip)** seeks to protect areas prone to erosion, landslip or other land degradation processes.
- **Clause 13.05-1S (Noise)** seeks to assist the management of noise effects on sensitive land uses.
- **Clause 13.07-1S (Land Use Compatibility)** seeks to protect community amenity, human health and safety while facilitating appropriate commercial, industrial, infrastructure or other uses with potential adverse off-site impacts.
- **Clause 14.01-1S (Protection of Agricultural Land)** seeks to protect the state's agricultural base by preserving productive farmland.
- **Clause 14.01-2S (Sustainable Agricultural Land Use)** seeks to encourage sustainable agricultural land use.
- **Clause 15.01-1S (Urban Design)** seeks to create urban environments that are safe, healthy, functional and enjoyable and that contribute to a sense of place and cultural identity.
- **Clause 15.01-1L-01 (Urban Design Along Main Roads)** seeks to ensure that all new use and development makes a positive contribution to the built environment in terms of design, siting, landscaping, ongoing maintenance and presentation.
- **Clause 15.01-6S (Design for Rural Area)** seeks to ensure development respects valued areas of rural character.
- **Clause 19.01-1S (Energy Supply)** seeks to facilitate appropriate development of energy supply infrastructure.
- **Clause 19.01-2S (Renewable Energy)** seeks to support the provision and use of renewable energy in a manner that ensures appropriate siting and design considerations are met.

- **Clause 19.01-2R (Renewable Energy – Hume)** seeks to create renewable energy hubs that support co-location of industries to maximise resource use efficiency and minimise waste generation and support opportunities to generate renewable energy from waste.

4.2. Municipal Planning Strategy

This section responds to the purpose of the Planning Scheme and the vision and strategic direction for the Municipality of Wodonga.

This section responds to the purpose of the Planning Scheme and the vision and strategic direction for the Municipality of Wodonga.

- **Clause 02.02 – Vision** the vision for Wodonga is an accessible, well- connected and sustainable city with a vibrant economy that fosters a sense of belonging and is welcoming to both residents and visitors. Wodonga provides the liveability associated with the country in tandem with many of the opportunities of a metropolitan area.
- **Clause 02.03-3 – Environmental Risks and Amenity** outlines the series of environmental hazards posing risk to the municipality with respect to Bushfire, Flooding and Soil Degradation and outlines series of strategies for consideration in addressing these risks.
- **Clause 02.03-4 Natural Resource Management** outlines the importance of Wodonga's rural land in relation to its agricultural productivity and land landscape quality. The policy seeks to protect the viability and productive capacity of this asset.
- **Clause 2.03-5 – Built Environment and Heritage** recognises the diversity of heritage places within Wodonga identifying that in conjunction with the settlement pattern and surrounding rural areas they provide valuable insight into the history and development of the region. The Clause goes on to emphasise the importance of quality urban design outcomes and the role that the built environment plays in facilitating safer, healthier, more inclusive and sustainable neighbourhoods
- **Clause 02.03-7 – Economic Development (Industry)** outlines that strong population growth and proactive economic development strategies have resulted in employment growth in the manufacturing and construction industries.
- **Clause 02.03-9 Infrastructure** recognises the historical challenges associated with leveraging of development contributions and outlines the catchments likely to demand services and infrastructure as the city grows. The Clause goes on to outlines a series of outcomes Council will seek to adopt to support the efficient delivery of infrastructure.

4.3. Farming Zone

The subject site is located within the Farming Zone ("FZ") of the Wodonga Planning Scheme.

The relevant purpose of the FZ is:

- *To provide for the use of land for agriculture.*
- *To encourage the retention of productive agricultural land.*
- *To ensure that non-agricultural uses, including dwellings, do not adversely affect the use of land for agriculture.*
- *To encourage the retention of employment and population to support rural communities.*
- *To encourage use and development of land based on comprehensive and sustainable land management practices and infrastructure provision.*
- *To provide for the use and development of land for the specific purposes identified in a schedule to this zone.*

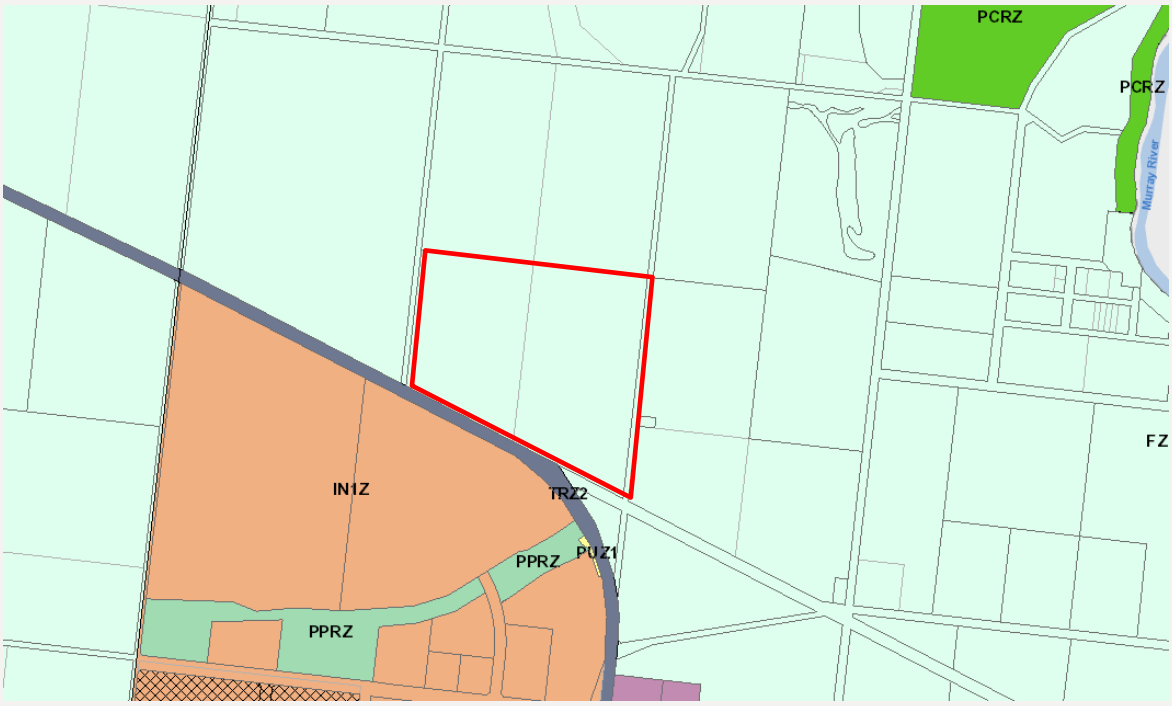

Figure 14 - Site Zoning

4.4. Overlays

No overlays affect the property.

4.5. Particular Provisions

- Native Vegetation (Clause 52.17)
- Land adjacent to the Principal Road Network (Clause 52.29)
- Bushfire Planning (Clause 53.02)
- Renewable Energy Facility (Clause 53.13)
- Decision guidelines (Clause 65)

5. Planning Considerations

A consideration of the planning merits of the proposal and how it responds to the relevant policies and planning provisions in relation to the land use and development has been divided and assessed under the following key questions:

- Is the proposal consistent with the key strategic planning directions?
- Is the proposal consistent with the objectives, requirements and decision guidelines of the Farming Zone?
- Does the proposal result in an unreasonable loss of productive agricultural land?
- Does the proposal respond to the requirements of Clause 53.13?
- Is the proposed native vegetation removal result in an acceptable outcome?
- Does the proposal represent an acceptable design response?
- Does the proposal represent an unreasonable visual impact?
- Does the proposal minimise potential offsite amenity impacts associated with noise?
- Does the proposal result in acceptable traffic, access and parking arrangements?
- Does the proposal appropriately respond to potential bushfire risk?
- Are the proposed stormwater and drainage arrangements appropriate?

5.1. Is the proposal consistent with the key strategic planning directions?

Within the Planning Policy Framework and Municipal Policy Framework, key themes emerge in relation to the strategic directions and policy objectives sought. The proposal responds to these themes by:

- Directly facilitating the development of renewable energy sources to assist in the combatting of climate change forces.
- Promoting the provision and use of renewable energy in a manner that ensures appropriate siting and design considerations are met.
- Providing a clean and renewable source of energy while minimising the potential for any negative environmental impacts.
- Contributing to a reduction in the Municipalities' carbon footprint to help to mitigate risks associated with climate change as well as reduce the dependence on non-renewable sources of energy.
- Siting and designing the facility to minimise impacts on the surrounding environment and community, through site responsive design including isolating the footprint to an area separated from sensitive receptors as well as mitigating issues associated with noise and visual amenity.
- Implementing the principles of ecologically sustainable development through the provision of alternative energy sources and renewable energy facilities.
- Minimising the removal of native vegetation where possible and where native vegetation has been proposed to be removed is proposed to be offset via a third party registered offset broker.
- Minimising the extent of ground disturbance through the use of direct piling for the installation of mounting pole and limiting grading and compaction construction techniques to the development of accessing roads and installation of associated hardstand area.
- Designing and siting the facility to protect and enhance the surrounding rural landscape while contributing to the implementation of the provision of sustainable environmental character.

- Providing a clean and renewable source of energy that supports emergency preparedness and enhances the resilience of the community.
- Siting and designing development to minimise visual impacts on surrounding natural scenery and landscape features of the surrounding context.
- Contributing to the decentralisation of the energy production through the provision of alternate sources or energy production.
- Design for bushfire mitigation through observing the design, alignment and setback recommendations of the *Solar Energy Facilities Design & Development Guidelines*.
- Providing a positive contribution to the built form environment through appropriate siting, design, landscaping and ongoing maintenance to minimise the impact of the development and prioritise the safety for users of the Murray Valley Highway.
- Siting and designing the facility to minimise associate impacts related to noise on surrounding sensitive receptors.
- Promoting the foundational principles of best practice urban design through the considered siting and location of the facility to maximise energy production through a largely unimpeded northerly aspect while having minimising impact on surrounding receptors and existing site conditions.
- Stimulating economic growth through the creation of new job opportunities in the construction, development and ongoing management of the proposed facility, broadening the economic base of the Municipality.
- Reducing the impacts associated with climate change through the provision of additional supply of renewable energy into to the grid, reducing the reliance on non-renewable energy sources that are associated with myriad negative climate, health and economic issues, and contributing to a more sustainable and reliable energy supply to support the growth and development of the Municipality.
- Supporting the sustainable development of the Municipality through the provision of a reliable and renewable source of energy that contributes to a raft of social, economic and environmental benefits for the broader community.

5.2. Is the proposal consistent with the objectives, requirements and decision guidelines of the Farming Zone?

The overarching objectives of the Farming Zone place a strong emphasis on the retention and ongoing enhancement of productive farming land to ensure its ongoing viability for agricultural use. The Zone goes on to prioritise the use of the land for agricultural purposes and ensure that uses not directly related agricultural activities be limited.

The use of the land for the purpose of a renewable energy facility is a Section 2 (permit required) land use. Pursuant to Clause 73.03 a renewable energy facility is defined as:

> *Land used to generate energy using resources that can be rapidly replaced by an ongoing natural process. Renewable energy resources include the sun, wind, the ocean, water flows, organic matter and the earth's heat.*
>
> *It includes any building or other structure or thing used in or in connection with the generation of energy by a renewable resource.*
>
> *It does not include a renewable energy facility principally used to supply energy for an existing use of the land.*

A solar energy facility is included within this definition; however, is also separately defined pursuant to Clause 73.03 as:

> *Land used to generate electricity from solar energy using ground-mounted photovoltaic and thermal technology, where the primary role is to export power to the electricity network.*
>
> *It does not include the generation of electricity principally used for an existing use of land.*

The proposed development is considered to harness the ambitions and directions of this Clause to deliver an acceptable land use outcome for the site.

Renewable energy production is commonly undertaken in rural areas given the larger spatial provision and availability of land, and planning policy recognises that such uses can be appropriately accommodated in rural areas. In particular, it is noted that 'agricultural production' as defined by the planning scheme includes "*Any form of primary production of renewable commodities*" (emphasis added).

While not typically reflective of standard agricultural uses the proposed development delivers on the ambitions of policy through the production of renewable energy in accordance with this definition. Through the considered design, siting and minimally invasive construction techniques the proposal also seeks to ensure that surrounding agricultural uses and the balance of the site are not compromised by the development. The remainder of the property will continue to be farmed, in the traditional agricultural sense, by allowing small scale 'agrivoltaic grazing' for livestock or cropping. Agrivoltaics is noted to be a proven method of maintaining the site conditions, offering frost protection to pastures and assisting with better growth. It is also a benefit in creating shade for stock or pasture establishment in the property.

The development will not include any substantial permanent works on the land to enable the site to have limited direct impact on the physical state of the site and ensure transition of the site to agricultural land can be achieved efficiently after decommissioning of the solar facility.

Once operational, the proposal will be a 'passive' development in that it will not generate high levels of traffic, will not generate any significant noise and has been designed to be as recessive as possible in the landscape.

The development of a renewable energy facility is considered to facilitate the overarching objectives of this Clause in the following ways:

- Implements the MPS and PPF through the promotion of sustainable development and supporting the transition to a low-carbon economy. The production and use of renewable energy sources can reduce greenhouse gas emissions and mitigate the impacts of climate change, which are key objectives of these planning policies and frameworks.
- Supporting the provision of land for agricultural purposes by utilising underutilised or marginal land, such as unused farmland for the purposes of energy production thus preserving productive agricultural land from encroachment from alternative uses.
- Minimising the impact of the development on the ongoing production of the land for agricultural uses through appropriate siting, design and use of minimally invasive construction techniques to limit the impact on land.
- Providing for a meaningful contribution to the local economy through a broadening of the economic base to include the development of renewable energy. It is anticipated that the development will contribute to the creation of local employment opportunities through the construction, development and ongoing management of the facility as well as decentralising the income source of the landowner away from standard agricultural practices.
- Contributing to the sustainable management of the land through best practice initiatives including vegetation and land management, erosion control and bushfire risk minimisation.
- Facilitating a meaningful contribution to the ongoing long-term sustainability of the area,

Decision Guidelines

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate the decision guidelines of the FZ. The decision guidelines considered against this proposal in below.

Table 1 – Consideration of the decision guidelines of the FZ

Decision Guidelines	Response
General	
• The Municipal Planning Strategy and the Planning Policy Framework	Addressed in **Section 4.1**.
• Any Regional Catchment Strategy and associated plan applying to the land	The North East Regional Catchment Strategy is the relevant catchment strategy that applies to the land. The proposal is consistent with this strategy.
• The capability of the land to accommodate the proposed use or development, including the disposal of effluent.	The land is suitable to accommodate the proposed development as it has excellent site access for both construction and operational traffic, is flat, is generally cleared and connections can easily be extended to the substation from the proposed point of connection opposite the Margerys Road. The site is able to accommodate the use with minimal impact. The works proposed will include ground disturbance and tree removal, however no on-site wastewater disposal is required.
• How the use or development relates to sustainable land management.	The use of the land in this instance is for an activity that will provide a sustainable renewable energy source. The earthworks required to establish the facility are not extensive and will involve only the driving of mounting piles and the establishment of the unsealed internal road. The use itself allows for transition to rural land in the future and will also ensure that surrounding land is not impacted, and may still continue to be farmed. After the decommissioning of the land, the land can return to its former agricultural function.
• Whether the site is suitable for the use or development and whether the proposal is compatible with adjoining and nearby land uses.	This Planning Report and the submitted technical assessments demonstrate that the land is suitable for development of a solar facility, particularly when considered against the siting and design requirements of the Solar Facility Design Guidelines. Residential dwellings and receptors are noted in the surrounding area, however, can be appropriately buffered from the development through the incorporation of landscape planting. The site is also located on land directly adjacent to existing power authority infrastructure that will provide for efficient distribution of generated electricity. The facility can be connected into the electrical network at the new point of connection opposite Margerys Road, within Council-owned parcel associated with the adjoining saleyards facility.

Decision Guidelines	Response
• How the use and development makes use of existing infrastructure and services.	The proposal will not have any significant load on existing services in the area, and will be appropriately connected into the electricity network in accordance with AusNet's requirements. The proposal has a positive benefit in that it will deliver additional renewable energy input into the local electricity system.
Agricultural issues and the impacts from non-agricultural uses	
• Whether the use or development will support and enhance agricultural production.	The proposed use is for a renewable energy facility, however, has been carefully considered and designed to be integrated into the agricultural context without significant impacts. The land will not be significantly compromised give the nature of construction works, and can be decommissioned and returned to an agricultural function at the end of its life. 'Agricultural production' as defined by the planning scheme includes "*Any form of primary production of renewable commodities*." This recognises that establishing land for renewable energy can be done in a manner which is sustainable to the agricultural conditions of rural properties.
• Whether the use or development will adversely affect soil quality or permanently remove land from agricultural production.	Earthworks for the development are minimal, as described above, and will not include significant disturbance of the site conditions. Topography and other physical conditions will be generally unchanged. Once decommissioned, the subject site can be easily reinstated to be used for productive purposes. The works will therefore not permanently remove land from agricultural production.
• The potential for the use or development to limit the operation and expansion of adjoining and nearby agricultural uses.	The development does not include any processes that will impact surrounding agricultural uses or expansion.
• The capacity of the site to sustain the agricultural use.	The remainder of the site will still operate for grazing purposes. Through leasing a portion of their holding, the landowners will be able to diversify their income and provide assurance of continued viability of operations. The parcel to be used for solar energy production will include small scale grazing purposes which represent ongoing low impact agricultural functions of the land to be developed.

Decision Guidelines	Response
• The agricultural qualities of the land, such as soil quality, access to water and access to rural infrastructure.	Refer to discussion above.
• Any integrated land management plan prepared for the site.	Not applicable.
Environmental issues	
• The impact of the proposal on the natural physical features and resources of the area, in particular on soil and water quality.	The development has been designed to minimise the impact upon the natural and environmental features of the land. It has been located within an area of the site that avoids the more significant areas of native vegetation, being the area along the western boundary. Rather, it occupies land which has been heavily modified for agricultural uses. There is a drainage line which runs through the site. The PV-array layout is distinctively split and buffered from this line to avoid impacts on this waterway. As such, the hydrology of the site will not be significantly altered. The additional hardstand of the substation yard can be accommodated by new smaller drainage facilities, integrating with existing drainage paths.
• The impact of the use or development on the flora and fauna on the site and its surrounds	As above, the proposed works are within an area of the site that avoids significant areas of native vegetation. With respect to removal the accompanying Native Vegetation Removal Report states: "*…two (2) standing dead trees (SDT), one (1) Scattered tree along the roadside, one (1) patch of native grasses and one (1) patch of regenerating yellow box (E. melliodora) trees with a predominantly native (yet disturbed) understorey in the roadside adjoining the site (which are to be removed to facilitate site access) are proposed to be removed.* *While the lost (living trees) are native, they are young regeneration surrounded by higher quality trees in the remnant vegetation located within the roadside reserve to the east and west. This access point was the lowest impact option, as the more cleared area to the west was unable to be utilised due to the presence of solid lines on the road from the intersection with the Murray Valley Highway.* *The SDTs (1A & 2A) contain some small hollows that may currently be used by woodland birds and or micro bats, however the isolated nature of these trees means they are highly unlikely to contain arboreal mammals. The four lost trees in the roadside do not possess any obvious hollow*

Decision Guidelines	Response
	bearing branches or trunk knots that may be used by woodland birds as nesting sites".
• The need to protect and enhance the biodiversity of the area, including the retention of vegetation and faunal habitat and the need to revegetate land including riparian buffers along waterways, gullies, ridgelines, property boundaries and saline discharge and recharge area	Areas of more significant vegetation have been protected by the proposal. The development will also include the establishment of new perimeter plantings in sections that are not buffered by established vegetation, which will provide additional revegetation opportunities. The development will also offset the vegetation loss from the site within the surrounding region.
• The location of on-site effluent disposal areas to minimise the impact of nutrient loads on waterways and native vegetation.	There is no on-site effluent disposal required as part of the proposal.
Design and siting issues	
• The need to locate buildings in one area to avoid any adverse impacts on surrounding agricultural uses and to minimise the loss of productive agricultural land.	The layout of all structures is distributed across the lease area, while incorporating generous setbacks and perimeter landscaping. As discussed throughout this report, the placement of panels also allows generally minimal impact on the landscape and avoids large scale landform changes.
• The impact of the siting, design, height, bulk, colours and materials to be used, on the natural environment, major roads, vistas and water features and the measures to be undertaken to minimise any adverse impacts.	The subject site and immediate surrounds are generally flat; however, the size and scale may have visual impacts on the surrounds. A visual impact assessment has been carried out in response, and subsequently recommends appropriate interface plantings and treatments. Visual impacts have been considered in terms of general visual impact and glare impacts, with the landscaping and siting design response provided accordingly. Landscape buffers are proposed along parts of the perimeter without vegetation interface. This is also intended to assist with minimising potential for glare.
• The impact on the character and appearance of the area or features of architectural, historic or scientific significance or of natural scenic beauty or importance	The design of the facility to incorporate only a small area of the holding, with generous setbacks to the adjoining roads and use of landscaping. The new features on the site will be generally non-reflective and the panels will be treated with anti-reflective coating. This means that the facility will remain passive in the landscape.
• The location and design of existing and proposed infrastructure including roads, gas, water, drainage, telecommunications and sewerage facilities	The proposed facility is provided with public road access, including the primary access via a new internal track from Old Barnawartha Road to the east, and a secondary access gate for emergency access located to the west to Margerys Road.

Decision Guidelines	Response
	The proposal will connect to the electrical infrastructure point of connection located to the immediate west opposite the Margerys Road within the adjoining saleyards site owned by Council. The site does not require connections to other essential service infrastructure.
• Whether the use and development will require traffic management measures.	A Traffic Impact Assessment has been completed and is attached to this application, please refer to this report for further details.

5.3. Does the proposal result in an unreasonable loss of productive agricultural land?

The majority of renewable solar energy development is undertaken on rural land, and the planning scheme and DELWP guidelines set out various considerations when proposing such uses on rural land. The development has been considered with regard to potential impact on agricultural production, and the need to avoid permanent loss of high value rural land.

An Agricultural Impact Assessment ("the AIA") has been undertaken by ICD and accompanies this planning permit application. The assessment considers the sites agricultural capability, the regional implications of removing agricultural land use from the site and provides commentary on whether the proposed facility can co-locate with other agricultural activities.

The assessment uses a variety of information sources including current land use, Victorian geomorphology framework, gross value of agricultural production and employment statistics. The impact of removal has also considered the agricultural potential of the site, including soils, rainfall and the surrounding agricultural uses in the surrounding area.

Overall, while being located in a rural context, the proposal is considered appropriate as it is not strategically important and highly productive agricultural land that would be lost from production and the development will generally have a low impact on the site and its existing conditions. The design enables the site to be returned to its agricultural function at the end of its life for a solar facility.

Please refer to this report for further details.

5.4. Does the proposal respond to the requirements of Clause 53.13?

Clause 53.13 applies a renewable energy facility, other than a wind energy facility, and the considerations of this clause therefore apply to the proposal. The purpose of this clause is to provide the framework for facility design and site determination.

It is also noted that the Department of Environment, Land, Water and Planning (DELWP) has released the *Solar Energy Facilities Design & Development Guidelines* (August 2019), which outlines the key considerations for the use and development of solar facilities across Victoria. The guidelines include siting and design guidance along with recommendations for community consultation, design, consideration of off-site impacts, construction, operation and decommissioning. The relevant considerations of the Guidelines are discussed below.

Application requirements

In accordance with Clause 53.13-2, an application must be accompanied by the information presented in the following table.

Table 2 – Application requirements for the development of a renewable energy facility (other than a wind energy facility)

Requirement	Response
A site and context analysis, including:	
A site plan, photographs or other techniques to accurately describe the site and the surrounding area.	Addressed in Section 2 and Section 3 of this report, as well as the proposed site plans attached at Appendix B.
A location plan showing the full site area, local electricity grid, access roads to the site and direction and distance to nearby accommodation, hospital or education centre.	Refer Section 3 of this report, and proposed site plans attached at Appendix B.
A design response, including:	
Detailed plans of the proposed development including, the layout and height of the facility and associated building and works, materials, reflectivity, colour, lighting, landscaping, the electricity distribution starting point (where the electricity will enter the distribution system), access roads and parking areas	The proposed development plan indicates the dimensions of the development, proposed alignments, landscaping and materials to be used in the development. The facility will incorporate non-reflective and muted materials and colours to avoid impacts on the surrounding area. The facility is intended to connect directly to adjacent electrical infrastructure including the 22kV overhead power lines which are located to the west of the site immediately opposite the Margerys Road within the site of the adjoining saleyards which is owned by Council.
Accurate visual simulations illustrating the development in the context of the surrounding area and from key public view points.	A visual assessment of the site and surrounding area has been prepared and is attached with this report. Given the scale of the development as a small-scale 4.95MW solar facility, fully prepared visual simulations have not been determined necessary.
The extent of vegetation removal and a rehabilitation plan for the site.	The site is generally disturbed; however, will require the removal of native vegetation to establish the development. The full extent of vegetation removal is addressed in the Native Vegetation Assessment attached with this report. While there is no rehabilitation plan prepared as part of this proposal, the works will include perimeter screening planting, that will consist of local native species in accordance with the attached Landscape Plan, ensuring the partial reinstatement of native habitat.
Written report and assessment, including:	Assessment of these items have been completed and incorporated into this report, as relevant. Generally, these

Requirement	Response
• An explanation of how the proposed design derives from and responds to the site analysis. • A description of the proposal, including the types of process to be utilised, materials to be stored and the treatment of waste. • Whether a Works Approval or Licence is required from the Environment Protection Authority. • the potential amenity impacts such as noise, glint, light spill, emissions to air, land or water, vibration, smell and electromagnetic interference. • the effect of traffic to be generated on roads. • the impact upon Aboriginal or non-Aboriginal cultural heritage. • the impact of the proposal on any species listed under the Flora and Fauna Guarantee Act 1988 or Environment Protection and Biodiversity Conservation Act 1999. • A statement of why the site is suitable for a renewable energy facility including, a calculation of the greenhouse benefits. • An environmental management plan including, a construction management plan, any rehabilitation and monitoring.	matters have been assessed within this report and where relevant within the submitted technical documents. The proposed development site is located sited with a suitable separation distance from any nearby viewpoints and is recessed behind the adjoining roadways. It is not in a prominent location and will not substantially impact sensitive receptors in the surrounds. The proposed facility will be a passive facility and will not include any significant noise or light transfer to surrounding properties or major access roads. Panels are designed to be non-reflective and will be screened from surrounding properties by landscaping. An Environmental Management Plan would be expected as a permit condition and is intended to be prepared prior to construction commencing on-site.

Decision guidelines

Before deciding on an application, in addition to the decision guidelines in Clause 65, the responsible authority must consider, as appropriate the decision guidelines of clause 53.13-3 for the development of a renewable energy facility. The decision guidelines considered against this proposal in the following table.

Table 3 – Decision guidelines for the development of a renewable energy facility (other than a wind energy facility)

Decision Guidelines	Response
• The Municipal Planning Strategy and the Planning Policy Framework	Addressed in **Section 4.1** of this report.

Decision Guidelines	Response
• The effect of the proposal on the surrounding area in terms of noise, glint, light spill, vibration, smell and electromagnetic interference	The subject site has considered the impact of the development on the surrounding landscape and sensitive receptors from a visual, noise, glint and glare perspective, with the mitigation measures within this report setting out the manner in which the site is to be treated to mitigate these impacts. The general operation of the facility is not anticipated to generate substantial noise, light spill, or vibration. A Glint and Glare Assessment is attached and considers the potential impact of the development on surrounding properties. An Acoustics Assessment Report is also attached to consider the impact of noise on adjoining properties.
• The impact of the proposal on significant views, including visual corridors and sightlines	The subject site in a relatively flat area and is not located along any ridgelines, valleys or other important sightlines. A Visual Assessment Report is attached and considers the potential implications on the effect on visual amenity as a result of the proposed facility.
• The impact of the proposal on strategically important agricultural land, particularly within declared irrigation districts.	An Agricultural Impact Assessment has been completed by GHD in support of the proposal and is attached. This assessment did not identify the land as being located in strategically important. Please refer to this report for further details.
• The impact of the proposal on the natural environment and natural systems	As discussed within the assessment of impacts within this report and the attached technical documents, the proposal is designed to minimise impacts on the physical conditions of the site, by avoiding substantial landform changes and/or hardstand areas that may alter the site conditions
• The impact of the proposal on the road network.	This is addressed in detail in the Traffic Impact Assessment attached. The proposal is not anticipated to significantly increase the traffic of the surrounding roads beyond their design capacity.
• *Solar Energy Facilities Design and Development Guideline* (Department of Environment, Land, Water and Planning, August 2019).	The relevant matters of the *Solar Energy Facilities Design and Development Guideline* have been addressed within this report and the attached technical documents.

5.5. Does the proposed native vegetation removal result in an acceptable outcome?

Clause 52.17 of the planning scheme refers to native vegetation and has the purpose to ensure that there is no net loss to biodiversity as a result of the removal, destruction or lopping of native vegetation. The requirements of the clause is supported by the three step approach in accordance with Guidelines for the removal, destruction or lopping of native vegetation (Department of Environment, Land, Water and Planning, 2017) ("the Guidelines").

A planning permit is required pursuant to clause 52.17-1 to remove, destroy or lop native vegetation, including dead native vegetation, unless an exemption is otherwise specified.

The proposal seeks to remove native vegetation to establish the new PV array and infrastructure. There are no exemptions which apply to these trees and a permit is therefore required.

A Native Vegetation Removal Report has been prepared by Red Gum Environmental Consulting the provides a detailed assessment of the proposed vegetation removal. The report concludes that the proposed vegetation removal is acceptable. Please refer to this report for further details.

5.6. Does the proposal represent an acceptable design response?

5.6.1. Design

The design and layout of the facility has been considered with a view to maximise energy production while having minimal impact on the site conditions. The land containing the facility is largely unconstrained, which allows for the PV panels to be arranged with maximum northern exposure.

The design has also been informed by the considerations of bushfire, observing the design, alignment and setback recommendations of the *Solar Energy Facilities Design & Development Guidelines* in August 2019. It has been designed to minimise potential impacts on the surrounding land uses ensuring that productive agriculture is not unreasonably impeded.

The facility itself is designed as a single axis tracking system with a single portrait (1p) orientation. A single axis tracker system arranges the panels on an array which follows the sun throughout the day from east to west. The proposed system has a maximum tilt of 60 degrees in both directions, with a 120 degree full rotation. The ‘single portrait orientation’ refers to proposed PV panels being arranged in a ‘portrait’ orientation along the arrays for a single panel length.

Figure 15 – Example of a single axis tracker system in a single portrait orientation. The example shows the panels at full 60-degree tilt.

Figure 16 – Height of a single axis tracker system with reference to a persons height.

The trackers are to be mounted to a fixed structure with mounting posts. The array will have a width of approximately 40 metres, with a central post. All mounting posts are to be direct pile driven or screw driven into the ground to a depth of approximately 2 metres. The panels are fixed to the tracker with a lower clearance height (at full tilt) of at least 500mm, with an overall height above ground of 2.4 metres, depending on the required ground clearance.

The solar energy facility will be operational for a period of at least 30 years, after which it is likely to be decommissioned and returned to agricultural production. The design is therefore considered on the basis of minimising the impacts on the natural conditions of the site so that it may be easily returned to its original state.

The proposal aims to retain as much of the overall property for agricultural production by only using the area necessary to generate the 4.95MW output. The proposal also utilises the most up to date panel technology to obtain higher energy outputs using less panel infrastructure. The ongoing maintenance of facility will ensure that any adverse impacts on nearby agricultural land are avoided.

5.6.2. Construction

The majority of impacts are likely to occur during the construction and decommissioning phases of the solar energy facility's life. The construction period will be undertaken over a relatively short period of time (weather dependent) and will be entirely contained within the subject site to avoid impacts on adjoining properties.

The proposal does not include any permanent concrete areas or works on the land as part the construction process to ensure that decommissioning and recovery of the agricultural land can be a relatively simple transition. Any decommissioning will be undertaken as per the Guidelines for Solar Energy Facilities.

It is proposed to use predominantly local workforce for the construction work, including for specialised technical contractors, subject to availability. The local workforce may also be sourced from nearby towns in the region.

The proposal does not include any permanent buildings on the land as part the construction process which ensures that decommissioning and recovery of the agricultural land can be a relatively simple transition once the solar energy facility is to decommissioned. The decommissioning will be undertaken as per the Guidelines for Solar Energy Facilities and best practice at that time for solar energy facilities.

5.6.3. Glint and Glare

Generally, solar panels will not create significant glint and glare compared with other commonly existing surfaces. Likewise, photovoltaic solar panels are generally less reflective than other naturally occurring elements such as soils and crops.

To analyse glare, the Forge Solar analysis tool has been used. This analysis tool allows mapping of a proposed project area and input of data to produce an analysis of potential glare on identified receivers. This tool was developed by the US based Sandia National Laboratories and licenced to Forge Solar and is a globally recognised industry standard assessment tool for assessing glare from solar developments.

The results of the modelling indicate that there will be no glare on the surrounding sensitivity receivers of paths. The reason for this is that that panels will be single axis trackers and will follow the sun through the day.

Overall, the assessment determines that there will be no glare impacts on the surrounding receptors, providing that backtracking is not allowed by the proposal system. The applicant has committed to this outcome and it is expected that any approval will require this outcome.

5.7. Does the proposal represent an unreasonable visual impact?

The proposal is located within an area where the landscape is generally flat and the site may be observed in the broader landscape from prominent public locations. A Visual Impact Assessment has been carried out by Yonder Studio, with associated landscape recommendations included in a Landscape Plan.

The Visual Impact Assessment includes an investigation of possible viewsheds along Murray Valley Highway, Margerys Road, Richardsons Road and Old Barnawartha Road where the proposed development may be seen, and undertaking a visual impact assessment using the grading matrix, considering visual sensitivity and the magnitude of the visual change.

Findings and recommendations

Findings

The visual assessment findings are summarised below:

Viewshed	Impact
1	Negligible
2	Negligible
3	Negligible
4	Negligible
5	High-moderate
6	Moderate
7	Low
8	Moderate
9	High-moderate
10	High-moderate
11	High
12	High
13	High
14	Moderate-low

Recommendations

3m wide screen planting of shrubs
5m wide screen planting of shrubs

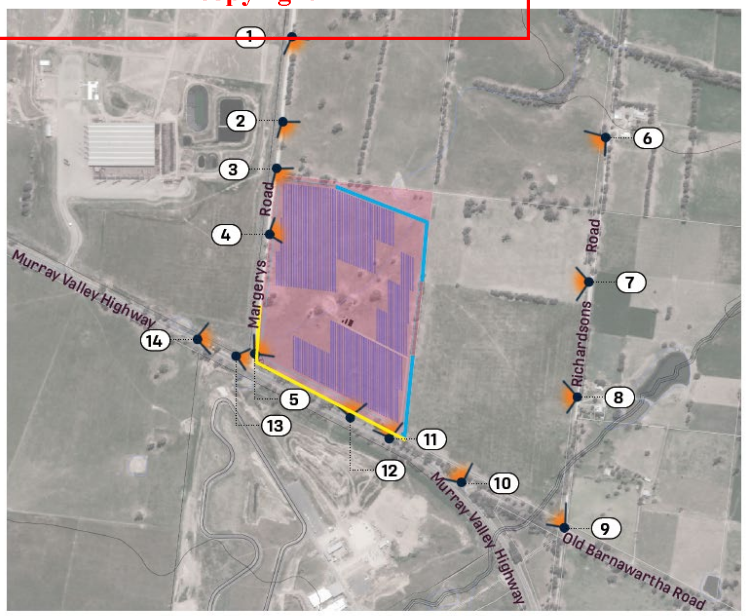

Figure 17 – Summary of Visual Impact Assessment

The assessment identifies that the approach along the Murray Valley Highway to the east, and along the frontage, as well as the eastern approach along Barnawartha Road are of a high visual sensitivity. As a result of this, the subsequent landscape recommendations are for the establishment of a 5 metre landscape buffer along the southern, eastern and northern development boundaries.

The landscape concept intends to create a natural condition along the site perimeter to firstly enable a screening of the facility, but also provide a long term benefit to the natural conditions of the area. The proposed landscaping outcome is intended to be a long term addition, being that it will contribute to the long term linkages within the area and serve as a useful boundary definition for ongoing agricultural operation.

Accordingly, the proposed development is not considered to result in an unreasonable visual impact, subject to the implementation of the recommendations of this assessment. Please refer to the assessment and plan for further details.

5.8. Does the proposal minimise potential offsite amenity impacts associated with noise?

A Noise Impact Assessment Report has been prepared by Acoustic Dynamics for the proposed development. The purpose of the assessment is to identify potential off-site noise emission from the proposed development and to determine required noise control measures, if necessary, to achieve compliance with relevant noise limits applicable under the legislation at noise sensitive locations.

The report concluded that *"..the proposed development can be designed to comply with the relevant acoustic criteria of the Wodonga City, EPA Victoria and Australian Standards. It is our opinion that the acoustic risks associated with the proposal can be adequately controlled and the amenity of neighbouring properties and residents satisfactorily protected".*

Please refer to this report for further details.

5.9. Does the proposal result in acceptable traffic, access and parking arrangements?

A traffic impact assessment has been prepared by Traffix Group and concludes that the proposed traffic, access and parking arrangements for the development are acceptable, subject to the following recommendations:

- *Recommendation 1: that Old Barnawartha Road at the new access be provided with an unsealed Type BAR treatment to the dimensions established in Table 7*
- *Recommendation 2: that Old Barnawartha Road at the new access be provided with a sealed Type BAL treatment to the dimensions established in Table 8*
- *Recommendation 3: that detailed design of the new site entry driveway incorporate the relevant aspects of SD 265 of the IDM.*

Please refer to this report for further details.

5.10. Does the proposal appropriately respond to potential bushfire risk?

The development of solar facilities should be informed by the CFA's Guidelines for Renewable Energy Installations February 2019 (the CFA Guidelines). Under these guidelines, the proposal represents a 'micro solar' facility and a number of components of the CFA Guidelines do not need to be considered for smaller scale facilities. The applicant has sought input from the CFA on the proposed development, with advice and direction provided that the facility should have regard to the CFA Guidelines.

The subject land is not mapped as Bushfire Management Overlay but is recognised as Bushfire Prone under the building regulations. Having regard to this, and the policy directions of clause 13.02-1S, it is appropriate that the facility be designed with regard to bushfire risks.

The proposed facility is considered to be fully compliant with the relevant provisions of the CFA Guidelines, which are discussed below.

<u>Risk and Emergency Management</u>

- A risk management process that meets occupational health and safety requirements for eliminating or reducing risk so far as is reasonably practicable provides the foundation for effective emergency and fire management planning, as per 2.1.1 to 2.1.4 of CFA Guidelines.

- The provision of an Emergency Information Container at site entrances, as per CFA's Guidelines for Renewable Energy Installations 2018 of an Emergency Information Book.
- familiarisation visit and explanation of emergency service procedures to CFA and other emergency services. Information in relation to the specific hazards and fire suppression requirements of the site should be provided to CFA during this visit.
- Appropriate training for staff operating and/or working in this facility

It is expected that appropriate management conditions will be imposed on any determination to require the preparation and maintenance of these procedures.

Access

- 3.1.2 Roads are to be of all-weather construction and capable of accommodating a vehicle of 15 tonnes.
- 3.1.3 Constructed roads should be a minimum of four (4) metres in trafficable width with a four (4) metre vertical clearance for the width of the formed road surface.
- 3.1.4 The average grade should be no more than 1 in 7 (14.4% or 8.1°) with a maximum of no more than 1 in 5 (20% or 11.3°) for no more than 50 metres.
- 3.1.5 Dips in the road should have no more than a 1 in 8 (12.5% or 7.1°) entry and exit angle.
- 3.1.7 Road networks must enable responding emergency services to access all areas of the facility.
- 3.1.8 The provision of at least two (2) but preferably more access points to the site, to ensure safe and efficient access to and egress from areas that maybe impacted or involved in fire. The number of access points should be informed through a risk management process.

All internal roads are designed to be an all-weather standard and will maintain appropriate grades and widths as required. Given the proposal is for a micro solar facility, no perimeter roads are necessary for the facility, however appropriate internal roads are identified to ensure safe access throughout.

Water Supply

- 3.2.1 The static water storage tank shall be of not less than 45,000 litres effective capacity. The static water storage tank(s) must be an above-ground water tank constructed of concrete or steel. The location and number of tanks should be determined as part of the site's risk management process and in consultation with a CFA delegated officer.
- 3.2.2 The static storage tanks shall be capable of being completely refilled automatically or manually within 24 hours.
- 3.2.3 The hard-suction point shall be provided, with a 150mm full bore isolation valve (Figure 1) equipped with a Storz connection, sized to comply with the required suction hydraulic performance. Adapters that may be required to match the connection are 125mm, 100mm, 90mm, 75mm, 65mm Storz tree adapters (Figure 2) with a matching blank end cap to be provided.
- 3.2.4 The hard-suction point shall be positioned within 4m to a hardstand area and provide clear access for fire personnel.
- 3.2.5 An all-weather road access and hardstand shall be provided to the hard-suction point. The hardstand shall be maintained to a minimum of 15 tonne GVM, 8m long and 6m wide or to the satisfaction of the relevant fire authority.
- 3.2.6 The road access and hardstand shall be kept clear at all times.
- 3.2.7 The hard-suction point shall be protected from mechanical damage (ie bollards) where necessary.

- 3.2.8 Where the access road has one entrance, a 10m radius-turning circle shall be provided at the tank.
- 3.2.9 An external water level indicator is to be provided to the tank and be visible from the hardstand area.
- 3.2.10 Signage (Figure 3) shall be fixed to each tank.
- 3.2.11 Signage (Figure 4) shall be provided at the front entrance to the site, indicating the direction to the static water tank and being to the satisfaction of a CFA delegated officer.

The proposed facility is capable of complying with all above requirements pertaining to water supply and vehicle turning. The proposed plan anticipates the location of a water supply tank within appropriate locations of the site however it is also expected that the CFA may impose conditions or requirements in relation to water supply size and position. Additionally, the two existing dams in the central portion of the land and on the northern parcel boundary will be retained and can provide a static water source for fire fighting purposes.

Dangerous Goods Storage and Handling

- 3.3.1 The requirements of the relevant Australian Standards must be complied with, e.g. (DR) Australian Standard 5139: Electrical installations – Safety of battery systems for use with power conversion equipment; Australian Standard 3780: The storage and handling of corrosive substances; and Australian Standard 1940: The storage and handling of flammable and combustible liquids.
- 3.3.2 Signage and labelling compliant with the Dangerous Goods (Storage and Handling) Regulations 2012, and the relevant Australian Standards is to be provided.
- 3.3.3 All dangerous goods stored on site must have a current safety data sheet (SDS). Safety data sheets must be contained in the site's emergency information book, in the emergency information container.
- 3.3.4 Appropriate material (including absorbent, neutralisers, equipment and personal protective equipment) for the clean-up of spills is to be provided and available on-site.

All electrical infrastructure is to be suitable contained inside purpose built container storage or other enclosed devices to avoid it being exposed. All components will be compliant with any regulations relation dangerous goods storage as required.

Vegetation Management

- 4.2.1 Grass is to be maintained at below 100mm in height during the declared Fire Danger Period.
- 4.2.2 A fire break area of ten (10) metres width is to be maintained around the perimeter of the facilities, electricity compounds and substations. This area is to be of non-combustible mulch or mineral earth.
  - The fire break area must commence from the boundary of the facility or from the vegetation screening (landscape buffer) inside the property boundary.
  - The fire break must be constructed using either mineral earth or non-combustible mulch such as crushed rock.
  - The fire break must be vegetation free at all times.
  - No obstructions are to be within fire break area (e.g. no stored materials of any kind).
- 4.2.3 Adhere to restrictions and guidance during the Fire Danger Period, days of high fire danger and Total Fire Ban days (refer to www.cfa.vic.gov.au).

- 4.2.4 All plant and heavy equipment is to carry at least a 9-litre water stored-pressure fire extinguisher with a minimum rating of 3A, or firefighting equipment as a minimum when on-site during the Fire Danger Period.
- 4.2.5 There is to be no long grass or deep leaf litter in areas where plant and heavy equipment will be working.
- 6.3.1 Solar arrays are to have grass vegetation maintained to 100mm under the array installation or mineral earth or non-combustible mulch such as stone.
- 6.3.2 Where practicable, solar energy installations can be sited on grazed paddocks. In this case, vegetation is to be managed as per the requirements of this guideline, or as informed through a risk management process.

The facility incorporates a 10 metre wide firebreak to the full perimeter of the development area. This includes around all panel array areas and the proposed substation.

It is expected that appropriate management conditions will be imposed on any determination. The applicant intends to maintain the site as per the CFA requirements by having stock grazing within the site and beneath the panel areas.

Operation and Maintenance of Solar Facilities

- 6.2.1 Solar farm operators must provide specifications for safe operating conditions for temperature and the safety issues related to electricity generation, including isolation and shut-down procedures, if solar panels are involved in fire. This information must be provided within the content of the emergency information book.

The proposal is for a small scale facility and it does not have the same temperature and other operational risks that may be present on larger scale facilities. It is considered that the arrangement and placement of facilities on the land is suitable to minimise potential bushfire risks.

5.11. Are the proposed stormwater and drainage arrangements appropriate?

A stormwater management and drainage plan has been prepared by SJE consulting. The report concluded that the proposed arrangement are appropriate, specifically noting that:

- *Discharge from the developed site will be limited to predeveloped flows.*
- *The discharge to predeveloped flows is achieved by a detention basin that limits the discharge to predeveloped flows.*
- *The water quality targets can be achieved to 'best practice' targets.*
- *Solar panel arrangement does not impact drainage and conveyance functions of waterways.*
- *Rill erosion will be restricted, point of discharge and rate of flow of discharge to adjacent property is unaltered.*

Please refer to this report for further details.

5.12. Does the proposal respond the general provisions of Clause 65?

Clauses 65.01 of the Wodonga Planning Scheme identifies that prior to determining an application the Responsible Authority must consider the directions of this Clause. The contents of this report herein clearly demonstrate consistency with outcomes of these considerations.

The proposal represents a carefully crafted design response that has provided due consideration to the site's opportunities and constraints to deliver a development outcome that is not only responsive to the directions and aspirations of planning policy, but also its existing physical context.

The proposal represents an efficient use of land zoned for agricultural purposes contributing to the promotion of sustainable development and the transition to a low carbon economy. The proposed design is responsive and sympathetic to the established character of its surrounds, can be suitably serviced by infrastructure, minimises the impact on any biodiversity values and appropriately manages impacts associated with natural hazard risk.

Accordingly, the proposal represents an acceptable response to the directions of this Clause.

6. Conclusion

This Planning Report seeks approval for use and development of land for a renewable energy facility (solar), associated utility installations, and the removal of native vegetation. The subject land is described as Crown Allotment 10, Section 29 in the Parish of Barnawartha North, and is addressed along the Murray Valley Highway, Barnawartha North.

The proposal deserves the support of DELWP because:

- it complies with the standards and objectives outlined within the Wodonga Planning Scheme;
- it represents orderly planning of large farming allotments in an area that minimises impacts on more sensitive land;
- it proposes a site responsive design which integrates with the existing topography and ensures the development does not significantly impact the amenity of the area;
- it proposes treatments such as perimeter landscape plantings and screenings to minimise conflicts with adjoining sensitive interfaces;
- access can be easily obtained through connections to the surrounding road network and
- existing infrastructure connections, including to a conveniently located distribution lines, can be easily extended with minimal works required;
- it contributes to the sustainability of the shire through providing an alternative renewable energy source;
- it contributes towards the state objective to reduce emissions by 28-33 per cent by 2025 and 45-50 per cent by 2030;
- it has the potential to generate 12,897 MWh (megawatt hours) of electricity per year with capacity to generate electricity for 1,660 average homes for one year;
- it has potential savings of 10,075 tons of CO2 gases entering the atmosphere each year; and
- it will have a positive economic effect through providing work and contracting opportunities to local businesses, and through indirect effects such as accommodation, hardware stores, or food premises';

In light of the above considerations, it is our opinion that the proposal is appropriate from a planning point of view and is in the public interest. The proposed development warrants support by DELWP.

Appendix A: Title Details

Appendix B: Development Plans

Appendix C: Landscape Concept Plan

Appendix D: Visual Impact Assessment

Appendix E: Traffic Impact Assessment Report

Appendix F: Agricultural Impact Assessment

Appendix G: Noise Impact Assessment

Appendix H: Flora & Fauna and Net Loss Report

Appendix I: Drainage Study