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Appendix 17 - Bush Fire Hazard Assessment

BUSH FIRE HAZARD ASSESSMENT REPORT

Bullawah Wind Farm Project



PREPARED BY:



JUNE 2024



PEAK LAND MANAGEMENT

Land management consulting services:

-Bush Fire-

-Ecological-

-Environmental-

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Cover Photo: View of Project Area.



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Document History

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AUTHOR DETAILS

Ted Smith is the director of PEAK LAND MANAGEMENT. He is a qualified Land Management Consultant with a Bachelor of Science Honours Degree in Physical Geography. He has over 25 years' experience commercially consulting with PEAK LAND MANAGEMENT PTY LTD and working within state government.

Ted has completed a Graduate Diploma in Design for Bush Fire Prone Areas from the University of Western Sydney and is a member of the Fire Protection Association of Australia (FPA of Australia), being a BPAD Accredited Bush Fire Practitioner Level 3.

CERTIFICATION

Ted Smith of PEAK LAND MANAGEMENT has prepared this detailed Bush Fire Assessment Report which includes the requirements set out in *Appendix 2 & 4 of Planning for Bush Fire Protection 2019* together with recommendations as to how the relevant specifications and requirements are to be achieved.

I hereby certify, in accordance with Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*:

1. That I am a person recognised by the *NSW Rural Fire Service* as a qualified consultant in Bush Fire Risk Assessment; and
2. That subject to the recommendations contained in the attached Bush Fire Assessment Report the proposed development conforms to the **relevant specifications and requirements** being the document entitled *Planning for Bush Fire Protection* prepared by the NSW Rural Fire Service in co-operation with the Department of Planning and any other document as prescribed by Section 4.14 of the *Environmental Planning and Assessment Act 1979 No 203*.



Signature

26th June, 2024

Date



TERMS AND ABBREVIATIONS

Abbreviation	Meaning
AHIMS	Aboriginal Heritage Information Management System
APZ	Asset Protection Zone
AS2419 -2005	Australian Standard – Fire Hydrant Installations
AS3959-2018	Australian Standard – Construction of Buildings in Bush Fire Prone Areas
BCA	Building Code of Australia
BPL	Bush Fire Prone Land
BPMs	Bush Fire Protection Measures
BRMP	Bushfire Risk Management Plan
BTA	Bushfire Threat Assessment
EPA Act	<i>NSW Environmental Planning and Assessment Act 1979</i>
EMP	Emergency Management Plan
FDI	Fire Danger Index
FMP	Fuel Management Plan
Ha	Hectare
IPA	Inner Protection Area
LEP	Local Environment Plan
LGA	Local Government Area
OPA	Outer Protection Area
PBP, 2019	Planning for Bushfire Protection 2019
SEARs	NSW Planning Secretary's Environmental Assessment Requirements

1.1 INTRODUCTION

Bullawah Wind Farm Pty Ltd (BWF) proposes to develop the Bullawah Wind Farm (the Project), located approximately 36 km south east of Hay, within the South West Renewable Energy Zone (South West REZ). The Project Area is located within the Hay Shire, Murrumbidgee and Edward River Local Government Areas (LGAs). The Project will include the installation, operation, maintenance and decommissioning of up to 143 wind turbine generators (WTGs), battery storage, ancillary infrastructure and temporary facilities associated with construction of the Project. The Project design incorporates up to 143 wind turbines, with a maximum blade-tip height of 300 m above ground level, and an installed capacity of up to 815.1 megawatts (MW).

PEAK LAND MANAGEMENT has been engaged by Umwelt (Australia) Pty Ltd (Umwelt) to prepare this Bush Fire Hazard Assessment Report for inclusion within the Environmental Impact Statement (EIS) for the Project.

The Project is deemed to be State Significant Development (SSD) being a development for the purposes of a large-scale renewable energy (wind) development. The Project therefore requires assessment and approval in accordance with Part 4, Division 4.7 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Figures 1-4 show the Project Area location, topography, vegetation assessment, Project Layout and Appendix 1 shows photos of the Project Area.

The Project Area encompasses approximately 20,628 hectares (ha) of predominantly grazing land and adjoins the Oolambeyan National Park, which is located directly north. The Project Area is zoned as RU1 Primary Production within the Hay Local Environment Plan (LEP) 2011, the Murrumbidgee LEP 2013 and Conargo LEP 2013. Within the Project Area, BWF has identified:

- a Development Corridor of approximately 4,311 ha, in which all proposed Project infrastructure will be placed and all Project related ground disturbance will occur
- an indicative Disturbance Footprint of approximately 642 ha, which equates to approximately 3 percent of the total Project Area.

A full schedule of land (including relevant lots and DPs) is included in the EIS (Umwelt, 2024).

This Report has been prepared to address the bushfire element of the NSW Planning Secretary's Environmental Assessment Requirements (SEARs) for the Project (SSD-50505215), specifically to:

'identify potential hazards and risks associated with bushfires / use of bushfire prone land, potential impacts on Oolambeyan National Park including the risks that a wind farm would cause bush fire and any potential impacts on the aerial fighting of bushfires and demonstrate compliance with Planning for Bush Fire Protection 2019.'

Section 8.3.5 of Planning for Bushfire Protection (PBP) 2019 (Wind and Solar Farms) states in part that:-

Wind and solar farms require special consideration and should be provided with adequate clearances to combustible vegetation as well as firefighting access and water.

The following should be provided for wind and solar farms:

- *a minimum 10m APZ for the structures and associated buildings/infrastructure; and*
- *the APZ must be maintained to the standard of an IPA for the life of the development.*

Infrastructure for the purposes of requiring APZ excludes:

- *road access to the site; and*
- *power or other services to the site and associated fencing.*

Essential equipment should be designed and housed in such a way as to minimise the impact of bush fires on the capabilities of the infrastructure during bush fire emergencies. It should also be designed and maintained so that it will not serve as a bush fire risk to surrounding bush.

A Bush Fire Emergency Management and Operations Plan should identify all relevant risks and mitigation measures associated with the construction and operation of the wind or solar farm.

Under the EP&A Act (and its regulations), and the *Rural Fires Act 1997* (and its regulations), councils/NSW Government are required to assess and control new developments in bush fire prone areas. This land has been assessed as being part of a Bush Fire Prone Land Area (Figure 4). It should be noted that Section 4.14 of the EP&A Act requires Councils/assessing authorities to be satisfied that developments in bush fire prone areas comply with PBP guidelines, and relevant standards including the Building Code Australia (BCA) which references AS 3959-2018 before granting development consent.

This report has been prepared in accordance with PBP, 2019 guidelines. Clause 46 of the *Rural Fires Regulation 2002* sets out these requirements, which are addressed in this report. A Bush Fire Assessment Report is required showing the current situation and recommending how the risk may be ameliorated.

Figure 1: Aerial photo showing Project Layout & regional location (from Umwelt, undated).

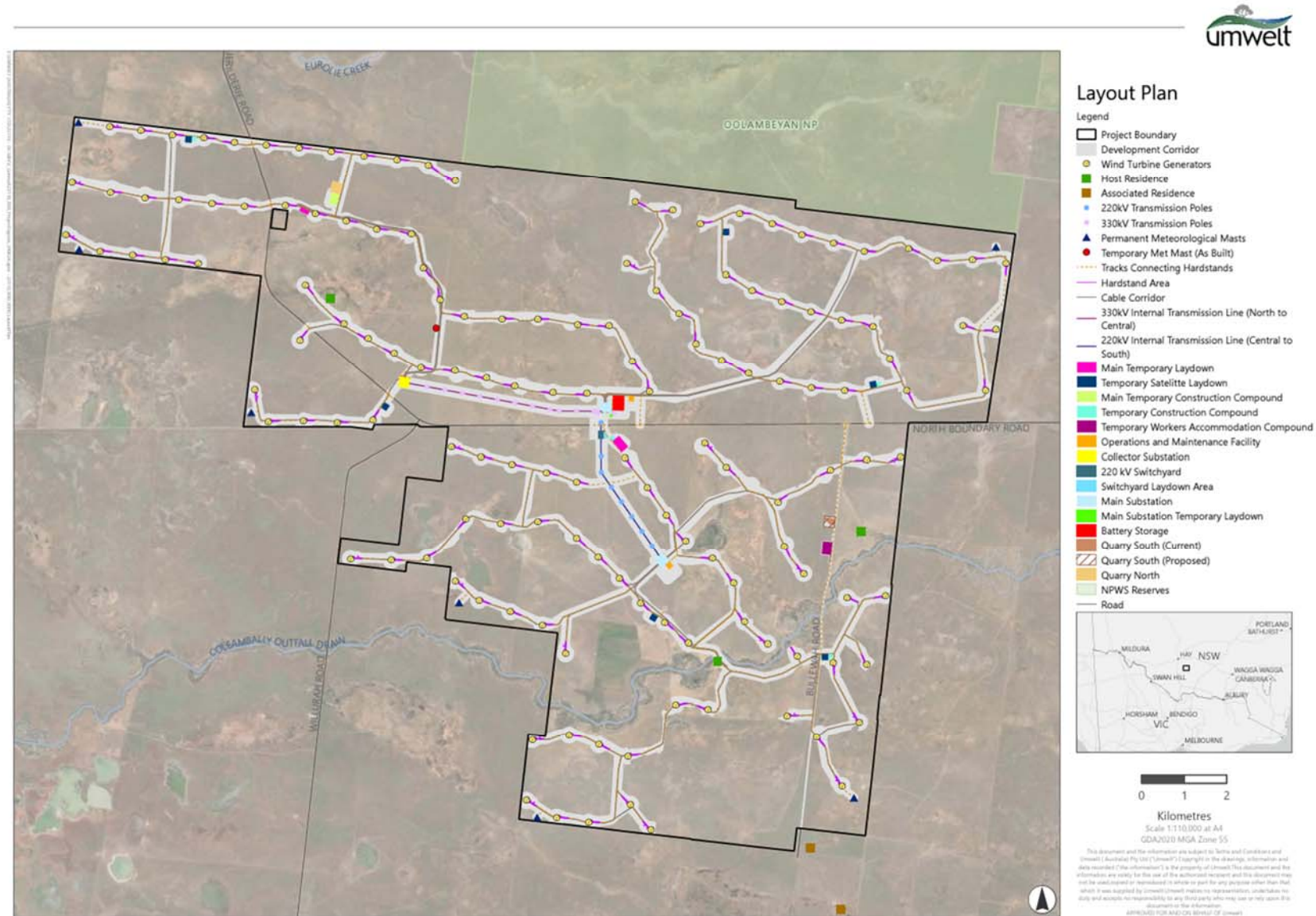


Figure 2: Aerial photo showing turbine layout (from Umwelt, undated).

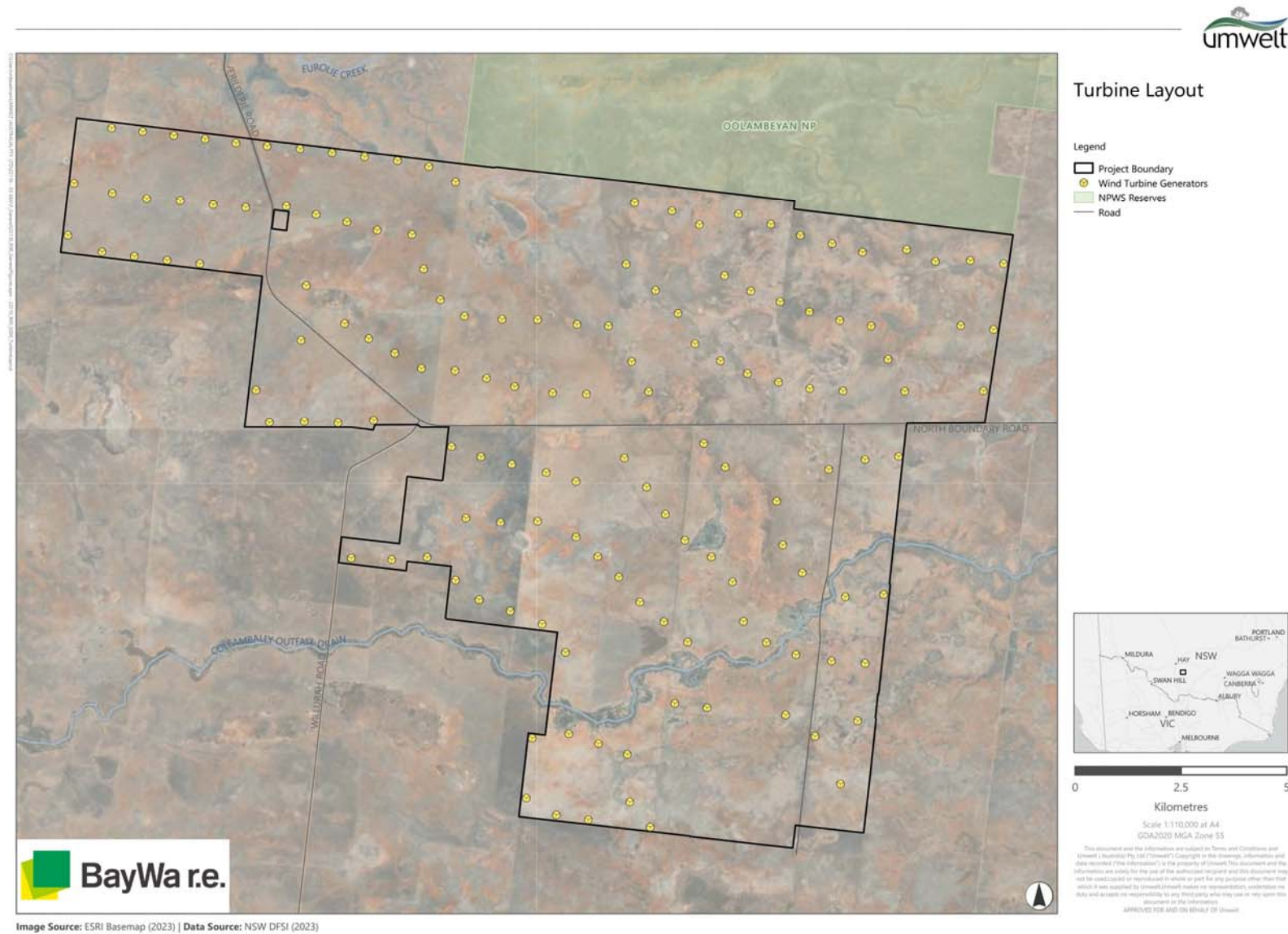


Figure 3a: Topographic map of simplified Project Area and surrounds (from SIX Maps, NSW Government)

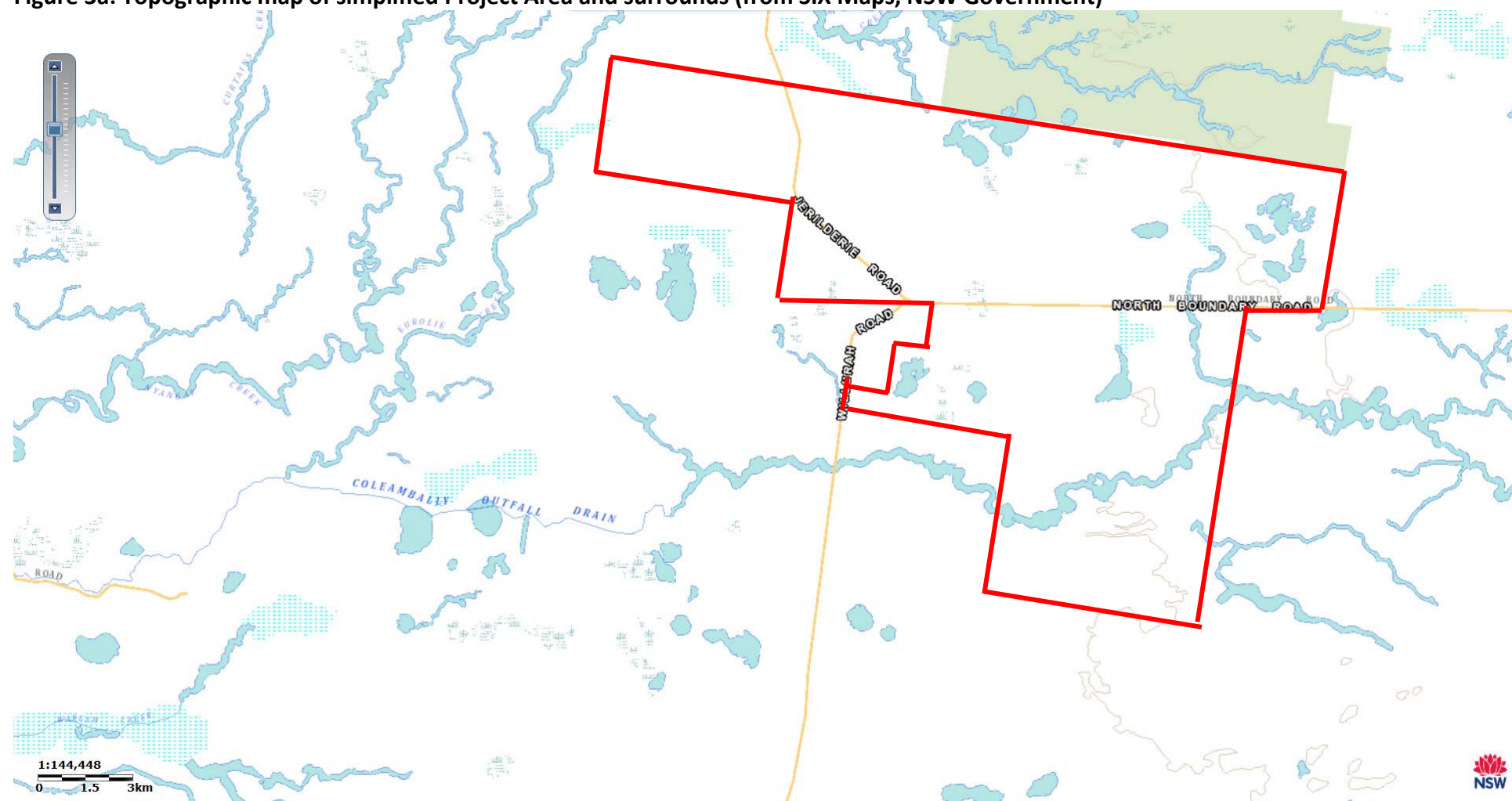


Figure 3b: Topographic map of simplified Project Area and vegetation assessment (base map from Umwelt, undated)

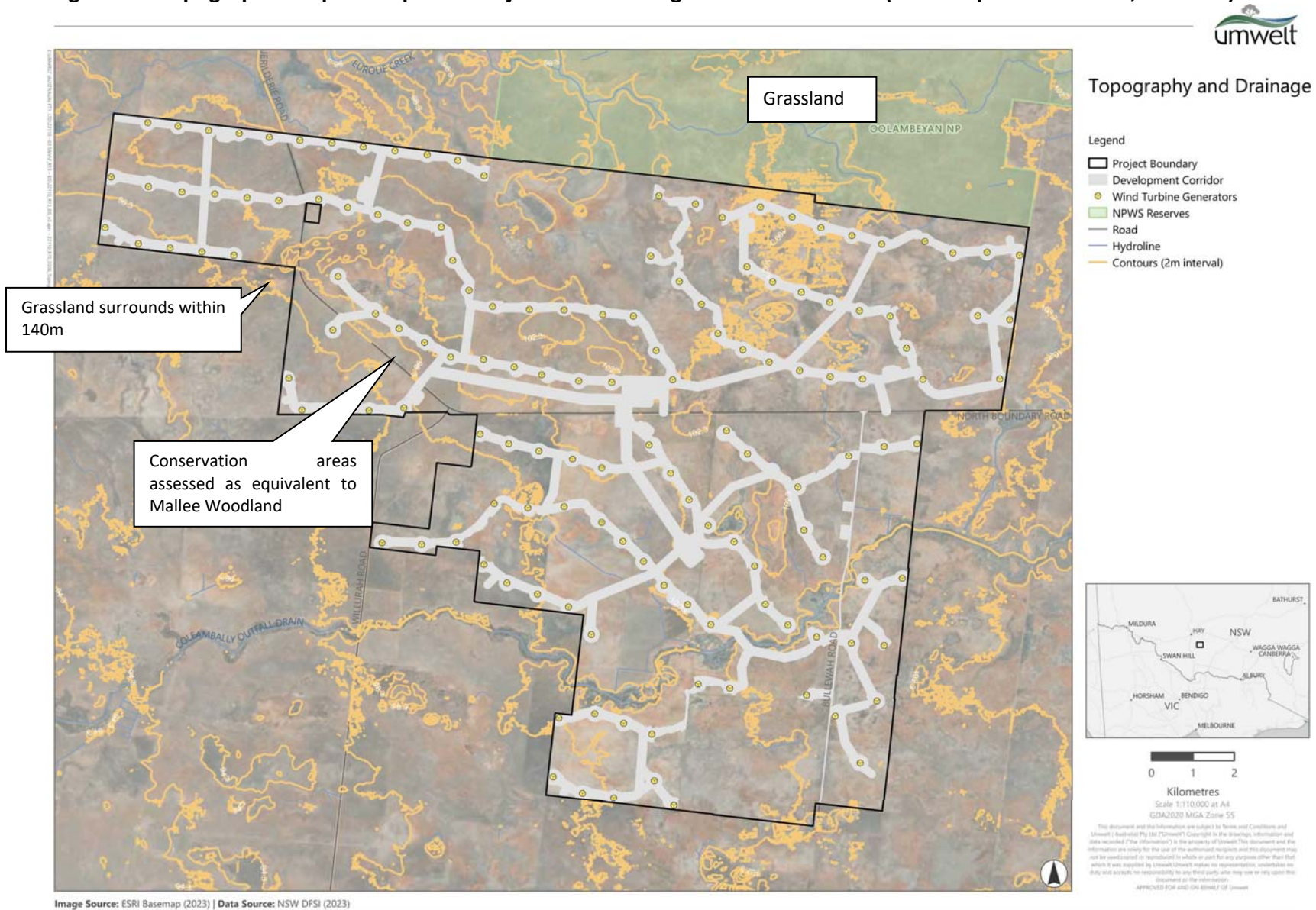
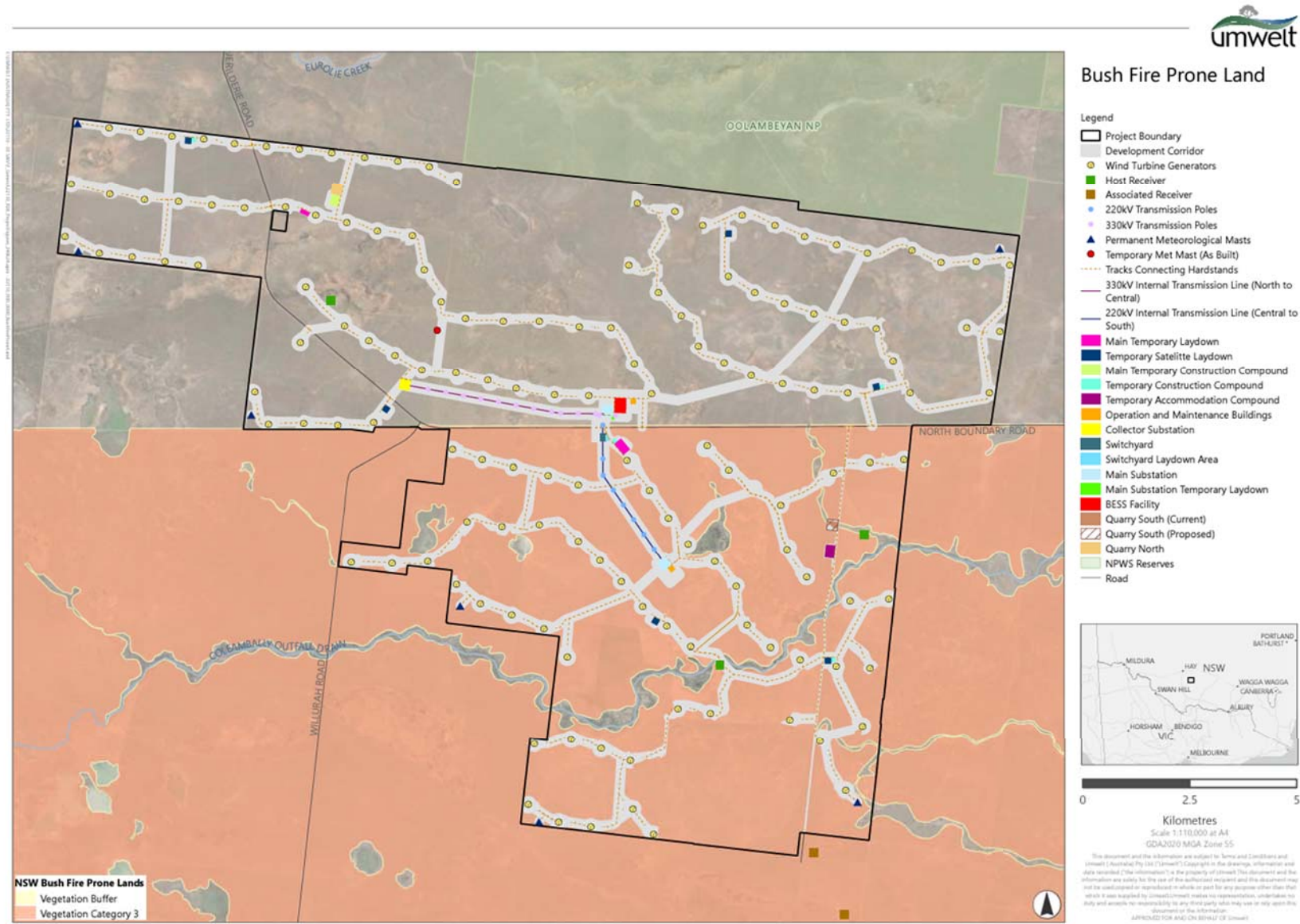


Figure 4: Bush Fire Prone Land Map (from Umwelt, undated)



3.0 SPECIFICATIONS, UTILITIES, ACCESS AND SURROUNDING LANDUSE

3.1 PROJECT DESCRIPTION

Photos of the Project Area and surrounds are shown in Appendix 1. Project layout plans are shown in Figures 1-2.

The key components of the Project include (from Umwelt, 2024):

- *up to 143 (three (3) blade) WTGs, with a maximum blade-tip height of 300 metres (m) above ground*
- *a 359 MW / 718 MWh battery energy storage facility*
- *permanent ancillary infrastructure including internal roads, hardstands, main and collector substations, switchyards, operations and maintenance facilities, underground and overhead electricity transmission lines and poles, telecommunications facilities and utility services, permanent meteorological masts and water storage tanks*
- *temporary facilities including temporary workforce accommodation, site offices, amenities, construction compounds and laydown areas, on-site borrow pits, rock crushing facilities, concrete or asphalt batching plants, minor 'work front' construction access roads, environmental management and monitoring and signage*
- *off-site road works, involving upgrades to the proposed local transport route and establishment of site access points to facilitate delivery of wind turbine components to the Project Area as required.*

Project construction and grid connection will occur in two (2) stages. The conceptual staging plan for the Project involves:

- *Stage 1 (South), located mostly south of North Boundary Road, connecting to the existing 220 kV transmission line which runs through the Project Area*
- *Stage 2 (North) located north of North Boundary Road, connecting to the approved (but not yet constructed) 330 kV Eastern Section of Project EnergyConnect, which will also run through the Project Area.*

Staffing & maintenance

A temporary workforce accommodation (TWA) camp will be established on site, and be accessed off North Boundary Road via Bullewah Road as shown in Figure 1.

The TWA camp has been sized to accommodate the Project's peak construction workforce of 350 FTE personnel, noting that approximately ten (10) percent of the Project's workforce is expected to be based locally.

The conceptual TWA design includes sleeping accommodation, site offices, meal facilities, ablutions, medical facilities, car parking, laundry services, a small on-site retail shop, tavern and gymnasium. These facilities will consist of pre-fabricated demountable modules which will be delivered and installed on site.

All buildings will have emergency lighting, smoke alarms and firefighting capability in accordance with the Building Code of Australia. Appropriate firefighting equipment will be installed (portable fire extinguishers/fixed fire hose reels/fire hydrant systems and water tanks). Implementation will be subject to detailed specialist consultant design. Emergency evacuation and emergency assembly points will be established for the TWA camp as required.

During the operational phase of the Project, there will be up to 40 full time equivalent (FTE) personnel on-site, however, the site will not be staffed 24/7. Once operational, the Project would be monitored both by on-site staff and through remote monitoring. Aspects of the Project operation to be dealt with by on-site staff would include safety management, environmental condition monitoring, landowner management, routine servicing, malfunction rectification and site visits. Functions to be overseen by remote monitoring will include WTG and battery storage performance assessment, Project reporting, remote resetting and maintenance co-ordination. Pro-active computer control systems will monitor the performance of the WTGs and battery storage so that any issues can be dealt with by on-site staff, as appropriate.

Maintenance staff will be on-site throughout the year, making routine checks of the WTGs, battery storage and ancillary infrastructure on an ongoing basis. Major planned servicing would be carried out approximately twice a year on each WTG. Each major service visit would potentially involve a number of service vehicles on-site. Replacement of major components, such as WTG blades, may require the use of cranes and ancillary equipment. Management of regrowth and existing vegetation will be necessary within the overhead transmission line corridors to reduce the threat of fire and physical damage to the transmission line, and to allow access for maintenance vehicles. Occasionally, access by medium and heavy vehicles may be required to repair or maintain overhead transmission line components.

APZ slashing/management will be undertaken by the proponent, BWF, or their subcontractors. It is anticipated that any required equipment can be accommodated at the permanent operations and maintenance (O&M) facilities.

The existing host residences will have no role in terms of bushfire fighting or maintenance of APZs. This will be the responsibility of the proponent. There are no further assessment requirements for these residences.

The O&M facilities will be fitted out with appropriate fire fighting equipment, and emergency evacuation signage/lighting. There will be no overnight accommodation at any Project facilities during operations. The O&M facilities are located as shown in Figure 1.

The proposed short term temporary overnight accommodation for construction workers, during construction only are addressed within Section 8.2.1 PBP, 2019 as “Rural Workers Dwellings”, as will be over approximately a 3.5 year time frame and therefore treated as permanent dwellings for the purposes of bush fire assessment only.

3.2 SURROUNDING LAND USE

The Project is located in a rural area, which is grazed by sheep & cattle permanently both over the Project Area, and surrounds. Ongoing stock grazing will continue within the Project Area over the life of the Project, with some new/adjusted exclusionary fencing where required for safety or habitat management purposes.

3.3 ACCESS

All public and internal roads used for Project access will be constructed to meet the requirements of PBP, 2019, as detailed in Section 8.0.

The Project will have access from multiple site access points on Jerilderie Road and North Boundary Road as shown in Figure 1. Jerilderie Road is a sealed road in good condition. The Project involves widening and upgrades (including drainage) to the section of North Boundary Road, an unsealed public road which will be used for Project access.

For bushfire fighting purposes, the Project Area is also accessible from the south via Willurah Road and the east via Conargo Road, both being sealed public roads.

A network of internal unsealed all weather trafficable access roads is proposed within the Project Area (Figure 1) servicing all turbines and associated infrastructure. There is ample room for fire fighting vehicles to access and turn around on site.

The existing crossing of the Coleambally Outfall Drain on Bullewah Road is capable of carrying fully laden 23 tonne fire trucks. However, it is anticipated that this crossing will require upgrading (through underpinning or installation of additional piers within and adjacent to the Outfall Drain) to accommodate the abnormal loads necessary to carry out the Project. Alternatively, a temporary bridge structure could be constructed alongside the existing crossing, and wholly within the proposed Development Corridor, which would then be removed at the conclusion of construction.

3.4 UTILITIES/WATER SUPPLIES

The Project Area is not serviced by reticulated town water supplies. While there are farm dams present within the Project Area, these may be utilised by the Project for supplementary fire fighting water supply purposes only.

A stream/outfall is present, but has unknown water supply/permanency, and all water will be retained within stream for environmental and downstream farmer use.

The proposed development will have at least one (1) dedicated non combustible 100,000 litre (l) water tank with Storz fitting, and unknown water supply for the TWA and other fire fighting equipment in compliance with Australian Standards. Emergency firefighting water would be stored in a suitable accessible location.

Section 8.3.5 PBP, 2019 makes no reference to water supply required amount for Solar & Wind Farms. This water dedicated water tank supply, is considered adequate, based upon the scale of the project, presence of temporary workers, and for other Solar & Wind Farm developments

The Project Area is serviced by above ground power to the site. There are no permanent proposed gas tanks/bottling, however, gas bottles may be used for cooking at the TWA during the construction period.

3.5 CONSTRUCTION STANDARDS

PBP, 2019 states *“Buildings of Class 5 to 8 and 10 of the BCA- The BCA does not provide any bush fire specific performance requirements and as such AS 3959 does not apply as a set of deemed to satisfy requirements. The general fire safety construction provisions are taken as acceptable solutions, but the aim and objectives of PBP 2006 apply in relation to other matters such as access, water and services, emergency planning and landscaping/vegetation management.”*

This report has addressed PBP, 2019 aims and objectives. Recommendations have been made to ember screen the O&M facility.

Note: the temporary workers accommodation camp (TWA) will be utilised for approximately 3.5 years during construction. It is therefore assessed as a “Rural Workers Dwelling” under Section 8.2.1 PBP, 2019.

For the purposes of this assessment it has been assumed that the equipment and activities required for decommissioning will be similar to those of construction, however noting that, decommissioning would likely occur over a shorter duration of time. Based on this, the same recommendations for mitigation measures should be implemented for construction and decommissioning phases of the Project.

Note: - A hazard assessment is currently being undertaken to investigate hazardous events and risks such as the explosion / spontaneous ignition risk associated with the operation of batteries. The level of risk / hazard depends on the type of battery and design, placement, safety measures etc. The results of the hazard assessment will form part of the EIS once known.

3.6 OTHER FIRE PROTECTION MEASURES/EMERGENCY EVACUATION

The EIS will document the requirement to prepare and implement an Emergency Response Plan – which will be developed with Department of Planning, Housing and Infrastructure (DHPI) Hazards / FRNSW / RFS. There will also be a commitment to prepare and implement a Bushfire Emergency Management Plan in consultation with FRNSW/RFS.

There will be up to 40 personnel during operations, however the Project will not be staffed 24/7. Once operational, the Project would be monitored both by on-site staff and through remote monitoring, providing local oversight and management of the property.

APZs will be established around selected Project infrastructure as detailed in Section 7.1. All vegetation and landscaping within the APZs should be in accordance with PBP, 2019.

A Bushfire Emergency Management Plan is required, nominating an emergency meeting point, and preferred evacuation route, and methodology for ensuring all occupants are safe and accounted for.

In regard to bushfire, the threat at this site is considered low, being predominately Grassland and small scattered areas of Woodland, with reduced grassland fuel loads and fire potential. Therefore the safest place in the event of bushfire would be the proposed site buildings (TWA camp during construction or O&M facilities during operations) as they will protect occupants from embers in the air/ and smoke if all windows and doors are shut.

Other mitigation measures which are recommended to improve bushfire safety include:

- Informing Local Fire & Rescue Brigade of the proposal once approved regarding its operation, water supplies, and layout;
- The interior of any buildings will have all necessary fire safety provisions (sprinklers, fire extinguishers, etc) as required by the relevant Australian Standards and legislation.
- Windows and doors of site buildings should be shut in a fire event, and ember proofing is recommended.
- It is anticipated relevant exterior fire fighting equipment will be provided including a mobile fire tanker unit with at least 3000l water tank, hoses, fire fighting pump, protective clothing/PPE clothing/equipment, etc.
- 100 000l water tank, with Storz fitting (to be installed at the TWA during construction and the O&M facilities during operations).
- Training for all on-site personnel regarding bushfire response procedures.
- Fire fighting training for operational workers.
- Operational vehicles to be fitted with basic fire fighting equipment.

3.0 VEGETATION

The predominant vegetation type over and within 140m of the Project Area is Grassland, and Mallee Woodland assessed as per PBP, 2019 (Figures 1-3b, Appendix 1 - photos).

Umwelt state all vegetation outside of the Project's Disturbance Footprint (taken as the physical footprint of all Project infrastructure as shown in Figure 1, which includes any required APZs) is to be preserved (not managed), and will be allowed to regrow/regenerate in accordance with the Biodiversity Development Assessment Report (BDAR) being prepared by Umwelt. The retained vegetation is therefore assessed as Mallee-Woodland.

Presently the majority of the Project Area and surrounds has been assessed as Grassland (grass generally over 100mm in height) in accordance with PBP, 2019 and NSW RFS policy. This is also in accordance with the Bush Fire Prone Land Map (Figure 4) which shows Category 3 Grassland over the lower southern half of the Project Area, and no hazard mapped over top half of the Project Area.

Woodland occurs along Coleambally Outfall Drain, in a small area, and scattered remnants over the Project Area. Trees are 5-10m high (Mallee type) with a shrub, and part grazed grass understorey.

4.0 SLOPE

PBP, 2019 states: - *“The effective slope is considered to be the slope under the vegetation which will most significantly influence the bush fire behaviour for each aspect. This is usually the steepest slope. In situations where this is not the case, the proposed approach must be fully justified. Vegetation located closest to an asset may not necessarily be located on the effective slope”.*

The Project Area is generally level, although it contains minor low rises and depressions. The wider locality is generally flat with minimal elevation change across the Project Area, rising from approximately 94 m Australian height Datum (AHD) in the north west to 106 m AHD in the central south east area, over a distance of approximately 12 km, as shown in Figure 3b.

While slopes across the Project Area are <5 degrees, it is noted that slope is irrelevant for determining APZ requirements for wind and solar farm developments. Minimum 10 m APZs are required as per Section 8.3.5 of PBP, 2019. Therefore no further slope site assessment is required under PBP, 2019, and this is considered adequate detail.

5.0 ENVIRONMENTAL FEATURES

As advised by Umwelt (March 2024):

*The Project Area will involve the removal of native vegetation, including threatened ecological communities listed under the NSW Biodiversity Conservation Act 2016 and Commonwealth Environment Protection and Biodiversity Conservation Act 1999. A number of State and Commonwealth listed threatened flora and fauna species have been recorded within the Project Area. Important habitat mapping for the Plains-wanderer (*Pedionomus torquatus*) is present within the Project Area, however, the Project has been designed to avoid all mapped primary habitat for the species. The Project is also located directly south of the Oolambeyan National Park. The Project does not directly impact the National Park and a variable width buffer has been established along the Project Boundary to minimise potential indirect impacts. A detailed BDAR has been prepared for inclusion in the EIS. The BDAR was prepared in accordance with the NSW Biodiversity Assessment Method and includes:*

- *A comprehensive biodiversity mitigation and management strategy to minimise the unavoidable impacts of the Project on biodiversity values, including:*
 - *salvage of biodiversity features, including habitat resources (e.g. hollow logs, tree hollows, fallen timber and rocks/boulders) from areas to be cleared;*
 - *implementation of a pre-clearing procedures;*
 - *weed management;*
 - *bushfire management;*
 - *erosion and sedimentation control;*
 - *A biodiversity offset strategy.*

6.0 ABORIGINAL FEATURES

As advised by Umwelt (March 2024):

The Project Area encompasses lands within both the Hay and Griffith Local Aboriginal Land Council (LALC) administrative boundaries. There are no known native title schedule, applications, determinations, or Indigenous Land Use Agreements over the Project Area. Searches of the Australian Heritage Information Management System (AHIMS) undertaken in support of the Project's Scoping Report identified a total of 115 registered sites within 10 km of the Project Boundary, including 13 within the Project Boundary (as at October 2022).

A detailed Aboriginal Cultural Heritage Assessment (ACHA) has been prepared for inclusion in the EIS. The ACHA was undertaken in consultation with Registered Aboriginal Parties (RAPs) for the purposes of determining and assessing impacts and developing and selecting options and mitigation measures, having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010b). A range of management strategies are available in relation to the Project that include varying levels of mitigation of identified sites or potential harm to Aboriginal cultural heritage. The micro-siting of infrastructure will allow for some flexibility in the management of Aboriginal cultural heritage. Where impacts to sites or areas of archaeological potential are unavoidable, a strategy has been developed that involves implementing appropriate measures to manage and mitigate these impacts with reference to the archaeological and Aboriginal cultural significance of the sites/areas of potential.

7.0 BUSH FIRE ASSESSMENT

The legislation as it relates to the Project calls for APZs to be established around the proposed development, provision of adequate access, design staging and siting of the development and provision of appropriate water supply for bush fire fighting purposes.

7.1 Setbacks including asset protection zones

Table 1 shows the bush fire assessment for the Project Area.

APZs will be established for the Project as follows, in compliance with PBP, 2019:

- Ten (10) m wide APZ around each WTG, substations, switchyards and battery storage
- 20 m wide APZ around O&M facilities
- 25 m wide APZ around the TWA.

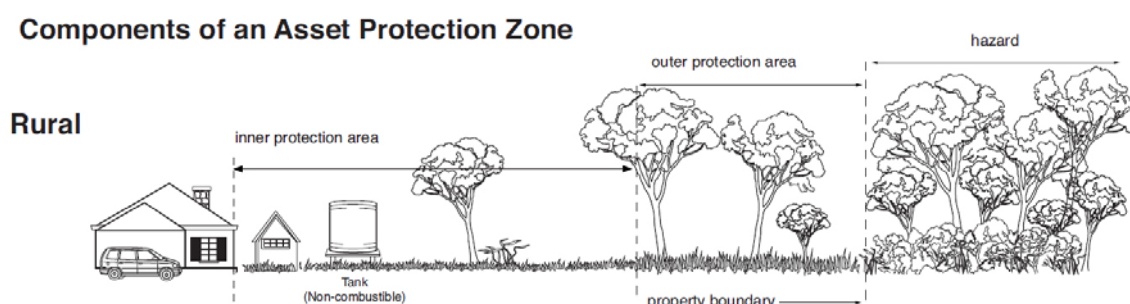
Additionally, BWF will maintain:

- Clearance of all woody vegetation within two (2) m of power poles
- Clearance of all woody vegetation within three (3) m of transmission tower structures or 12 m from the centre of the tower (whichever is greater).

Table 1: Bush Fire Site Assessment – Fire Danger Index (FDI) 80 – Wind turbines/development

DIRECTION TO BUSH FIRE HAZARD	EFFECTIVE SLOPE	PREDOMINANT VEGETATION TYPE WITHIN 140m as per PBP, 2019	Distance to edge of hazard	PBP, 2019 required Asset Protection Zone (IPA)	Bush Fire Attack Level (BAL) (from PBP, 2019)
All directions (from WTG, substations, switchyards and battery storage)	0-5 ⁰ up & downslopes	Primarily Grassland, some Woodland	>10m	10m	N/A
O&M Facilities	0-5 ⁰ up & downslopes	Primarily Grassland, some Woodland	>20m	20m	N/A
TWA	0-5 ⁰ up & downslopes	Grassland	25m	12m	BAL 12.5

Note: BAL refers to the maximum Bush fire attack level expressed in kW/m² radiant heat flux exposure for the given slope, distance to hazard, and type of hazard (i.e. vegetation type and fuel load).

Figure 5: Pictorial diagram of an Asset Protection Zone (diagram from PBP, 2006)

7.2 Cumulative Impacts

NSW Government – EnergyCo seeks to maximise opportunities created by the transformation of the NSW electricity system by coordinating investment in Renewable Energy Zones (REZs) across NSW. A REZ is the equivalent of modern-day power stations, combining new renewable energy infrastructure, including generators (such as solar and wind farms), storage (such as batteries and pumped hydro) and then high-voltage transmission infrastructure. Five (5) dedicated REZs have already been identified in NSW.

The Project is located wholly within the South West REZ. Because of this, and the REZ benefits anticipated by NSW Government – EnergyCo, the South West REZ has the potential to see strong interest for renewable energy development.

Based on information available within the public domain, the following developments are identified in the vicinity of the Project:

- Pottinger Solar Farm (SSD-59254709) – adjoining, the boundaries touch.

- Pottinger Wind Farm (SSD-59235464) – adjoining, the boundaries touch.
- Dinawan Wind Farm (SSD-50725708) – 16 km from the centre of Bullawah to the closest edge of boundary.
- Dinawan Solar Farm (SSD-50725959) – 47.65 km from the centre of Bullawah to the closest edge of boundary.
- Argoon Wind Farm (SSD-64935522) – 41.15 km from the centre of Bullawah to the closest edge of boundary
- Yanco Delta Wind Farm (SSD-41743746) – 26.25 km from the centre of Bullawah to the closest edge of boundary
- The Plains Solar Farm BESS (SSD-51219280) – 39.68 km from the centre of Bullawah to the closest edge of boundary
- The Plains Wind Farm (SSD-50629707) – 20 km from the centre of Bullawah to the closest edge of boundary
- Romani Solar Farm (SSD-67105475). – 57 km from the centre of Bullawah to the closest edge of boundary
- Tchelery Wind Farm – 78.27 km from the centre of Bullawah to the closest edge of boundary
- Hay Sun Farm – 49.63 km from the centre of Bullawah to the closest edge of boundary
- Hay Solar Farm – 50 km from the centre of Bullawah to the closest edge of boundary
- Hay 1A and 2A solar farm – 52.23 km from the centre of Bullawah to the closest edge of boundary.

Based on the proximity of the above-mentioned developments to the Project, cumulative impacts will vary but negative impacts are not anticipated to be significant. Fire fighting workload (and call outs) should not significantly increase during either construction (incl. decommissioning) and operations as the risk of ignition is considered to be low (based on the nature and location of proposed activities). This potential is further reduced during operations due to minimal traffic and road use associated with the Project, when compared to construction (incl. decommissioning).

Potential positive cumulative impacts may also occur in the region e.g. increased activity in managing fire risk, and increased land access associated with wind farm access roads across of multiple Projects.

These factors would be addressed within the Bushfire Emergency Management and Operations Plan (see Section 8.0) that will be prepared and implemented in consultation with FRNSW/RFS to ensure the most current information relating to fire risk from, and to, surrounding land uses is considered.

It is noted that because of the development activity in the South West REZ the above list may not address all potential sites being privately developed and not yet in the public domain and so any of these are excluded for this study.

8.0 BUSH FIRE RECOMMENDATIONS (MITIGATION MEASURES)

The development complies with PBP, 2019:

- ❑ Construction - No BAL applicable for the wind farm/commercial development. The TWA buildings however shall be constructed to BAL 12.5, and O&M site offices should be ember screened & preferably constructed from non-combustible materials- complies with PBP, 2019
- ❑ Serviced by static water supplies - complies with PBP, 2019.
- ❑ Serviced by above & underground power - complies with PBP, 2019.
- ❑ Serviced by public road & interior property access roads - complies with PBP, 2019.
- ❑ Asset Protection Zone - 10m for wind turbines & other commercial development, 25m for TWA residences, 20m for O&M site offices - provides a defensible space available around the proposed development- complies with PBP, 2019.
- ❑ Emergency Management - complies with PBP, 2019.

The Project therefore meets the criteria outlined in Section 8.3.5 PBP, 2019 (Wind and Solar Farms).

The following recommendations are made:

- ❑ **Design and Construction:** - The intent of measures is that buildings are designed and constructed to withstand the potential impacts of bush fire attack. To achieve this, the following is recommended:
 - TWA residences(s) shall comply with Sections 3 and 5 (BAL 12.5) of Australian Standard AS3959-2018 'Construction of buildings in Bush Fire-prone areas', except as modified by Section 7.5 of PBP, 2019.
 - Essential equipment should be designed and housed in such a way as to minimise the impact of bush fires on the capabilities of the infrastructure during bush fire emergencies. It should also be designed and maintained so that it will not serve as a bush fire risk to surrounding bush.
 - Fire protection equipment within buildings including fire extinguishers, fire hose reels, evacuation signage, first aid kits, etc be available at all times and serviced /maintained regularly;
 - The O&M site offices should be ember screened, and have a policy to shut all windows & doors in a bush fire emergency, as part of their Emergency Evacuation Plan procedures;
 - For construction and decommissioning phases, the following should apply:
 - Provide good access i.e. construct access roads prior to WTG and ancillary infrastructure installation, and then decommission access roads after WTG and ancillary infrastructure removal
 - Install appropriate signage to assist emergency response crews
 - Ensure any and all appropriate permits are issued as required
 - Adhere to restrictions on total fire ban, or days of high fire danger
 - Suitable firefighting equipment is on site (as deemed necessary in consultation with RFS)
 - Vehicles carry fire extinguishers or fire fighting equipment, where possible
 - Emergency communications equipment is carried

- Vehicles will be selected with a preference for diesel and/or will utilise cleared tracks/internal roads to minimise likelihood of ignition
 - Smoking is restricted to prescribed areas with suitable butt disposal
 - Plant equipment and machinery is maintained to a suitable standard and cleaned to remove any accumulated flammable material
 - The 'Fires Near Me' app is utilised to understand proximal threat of fire.
- ❑ **Asset Protection Zone:** - The intent of measures is to provide sufficient space and maintain reduced fuel loads to ensure radiant heat levels at the buildings are below critical limits and prevent direct flame contact. To achieve this, the following should apply:
- During construction and for the life of the Project, APZs shall be established as set out in Table 1 Section 7.1 above and as outlined within Appendix 4 of PBP, 2019.
 - The O&M site offices, substations, switchyards and battery storage shall have a 20m Asset Protection Zone, 10m Asset Protection Zone for wind turbines & other commercial development, and 25m Asset Protection Zone for the TWA.

In summary PBP, 2019 states "Asset Protection Zone should consist of mown grass, concrete, pavers, pebbles, small clumps of vegetation, isolated trees, etc. Lawns and garden should be maintained so that they do not become overgrown, vegetation does not grow over or touch the dwelling, and canopy of trees do not touch or become continuous with the surrounding bushland (at least 2-5 metres between tree canopies).

Please note in this modified agricultural landscape that isolated paddock trees, woodlots, conservation areas can be retained as they are environmentally important and of a low risk, so long as vegetation is managed within the nominated Asset Protection Zone to an Asset Protection Zone standard.

- ❑ **Water and Utilities:** - The intent of measures is to provide adequate services of water for the protection of buildings during and after the passage of a bush fire, and to locate gas and electricity so as not to contribute to the risk of fire to a building. To achieve this, the following should apply:
- Water, electricity and gas shall comply with Table 7.4a (where relevant) of PBP, 2019.
 - The proposed development is to have a non-combustible 100,000l dedicated water tank with Storz fitting, and other fire fighting equipment in compliance with Australian Standards. Dedicated fire fighting water supply from this tank is specifically for fire tanker refilling/on-site fire fighting. This Static Water Supply (SWS) should be located in an easy to access part of the Project Area by fire tanker, within the TWA or O&M compounds (or similar), with 10m Asset Protection Zone around it, and signposted "SWS".
- ❑ **Access:** - The intent of measures for access roads is to provide safe operational access for emergency services personnel in suppressing a bush fire, while residents are accessing or egressing an area. To achieve this, the following should apply:
- The internal road network shall conform to PBP, 2019.
 - Internal roads should have a minimum 4m vertical clearance to any overhanging obstructions, and be a minimum 4m width with 1m traversable shoulders, unsealed/sealed all weather traversable road with suitable load bearing capacity,

drainage structures and feature crossings. Road grade should be less than 10°, short steep sections are acceptable if sealed and <15° and then suitable cross fall of the road surface provided. Two way traffic flow (with capacity for passing and turning areas) which enables safe access & egress for emergency services and allow crews to work with equipment about the vehicle is to be provided by the proposed road system & APZs.

Emergency management planning- The intent of measures is to provide suitable emergency and evacuation arrangements for occupants of the development, and to reduce bush fire risk from the proposed development. To achieve this, the following measures are recommended:

- o A Bush Fire Emergency Management and Operations Plan should identify all relevant risks and mitigation measures associated with the construction, operation and decommissioning of the Project. This should include:
 - detailed measures to prevent or mitigate fires igniting;
 - work that should not be carried out during total fire bans;
 - availability of fire-suppression equipment, access and water;
 - storage and maintenance of fuels and other flammable materials;
 - notification of the local NSW RFS Fire Control Centre for any works that have the potential to ignite surrounding vegetation, proposed to be carried out during a bush-fire fire danger period to ensure weather conditions are appropriate; and
 - appropriate bush fire emergency management planning.

It is important to be aware of operations that may be carried out on days of Total Fire Ban and any prohibited activities or exemptions that are notified by the Commissioner of the NSW RFS under the *Rural Fires Act 1997* s.99. The Bush Fire Emergency Management and Operations Plan should include training, awareness and notification protocols in this regard.

The following information is provided for the proponent in order to improve bush fire safety if desired. It is not compulsory under PBP, 2019:

- o A sprinkler system (i.e. metal garden sprinklers on the ground) should be considered for the O&M & TWA APZs, including wetting the walls of the building. This would provide limited fire suppression in the event of a fire.
- o A petrol or diesel or solar powered (with battery storage backup so can be used at any time and for a sufficiently long time as necessary) powered fire fighting pump and 30m+ hose reel with steel nozzle is purchased and stored in an ember proofed housing (or garage/shed/cabin that has been ember proofed). This mobile pump can be used on the back of a 4WD or similar vehicle to fight Grassland fires/spot fires, and for pumping water from water tank(s).
- o Training is recommended for all on-site personnel regarding bushfire response procedures.
- o Fire fighting training is recommended for operational workers.
- o Operational vehicles should be fitted with basic fire fighting equipment.

9.0 CONCLUSION

The bush fire risk is considered to be adequately managed through the recommendations made above, and in conjunction with consent conditions from NSW DPPI/NSW RFS.

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DISCLAIMER: Whilst every effort is made to present clear and factual information based on fieldwork and current legislation no guarantee is made that the development or its occupants are safe from bush fire, or development will be approved or to the recommended BAL, as this is in the hands of the approving statutory authority. No warranty or guarantee, whether expressed or implied, is made with respect to the observations, information, findings and inclusions expressed within this report. No liability is accepted for losses, expenses or damages occurring as a result of information presented in this document.

9.0 REFERENCES

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Websites

www.rfs.nsw.gov.au

Lands Department- SIX Maps

ePlanning

APPENDIX 1: PHOTOS OF SITE AND SURROUNDS

Photo locations

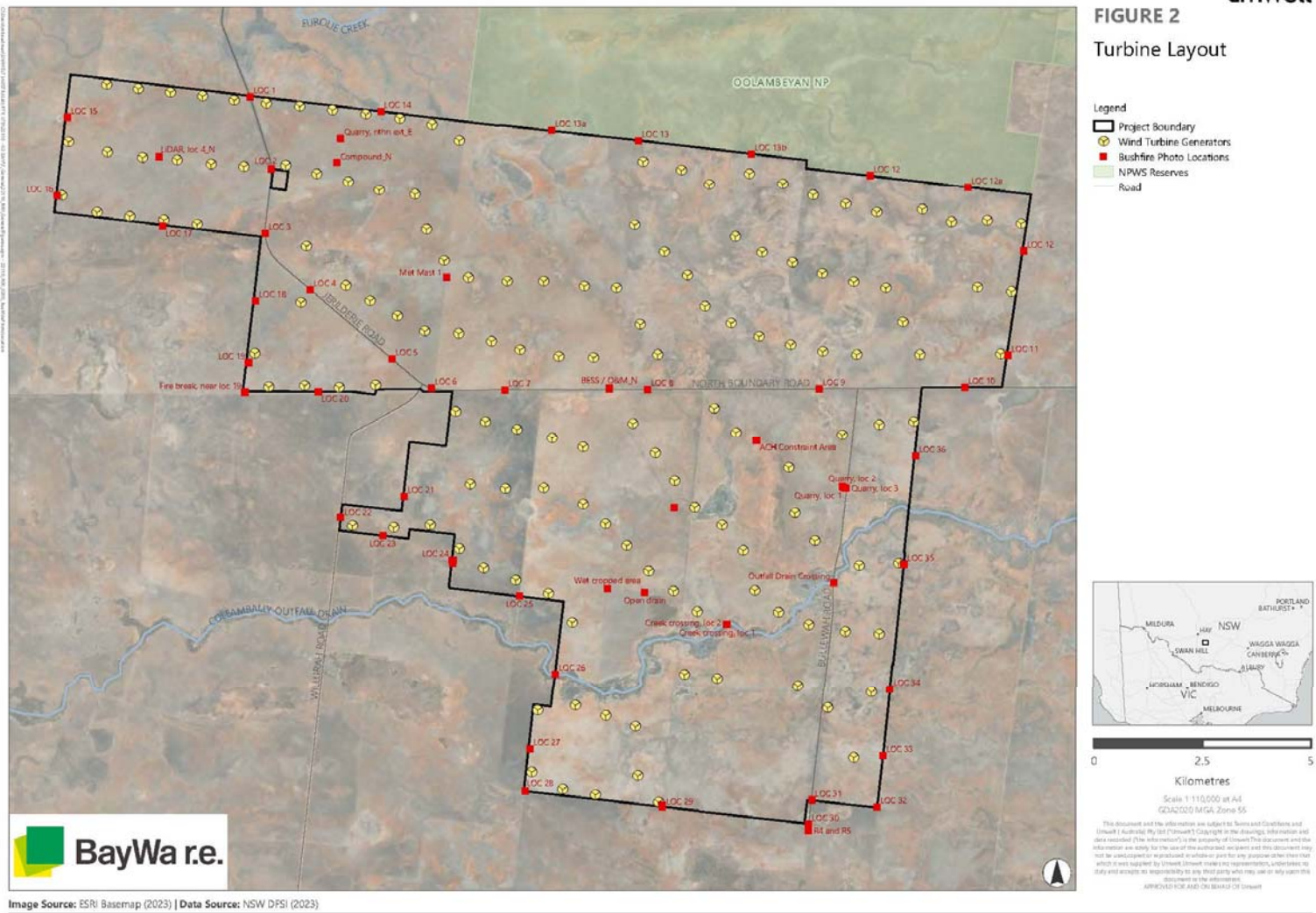
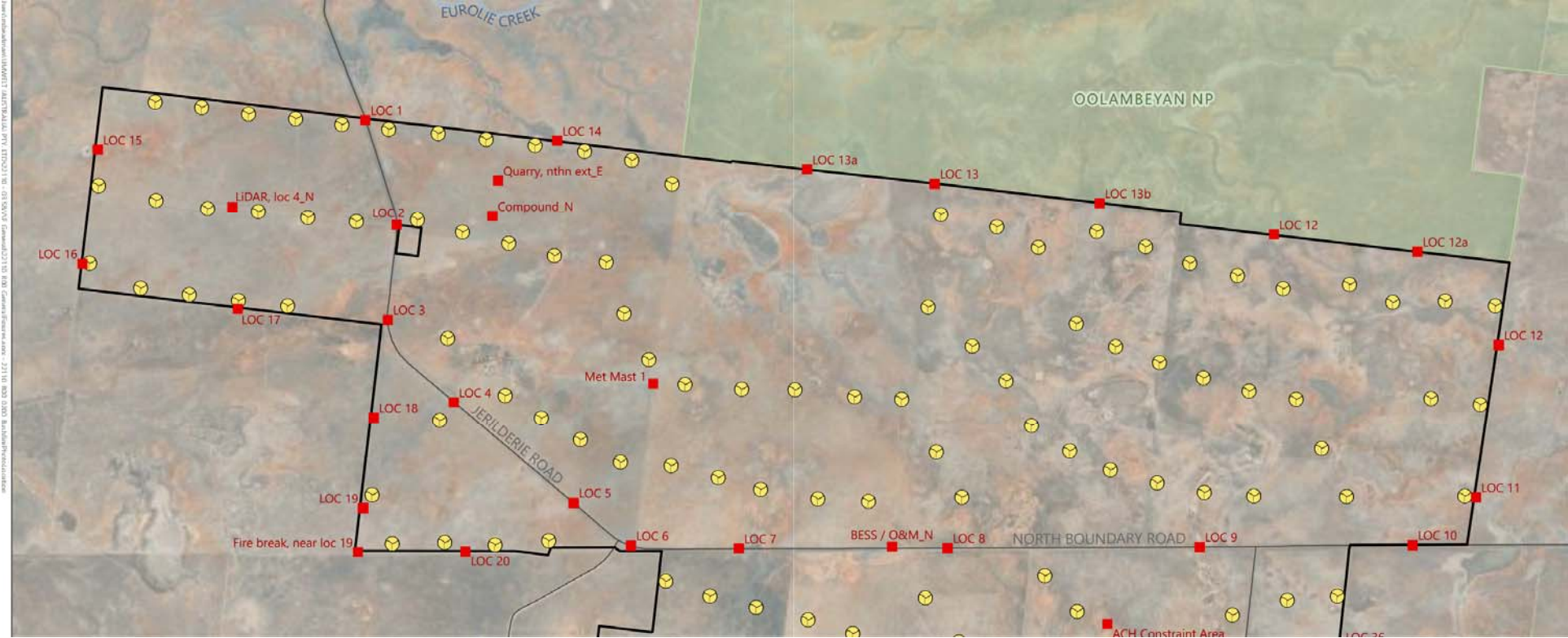
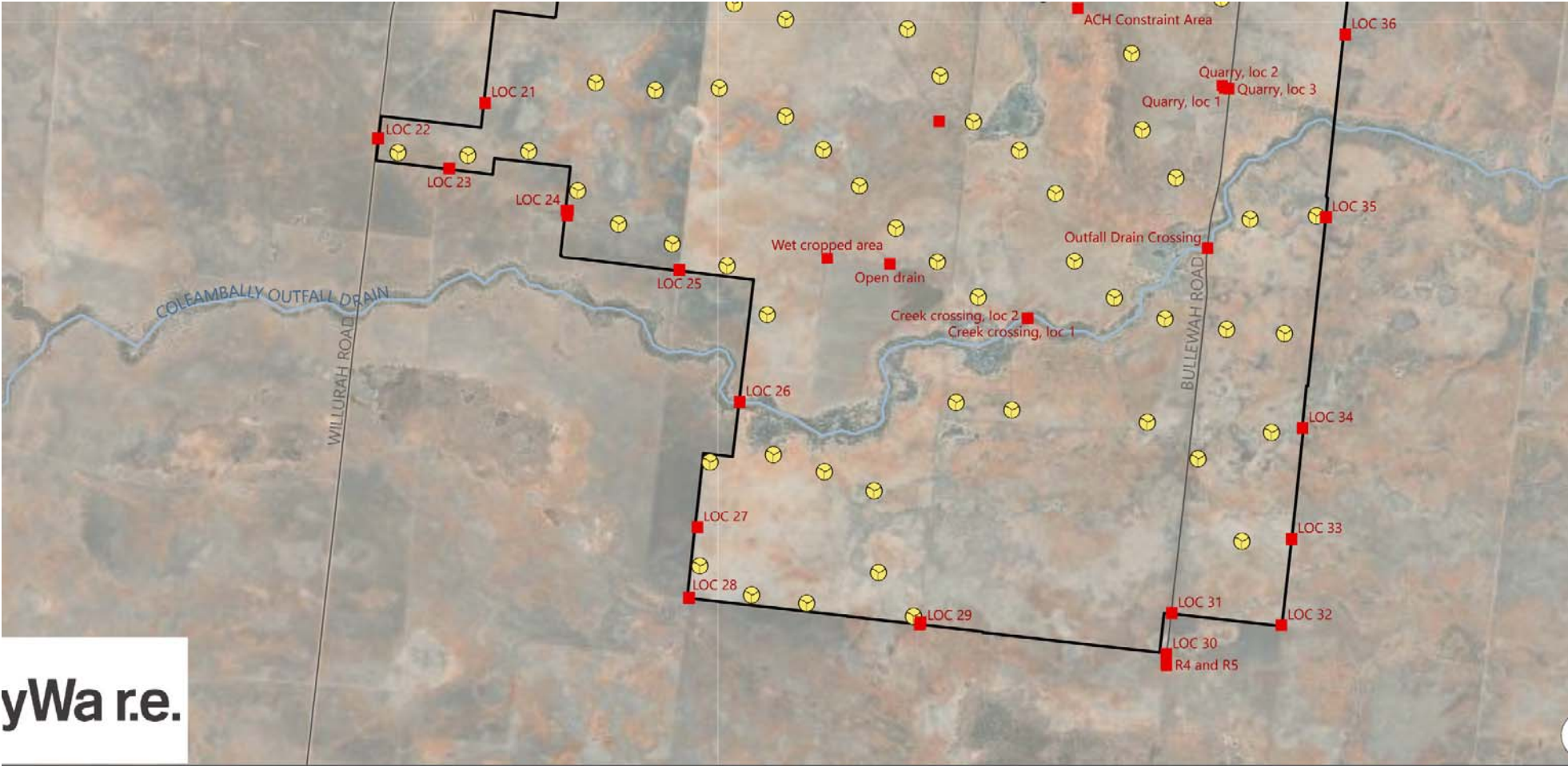


Photo locations enlarged





Grassland over site and surrounds- Photo location 1.



Grassland over site and surrounds- Photo location 3.



Grassland over site and surrounds- Photo location 13b looking north over Oolambeyan National Park. Assessed as Grassland within this report.



Woodland over Coleambally Outfall Drain Creek. Photo location “Outfall Drain Crossing”



Grassland over site and surrounds- Photo location 29 looking south.



Grassland over site and surrounds- Photo location 35 looking east.



Grassland over site and surrounds- Photo location 25 looking south.



BESS site looking south



Intersection of Cobb Highway and Jerilderie Road

