BUSH FIRE ASSESSMENT REPORT

MOREE BATTERY ENERGY STORAGE SYSTEM BULLUSS DRIVE, MOREE

Assessment of bushfire protection for a battery energy storage system (BESS)

Prepared for AE BESS 2 Pty Ltd

9.12.24

Version 1.0

ember bushfire consulting

EXECUTIVE SUMMARY

EMBER Bushfire Consulting has been engaged by AE BESS 2 Pty Ltd as Trustee for AE BESS 2 Unit Trust, care of NGH Consulting, to prepare a bush fire assessment report (BFAR) in support of an Activation Precinct Certificate (APC) and Development Application (DA) for the Moree Battery Energy Storage System (MBESS) and associated works at Bulluss Brive, Moree NSW (*the Project*). The proposal will include the development, construction, operation and decommissioning of the BESS with a nominal capacity of up to 120 MW / 480 MWh (4 hours).

The Project site is located approximately 3 kilometres southeast of the Moree CBD on Bulluss Drive within the Moree Plains Shire Council Local Government Area (LGA) in northern NSW, on land predominantly used for primary production and agricultural activities.

The MBESS is located in the Moree Special Activation Precinct (SAP), with several triggers requiring an assessment from a bushfire protection perspective, not least of which the proposal is on designated bushfire-prone land.

The report establishes the level of bushfire threat to the Project Area. It examines protection measures for the proposal to satisfy the broad aims and objectives of the NSW Rural Fire Service document Planning for Bushfire Protection 2019 (PBP (2019)) as well as specific considerations detailed in Chapter 8 of PBP (2019), such as asset protection zones, landscaping, access, water supplies, construction and emergency management.

The recommendations are designed to inform the EIS and, in turn, inform the Development Application approval.

Given that the Project Area is a greenfield site with large open spaces and immediately adjacent to the existing 132 kV Moree Bulk Supply Zone substation, there is an excellent opportunity to provide a range of bushfire protection measures that address the bushfire threat and requirements of PBP (2019).

The proposed Asset Protection Zone (APZ) dimensions will ensure that the critical components of the MBESS are not exposed to excessive radiant heat levels exceeding 29 kW/m^2.

Access to the Project Area will be well provided for with a new entrance point and access road off Bulluss Drive that will meet the access requirements and an internal road network, including a perimeter road surrounding the MBESS area, all of which will comply with the acceptable solutions set out in PBP (2019).

Specific Firefighting water supplies will be provided and will exceed the specific requirements of PBP (2019).

Preparation of a Bush Fire Emergency Management and Operations Plan during the construction and operational phase of the MBESS is recommended as part of the project's fire mitigation strategy.

Based on the bushfire assessment and the recommendations in this report, the development proposal will be capable of complying with the specific and broad objectives of PBP (2019).

CERTIFICATION STATEMENT

Document Title:	Bushfire Assessment Report Moree BESS Bulluss Drive, Moree NSW
EMBER Reference:	Moree PH.66.25
Lot & DP Number	Lots 82 & 144 DP 751780
Street Address	Bulluss Drive, Moree NSW
Local Government Area	Moree Plains Shire Council
Description of the development	Planning proposal
Type of assessment under Planning for Bushfire Protection (2019)	Section 4 – Bush Fire Strategic Study
Is referral of the proposal to the NSW RFS required?	Yes – Direction 4.7 of the EP&A Act (1979)
Has a pre-DA lodgment or bushfire design brief been provided to the NSW RFS?	No
The highest radiant heat flux determined for indicative development.	<29kW/m^2
Highest level of construction applicable:	Bushfire Attack Level (BAL) -29
Accreditation Scheme / Level of accreditation	Bushfire Planning and Design (BPAD) Accreditation Scheme administered by the Fire Protection Association Australia (FPAA)
Prepared by:	Peter Hague (EMBER Bushfire Consulting)
Verified by:	Jeff Dau – BPAD 33128 - Level 3

The author (Jeffrey Dau) hereby certifies that:

- Peter Hague from EMBER Bushfire Consulting carried out a thorough, in-person survey of the Project area on the 7th of October 2024;
- A subsequent bushfire threat assessment was undertaken of the site and the proposal per the relevant sections of the NSW Rural Fire Service (NSW RFS) document Planning for Bushfire Protection 2019 (PBP 2019);
- A detailed bush fire assessment report is attached per the submission requirements of Section 4 of PBP (2019), together with recommendations needed for future development to satisfy the specifications and requirements of PBP (2019);
- I am a person recognised by NSW RFS as a qualified consultant in bush fire risk assessment and
- Subject to the recommendations in this report, the proposed development conforms to PBP's relevant specifications and requirements.

Furthermore, I am aware that this report will be submitted to support a development application for this site and will be relied upon by the Council to ensure that the bushfire risk management aspects of the proposal have been addressed per PBP (2019).

9/12/2024

BPAD Bushfire Planning & Design Accredited Practitioner Level 3

Document Control

Information	Detail
Document Title:	Bushfire Assessment Report Moree BESS Bulluss Drive, Moree NSW
EMBER Reference:	Moree PH.66.25
Other Reference:	Project No.: 230246 (NGH Consulting)
Version:	1.0
Version Control:	1.0 – First Issue – 9.12.24
Status:	Issued
Valid until:	9.12.25 (12 months)

Key details of the development

Information	Detail
Street Address	Bulluss Drive, Moree NSW
Local Government Area	Moree Plains Shire Council
Zoning of Project land	REZ – Regional Enterprise Zone
Zoning of adjoining lands	REZ – Regional Enterprise Zone SP2 – Special Purpose Infrastructure
Project Area size	~4.06 ha (Subject Site ~18 ha)
Staging issues	N/A
Planning for Bush Fire Protection 2019 Development Classification	Section 8 – Other Development - 8.3.9 Hazardous Industry
Type of assessment	Bush Fire Assessment Report (BFAR) in support of a Statement of Environmental Effects (SEE) and DA per the Department of Planning Housing and Infrastructure (DPHI)
	Performance criteria PC57 in the Moree SAP Delivery Plan.
Fire weather area	North Western
Fire Danger Index	80
Predominant vegetation	Cleared land (Grassland)
Slope	Upslope/Flat
Environmental constraints	Subject to APC
Cultural constraints	Subject to APC
Method of meeting performance requirements	Adoption of Acceptable Solutions.

How to read this document

Section 1 Introduction – Introduction and overview of the subject site and proposed development.

Section 2 Bushfire Threat Assessment - Assessment of the critical factors contributing to the potential bushfire attack of the proposed development, planning considerations and assessment of the overall bushfire hazard.

Section 3 Bushfire Protection & Prevention Measures – Discussion and recommendation discussion of the recommended bushfire protection measures in response to the Bushfire Attack Assessment, necessary for life safety and compliance purposes.

Section 4 Bushfire Management Plan – A summary of the recommendations.

Section 5 Conclusion – Concluding statement.

DEFINITIONS -

Asset Protection Zone (APZ) - A fuel-reduced area surrounding a built asset or structure that provides a buffer zone between a bushfire hazard and an asset. The APZ includes a defendable space within which firefighting operations can be carried out. The size of the required APZ varies with slope, vegetation and FFDI.

Bushfire attack - Attack of a built asset or structure by burning embers, radiant heat or flame generated by a bush fire.

Bushfire hazard - Any vegetation that can potentially burn and threaten lives, property or the environment.

Bushfire-prone land (BFPL) - An area of land that can support a bushfire or is likely to be subject to bushfire attack, as designated on a bushfire-prone land map.

Bush fire protection measures (BPMs) - A range of measures used to minimise the risk from a bush fire that needs to be complied with. BPMs include APZs, construction provisions, suitable access, water and utility services, emergency management and landscaping.

Bushfire risk - This is the likelihood and consequence of a bushfire igniting, spreading and causing life loss or damage to buildings of value to the community. Note: This assessment does not intend to determine the likelihood of bushfire impacting the subject site. Instead, it focuses on assessing the degree of bushfire attack, its expected consequences and the BPMs needed to moderate this attack.

Managed land - Land with vegetation removed or maintained to a level that limits the spread and impact of bush fire. This may include developed land, roads, golf course fairways, playgrounds, sports fields, vineyards, orchards, cultivated ornamental gardens and commercial nurseries. The most common will be gardens and lawns within the curtilage of buildings. These areas are managed to meet the requirements of an APZ.

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1 INTRODUCTION AND OVERVIEW

1.1 PROJECT DESCRIPTION

EMBER Bushfire Consulting has been engaged by AE BESS 2 Pty Ltd as Trustee for AE BESS 2 Unit Trust (the Proponent and Applicant), care of NGH Consulting Pty Ltd, to conduct a Bushfire Impact Assessment (BIA) of the Moree Battery Energy Storage System (MBESS) (*the Project*). Potential Bushfire Impacts from the construction, operation and decommissioning phases of the Project are addressed in this report per relevant regulatory requirements and guidelines.

This report supports an Activation Precinct Certificate (APC) Development Consent approval under Chapter 3, Part 3.3 of the *State Environmental Planning Policy* (Precincts – Regional) 2021 as part of a Statement of Environmental Effects (SEE) for the Project.

The Subject Site is part of a larger commercial precinct, the Moree Special Activation Precinct (SAP), which is subject to a master plan that took effect in March 2022. This precinct is one of 6 special activation precincts across regional NSW that have been identified to become thriving business hubs. The Moree Special Activation Precinct will provide a new business hub, specialising in agribusiness, logistics and food processing, capitalising on the existing agricultural industry and its access to the inland rail and major highways.

The Project Area is located on a ~18 ha privately owned property approximately 3 kilometres southeast of the Moree CBD within the Moree Plains Shire Council Local Government Area (LGA) in northern NSW, on land predominantly used for primary production and agricultural activities. The Moree BESS development footprint extends across an area of approximately 4.06 ha with direct access from Bulluss Drive, which runs along the site's western boundary.

The Project will involve the development, construction, operation and decommissioning of a lithium-ion phosphate (LFP) battery energy storage system (BESS) with a nominal capacity of up to approximately 120 MW / 480 MWh (4 hours storage) consisting of containerised batteries, power conversion stations, and transformers. The Project would include:

- 140 containerised battery systems, each consisting of around 40 battery modules and other ancillary equipment, such as the liquid cooling system and control systems. Each container measuring approximately 6.05m (L) x 2.5m (W) x 2.9m (H).
- 42 skid-mounted Power Conversion Systems (PCS) comprising of the inverters, which convert direct current (DC) to alternating current (AC), the medium-voltage transformer, which converts the inverter output voltage to the medium-voltage of the system (33 kilovolts), and the medium voltage switchgear, which contains the medium voltage circuit breakers and disconnectors for the PCS. The approximate dimensions for the PCS are also 6.05m (L) x 2.5m (W) x 2.9m (H).

- A 33kV switch room collects all the individual medium voltage cables from the PCS units in one location before connecting them to the high-voltage transformer. Auxiliary power is supplied from a low-voltage room, which is connected to the medium-voltage switch room. Underground cables would connect the switch room, power conversion units and batteries to allow for easy access and minimal disruption. The approximate dimensions are 14.52m (L) x 5.2m (W) x 3.8m (H) on an elevated platform approximately 2.7m above ground level.
- An internal HV substation including 33kV/132kV step up transformer and associated components to enable underground connection to the Moree Bulk Supply Point substation.
- Associated ancillary infrastructure including:
    - Bulk earthworks.
    - Concrete foundations and pad footings for the buildings and structures, including containerised batteries and power conversion stations.
    - Construction laydown area, internal access roads, and tracks, including connection point to Bulluss Drive.
    - Stormwater drainage infrastructure, including new detention basin.
    - Security fencing to site perimeter and internal substation.
    - Perimeter landscape screening as per Landscape Plan.
    - On-site car parking.
    - Operations and maintenance (O&M) building.
    - Underground cabling connecting site infrastructure.
    - Auxiliary low-voltage transformers.
    - Water tank and
    - Pump out sewerage holding tank.

The Project layout is shown in Figure 3.

1.2 ASSESSMENT APPROACH

The Moree BESS is located within the Moree SAP, with several triggers initiating an assessment of the proposal from a bush fire protection and prevention perspective, including:

- The Moree BESS Scoping Report to assess the potential for increased risk of bushfire generated by the development.
- The Department of Planning Housing and Infrastructure (DPHI) identifies the following: Performance criteria PC57 in the Delivery Plan states development identified on grassland requires an asset protection zone from the grass fire hazard. To achieve PC57 development within 50 metres of grassland must comply with the requirements of the latest version of Planning for Bushfire Protection (PBP) and the Rural Fires Act 1997. To satisfy this requirement, Section 6.3.1.2 of the Delivery Plan requires a bushfire hazard assessment and management plan to be prepared in accordance with PBP.

- The Project is located on land designated bushfire-prone by the Council and the NSW Rural Fire Service (NSW RFS) and, as a result (if approved), would be subject to Section 4.14 of the EP&A Act and the NSW RFS document Planning for Bushfire Protection 2019 (PBP (2019)).

These documents are, therefore, the basis and key reference for this assessment.

The aim of PBP (2019) in this regard is to protect human life and minimise impacts on property from the threat of bushfires while considering the development potential, site characteristics, and protection of the environment.

It is assumed that this assessment will be one of several through the various development application phases, such as the strategic planning and detailed design phases.

This assessment has been prepared through a desktop study of the Project Area and an in-person area survey completed on the 7th of October 2024 by Peter Hague from EMBER Bushfire Consulting and peer-reviewed by BPAD Level 3 Accredited Bushfire Practitioner Jeff Dau.

The above confirms that a bush fire assessment report shall be prepared which identifies the extent to which the proposed development conforms with or deviates from the relevant provisions of Planning for Bush Fire Protection 2019 and that NSW RFS will have the opportunity to review the proposal at the more detailed phase of planning.

On this basis, PBP (2019) has been the key reference for this assessment.

1.3 AIM AND OBJECTIVES

The aim of this report is to:

- Evaluate the potential bushfire threat to the Project Area,
- Evaluate the potential threat of fire propagating from the site,
- Recommend a range of protection measures that would be required to address these threats and provide the minimum bushfire protection necessary to offer life safety, improve property protection and facilitate fire service intervention during a bushfire event.

The bushfire protection objectives expected from the proposal are to satisfy the broad aims and objectives of PBP (2019) and specific considerations detailed in Chapter 8, Section 8.3.9 Hazardous Industry (Planning for Bushfire Protection, 2019).

The bush fire protection objectives include:

- afford buildings and their occupants protection from exposure to a bushfire,
- provide for a defendable space to be located around buildings,

- provide appropriate separation between a hazard and buildings, which, in combination with other measures, prevent the likely fire spread to buildings,
- ensure that appropriate operational access and egress for emergency service personnel and occupants is available,
- provide for ongoing management and maintenance of BPMs and
- ensure that utility services are adequate to meet the needs of firefighters.

Accordingly, the following bushfire protection measures are to be assessed:

- Asset Protection Zones (APZs) and setbacks,
- Landscaping,
- Access,
- Water Supplies,
- Utilities, and
- Emergency Management.

1.4 LIMITATIONS AND DISCLAIMER

This report is primarily concerned with assessing the proposal's capacity to withstand the impacts of a bushfire, including ember attack, radiant heat exposure and flame contact.

Protection measures will be recommended where necessary to protect the occupants, firefighters and the structures themselves.

It should be kept in mind that the measures recommended cannot guarantee the development will survive a bushfire event on every occasion. This is primarily due to the dependence on ongoing vegetation management, the unpredictable behaviour of fire, and extreme weather conditions.

EMBER Bushfire Consulting has prepared this report with all reasonable diligence. The information in this report has been gathered from field investigations of the site and plans provided by the Project designer, as well as communications with representatives of the property owner.

Table 1 - Stakeholders

Stakeholder	Role	Contact	Detail
Brett Bourke	Property Owner	Brett Bourke	0427 206 740
"AE BESS 2 Pty Ltd as Trustee for AE BESS 2 Unit Trust"	Independent Power Producer (IPP)	Not Given	Not Given
NGH Consulting Pty Ltd	Environmental Consultants	Sarah Hillis	0413 343 912
Moree Plains Shire Council	Consent Authority	Not Given	02 6757 3222
Department of Planning, Housing & Infrastructure (DPHI)	Determining Authority	Not Given	Not Given
NSW Rural Fire Service	Referral Authority	Not Given	03 5898 4100

1.5 COPYRIGHT NOTICE

1.6 PROJECT AREA REGIONAL CONTEXT

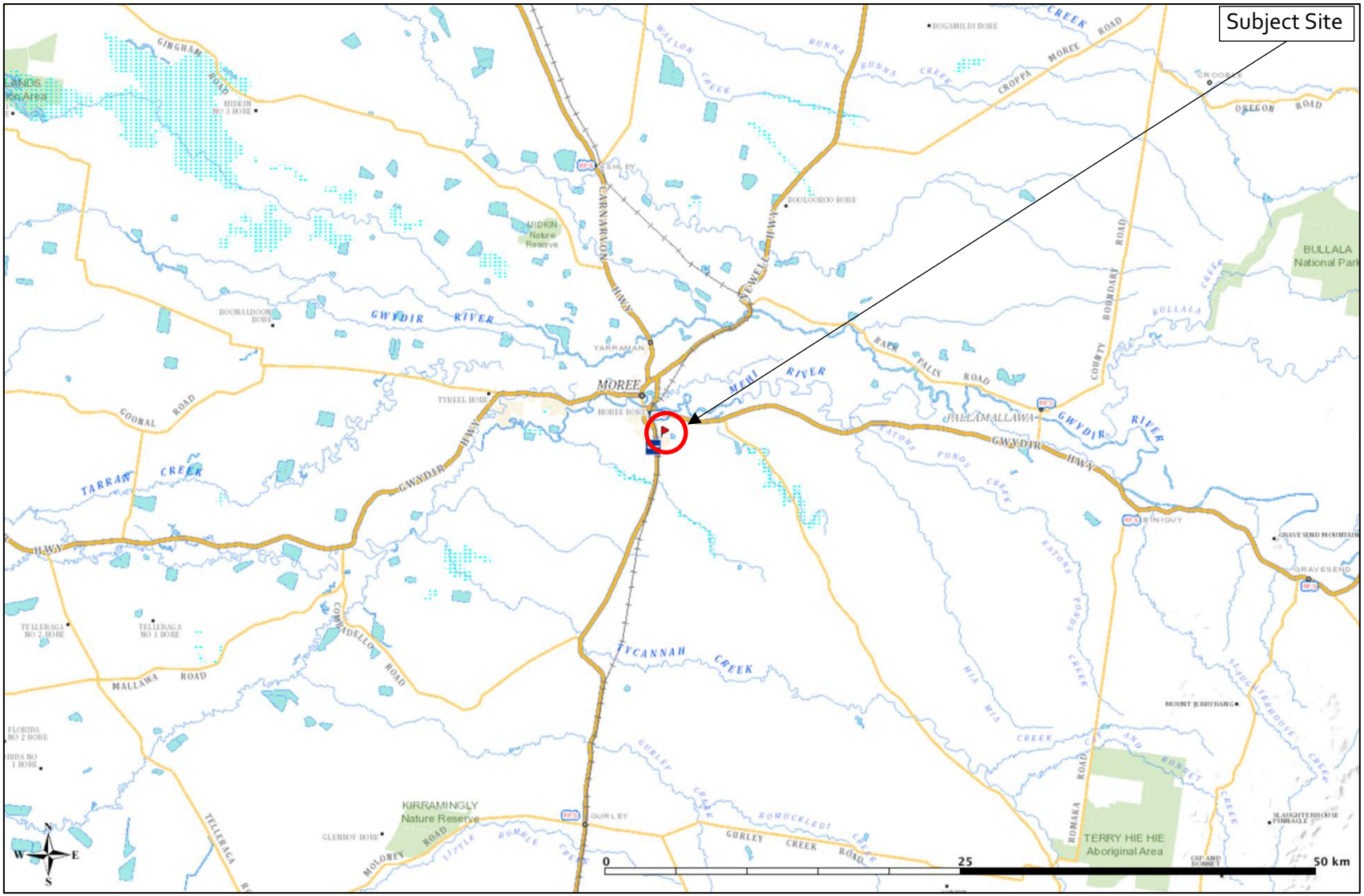

Figure 1 – Regional context of the Project Area (FPAA FireMaps, 2024)

1.7 SUBJECT SITE, PROJECT AREA EXTENT AND ACCESS OVERVIEW

Figure 2 – Subject sites and indicative extent of the proposed Project Area, point of access and existing Moree Bulk Supply Zone Substation (NGH Consulting Pty Ltd, 2024)

1.8 PROJECT AREA INDICATIVE LAYOUT

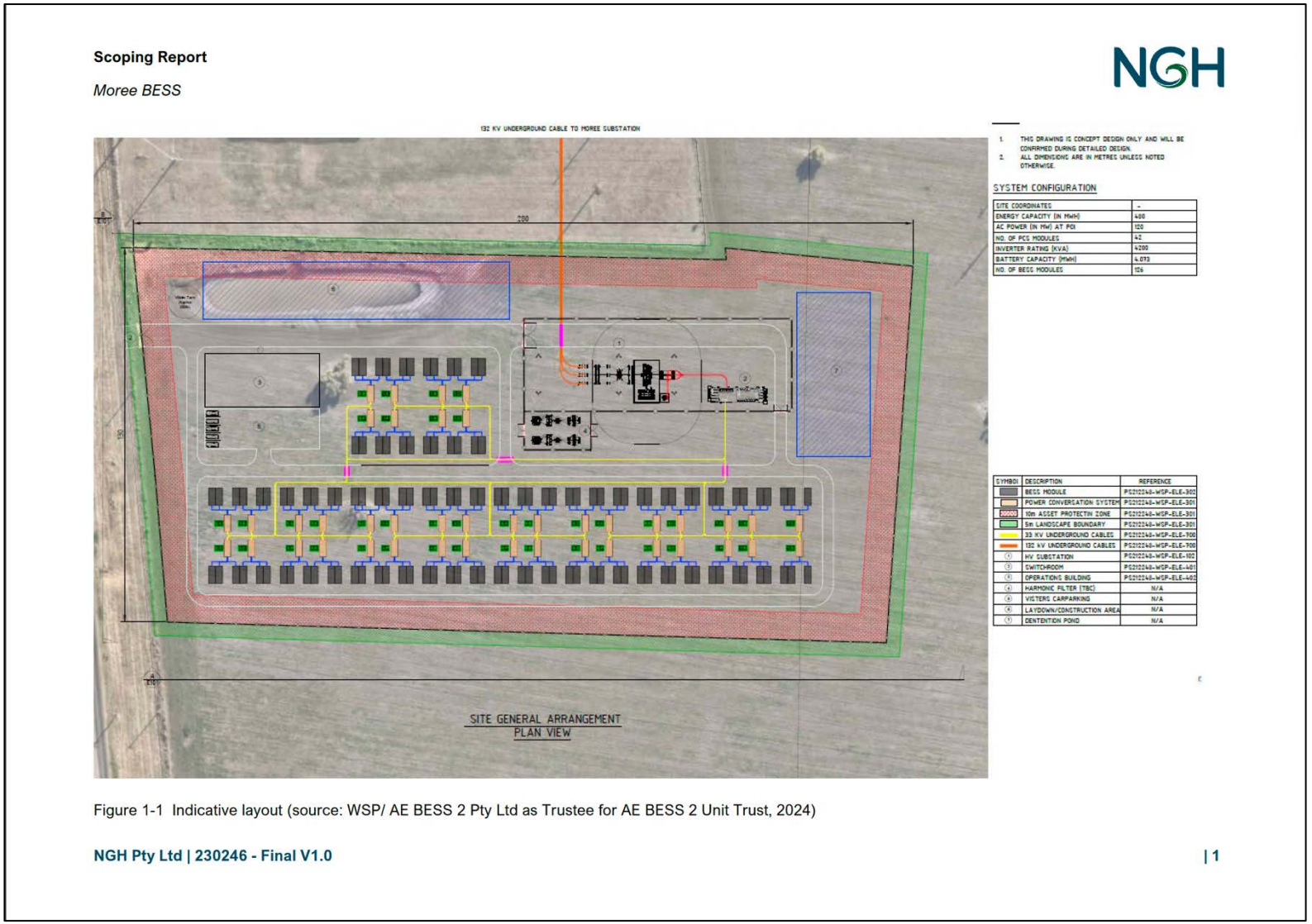

Figure 1-1 Indicative layout (source: WSP/ AE BESS 2 Pty Ltd as Trustee for AE BESS 2 Unit Trust, 2024)

Figure 3 – Moree BESS indicative Project Area layout (NGH Consulting Pty Ltd, 2024)

1.9 PROJECT AREA DESCRIPTION

Administration:

The ~18 ha Subject Site (Project Area footprint ~4.06 ha) falls under the Moree Plains Shire Council (MPSC) administration. Given that the proposal is within the Moree SAP, it is subject to the Department of Planning, Housing and Infrastructure (DPHI) being the determining authority, with MPSC being a consent authority.

Land use:

The Subject Site lies within the Moree Special Activation Precinct (SAP). It is surrounded by further areas of land cleared for agricultural use (east) and numerous commercial businesses specialising in agribusiness, logistics and food processing to the north, south and west. Accordingly, the Subject Site and Project Area are zoned REZ – Regional Enterprise Zone, as are the neighbouring lots.

The Newell Highway to the west and the Werris Creek Mungindi Railway to the north traverse through the Moree SAP and are zoned SP2 – Special Purpose Infrastructure.

Topography:

The Subject Site and surrounding topography are predominantly featureless and generally consist of open and flat plains consistent with historical land clearing practices for livestock grazing and agricultural use. The landform slopes gently as it approaches natural drainage lines within the subject site that flow onto the neighbouring properties to the northeast and continue onto Mehi River to the far north of the property (Figure 7). An existing borrow pit turned farm dam is in the northwest corner of the project area presenting the only depressions to an otherwise flat site.

The landform surrounding the Subject Site remains predominantly flat in all directions on the neighbouring properties.

With the near flat topography, the Project Area and subject site are currently used for cropping.

Vegetation:

The Subject Site and Project Area lie within an area of the Moree SAP that has undergone historically widespread native vegetation modification, primarily for dry cropping and livestock grazing, resulting in large areas of cleared land treated as a grassland hazard.

Woody vegetation in the form of Remnant vegetation is present on Campion Close north of the Project and adjacent to the Moree Bulk Supply Zone substation with a large area of Weeping Myall open woodland of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion (PCT ID: 27) vegetation formation of varying density present to the northeast of the Subject Site and classified as Semi-arid Woodlands (Grassy sub-formation).

Vegetation formations have been cross-checked against the NSW State Vegetation Type Map (Figures 6a), verified on-site and detailed in the relevant Biodiversity Report for the Moree SAP Master plan (https://shared-drupal-s3fs.s3-ap-southeast-2.amazonaws.com/master-test/fapub_pdf/Moree+SAP/Biodiversity+Report.pdf) and are discussed further in Section 2.

Access:

Access to/from the Project Area to the public road network (Figure 8) is as follows:

- The Project will have close and direct access to Bulluss Drive via a new property access road ~30 m long from the Moree BESS facility entrance point with no alternative access/egress provided.
- Bulluss Drive is a sealed two-lane public through road (one lane in each direction) maintained by Transport for NSW. It provides access to the Newell Highway and the township of Moree heading north, exiting the Project site and intersecting with Burrington Road to the south, which intersects with the Newell Highway to the west.
- A new internal road network has been designed to ensure comprehensive access throughout and around the Project site, including a perimeter road surrounding the MBESS area.

2 BUSHFIRE THREAT ASSESSMENT

2.1 METHODOLOGY

The methodology adopted by this report is as follows:

Table 2 - Report Methodology

Method	Task	Considerations
Desktop analysis	Review available mapping resources, policy documents & development plans	Online Maps Development Control Plans Local Environmental Plan
Site inspection	Evaluate the context of the site, determine bushfire threat, options for asset protection zones, access roads and infrastructure.	Ground truth online mapping data, validate vegetation class, obtain site measurements, and assess existing structures and infrastructure.
Assessment of proposal against the Moree SAP Master Plan & Delivery Plan, Scoping document and PBP (2019) requirements.	Assess the Project against the objectives of PBP (2019).	APZs, Landscaping, Access, Water supplies, Utilities and Emergency Management.
Report	Preparation and publication of bushfire assessment report	Assess bushfire threat and detail the required and recommended protection measures expected of the proposal.

2.2 DESIGN FIRE ATTRIBUTES

The following bushfire attributes are assessed to determine the potential bushfire threat posed to the Project Area (design fire).

Vegetation Formations

Vegetation formation surrounding the Project Area represents a key bushfire behaviour attribute that determines potential fire intensity and directly relates to the overall bushfire threat.

For example, a fire will burn with significantly greater intensity in forest vegetation than grassland vegetation.

Vegetation formations within 140 m of the Project Area were identified and classified per Appendix A1.2 of PBP (2019).

Slope

In addition to vegetation type and weather conditions, the extent of a fire's rate of spread and intensity will also be determined by the angle of the slope of the land. For example, with each 10 degrees of uphill slope, a fire will double in rate of spread and increase in intensity. Therefore, evaluating the site slope is essential in determining the potential bushfire threat.

Slopes within the Project Area have been calculated per A1.4 & A1.5 of PBP (2019) (Figure 7).

Forest Fire Danger Index (FFDI)

The FFDI measures the degree of danger of fire in Australian vegetation. For PBP (2019), the FFDI required for development assessment purposes is based on local government boundaries.

The 1:50-year fire weather scenario for the North Western fire weather area is FFDI 80, as defined by NSW RFS NSW Local Government Areas FDI in May 2017.

Table 3 – Design fire attributes

Factor	Value
Fire Weather Area	North Western
FFDI	80
Dominant Vegetation Formations	Grassland
Slope	Upslope/Flat

2.3 PROJECT AREA BUSHFIRE PRONE MAPPING

Bushfire-prone mapping relative to the Project Area (Figure 4) shows the Subject Site and adjacent land containing Category 3 and Buffer Vegetation identified as bushfire-prone land by the Council and NSW RFS.

Vegetation Category 3 is considered to be medium bush fire risk vegetation. This category generally consists of Grasslands, freshwater wetlands, semi-arid woodlands, alpine complex and arid shrublands. A 30 m external Vegetation Buffer is applied to each area of Bushfire Prone Vegetation (BFPV) Category 3.

During the site survey conducted on the 7th of October 2024, these vegetation categories were verified, and the bushfire-prone map was found to accurately represent the identified hazard across this site.

The location of electricity generating infrastructure, including BESS, should avoid any land subject to identified natural hazards (such as bushfires) and should not contribute to an increased risk of a natural hazard (bushfire).

As the proposed MBESS is located on grassland, it must satisfy Performance criteria PC57 in the Moree SAP Delivery Plan. To achieve PC57 development within 50 metres of grassland must comply with the requirements of the latest version of Planning for Bushfire Protection (PBP) and the Rural Fires Act 1997. To satisfy this requirement, Section 6.3.1.2 of the Delivery Plan requires a bushfire hazard assessment and management plan to be prepared in accordance with PBP.

The bushfire-prone mapping in and of itself is not a bushfire risk assessment. It does not aim to determine the likelihood or level of hazard posed to the Project Area. Instead, the bushfire-prone mapping aims to identify if the Project Area has the potential to be impacted by a bushfire (or not).

In this case, the Subject Site, within which the Project Area is located, is mapped as bushfire-prone; therefore, a range of protection measures are required to address this threat. This report indicates what these bushfire

protection measures are, and the broad specifications needed for an acceptable level of protection.

A more thorough analysis of the site and the Project during the detailed design and post-approval process would be needed to refine the specifications of these protection measures and ensure an acceptable level of bushfire protection has been met.

2.4 Project Area Fire History

While the bushfire-prone mapping identifies that any development on the Subject Site triggers the requirement for a bushfire assessment and compliance with PBP (2019), fire history provides a clear picture of the actual vulnerability of the site.

Figure 5 shows the fire history and approximate extent of bushfires impacting the area surrounding the Subject Site. The most recent bushfires that have affected the area were the Bartell Wildfire, which burnt an area of approximately 2 ha ~4 km northeast of the proposed Project area and the Bradmill Grass Fire, which burnt an area of approximately 3 ha ~5 km south of the proposed Project area. Both wildfires occurred during the 2009 -2010 bushfire season.

The last major bushfire (Arson) that impacted the area was the Mehi River Ticklebelly Flat wildfire during the 2007 -2008 bushfire season, which burnt an area of approximately 79 ha on the southern side of the Gwydir Highway and Mehi River ~4 km northwest of the proposed Project. These fires did not impact the Subject Site.

Although surrounded predominantly by grassland and cropping and with areas of woodland to the northeast of the proposed Project area, the greatest threat from bushfire comes from the vegetated areas along the Mehi River ~2 km north of the Project Area at its closest point, extending further east and west along the winding river and the large areas of grass fuels and crops to the west that are capable of supporting fast-moving, high-intensity grass fires but with relatively shorter residence time when enough is present and cured representing a medium fire risk.

2.5 Project Area Vegetation Formations and Photo Points

Project Area vegetation formations (Figure 6a) as defined by SEED (NSW Government, 2022) NSW State Vegetation Map.

Vegetation mapping indicates that the Project Area is influenced by –

- Grassland (Including Cleared Land)

Examples of these formations are provided below in Photos 1 to 3 (Page 24).

Grassland with individual paddock trees is not viewed as presenting any more significant hazard than grassland and, therefore, is given the same hazard rating.

A comprehensive photographic overview of the project area is provided in the following Appendices:

- Appendix A – Photographic overview of the vegetation and topography within and surrounding the Project Area.
- Appendix B – Aerial imagery of the Project Area and surrounding landscape and existing development.

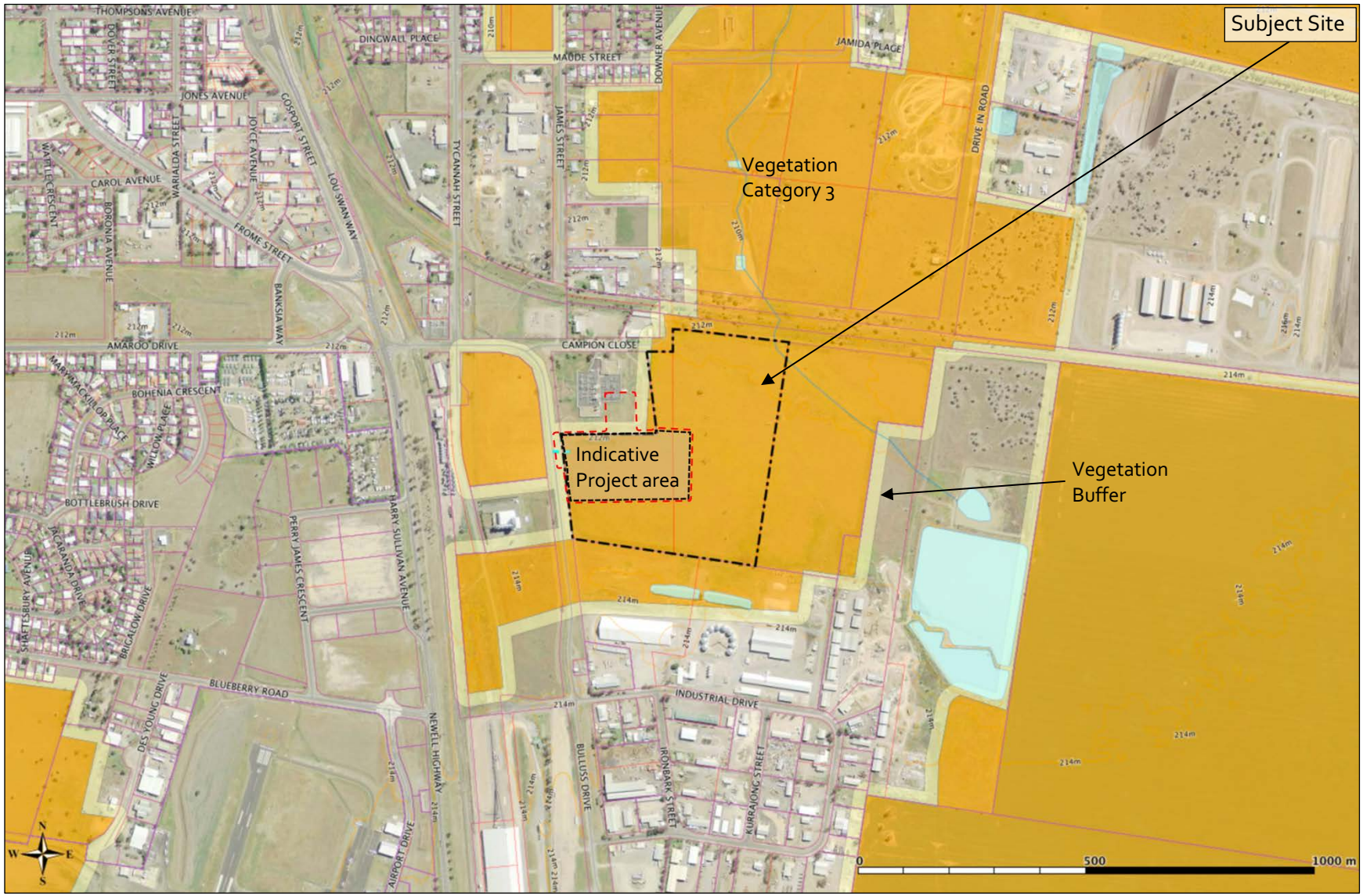

Figure 4 – Subject site bushfire prone land map. (FPAA FireMaps, 2024)

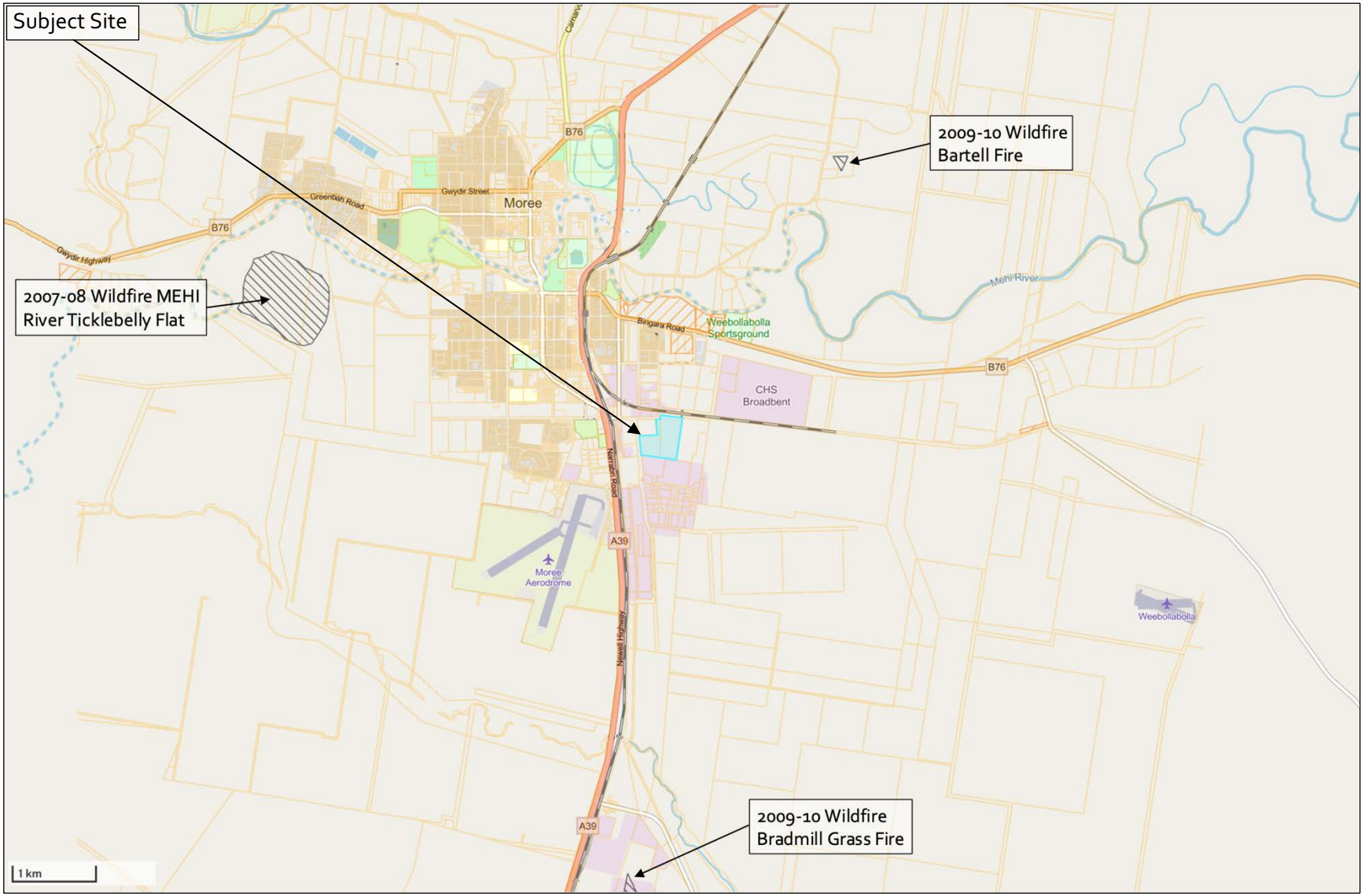

Figure 5 – Map showing fire history and extent in proximity of the Project Area. (SEED, 2024)

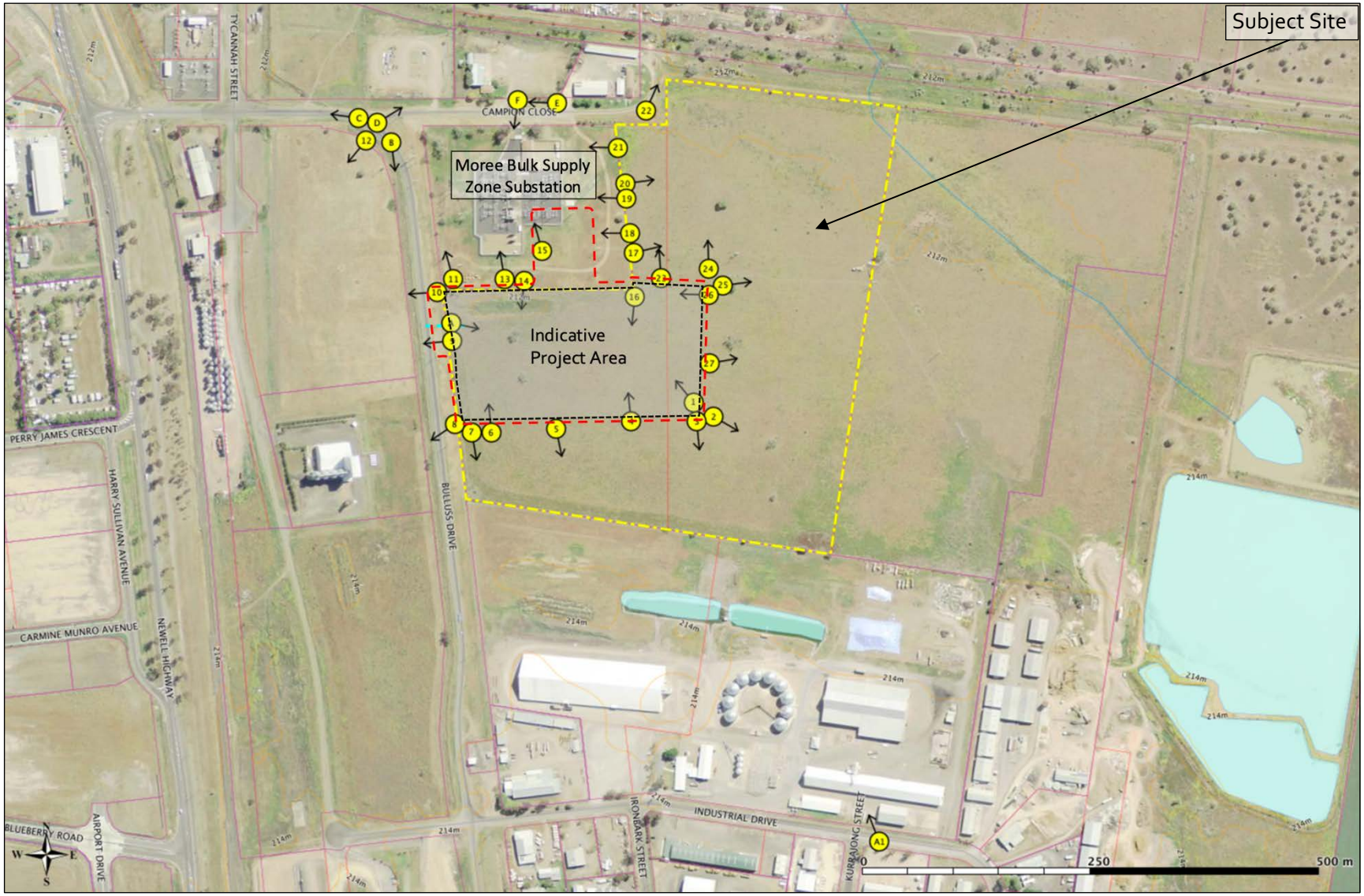

Figure 6 – Study Area photo point locations. (Hague, 2024)

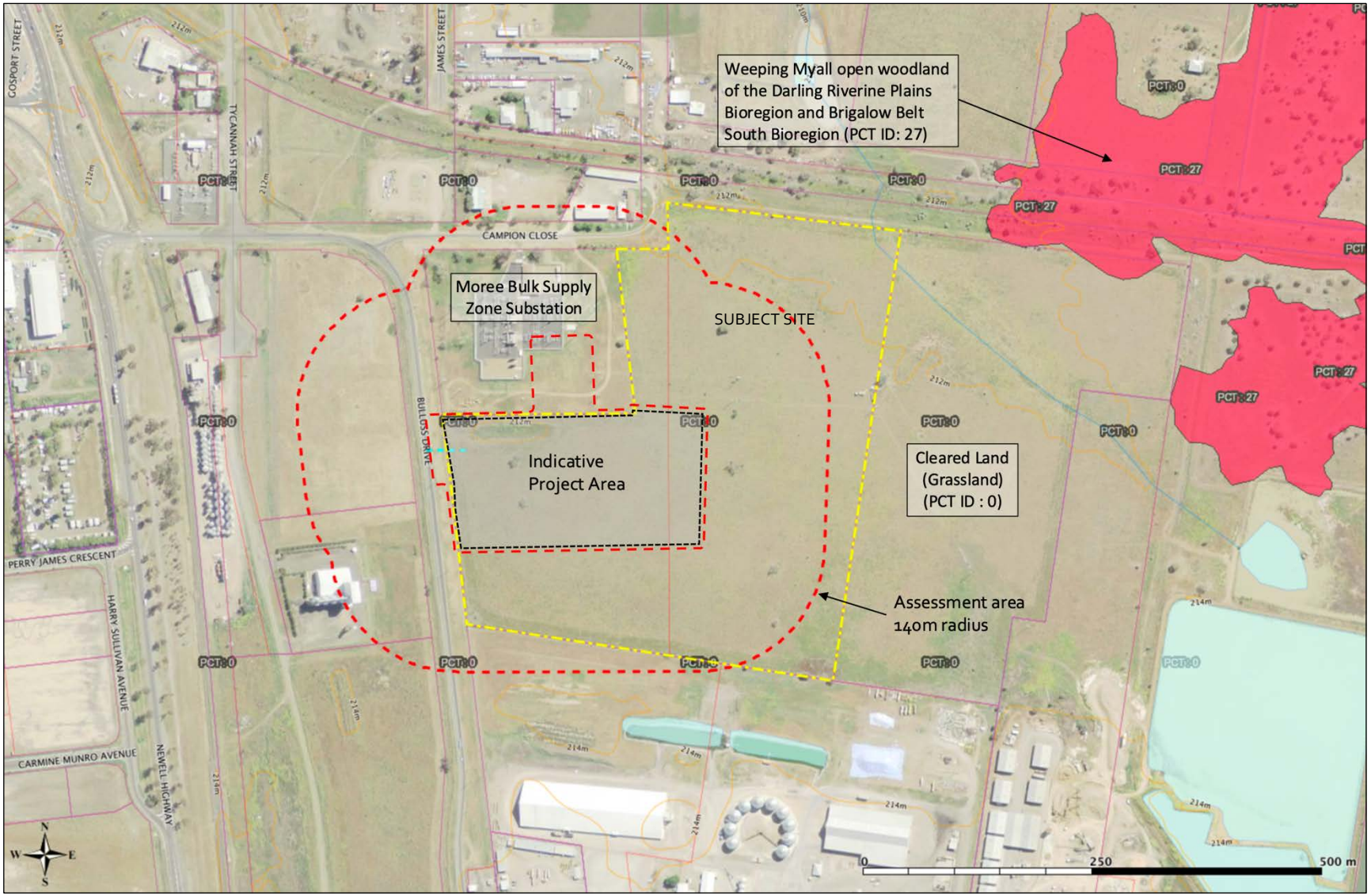

Figure 6a – Vegetation classification within and surrounding the Subject Sites. (SEED,

2.6 EXAMPLES OF HAZARD TYPES

Photo 1 – Example of grassland hazard. (Hague, 2024)

Photo 2 – Example of grassland hazard with scattered paddock trees. (Hague, 2024)

Photo 3 – Example of Remnant vegetation along Campion Close. (Hague, 2024)

2.7 SLOPE ASSESSMENT

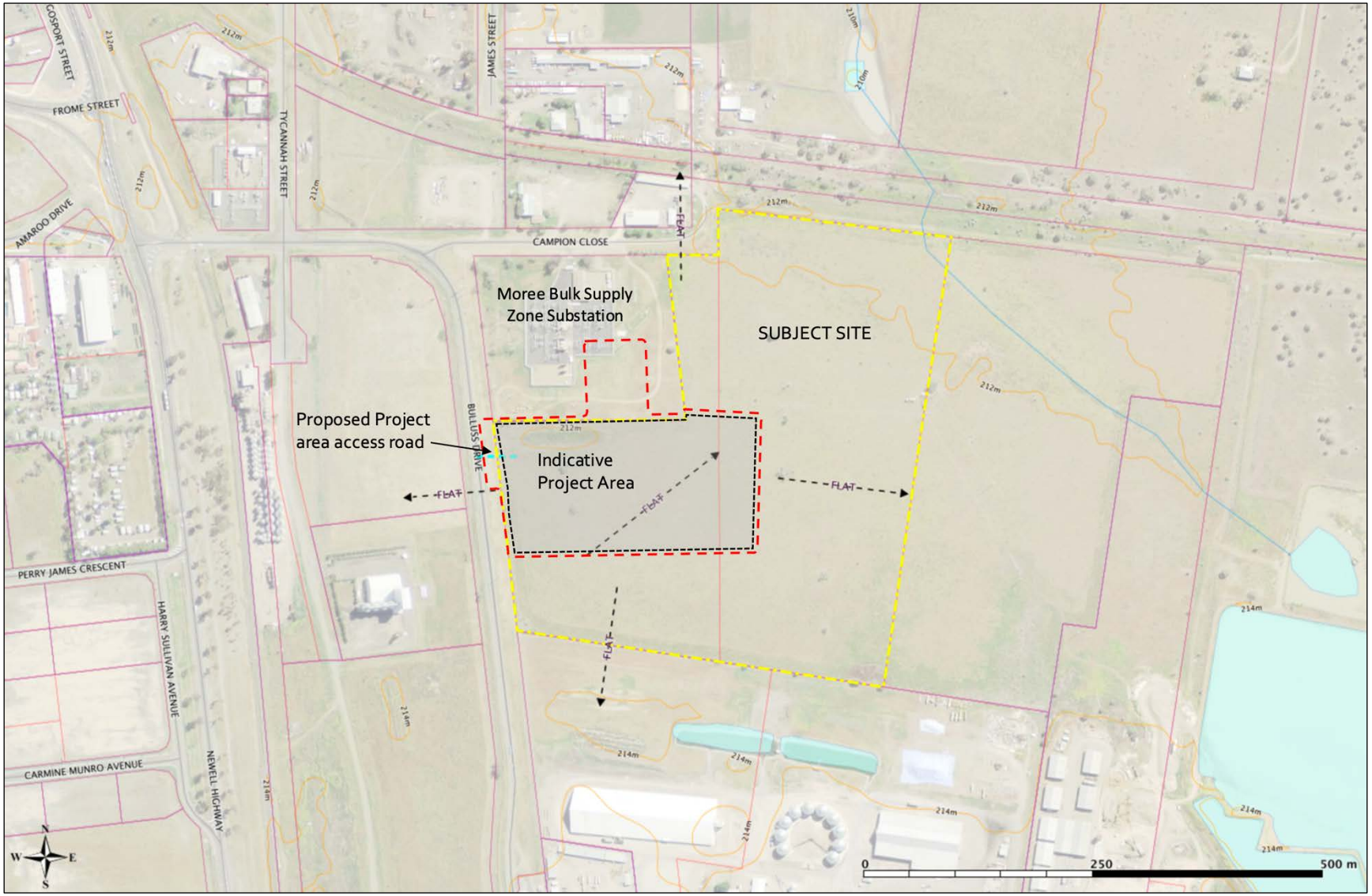

Figure 7 – Broadscale slope assessment highlighting minimal gradients within and surrounding the indicative Project Area. (FPAA FireMaps, 2024)

2.8 PHOTOGRAPHIC OVERVIEW OF ACCESS ARRANGEMENTS

Photo point A. Showing the indicative access point to the proposed Moree BESS development site from Bulluss Drive (Public through road). (Hague, 2024)

Photo point C. Showing the general condition of Bulluss Drive heading towards the Newell Highway looking from the intersection of Campion Close. (Hague, 2024)

Photo Point B. Showing the general condition of Bulluss Drive heading towards the proposed Moree BESS boundary entrance point from the Newell Highway . (Hague, 2024)

Photo Point D. Showing the general condition of the intersection of Bulluss Drive and Campion Close adjacent to the Moree Bulk Supply Zone Substation. (Hague, 2024)

Photo point E. Showing the general condition of Campion Close looking towards Bulluss Drive providing access to the Moree Bulk Supply Zone Substation. (Hague, 2024)

Photo Point F. Showing the general condition of the existing boundary entrance point to the Moree Bulk Supply Zone Substation from Campion Close (Public no through road). (Hague, 2024)

Figure 8 – Overview of access arrangements to/from the indicative Project Area. (FPAA FireMaps, 2024)

2.9 EMERGENCY SERVICES

NSW Rural Fire Service (NSW RFS) and Fire and Rescue NSW (F&RNSW) service the Project Area.

The Moree area is serviced by NSW RFS Moree Plains District fire brigades (Namoi/Gwydir Zone (NGZ)) under the control of the Moree Fire Control Centre as confirmed by Vicky Hogland (Operational Officer - Namoi/Gwydir). The attending fire brigade depends on the type and level of incident requiring response.

The NSW RFS Moree Plains District brigades comprise seventeen (17) brigades and one (1) control centre located at Tycannah Street, Moree.

The Moree Plains District brigades most likely to attend a fire at the Subject Sites and resources are as follows:

- Moree – 1 x Cat 1 and 1 x Cat 7 tanker
- Ashley – 1 x Cat 1 and 1 x Cat 6 tanker
- Pallamallawa – 2 x Cat 7 and 1 x Cat 6 tankers
- Gurley – 1 x Cat 7 and 1 x Cat 6 tankers

<u>FIRE & RESCUE NSW</u>

- Moree (179 Balo Street) – Structural Fire and Hazmat Capability (To be confirmed) – (~3.3 km), response time 5 min.
- Warialda (19 Geddes Street) – Structural Fire and Hazmat Capability (To be confirmed) – (~79 km), response time 52 min.
- Bingara (44 Finch Street) – Structural Fire and Hazmat Capability (To be confirmed) – (~100 km), response time 1 hr 7 min.
- Narrabri (2 Doyle Street) – Structural Fire and Hazmat Capability (To be confirmed) – (~98.5 km), response time 1 hr 13 min.

3 BUSHFIRE PROTECTION AND PREVENTION MEASURES

In response to the bushfire threat analysis, a suite of Bushfire Protection and Prevention Measures (BPMs) are proposed to satisfy the broad aims and objectives of PBP (2019) and specific considerations detailed in Chapter 8, Section 8.3.9 Hazardous Industry PBP (2019).

These BPMs intend to protect human life and minimise impacts on the facility from the threat of bushfires while considering development potential, site characteristics, and environmental protection.

Bush fire protection measures generally serve a dual purpose: protecting the site from external fire threats, containing fire within the site should it occur, and stopping it from escaping onto adjoining lands. Where specific prevention measures are required, these will be detailed separately.

Given the potentially more hazardous and vulnerable nature of the MBESS substation and associated infrastructure, the protection and prevention measures may be increased according to the proposal.

3.1 ASSET PROTECTION ZONES (APZS) & SETBACKS

Discussion - APZs:

APZs and setbacks provide a buffer zone between identified hazards and structures. Setbacks will ensure appropriate separation from hazardous vegetation. At the same time, APZs are bands of managed vegetation that minimise fuel loads and reduce potential radiant heat levels, flame, localised smoke, and ember attacks. The required APZ and setback size varies with slope, vegetation and FFDI.

Appropriate setbacks from adjacent unmanaged hazardous vegetation are to be provided for the Moree BESS substation and associated infrastructure. An APZ surrounding the facility, the MBESS, substation, and related infrastructure is required.

The final APZ dimensions may only be determined at the detailed design phase, in consultation with the NSW RFS and are to be incorporated into the Bushfire Emergency Management and Operations Plan.

PBP (2019) does not provide a maximum radiant heat threshold for Solar Farms or BESS facilities, with the only direction being a minimum 10 m APZ for structures and associated buildings. This dimension, however, does not consider the nature of the surrounding hazard. Therefore, the applicant may wish to consider larger APZs to better protect the MBESS and associated infrastructure.

Given the heat-sensitive nature of the MBESS substation and associated infrastructure, larger APZ and setback dimensions are recommended than those prescribed for photovoltaic (PV) modules.

The current siting, layout and design of the Moree BESS provides sufficient space to achieve large APZ and setback dimensions from unmanaged hazardous vegetation, ensuring the development site is not exposed to radiant heat flux levels exceeding 29 kW/m², offering a higher level of protection for the site. Adequate separation and access to the MBESS from surrounding infrastructure is also provided to minimise the spread of fire within the site should the MBESS become involved in fire.

Where site constraints make achieving the required APZ or setback dimensions challenging, alternative methods may be employed, such as radiant heat barriers/firewalls or the like, to ensure the critical radiant heat thresholds can be achieved. Such alternative methods are called performance-based design and are subject to endorsement by the consent authority during the detailed design phase of the Project.

Table 4 details the minimum APZ dimensions and setbacks for the MBESS, substation and associated infrastructure, ensuring they are not exposed to radiant heat levels exceeding 29 kW/m².

The proposed APZ and setback dimensions will meet or exceed the minimum requirements specified by PBP (2019) and can satisfy the acceptable solutions for APZs.

Recommendations:

- Appropriate setbacks from adjacent unmanaged hazardous vegetation are to be provided for the MBESS, substation and associated infrastructure according to the vegetation type and slope under that classified vegetation. The indicative APZ setback dimensions are provided in Table 4.
- A future APZ will be established surrounding the facility, the MBESS, substation, and associated infrastructure with the dimensions provided in Table 4.
- APZ and setback locations and widths will be confirmed subject to detailed design in consultation with NSW RFS.
- A minimum 10 m wide facility perimeter APZ is to be provided and incorporate an all-weather, gravel road with a minimum width of 4 m where practicable.
- At the commencement of building works and for the life of the Project, all land identified as APZ within the Project Area is to be managed as an Inner Protection Area (IPA) APZ per the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).
- If required, where site constraints limit the APZ and setback widths, a Performance-based Design approach may provide alternative methods to achieve critical radiant heat thresholds on heat-sensitive equipment.

3.2 LANDSCAPING

Recommendations:

- All vegetation within the areas identified as APZ surrounding the MBESS, substation and associated infrastructure (entire Project area) is to be managed for the life of the Project per the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).
- Where practicable, the landscape design for areas identified as APZ surrounding the MBESS, substation and associated infrastructure is to incorporate non-combustible mulch (stone or aggregate) managed for the life of the Project to eliminate the growth of vegetation or storage of combustibles near this infrastructure.

3.3 ACCESS

Discussion – Access:

Access to/from the Project Area to the public road network (Figure 8) is as follows:

- The Project will have close and direct access to Bulluss Drive via a new property access road ~30 m long from the Moree BESS facility entrance point with no alternative access/egress provided.
- Bulluss Drive is a sealed two-lane public through road (one lane in each direction) maintained by Transport for NSW. It provides access to the Newell Highway and the township of Moree heading north, exiting the Project site and intersecting with Burrington Road to the south, which intersects with the Newell Highway to the west.
- A new internal road network has been designed to ensure comprehensive access throughout and around the Project site, including a perimeter road surrounding the MBESS area.

In general terms, access is well provided for the site, with direct and close access to Bulluss Drive and Moree. The proposed access provisions will ensure the Project can comply with PBP (2019) access requirements.

Recommendations:

- Property access and the internal road network are to generally comply with the specifications and requirements set out in PBP (2019).
- Provide a perimeter road within the Project Area 10 m perimeter APZ where practicable that is an all-weather, gravel road with a minimum width of 4 m.

3.4 WATER SUPPLIES

Discussion – Water supplies:

The MBESS will require an adequate water supply and be located so that it is readily accessible by emergency crews for either protection from an external bushfire threat or to protect surrounding exposures should the MBESS become involved in fire.

The current MBESS design and layout includes 1 x ~200,000 L non-combustible water tank, providing a significant volume of water designated for firefighting purposes.

Recommendations:

- Inclusion of 1 x 200,000 L static water supplies (non-combustible tank) within the APZ for the MBESS, substation, and associated infrastructure.
- All fittings and specifications for water supplies are to be per Table 7.4a PBP (2019).

3.5 ELECTRICITY SERVICES

Recommendations:

- Electrical services are to be provided per Table 7.4a of PBP (2019).

3.6 CONSTRUCTION

Recommendations:

- The MBESS, substation and associated buildings are recommended to be constructed to the appropriate Bushfire Attack Level (BAL) as per AS3959:2018 - Construction of buildings in bushfire-prone areas.

3.7 EMERGENCY MANAGEMENT PLANNING

Discussion:

Emergency management and operational procedures of the facility during construction and while operational throughout the bushfire season play an important part in fire prevention and site protection. As such, various guidelines, procedures and emergency plans are required.

A Bushfire Emergency Management and Operations Plan (BFEMOP) should identify all relevant risks and mitigation measures associated with the construction and operation of the MBESS.

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, to be carried out during a bushfire 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 notified by the Commissioner of the NSW RFS under the RF Act s.99.

This is considered an operational phase document (outlining a management plan for the operation of the proposal) and is prepared after approval is granted.

Recommendation:

- Preparation of a Bush Fire Emergency Management and Operations Plan to address the construction and operational phases of the MBESS.

4 BUSHFIRE MANAGEMENT PLAN – SUMMARY OF RECOMMENDATIONS TO INFORM THE SEE/DA.

4.1 ASSET PROTECTION ZONES AND SETBACKS

Appropriate setbacks from adjacent unmanaged hazardous vegetation are to be provided for the MBESS, substation, and associated infrastructure. An APZ surrounding the facility, the MBESS, substation, and related infrastructure is required.

The final APZ and setback dimensions may only be determined at the detailed design phase, in consultation with the NSW RFS and are to be incorporated into the Bushfire Emergency Management and Operations Plan.

Table 4 Indicative APZ dimensions for MBESS, Substation and associated infrastructure.

Vegetation Formation	Slope (Assumed worse case)	Min. APZ required	Max. Radiant Heat (kW/m²)
Grassland	Upslope/Flat	10 m	29
Remnant	Upslope/Flat	9 m	29

- Appropriate setbacks from adjacent unmanaged hazardous vegetation are to be provided for the MBESS, substation, and associated infrastructure. The indicative APZ setback dimensions are provided in Table 4.
- A future APZ will be established surrounding the facility, the MBESS, substation, and associated infrastructure with the dimensions provided in Table 4.
- APZ and setback locations and widths will be confirmed subject to detailed design in consultation with NSW RFS.
- A minimum 10 m wide facility perimeter APZ is to be provided and incorporate an all-weather, gravel road with a minimum width of 4 m where practicable.
- At the commencement of building works and for the life of the Project, all land identified as APZ within the Project Area is to be managed as an Inner Protection Area (IPA) APZ per the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).
- If required, where site constraints limit the APZ and setback widths, a Performance-based Design approach may provide alternative methods to achieve critical radiant heat thresholds on heat-sensitive equipment.

4.2 LANDSCAPING

Recommendations:

- All vegetation within the areas identified as APZ surrounding the MBESS, substation and associated infrastructure (entire Project area) is

to be managed for the life of the Project per the requirements of Asset Protection Zone Standards - Appendix 4 of PBP (2019).

- Where practicable, the landscape design for areas identified as APZ surrounding the MBESS, substation and associated infrastructure is to incorporate non-combustible mulch (stone or aggregate) managed for the life of the Project to eliminate the growth of vegetation or storage of combustibles close to this infrastructure.

4.3 ACCESS

- Property access and internal road network to generally comply with the specifications and requirements set out in PBP (2019).
- Provide a perimeter road within the Project Area 10 m perimeter APZ where practicable that is an all-weather, gravel road with a minimum width of 4 m.

4.4 WATER SUPPLIES

- Inclusion of 1 x 200,000 L static water supplies (non-combustible tank) within the APZ for the MBESS, substation, and associated infrastructure.
- All fittings and specifications for water supplies are to be per Table 7.4a PBP (2019).

4.5 ELECTRICITY SERVICES

- Electrical services are to be provided per Table 7.4a PBP (2019).

4.6 CONSTRUCTION

- The MBESS, substation and associated buildings are recommended to be constructed to the appropriate Bushfire Attack Level (BAL) as per AS3959:2018 - Construction of buildings in bushfire-prone areas.

4.7 EMERGENCY MANAGEMENT PLANNING

- Preparation of a Bush Fire Emergency Management and Operations Plan during the construction and operational phase of the MBESS.

5 CONCLUSION

This report documents the findings from a bush fire protection assessment to support an Activation Precinct Certificate (APC) and Statement of Environmental Effects (SEE) for the proposed Moree Battery Energy Storage System (MBESS) located approximately 3 kilometres southeast of the Moree CBD.

The report establishes the level of bushfire threat to the Project Area. It examines protection measures for the proposal to satisfy the broad aims and objectives of PBP (2019) and specific considerations detailed in Chapter 8 of PBP (2019), such as asset protection zones, landscaping, access, water supplies, construction and emergency management.

The recommendations are designed to inform the upcoming SEE and, in turn, inform the Development Application approval.

Given that the Project Area is a greenfield site with large open spaces and neighbouring the existing Moree Bulk Supply Zone Substation, there is an excellent opportunity to expand on the existing and provide a range of bushfire protection measures that address the bushfire threat and requirements of PBP (2019).

The proposed APZ dimensions will ensure that the critical components of the MBESS, substation, and associated infrastructure are not exposed to radiant heat levels exceeding 29 kW/m^2.

Access to the Project Area will be well provided for with a new entrance point and access road off Bulluss Drive that will meet access requirements and an internal road network, including a perimeter road surrounding the MBESS area, all of which will comply with the acceptable solutions set out in PBP (2019).

A significant volume of firefighting water supplies will be provided, exceeding the requirements of PBP (2019).

Preparation of a Bush Fire Emergency Management and Operations Plan prior to the construction and operational phase of the MBESS is recommended as part of the site's fire mitigation strategy.

Based on the bushfire assessment and the recommendations contained in this report, the development proposal will be capable of:

- affording structures protection from exposure to a bushfire,
- provide for a defendable space,
- provide appropriate separation between a hazard and structures to prevent the likely spread of fire,
- ensure that appropriate operational access and egress for emergency service personnel is available,
- provide for ongoing management and maintenance of BPMs and
- ensure that utility services are adequate to meet the needs of firefighters.

Therefore, the Project is deemed capable of complying with the specific and broad objectives of PBP (2019).

6 REFERENCE

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7 APPENDIX A – PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 1. Looking northwest towards the proposed MBESS Project Area. (Hague, 2024)

Photo point 3. Looking at hazard vegetation south of the proposed MBESS development site. (Hague, 2024)

Photo point 2. Looking at hazard vegetation southeast of the proposed MBESS development site and Bulluss Drive. (Hague, 2024)

Photo point 4. Looking north towards the proposed MBESS Project Area. (Hague, 2024)

PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 5. Looking at hazard vegetation south of the proposed MBESS development site. (Hague, 2024)

Photo Point 7. Looking at hazard vegetation south of the proposed MBESS development site and Bulluss Drive. (Hague, 2024)

Photo point 6. Looking north towards the proposed MBESS Project Area. (Hague, 2024)

Photo point 8. Looking at hazard vegetation southwest of the proposed MBESS development site and Bulluss Drive. (Hague, 2024)

PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 9. Looking at hazard vegetation west of the proposed MBESS development site and Bulluss Drive. (Hague, 2024)

Photo Point 11. Looking at hazard vegetation north of the proposed MBESS development site between Bulluss Drive and the Moree Bulk Supply Zone substation. (Hague, 2024)

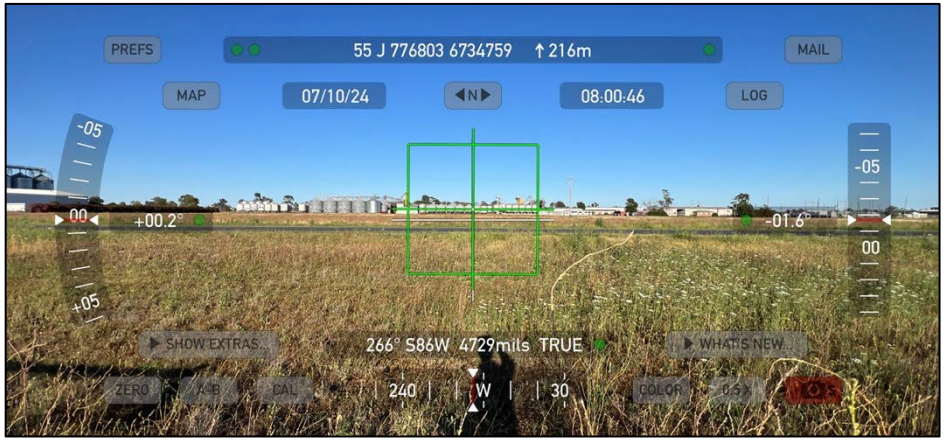

Photo point 10. Looking at hazard vegetation west of the proposed MBESS development site and Bulluss Drive. (Hague, 2024)

Photo point 12. Looking at hazard vegetation northwest of the proposed MBESS development site and Bulluss Drive. (Hague, 2024)

PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 13. Looking at managed vegetation north of the proposed MBESS development site and south of the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo Point 15. Looking at managed vegetation north of the proposed MBESS development site and south of the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo point 14. Looking south towards the proposed MBESS Project Area. (Hague, 2024)

Photo point 16. Looking south towards the proposed MBESS Project Area. (Hague, 2024)

PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 17. Looking at hazard vegetation east of the proposed MBESS development site and the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo Point 19. Looking at managed vegetation north of the proposed MBESS development site and east of the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo point 18. Looking at managed vegetation north of the proposed MBESS development site and east of the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo point 20. Looking at hazard vegetation northeast of the proposed MBESS development site and east of the Moree Bulk Supply Zone substation. (Hague, 2024)

PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 21. Looking at managed vegetation north of the proposed MBESS development site and east of the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo Point 23. Looking at hazard vegetation north of the proposed MBESS development site and east of the Moree Bulk Supply Zone substation. (Hague, 2024)

Photo point 22. Looking at managed vegetation northeast of the proposed MBESS development site and Moree Bulk Supply Zone substation. (Hague, 2024)

Photo point 24. Looking at hazard vegetation northeast of the proposed MBESS development site and east of the Moree Bulk Supply Zone substation. (Hague, 2024)

PHOTOGRAPHIC OVERVIEW OF THE STUDY AREA

Photo Point 25. Looking at hazard vegetation east of the proposed MBESS development site and Moree Bulk Supply Zone substation. (Hague, 2024)

Photo Point 27. Looking at hazard vegetation east of the proposed MBESS development site. (Hague, 2024)

Photo point 26. Looking west towards the proposed MBESS Project Area and Moree Bulk Supply Zone substation. (Hague, 2024)

8 APPENDIX B – AERIAL OVERVIEW OF THE SUBJECT SITE

Photo Point A1. Looking northwest at the Subject Sites and indicative Project Area showing the extent of surrounding hazard vegetation and exisitng development and the adjacent Moree Bulk Supply Zone Substation. (Hague, 2024)