7.6 Codes

The Development Area is subject to the following mapped overlays:

- Clause C4.0 Electricity transmission infrastructure protection
- Clause C7.0 Natural assets (Waterway and coastal protection area only, not Priority vegetation area)
- Clause C13.0 Bushfire-prone areas
- Clause C16.0 Safeguarding of Airports Code (OLS 1467.84m AHD)

The following codes are also relevant to the Proposal:

- Clause C2.0 Parking and sustainable transport
- Clause C3.0 Road and railway assets

The following codes are *not* applicable to the Proposal:

- Clause C6.0 Local heritage place (not mapped over Development Area, although nearby)
- Clause C12.0 Flood-prone areas (not mapped over Development Area, although nearby)
- Clause C15.0 Landslip hazard (not mapped over Development Area, although nearby)
- Clause C1.0 Signs (no signage proposed)
- C5.0 Telecommunications Code (no telecommunications facility is proposed)
- C8.0 Scenic Protection Code (not mapped over Development Area, although mapped nearby)
- C9.0 Attenuation Code (not mapped)

The following sub-sections provide assessment against relevant codes.

7.6.1 Clause C2.0 Parking and Sustainable Transport Code

See Chapter 6.1 within the Traffic Impact Assessment prepared by Pitt & Sherry (09 August 2023), of Appendix E, for an assessment against this code. Car parking and Loading bay Performance Criteria are relied upon, otherwise all relevant Acceptable Solutions are complied with.

Broadly, the Development Area's size allows for all necessary access, turning, loading and parking requirements to be met.

7.6.2 Clause C3.0 Road and Railway Assets Code

See Chapter 6.1 within the Traffic Impact Assessment prepared by Pitt & Sherry (09 August 2023), of Appendix E, for an assessment against this code. The Proposal generally complies with relevant Acceptable Solutions, or satisfies Performance Criteria where necessary.

Broadly, the use will generate negligible traffic in operation. During construction, while vehicle traffic generation will exceed a 20% increase, Poatina Road is currently operating well below capacity, and therefore the Proposal is not expected to generate any unacceptable impacts. No parking delineation is required considering the low level of operational phase vehicle movements.

7.6.3 Clause C4.0 – Electricity Transmission Infrastructure Protection Code

The Electricity Transmission Infrastructure Protection Code is mapped across the Site, pertaining to existing overhead transmission lines and the Palmerston Substation (Figure 10). This '*electricity transmission corridor*' comprises an 80 m Inner Zone plus 20 m either side (total width 120 m).

The Proposal includes some works that are within the 'Substation facility buffer area' and 'Substation facility'. The Proponent and its consultant team has engaged with TasNetworks through the early concept design stages.

The components of the overlay and the works proposed within them are:

- Substation facility: electrical infrastructure connection works and extension of the existing perimeter security fence to accommodate the new infrastructure.
- Substation facility buffer area: all components of the Proposal, including the BESS.
- Inner protection area: perimeter fencing for the BESS compound is marginally within the inner protection area.
- Electricity transmission corridor: a small sliver of all components, including the BESS.

Pursuant to Clause C4.2.1, this code applies to the use or development of land within an electricity transmission corridor and substation facility buffer area, if for buildings and works.

As noted above, the Proposal includes development within the electricity transmission corridor and substation facility buffer area, including the 33 kV underground transmission line (crossing into Palmerston Substation), security fencing 2.1 m tall, access tracks and BESS.

While nominally, the Proposal triggers this application of the code, some components are exempt under Clause C4.4.1 (*(d) use or development of electricity transmission infrastructure*). The proposed 33 kV underground transmission line, electrical infrastructure and structures and access tracks associated with the transmission of electricity is exempt under Clause C4.4.1, as it is for use and development of electricity transmission infrastructure. The 33 kV transmission line is considered to meet the purpose and expectations of the code. Similarly, any works undertaken within Palmerston Substation's 'Substation facility' and 'Substation facility buffer area' will be for electricity transmission infrastructure and therefore is exempt.

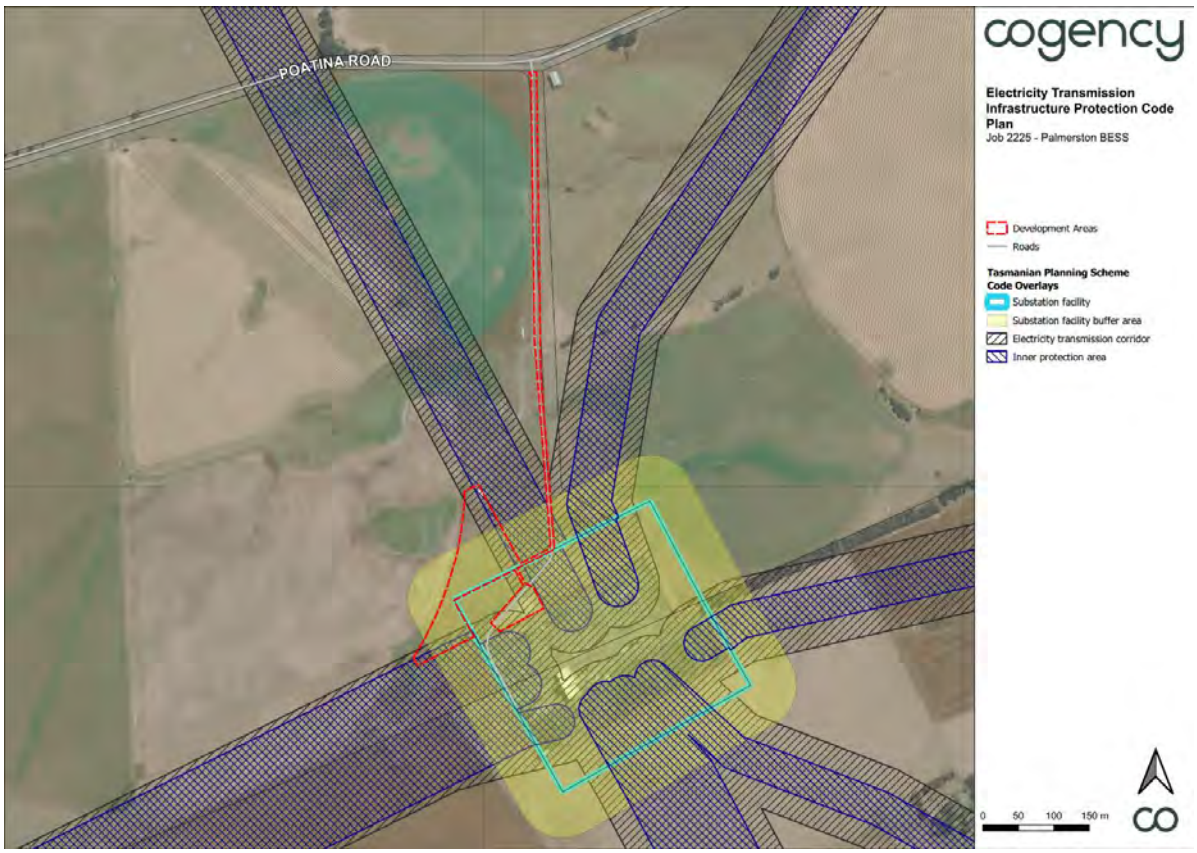


Figure 10 Electricity Transmission Infrastructure Protection Code Plan

The below assessment therefore focuses on the development components listed above and excludes the 33 kV underground line and infrastructure works comprising an extension of the substation facility.

Broadly, the Proposal does not include any major development within the overlay that could create conflict with the existing transmission infrastructure, and therefore is appropriate. Further, discussions with TasNetworks has revealed general satisfaction with the use of this land.

Some of the Development Standards do not apply. The Proposal is not for a sensitive use, not a use listed within Table C.4.1 (Uses with potential to create dust or other airborne particulates) and does not include subdivision.

7.6.3.1 Clause C4.6.1 – Buildings or Works within an Electricity Transmission Corridor

Table 10 Electricity Transmission Infrastructure Protection Code – C4.1 Purpose

Purpose	Response
C4.1.1: To protect use and development against hazards associated with proximity to electricity transmission infrastructure.	The Proposal is sited so that it does not create any hazards or conflict with the nearby electricity transmission infrastructure and substation.
C4.1.2: To ensure that use and development near existing and future electricity transmission infrastructure does not adversely affect the safe and reliable operation of that infrastructure.	The Proposal is sited so that it does not adversely affect the safe and reliable operation with the nearby electricity transmission infrastructure and substation.
C4.1.3: To maintain future opportunities for electricity transmission infrastructure.	The Proposal includes expansion of the transmission network, in an appropriate location adjacent to existing lines and Palmerston Substation.

Table 11 Electricity Transmission Infrastructure Protection Code – 21.3 Use Standards

C4.5.1 Sensitive use within a substation facility buffer area
Does not apply (not a sensitive use)
C4.5.2 Dust or other airborne particulates within an electricity transmission corridor
Does not apply (not a use listed in Table C4.1)
C4.5.3 Dust or other airborne particulates within a substation facility buffer
Does not apply (not a use listed in Table C4.1)

Table 12 Electricity Transmission Infrastructure Protection Code – C4.6 Development Standards for Buildings and Works

C4.6.1 Buildings or works within an electricity transmission corridor
Objective: That buildings or works within an electricity transmission corridor are located at appropriate distances from transmission lines or cables to: (a) ensure operational efficiencies, access to, and security of, existing or future electricity transmission infrastructure; and (b) protect against a safety hazard associated with proximity to existing or future electricity transmission infrastructure.

Acceptable Solution or Performance Criteria	Assessment
P1 Buildings or works within an electricity transmission corridor must not cause an unreasonable impact on the safety, security, operation of, or access to, existing or future electricity transmission infrastructure, having regard to: (a) the nature, height and materials of the buildings and works; (b) the extent of encroachment of the buildings and works into the electricity transmission corridor; (c) the location of the buildings and works within the electricity transmission corridor; and (d) any advice from the electricity entity.	**Satisfies P1.** The Proposal includes a minor encroachment into the inner protection zone for the 2.1 m tall security fence. This is considered acceptable and does not impact the existing electricity transmission infrastructure. The Proponent consultant team have had ongoing engagement with TasNetworks, who will also provide written advice as part of a referral of this application. The fringe of the transmission corridor will include other development components, including the BESS, but again, the height is acceptable and the Proposal will not have a detrimental impact upon transmission infrastructure. Continued and full access to the existing transmission line will be maintained.
C4.6.2 Buildings or works within a substation facility buffer area	
Objective: That buildings or works within a substation facility buffer area are appropriately located to minimise risk to the security, operation, safety and access to existing and future electricity transmission infrastructure.	
P1 Buildings or works within a substation facility buffer area and located less than 5m from a substation facility, must minimise any impact on the safety, security, operation or access to the substation facility, having regard to: (a) the nature, height, and materials of the buildings and works; (b) the location of the buildings and works; (c) any proposed mitigation measures; and (d) any advice from the electricity entity.	**Satisfies P1.** While the Proposal is directly adjacent to the parcel of the Substation facility, the BESS area is a minimum 20 m from the existing security fence. Nonetheless, the Proposal is considered appropriate and complements the facility. It will not impact the safety, security, operation or access to the substation facility. The location, nature, height, and materials of the buildings and works are appropriate.

Overall, the Proposal complies with the purpose, objectives and controls set out in Clause C4.0. Hazard and efficiency considerations have been central to the Proposal's design and engineering, as well as leveraging the existing infrastructure to improve overall electrical transmission infrastructure.

The Proposal is complementary to the existing substation facility and will not affect the operational efficiency of the Palmerston Substation or any transmission line, nor will increase hazards associated with electricity transmission or substation infrastructures. The Proposal's siting within the electricity transmission corridor is inevitable due to the number and placement of transmission lines that connect into the Palmerston Substation.

7.6.4 Clause C7.0 – Natural Assets Code

Pursuant to Clause C7.2.1, this code applies to development on land within a waterway and coastal protection area (mapped as a buffer to identified waterways). There are a number of mapped waterways within the Site, but only one within the Development Area (Figure 11), comprising the junction of an un-named minor-tributary that joins another un-named tributary, flowing to the east. The buffer areas are determined by the watercourse 'class'. Prior to the joining, the minor-tributary and tributary are Stream Order 1 & 2 respectively, with 20m wide overlays, and once joined, the tributary has a 40m wide overlay.

The minor-tributary crosses through the southern BESS area, while the joined tributary is a formed drain within the substation land, that the proposed 33 kV underground transmission line will cross. Photos of both watercourses are shown in the following photos.

As the photos demonstrate, the waterways have no defined bed and bank and appear as minor grassed drainage lines in the landscape, and in some parts are not discernible. Some earthworks will be required to realign these drains which also offers the opportunity for improvements and naturalisation. Considering the minor nature of the tributary, the Proposal is considered acceptable against the provisions of the Natural Assets Code.

Notably, the controls under the Natural Assets Code regarding the clearance of native vegetation do not apply where the native vegetation is 'on existing pasture or crop production land' (Clauses C7.4.1(c)(i-ii)).

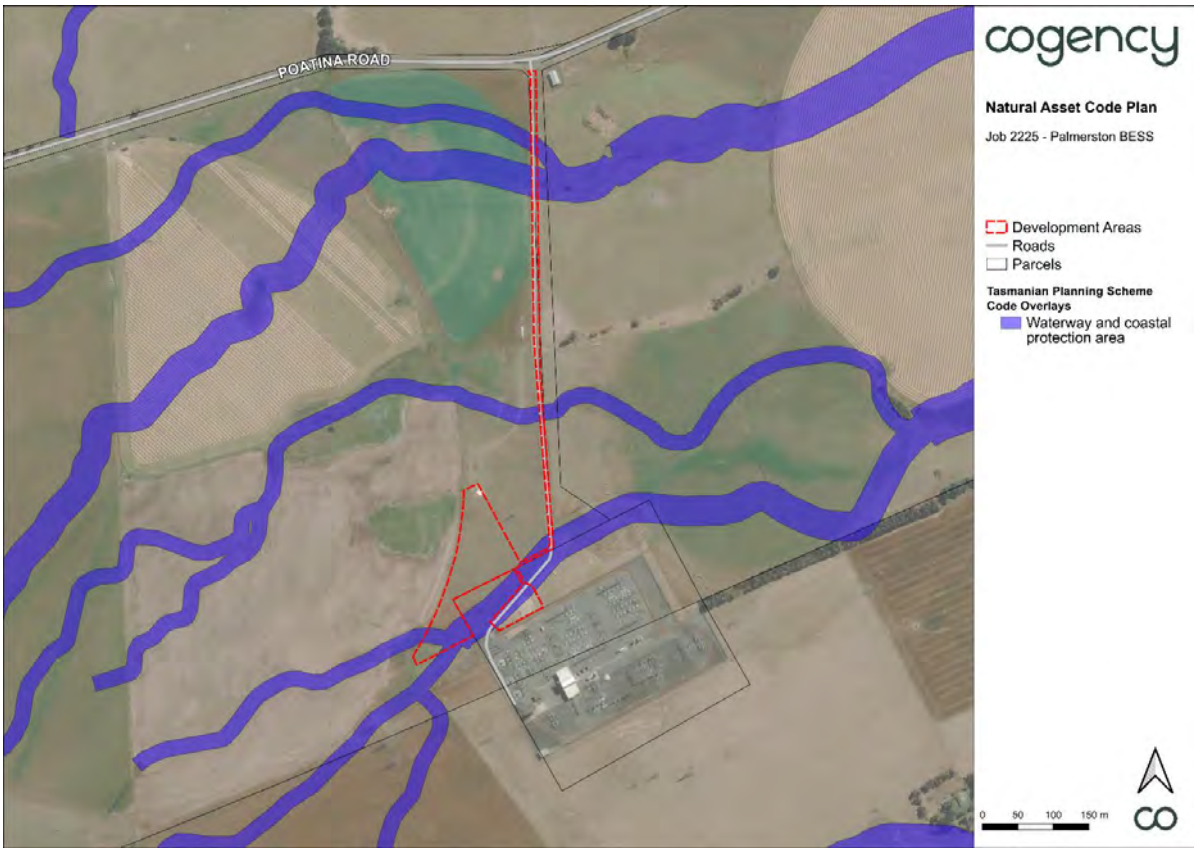


Figure 11 Natural Asset Code Plan

Table 13 Natural Assets Code (Waterways) – C7.1 Purpose

Purpose	Response
C7.1.1 To minimise impacts on water quality, natural assets including native riparian vegetation, river condition and the natural ecological function of watercourses, wetlands and lakes.	The Proposal does not create impacts upon water quality. The Proposal generally avoids the one nearby waterway and is not expected to impact its quality or ecological function.
C7.1.2 To minimise impacts on coastal and foreshore assets, native littoral vegetation, natural coastal processes and the natural ecological function of the coast.	*Not applicable*
C7.1.3 To protect vulnerable coastal areas to enable natural processes to continue to occur, including the landward transgression of sand dunes, wetlands, saltmarshes and other sensitive coastal habitats due to sea-level rise.	*Not applicable*
C7.1.4 To minimise impacts on identified priority vegetation.	*Not applicable*
C7.1.5 To manage impacts on threatened fauna species by minimising clearance of significant habitat.	*Not applicable*

Within this code, 'natural assets' means biodiversity, environmental flows, natural streambank and streambed condition, riparian vegetation, littoral vegetation, water quality, wetlands, river condition and waterway and/or coastal values.

Table 14 Natural Assets Code (Waterways) – C7.6 Development Standards for Buildings and Works

C7.6.1 Buildings and works within a waterway and coastal protection area or a future coastal refugia area	
Objective: That buildings and works within a waterway and coastal protection area or future coastal refugia area will not have an unnecessary or unacceptable impact on natural assets.	
Acceptable Solution or Performance Criteria	**Assessment**
P1.1 Buildings and works within a waterway and coastal protection area must avoid or minimise adverse impacts on natural assets, having regard to: (a) impacts caused by erosion, siltation, sedimentation and runoff; (b) impacts on riparian or littoral vegetation; (c) maintaining natural streambank and streambed condition, where it exists; (d) impacts on in-stream natural habitat, such as fallen logs, bank overhangs, rocks and trailing vegetation; (e) the need to avoid significantly impeding natural flow and drainage; (f) the need to maintain fish passage, where known to exist; (g) the need to avoid land filling of wetlands; (h) the need to group new facilities with existing facilities, where reasonably practical; (i) minimising cut and fill; (j) building design that responds to the particular size, shape, contours or slope of the land;	**Satisfies P1.1** The Proposal has a minor interaction with watercourses, that are classed as the lowest levels of 'Stream Order'. In reality, the watercourses are heavily modified, usually not discernible, and do not contain sensitive flora. They run in open, partially cut drains through cleared agricultural paddocks and therefore have been heavily grazed. The overlap with the Development Area is minor, and the proposed works will partially realign the minor-tributary and tributary. No waterways will have their flow impeded, with minor instances of some drainage diversion around proposed assets. The BESS will be partially elevated to avoid any inundation, with water-sensitive run-off capture and management.

(k) minimising impacts on coastal processes, including sand movement and wave action; (l) minimising the need for future works for the protection of natural assets, infrastructure and property; (m) the environmental best practice guidelines in the *Wetlands and Waterways Works Manual*; and (n) the guidelines in the *Tasmanian Coastal Works Manual*.	
A2 / P2.1/P2.2 Does not apply (not a future coastal refuge area)	
A3 Development within a waterway and coastal protection area or a future coastal refugia area must not involve a new stormwater point discharge into a watercourse, wetland or lake.	Complies No points of discharge into a waterway are required.
A4 Dredging or reclamation must not occur within a waterway and coastal protection area or a future coastal refugia area.	Complies No dredging is proposed.
A5 Coastal protection works or watercourse erosion or inundation protection works must not occur within a waterway and coastal protection area or a future coastal refugia area.	Complies No watercourse erosion protection works are proposed.
C7.6.2 Clearance within a priority vegetation area	
Does not apply (not within a priority vegetation area)	

Overall, the Proposal includes negligible impacts on flora and watercourses, and is compatible with the objectives and controls of Clause C7.0. While generally the modification of waterways is to be avoided, these watercourses have highly limited ecological value and water flow will not be negatively impacted.

Notably, the Proposal will not generate any waste or wastewater, and so avoids the need for wastewater discharge. The proposed use does not emit any pollutants into waterways, soil or the atmosphere.

7.6.5 Clause C13.0 – Bushfire-Prone Areas Code

As shown in Figure 12, the entire Site is mapped within the Bushfire-Prone Areas Code.

Pursuant to Clause C13.2.1, this code applies to subdivision and use for a vulnerable or ‘hazardous’ use within the mapped area. Under C13.3.1, ‘Hazardous use’ means a use where:

(a) hazardous chemicals of a manifest quantity are stored on a site; or

(b) explosives are stored on a site and where classified as an explosives location or large explosives location as specified in the *Explosives Act 2012*.

A BESS is not listed as a Hazardous use. Nonetheless, a Fire Hazard and Risk Assessment has been prepared to address fire and bushfire risk. The findings of this report are detailed in Chapter 8.6.

The Proposal’s design and supporting Fire Hazard and Risk Assessment consider the surrounding landscape, emergency vehicle access, static water (firefighting) supply, vegetation layout, firebreaks and separation of development components.

The Fire Hazard and Risk Assessment addresses the Victorian Country Fire Authority *Design Guidelines and Model Requirements - Renewable Energy Facilities* (v3 March 2022) as a leading example of risk mitigation, and concludes that the Proposal is an acceptable and appropriate design, with Very Low fire risk. An

assessment against some of the code provisions is provided below, recognising that while a BESS is not a listed Hazardous Use, it warrants risk assessment.

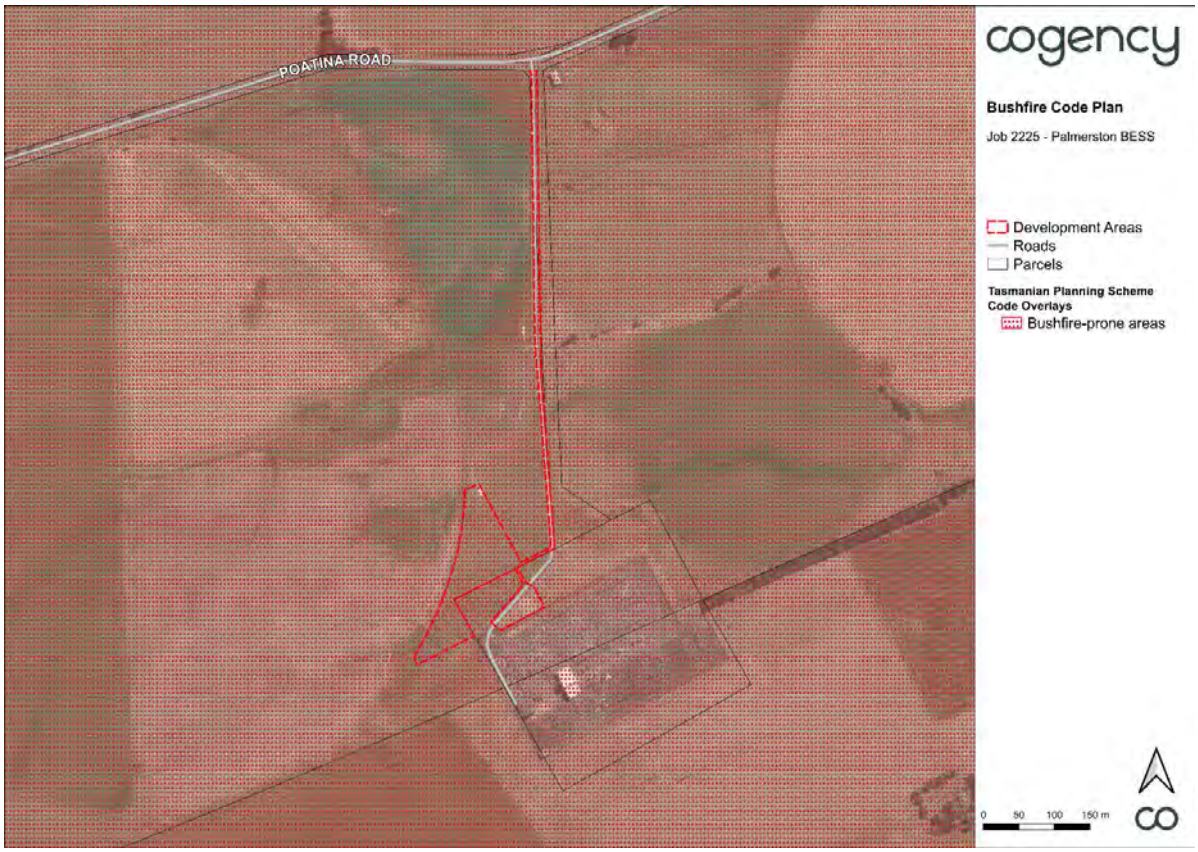


Figure 12 A Bushfire-prone Areas Code Plan

Table 15 Bushfire-Prone Areas Code – C13.5 Use Standards

C13.5.2 Hazardous uses	
Objective: That hazardous uses can only be located on land within a bushfire-prone area where tolerable risks are achieved through mitigation measures that take into account the specific characteristics of both the hazardous use and the bushfire hazard.	
Acceptable Solution or Performance Criteria	**Assessment**
P1 A hazardous use must only be located in a bushfire-prone area if a tolerable risk from bushfire can be achieved and maintained, having regard to: (a) the location, characteristics, nature and scale of the use; (b) whether there is an overriding benefit to the community; (c) whether there is no suitable alternative lower-risk site; (d) the emergency management strategy (hazardous use) and bushfire management plan; and (e) other advice, if any, from the TFS.	**Satisfies P1.** The proposed location of the development is specifically sited to take advantage of the existing grid infrastructure of Palmerston Substation. The Proposal will provide significant benefit to Tasmania, providing firming services to the grid. There is no suitable alternative lower-risk site. The fire risk is considered Very Low considering the landscape characteristics (flat, low tree cover, high rainfall), adjacent uses (substation and associated high sensitivity for fire protection, and centre-pivot irrigation / agricultural grazing), and site design (fire breaks, static water supply, hydrant siting and emergency vehicle access). It is expected that a condition of planning permit can require the preparation of emergency management strategy and bushfire management plans for the facility.

A2 An emergency management strategy (hazardous use) endorsed by the TFS or accredited person.	**Not applicable.** ▪ An emergency management strategy is not considered necessary for this facility at this point in time. ▪ It is expected that a condition of permit can appropriately require preparation of further management plans, that can address specific issues such as Work Health & Safety Act 2012. ▪ No chemical storage or storage of hazardous materials will be required, other than the internal battery components themselves. All battery units have inbuilt fire suppression measures and meet international standards. ▪ The BESS does not require full time operational staff and therefore risk to personnel is simple to manage.
A3 A bushfire hazard management plan that contains appropriate bushfire protection measures that is certified by the TFS or an accredited person.	**Not applicable.** ▪ As above, because the Proposal is not a listed Hazardous Use, a bushfire hazard management plan certified by the TFS is not considered necessary for this facility at this point in time. ▪ The supporting Fire Risk and Hazard Assessment report illustrates clear acceptable 'Very Low' risks, and confirms that appropriate fire-fighting measures are in place (water and hydrant supply, access etc). ▪ It is expected that a condition of permit can appropriately require preparation of further management plans to the satisfaction of the TFS. ▪ Access to the facility will be adequate for bushfire purposes and for evacuation purposes.

In summary, a BESS facility is not listed as a hazardous use. However, the battery units utilise lithium as a key component. Accordingly, a Fire Risk and Hazard Assessment has been prepared to consider the controls set out under the Bushfire-prone Areas Code and the Victorian guidelines.

This report submits that the proposed siting of the Proposal within the Bushfire-prone Areas Code is appropriate, given that there are no other sites in the vicinity suitable for the Proposal that are not affected by the code. The Proposal's location is also benefited by its adjacency to the Palmerston Substation. As related critical infrastructure, the agglomeration of fire risks limits the distribution of ignition sources and fuel loads across the region, and can help to concentrate a fire emergency response. Importantly, the Proposal is located distant from natural fuel loads, such as vegetation, and incorporates setbacks and fire breaks. The surrounding area is generally flat, and features no significant areas of vegetation, inhibiting the spread of uncontrolled burn.

Through the planning and development process, Cogency will engage with specialists and the TFS on behalf of the client and as appropriate. The preparation of an emergency management strategy and bushfire hazard management plan are considered appropriate as a condition of planning permit, considering the Very Low fire risk rating conclusion of the supporting Fire Risk and Hazard Assessment.

7.6.6 Clause C16.0 – Safeguarding of Airports Code

Although the entire Site is mapped within the Safeguarding of Airports Code, the airport obstacle limitation area over the Site is 1467.84m AHD. The elevation of the Development Area is approximately 180m AHD. As such, the Proposal is exempt from this Code under Clause C16.4.1.

7.7 Northern Midlands Local Provisions Schedule

There are no Local Area Objectives or other relevant provisions within the LPS that apply to the Development Area, beyond those already addressed in prior sections.

7.8 Planning Assessment Summary

As demonstrated in the above sections, the Proposal is consistent with the applicable planning provisions. While the Use Class Utilities is Discretionary within the Agriculture Zone, the Proposal is consistent with the objectives of the Agriculture Zone and Utilities Zone, and complies with applicable Acceptable Solutions or, where necessary, satisfies applicable Performance Criteria under the zones and relevant codes.

The Proposal has been designed to avoid and minimise key hazards and considerations, or mitigate where required, including bushfire risk, infrastructure protection, natural values (waterways and native vegetation) and cultural heritage.

The buildings and works are considered appropriate to their surrounds, do not impact the amenity of neighbours, and have been sited adjacent to the existing Palmerston Substation to minimise visual impact.

The Proposal supports ongoing agricultural use on the Site and will provide significant local and regional economic benefits.

It is considered that the Proposal is highly consistent with the applicable planning provisions and should be approved.

7.9 Other Relevant Applications and Amendments

There is one other known Planning Application near to the Proposal (the Northern Midlands Solar Farm) but it will not impede this Proposal or vice versa. The presence of multiple renewable energy developments is positive for the Northern Midlands region and is an important step to increasing reliable and affordable power, and to ensuring growth in Tasmania’s economy through investment and job creation.

Engagement with TasNetworks is ongoing to coordinate the interface with the Palmerston Substation.

8. Impact Assessments

A group of suitably qualified, experienced specialist consultants were engaged to assess and provide input to the Proposal. The following environmental and technical impact assessments have been prepared to support the Planning Application and should be read in conjunction with this Planning Report:

- Native vegetation assessment, Nature Advisory (Appendix C)
- Aboriginal Cultural Heritage Assessment, Cultural Heritage Management Australia, (Appendix D)
- Traffic Impact Assessment, Pitt & Sherry (Appendix E)
- Landscape and Visual Impact, Orbit Solutions (Appendix F)
- Noise Impact Assessment, SLR Consulting (Appendix G)
- Fire Hazard and Risk Assessment, NJM Design (Appendix H)

8.1 Ecology

A native vegetation assessment was undertaken by Nature Advisory Pty Ltd in October 2022. The assessment involved a review of DNRE's *TASVEG 4.0* and an on-foot study undertaken by an accredited botanist.

The assessment found that the site's vegetation mostly comprised 'introduced pasture grasses,' as well as 'commonly associated weeds'. The only native species recorded were 'all species that readily occur opportunistically on disturbed and previously cleared ground', 'at very low density,' that did not 'comprise any native vegetation community listed in TASVEG 4.0.' The assessment included the areas of the watercourses that intersect the Development Area. Notably, no remnant native vegetation was identified.

Therefore, the Proposal footprint is a small area of agricultural land that is already used for grazing and is dominated by exotic species. Moreover, the Proposal will not require the removal of any native vegetation communities or treed vegetation. The assessment concluded on these bases that no permit for the removal of native vegetation would be required, and that no further ecological assessment would be required.

The proposal has been appropriately sited to avoid any areas of ecological value.

8.2 Aboriginal Cultural Heritage

An Aboriginal Cultural Heritage Assessment was undertaken by Cultural Heritage Management Australia (CHMA) in January 2023. There were three primary stages of the assessment which included Stage 1 (Pre-fieldwork, and background work), Stage 2 (Field work) and Stage 3 (Report Preparation). The findings within the final report are outlined below, including recommendations of the study. The Study Area for this assessment focused on the 1.5 hectare Development Area.

As part of Stage 1, an initial search was conducted of the Aboriginal Heritage Register (AHR) to determine the extent of registered Aboriginal Sites within the general vicinity of the Palmerston BESS. The AHR search showed that there are a total of 28 registered Aboriginal sites situated within a 5km radius of the study area. None of these 28 registered Aboriginal sites are located within or in the immediate vicinity of the Proposal's Development Area. The closest registered site is situated approximately 1.3km South of the Study Area identified as AH8949 (artefact scatter).

During the field assessment, that included a full walkover of the Development Area, any potential sites or relics of Aboriginal heritage having the potential to occur were inspected. The field survey results strongly indicate that the Site and any artefact densities across the site area are likely to be absent. As the Proposal progresses into construction other recommendations relating to construction management and unanticipated finds will be followed.

The findings presented in the report demonstrate that the Proposal's impact on places of Aboriginal cultural heritage sites will be negligible given the limited presence of Aboriginal heritage sites, suspected features or specific areas of elevated archaeological potential are present or within the immediate vicinity of the site.

8.3 Traffic

The Traffic Impact Assessment was conducted by Pitt & Sherry. The assessment considered the traffic impacts of the Proposal, assessing the existing conditions of site access and transport routes, traffic volumes and safety history. This was assessed for both the construction and operation phases of the Proposal. Initial findings helped to inform the site access and design layout.

It was determined within the assessment that the existing access road into the Palmerston Substation has good sight distance in both directions, meeting the Austroads requirements. Prior to the commencement of construction it is recommended the potholes are repaired, as they may worsen and pose as a safety hazard. Typically, a planning permit condition can require a dilapidation report be prepared as part of a Traffic Management Plan and/or Construction Management Plan, required prior to construction.

Traffic impacts at the site are expected to occur predominantly during construction which is estimated to take a total of 12 months. It is anticipated that the impact of additional traffic produced by the Proposal during the construction phase will be negligible and will not negatively impact the function or safety of the local network. Once operational, there will be very minimal increases in traffic.

8.4 Landscape and Visual Impact

The Landscape and Visual Impact Assessment (LVIA) was prepared by Orbit Solutions. The assessment reviewed key viewpoints and locations including sensitive receptors, dwellings and scenic lookouts that have with potential views towards the Proposal. The assessment also provided a comprehensive overview of the potential treatments to assist in the mitigation of any identified potential visual impacts.

The assessment comprised an amalgamation of desktop review, field work and analysis using different methodological approaches. Analysis included the magnitude of change, the visual absorption compatibility and visual sensitivity of the Proposal. A photomontage and survey methodology was also utilised within the final stages of analysis (example image shown in Figure 13).

Cumulative impacts in relation to land sue, management and capacity for change, were assessed using the Visual Character Units (VCUs): Landform/Water, Vegetation and Structure. From the assessment it was determined that the agriculturally based landform, intermittent vegetation, and existing infrastructure in the area enable the proposal to remain within Visual Absorption Capacity of the Area.

The assessment concludes that the Proposal and existing terminal station, with their similar use and physical characteristics can visually integrate harmoniously into the existing environment without significant impacts. Existing vegetation and planned screening measures effectively mitigate potential impacts upon views from nearby dwellings and roads.

Figure 13 Photomontages from viewpoint: pre and post-maturation of vegetation screen planting

Source: Orbit Solutions.

8.5 Acoustic

The Noise Impact Assessment (NIA) was completed by SLR Consulting. Noise modelling was conducted, supported by noise monitoring at an identified sensitive receptor - a nearby residential dwelling approximately 1.5km from the Proposal. This ensured noise monitoring conducted was representative of the existing ambient environment.

The NIA concludes that key potential impacts in relation to noise are:

Construction activities:

Due to the short duration of construction activities and the distance between proposed site and the closest receptors, noise impacts are anticipated to be relatively small. To further minimise residual risk of harm to nearby receptors, construction activities will be scheduled in accordance with the 'Prohibited hours' as defined in the regulations, community engagement and best practise noise management controls.

Operational activities:

The closest receptor is located approximately 770m south-east of the BESS. Without any mitigation, the BESS exceeds night-time requirements by a small amount at this receptor. Mitigation options are outlined in Chapter 6.3 of the NIA. The EPP (NOISE) noise goals are expected to be achieved through the implementation of one or a combination of mitigation options including: low noise BESS fans and/or silencing treatment, noise barriers and operational control measures such as load locking during night periods.

Overall, the acoustic impacts generated by the Proposal are expected to be negligible and through the adoption of mitigation measures outlined in Chapter 6.3 of the NIA, compliance will be achieved where not currently met. Mitigation measures will be finalised during the detailed design phase of the Project.

8.6 Fire Risk and Bushfire

The Fire Hazard and Risk Assessment has been conducted by NJM design. The report scope was to:

a. Provide a risk review consistent with fire risk assessment techniques for Hazardous industry planning.
b. Quantify severity of fires including heat radiation level at various distances from BESS and transformer fires and durations of the fire.
c. Put the risks into context via comparison with other accepted risks such as those from existing power infrastructure and surrounding buildings in the community.
d. Recommend mitigation measures if required.

In the absence of specific Tasmanian guidelines, the Proposal has taken consideration of Victoria's Guidelines for renewable Energy Facilities. The report has assessed the Proposal design, including fire breaks, access and water supply. Overall, the report concludes that the design of the BESS is appropriate and acceptable. The fire risk is deemed 'Very low' and the risk of fire development and spread is no worse than that posed by existing utility infrastructure in the vicinity.

Section 7.5 of the report concludes that the design and layout of the BESS complies with the Victorian guidelines, hence providing an acceptable level of fire safety to personnel, fire brigade and adjacent properties.

As discussed in Chapter 7.6.5 regarding the Bushfire Prone Areas Code, the BESS is not a listed Hazardous Use. The Proposal has nonetheless been designed with high regard to fire risk. The results of the supporting report demonstrate that the risk is Very Low, and therefore, further emergency and hazard management plans are appropriate for preparation as a condition of planning permit.

8.7 Agriculture

The Proposal is not considered to impact agriculturally productive land either in the Site or in the vicinity and does not pose a risk to the Northern Midlands' growing economic base. Rather, it is considered to support the

longevity of an ongoing agricultural use by providing an additional revenue stream for a local landowner by developing an improvement on historically risdual and unproductive land.

The Project's small development footprint has also been located in the unwatered corner segment of a square paddock, and therefore avoids diminishing the stock of irrigated land. This is reflected in mapping data prepared by the State government[4], wherein the Site is not recognised as irrigated land, but rather grazing land, indicating its lower agricultural productivity relative to surrounding areas.

Similarly to the Palmerston Substation, the use and development of a BESS will not compromise the productivity of adjacent farming operations and is not itself a sensitive receptor that would constrain the intensification of an agricultural or other primary production use on an adjacent site at a later time. The proposed use of the land is considered entirely compatible with surrounding agricultural uses.

The Project will not permanently sterilise the agricultural productivity of the land. BESS assets do not emit pollutants into the soil or groundwater, and pursuant to the Proposal's decommissioning the land can simply be returned to an agricultural use.

Because the Proposal is for a grid-connected battery system, its location is naturally constrained to be close to the substation it serves – in this case, the Palmerston Substation. To the greatest extent possible it has therefore been co-located in proximity to the Palmerston Substation. Locations outside of an agricultural area would be too distant from the Substation and are not considered cost effective or electrically efficient.

8.8 Water, Groundwater and Flooding

It is considered that the Proposal would not impact negatively on groundwater. The introduction of hard standing would not cause adverse drainage issues due to adequate stormwater planning in developed accordance with regulation. Stormwater and fire-fighting run-off will be appropriately managed.

The Proposal does not require consumption of water resources, particularly in contrast to the nearby intensive agricultural activities. The main uses for onsite water will be maintenance activities (eg cleaning, weed spraying) and irregular firefighting. Workers undertaking these activities will take reasonable care to minimise water use and to avoid any off-site impacts. The BESS asset will be subject to regularly scheduled maintenance and system inspections to identify and address any potential issues. The Construction and Environment Management Plan (proposed as a condition of planning permit) can detail measures to minimise water use and mitigate impacts.

While the area is not considered flood prone, several measures can be taken to mitigate potential flood impacts on the Proposal, including:

- Implementing protective measures in the system design, such as designing the battery system to incorporate an elevated container, elevated racks, and/or an elevated platform to allow for greater flood resistance.
- Deploying waterproof sealing mats, materials, and other waterproofing methods in the battery storage system to prevent flooding from entering the system.
- Installing a water detection system to alert personnel of water infiltration in the system.
- Implementing a monitoring system to track the battery system's performance during a flood event.
- Establishing a contingency/emergency response plan to ensure that the battery system can be safely taken offline in the event of a flood.
- Have regularly scheduled maintenance and regular system inspections to identify and address any potential issues.

[4] https://www.thelist.tas.gov.au/app/content/data/geo-meta-data-record?detailRecordUID=223038ed-d05d-496c-8b60-c690619afc83

9. Conclusion

On the basis of a detailed evaluation of the Proposal against the Tasmanian Planning Scheme - Northern Midlands, and relevant State and Commonwealth legislation, this planning application report concludes that the Proposal is supported by the provisions, objectives and strategies of these policies.

The proposed use and development of a BESS at the Site will contribute to the Northern Midlands Council and Tasmania's social, economic and climate goals, including the 200% TRET, by supporting the continued expansion of the local economy and increased renewable energy generation. Importantly, the BESS will provide critical grid-stabilising support for both the Tasmanian and National electricity networks.

The Proposal is sited specifically adjacent to existing electrical infrastructure (Palmerston Substation), to maximise benefits to the grid. It is distant from sensitive receptors and is on unproductive agricultural land with a relatively small footprint. The design is relatively benign on a small footprint, with underground transmission connection avoiding the need for tall overhead transmission towers. As such, the Proposal visually sits comfortably within the landscape, particularly considering the adjacent substation and numerous overhead transmission lines.

Importantly, the Proposal would not result in significant changes to the environmental condition of the Site or surrounding areas. The Proposal's use and development would not lead to the removal of significant flora and fauna and includes no impacts to treed or remnant native vegetation. The bushfire risk characteristics of the landscape and the proposal result in a 'Very Low' fire risk hazard rating.

Further, by providing support for the further integration of renewable energy resources into the electricity grid, the Proposal can support climate change action through reduction of greenhouse gas emissions in the energy sector.

Appendix A Certificate of Title Details

The following table summarises all lots that comprise the site, due to them containing the Development Area.

Our Ref #	Area	Address	Property ID	Title Ref.	Schedule of Easements
1	Primary Development Area (BESS)	1440 Saundridge Road Cressy TAS 7302	6753396	105802/1	Yes - included in Folio Text provided
2	Palmerston Substation East	'Palmerston Transend SUB STN' – 4554 Poatina Rd Cressy TAS 7302'	6753097	142369/1	No – included in Folio Text provided Authority – Tas Networks
3	Palmerston Substation Access Road	'Palmerston Transend SUB STN' – 4554 Poatina Rd Cressy TAS 7302'	6753097	142369/2	No – included in Folio Text provided Authority – Tas Networks
4	Palmerston Substation West	'Palmerston Transend SUB STN' – 4554 Poatina Rd Cressy TAS 7302'	6753097	142369/3	No – included in Folio Text provided Authority – Tas Networks

Appendix B Site Layout Masterplan

Appendix C Native Vegetation Assessment

Appendix D Aboriginal Cultural Heritage Assessment

Appendix E Traffic Impact Assessment

Appendix F Landscape and Visual Impact Assessment

Appendix G Noise Impact Assessment

Appendix H Fire Hazard and Risk Assessment

FOLIO PLAN

RECORDER OF TITLES

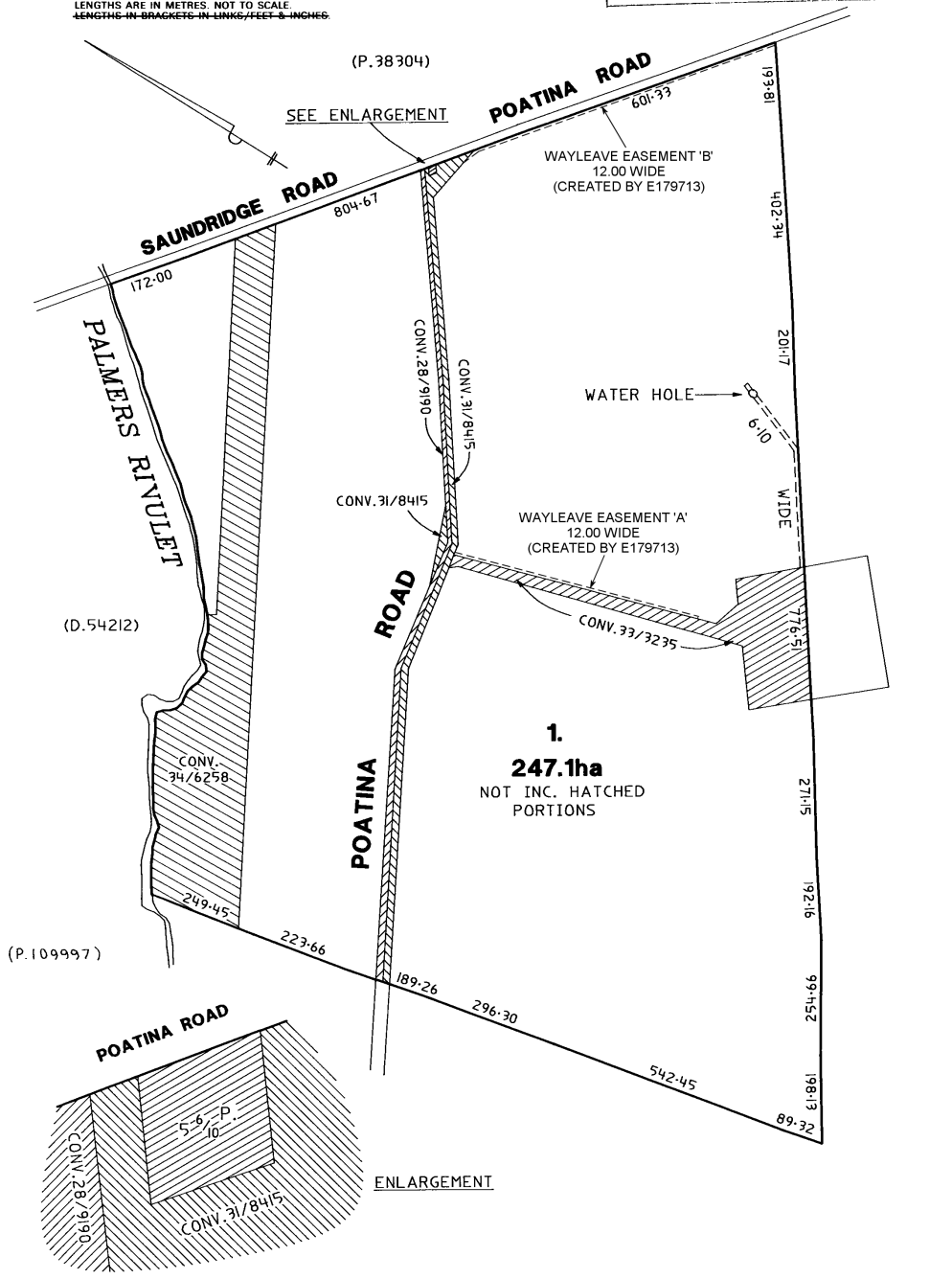
Issued Pursuant to the Land Titles Act 1980

APPROVED 28 MAY 1993 RECORDER OF TITLES	CONVERSION PLAN CONVERTED FROM 39/6017	REGISTERED NUMBER P.105802
FILE NUMBER Y.16079	GRANTEE: PART OF 3000Ac. GTD. TO JOSEPH ARCHER	DRAWN M.J.T. 27-5-93

SKETCH BY WAY OF ILLUSTRATION ONLY

TASMAP MUNICIPAL CODE NO. 56	LAST TASMAP NO. 0275	LAST SURVEY PLAN NO.
ALL EXISTING SURVEY NUMBERS ARE THE SAME AS APPEAR ON THIS PLAN		

~~CITY/TOWN OF~~
LAND DISTRICT OF WESTMORLAND
PARISH OF WOODSIDE
LENGTHS ARE IN METRES. NOT TO SCALE.
~~LENGTHS IN BRACKETS IN LINKS/FEET & INCHES.~~



FOLIO PLAN

RECORDER OF TITLES

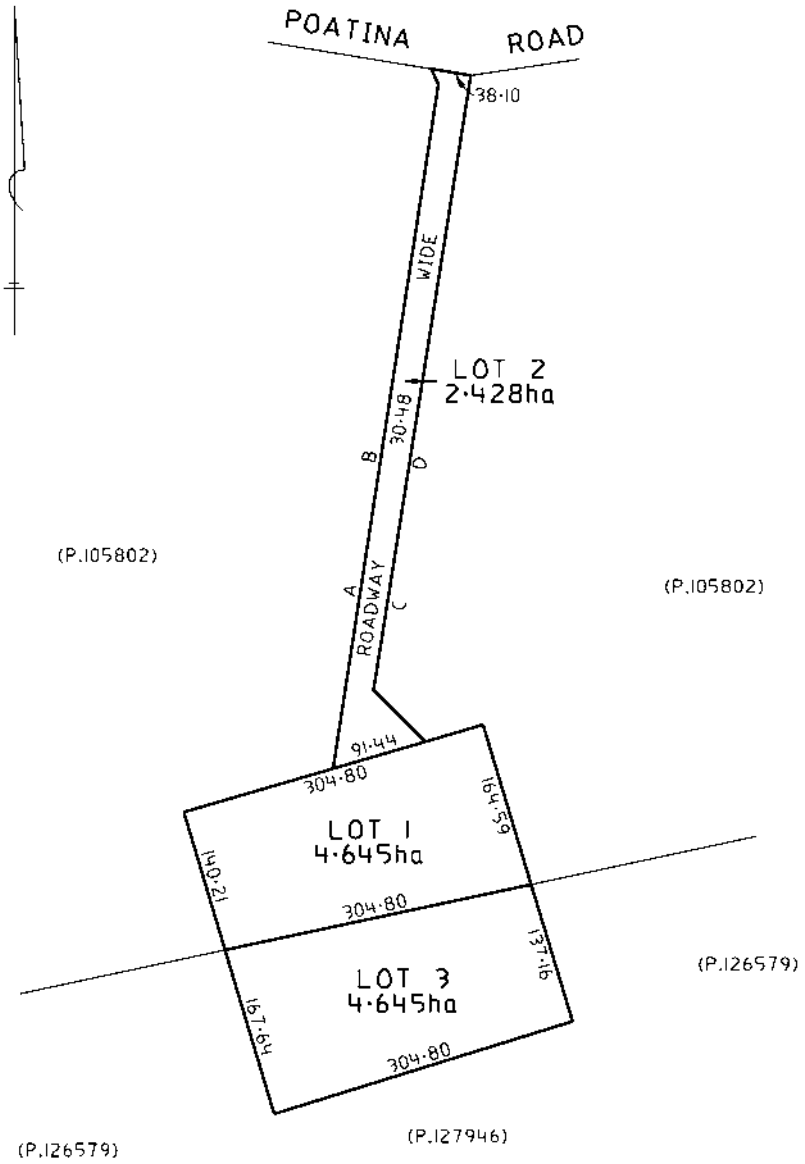
Issued Pursuant to the Land Titles Act 1980

Tasmanian Government

FILE NUMBER Y20314 GRANTEE PART OF 3000 ACRES GTD TO JOSEPH ARCHER	CONVERSION PLAN LOCATION WESTMORLAND - WOODSIDE CONVERTED FROM GL1268 (1stly, 2ndly & 3rdly Desc.) NOT TO SCALE LENGTHS IN METRES	Registered Number P.142369 APPROVED 22 SEPT 2004 Alice Kawa Recorder of Titles
MAPSHEET MUNICIPAL CODE No.123 (4837-45)	LAST UPI No. 5600276	ALL EXISTING SURVEY NUMBERS TO BE CROSS REFERENCED ON THIS PLAN DRAWN NJD

SKETCH BY WAY OF ILLUSTRATION ONLY

"EXCEPTED LANDS"



akaysha

Concept Layout Plan

2225 - Palmerston BESS

- Parcels
- Existing 220 kV Transmission Line

Proposed Features

- Battery Storage and Inverter Area
- Operations and Maintainence
- Native Vegetation Screening (5m)
- Water Tank
- Access Roads (4m)
- Parking
- Fence
- 220 - 33 kV Substation Extension
- 33 kV Underground Reticulation

Version: 8.0

Date: 05/09/2023

0 10 20 30 m

1:900 at A3

27th October 2022

Akaysha Energy Pty Ltd
10-20 Gwynne Street
Cremorne VIC 3121

Attention: Tony Fullelove (Director)
By email — tony.fullelove@akayshaenergy.com.au (phone +61 436 380 652)

Dear Tony,

RE: 1440 SAUNDRIDGE ROAD, CRESSY, TASMANIA
FLORA AND FAUNA OVERVIEW ASSESSMENT
NATURE ADVISORY REF. NO. 22285.01

Introduction and methods

Thank you for engaging Nature Advisory Pty Ltd to undertake a native vegetation assessment of an approximately 2-hectare area of land at 1440 Saundridge Road, Cressy, adjacent to the Palmerstone Terminal Substation. This specific area investigated, referred to herein as the 'study area', is proposed for development of a Battery Energy Storage System (BESS) and expansion of the substation to include a BESS switchboard.

A review of existing information on the study area and surrounds was undertaken, including:

- DNREs *TASVEG 4.0*; and
- The Northern Midlands Interim Planning Scheme 2013.

The study area lays within the Northern Midlands Local Government Area and is currently zoned Rural Resource Zone and Utilities Zone in the Northern Midlands Planning Scheme. No Code Overlays relevant to biodiversity cover the study area.

The study area was assessed on foot by Dean Karopoulos (a DELWP VQA accredited botanist) for the presence of native vegetation on 12th October 2022. The species identified in the study area were recorded and are listed in Appendix 2.

Findings

The study area supports sheep grazing to the north of the substation and cattle grazing to the south, as well a number of easements supporting existing electrical towers, which are also grazed. A shelter belt occurred to the east of the substation (outside the impact area), which consists of rows of planted Shining Gum (*Eucalyptus nitens*) with an understory of Cocksfoot (*Dactylis glomerata*), Gorse (*Ulex europaeus*) and Blackberry (*Rubus fruticosus spp. agg.*).

Vegetation comprised introduced pasture grasses such as Cocksfoot, Annual Bluegrass (*Poa annua*) and Perennial Rye-grass (*Lolium perenne*) as well as commonly associated weeds such as Sheep Sorrel (*Acetosella vulgaris*), Clover (*Trifolium spp.*) and Buck's Horn Plantain (*Plantago*

coronopus). Additional sporadic high-threat weeds included Spear Thistle (*Cirsium vulgare*) and Variegated Thistle (*Silybum marianum*). The only native species recorded comprised sporadic occurrences of Spreading Crassula (*Crassula decumbens*), Little-club Sedge (*Isolepis marginata*) and scattered Rush (*Juncus spp.*), which are all species that readily occur opportunistically on disturbed and previously cleared ground. These scattered individuals occur at very low density and are not considered to comprise any native vegetation community listed in *TASVEG 4.0*.

These findings are consistent with *TASVEG 4.0* mapping, which shows the study area as being comprised entirely of the "Modified Land - Agricultural Land" vegetation community (Vegetation Community Code FAG), with the shelter belt of planted Shining Gum being mapped as the "Modified Land – Plantations for Silviculture (Hardwood)" vegetation community (Vegetation Community Code FPH). Neither of these vegetation communities are considered remnant native vegetation.

Photographs of the study area are provided in Appendix 1.

Impacts and implications

The proposed development would impact a small area of agricultural land currently used for grazing which is dominated by exotic pasture species. Native vegetation occurs in this area as a few scattered individuals of Rush and Spreading Crassula.

As no native vegetation communities or treed vegetation will be removed by the proposed development, a permit for the removal of native vegetation is not required under the Northern Midlands Planning Scheme. Additionally, the study area is not subject to any environmental code overlays under the Northern Midlands Planning Scheme.

We trust the foregoing advice is of assistance. If you have any questions, please do not hesitate to call our office.

Yours sincerely,

Brett Lane

Managing Director
Nature Advisory Pty Ltd

(03) 9815 2111 | brettl@natureadvisory.com.au

Appendix 1: Photographs of the study area

Photo 1: Example of exotic pasture grasses dominating proposed BESS site

Photo 2: Close-up of exotic ground layer of proposed BESS site

Photo 3: Planted row of Shining Gum and associated Gorse infestation

Photo 4: Close-up of exotic ground layer of Shining Gum windbreak

Appendix 2: Flora species list

Origin	Common name	Scientific name
*	Sheep Sorrel	*Acetosella vulgaris*
*	Capeweed	*Arctotheca calendula*
*	Common Water-starwort	*Callitriche stagnalis*
*	Common Mouse-ear Chickweed	*Cerastium glomeratum s.l.*
*	Spear Thistle	*Cirsium vulgare*
	Spreading Crassula	*Crassula decumbens var. decumbens*
*	Cocksfoot	*Dactylis glomerata*
*	Annual Veldt-grass	*Ehrharta longiflora*
*	Big Heron's-bill	*Erodium botrys*
	Shining Gum	*Eucalyptus nitens*
*	Flatweed	*Hypochaeris radicata*
	Little Club-sedge	*Isolepis marginata*
*	Capitate Rush	*Juncus capitatus*
	Rush	*Juncus spp.*
*	Perennial Rye-grass	*Lolium perenne*
*	Wimmera Rye-grass	*Lolium rigidum*
*	Red Bartsia	*Bellardia latifolia*
*	Toowoomba Canary-grass	*Phalaris aquatica*
*	Buck's-horn Plantain	*Plantago coronopus*
*	Annual Meadow-grass	*Poa annua s.l.*
*	Four-leaved Allseed	*Polycarpon tetraphyllum*
*	Blackberry	*Rubus fruticosus spp. agg.*
*	Variegated Thistle	*Silybum marianum*
*	Clover	*Trifolium spp.*
*	Gorse	*Ulex europaeus*
*	Squirrel-tail Fescue	*Vulpia bromoides*

* = introduced to Tasmania

Palmerston Battery Energy Storage System (BESS) Project. 1440 Saundridge Road, Cressy

Aboriginal Heritage Assessment Report
Final Version 1

AUTHOR: Shay Hannah and Vernon Graham
27 Apsley St South Hobart, TAS 7004

CLIENT:
Akaysha Energy

17.2.2023

CULTURAL HERITAGE MANAGEMENT AUSTRALIA

Report Version Control

Report version	Report distribution	Date of Distribution
Draft Report V1	Zoe Smith (CHMA) for editing	7.2.2023
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Final Draft Report V1	Aboriginal Heritage Tasmania	17.2.2023
Final Report version	Aboriginal Heritage Tasmania	10.3.2023

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Executive Summary

Project Details

Cogency Australia (Cogency) has been engaged by Akaysha Energy (the proponent) to prepare a planning application report for a 1.5ha, 100MW/200MWh Battery Energy Storage System (BESS) at 1440 Saundridge Road, in Cressy, Tasmania. The site for the BESS footprint is located adjacent to the existing Palmerston Substation, 2.3km east of Poatina and 12.5km southwest of Cressy in the Northern Region of Tasmania (see Figure 1). The Palmerston BESS Project will be situated on an approximately 1.5ha area of private pastureland. The site will be accessed via an existing access road linking the Palmerston Substation to Poatina Road. Figures 2 and 3 show the proposed layout plan for the BESS project.

CHMA Pty Ltd and Aboriginal Heritage Officer (AHO) Vernon Graham have been engaged by the proponent to undertake an Aboriginal heritage assessment for the proposed Palmerston BESS project (the study area), to identify any potential Aboriginal heritage constraints. This report presents the findings of the Aboriginal heritage assessment.

Registered Aboriginal Sites in the Vicinity of the Study Area

As part of Stage 1 of the present assessment, a search was carried out on Aboriginal Heritage Register (AHR) to determine the extent of registered Aboriginal heritage sites within and in the general vicinity of the Palmerston BESS Project study area.

The search shows that there are a total of 28 registered Aboriginal sites that are situated within a 5km radius of the study area (search results provided by Rueben West from Aboriginal Heritage Tasmania (AHT) on 24-11-2022). None of these registered Aboriginal sites are situated either within or in the immediate vicinity of the BESS project footprint. The closest registered Aboriginal sites are AH8949 (an artefact scatter), which is situated around 1.3km to the south of the study area, and AH9964 (an isolated artefact) which is located around 2km to the north-east. The detailed AHR search results are presented in section 4.2 of this report.

Summary of Survey Results

No Aboriginal heritage sites, suspected features or specific areas of elevated archaeological potential were identified during the field survey inspection of the proposed Palmerston BESS Project footprint. As noted previously, a search of the AHR shows that there are no other registered Aboriginal sites within or in the immediate vicinity of the Palmerston Battery Project footprint. The field survey was able to confirm that there are no stone resources identified within the study area that would be suitable for stone artefact manufacturing. Nor are there any sizeable rock outcrops occurring within the study area, and therefore there is no potential for Aboriginal rock shelters to be present.

Surface visibility across the study area was variable, ranging between <10% to 90%, averaging at 25%. Given these constraints, it cannot be stated with certainty that there are. no undetected Aboriginal heritage sites present in the proposed Palmerston BESS Project footprint. However, the negative survey results strongly indicate that site and artefact densities across the study area are likely to be either absent, or present in low to very low densities. If undetected sites are present, they are most likely to be isolated artefacts or small artefact scatters, representing sporadic Aboriginal activity. Any undetected sites that are.

The present will have been heavily disturbed by the past land-use practices described in section 2 of this report.

It is worth noting that the negative survey results for the BESS study area are consistent with the recent survey assessment findings for an adjacent site, which was undertaken by CHMA. This site was situated immediately to the south of the current study area. No Aboriginal heritage sites or specific areas of elevated sensitivity were identified in this adjacent area and it was assessed that there was a low potential for undetected sites to be present.

The detailed survey results and discussions are presented in section 7 of this report.

Management Recommendations

- Heritage management options and recommendations provided in this report are made based on the following criteria.
- Consultation with Vernon Graham (Aboriginal Heritage Officer).
- The legal and procedural requirements as specified in the *Aboriginal Heritage Act 1975* (The Act).
- The results of the investigation as documented in this report; and
- Background research into the extant archaeological and ethnohistoric record for the study area and the surrounding region.

Recommendation 1

No Aboriginal heritage sites, suspected features, or areas of elevated archaeological sensitivity were identified within the proposed Palmerston BESS Project footprint. It is assessed that there is a very low potential for undetected Aboriginal heritage sites to be present. On this basis it is advised that there are no Aboriginal heritage constraints or requirements to the development proceeding.

Recommendation 2 (Unanticipated Discovery Plan)

It is assessed that there is generally a low to very low potential for additional undetected Aboriginal heritage sites to occur within the Palmerston BESS Project footprint. However, if, during the course of the proposed works, previously undetected archaeological sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see Appendix 3). A copy of the Unanticipated Discovery Plan should be kept on-site during all ground disturbance and construction work. All construction personnel should be made aware of the Unanticipated Discovery Plan and their obligations under the Aboriginal Heritage Act 1975 (the Act).

Recommendation 3

Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) for review and comment.

1.0 Project Outline

1.1 Project Details

Cogency Australia (Cogency) has been engaged by Akaysha Energy (the proponent) to prepare a planning application report for a 1.5ha, 100MW/200MWh Battery Energy Storage System (BESS) at 1440 Saundridge Road, in Cressy, Tasmania. The site for the BESS footprint is located adjacent to the existing Palmerston Substation, 2.3 km east of Poatina and 12.5km southwest of Cressy in the Northern Region of Tasmania (see Figure 1). The Palmerston BESS Project will be situated on an approximately 1.5ha area of private pastureland. The site will be accessed via an existing access road linking the Palmerston Substation to Poatina Road. Figures 2 and 3 show the proposed layout plan for the BESS project.

CHMA Pty Ltd and Aboriginal Heritage Officer (AHO) Vernon Graham have been engaged by the proponent to undertake an Aboriginal heritage assessment for the proposed Palmerston BESS project (the study area), to identify any potential Aboriginal heritage constraints. This report presents the findings of the Aboriginal heritage assessment.

1.2 Aims of the Investigation

The principal aims of the current Aboriginal Heritage assessment are as follows.

- To undertake an Aboriginal cultural heritage assessment for the proposed Palmerston BESS project footprint (the study area, as shown in Figures 1-3). The assessment is to be compliant with both State and Commonwealth legislative regimes, in particular the intent of the *Aboriginal Heritage Act 1975* and the associated *Aboriginal Heritage Standards and Procedures (June 2018).*
- Search the Aboriginal Heritage Register (AHR) to identify previously registered Aboriginal heritage sites within and in the general vicinity of the study area.
- Undertake relevant archaeological, environmental and ethnohistoric background research to develop an understanding of site patterning within the study area.
- To locate, document and assess any Aboriginal heritage sites located within the study area.
- To assess the archaeological and cultural sensitivity of the study area.
- To assess the scientific and Aboriginal cultural values of any identified Aboriginal cultural heritage sites located within the study area.
- Consult with (or ensure the Aboriginal community representative consults with) Aboriginal organisation(s) and/or people(s) with an interest in the study area in order to obtain their views regarding the cultural heritage of the area.
- To develop a set of management recommendations aimed at minimising the impact of the proposed Palmerston BESS project on any identified Aboriginal heritage values.
- Prepare a report which documents the findings of the Aboriginal heritage assessment and meets the standards and requirements of the current standards and procedures of *Aboriginal Heritage Standards and Procedures* prepared by AHT.

1.3 Project Methodology

A three-stage project methodology was implemented for this assessment.

Stage 1 (Pre-Fieldwork Background Work)

Before fieldwork was undertaken, the following tasks were completed by CHMA staff.

Consultation with Aboriginal Heritage Tasmania

Aboriginal Heritage Tasmania (AHT) was contacted and informed that CHMA had been engaged to undertake an Aboriginal heritage assessment for the Palmerston BESS Project. As part of this initial contact, a search request of the Aboriginal Heritage Register (AHR) was submitted to AHT in order to ascertain the presence of any previously registered sites in the vicinity of the study area (search request submitted on 17-11-2022).

The collation of relevant documentation for the project

As part of Stage 1, the following research was carried out and background information was collated for this project:

- The collation of information pertaining to any registered heritage sites located within the general vicinity of the study area.
- Mapping information showing the proposed footprint of the Palmerston BESS Project.
- Relevant reports documenting the outcomes of previous Aboriginal heritage studies in the vicinity of the study area.
- Ethno-historic literature for the region.
- References to the land-use history of the study area.
- GIS Information relating to landscape units present in the study area.
- Geotechnical information for the study area, including soil and geology data.

Consultation with Aboriginal Heritage Officer

Vernon Graham is the Senior Aboriginal Heritage Officer for this project. As part of Stage 1 works, Stuart Huys and Shay Hannah (CHMA archaeologists) were in regular contact with Vernon Graham. The main purpose of this contact was to discuss the scope of the present investigations, ratify the proposed methodology for the investigations and coordinate the timeframes for implementing fieldwork.

Stage 2 (Field Work)

Stage 2 entailed the fieldwork component of the assessment. The field survey was undertaken by Shay Hannah (CHMA archaeologist) and Vernon Graham (Senior Aboriginal Heritage Officer), over a period of 1 day (14-12-2022).

The field team walked a total of 1.2km of survey transects across the proposed Palmerston BESS Project footprint, with the average width of each transect being 5m. As part of the field survey program, additional transects were walked in areas where there was improved surface visibility, in order to gain a better insight as to the potential presence or absence of Aboriginal sites across the study area. Section 6 provides further details as to the survey coverage achieved within the study area.

The results of the field investigation were discussed between Vernon Graham and Shay Hannah (CHMA Archaeologist). This included the potential cultural and archaeological sensitivity of the study area, and possible management options.

Stage 3 (Report Preparation)

Stage three of the project involves the production of a Draft and Final Report that includes an analysis of the data obtained from the field survey, an assessment of archaeological sensitivity and management recommendations. The report has been prepared by Stuart Huys and Shay Hannah, in consultation with Vernon Graham.

A draft copy (electronic PDF version) of the report was submitted to the proponent for review. Any comments that were received have been incorporated into the final draft report. One electronic copy (PDF version) of the final draft report has been provided to Aboriginal Heritage Tasmania (AHT) for review and comment. A copy of the report has been provided to Vernon Graham, to assist in the Aboriginal community consultation process. The report has been sent out to a range of Tasmanian Aboriginal organisations for information purposes.

1.4 Project Limitations

Most archaeological investigations are subject to limitations that may affect the reliability of the results. The main constraint to the present investigation was restricted surface visibility due primarily to vegetation cover. At the time of the field survey, surface visibility across the proposed footprint ranged between <10% and 90%, with the estimated average being 25%. The main access track to the study area is a previously graded vehicle track, where surface visibility was <10%. There were also numerous areas where erosion scalds were present within the pastureland that provided locations of improved visibility. To offset constrained surface visibility, any areas of improved visibility were inspected in detail. The constraints in surface visibility limited the effectiveness of the survey assessment to some extent. The issue of surface visibility is further discussed in Section 6 of this report.

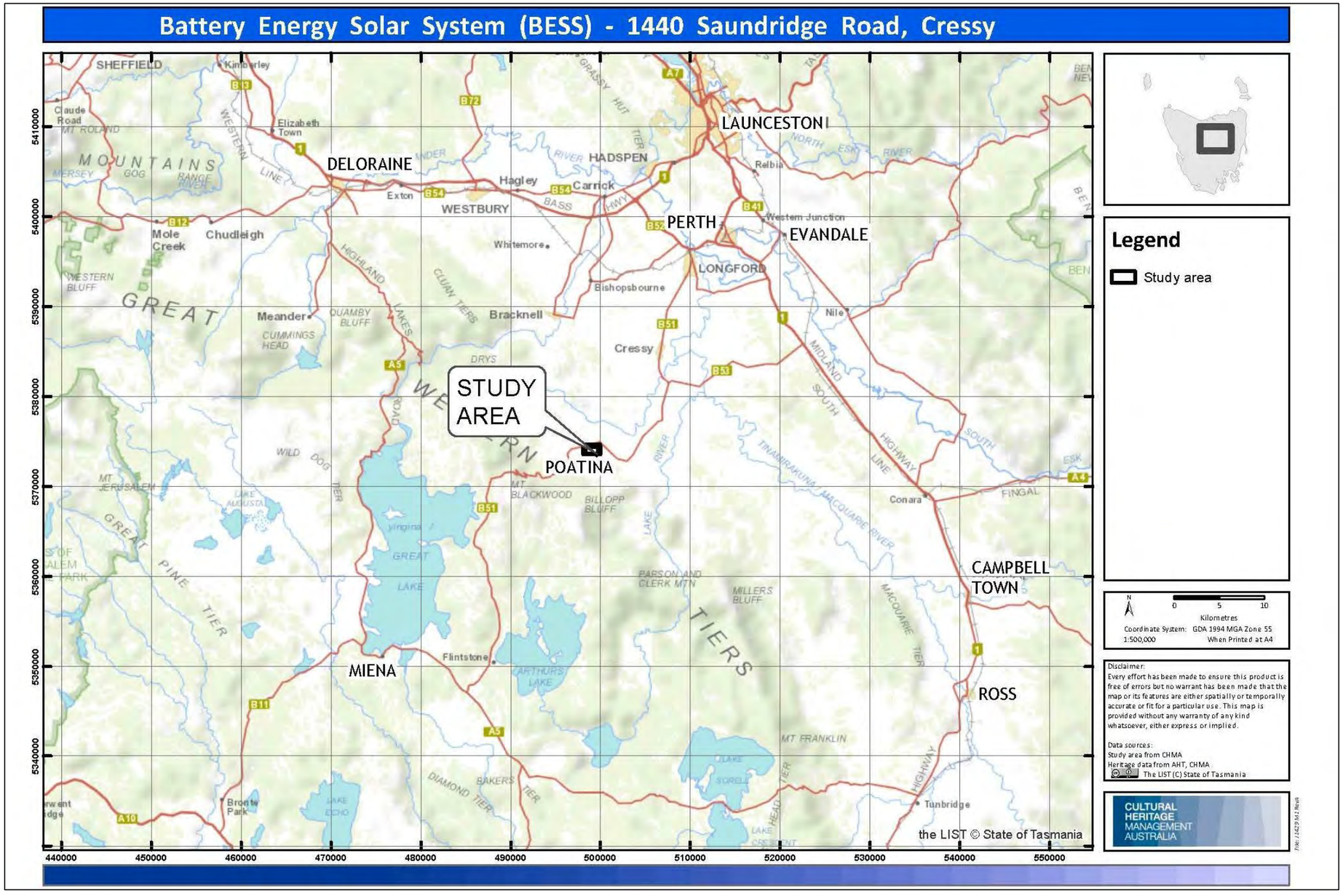

Figure 1: Topographic map showing the location of the BESS project study area at Poatina/Cressy in the Northern Region of Tasmania.

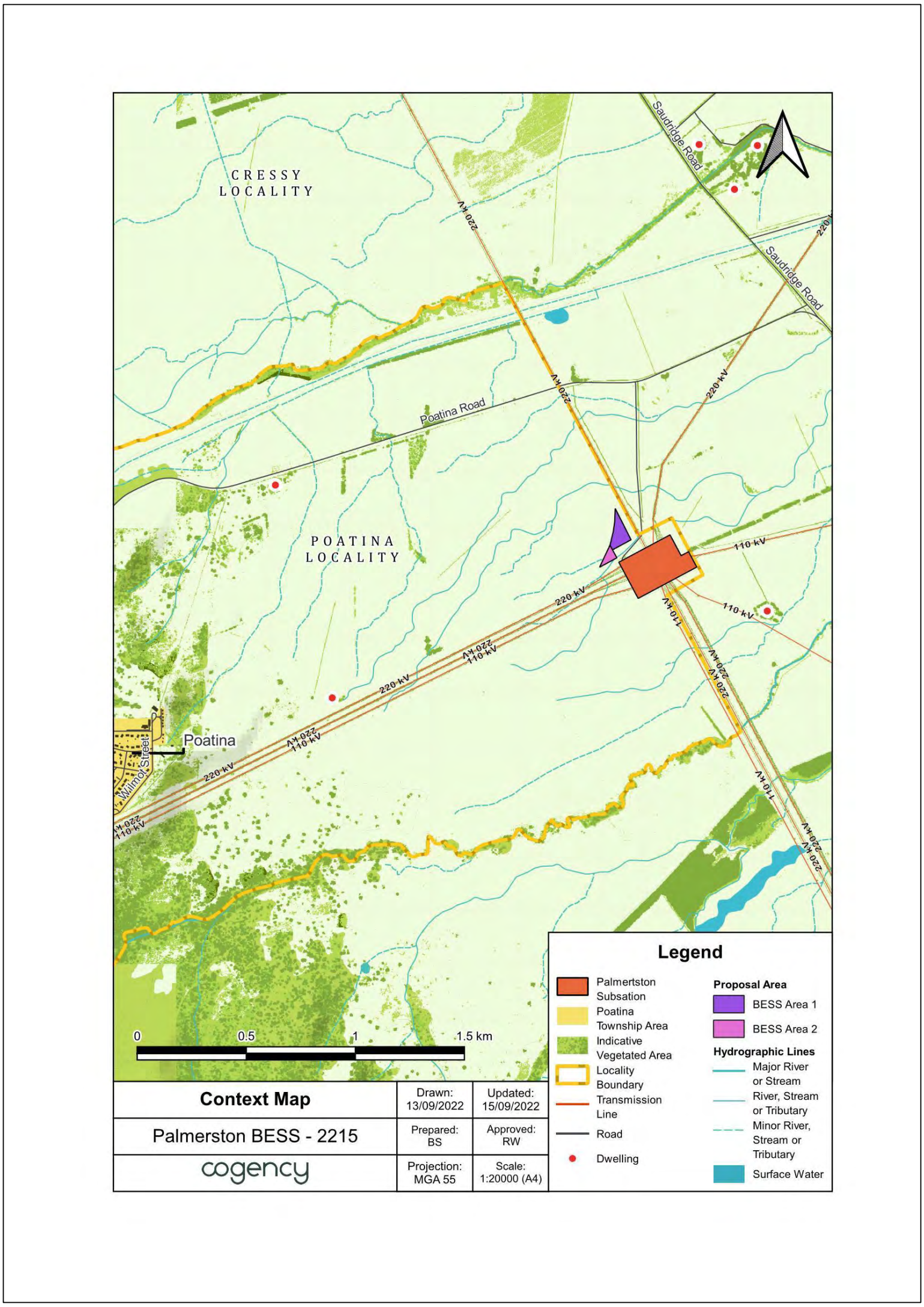

Figure 2: Topographic map showing the proposed layout of the BESS project.

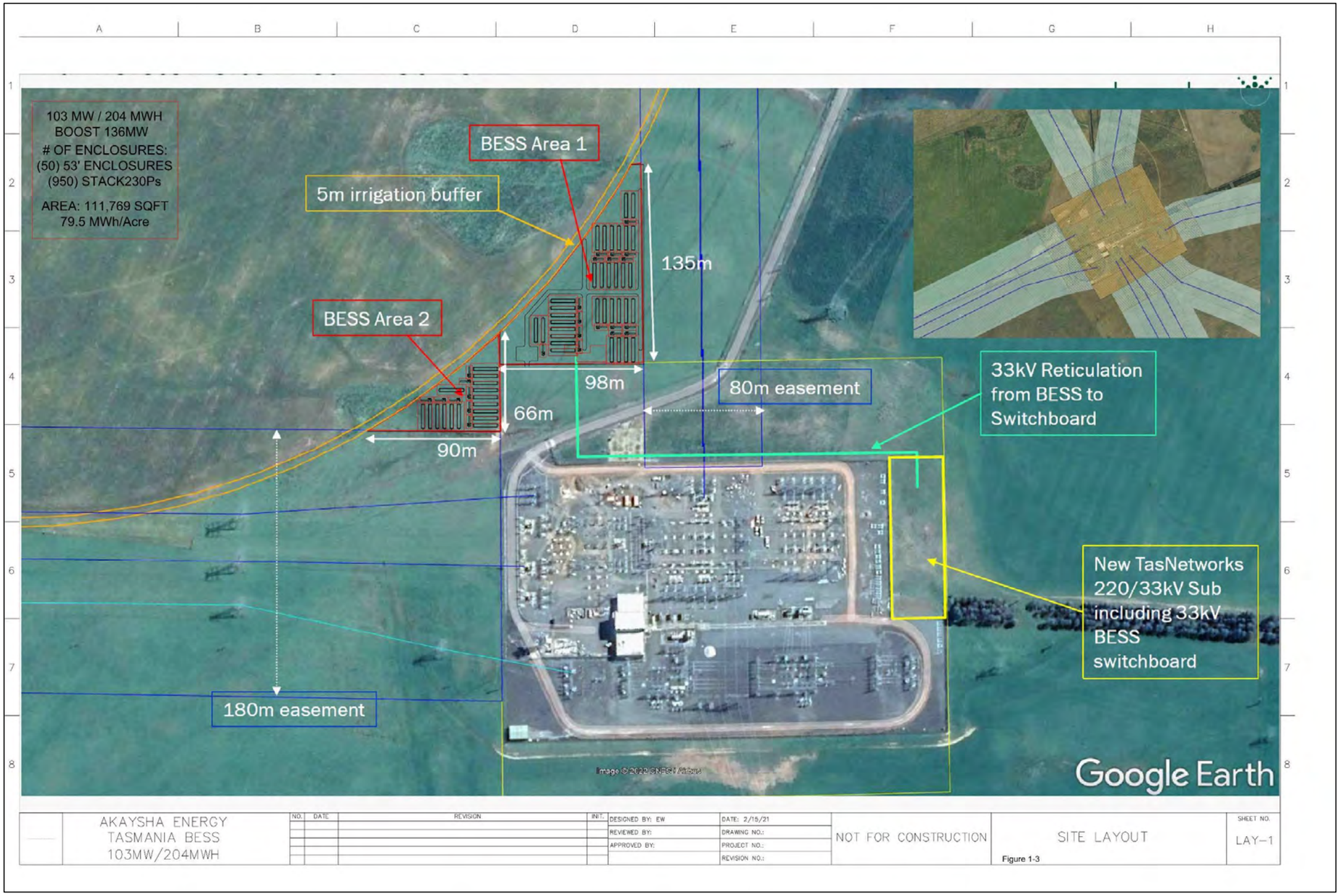

Figure 3: Aerial image showing the proposed layout for the BESS project.

2.0 Environmental Setting of the Study Area

2.1 Introduction

Prior to undertaking an archaeological survey of the study area, it is necessary to characterise the landscape. This includes considering environmental factors such as topography, geology, climate, vegetation, and past and current landscape use. An assessment of the environmental setting helps to develop an understanding of the nature of Aboriginal occupation and site patterning that might be expected to occur across the study area. In addition, it must be remembered that in Aboriginal society, the landscape extends beyond economic and technological behaviour to incorporate social geography and the embodiment of Ancestral Beings.

The archaeological context is generally only able to record the most basic aspects of the activities of Aboriginal as they relate to artefact manufacture and use and other subsistence-related activities undertaken across the landscape such as raw material procurement and resource exploitation. The distribution of these natural resources occurs intermittently across the landscape and as such, Aboriginal occupation and associated archaeological manifestations occur intermittently across space. However, the dependence of Aboriginal populations on specific resources means that an understanding of the environmental resources of an area accordingly provides valuable information for predicting the type and nature of archaeological sites that might be expected to occur within an area.
The primary environmental factors known to affect archaeological patterning include the presence or absence of water, both permanent and ephemeral, animal and plant resources, stone artefact resources and terrain.

Additionally, the effects of post-depositional processes of both natural and human agencies must also be taken into consideration. These processes have a dramatic effect on archaeological site visibility and conservation. Geomorphological processes such as soil deposition and erosion can result in the movement of archaeological sites as well as their burial or exposure. Heavily vegetated areas can restrict or prevent the detection of sites, while areas subject to high levels of disturbance may no longer retain artefacts or stratified deposits.

The following sections provides information regarding the landscape context of the study area including topography, geology, soils, and vegetation.

2.2 Landscape Setting of the Study Area

The proposed Palmerston BESS Project footprint covers approximately 1.5ha of private pastureland and a graded access track. The study area is situated immediately adjacent to the existing Palmerston Substation and is 2.3 km east of Poatina and 12.5km southwest of Cressy in the Northern Region of Tasmania (see Figures 1–3). The study area is situated within a broad open valley context, approximately 2km east of the foothills of the Great Western Tiers. The terrain across the study area and surrounds is characteristically flat to gently undulating, with slope gradients not exceeding 3º (see Plates 2-4).

The underlying geology of the study area consists of Cenozoic cover sequences which consist of sand gravel and mud of alluvial, lacustrine, and littoral origin (List 2022). Soils within the study area are light to dark red/brown sandy loam.

The Palmerston BESS Project footprint is surrounded by named watercourses, unnamed tributaries, and numerous drainage lines. The two closest named water courses to the study area are the Woodside Rivulet which is 985m south of the study area and runs in a northeast-to-southwest direction and Palmers Rivulet which is 1.3km north and runs in the northeast-to-southwest direction. Both of these watercourses are semi-permanent and tributaries associated with Brumby's Creek which is situated 3.3km northeast of the study area.

The vegetation structure across the study area primarily consists of introduced grasses, most notably Prairie Grass (*Bromus wildenowie*) and White Clover (*Trifolium repens*) (NSW Department of Primary Industries 2022). Amongst the introduced grasses are weeds, such as the Scotch Thistle (*Onopordum acanthium*) and sparse stands of native rushes (see Plates 2-4).

The entire study area has been intensively disturbed. The entire study area and immediate surroundings have been subject to past clearing to make way for agricultural activity. The main access track leading into the study area has been graded with bitumen to facilitate access to the Palmerston Substation which is immediately adjacent to the eastern border of the study area (see Plate 5). The construction and ongoing maintenance and development of the Palmerston Substation have also been a source of disturbance to the study area. Any Aboriginal sites that may be present within these more highly disturbed infrastructure/agricultural areas will have been either destroyed or heavily impacted.

The study area has a cool, wet climate typical of northern Tasmania. Rainfall occurs throughout the year; with a mean annual rainfall of 589mm. Rainfall is highest in August and September (64mm – 71mm) and lower from January to February (28 – 31mm). The warmest months of the year are January and February when mean temperatures range from minimums of 10°C to maximums of about 23°C. Winter tends to be cold with mean annual temperatures in the coldest months of June and July ranging from 1.5°C mean minimum to maximum temperatures of about 11°C (BOM 2022).

Plate 1: View southwest showing the border of the reticulation adjacent to the Palmerston Substation.

Plate 2: View east showing the reticulation associated with the Palmerston BESS Project.

Plate 3: View west showing the Palmerston BESS Project study area.

Plate 4: View south showing the Palmerston BESS Project study area.

Plate 5: View southwest showing the graded access track in the study area.

3.0 Ethno-historic Background

3.1 Aboriginal Social Organisation in Tasmania

Ryan (2012) explains that the terms 'nation' and 'clan' are the preferred terms used by the Tasmanian Aboriginal community in place of 'tribe' and 'band' respectively. This terminology has been adopted in the following discussion.

According to Jones (1974), the social organisation of Tasmanian Aboriginal society appears to have consisted of three social units, these being the hearth group, the band (clan) and the tribe (nation). The hearth group was the basic family unit and would generally have. consisted of a man and woman, their children, aged relatives and sometimes friends and other relatives. The size of hearth groups would generally range from between 2-8 individuals (Jones 1974: Plomley 1983). Plomley (1983) provides a description made by Peron of a hearth group he encountered at Port Cygnet:

> *There were nine individuals in this family, and clearly they represented a hearth group, because Peron visited their campsite with its single hut. The group comprised an older man and wife, a younger man and wife, and five children, one a daughter (Oure-Oure) of the older man and wife, and the other four the children of the younger man and wife.* (Plomley 1983:168).

The clan appears to have been the basic social unit and was comprised of a number of hearth groups (Jones 1974). Jones (1974:324-325) suggests that the clan owned a territory and that the boundaries of this territory would coincide with well-marked geographic features such as rivers and lagoons. Whilst the clan often resided within its territory, it also foraged widely within the territories of other clans. Brown (1986:21) states that the band was led by a man, usually older than the others and who had a reputation as a formidable hunter and fighter. Brown also suggests that the clan (as well as the hearth group) was ideally exogamous, with the wife usually moving to her husband's band and hearth group.

Each clan was associated with a wider political unit, the nation. Jones (1974:328-329) defines the tribe (or nation) as being:

> *…that agglomeration of bands which lived in contiguous regions, spoke the same language or dialect, shared the same cultural traits, usually intermarried, had a similar pattern of seasonal movement, habitually met together for economic and other reasons, the pattern of whose peaceful relations were within the agglomeration and of whose enmities and military adventures were directed outside it. Such a tribe had a territory, consisting of the sum of the land owned by its constituent bands…The borders of a territory ranged from a sharp well defined line associated with a prominent geographic feature to a broad transition zone*. (Jones 1974:328-329)

According to Ryan (2012:11), the Aboriginal population of Tasmania was aligned within a broad framework of nine nations, with each nation comprised of between six and fifteen clans (Ryan 2012:14). The mean population of each nation is estimated to have been between 350 and 470 people, with overall population estimates being in the order of between seven to ten thousand people prior to European occupation (Ryan 2012:14).
The current study area is located within the territory of the Big River Nation, very close to the boundary with the Northern Midlands Nation (see Figure 4). The territory of the Big River

Nation ran from approximately New Norfolk through to the southwest corner of Surrey Hills to Quamby Bluff in the west and along the Western Tiers through to St Peters Pass and eventually linking up at Herdsman's Cove. In total, the Big River Nation occupied an area of approximately 8000km² and incorporated around 240km of lake shoreline (Ryan 2012:25).

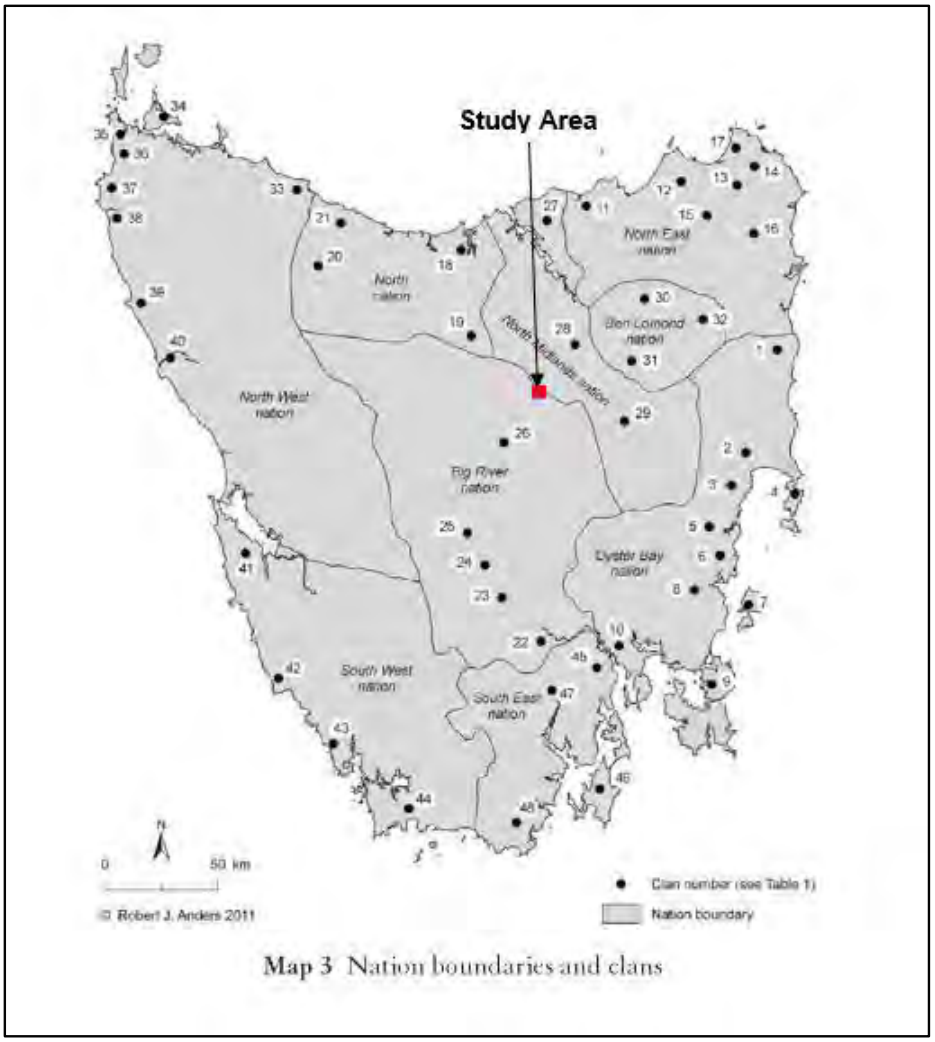

Figure 4: The Aboriginal Nations of Tasmania in relation to the study area (Ryan 2012:13).

The Big River Nation was comprised of at least five clans. These were the Leenowwenne. who were located around New Norfolk, the Pangerninghe located around the Clyde-Derwent junction between the Ouse and Dee Rivers, and the Braylwunyer (located around the area as the Pangerninghe). The remaining clans were the Larmairremener who were located west of the River Dee and the Luggermairrernerpairrer who were located at the Great Lake. Each clan is thought to have been comprised of between 50 and 80 people, with the overall population of the North Midlands nation estimated at between 400 and 500 people (Ryan 2012:29). The clan most likely to have occupied the area around Poatina/Cressy (including the current study area) was the Luggermairrernerpairrer.

The Big River nations were among the first to experience British invasion in northern Tasmania in 1804, and as such, insufficient information exists as to the exact location of each clan. However, the clan most likely to have had rights over the land within which the study area is located are the Luggermairrernerpairrer clan who extensively utilized the plains areas surrounding Poatina and Cressy (Ryan 2012).

Within the Big River Nation, clans appear to have camped along lake shores and along the rivers such as the Clyde River, which provided access to bird and freshwater marine life resources, as well as kangaroo hunting grounds that these waterways opened up to. Clans of the Big River Nation regularly made seasonal migrations (see Figure 5). As such, the Big River Nation had extensive relations with neighbours of the North, North Midlands, Oyster Bay, North West, South West and South East nations (Ryan 2012:26–27). These connections in turn facilitated seasonal access of the Big River nation to the east coast at Oyster Bay through negotiations with the Oyster Bay Nation (Ryan 2012:27) and the existence of other seasonal travel routes to the east venturing into the territory of the North Nation to exchange ochre (Ryan 2012:28). Other major ochre sources in Tasmania were in the Western Tiers, in the territory of the North Nation.

The Luggermairrernerpairrer is said to have spent the winter on the shoreline of the Great Lake within their own country exploiting available freshwater marine life and birds, before migrating within or outside their own country to exploit the hunting grounds in spring (Ryan 2012:26–28).

Very few available ethnohistoric accounts exist that relate to aspects of the material culture of the Big River Nation. Several early explorers and ethnographers have left accounts of their observations of the Big River Nation that provide an insight into the economy, material culture and social customs of the people prior to European settlement. Primary among the ethnographic sources are the diaries of George Augustus Robinson, appointed as government Protector of Aborigines who followed a policy of conciliation with the ultimate aim of removing Aboriginal people to offshore islands (Plomley 2008:515).

Around the Lake Echo area, Robinson records Aboriginal hut sites along the margins of the marshy lagoons that intercept the rugged hills (Plomley 2008:543-44). There are often large numbers of huts that Robinson describes as ‘villages’ (Plomley 2008:548). When Robinson approached the huts they were empty but showed signs of having recently been occupied. He repeatedly described the abundance of ‘kangaroo’ (Bennett’s wallaby), ‘native bread’ (a tuber, *Polyporus myllitae*) and duck and bird life that abounded in: ‘the place of resort … and their hunting grounds’ (Plomley 2008:542). There is also a reference to a plant with a red berry that the Larmairremener people call Murerleener (Plomley 2008:543). The plant was unknown to those Aboriginal people from the south that were with Robinson.

The valleys of the Big River Nation that Robinson travelled through had been burnt to facilitate access and attract game. Robinson records the evidence of this as he travels through the area around modern-day Bronte Lagoon (Plomley 2008:545). Robinson also recorded the petrified wood artefacts that he found across the southern plateau country (Plomley 2008:548). There were worn paths through the country that Robinson in some

cases followed. One ran along the Dee River valley, and it seems that this was a major seasonal travel route for the Big River people (Plomley 2008:549).

There is evidence that the Big River people put ochre in their hair. In a wonderful example of culture contact, Robinson recorded that when his party passed through Campbell Town some of the Big River people pound a brick to a fine powder and mixed it with animal grease to apply a thick coat to their hair (Plomley 2008:535).

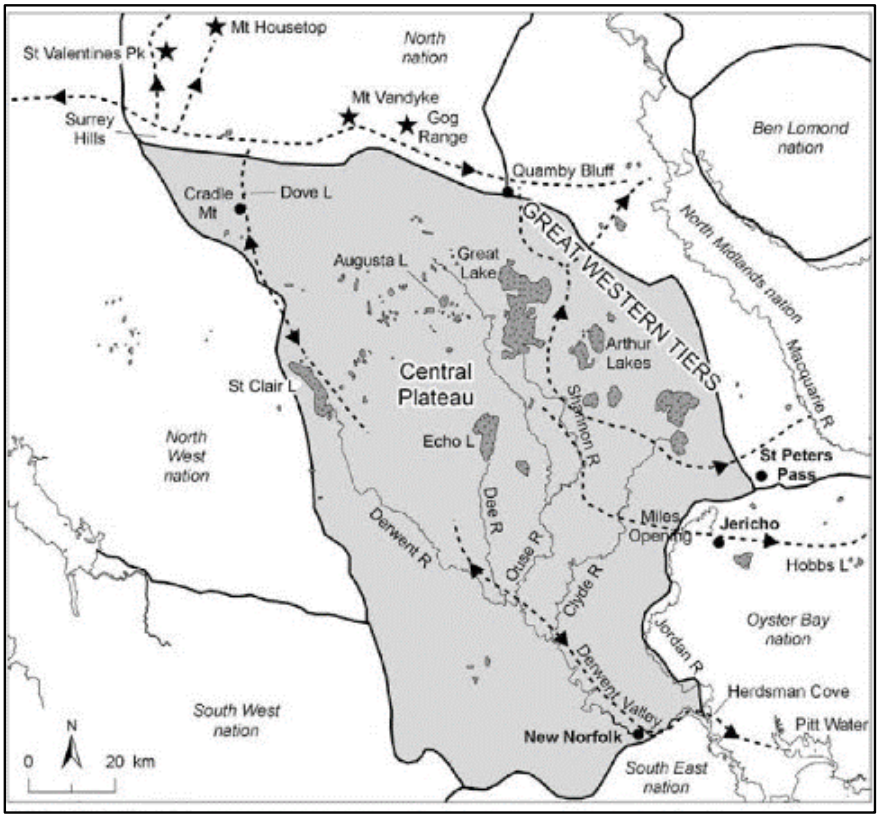

Figure 5: Settlement and movement patterns of the Big River Nation clans (Ryan 2012:27).

3.2 Culture Contact and Frontier Violence

The first Europeans to venture into the highlands with any sense of permanency were kangaroo hunters, stockkeepers and bushrangers (Jetson 1989:12). One hunter called Toombs is reported to have advanced as far as the Great Lake by 1815 (Kostoglou 1998). The notorious bushranger Michael Howe made the highlands his home, living off the bush and wearing skins until his violent death at the hands of a past accomplice near Bothwell in 1818 (Jetson 1989:16). Robinson gives a sense of the violence of these people, who were more than ready to attack the Aboriginal inhabitants of the highlands. Robinson described numerous attacks by the settlers and gives a revealing description of a typical stockkeepers hut that he observed near Lake Echo:

A formidable construction … made by piling large rolled logs horizontally upon each other, halved together at the ends, with portholes to fire out of. The roof is barked and covered with turf so as not to ignite. (Plomley 2008:541).

For the first two decades of European settlement in Van Diemen's Land, the highlands provided something of a refuge for members of the Big River Nation as the plains below became settled. Robinson claimed in 1831 that in this country '[the Big River Nation] had remained undisturbed by their white enemies' (Plomley 2008:548). However, all this was about to change (CHMA 2020:27–30).

From the early 1820s European settlement of the central highlands began to have a devastating impact on the Big River Nation. Within one year from 1822 to 1823, the European population of the highlands multiplied tenfold; from a population of fewer than ten men and a few thousand sheep to over sixty settlers with their families and upwards of sixty thousand sheep (Ryan 2012:115). The Big River Nation responded to this rapid colonisation with the onset of guerrilla war (CHMA 2020:27–30).

Initial contact between the Big River Nation and European settlers had aspects of an exchange dialogue. Ryan (2012:115) records that in the autumn of 1822 Big River people visited the east coast, and on their return to their territory encountered the new wave of settlers. Ryan notes that Big River women were traded to the settlers in exchange for food (2012:115). This suggests either a very rapid adaptation to European dietary staples or the rapid devastation of traditional hunting grounds and resources (CHMA 2020:27–30).

The 1820s through to the mid-1830s saw an increased number of surveying and exploration parties entering the central highlands. These included Scott (1821-23), Helder (1825), Sharland (1832) and Frankland (1835). The increasing shortage of food supplies in the colonies led to the dispatch of kangaroo hunters into the unsettled parts of the colonies. These hunting parties were soon roaming areas well beyond the borders of the colonised areas (CHMA 2020:27–30).

Pastoralists soon followed the hunting parties, with shepherds penetrating the eastern fringes of the Lakes District by 1818. By the early 1820s, larger flocks of sheep were grazing as far west as the Great Lake. Wild cattle were sighted in these areas in the early 1820s. Grazing operations in the central highlands during this early period were generally small-scale operations run by a single shepherd or small groups of men, with the herds rarely being contained by fences. By the latter part of the 18th century, many of the small-scale pastoral holdings had been abandoned or bought out by large sheep stations that had begun to operate in the district. From 1824 violence and guerrilla attacks came to characterise the highlands. In January 1824 a European stockman was killed at Abyssinia when he attempted to abduct a Big River woman (Ryan 2012:115). This led to a skirmish in which the stockman was speared and his hut burnt (Ryan 2012:115). Attacks continued from both the Big River people and the Europeans throughout the 1820s (CHMA 2020:27–30).

In 1827 Luggermairrernerpairrer people robbed five huts along the Ouse and Shannon Rivers, creating panic among the European settlers (Ryan 2012:118). By the end of the year, the Luggermairrernerpairrer had moved west into more rugged country, although they

continued to attack and raid settler's huts. Firearms were sometimes taken during these raids, and Ryan suggests that these were useful trade items (2012:118).
Ryan argues that firearms were quickly absorbed into the material culture of the Big River people and were exchanged items rather than valued weapons (1996:118). However, Robinson claims that his companions saw the firearms as weapons, to use against the Europeans but also in fights with antagonistic neighbouring tribes, such as the North Tribe (Plomley 2008:547). In his 1830 expedition through the highlands, Robinson expresses surprise at the sheer number of weapons caches that his companions reveal to him (Plomley 2008:547). This demonstrates the volatile situation in the highlands, and the rapidity with which violence could erupt (CHMA 2020:27–30).

By 1828 the two surviving Big River clans, the Luggermairrernerpairrer and the Larmairremener had moved to the Lagoon of Islands and Regents Plains areas (Ryan 2012:118). This congregation of people was seen as a threat by the Europeans and prompted the settlers to appeal to Hobart for protection (Ryan 2012:118). Military parties were dispatched to disperse the Aboriginal people, but the bands were not located. Ryan suggests that the Big River people had travelled to the north coast for the winter (2012:118). However, by October the surviving members of the Big River Nation returned to the highlands, and guerrilla warfare intensified (Ryan 2012:118). The Larmairremener people travelling with Robinson told him how during the cold winter of 1830, the people stayed in the highlands rather than follow seasonal migration patterns to Oyster Bay (Jetson 1989:32).
This demonstrates the danger on the midlands to Aboriginal people by the early 1830s.
In September 1830 the 'Black Line' moved through the central highlands; a military operation aimed at forcibly removing Aboriginal people from pastoral districts across Tasmania. Ryan (2012:120) argues that the Big River people once again moved from the high country to the west in order to avoid the armed parties (CHMA 2020:27–30).

The Black Line was largely ineffective in the highlands; Robinson relates how his companions showed him how people avoided the line in the steep terrain and thick bush (Plomley 2008:547). He writes that 'the people here had avoided the strictest search' (Plomley 2008:547). Robinson met the surviving Big River people in December 1831 just north of Lake Echo (Ryan 2012:120). At this point, the group numbered only 26 people and was led by Montpeilliater of the Big River Tribe and Tongerlongton from the Oyster Bay Nation (Ryan 2012:121). The group agreed to accompany Robinson to Hobart in order to claim compensation for the loss of their land and the lives of many of their people (Ryan 2012:122). This compensation never eventuated and the people were eventually resettled on offshore islands (CHMA 2020:27–30).

The Big River Nation was dispossessed of their country by the killing of an estimated two hundred and forty people, while around sixty Europeans were also killed in frontier violence on the highlands (Ryan 2012:122). In addition, the trade and abduction of Big River women by male European stockmen and settlers contributed to the decimation of the Big River people (CHMA 2020:29–30).

4.0 Background Archaeology

4.1 Previous Archaeological Investigations in the Region

The study area is located in the Northern Region and the Central Highlands of Tasmania. A number of regional archaeological investigations have been undertaken in these regions over the past three decades. The most comprehensive, and pertinent investigations are those of Cosgrove (1984), Kee (1990) and Thomas (1991) and Entura (2011). The following provides an overview of these studies.

Cosgrove (1984)

In 1981–1982 Cosgrove conducted a systematic archaeological study of the High Plateau Surface, known as the Tasmanian Central Highlands Prehistory Project. The primary objective of this study was to investigate the site types, distribution and density of sites on the High Plateau Surface (HPS). The secondary objective was to provide data on which to base an archaeological management strategy, due to the previous hydroelectric power development and the subsequent hydrologically altering of river systems and lakes which had impacted the potential archaeological sites within the area (Cosgrove 1984:88).

As part of the survey, five rivers and six lakes were surveyed adding to a total of 41km^2 of transects. The survey resulted in the identification of 116 Aboriginal sites. The vast majority of the sites are classified as artefact scatters and isolated artefacts. The exception is the three rock cairns (possibly of Aboriginal origin), two quarry sites and four sandstone rock shelters (Cosgrove 1984:103).

Cosgrove (1984) noted that the Tasmanian pattern of highland settlement has parallels with the alpine areas of the mainland, the Monaro Tablelands and the Snowy River. Evidence from the survey of the HPS suggests that exploitation of resources by Aboriginal people took place in extremely exposed sections of the highest moorland subject to the westerly weather pattern (Cosgrove 1984:104). Cosgrove (1984) provides two theories for this, the first suggests that the sites represent camping activity in 8000 – 5000 BP when the climate was warmer and wetter; the second suggests that these were sites of ephemeral camps only used in times with optimum weather conditions (Cosgrove 1984:104). The second theory is supported by the fact that few surface artefacts were identified in high moorland areas, which in turn may reflect travel by Aboriginal groups over the quickest routes over the moraine ridges, bypassing difficult terrain (Cosgrove 1984:104).

The distribution and density of artefacts also reveal that campsites were situated in the most advantageous positions for resource acquisition and climatic protection (Cosgrove 1984:103). A tentative settlement model was predicted showing a preference by Aboriginal people toward long-term occupation at the boundaries of rivers, lakes and forests, solidifying the conclusion of campsites being located at advantageous positions in the High Plateau Surface (Cosgrove 1984:103).

Cosgrove (1984) noted that the Tasmanian Aboriginal's land use of the highlands can be seen as highly efficient, considering the Central Plateau's low latitude with long periods of winter and variable climate. It is estimated that the occupation of the highest plateau and the subalpine areas in Tasmania took place around 9000 BP, shortly after the retreat of the last

glaciers (Cosgrove 1984:105). In conclusion, the density and distribution of sites in the lake (lacustrine) and highland riverine environments reflect a process of adaptation geared to the exploitation of the subalpine region by Aboriginal people.

Kee (1990)

In 1990 Kee implemented the Midlands Regional Aboriginal archaeological site investigation, which was funded through the National Estate Grants Program. The primary objectives of the study were primarily to establish (on the basis of literary and field research) a predictive model of site location for the Midlands Region, and secondly to carry out a limited archaeological excavation with the aim of providing a temporal context for the information generated for the study.

As part of the study, Kee (1990) surveyed 72km within the Midlands area. This survey resulted in the identification of 236 Aboriginal sites. This brought the total number of known Aboriginal sites in the Midlands to 350. The vast majority of these sites are classified as isolated artefacts or artefact scatters. The exception is the coastal fringes in the midlands where shell-midden sites tend to predominate. Stone quarries and suitable stone sources for procurement were identified in many locations throughout the Midlands, and a small number of rock shelters were also identified (Kee 1990).

As part of the analysis of the distribution of sites throughout the Midlands, Kee (1990) divided the Midlands into seven separate landscape divisions. These are Aeolian lunettes, coastal dunes and beaches, estuaries, lakes (uplands and lowlands), lowland hills and plains, upland hills and plains and rivers. The highest number of sites were identified in the Aeolian lunettes and coastal dunes, accounting for around 50% of the total number of sites recorded in the Midlands. Between 20 and 30 Aboriginal sites were recorded in each of the other five landscape divisions. Kee (1990) is of the opinion that the observed pattern of distribution accurately reflects true differences or variations in site densities throughout these different landscape divisions, and is not merely a product of skewed visibility or survey coverage.

Kee (1990) also noted a distinct difference in the distribution of site types within the Midlands Region, which she believes is also suggestive of differences in occupation patterns throughout the region. For example, the sites recorded around the margins of Lake Dulverton comprise mostly artefact scatters and rock shelters. Some of these sites are quite large (in terms of artefact numbers) and suggest intensive occupation. In contrast, the sites associated with the Aeolian lunettes were mostly small campsites located adjacent to lagoons, and are interpreted as being the product of short-term visitations to the area by small groups of people exploiting the resources of these lagoons and the associated hinterland areas.

One of the features of Kee's (1990) investigations is that the vast majority of sites identified as part of the field survey were recorded within ploughed farm paddocks, where the surface visibility is improved and the soils have been churned. This pattern of site location highlights the importance of good surface visibility in identifying sites during field surveys and demonstrates how varying conditions of surface visibility can potentially skew the results of survey investigations. Kee (1990) does not really adequately address this factor in her

assessment. It is plausible that the factor of surface visibility variations could be a major contributor to the pattern of site distribution observed for the Midlands, with site densities being highest in the Aeolian dunes and coastal areas where surface visibility is improved and lowest in the Riverine and Uplands areas where surface visibility is poor. The only way to adequately determine how accurate the perceived pattern of site distribution is in the Midlands region would be through extensive sub-surface investigations within the various landscape divisions.

The summary interpretation provided by Kee (1990) for the observed archaeological record of the Midlands Region is that the areas with observed higher site and artefact densities correlate with areas where there is an increase in available resources, making these areas attractive for human habitation, and facilitating prolonged periods of occupation. Those areas with lower site and artefact densities also correlate with areas of decreased resource availability, resulting in shorter, less frequent occupation of these areas by small groups of people.

Taking into account historic records for the region, Kee (1990) presents a seasonal model of occupation for the Midlands Region. This model involves the movement of Aboriginal people around inland resource-rich zones such as lagoons and lakes in the spring and early summer months, with summertime spent on the north coast areas. It is suggested that the winter months may have been spent in the inland parts of the Uplands where there was good soil drainage.

Thomas (1991)

Thomas conducted an archaeological study into the Holocene Archaeology and paleoecology of north-eastern Tasmania. Thomas (1991) analysed ethnohistorical sources, fossil pollen, modern pollen rain, contemporary vegetation patterns and the distribution of Aboriginal sites enabling the creation of a model of Holocene vegetation change in north-eastern Tasmania (Thomas 1991:i).

To do this, consultation of ethnohistorical sources dating from 1773–1830 pertaining to Aboriginal cultural burning revealed patterns of land use, as well as other historical sources, helped determine that Aboriginal fire regimes differed across Tasmania according to environmental determinants and social prerogatives (Thomas 1991:i). Archaeological surveys and limited excavations were examined as well to determine the commencement of settlement by Aboriginal people in inland, coastal and mountainous environments (Thomas 1991:i).

On subalpine and alpine areas of the Central Plateau studies conducted by Thomas (1983) and Cosgrove (1984) established that a pattern of occupation characterised by sites containing <10 artefacts located at the boundaries of rivers, lakes and forests, solidifying the conclusion of campsites being located at advantageous positions within the environments (Thomas 1991:130). In 1983, Thomas found that evidence from the Central Plateau demonstrates that Aboriginal sites are closely associated with the presence of forest. In environments such as the plains to the west of Great Lake where there is stable long-term vegetation history, occupation patterns probably had the same relationship to forests as is suggested by the contemporary archaeological record (Thomas 1991:130).

Thomas (1991) concluded that Aboriginal settlement patterns may therefore have continued relatively unchanged for the entire Holocene (Thomas 1991:130). Furthermore, it was better to view Aboriginal peoples' interactions with vegetation as multi-directional phenomena, continuously varying, rather than as examples of unidirectional change (Thomas 1991:327).

Entura (2011)

Greg Jackman (Entura archaeologist) undertook a comprehensive survey of the Midlands for the Midlands Water Scheme (2011). The survey by Entura (2011) was focused on three main components.

- 34km of supply pipeline corridor extending from Arthur's Lake through to a proposed dam on Floods Creek in the Midlands.
- The Flood Creek Dam.
- 92km of distribution pipeline throughout the Midlands.

A total of 136 Aboriginal heritage sites were recorded during the assessment of the areas listed above. The vast majority of these sites (118 sites) were recorded across the 92km of distribution pipeline and the Flood Creek Dam footprint. The remaining 18 sites were recorded along the supply pipeline (Entura 2011:41-42).

Entura (2011:42) divided the study area into two broad Physiographic units, these being the Highlands (Arthurs Lake to the foot of the Great Western Tiers) and the Lowland Hills and Plains. Only eight Aboriginal sites were recorded within the Highlands Unit, equating to an average site density of 2.1 sites per linear km. This was low compared with the average site density of 8.4 sites per linear km recorded for the Lowland Hills and Plains unit. The eight sites recorded within the Highlands unit comprised four isolated artefacts, three low density artefact scatters and a medium density artefact scatter. A concentration of sites was noted around Silver Plains on the northern margins of Lake Sorell, with four of the recorded sites located in this area.

Based on analysis of the 48 sites recorded by Jackman in the Midlands as part of the Midlands Water Scheme survey, Entura archaeologist Greg Jackman suggested several potential site distribution patterns (Entura 2011:43). In the Midlands, Jackman argues that the dominant site type will be Artefact Scatters and Isolated Artefacts. Open Artefact Scatters may be large and there is potential for stratified sites to occur. Other site types include quarries and stone procurement sites and rock shelters and rock overhangs with associated archaeological deposits (Entura 2011:49).

Jackman suggests that open sites are likely to be closely correlated with permanent watercourses, with the majority of open sites recorded by Jackman situated within 500m of water. Moreover, large Artefact Scatters are most likely to be located along the margins of lakes, lagoons and floodplains where a range of other plant and terrestrial resources were available (Entura 2011:49). Occupation sites, such as artefact scatters, were often found to be located on benched terraces or low rises. Aeolian sand banks bordering lagoons and rivers have increased potential to contain archaeological deposits, as these provide elevated, well drained camp sites with close proximity to fresh water (Entura 2011:49).

Jackman noted that concentrations of sites also often occur in small, sheltered valleys at the foot of the various ranges, including Black Tier, south of Tunbridge (Entura 2011:50). This reflects the choice of sheltered camp sites along pathways used by groups of Aboriginal people moving between seasonal resource zones along ethnographically documented pathways.

One such clustering of sites occurs at the Salt Pan Plains and Kitty's Creek area at the foot of the Black Tier. At the gap between Salt Pan Plains and Kitty's Creek, there are a series of small artefact scatters and isolated artefacts. Jackman suggests that this may indicate that people regularly passed through this gap when travelling between the Central Tiers and the Midlands (Entura 2011:43). Jackman records this area as being of high archaeological sensitivity (Entura 2011:53). Jackman also suggests that the name Black Tier may be a reference to Aboriginal people living in this area at the time of European settlement, however, there is no documented historical basis to this tempting assertion (Entura 2011:43).

Quarry sites in the Midlands tend to target chert and hornfels outcrops occurring at the contact points of Jurassic dolerite and Permo-Triassic mudstone and siltstone deposits (Entura 2011:49). Chert quarries occur in outcrops of Tertiary claystone (Entura 2011:50).

4.2 Registered Aboriginal Sites in the Vicinity of the Study Area

As part of Stage 1 of the present assessment, a search was carried out on Aboriginal Heritage Register (AHR) to determine the extent of registered Aboriginal heritage sites within and in the general vicinity of the Palmerston BESS Project study area.

The search shows that there are a total of 28 registered Aboriginal sites that are situated within a 5km radius of the study area (search results provided by Rueben West from AHT on 24-11-2022). Twelve (12) of these sites are classified as artefact scatters, 11 sites are classified as isolated artefacts and five are classified as occupied rockshelters. Table 1 provides the summary details for these 28 registered Aboriginal sites with Figure 6 showing the location of these sites in relation to the study area footprint.

None of these registered Aboriginal sites are situated either within or in the immediate vicinity of the BESS project footprint. The closest registered Aboriginal sites are AH8949 (an artefact scatter), which is situated around 1.3km to the south of the study area, and AH9964 (an isolated artefact) which is located around 2km to the north-east (see Figure 7).

Table 1: Registered Aboriginal sites in a 5km radius of the Palmerston BESS Project study area (based on the results of the AHR search dated 24-11-2022).

AH Number	Site Type	Locality	Grid Reference Easting (GDA94)	Grid Reference Northing (GDA94)
10741	Artefact Scatter	Cressy	503845	5374657
10742	Artefact Scatter	Cressy	504002	5374541
10743	Artefact Scatter	Cressy	505650	5373357
10921	Isolated Artefact	Blackwood Creek	496877	5378068
10922	Isolated Artefact	Blackwood Creek	496033	5379970
10923	Isolated Artefact	Blackwood Creek	496215	5379292
11562	Isolated Artefact	Blackwood Creek	495934	5379369
11563	Isolated Artefact	Blackwood Creek	495824	5379374

AH Number	Site Type	Locality	Grid Reference Easting (GDA94)	Grid Reference Northing (GDA94)
1876	Occupied Rockshelter	Cressy	493812	5369683
2564	Occupied Rockshelter	Cressy	493932	5369283
2565	Occupied Rockshelter	Cressy	493875	5369721
3668	Isolated Artefact	Blackwood Creek	495712	5379583
3669	Isolated Artefact	Blackwood Creek	495512	5379483
8885	Isolated Artefact	Cressy	502862	5371533
8886	Artefact Scatter	Cressy	502662	5371233
8949	Artefact Scatter	Cressy	499679	5372696
8950	Artefact Scatter	Cressy	499383	5372278
8951	Artefact Scatter	Cressy	499343	5372312
9039	Artefact Scatter	Cressy	502600	5375503
9278	Artefact Scatter	Cressy	500306	5372273
9279	Artefact Scatter	Cressy	500622	5371976
9280	Artefact Scatter	Cressy	500818	5371975
9281	Artefact Scatter	Cressy	501141	5372262
9946	Isolated Artefact	Cressy	501740	5375928
9964	Isolated Artefact	Cressy	500894	5375684
13259	Isolated Artefact	Cressy	499856	5371776
13373	Unoccupied Rockshelter	Cressy	493910	5369309
13377	Unoccupied Rockshelter	Cressy	493794	5369916

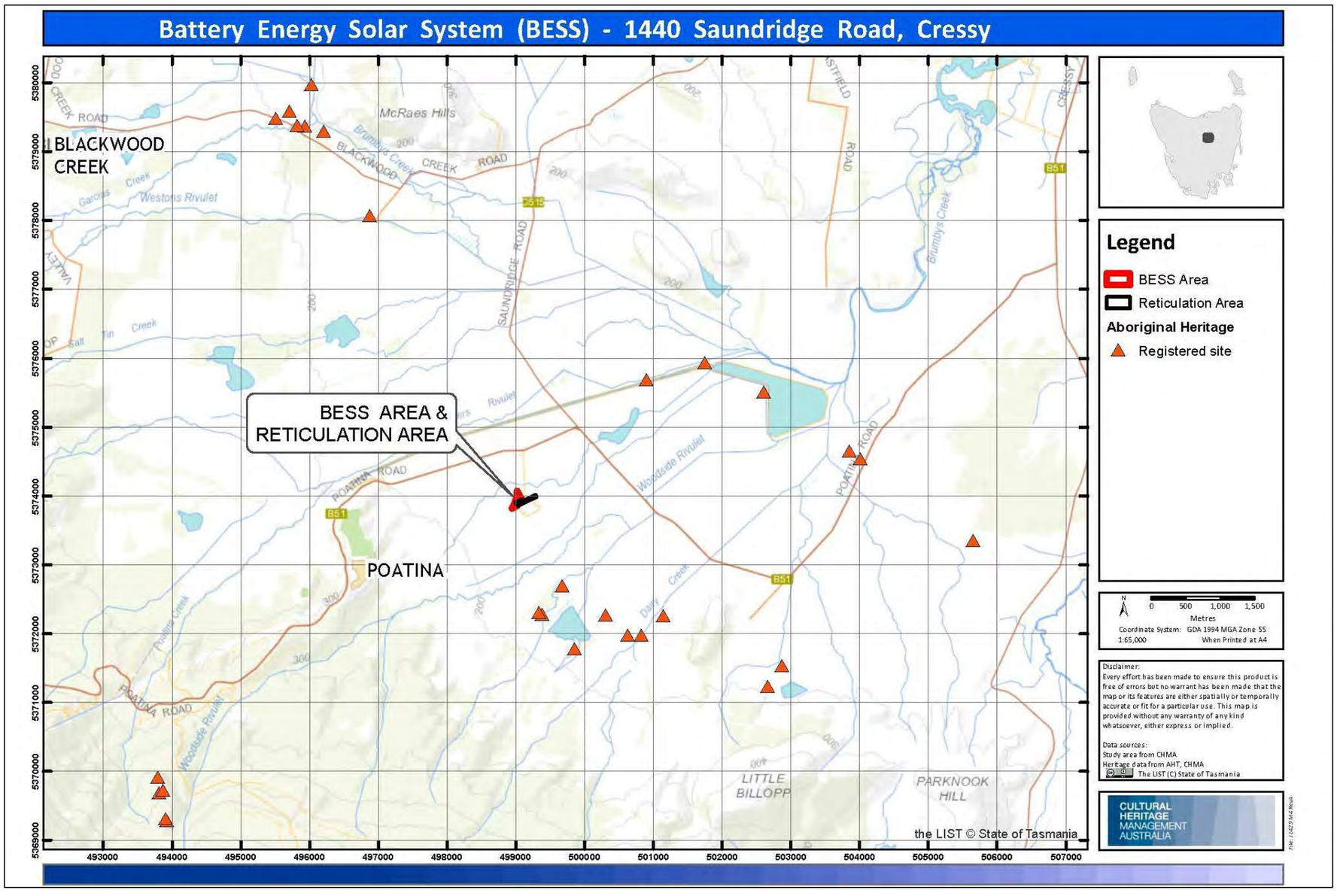

Figure 6: Topographic map showing the location of registered Aboriginal sites in a 5km radius of the Palmerston BESS Project study area (based on the results of the AHR search dated 24-11-2022).

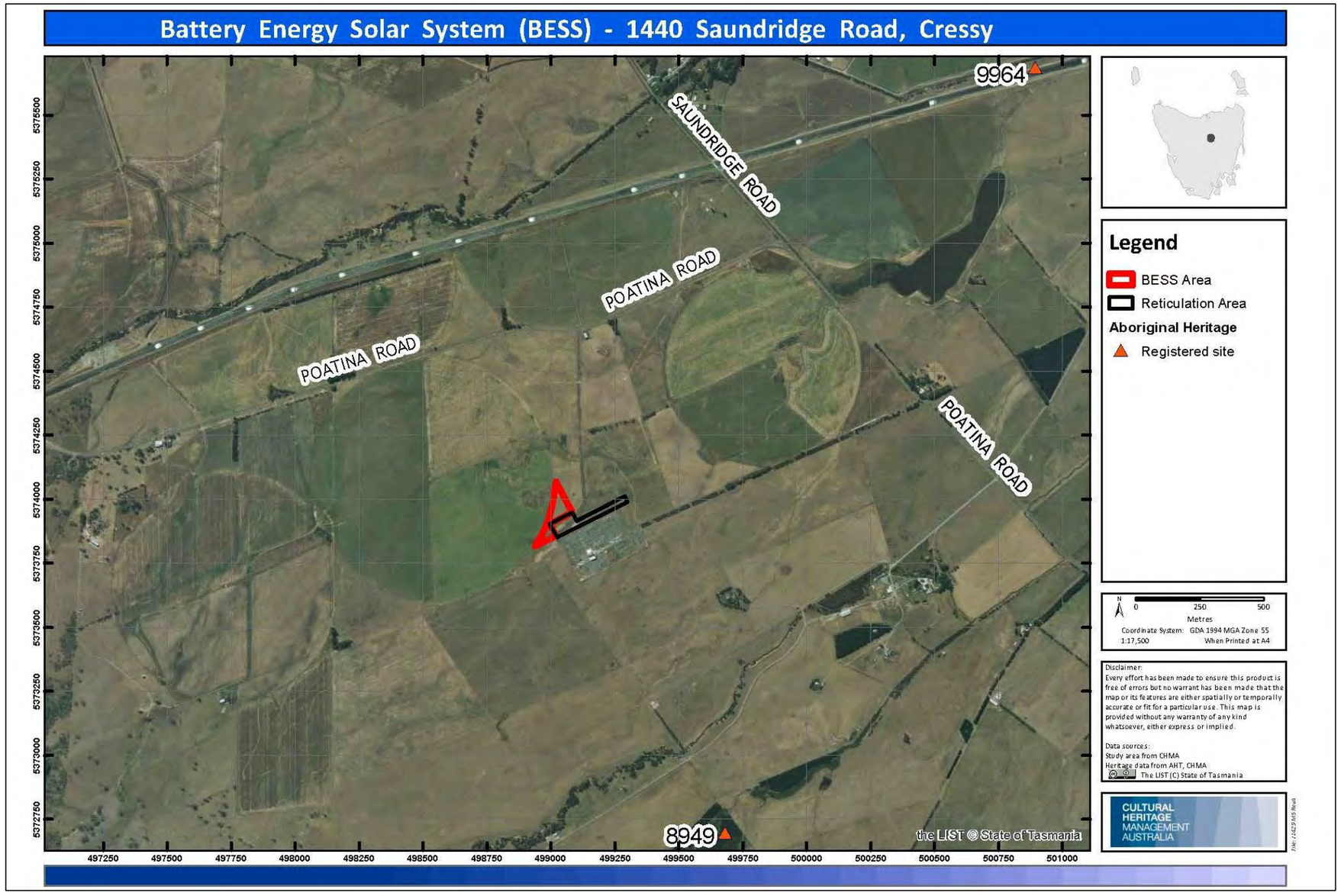

Figure 7: Aerial map showing the location of registered Aboriginal sites AH8949 and AH9964 in relation to the Palmerston BESS Project study area (based on the results of the AHR search dated 24-11-2022).

5.0 Predictive Modelling

5.1 Introduction to Predictive Modelling

Predictive modelling, in an archaeological context, is a fairly straightforward concept and has been utilised by archaeologists in Australia for a number of years as a tool for undertaking research into Aboriginal heritage sites. In summary, predictive modelling involves the collation of information generated from previous archaeological research in a given region and using this information to establish patterns of Aboriginal site distributions within the landscape of that particular region. Based on perceived patterns of site distribution, archaeologists can then make predictive statements regarding the potential for various Aboriginal site types to occur within certain landscape settings and can make preliminary assessments regarding the potential archaeological sensitivity of landscape types within a given region.

5.2 Predictive Models; Strengths and Weaknesses

It should be acknowledged that most, if not all predictive models have a number of potential inherent weaknesses, which may serve to limit their value. These include, but may not be limited to the following:

1) The accuracy of a predictive model is directly influenced by the quality and quantity of available site data and information for a given region. The more data available and the greater the quality of that data, the more likely it is that an accurate predictive model can be developed.
2) Predictive modelling works very well for certain types, most particularly isolated artefacts and artefact scatters, and to a lesser extent scarred trees. For other site types, it is far more difficult to accurately establish distribution patterns and therefore make predictive modelling statements. Unfortunately, these site types are generally the rarer site types (in terms of frequency of occurrence) and are therefore generally the most significant sites.
3) Predictive modelling (unless it is very sophisticated and detailed) will generally not take into account micro-landscape features within a given area. These micro features may include (but are certainly not limited to) slight elevations in the landscape (such as small terraces) or small soaks or drainage depressions that may have held water. These micro features have been previously demonstrated to occasionally be focal points for Aboriginal activity.
4) Predictive modelling to a large extent is often predicated on the presence of watercourses. However, in some instances, the alignment of these watercourses has changed considerably over time. As a consequence, the present alignment of a given watercourse may be substantially different to its alignment in the past. The consequence of this for predictive modelling (if these ancient watercourses are not taken into account) is that predicted patterns of site distributions may be greatly skewed.

5.3 A Predictive Model of Site Type Distribution for the Study Area

The findings of previous archaeological investigations undertaken in the general vicinity of the study area, together with the results of the AHR search, indicate that by far the most likely site types that will be encountered during the current assessment will be artefact scatters and isolated artefacts. The following provides a definition for the site types likely to

be encountered in the study area and a general predictive statement for their distribution across the study area.

As discussed in section 4.1 of this report, other Aboriginal site types have been recorded in the Northern Tasmanian and Central Plateau Region, in the general surrounds of the study area. These include Aboriginal stone quarries and Aboriginal rock shelters. The underlying geology of the study area consists of Cenozoic cover sequences which consist of sand gravel and mud of alluvial, lacustrine and littoral origin (List 2022). These stone material are generally not well suited for aboriginal artefact manufacturing nor the formation of rock shelters and as such it is highly unlikely that Aboriginal stone quarries or Aboriginal rock shelters will be present in the study area.

Artefact Scatters and Isolated artefacts

Definition

Isolated artefacts are defined as single-stone artefacts. Where isolated finds are closer than 50 linear metres to each other they should generally be recorded as an artefact scatter. Artefact scatters are usually identified as a scatter of stone artefacts lying on the ground surface. For the purposes of this project, artefact scatters are defined as at least 2 artefacts within 50 linear metres of each other. Artefacts spread beyond this can be best defined as isolated finds.

It is recognised that this definition, while useful in most instances, should not be strictly prescriptive. On some large landscape features, for example, sites may be defined more broadly. In other instances, only a single artefact may be visible, but there is a strong indication that others may be present in the nearby sediments. In such cases, it is best to define the site as an Isolated Find/Potential Archaeological Deposit (PAD).

Artefact scatters can vary in size from two artefacts to several thousand and may be representative of a range of activities, from sporadic foraging through to intensive camping activity. In rare instances, campsites which were used over a long period of time may contain stratified deposits, where several layers of occupation are buried one on top of another.

Site Distribution Patterns:

Previous archaeological research in the region has identified the following pattern of distribution for this site type.

- The majority of artefact scatters are located in close proximity to a watercourse on relatively level and well-drained ground.
- Larger open artefact scatters (representing more intensive activity, such as regular camp areas), tend to be located on level, elevated landscape features, close to (within 500m) major watercourses. The most common areas are the elevated basal slopes of hills, the level spines of spurs (around the termination point of the spur), or on elevated sand bodies.
- Sites in the Midlands are likely to occur at the intersection of the hilly country with the plains. Sheltered valleys at the base of ridgelines have been noted as having an increased likelihood of containing archaeological sites.

- Site and artefact densities on the lower-lying flood plains of watercourses tend to be comparatively lower. This may be reflective of the fact these low-lying areas were less favoured as camp locations, due to such factors as rising damp and vulnerability to flooding; and
- Site and artefact densities also tend to be comparatively lower in areas away from watercourses.
- Site and artefact densities are comparatively lower in moderate to steeply sloping terrain.
- Isolated artefacts may be found distributed across the landscape.

Predictive Statement:

The proposed Palmerston BESS Project area is situated within terrain that is characteristically flat to gently undulating pastureland, with some sections of lowland floodplains surrounding the existing drainage lines. The gentle slope gradients occur throughout the northern section of the study area, where gradients range between 2º to 5º. In the southeast and southwest sections of the study area, the slope gradients decrease between flat to 5º. The closest watercourses to the study area are Woodside Rivulet which is 985m south and Palmers Rivulet which is 1.3km north.

Applying the broad regional pattern of site distribution to the study area, it is anticipated that the density of sites (artefact scatters and isolated artefacts), and the density of artefacts associated with these sites would generally be expected to be low to very low. If sites are present in the study area, they are likely to be isolated artefacts or small artefact scatters, representing sporadic hunting and travelling through this landscape. These sites are most likely to be present in those parts of the study area where the slope gradient decreases to below 5º. Higher-density artefact scatters, representing more intensive activities such as interim campsites are unlikely to occur in the study area, given the distance away from any major water courses.

6.0 Survey Coverage of the Study Area

Survey Coverage and Surface Visibility

Survey coverage refers to the estimated portion of a study area that has been visually inspected during a field survey. Surface Visibility refers to the extent to which the actual soils of the ground surface are available for inspection. There are a number of factors that can affect surface visibility, including vegetation cover, surface water and the presence of introduced gravels or materials. Figure 8 provides a useful guide for estimating surface visibility.

The field survey was undertaken by Shay Hannah (CHMA archaeologist) and Vernon Graham (Senior Aboriginal Heritage Officer), over a period of 1 day (14-12-2022). The field team walked a total of 1.2km of survey transects across the proposed Palmerston BESS Project footprint, with the average width of each transect being 5m. Table 2 provides the total transects walked for each section and Figure 9 shows the alignment of the survey transects walked by the field team.

The survey transects were predominately focussed on the Palmerston BESS Project footprint and the main access track leading into the study area. As part of the field survey program, additional transects were walked in areas where there was improved surface visibility, in order to gain a better insight as to the potential presence or absence of Aboriginal sites across the study area. Surface visibility across the study area was variable, ranging between <10% to 90%, averaging at 25% which is in the low range. Improved surface visibility was found within erosion scalds which ranged from 50% and 100%, averaging at 70%. Vegetation cover was the main impediment to visibility.

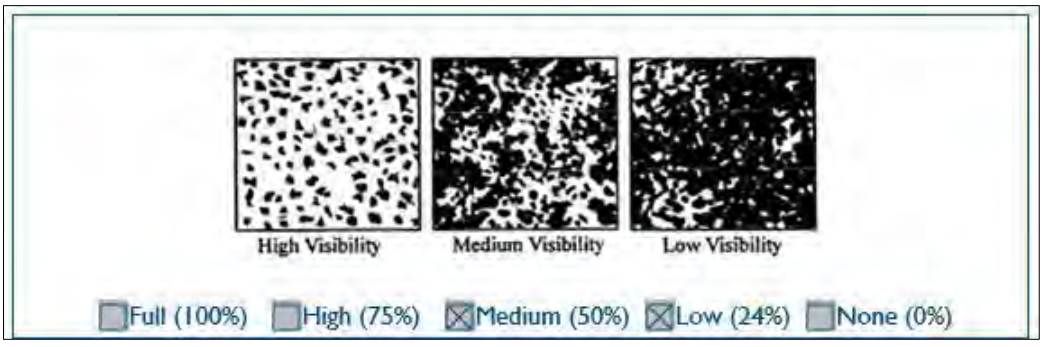

Figure 8: Guidelines for the estimation of surface visibility.

Effective Coverage

Variations in both survey coverage and surface visibility have a direct bearing on the ability of a field team to detect Aboriginal heritage sites, particularly site types such as isolated artefacts and artefact scatters (which are the site types most likely to occur in the study area). The combination of survey coverage and surface visibility is referred to as effective survey coverage. Table 2 presents the estimated effective survey coverage achieved during the course of the survey assessment. The effective coverage is estimated to have been around 1276.25m². This level of effective coverage is assessed as being adequate for the purposes of determining the potential extent, nature and distribution of Aboriginal cultural heritage sites in the study area.

Table 2: Effective Survey Coverage achieved across the surveyed areas.

Area Surveyed	Survey Transects	Estimated Surface Visibility	Effective Survey Coverage
BESS	894.75m x 5m= 4473.75m^2	20%	894.75m^2
Reticulation	305.25m x 5m= 1526.25m^2	25%	381.5m^2
Total	**6000m^2**		**1276.25m^2**

Plate 6: View south showing an erosion scald within the study area that provided 100% surface visibility.

Plate 7: View east showing the vegetation cover present throughout the study area which averaged surface visibility to 25%.

Plate 8: View southwest showing the graded access track where surface visibility dropped to <10%.

Figure 9: Aerial image showing survey transects walked by the field team across the study area.

7.0 Survey Results and Discussion

No Aboriginal heritage sites, suspected features or specific areas of elevated archaeological potential were identified and recorded during the field survey inspection of the proposed Palmerston BESS Project footprint. As noted previously, a search of the AHR shows that there are no other registered Aboriginal sites within or in the immediate vicinity of the Palmerston Battery Project footprint. The field survey was able to confirm that there are no stone resources identified within the study area that would be suitable for stone artefact manufacturing. Nor are there any sizeable rock outcrops occurring within the study area, and therefore there is no potential for Aboriginal rock shelters to be present.

As discussed in section 6, surface visibility across the study area was variable, ranging between <10% to 90%, averaging at 25%. Given these constraints, it cannot be stated with certainty that there are no undetected Aboriginal heritage sites present in the proposed Palmerston BESS Project footprint. However, the negative survey results strongly indicate that site and artefact densities across the study area are likely to be either absent, or present in low to very low densities. If undetected sites are present they are most likely to be isolated artefacts or small artefact scatters, representing sporadic Aboriginal activity. Any undetected sites that are present will have been heavily disturbed through the past land-use practices described in section 2.

It is worth noting that the negative survey results for the BESS study area are consistent with the recent survey assessment findings for an adjacent site, which was undertaken by CHMA. This site was situated immediately to the south of the current study area. No Aboriginal heritage sites or specific areas of elevated sensitivity were identified in this adjacent area and it was assessed that there was a low potential for undetected sites to be present.

The findings are also consistent with the regional pattern of site distribution and predictive modelling discussed in section 5. Previous rarchaeological investigations undertaken in the region indicate that site densities are generally significantly lower in areas away from major water courses and resource zones, compared with areas around the margins of the natural lakes, rivers and marshes in the region. The study area is situated on a broad valley floor, well away from any major water courses. Predictive modelling, based on the results of previous investigations indicate that site densities in this type of landscape is typically low to very low.

The most likely interpretation of the available evidence is that Aboriginal people from the Big River Tribe will have travelled on a seasonal basis through the Central Highlands and adjacent Northern Midlands valley region. The main focus of activity in the region would have been the major river valleys, and the larger natural lake and lagoon systems, mainly because these were the major resource zones where food and water would have been readily available. Occasionally, the hillier terrain fringing these river corridors, and the plains away from water courses may have been accessed as part of hunting and foraging activity. However, people are unlikely to have camped in these areas for any lengthy duration.

Seasonal, short term visits to the area are likely to leave an archaeological signature of isolated artefacts and low density artefact scatters found in clusters that reflect these pathways. Such patterning is representative of small groups of people returning to roughly the same area on a regular basis, although at long intervals. The visits are short and intermittent so that large scale cultural deposits do not accumulate to any great extent. The

people would carry the majority of their tool kit with them, as they needed to be highly mobile in order to make the most of the seasonal resources and trade opportunities. Artefacts discarded by such groups are likely to be those that are easily replaced. Rates of discard are expected to be low, resulting in low to very low densities of archaeological sites and isolated artefacts. Given the very small size of the project area (around 1.5ha) such low discard rates are likely to have a very minimal archaeological expression.

8.0 Consultation with Aboriginal Communities and Statement of Aboriginal Significance

The designated Aboriginal Heritage Officer (AHO) for this project is Vernon Graham. One of the primary roles of the Aboriginal Heritage Officer is to consult with Aboriginal community groups. The main purpose of this consultation process is:

- to advise Aboriginal community groups of the details of the project,
- to convey the findings of the Aboriginal heritage assessment,
- to document the Aboriginal social values attributed to Aboriginal heritage resources in the study area,
- to discuss potential management strategies for Aboriginal heritage sites, and
- to document the views and concerns expressed by the Aboriginal community representatives.

Aboriginal Heritage Tasmania (AHT) has advised that there have been some changes to the accepted approach to Aboriginal community consultation, based on recommendations made by the AHC on 28 April 2017. These changes relate to cases where the AHC consider it may be sufficient for a Consulting Archaeologist (CA) or Aboriginal Heritage Officer (AHO) to consult only with the Aboriginal Heritage Council.

The Council recommended that consultation with an Aboriginal community organisation is not required for a proposed project when:
There are less than 10 isolated artefacts that are not associated with any other nearby heritage; or
The impact of the project on Aboriginal heritage:

- is not significant; or
- will not destroy the heritage; or
- affects only part of the outer approximately 20% of a buffer around a registered site.

The CA and AHO will need to demonstrate in Aboriginal heritage reports including map outputs:

- that the proposed impact on the Aboriginal heritage within the project area is not significant and why;
- that the project activity will not destroy the heritage;
- that the proposed impact to the site buffer is not adjacent to a significant component of the registered site polygon.

No Aboriginal sites were identified during the field survey of the proposed Palmerston BESS Project footprint (the study area). A search of the AHR shows that there are no registered Aboriginal sites located within the study area, and it is assessed that there is a low to very low potential for undetected Aboriginal heritage sites to be present. However, because of the presence of 28 registered Aboriginal sites within a 5km radius of the study area, the decision has been made to distribute this report to a select range of Aboriginal community groups in the north of the State for information purposes. The report has also been provided to AHT for review.

Vernon Graham has provided a statement of the Aboriginal cultural values attributed to the study area as a whole. This statement is presented below.

Statement of Cultural/Social Significance by Vernon Graham

Aboriginal heritage/relics are not renewable. Hence any cultural heritage values provide a direct link to past occupation undertaken by traditional indigenous ancestors in the region of the project proposal. This provides a story or link for the Aboriginal community today and facilitates the connection to social-cultural heritage values, ethnohistory /story and the relationship pertaining to country. This is an integral part of regaining knowledge so it can be encapsulated and retained by both the individual Aboriginal people and for the Aboriginal community collectively.

We did not identify any Aboriginal heritage sites during the survey conducted on 14/12/2022 of the proposed Palmerston BESS Project area on Saundridge Road. Based on these results, and my observations made during the field survey, I am satisfied that there is a low to very low potential for other Aboriginal sites to be present in the study area, given the dense vegetation and the cleared pastureland terrain of the study area. Therefore, I am satisfied that this proposal poses a minimal risk of impacting Aboriginal heritage values.

Even if the site of the project proposal contains no further evidence of Aboriginal heritage there are always the cultural resources (flora, fauna, aquaculture or any other resource values that the earth may offer) and the living landscape, which highlight the high significance to the Aboriginal cultural heritage values to the country. However, due to the past clearing and construction disturbance throughout the study area, there are no cultural resources in the study area that can be disturbed. Therefore, it is unlikely that any cultural resources will be impacted as part of the development of the Palmerston BESS Project.

9.0 Statutory Controls and Legislative Requirements

The following provides an overview of the relevant State and Federal legislation that applies to Aboriginal heritage within the state of Tasmania.

9.1 State Legislation

In Tasmania, the *Aboriginal Heritage Act 1975* (the Act) is the primary Act for the treatment of Aboriginal cultural heritage. The Act is administered by the Minister for Aboriginal Affairs, through Aboriginal Heritage Tasmania (AHT) in the Department of Primary Industries, Parks, Water and the Environment (DPIPWE). AHT is the regulating body for Aboriginal heritage in Tasmania and 'no fees apply for any application to AHT for advice, guidance, lodgement or permit application'.

The Act applies to 'relics' which are any object, place and/or site that is of significance to the Aboriginal people of Tasmania (as defined in section 2(3) of the Act). The Act defines what legally constitutes unacceptable impacts on relics and a process to approve impacts when there is no better option. Aboriginal relics are protected under the Act, and it is illegal to destroy, damage, deface, conceal or otherwise interfere with a relic, unless in accordance with the terms of a permit granted by the Minister. It is illegal to sell or offer for sale a relic, or to cause or permit a relic to be taken out of Tasmania without a permit (section 2(4) qualifies and excludes 'objects made, or likely to have been made, for purposes of sale').

Section 10 of the Act sets out the duties and obligations for persons owning or finding an Aboriginal relic. Under section 10(3) of the Act, a person shall, as soon as practicable after finding a relic, inform the Director or an authorised officer of the find.

It should be noted that with regard to the discovery of suspected human skeletal remains, the *Coroners Act 1995* takes precedence. The *Coroners Act 1995* comes into effect initially upon the discovery of human remains, however once determined to be Aboriginal the *Aboriginal Relics Act* overrides the *Coroners Act.*

In August 2017, the Act was substantively amended, and the title changed from the *Aboriginal Relics Act 1975*. As a result, the AHT *Guidelines to the Aboriginal Heritage Assessment Process* were replaced by the *Aboriginal Heritage Standards and Procedures*. The Standards and Procedures are named in the statutory *Guidelines* of the Act issued by the Minister under section 21A of the Act.
Other amendments include:

- An obligation to fully review the Act within three years.
- Increases in maximum penalties for unlawful interference or damage to an Aboriginal relic. For example, maximum penalties (for deliberate acts) are 10,000 penalty units (currently $1.57 million) for bodies corporate other than small business entities and 5,000 penalty units (currently $785,000) for individuals or small business entities; for reckless or negligent offences, the maximum penalties are 2,000 and 1,000 penalty units respectively (currently $314,000 and $157,000). Lesser offences are also defined in sections 10, 12, 17 and 18.
- Prosecution timeframes have been extended from six months to two years.
- The establishment of a statutory Aboriginal Heritage Council to advise the Minister.

Section 21(1) specifies the relevant defence as follows: “It is a defence to a prosecution for an offence under section 9 or 14 if, in relation to the section of the Act which the defendant is alleged to have contravened, it is proved … that, in so far as is practicable … the defendant complied with the guidelines”.

9.2 Commonwealth Legislation

There are also a number of Federal Legislative Acts that pertain to cultural heritage. The main Acts being; *The Australian Heritage Council Act 2003*, *The Aboriginal and Torres Strait Islander Heritage Protection Act 1987* and the *Environment Protection and Biodiversity Conservation Act 1999*

Australian Heritage Council Act 2003 (Comm)

The *Australian Heritage Council Act 2003* defines the heritage advisory boards and relevant lists, with the Act’s Consequential and Transitional Provisions repealing the Australian Heritage Commission Act 1975. The Australian Heritage Council Act, like the Australian Heritage Commission Act, does not provide legislative protection regarding the conservation of heritage items in Australia but has compiled a list of items recognised as possessing heritage significance to the Australian community. The Register of the National Estate, managed by the Australian Heritage Council, applies no legal constraints on heritage items included on this list.

***The Aboriginal and Torres Strait Islander Heritage Protection Act 1987*.**

This Federal Act is administered by the Department of Sustainability, Environment, Water, Populations and Communities (SEWPaC) with the Commonwealth having jurisdiction. The Act was passed to provide protection for the Aboriginal heritage, in circumstances where it could be demonstrated that such protection was not available at a state level. In certain instances, the Act overrides relevant state and territory provisions.

The major purpose of the Act is to preserve and protect from injury and desecration, areas, and objects of significance to Aborigines and Islanders. The Act enables immediate and direct action for the protection of threatened areas and objects by a declaration from the commonwealth Minister or authorised officers. The Act must be invoked by, or on behalf of an Aboriginal or Torres Strait Islander or organisation.

Any Aboriginal or Torres Strait Islander person or organization may apply to the Commonwealth Minister for a temporary or permanent 'Stop Order' for the protection of threatened areas or objects of significant indigenous cultural heritage.

The Commonwealth Act 'overrides' State legislation if the Commonwealth Minister is of the opinion that the State legislation (or undertaken process) is insufficient to protect the threatened areas or objects. Thus, in the event that an application is made to the Commonwealth Minister for a Stop Order, the Commonwealth Minister will, as a matter of course, contact the relevant State Agency to ascertain what protection is being imposed by the State and/or what mitigation procedures have been proposed by the land user/developer.

In addition to the threat of a 'Stop Order' being imposed, the Act also provides for the following:

- If the Federal Court, on application from the Commonwealth Minister, is satisfied that a person has engaged or is proposing to engage in conduct that breaches the 'Stop Order', it may grant an injunction preventing or stopping such a breach (s.26). Penalties for breach of a Court Order can be substantial and may include a term of imprisonment;
- If a person contravenes a declaration in relation to a significant Aboriginal area, penalties for an individual are a fine of up to $10,000.00 and/or 5 years gaol and for a Corporation a fine up to $50,000.00 (s.22);
- If the contravention is in relation to a significant Aboriginal object, the penalties are $5,000.00 and/or 2 years gaol and $25,000.00 respectively (s.22);
- In addition, offences under s.22 are considered 'indictable' offences that also attract an individual fine of $2,000 and/or 12 months gaol or, for a Corporation, a fine of $10,000.00 (s.23). Section 23 also includes attempts, inciting, urging and/or being an accessory after the fact within the definition of 'indictable' offences in this regard.

The Commonwealth Act is presently under review by Parliament and it is generally accepted that any new Commonwealth Act will be even more restrictive than the current legislation.

Environment Protection and Biodiversity Conservation Act 1999 (Comm)

This Act was amended, through the Environment and Heritage Legislation Amendment Act (No1) 2003 to provide protection for cultural heritage sites, in addition to the existing aim of protecting environmental areas and sites of national significance. The Act also promotes the ecologically sustainable use of natural resources, biodiversity and the incorporation of community consultation and knowledge.

The 2003 amendments to the *Environment Protection and Biodiversity Conservation Act 1999* have resulted in the inclusion of indigenous and non-Indigenous heritage sites and areas. These heritage items are defined as:
'indigenous heritage value of a place means a heritage value of the place that is of significance to indigenous persons in accordance with their practices, observances, customs, traditions, beliefs or history;

Items identified under this legislation are given the same penalty as actions taken against environmentally sensitive sites. Specific to cultural heritage sites are §324A-324ZB.

Environment and Heritage Legislation Amendment Act (No1) 2003 (Comm)

In addition to the above amendments to the *Environment Protection and Biodiversity Conservation Act 1999* to include provisions for the protection and conservation of heritage, the Act also enables the identification and subsequent listing of items for the Commonwealth and National Heritage Lists. The Act establishes the *National Heritage List*, which enables the inclusion of all heritage, natural, Indigenous and non-Indigenous, and the *Commonwealth Heritage List*, which enables the listing of sites nationally and internationally that are significant and governed by Australia.

In addition to the *Aboriginal and Torres Strait Islander Heritage Protection Act 1987*, amendments made to the *Environment Protection and Biodiversity Conservation Act 1999*

(Cth) enables the identification and subsequent listing of indigenous heritage values on the Commonwealth and/or National Heritage Lists (ss. 341D & 324D respectively). Substantial penalties (and, in some instances, gaol sentences) can be imposed on any person who damages items on the National or Commonwealth Heritage Lists (ss. 495 & 497) or provides false or misleading information in relation to certain matters under the Act (ss.488-490). In addition, the wrongdoer may be required to make good any loss or damage suffered due to their actions or omissions (s.500).

10.0 Aboriginal Cultural Heritage Management Plan

Management Recommendations

Heritage management options and recommendations provided in this report are made based on the following criteria.

- Consultation with Vernon Graham (Aboriginal Heritage Officer).
- The legal and procedural requirements as specified in the *Aboriginal Heritage Act 1975* (The Act).
- The results of the investigation as documented in this report; and
- Background research into the extant archaeological and ethnohistoric record for the study area and the surrounding region.

Recommendation 1

No Aboriginal heritage sites, suspected features, or areas of elevated archaeological sensitivity were identified within the proposed Palmerston BESS Project footprint. It is assessed that there is a very low potential for undetected Aboriginal heritage sites to be present. On this basis it is advised that there are no Aboriginal heritage constraints or requirements to the development proceeding.

Recommendation 2 (Unanticipated Discovery Plan)

It is assessed that there is generally a low to very low potential for additional undetected Aboriginal heritage sites to occur within the Palmerston BESS Project footprint. However, if, during the course of the proposed works, previously undetected archaeological sites or objects are located, the processes outlined in the Unanticipated Discovery Plan should be followed (see Appendix 3). A copy of the Unanticipated Discovery Plan should be kept on-site during all ground disturbance and construction work. All construction personnel should be made aware of the Unanticipated Discovery Plan and their obligations under the Aboriginal Heritage Act 1975 (the Act).

Recommendation 3

Copies of this report should be submitted to Aboriginal Heritage Tasmania (AHT) for review and comment.

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Glossary of Terms

Aboriginal Archaeological Site
A site is defined as any evidence (archaeological features and/or artefacts) indicating past Aboriginal activity, and occurring within a context or place relating to that activity. The criteria for formally identifying a site in Australia varies between States and Territories.

Artefact
A portable object that has been humanly made or modified (see also stone artefact).

Assemblage (lithic)
A collection of complete and fragmentary stone artefacts and manuports obtained from an archaeological site, either by collecting artefacts scattered on the ground surface, or by controlled excavation.

Broken Flake
A flake with two or more breakages, but retaining its area of break initiation.

Chert
A highly siliceous rock type that is formed biogenically from the compaction and precipitation of the silica skeletons of diatoms. Normally there is a high percentage of cryptocrystalline quartz. Like chalcedony, chert was valued by Aboriginal people as a stone material for manufacturing stone tools. The rock type often breaks by conchoidal (shell like) fracture, providing flakes that have hard, durable edges.

Cobble
Water worn stones that have a diameter greater than 64mm (about the size of a tennis ball) and less than 256mm (size of a basketball).

Core
A piece of stone, often a pebble or cobble, but also quarried stone, from which flakes have been struck for the purpose of making stone tools.

Core Fragment
A piece of core, without obvious evidence of being a chunky primary flake.

Cortex
The surface of a piece of stone that has been weathered by chemical and/or physical means.

Debitage
The commonly used term referring to the stone refuse discarded from knapping. The manufacturing of a single implement may result in the generation of a large number of pieces of debitage in an archaeological deposit.

Flake (general definition)
A piece of stone detached from a nucleus such as a core. A complete or substantially complete flake of lithic material usually shows evidence of hard indenter initiation, or occasional bending initiation. The most common type of flake is the 'conchoidal flake'. The flake's primary fracture surface (the ventral or inside surface) exhibits features such as fracture initiation, bulb of force, and undulations and lances that indicate the direction of the fracture front.

Flake fragment
An artefact that does not have areas of fracture initiation, but which displays sufficient fracture surface attributes to allow identification as a stone artefact fragment.

Flake portion (broken flake)
The proximal portion of a flake retaining the area of flake initiation, or a distal portion of a flake that retains the flake termination point.

Flake scraper
A flake with retouch along at least one margin. The character of the retouch strongly suggests shaping or rejuvenation of a cutting edge.

Middens
Middens range in thickness from thin scatters to stratified deposits of shell and sediment up to 2m thick. In addition to shell which has accumulated as food refuse, shell middens usually contain other food remains such as bone from fish, birds and terrestrial animals and humus from the decay of plant and animal remains. They also commonly contain charcoal and artefacts made from stone, shell and bone.

Nodules
Regular or irregular cemented masses or nodules within the soil. Also referred to as concretions and buckshot gravel. Cementing agents may be iron and/or manganese oxides, calcium carbonate, gypsum etc. Normally formed in situ and commonly indicative of seasonal waterlogging or a fluctuating chemical environment in the soil such as; oxidation and reduction, or saturation and evaporation. Nodules can be redistributed by erosion. (See also 'concretion').

Pebble
By geological definition, a waterworn stone less than 64 mm in diameter (about the size of a tennis ball). Archaeologists often refer to waterworn stones larger than this as pebbles though technically they are cobbles.

Quartz
A mineral composed of crystalline silica. Quartz is a very stable mineral that does not alter chemically during weathering or metamorphism. Quartz is abundantly common and was used by Aboriginal people throughout Australia to make light-duty cutting tools. Despite the often unpredictable nature of fracture in quartz, the flakes often have sharp cutting edges.

Quartzite
A hard silica rich stone formed in a sandstone that has been recrystallised by heat (metaquartzite) or strengthened by slow infilling of silica in the voids between the sand grains (Orthoquartzite).

Retouch (on stone tools)
An area of flake scars on an artefact resulting from intentional shaping, resharpening, or rejuvenation after breakage or blunting of a cutting edge. In resharpening a cutting edge the retouch is invariably found only on one side (see also 'indeterminate retouched piece', retouch flake' etc).

Scraper
A general group of stone artefacts, usually flakes but also cores, that one or more retouched edges thought to have been used in a range of different cutting and scraping activities. A flake scraper is a flake with retouch along at least one margin, but not qualifying for attribution to a more specific implement category. Flake scrapers sometimes also exhibit use-wear on the retouched or another edge.

Silcrete
A hard, fine grained siliceous stone with flaking properties similar to quartzite and chert. It is formed by the cementing and/or replacement of bedrock, weathering deposits, unconsolidated sediments, soil or other material, by a low temperature physico-chemical process. Silcrete is essentially composed of quartz grains cemented by microcrystalline silica. The clasts in silcrete bare most often quartz grains but may be chert or chalcedony or some other hard mineral particle. The mechanical properties and texture of silcrete are equivalent to the range exhibited by chert at the fine-grained end of the scale and with quartzite at the coarse-grained end of the scale. Silcrete was used by Aboriginal people throughout Australia for making stone tools.

Site Integrity
The degree to which post-depositional disturbance of cultural material has occurred at a site.

Stone Artefact
A piece (or fragment) of stone showing evidence of intentional human modification.

Stone procurement site
A place where stone materials is obtained by Aboriginal people for the purpose of manufacturing stone artefacts. In Australia, stone procurement sites range on a continuum from pebble beds in water courses (where there may be little or no evidence of human activity) to extensively quarried stone outcrops, with evidence of pits and concentrations of hammerstones and a thick layer of knapping debris.

Stone tool
A piece of flaked or ground stone used in an activity or fashioned for use as a tool. A synonym of stone tool is ‘implement’. This term is often used by archaeologists to describe a flake tool fashioned by delicate flaking (retouch).

Use wear
Macroscopic and microscopic damage to the surfaces of stone tools, resulting from it's use. Major use-wear forms are edge fractures, use-polish and smoothing, abrasion, and edge rounding bevelling.

Appendix 1

Unanticipated Discovery Plan

Unanticipated Discovery Plan

Procedure for the management of unanticipated discoveries of Aboriginal relics in Tasmania

For the management of unanticipated discoveries of Aboriginal relics in accordance with the *Aboriginal Heritage Act 1975* and the *Coroners Act 1995*. The Unanticipated Discovery Plan is in two sections.

Discovery of Aboriginal Relics other than Skeletal Material

Step 1:

Any person who believes they have uncovered Aboriginal relics should notify all employees or contractors working in the immediate area that all earth disturbance works must cease immediately.

Step 2:

A temporary 'no-go' or buffer zone of at least 10m x 10m should be implemented to protect the suspected Aboriginal relics, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected Aboriginal relics have been assessed by a consulting archaeologist, Aboriginal Heritage Officer or Aboriginal Heritage Tasmania staff member.

Step 3:

Contact Aboriginal Heritage Tasmania on 1300 487 045 as soon as possible and inform them of the discovery. Documentation of the find should be emailed to aboriginal@dpac.tas.gov.au as soon as possible. Aboriginal Heritage Tasmania will then provide further advice in accordance with the *Aboriginal Heritage Act 1975*.

Discovery of Skeletal Material

Step 1:

Call the Police immediately. Under no circumstances should the suspected skeletal material be touched or disturbed. The area should be managed as a crime scene. It is a criminal offence to interfere with a crime scene.

Step 2:

Any person who believes they have uncovered skeletal material should notify all employees or contractors working in the immediate area that all earth disturbance works cease immediately.

Step 3:

A temporary 'no-go' or buffer zone of at least 50m x 50m should be implemented to protect. the suspected skeletal material, where practicable. No unauthorised entry or works will be allowed within this 'no-go' zone until the suspected skeletal remains have been assessed by the Police and/or Coroner.

Step 4:

If it is suspected that the skeletal material is Aboriginal, Aboriginal Heritage Tasmania should be notified.

Step 5:

Should the skeletal material be determined to be Aboriginal, the Coroner will contact the Aboriginal organisation approved by the Attorney-General, as per the *Coroners Act 1995*.

Aboriginal Heritage Tasmania
Department of Premier and Cabinet

Tasmanian Government

Guide to Aboriginal site types

Stone Artefact Scatters

A stone artefact is any stone or rock fractured or modified by Aboriginal people to produce cutting, scraping or grinding implements. Stone artefacts are indicative of past Aboriginal living spaces, trade and movement throughout Tasmania. Aboriginal people used hornfels, chalcedony, spongelite, quartzite, chert and silcrete depending on stone quality and availability. Stone artefacts are typically recorded as being 'isolated' (single stone artefact) or as an 'artefact scatter' (multiple stone artefacts).

Shell Middens

Middens are distinct concentrations of discarded shell that have accumulated as a result of past Aboriginal camping and food processing activities. These sites are usually found near waterways and coastal areas, and range in size from large mounds to small scatters. Tasmanian Aboriginal middens commonly contain fragments of mature edible shellfish such as abalone, oyster, mussel, warrener and limpet, however they can also contain stone tools, animal bone and charcoal.

Rockshelters

An occupied rockshelter is a cave or overhang that contains evidence of past Aboriginal use and occupation, such as stone tools, middens and hearths, and in some cases, rock markings. Rockshelters are usually found in geological formations that are naturally prone to weathering, such as limestone, dolerite and sandstone

Quarries

An Aboriginal quarry is a place where stone or ochre has been extracted from a natural source by Aboriginal people. Quarries can be recognised by evidence of human manipulation such as battering of an outcrop, stone fracturing debris or ochre pits left behind from processing the raw material. Stone and ochre quarries can vary in terms of size, quality and the frequency of use.

Rock Marking

Rock marking is the term used in Tasmania to define markings on rocks which are the result of Aboriginal practices. Rock markings come in two forms; engraving and painting. Engravings are made by removing the surface of a rock through pecking, abrading or grinding, whilst paintings are made by adding pigment or ochre to the surface of a rock.

Burials

Aboriginal burial sites are highly sensitive and may be found in a variety of places, including sand dunes, shell middens and rock shelters. Despite few records of pre-contact practices, cremation appears to have been more common than burial. Family members carried bones or ashes of recently deceased relatives. The Aboriginal community has fought long campaigns for the return of the remains of ancestral Aboriginal people.

Further information on Aboriginal Heritage is available from:

Aboriginal Heritage Tasmania
Community Partnerships and Priorities
Department of Premier and Cabinet
GPO Box 123 Hobart TAS 7001
Telephone: 1**300 487 045**
Email: **aboriginal@dpac.tas.gov.au**
Web: **www.aboriginalheritage.tas.gov.au**

pitt&sherry

Palmerston BESS

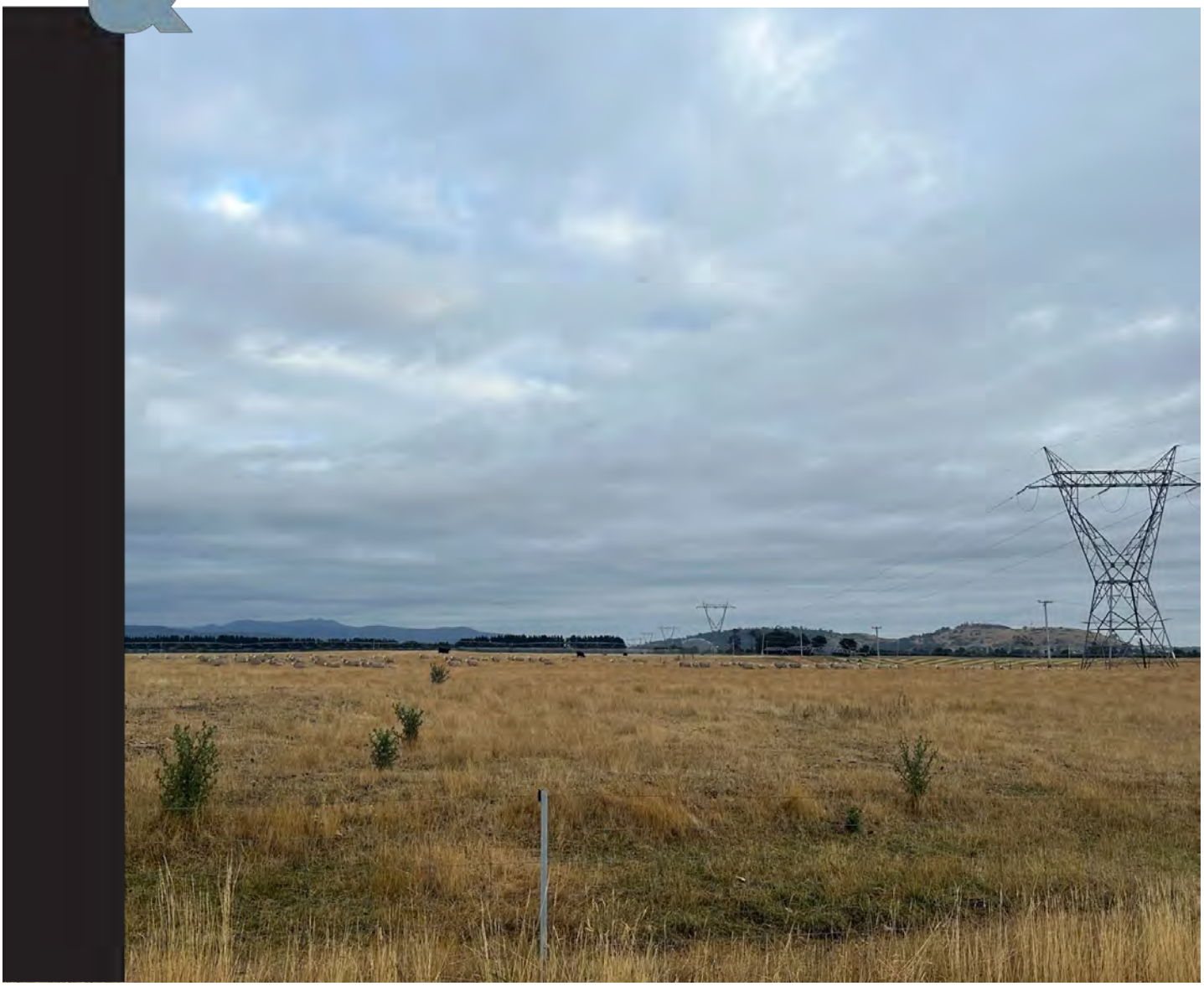
Traffic Impact Assessment

Prepared for
Cogency Australia

Client representative
Akaysha Energy (c/- Cogency)

Date
11 August 2023

Rev00



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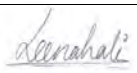
Reviewed by — Leenah Ali-Lavroff		**Date —** 11 August 2023
Authorised by — Rebekah Ramm		**Date —** 11 August 2023

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft Traffic Impact Assessment	SJD	LA	RLR	21/04/2023
00	First Issue	SJD	RLR	RLR	11/08/2023

1. Introduction

1.1 Background

Akaysha Energy proposes to develop a 100MW/ 200MWh battery energy storage system (BESS) adjacent to the existing Palmerston Substation off Poatina Road, east of Poatina, Tasmania. The proposed Palmerston BESS will enable efficient energy management.

1.2 Traffic Impact Assessment scope

Cogency Australia, on behalf of Akaysha Energy, engaged pitt&sherry to undertake a Traffic Impact Assessment (TIA) for the Palmerston BESS development. The TIA is required as part of the Development Application with the Northern Midlands Council.

This report has been prepared with reference to the *Tasmanian Planning Scheme - Northern Midlands* (the Planning Scheme) and in accordance with the Department of State Growth's (the department's) Publication *Traffic Impact Assessments (TIA) Guidelines.*

2. Existing conditions

2.1 Site location

The development footprint for the Palmerston BESS covers 1.5Ha adjacent to the existing Palmerston Substation located approximately 2.3km east of Poatina (see Figure 1, below).

The site has a land use classification under the Planning Scheme of 21.0 – Agriculture. The area of the existing substation, directly adjacent is zoned 2.0 – Utilities. The BESS is located clear of the electricity transmission corridor zones, but within the substation facility buffer area (Code 4 - Electricity Transmission Infrastructure Protection Code).

Figure 1: Palmerston BESS Site Location

2.2 Site access

The Palmerston BESS site will be accessed from the Palmerston Substation Access Road - a dedicated private access road from Poatina Road.

2.3 Surrounding road network

2.3.1 Poatina Road

Poatina Road is a Department of State Growth (State Growth) arterial road under the State Road Hierarchy, and has a speed limit of 100km/h. The road carries approximately 406 vehicles per day (2021)[1], of which 17% are heavy vehicles. Poatina Road forms part of the Tasmanian 26 metre B-double network.

2.3.2 Saundridge Road

Saundridge Road is a Council owned collector road[1] which intersects with Poatina Road 800m from the site access, then spans to Cressy. Saundridge Road is subject to the Tasmanian Sealed Rural Road speed limit of 100km/h.

[1] Traffic volume obtained from Department of State Growth traffic count website: *tasmaniatrafficdata.drakewell.com;* Station: A1604181

2.3.3 Macquarie Road

Macquarie Road is a Council owned collector road[2] which spans across the Northern Midlands from Campbell Town (junction with West Street/ Pedder Street) to Cressy (junction with Poatina Road/ Cressy Road). Macquarie Road is a two-way road configured with a single lane in each direction. Macquarie Road is subject to the Tasmanian Sealed Rural Road speed limit of 100km/h. It carries approximately 350 vehicles per day[3] (2016) counted at the Lake River bridge just north of the Connorville Station site.

2.3.4 Cressy Road

Cressy Road is a State Growth arterial road which connects Macquarie Road to major northern transport routes. Cressy Road is part of the State Growth Tasmanian 26 m B-double network, has a speed limit of 100km/h and carries approximately 1,359 vehicles per day (2021) with 22% heavy vehicles.

2.3.5 Illawarra Road

Illawarra Road links between Midland Highway and Bass Highway and is part of the Tasmanian State Highway network.

Illawarra Road will link incoming traffic from Bass Highway in the west, and from Launceston (via Midlands Highway) in the east to Cressy Road and be part of the key transport routes for the Palmerston BESS project.

2.3.6 Bass Highway

The Bass Highway is a State Growth road classified as a Primary Freight and Passenger Road (Category 1) in the State Growth Road Hierarchy. It spans from Launceston to the northwest of Tasmania and provides primary transport links to the ports of Burnie and Devonport.

2.3.7 Pedder Street

Pedder Street is the eastern continuation of Macquarie Road through the urban area of Campbell Town and links Macquarie Road to the Midland Highway. Pedder Street is a 5m wide sealed road with unsealed shoulders and a speed limit of 60km/h.

2.3.8 Midland Highway

The Midland Highway (shown in Figure 2 and Figure 3) is a State Growth Road, classified as a Primary Freight and Passenger Road (Category 1) in the State Growth Road Hierarchy, and spans from Launceston to Hobart. It is a two-way highway, typically with one lane in each direction and an overtaking lane, and operates predominantly in a north-south direction. The highway is part of the State Growth Tasmanian 26 m B-double network..

The Midland Highway has a speed limit of 110km/h for much of its length. North of Campbell Town, the highway carries approximately 6,534 vehicles per day, of which 20% are heavy vehicles.

[2] Based on the LIST Road Centrelines Transport Class.
[3] Daily traffic volumes provided by Northern Midlands Council.

Figure 2: Midland Highway approaching Campbell Town facing north.

Figure 3: Midland Highway south of Campbell Town facing south.

2.4 Traffic volumes

Poatina Road traffic volumes were estimated using the data available from the Department of State Growth Traffic Data website. A continuous classified traffic counter is located on Poatina Road just west of the Palmerston Substation and shows AADT for 2021 of 406 vehicles per day with 17% heavy vehicles. Based on typical growth rates in the area, a compounding growth rate of 3% per year was applied to estimate the AADT for 2023 to be 431 vehicles per day.

An increase in the percentage of heavy vehicles has been observed at the Poatina Road traffic counter (station A1604181) and the 2023 heavy vehicle percentage is estimated to be approximately 18% on Poatina Road

Based on the available traffic data, it was noted that the weekday AM peak hour for Poatina Road (Nov 2021) is between 11:00am and 12:00pm and the PM peak hour is between 4:00pm and 5:00pm. These weekday peak times have been adopted for this assessment.

A summary of the estimated current traffic parameters in the vicinity of the BESS site, are shown below in Table 1.

Table 1: Poatina Road traffic estimates 2023

Location	AADT	% Heavy Vehicles	Weekday AM peak hour	Weekday PM peak hour
Poatina Road	431	18 %	11.00am – 12.00pm	4.00pm – 5.00pm

2.5 Road safety

2.5.1 Crash history

State Growth has provided crash data for Poatina Road in the vicinity of the proposed BESS development. The data provided was for a 10-year period.

The crash history shows that only one crash has occurred on Poatina Road in the vicinity of the Palmerston Substation and the proposed BESS development in the past 10 years. The crash was a single vehicle crash that occurred by an inexperienced driver. First-aid was provided on site.

The data does not indicate any existing road safety issues.

3. Development proposal

3.1 Overview

Akaysha Energy proposes to develop a 100MW/200MWh battery energy storage system (BESS) adjacent to the existing Palmerston Substation off Poatina Road, north of Poatina, Tasmania.

The concept involves installing two areas of batteries and an additional underground 33kV reticulation which will be routed from the BESS to the substation's 33kV switchgear - see Concept Layout Plan in Appendix A.

3.2 Staff and site operation

3.2.1 During construction

Construction of the BESS is estimated to take approximately 12 months.[4]

The site is expected to typically operate within standard construction hours of 7.00am – 4.00pm, Monday-Saturday. Out of hours deliveries or extended working hours may be required at times.

3.2.2 Post construction

Once construction is complete and the BESS is operational, the ongoing access requirements will reduce dramatically. The BESS will operate continuously, but access requirements will be minimal – 4 light vehicles per day is a generous estimate. Only in the event of major reactive maintenance in the case of equipment failure will heavy vehicle access be required.

[4] Client estimate based on similar sized projects.

4. Construction phase assessment

4.1 Site access and circulation

The existing access and egress to Palmerston substation is from Poatina Road, along a short dedicated private road (Figure 4). This will provide access to the Palmerston BESS site.

Figure 4: Palmerston BESS site access

4.2 Construction site access suitability

pitt & sherry visited the Palmerston BESS area and inspected the proposed site access for suitability.

Palmerston Substation Access Road is a privately owned access road functioning solely to service the substation (Figure 5). The sealed road is in poor condition needing repair in places with numerous large potholes (Figure 6).

It is recommended that potholes on Palmerston Substation Access Road be repaired prior to the commencement of the proposed works at the substation as these pavement defects are likely to worsen with increased use and may pose a safety hazard.

Palmerston Substation Access Road has an average width of 4.5m. It operates as a circuit around the substation, ensuring vehicles enter and exit the site in a forward direction.

Figure 5: Palmerston Substation Access Road (looking south)

Figure 6: poor state of repair of Palmerston Substation Access Road

4.2.1 Sight distance assessment

The Safe Intersection Sight Distance (SISD) has been assessed for the proposed site access in accordance with the *Austroads Guide to Road Design – Part 4A: Unsignalised and Signalised Intersections*. The speed limits on Poatina Road are 100km/h resulting in a required sight distance of 248m. The sight distances observed on site (Figure 7 and Figure 8) meet the required SISD of 248m in both directions (see Table 2, below).

Figure 7: Poatina Rd, west approach to Palmerston Substation Access Rd

Figure 8: Poatina Rd, east approach to Palmerston Substation Access Rd

Table 2: Site Access SISD

Access	Road width	Sight distance west	Sight distance east
Palmerston Substation Access Road	4.5m	>250m	>250m