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NEOEN

MUCHEA BATTERY ENERGY STORAGE SYSTEM

Planning Report

FINAL

April 2022

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Planning Report

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Neoen Australia Pty Limited

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1.0 Introduction

1.1 Purpose of Application

This Planning Report supports an application for Development Approval under the Shire of Chittering *Local Planning Scheme No. 6* to develop a battery energy storage system (BESS) (the Project) on land adjacent to the existing electricity substation in the municipality of Muchea.

In summary, this report addresses all relevant requirements outlined within the Shire of Chittering *Local Planning Scheme No. 6* (LPS No. 6) as well as any other relevant local, state, and federal guidelines relating to the proposed BESS (the Project).

A critical outcome from the development of a BESS facility at a utility scale in this locality is supporting greater energy security and sustainability in the region. There is significant potential for this facility to address intermittencies in energy supply due to the ability of large battery storage systems to respond quickly to fluctuations in the grid. This project will also support State objectives to achieve net zero emissions by 2050. It makes use of land that is already cleared and in proximity to existing energy infrastructure.

This application is submitted on behalf of Neoen Australia Pty Limited (Neoen).

1.2 Outline of the Proposal

Development approval is being sought from the Shire of Chittering and the Regional Joint Development Assessment Panel (JDAP) to establish a BESS facility near the town of Muchea. The BESS is proposed to be located on Lot 2364 on deposited plan 124489, within a fully cleared 5 ha area adjacent to the existing Muchea Substation. The indicative project size will be up to 200 MW / 400 MWh.

The BESS will be comprised of an orderly arrangement of battery cabinets, inverters and control systems including electrical and data cabling. The battery packs are enclosed in custom designed, dust and water-proof steel cabinetry with industry standard safety and security features. The batteries will connect to a step-up transformer and switchgear, which in turn will connect the BESS to the Muchea Substation via overhead transmission lines. The Project will also include an operations and maintenance facility which will be co-located alongside the storage system.

1.3 The Proponent

Founded in 2008 in France, Neoen is one of the world's most dynamic independent producers of renewable energy. As of July 2021, Neoen has over 2.5 GW of renewable assets in operation or under construction in Australia, representing over $3 billion Australian dollars in investment. The company intends to reach 5 GW in Australia by 2025.

Neoen is active in France, Australia, El Salvador, Zambia, Jamaica, Portugal, Mexico, Mozambique, Finland and Argentina and has assets in more than 15 countries. It operates Europe's most powerful solar PV farm (300 MW in Cestas, France) and the world's largest lithium-ion power reserve in Hornsdale, Australia (150 MW/194 MWh storage capacity).

Neoen has been listed since October 2018 on the Compartment A of the regulated market of Euronext Paris. Combined with a committed and stable shareholding, Neoen has secured access to the capital it needs to support its growth: Neoen is targeting 10 GW capacity in operation and under construction worldwide by 2025.

From its inception, Neoen's core business model has been to develop, build, own and operate all of its projects for the entirety of their lifespans. This strategy means that Neoen takes a long-term approach to its assets, to the local communities in which they are situated, and to electricity markets overall.

Neoen Australia began in Sydney in 2012. Since then, the Australian branch has grown rapidly and represents Neoen's largest portfolio outside Europe and a major strategic priority. Neoen's local team has grown to more than 60 employees across both Sydney, Canberra and Perth working in development, finance, construction, and operations.

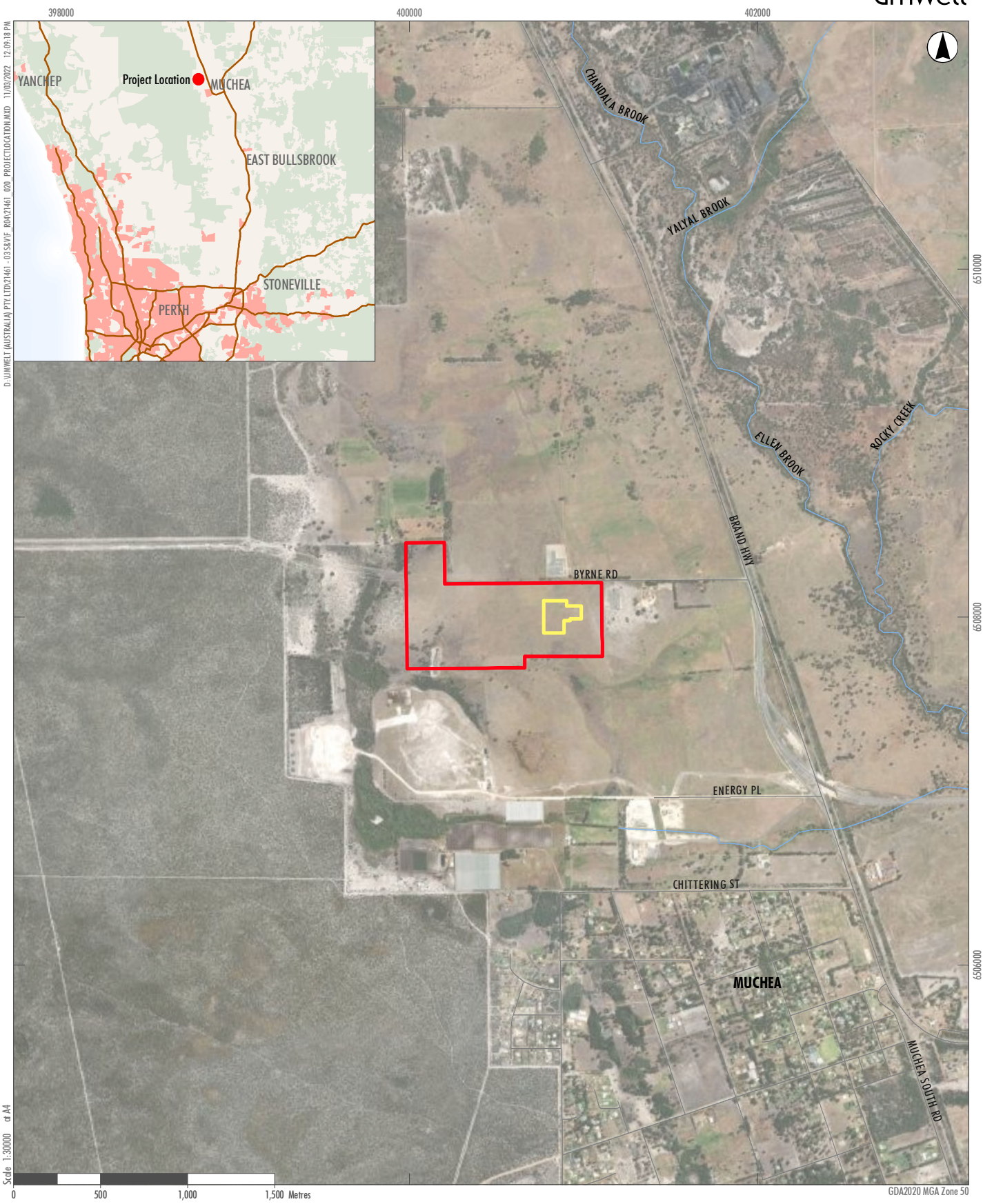

FIGURE 1.1

Project Location

Image Source: ESRI Basemap Data source: Landgate (2021b)

1.4 Pre-application Process

The following activities have been completed to enable a Project that meets legislative requirements, Western Australian policies and strategies, and the needs of the local community:

- An initial environmental and planning constraints analysis was completed (Umwelt, 2021), which:
    - Reviewed the environmental setting, potential impacts, and determined required baseline studies so that potential impacts are identified and appropriately managed.
    - Identified stakeholders who may have an interest in the project.
    - Considered relevant legislation, policy, guidelines and strategy.
    - Provided a pathway for further studies and required approvals.
- Baseline studies have been completed, related to flora and vegetation, hydrogeology, flood risk, Acid Sulphate Soils (ASS), bushfire, noise, visual impacts and traffic.
- Local stakeholder and community consultation has been completed, including with the Shire of Chittering, local landholders, special interest groups and the community.
- An Option Deed has been signed with the landholder for the use of the lot.
- The process to connect to Western Power's electricity network is advanced.
- Relevant state government agencies have been engaged on the Project.

1.5 Project Benefits

1.5.1 Local Community Benefits

As the long-term owner and operator of all their renewable energy assets, Neoen is committed to maximising the long term economic and employment opportunities and benefits for the local community with the Project.

Neoen's 'develop to own' business model is rare in the renewables industry, affording a clear advantage over competitors with respect to local communities and businesses. Neoen's starting point is the clear understanding that they will be neighbours and participants in the community for the lifetime of the Project.

As such Neoen seeks to develop and nurture local procurement initiatives, partnerships and innovation with the confidence that they will be there to see projects through from early development to the final stages of operations in many years to come.

Construction for the Project will provide direct economic benefits to the local community. It is expected to generate on average 60-80 direct jobs over an approximately 16-month construction period with a peak of 150-200 positions as well as a number of on-going roles during the operational phase of the Project. In consideration of providing economic benefits to the local community, Neoen will seek to, where possible:

- maximise local industry participation by providing local jobseekers and industry with full, fair and reasonable opportunity to participate
- prioritise employees from the local community, or accommodate employees in the nearby area

- undertake a local economic and supply market analysis and maintaining a register to identify potential local suppliers
- provide early notice to the market of a planned upcoming major procurement activity
- use the services of local content specialists and supporting their use by contractors and sub-contractors
- hold public briefings which will provide timely information to regional business and industry on the jobs, services, supplies and support requirements of the Project
- hold a Local Employment & Networking session in pre-construction period (and advertise this in local media) to provide timely and equitable access to supply opportunities
- encourage sub-contractors to maximise the use of local business when contracts are awarded outside the region
- identify opportunities for local industry support and innovation
- identify opportunities to support training, upskilling and apprenticeships
- identify training opportunities and support for subcontractors on the preparation of bids.

Additionally, a Community Benefit Fund will be established, the value of which will be determined based on the final size of the battery. The fund will consist of annual community grants, will commence at the start of the Project's operations and will run annually for the project's lifetime. This fund will be administered a non-profit foundation and the decision-making will be undertaken by an Advisory Committee consisting of representatives from Shire of Chittering, the local community and Neoen. Local community organisations will be able apply for this fund for local community-building, environmental, and education projects. The fund is not intended for individuals, businesses or local government projects. Neoen have already started engaging with the community to understand the priorities of local residents with regards to a Community Benefit Fund. Further details are provided in **Section 5.0**.

1.5.2 Strategic and Electricity Network Level Benefits

This Project contributes to achieving key goals and objectives outlined by the State government in their *Energy Transformation Strategy*, by helping to maintain a secure and reliable energy supply, ensure affordable energy, and reduce emissions through increasing renewable energy supply at a local and regional level (Energy Policy WA, 2021). The proposed BESS will be connected to the South-West Interconnected System (SWIS) which has seen significant investment towards increasing renewable energy systems (RES). Despite RES providing an increasing proportion of energy supply within the SWIS, a major gap has been raised regarding the potential intermittency and reliability of RES (Department of Treasury, 2019).

In 2019 the Australian Energy Market Operator (AEMO) identified that:

- Without changes to the Wholesale Electricity Market (WEM) to accommodate new technologies, voltage in the South West Interconnected System cannot be controlled within technical limits as the level of minimum power system operational demand approaches the present critical level of 700 MW. AEMO's current forecasts of rooftop photovoltaic (PV) distributed energy resources (DER) growth indicate that minimum operational demand will reach 700 MW between 2022 and 2024, depending on the PV DER installation rate and load growth and taking into account day-to-day variability in weather and load conditions.

- System security risks are emerging now as the increase in large-scale renewable generation and DER displaces the dispatchable thermal generators that presently provide all system security services such as inertia, frequency control, system strength, and voltage control.

- Technical standards and regulatory and market constructs require carefully designed but urgent change, to implement or incentivise new technologies in the SWIS such as synchronous compensation, energy storage, and increased inverter capabilities. These changes will support the management of power system security and effectively integrate renewable generation and DER in a way that facilitates efficient utilisation of existing and future electricity sources.

The proposed Project will address these issues identified above by providing:

- Firming services - grid-scale batteries can store wind and solar energy, then discharge it when the wind isn't blowing and the sun isn't shining. The Project aims to be an essential component in the stable transition to clean electricity.

- Frequency support - to maintain the stability of the system, the grid requires frequency control services. The Project will discharge electrical power into the network in response to frequency changes. The Project can lower the cost of these service markets.

- Inertia - as with vehicle suspension on an uneven road, inertia services are essential for stabilising the grid. The advanced power inverters associated with the Project can emulate the inertia services that are currently provided by an ageing fleet of fossil fuel power plants.

- Transmission network support - grid-scale batteries can provide dynamic millisecond responses so existing transmission lines can operate at full capacity. Like adding another lane to a freeway, the Project can unlock additional capacity on existing transmission networks – saving millions of dollars in expensive transmission line upgrades.

1.6 Report Structure and Information

To support the Application for Development, this report contains the information as described in **Table 1.1**.

Table 1.1 Report Contents

Heading	Information/Description
Section 1.0	An introductory section, providing the report's purpose, scope and benefits
Section 2.0	Details and features of the Project site and surrounding locality
Section 3.0	An overview and description of the Project proposal
Section 4.0	An assessment of all environmental and planning policies and controls relevant to the Project
Section 5.0	A summary of stakeholder and community engagement
Section 6.0	A review of any potential impacts related to the Project and mitigation strategies designed to address these
Appendix 1	Concept site plans and elevations
Appendix 2	Concept design report
Appendix 3	A Certificate of Title of the proposed Project site
Appendix 4-9	Relevant specialist studies that have been conducted
Appendix 10	A Bushfire Management Plan and Emergency Evacuation Plan
Appendix 11	Stakeholder engagement report

1.7 Contact Details

The key contact for all discussions relating to this Application for Development Approval is:

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2.0 Physical Context

2.1 Location History and Context

Muchea is a suburb of the Shire of Chittering. The town's name comes from the Aboriginal word "Muchela" which means 'water hole' in the Nyoongar language, referring to the abundance of water in Muchea.

The area was first surveyed as farmland in 1845 as part of a property to be owned by George Moore. The opening of a railway siding in the area between 1892 and 1898 caused permanent structures to be built and by 1903 farm lots were surveyed close to the siding. The townsite was later gazetted in 1904.

In 1960, the Muchea Tracking Station was established about 4 kilometres (2 miles) SSW outside of town as part of NASA's Mercury project. In 1962, the first Australian to speak with a space traveller did so from the Muchea facility. The station was closed in 1964.

2.2 Description of Site

The Project is located on cleared land with low topographic relief. Surrounding land use is mostly agricultural, although the Project is proposed to be constructed adjacent to the existing Muchea electricity substation and Neerabup gas transfer infrastructure.

The Project site is located approximately two kilometres north of the town of Muchea in the municipality of the Shire of Chittering **(Figure 2.1**). Access to the Project is off Byrne Road, approximately 800 metres from the junction with Brand Highway.

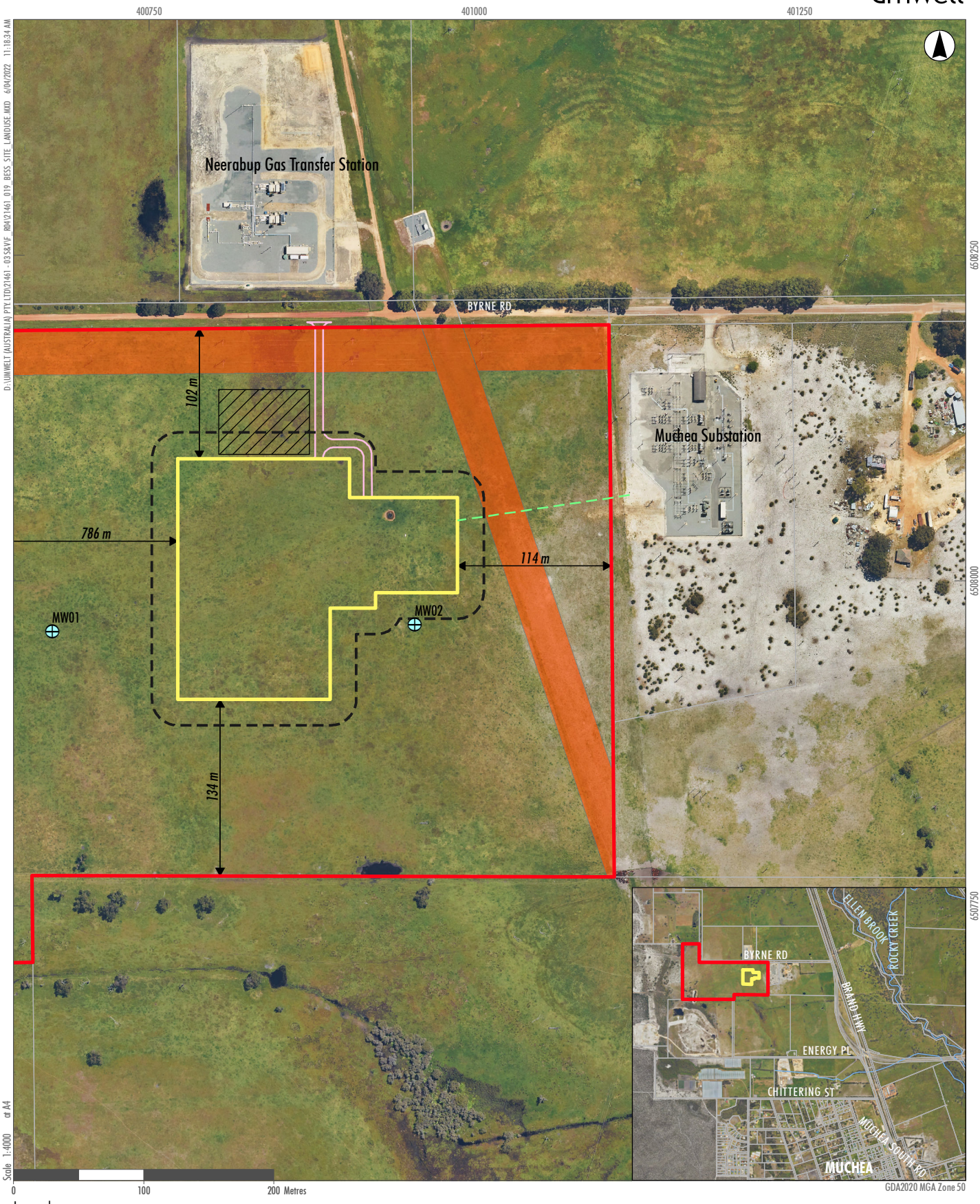
2.3 Cadastre

The Project footprint will occupy up to 5 ha of fully cleared land located within **Lot 2364 on Plan 124489** held in the Certificate of Title Volume 2908, Folio 693. This lot comprises a total area of 57 ha with an arrangement for Neoen to lease the Site footprint through an option agreement with the landholder.

2.4 Land Use

The Project site is used for agriculture, though it is directly adjacent is the Muchea substation to the east and the Neerabup gas transfer station to the north. The remaining surrounding land use types are agriculture on predominantly cleared land. There are two small envelopes of remnant native vegetation located to the west and south-west of the Project site, however the nearest conservation area of significance is the Gnangara State Forest located approximately 5 km to the west. There are some residential areas and private properties located to the south, south-east and west of the area.

There are two easements that run through the property where the BESS is proposed which are shown on **Figure 2.1**.



Legend

- Lot 2364
- Project Area
- APZ Boundary
- Access Road
- Temporary Laydown Area
- Easements within Lot Boundary
- Property Boundaries
- Indicative Overhead Transmission Line
- Monitoring Bores

FIGURE 2.1

Proposed Project Site and Surrounding Land Uses

Image Source: Landgate (2021) Data source: Landgate (2021), MRWA (2020)

3.0 Proposal Description

The Project is currently at the 'Concept Design' stage. General requirements, locations, and designs of Project infrastructure are sufficiently known to enable assessment of potential impacts. Following this, the Project will progress to 'Detailed Design', during which Project infrastructure will be refined and finalised to enable construction. The indicative project size would be up to 200MW / 400MWh.

3.1 Overview of BESS

The Project is proposed to be within a fully cleared five ha area adjacent to the existing Muchea Substation and will include:

- battery banks, Power Conversion Systems (PCS), Power and Auxiliary Transformers and Ring Main Units (RMU)
- internal access roads and limited car spaces
- a combined 33kV switchgear and control building, housing protections, metering, and control panels
- a 132kV/33kV substation with step-up power transformers, Neutral Earthing Resistors (NERs) and 132kV outdoor switchgear
- 132kV overhead cables assumed to connect directly to the adjacent Muchea Substation
- a 33kV cable reticulation and earthing networks
- low voltage cabling for auxiliary supplies, between the PCS and Power Transformers, and between the battery banks and the PCS
- a communication cable network
- an operations and maintenance (O&M) office, storage warehouse and rainwater tank
- a 45,000-kL fire water tank
- lightning rods up to 15 metres
- CCTV cameras and lighting
- site perimeter fences and gates
- site laydown area and facilities for Project construction.

The final configuration of the BESS will be determined as part of the detailed design stage, after a supplier is selected through a competitive tendering process. Detailed conceptual site plans and elevations for the major proposed infrastructure as part of the Development Application are included in **Appendix 1**, and a more detailed description of the conceptual design is provided in **Appendix 2**.

The BESS is likely to resemble other Neoen big batteries around Australia, as shown in **Figure 3.1**. More examples of battery cabinets are provided in **Figure 3.2**.

Figure 3.1 Examples of Other Neoen Batteries Around Australia

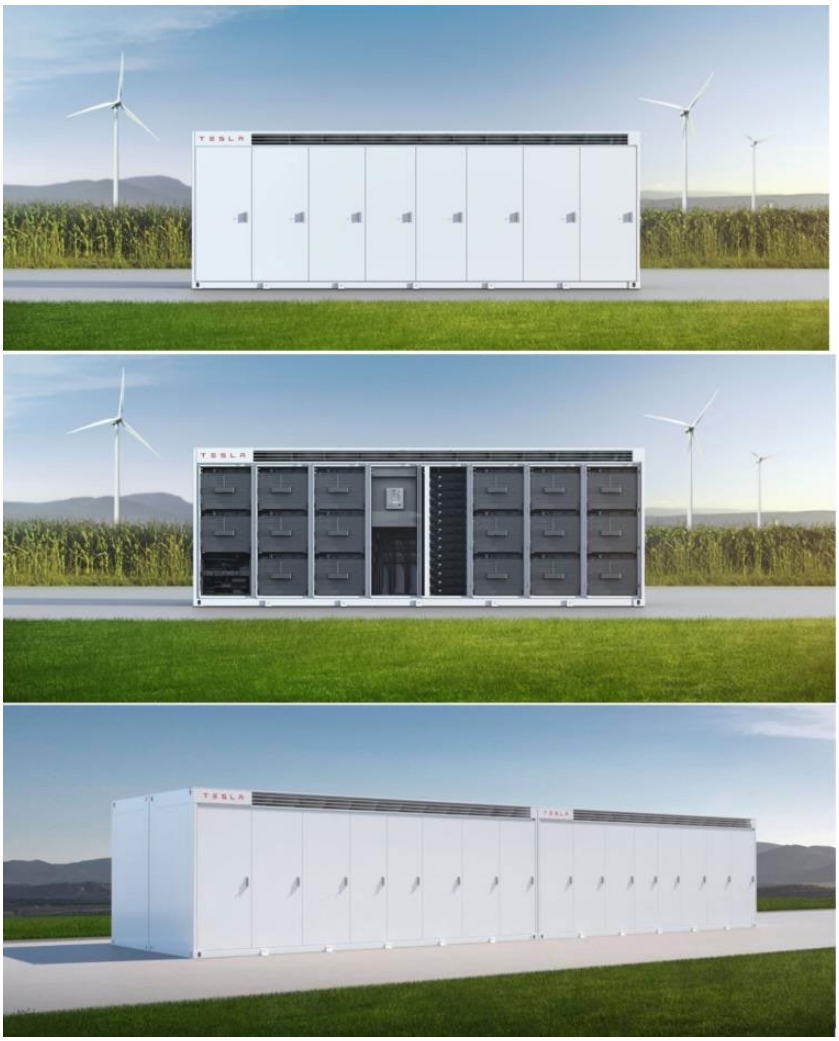


Figure 3.2 Examples of Battery Storage Systems and Containers

The construction period is anticipated to be between 9 and 12 months. During this time:

- approximately 150 to 200 personnel are expected to be employed
- there are expected to be a total of approximately 40-60 light vehicle trips and 300 heavy vehicle trips
- the Project will be constructed generally in accordance with the conceptual construction methodology as described in **Appendix 2**, noting that a more detailed design will be completed for the Project as it progresses.

The Project is expected to be operational for approximately 20 years. During operations, the Project will employ two to four personnel to operate and maintain the facility and may have approximately one light vehicle trip per day. It will operate around the clock – typically charging during the day while there is excess renewable generation and discharging during peak periods. After 20 years, the Project will be reviewed to determine whether it will be renewed or decommissioned.

3.2 Procurement and Development Schedule

Neoen is aiming to commence construction activities for the Project in Q4 of 2023, following which it is expected to be operational by Q4 2024. The analysis of connections to Western Power network and detailed design of the project will run in parallel to the development application process. Granting of the development application is the first step before the procurement process for the Engineering Procurement and Construction (EPC) can commence. An indicative timeline for the Project is shown in **Figure 3.3**, and the complete project lifecycle for the BESS is provided in **Figure 3.4.**

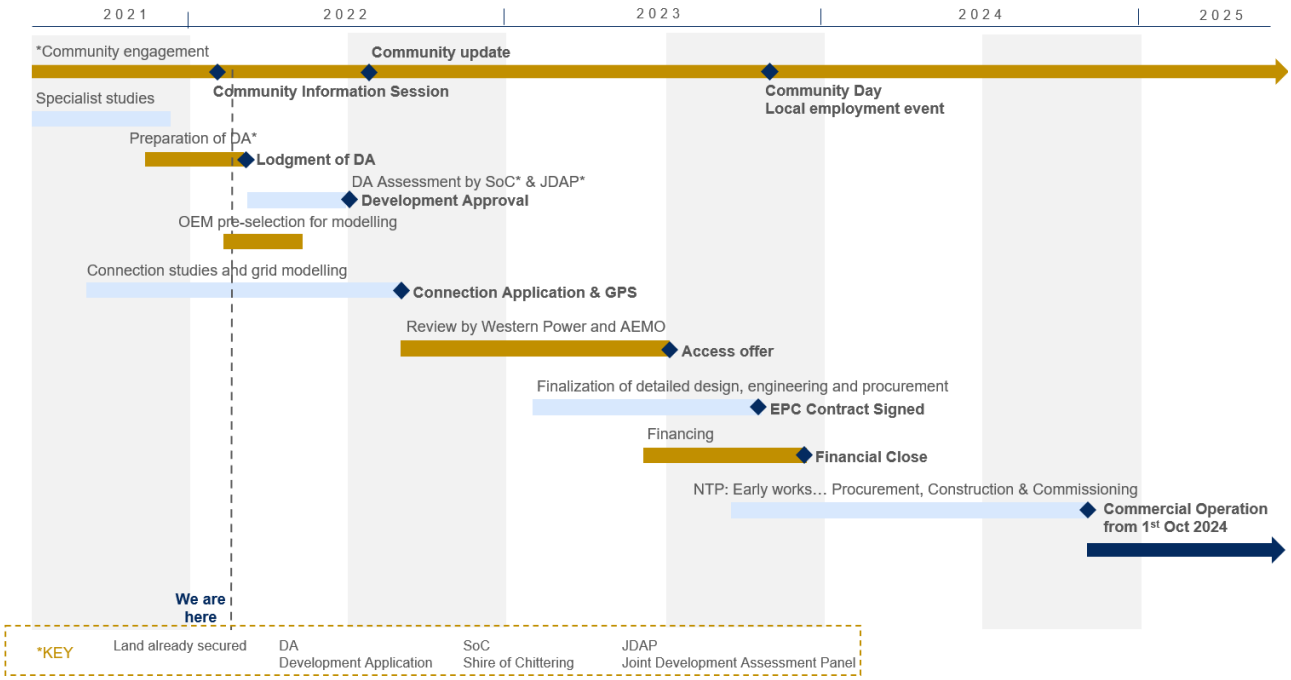


Figure 3.3 Indicative Project Development Schedule

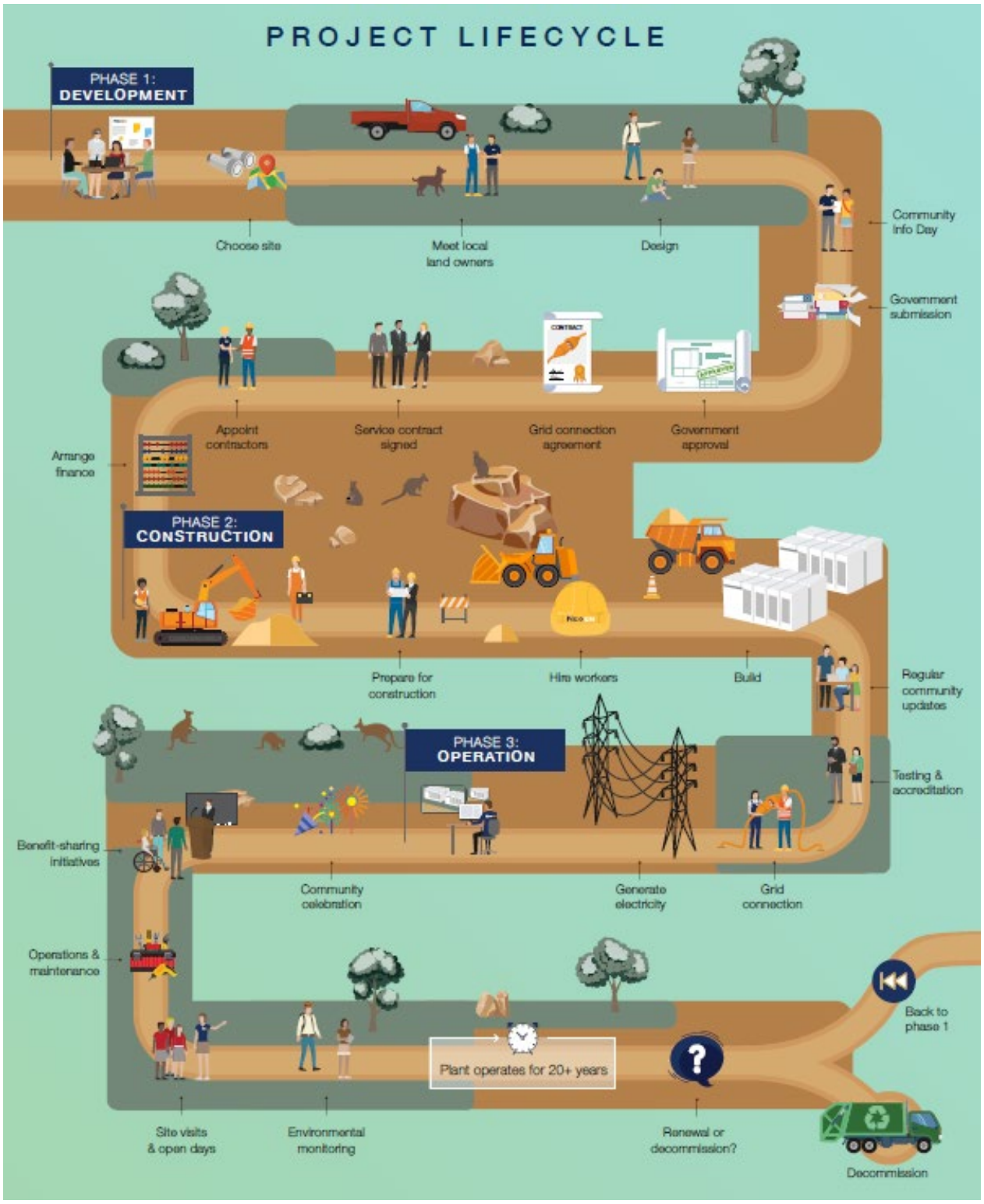


Figure 3.4 BESS Project Lifecycle

4.0 Planning Considerations

This section describes how the Project meets the requirements of relevant legislation, and strategy and statutory planning provisions.

4.1 Key Legislation and Regulations

4.1.1 Planning and Development Act 2005 (WA) (P&D Act)

What is it?

The P&D Act is the primary piece of legislation governing development in Western Australia. The purpose of the P&D Act is to provide for efficient and effective land use planning and to promote the sustainable use and development of land. It gives powers to local government to make local planning schemes, which are the main statutory tool used to determine development in the local government jurisdiction.

Relevance to the Project

Key parts of the P&D Act that are directly relevant to the Project include:

- Process for assessment of developments in accordance with the local planning scheme, which in the case of the Project is the *Shire of Chittering Local Planning Scheme No. 6* (see **Section 4.3.1**).
- Development and application of State planning policies.
- Process by which Development Assessment Panels (DAPs) are established and administered and defines the functions of Development Assessment Panels, with certain development applications to be determined by DAPs.

This Project Development Application is a mandatory DAP application due to its financial value. As the proposed project is located outside the metropolitan area, it will be determined by the Joint Development Assessment Panel (JDAP).

4.1.2 Planning and Development (Development Assessment Panels) Regulations 2011 (DPLH, 2011)

What is it?

The *Planning and Development (Development Assessment Panels) Regulations 2011* aim to create guidance for the implementation of the P&D Act in relation to Development Assessment Panels (DAPs) and provide for efficient and effective land use planning systems in the State, while promoting sustainable use and development of land.

The Regulations outline where development applications must be evaluated by DAPs, and include provisions for DAPs to refuse, approve, and apply conditions on any approval.

Relevance to the Project

As the Project is in a regional area and the value is greater than $10 million, it is mandatory for it to be assessed by the regional Joint Development Assessment Panel (JDAP).

4.1.3 Environmental Protection Act 1986 (WA) (EP Act)

What is it?

The EP Act allows the State government to assess and apply controls for projects that may have an impact on the environment. Part IV of the EP Act requires that projects likely to have a significant effect on the environment are referred to the EPA to assess whether an environmental impact assessment is required. Part V of the EP Act regulates emissions and discharges to the environment through a works approval and licensing process and regulates the clearing of native vegetation through clearing permit applications. Premises with the potential to cause emissions and discharges to air, land, or water are known as 'prescribed premises' and require works approvals for construction, and a licence or registration for ongoing emissions and discharges.

Relevance to the Project

The proposed Project:

- Will not require assessment under Part IV of the EP Act as it is highly unlikely to have significant impacts on the environment.
- Will not clear any native vegetation, so does not require a clearing permit under Part V of the EP Act.
- Is not classified as a prescribed premise, so will not require assessment and approval under Part V of the EP Act.

4.1.4 Environmental Protection (Noise) Regulations 1997 (EP (Noise) Regulations)

What is it?

The EP (Noise) Regulations provide a prescribed standard under the EP Act that sets limits for noise emissions. The EP (Noise) Regulations are used to assess and set conditions for new developments regarding domestic, commercial, and general industry noise emissions and outline provisions for noise sensitive premises to mitigate potential impacts.

Relevance to the Project?

An Environmental Noise Impact Assessment (**Appendix 8**) indicates that operation of the Project will meet noise criteria under the EP (Noise) Regulations.

4.1.5 Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)

What is it?

Protection under the EPBC Act is afforded to nine Matters of National Environmental Significance (MNES). Proposed developments that may adversely impact MNES must be referred for assessment by the federal Department of Agriculture, Water, and the Environment (DAWE), who are the agency responsible for administering the EPBC Act.

Relevance to the Project

The Project will not impact on MNES and does not trigger the need for referral under the EPBC Act. No MNES are known to occur within or near to the Project area.

4.1.6 Rights in Water and Irrigation Act 1914 (WA) (RIWI Act)

What is it?

The RIWI Act establishes a licensing system for taking water from a watercourse, well, or underground source, and constructing or altering wells. The Department of Water and Environmental Regulation (DWER) is responsible for administering the RIWI Act. A licence may be required to take groundwater (or to construct or alter a well, bore, or soak) in a proclaimed groundwater area If dewatering above a certain volume is required during construction.

Relevance to the Project

No groundwater abstraction or dewatering is required, and therefore no approval under the RIWI Act is needed.

4.1.7 Dampier to Bunbury Pipeline Act 1997 (WA) (DBP Act)

What is it?

The DPB Act restricts land uses within the DBNGP Corridor and provides guidelines for the use of any land located within this corridor. In particular, the DBP Act sets out that landowners, pipeline operators, and other third parties cannot use land in the DBNGP corridor in a way that is inconsistent with rights granted to the access right holders (i.e., the right to construct, operate, maintain, test, or repair and enhance the DBNGP). It also requires that landowners, pipeline operators, and other third parties must seek written approval from DPLH, who administer the DBNGP Corridor on behalf of the Minister, to carry out any work within the DBNGP Corridor.

Relevance to the Project

The DBNGP is located adjacent to the Project area. The Australian Gas Infrastructure Group (AGIG) and DPLH have been consulted and all requirements will be addressed (see **Section 5.0**).

4.1.8 Dangerous Goods Safety Act 2004 (WA) (DGS Act)

What is it?

The DGS Act stipulates that any sites at which dangerous goods (DG) are stored or handled may require:

- A licence and/or
- The site to be determined as a major hazard facility under the *Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007*.

Whether a licence will be required depends on the quantities of dangerous goods stored and handled at the Site. In general terms, a substance or article is classified as a DG if it is listed in the *Australian Dangerous Goods* (ADG) *Code, 7th Edition* (available from the National Transport Commission).

Relevance to the Project

While there are some exemptions to licensing requirements, the Project may need to apply for a dangerous goods site licence if DG materials are proposed to be stored at the Project site and exceed those threshold quantities outlined in Schedule 1 of the 2007 *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations*. Any materials expected to be stored and handled on-site and classified as dangerous goods under the ADG Code 7th edition are listed in **Table 4.1**. Following finalization of the Project

design and selection of the battery modules to be installed on-site, Neoen will consult with the Department of Mines, Industry Regulation and Safety (DMIRS) to determine the necessity of a dangerous goods site licence and any other regulatory requirements including risk assessments or operating and handling procedures.

Table 4.1 Potentially Dangerous Goods Stored and Handled On-site

Material or substance	DG Class	Use
Construction Phase		
Flammable or combustible materials	Class 3 – Flammable liquids	Limited amounts stored and used during construction phase (e.g., diesel, petrol, superglue, solvents, thinners, and paints)
Pesticides	Class 6 – Toxic and infectious substances	To be used for the management of declared pests on-site where required
Hydrochloric acid and other corrosives	Class 8 – Corrosive substances	Small containers stored for use in surface preparation
Operations Phase		
Lithium-ion batteries	Class 9 - Miscellaneous	To be contained within modules on-site
Compressed gas refrigerant	Class 2.2 – Non-flammable, non-toxic gases	May be used in battery racks
Inert gas	Class 2.2 – Non-flammable, non-toxic gases	Potential use for fire suppression inside battery module units

4.2 Strategic Planning and Policy

4.2.1 State Planning Strategy 2050 (WAPC, 2014)

What is it?

This strategy provides overarching context, principles, goals, and strategic direction for land use planning in WA. The uptake of renewable energy generation and technology is a critical component of the Strategy and is specifically discussed under strategic goals for global competitiveness, and strategic directions for physical infrastructure, and environment.

Alignment of the Project

The *State Planning Strategy 2050* makes specific reference to a need to improve the state's electricity network infrastructure to manage the increased generation and use of renewable energy. The Project is consistent with and supports the implementation of the goals and strategic directions of the *State Planning Strategy 2050*.

4.2.2 Energy Transformation Strategy (Department of Treasury, 2019)

What is it?

The State's *Energy Transformation Strategy* sets out the State government's work program for delivering secure, reliable, sustainable, and affordable electricity for WA.

The Strategy sets out several key initiatives, most of which are now underway or complete. Those initiatives relevant to the Project include:

- Establishing an Energy Transformation Taskforce.
- Development a Whole of System Plan.
- Produce a Distributed Energy Resources Roadmap.
- Modernise network connection and market arrangements to allow more low-emission energy technologies to connect to the network.

Alignment of the Project

The Project is well aligned with, and directly advances, three of the five Strategy objectives:

- Maintain a secure and reliable electricity supply.
- Ensure affordable electricity for households and businesses.
- Reduce energy sector emissions.

4.2.3 Distributed Energy Resources Roadmap (Energy Transformation Taskforce, 2019)

What is it?

This document sets out the actions, responsibilities for those actions and timeframes to realise the vision for Distributed Energy Resources (DER) for WA by 2025. It is a key part of the *Energy Transformation Strategy*, and refers to:

- A safe and reliable electricity system where customers can continue to connect to DER and where DER supports the system in an efficient way.
- DER capability offering value throughout the electricity supply chain.
- DER benefits flowing to all customers, both with and without DER.

Alignment of the Project

The Project directly advances the aims and specific actions of the Roadmap, as distribution battery storage is a key element in progressing the Roadmap initiatives. The Roadmap makes specific reference to the importance of utility scale batteries:

> *'Deployment of storage within the SWIS will be needed as part of measures to ensure power system stability and security.*
> *Large scale front-of-the-meter storage can unlock the full capability of storage to provide power system and network benefits and storage products that can be offered to customers or retailers.'*
> *(Energy Transformation Taskforce 2019, p. 56)*

4.2.4 Future Battery Industry Strategy (JTSI, 2019)

What is it?

The WA *Future Battery Industry Strategy* is intended to provide a framework for WA to become a globally recognized producer and exporter of battery materials, technology, and expertise. In particular, the Strategy is supported by several key objectives which aim to increase and accelerate the domestic uptake of battery technology across the State.

Alignment of the Project

The Project is directly aligned with these objectives by establishing a utility-scale BESS within the Wheatbelt that allows integration of greater renewable energy technology into the SWIS. The Project will take advantage of the latest technology in BESS facilities and illustrate the potential for more to be embedded within the SWIS.

4.2.5 Western Australian Climate Policy (DWER, 2020)

What is it?

The *Western Australian Climate Policy* was released in 2020 (DWER, 2020). It sets out the vision for a climate resilient state that has net zero greenhouse gas emissions by 2050. The policy lays out the following key areas of focus for climate action in the state:

- Clean manufacturing and future industries.
- Transforming energy generation and use.
- Storing carbon and caring for our landscapes.
- Lower-carbon transport.
- Resilient cities and regions.
- Government leadership.
- The policy also describes the actions already underway, and the qualitative outcomes that the State seeks to achieve in these key focus areas.

Alignment of the Project

As a renewable energy development, the Project is well aligned with a number of these key areas while supporting progress in others. A utility scale BESS established within the South-West Interconnected System (SWIS) will allow industry growth and development in a way that is consistent with a low-emissions economy by providing vital infrastructure to support the integration of more renewable energy. This will further reinforce the resilience of the SWIS, the reliability of energy supply, and support transitions in other industries (such as transport) to lower-carbon pathways. Furthermore, the site selected for the Project is on existing cleared land so the clearing of any native vegetation which serves as a sink for carbon storage within the landscape is avoided.

4.2.6 Position Statement – Renewable Energy Facilities (DPLH, Position Statement - Renewable energy facilities, 2020)

What is it?

This Position Statement aims to support appropriate development of renewable energy facilities by facilitating consistent consideration and assessment of renewable energy developments. In particular, it:

- Describes the provisions that should be made in state and local planning instruments (local planning schemes, planning strategies etc.) to guide decision making regarding renewable energy facilities.
- Lists the factors that should be considered during assessments of proposed renewable energy facilities, including community consultation, environmental impact, visual and landscape impact, public and aviation safety, heritage, and construction impact.
- Seeks to maximise energy production and operational efficiency, and minimise potential impacts to the environment, natural landscape, and urban areas.

Alignment of the Project

The Shire of Chittering has not specifically provided for renewable energy facilities in their local planning scheme. This Position Statement has been considered in the design, location, and management of the Project, as follows:

- Relevant state government agencies have been contacted to discuss the Project and ensure it is aligned with the overall planning and development strategies in the region around industry and renewable energy developments.
- Relevant legislation, policy, guidelines, and strategies have been reviewed to ensure compliance in the Project design and operational strategy with State objectives relating to energy production and mitigating impacts to both the built and natural environment.
- Baseline studies have been completed, relating to flora and vegetation, hydrogeology, flood risk, Acid Sulphate Soils (ASS), bushfire, noise, and visual impacts to ensure all potential Project impacts have been considered and accounted for.
- Local stakeholder and community consultation has been completed, including with the Shire of Chittering, local landholders, special interest groups and the community to maintain a strong relationship with local stakeholders and address any concerns or priorities raised by these groups.

4.2.7 Wheatbelt Regional Planning and Infrastructure Framework (WAPC, 2015)

What is it?

This framework provides an overall strategic context for land-use planning and development in the Wheatbelt. It specifically establishes an objective for economic diversification through establishment and growth of new industries, and sets out the following vision for the region:

> *'the Wheatbelt will have a diverse social and economic base, be a leader in innovation and create new opportunities that confirm it as a key contributor to the State's prosperity'*

The abundance of renewable energy is identified as a strength for the region, but one that is curbed by the limited capacity for the SWIS to take on additional generation. Energy unreliability and variation at the extremes of the South-West Interconnected Network is also identified as a challenge for the region.

Alignment of the Project

This Project addresses some of the key energy challenges highlighted in the framework and is well aligned to the region's economic diversification goals.

4.2.8 Shire of Chittering Local Planning Strategy (Shire of Chittering, 2019)

What is it?

This Strategy guides future land use planning and decision making and provides the rationale for land use and development controls to be included in the Council's *Local Planning Scheme No. 6*.

The strategic intent of the Shire's *Local Planning Strategy* is to 'Conserve and Consolidate'; to 'conserve' its natural areas and rural character, and to 'consolidate' future development in areas where infrastructure and services are available.

The Strategy seeks to provide for the majority of development activity in Bindoon and south, and to consolidate the northern portion of the Shire for primary production.

Alignment of the Project

The Project aligns with these strategic aims in that it will be co-located with existing transmission infrastructure and is located in the south of the Shire.

4.3 Statutory Planning

4.3.1 Shire of Chittering Local Planning Scheme No. 6 (DPLH, 2004)

The Shire of Chittering *Local Planning Scheme* (LPS) sets out the aims for development in the Shire, controls and guides land use, and determines the zoning and reservation of land for specific purposes. The Project is consistent with the general aims of the LPS in that:

- The Project overall provides for improved quality of air, by allowing the increased uptake of renewable energy and the phasing out of fossil fuels.
- It is in an area directly adjacent to a gas transfer station and electricity substation that is not productively used for agriculture at present.
- It will have design elements that reduce the risk of contamination of surface or groundwater.
- It does not require the disturbance, disruption or degradation of any remnant vegetation, waterways, or wildlife corridors.
- It promotes employment opportunities, particularly during construction.
- It provides essential infrastructure to stability the SWIS (South-West Interconnected System).

The LPS determines the zoning of land in the Project area as Agricultural Resource and also designates it as within a Water Prone area (DPLH, 2019). Based on consultation with the Shire of Chittering, under the Shire of Chittering LPS, the Project is best classified as a 'land use not listed'. The consistency of the Project in the context of the zoning and special control area requirements according to the LPS is provided below.

4.3.1.1 Agricultural land

The objective of agricultural resource zones within the Shire are to:

- Preserve productive land suitable for grazing, cropping and intensive horticulture and other compatible productive rural uses in a sustainable manner.
- Protect the landform and landscape values of the district against despoliation and land degradation.
- Encourage intensive agriculture and associated tourist facilities, where appropriate.
- Allow for the extraction of basic raw materials where it is environmentally and socially acceptable.

The Project is consistent with these objectives as follows:

- It is located within the southern portion of the Shire, rather than the North of the Shire that is intended for primary production as per the Shire of Chittering's *Local Planning Strategy* (Shire of Chittering, 2019).
- Landscape and visual impacts are reduced by co-locating the Project adjacent to the existing Muchea substation and Neerabup gas transfer station.
- Less than 10% (5 Ha) of the 57 Ha lot will be occupied by the Project, allowing the remaining lot to be utilized for agriculture, noting that it is not currently used for productive purposes.
- It provides one of the first BESS facilities in Perth, which community stakeholders indicated could be a tourist attraction during the stakeholder engagement sessions previously undertaken and further detailed in **Section 5.0**.

4.3.1.2 Water Prone area

Water Prone Areas are designated to assess and mitigate risk of inundation, preclude land use which may result in unacceptable impacts to surface and groundwater systems, and to ensure wetland values and ecological integrity are maintained. Conditions may be imposed on Development Approvals to address potential risks and impacts where necessary. Specific conditions may relate to effluent disposal, minimum floor heights in relation to water levels, and works which may alter the natural flow of surface water. In considering Development Applications within Water Prone Areas, the local government makes considerations for impacts to health and welfare of stakeholders, risks relating to nutrient pollution and eutrophication, and the relative proximity of the development to important water courses or wetlands.

Hydrogeological and hydrological assessments have been completed to understand site specific risk related to groundwater and flooding for the Project. The Project concept design has made consideration of these risks, and the following mitigations will be included as part of the ongoing design works:

- The effluent treatment unit will be designed as per Department of Health guidelines and in consultation with the Shire of Chittering Principal Environmental Health Officer.
- Potential impacts to surface water or groundwater during construction will be managed through the Construction Environmental Management Plan.
- Considering the flood modelling that has been completed **(Appendix 5**), and the height of the adjacent substation and gas transfer station, the bench height for the BESS facility will be up to 0.5 metres to mitigate risk of stormwater inundation.

- Risk of groundwater and surface water contamination during operation will be managed through controls as described in **Section 6.3.6**.

4.3.1.3 Amenity of Non-Residential Development

Factors considered relevant in determining the amenity of non-residential developments in the Shire are outlined in clause 4.20 of the LPS. The Project is consistent with these provisions as follows:

- The form and scale are consistent with the adjacent electricity substation and gas transfer station.
- The local community and nearby landholders have been engaged to identify local priorities and concerns in relation to the Project and ensuring it remains compatible with surrounding land uses (for more info, refer to **Section 5.0**).
- The conceptual design includes provision for staff and visitor parking.
- The conceptual design provides for a minimum of 10 percent of landscaping of the Project area.
- A range of baseline studies have been completed involving flora and fauna, noise, visual impacts, hydrology, traffic and transport, and bushfire which are further detailed in **Section 6.0**. As a result of these studies, the Project has demonstrated minimal impact to nearby social and environmental receptors.

4.3.2 Local Planning Policy No. 18 Setbacks (Shire of Chittering, 2018a)

The Shire's *Local Planning Policy No. 18* provides guidance on appropriate setbacks where they are not specified in the *Local Planning Scheme*. The minimum setback distances specified in the policy largely apply to buildings, and therefore do not apply to the main components of this Project. However, the following setbacks have been considered as a general guide where identified as suitable:

- In Water Prone Areas, the minimum building setback is 30m from an existing water body or highest known flood level. There are no water bodies in the nearby vicinity of the Project. While there are no records of flooding, the hydrological modelling completed for the Project does not indicate any significant risk of inundation during storm events (**Section 6.3.6** and **Appendix 5**).
- In the Agricultural Resource Zone, the following minimum setback distances apply to buildings:
    - Highway – 100 metres – the Project is approximately 1 kilometre from the highway.
    - Major Road – 50 metres – no major roads nearby.
    - Other Road – 30 metres – the Project fence-line will be approximately 102 metres from the access road.
    - Rear – 30 metres – the Project fence-line is approximately 134 metres from the rear of the lot.
    - Side – 30 metres – the Project fence-line is approximately 114 metres from the side of the lot to the east, and 786 metres to the west.

4.3.3 Local Planning Policy No. 13 Car Parking Requirements (Shire of Chittering, 2018b)

The Shire's *Local Planning Policy No. 13* outlines the requirements relating to vehicle access and parking for new developments within the Shire. This planning policy identifies the required parking spaces and suitable specifications according to land use. For land use not defined in this planning policy, the Local Government

is responsible for determining the suitable number of bays to be provided on site. The Project conceptual design currently incorporates 6 parking bays which allows for an expected 1-2 on-site employees at any one-time during operations and for 4 bays to be allocated for visitors.

Considerations for vehicle access during both construction and operations of the Project have been undertaken through the Traffic and Transport technical study outlined in **Section 6.1.4**. This study has determined that traffic generation from the site will be minimal during both construction and operation with the existing road network being sufficient to accommodate the volume generated.

4.3.4 State Planning Policy No. 2 – Environment and Natural Resources Policy (SPP2) (WAPC, 2003)

State Planning Policy No. 2 (SPP2) defines the principles and considerations that represent good and responsible planning in terms of environment and natural resource issues within the framework of the State Planning Strategy.

SPP2 specifically refers to reducing greenhouse gas emissions by decreasing reliance on non-renewable fuels, stating that 'planning strategies, schemes and decision making should support the use of alternative energy generation, including renewable energy, where appropriate.' SPP2 also includes measures related to the protection of the environment (biophysical and social), mitigation of impacts, and management of water resources, soil and land quality, biodiversity, and landscape values.

The Project is especially well aligned to these objectives of the policy related to energy and renewable energy capacity. It has considered the objectives and measures in SPP2 by completing studies to understand the biophysical and social environment, and developed measures to mitigate environmental impacts during construction and operation (see **Section 6.0**).

4.3.5 State Planning Policy 3.7 – Planning in Bushfire Prone Areas (WAPC, 2015)

State Planning Policy 3.7 applies to all land which has been designated as bushfire prone and all development applications on those lands. Specifically, developments in Bushfire Prone Areas must have a Bushfire Risk Assessment undertaken by an accredited professional which includes a Bushfire Attack Level (BAL) assessment, identification of any bushfire hazard issues, and compliance with criteria outlined in policy guidelines.

As the proposed project site is located in a designated Bushfire Prone Area, the Project has been designed to be compliant with this policy, and, to make considerations for the requirements under Section 6.5 (Information to accompany development applications). Design considerations made to ensure requirements under this policy were addressed include:

- An Asset Protection Zone (APZ) of 20 metres which has been assessed as sufficient to achieve a BAL-12.5 which is significantly lower than the highest acceptable BAL rating for the Project site (BAL-29).
- A Bushfire Management Plan (BMP) and Emergency Evacuation Plan (EEP) (**Appendix 10**) have been prepared for the Project and outline specific triggers and related procedures to ensure the Project remains compliant with requirements for managing fire hazard risk throughout construction and operation phases.
- Battery module design specifications that reduce risk of spread of fire between units as well as the capability to identify and isolate problematic units wherever necessary from Neoen's 24-hour monitoring facility.

Details relating to the Project's controls and risk management strategies for fire hazard risks are further outlined in **Section 6.1.7.**

4.3.6 Guidance Statement 33 – Environmental Guidance for Planning and Development (EPA, 2008)

Guidance Statement 33 provides an overview of the relevant environmental protection frameworks and processes implemented in Western Australia to assist in land use planning and development. In particular, the guidance statement describes procedures and requirements relating to referrals and environmental impact assessments delegated under Part IV of the EP Act. It combines the relevant State environmental and planning frameworks to provide standardised procedures for appropriate consideration and assessment of potential environment impacts at both a broad and local planning scale. These may include, but are not limited to, the undertaking of baseline studies and impact assessments, consultation with relevant government agencies, and identification of environmental objectives, priorities, and targets relevant to the Project location.

In considering *Guidance Statement 33*, Neoen has undertaken a range of technical studies to understand any potential impact to environmental factors listed under Part IV of the EP Act. Through this process it has been determined the Project is unlikely to require referral for further assessment by the EPA (as outlined in **Section 4.1.3**)**.** It is expected that any potential impacts that may arise can be sufficiently minimised and mitigated through the controls incorporated into the Project design and as part of ongoing management.

5.0 Stakeholder and Community Engagement

Engagement and consultation activities have been undertaken with a range of relevant stakeholders in preparing this development application to ensure stakeholder concerns and priorities are considered in the design of the Project. The stakeholder engagement process undertaken was aligned with Neoen's stakeholder engagement framework and further informed by best-practice stakeholder engagement approaches.

This section provides a summary of the engagement process and outcomes, and a more detailed description is provided in **Appendix 11**.

5.1 Engagement and Consultation Process

5.1.1 Aim

The key objectives addressed through this stakeholder engagement process were, and continue to be:

1. Foster a transparent and open approach to project development and ensure 'no surprises' for the local community.
2. Keep the community and stakeholders informed about the Project through the provision of accurate, timely and factual project information.
3. Identify and address community and stakeholder concerns and maintain transparency in the Project's design, implementation, and ongoing operations.
4. Involve stakeholders and community regarding key decisions.
5. Identify opportunities for local business involvement and local employment in the construction and operation of the Project.
6. Co-design, develop and deliver a benefit sharing program in collaboration with the community, and in partnership with local stakeholders where possible.
7. Develop long-term relationships and partnerships with community and stakeholders.

5.1.2 Stakeholders

The stakeholder groups engaged as part of this process included:

- Local community members from the Shire of Chittering.
- Nearby landowners.
- Those with special interests, including Chittering Landcare and the nearby Muchea Industrial Park.
- Relevant local and State government agencies.

5.1.3 Timeline

The timeline of stakeholder engagement to date on the Project is described in **Table 5.1**.

Table 5.1 Timeline of Stakeholder Engagement Activities

Date	Relevant Group	Activity	Summary
June 2021 - March 2022	**Government Agencies**	**Stakeholder meetings**	Relevant agencies contacted to discuss the Project and any concerns or opportunities from the perspective of each agency
Dec 2021 - Jan 2022	**Landowners**	**Initial contact via phone and / or letter**	Relevant landowners contacted to provide project information and arrange meetings for further clarification if necessary
Jan 2022	**Local Community**	**Consultation Invitations via newspaper, Shire of Chittering website and Facebook page, and a flyer**	Invitations sent to the local community via multiple mediums to attend consultation sessions held in February
Feb 2022	**Local Community**	**Stakeholder Meetings (Public Consultation Sessions)**	Consultation sessions held at the Muchea Hall to provide project information and understand local concerns and priorities from the wider community
Feb 2022	**All**	**Community Engagement Plan**	Results and outcomes of the community engagement activities undertaken are provided in report format and summarised in the final Development Application

5.2 Outcomes

5.2.1 Local Community

Community members that participated in the consultation sessions attended from Bindoon in the north of the shire to Lower Chittering in its south. Two consultation sessions were held at the Muchea Community Centre in February after the local community was notified through local newspapers, mail, and social media. Invitation was sent out in early January with sessions held on a Wednesday night and late Saturday morning in mid-February to accommodate as many attendees as possible. A project website was set up by Neoen to allow interested parties to review Project details prior to attending the consultation sessions.

Representatives from Neoen and Umwelt (Australia) Pty Ltd were present at the sessions to discuss the Project design with local community members and provide further information and clarification where needed. Community members made use of both online and written surveys to provide feedback, with notes also taken by an Umwelt consultant of key points verbally raised by attendees during each session.

Overall, the participants of the community sessions indicated a high level of interest and support for the Project which was primarily a result of their nearby residential location and personal interest in renewable energy development. Concerns relating to the Project that were raised by session attendees revolved around bushfire risk and potential impacts to the surrounding environment from the Project.

When respondents were asked about potential focuses for a community benefit-sharing scheme, a majority indicated preference for an environmental or biodiversity project, followed by investment in local community building initiatives and renewable energy educational resources for local schools. It is Neoen's intention that a community benefit-sharing program be established when the Project commences operations and be focused on priority areas for the local community.

Nearby landholders were initially contacted using details collected from publicly available databases. Letters were issued to landholders which introduced the Project and contained the Project website address, which contains information relating to the Project's purpose, design and lifecycle and an online survey. Landholders were also invited to attend the community sessions held for the wider community as well as being provided the opportunity to discuss any concerns and questions in detail via private meetings with a Project consultant from Umwelt. Out of the seven nearby landowners identified, no individuals indicated the need for further discussions or clarity around the Project. Communication channels have been established to ensure on-going engagement.

5.2.2 Special Interest Groups and Industry

Special interest groups and industry consulted as part Project development include:

- The Chittering Landcare Group
- Harvis Capital Pty Ltd
- Western Power.

Chittering Landcare Group were contacted as they hold local information on catchment management in the area. Their response indicated that no great concerns were likely, however they will be considering the drainage and inundation risks, use of ATUs for ablution blocks, and vegetation screening. These aspects are discussed in **Section 6.0**.

Harvis Capital Pty Ltd (Harvis) are the owners of the nearby Muchea Industrial Park. They were contacted to discuss any concerns around the location of the battery or opportunities the Project might present for Harvis. No comments or concerns were raised during discussions with Harvis.

Neoen has held several conversations since mid-2021 with Western Power (WP) regarding connection of the Project into the grid. Since then, WP has conducted a high-level desktop assessment stating the scope and requirements for a detailed enquiry assessment. Currently Neoen is engaging with WP to undertake a detailed enquiry assessment. This engagement with WP will be ongoing and will continue until the granting of the access letter and commissioning of the Muchea Battery Facility.

5.2.3 Government Agencies

Relevant government authorities or stakeholders with an interest in the Project or potential to be involved in the approval pathway were engaged to discuss the Project and address any concerns. There was also an aim of understanding priorities at both a state and local level to ensure the Project remains aligned with the overall development goals in the region. During discussions, Umwelt provided information on the Project and obtained feedback from representatives of these agencies on potential approval requirements,

areas of concern and general considerations relating to their field of interest. The government agencies engaged through this process and the details of engagement are provided in **Table 5.2.**

Table 5.2 Government Agency Stakeholders

Stakeholder	Timeline	Outcome
The Shire of Chittering	June - Feb 2021	The Shire of Chittering provided general direction in aspects relating to the Project's development application (this Report) and other relevant referring agencies that may be involved in the approval's pathway.
Department of Jobs, Tourism, Science and Innovation (JTSI)	July 2021	Discussions with JTSI were centred around development pathways for the WA renewable energy industry and the WA Future Battery Industry Strategy.
Department of Planning, Lands and Heritage (Development Assessment Panel Secretariat; Aboriginal Heritage)	June 2021 (DAP) Feb 2022 (Aboriginal Heritage)	Provided guidance on the JDAP process. Confirmed that there are no interactions with known Aboriginal Heritage Places or sites and no approvals required.
Department of Water and Environmental Regulation (DWER)	Dec 2021	No major concerns were raised regarding ASS, groundwater, or other potential water impacts. A noise impact assessment was conducted to ensure compliance with regulatory guidelines (*EP regulations* (*Noise*)).
Department of Fire and Emergency Services	Jan 2021	A BAL assessment has been undertaken and the necessary controls implemented to achieve an acceptable level of bushfire risk. It has been determined the application will be referred to DFES for assessment due to being a high-risk land use (battery facility). DFES may recommend conditions related to Unexploded Ordnance (UXO) risk, though no further work is required for the Development Application.
Department of Mines, Industry Regulation and Safety (DMIRS)	February 2022	DMIRS were contacted regarding potential restrictions as related to the Special Prospecting Authority (SPA34) and exploration lease (E70/4905) that cover the Project area. Comment from DMIRS is that the project will be referred to DMIRS if there are any aspects of these tenure types that need to be considered as part of the proposed Project.
Department of Biodiversity, Conservation and Attractions (DBCA)	March 2022	DBCA noted that the Project is unlikely to be referred to them as is it not within pre-European vegetation, or a Conservation or Resource Enhancement Wetland. Suggested that a good use of the community benefit fund might be conservation programs for the Western Swamp Tortoise, which is an iconic local species and critically endangered.
Australian Gas Infrastructure Group (AGIG); DPLH	Sept 2021	AGIG has provided study conditions for any proposed overhead power line crossing on the existing gas pipeline easement. Neoen will complete the required work as part of detailed designs if required.

Stakeholder	Timeline	Outcome
Main Roads WA	Nov 2021	Main Roads WA were consulted as part of the Traffic Assessment. They advised that roadworks are intended on Brand Hwy in 2022. Main Roads WA will be consulted further as the Project nears construction.

5.3 Future Consultations

Neoen aims to maintain community and stakeholder engagement throughout the project lifecycle, i.e., development, construction, operation, and decommissioning. A dynamic community relations plan will be prepared and will be updated on a regular basis.

Continued consultation and engagement, through the means of social and traditional media, will encourage community involvement in the Project. Neoen will take particular care with key stakeholders, including neighbouring landowners, ensuring they are kept satisfied and informed by undertaking private briefings.

A specific email address, dedicated phone number, and online forum would be set up to receive and address any expressions of concern from the community throughout the project lifecycle.

6.0 Development Impacts and Mitigations

This section describes:

- The technical studies that have been completed to understand potential impacts and inform appropriate mitigation measures (**Section 6.1**).
- Potential impacts and proposed mitigation measures during construction (**Section 6.2**).
- Potential impacts and proposed mitigation measures during operations (**Section 6.3**).

6.1 Baseline Studies to Inform Impacts and Mitigation

An environmental and planning constraints analysis was conducted as part of a preliminary assessment for the Project. A range of technical studies were identified as part of the initial constraints analysis with the aim of understanding potential environmental impacts and appropriate mitigation measures. A summary of the findings from these technical studies is provided in further detail below.

6.1.1 Hydrogeology and Acid Sulfate Soils

A groundwater and Acid Sulfate Soils (ASS) study was completed to help understand the risks associated with groundwater in the Project area, determine the highest groundwater level, install groundwater bores for ongoing monitoring, and to collect samples for an initial ASS assessment. The construction of the bores and sampling methodology is described in **Appendix 4**.

The bore construction confirmed that groundwater levels are near to the ground surface. Groundwater levels in the two monitoring bores ranged from 0.475 to 0.573 metres below ground level (mbgl) at the date of bore construction (5 October 2021). As the groundwater levels were collected part way through spring (5 October), it can be assumed that groundwater levels will be near or at ground surface during a wet winter. Groundwater levels in the two bores also confirmed that groundwater flow is to the east, away from the P1 drinking water protection area and towards Ellen Brook.

ASS screening indicated a low potential for ASS in the upper 2.3 metre silty sand profile. The pale grey sand from 2.3 mbgl showed some indications of acidity under oxidising conditions, with a pH_{fox} of <4 and a change in pH of up to 3.7. This suggests the material may be potentially acid sulfate soil (PASS). No dewatering or excavation below this depth is required and no further mitigations are required.

Given that the Project is in a water prone area and there is minimal separation to groundwater, risks around groundwater contamination have also been accounted for and mitigated through the Project design considerations outlined in **Section 6.3.6**.

The Project is also within a “Multiple Use Wetland”, as per the *Geomorphic Wetlands Swan Coastal Plain* dataset (DBCA, 2014). Multiple use wetlands have few remaining important attributes and functions, and development in these areas should be considered in the context of ecologically sustainable development and best practice catchment management. The Project meets this objective through avoidance of any clearing and the implementation of the mitigations as described in **Sections 6.2** and **6.3**.

6.1.2 Hydrology

Hydrological and hydraulic modelling was undertaken to define the risks associated with surface water flooding in the Project area and estimate the potential flood inundation extents from mainstream flooding of Ellen Brook and local overland flow catchments. Refer to **Appendix 5** for more detail on the flood modelling methodology.

The Site is located adjacent to the Ellen Brook, a tributary of the Swan River. The limit of existing flood mapping for Ellen Brook is at Rutland Road, Bullsbrook, some 11 km downstream of the Site (DWER, n.d.). With no existing flood mapping available for the Project area, hydrological and hydraulic modelling was undertaken to simulate design flood inundation extents for the principal flood planning event (1% Annual Exceedance Probability). Given the availability of LiDAR topographical data, a TUFLOW two-dimensional (2D) model of a local reach of the Ellen Brook and the local overland drainage catchments around the Site was developed.

The Project Area is not subject to inundation from Ellen Brook at the 1% AEP flood level. The peak flood inundation extents along Ellen Brook are confined to east of the Brand Highway. The simulated Ellen Brook flood extents adjacent to the Project area are consistent with the general widths of floodplain inundation in the DWER mapping for the reach downstream of Bullsbrook.

Overland flow is derived from the local catchment areas west of the Project area. There are constructed drainage lines to south of the Project area with other drainage paths following the local topographical depressions. Given the limited local catchment area and typically high infiltration rates, local runoff generation only provides for shallow overland flow around the Project area which will be managed through typical site drainage provisions.

6.1.3 Flora and Vegetation

Given the Study Area is predominately cleared, the likelihood of occurrence of listed flora and fauna species is considered low. However, a targeted field survey was completed to confirm listed flora species are not present in or near the proposed Project area. Further details are provided in **Appendix 6**.

Two small pockets of degraded vegetation occur in the north-western and south-western corners of the Study Area, outside of the proposed development footprint. There are no records of significant flora or matters of national environmental significance within the Study Area. No vegetation in the Study Area was representative of any listed Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) and was not considered to be significant under the EPA's *Technical Guidance* or *Factor Guidelines*.

Two Declared Pests were recorded in the Study Area, being Arum Lily (*Zantedeschia aethiopica*) and One-leaf Cape Tulip (*Moraea flaccida*). These are Declared Pests under *the Biosecurity and Agriculture Management Act 2007* (BAM Act) for the whole of state (DAWE, 2021) and will be managed in accordance with the *Biosecurity and Agriculture Management Act 2007* (BAM Act).

As the flora survey indicated that the proposed Project area is completely cleared, there is a very low risk of impact to fauna species as part of the construction or operation of the Project.

6.1.4 Traffic and Transport

A traffic assessment was completed to assess the potential transport impacts of the Muchea BESS, including implications for the construction and operation of the Project. The traffic assessment is included in **Appendix 7.**

A Low Impact assessment was undertaken (<10 vehicle trips in the subdivision or development's peak hour) whereby key transport issues were identified and assessed, including:

- Access for construction vehicles and traffic generation.
- Sight Line Assessment.
- Over Sized, Over Mass Movements.

The site will generate minimal movements during both construction and operational phases. All access will be via Byrne Road and Brand Highway in Muchea and the volume of traffic generated can be accommodated on the existing network. The sight line analysis has determined that the existing configuration of the intersection of Byrne Road and Brand Highway, as well as the approaches, are considered appropriate.

The site would require delivery of materials during the construction stages that would require use of RAV Network 7 vehicles and a small number of Over Width truck movements. Brand Highway is a RAV Network 7 road that is capable of catering for most over-sized deliveries to the site, with specialised delivery of indivisible loads of 4.3-metres-wide requiring permits through Main Roads WA to ensure they are managed accordingly.

The overall traffic impact of the site is low. As the Project detailed design progresses, transport requirements will be confirmed, and Main Roads WA will be further consulted on permitting.

6.1.5 Noise

A preliminary environmental noise study was undertaken with the objective of identifying potential noise impacts to nearby sensitive receptors (**Appendix 8**). Following identification of nearby sensitive receptors, the study undertook both unattended and attended acoustic monitoring at several locations to map the existing acoustic environment. Predicted noise levels generated by the Project were then evaluated against noise criteria defined by the *Environmental Protection (Noise) Regulations 1997* and in the context of the existing acoustic environment in the area.

The study determined the Project to be compliant with relevant noise criteria without any additional mitigation measures implemented. It was noted that the Project may have potential to become audible for two of the most nearby sensitive receptors on Byrne Rd and Brand Highway during periods of low background noise, however noise criteria will not be exceeded.

6.1.6 Visual Assessment

A visual assessment was completed to determine the areas within and surrounding the Project area that could potentially be impacted visually by the proposed development. A viewshed analysis was performed for 5 viewpoints surrounding the Project area using a digital elevation model created from available elevation data (LiDAR – Geoscience Australia). Each analysis reflects what would be visible from that point (each point is 1.7m above ground level to reflect the average height of a person) with the corresponding display representing visible ground surface to the extent of the model. This is considered a "worst case" scenario as it does not account for screening vegetation. Refer to **Appendix 9** for more details.

Each viewpoint location had some level of visibility of the Project area. Topography aided in reducing this impact in places and as the model only reflects natural surface, existing tree screening from adjoining properties particularly to the south of the Project area will contribute to further reduction in visibility.

Largely due to proximity, viewpoint location 1 will have a higher level of impact, however existing tree screening will also reduce this impact.

6.1.7 Bushfire

A Bushfire Management Plan (BMP) and Emergency Evacuation Plan (EEP) were prepared to meet the requirements for a Development Application in a Bushfire Prone Area. A Bushfire Attack Level (BAL) assessment was completed by an accredited BPAD Practitioner in accordance with Simplified Procedure (Method 1) in *AS 3959-2018 Construction of Buildings in Bushfire Prone Areas*. The proposed development footprint was assessed against the *Guidelines for Planning in Bushfire Prone Areas – Bushfire Protection Criteria* (WAPC, 2017), and a Bushfire Emergency Evacuation Plan was prepared in accordance with *the Guide to Developing a Bushfire Emergency Evacuation Plan* (WAPC, 2019). Refer to **Appendix 10** for more details.

The immediate bushfire hazard risk to the project without mitigation is from flat grassland. With the installation of an Asset Protection Zone (APZ) of 20 metres surrounding the development and with offsets as described in the BMP, it is possible to achieve a BAL-12.5. Achieving a BAL-12.5 rating may be considered acceptable for this project, considering it is a “high-risk” land use. If a BAL-12.5 rating is not acceptable, a BAL-LOW rating can be achieved by maintaining an APZ of 50 metres around the proposed development. As the site is not serviced by reticulated water, the BMP indicated that a minimum of 10,000L fire water tank is required to be installed on the property and provided with a hardstand of 17.5m x 17.5m within 3 metres of the outlet.

The proposed development does not comply with Bushfire Protection Criteria Element 3: Vehicular access as Byrne Road is a cul-de-sac. However, the exposed risk is minimal as the proposed project is not an urban development in nature and does not involve/increase the number of residents utilising Byrne Road.

6.2 Construction Impacts and Mitigation

Neoen will contract out the construction of the Project through an Engineering, Procurement and Construction (EPC) contract. As part of the contract and prior to mobilisation to site, the EPC contractor will be required to prepare a Construction Environmental Management Plan (CEMP) for sign off by Neoen.

All potential environmental impacts that might occur during construction will be addressed in the CEMP. Potential impacts and appropriate mitigation controls might include but not be limited to the following:

- dust emissions
- noise emissions
- flora and fauna, including weeds
- stormwater, including erosion and sedimentation
- acid sulphate soils
- waste management
- heritage
- traffic and transport
- Unexploded ordnance (UXO).

Preliminary identification of appropriate controls for the above aspects are described in the following sections.

6.2.1 Dust

The potential for dust impacts is primarily a result of minor clearing, transport and earthworks required for the construction phase of the Project. The CEMP to be prepared for the Project will address these potential dust emissions and include necessary mitigation measures to avoid, minimise, or mitigate impacts to a suitable level.

6.2.2 Noise

A technical study undertaken on the noise risk to nearby sensitive users has identified the closest sensitive land users as private residences approximately 1km to the East and West of the proposed project site. The noise assessment indicated that noise criteria as per the *Environmental Protection (Noise) Regulations 1997* will not be exceeded during the operation stage of the Project, however potential construction impacts were not assessed. Construction activities will be during the hours of 7am to 7pm Monday to Friday and possibly during the same hours on Saturday, so it is unlikely that noise levels will exceed noise criteria during these times.

6.2.3 Flora and Fauna

6.2.3.1 Flora

The Project area is completely cleared land and there is limited to no risk of impact to flora and vegetation. The CEMP will include provisions to ensure no clearing of native vegetation is undertaken for the project.

Two declared pests were recorded at the proposed project site which were Arum Lily (*Zantedeschia aethiopica*) and One-leaf Cape Tulip (*Moraea flaccida*). Adequate weed management plans will be implemented as part of the CEMP to monitor, mitigate, and prevent further spread of these declared pests.

6.2.3.2 Fauna

There is minimal risk of impact to fauna risk as the Project is in cleared agricultural land. The contractor's CEMP will include provisions for managing fauna interactions on-site, which may include pre-work checklists to ensure fauna are not present or can be safely moved on before construction activities commence.

6.2.4 Stormwater

The main hydrological consideration for the Project's construction phase is increased risk of sediment runoff from cleared areas during storm events. Flood modelling indicates that there is minimal risk of surface water inundation at the Project site, and there are no surface watercourses located in or near to the proposed project site.

A temporary sediment basin is expected to be constructed, with its size based on the volume and area of earthworks. Typical erosion and sediment control measures such as silt fences, diversion bunds, rock check dams and construction entry/exit pads will divert rainfall runoff into the temporary sediment basin to enable the settlement of suspended solids.

Existing ground vegetation maintains surface stability. As such, the removal of vegetation will be limited to only those areas where construction works are required.

The contractors CEMP is expected to include controls as necessary to mitigate erosion and sedimentation potentially impacting downgradient areas.

6.2.5 Acid Sulphate Soils

Soil samples were collected during the construction of monitoring wells at the proposed project site and preliminary laboratory analysis of these samples has indicated a low potential for ASS to be present in the upper 2.3 metre soil profile which consists of silty sand.

No dewatering or excavation is required below 2.3 metres and no further mitigations are required.

6.2.6 Waste Management

Throughout the construction phase, the EPC contractor will sort any waste produced by the Project into bins that are determined by defined categories of recyclable materials. Waste management provisions will be specifically addressed in the contractor's CEMP. Furthermore, implementation of the CEMP will be closely monitored by Neoen to ensure compliance with the approved waste management actions and controls.

6.2.7 Heritage

A review of the Aboriginal Heritage Inquiry System has revealed no Registered Aboriginal Sites or Other Heritage Places are recorded within the study area from a total of 16 surveys previously undertaken. This provides a high level of confidence that the site has been extensively surveyed and risk to Aboriginal heritage values remains minimal to nil. The Department of Planning, Lands and Heritage has been consulted on the Project and confirm that there are no further requirements regarding Aboriginal heritage.

There are no European or other Australian heritage sites identified in the Project area.

Neoen will require that the contractor's CEMP includes management measures related to heritage. This may include procedures around stopping work if unexpected heritage finds are made during construction.

6.2.8 Traffic and Transport

Technical analysis of the traffic and transport risk posed by the construction phase of the Project has identified that the site will generate minimal movements with all access via Byrne Rd and Branch Highway in Muchea. The volume of traffic expected to be generated can be accommodated on the existing road network. Site line analyses have determined existing intersection configurations and approaches to be used are considered appropriate. During the construction stage, materials would be delivered using RAV Network 7 vehicles and a small number of Over Width truck movements, for which the relevant permit will be obtained from Main Roads WA.

6.2.9 Unexploded Ordnance (UXO)

The Project is in an area where the UXO category is 'Slight', which means the possibility exists that dangerous items of UXO may still be found on the site. Based on consultation with the Department of Fire and Emergency Services, there is no requirement to assess or search the site for UXO.

The ‘Slight’ risk of UXO will be documented in the contractors CEMP, with a procedure to contact police if a suspicious item that may be an UXO is found.

6.3 Operational Impacts and Mitigation

Neoen will develop an Environmental Management Plan prior to the Project being operational which will provide appropriate mitigations for potential environmental impacts.

Environmental impacts that have the potential to occur during the operational phase of the Project might be related to:

- visual amenity
- hazardous materials and hydrocarbons
- noise
- fire
- vehicle movements and parking
- protection of surface water and groundwater.

The following sections provide a preliminary identification of appropriate controls for the above aspects.

6.3.1 Visual Amenity

A visual assessment was conducted to determine the visual impacts associated with the Project in November 2021, as described in **Section 6.1.6**. This assessment revealed potential worst-case visibility of the Project area from a number of location viewpoints around the proposed Project site (**Appendix 9**). Topography has aided in reducing the visual impact of the Project and existing tree screen from adjoining properties will contribute further to a reduction in visibility. If the impact to viewpoint location 1 is not acceptable, further tree screening along Byrne Road and the north-eastern portion of the Project area would help mitigate this impact. The figures in **Appendix 9** can be used to assist in the consideration of a broader screening program if required.

The Project is also located adjacent to an existing electricity substation and gas transfer station, so it is visually consistent with the local landscape.

While the visual impact from the Project is expected to be low based on the visual assessment, the Project will include a minimum of 10% of the area as landscaping, as per clause 4.20 of the Shire’s *Local Planning Scheme No. 6* (DPLH, 2004), which will further reduce any visual impacts.

6.3.2 Hazardous Materials

Risks relating to hazardous materials on-site primarily involve potential spills or leakages leading to contamination of the surrounding environment, or fire hazard risk from combustible materials. To address these risks, battery modules are not opened on-site and are monitored 24 hours a day by an external facility. Through external monitoring and regular on-site inspections, Neoen can identify and isolate any problematic units and implement further controls where necessary to minimise potential risks.

Potentially hazardous materials that are expected to be stored and handled on-site have been outlined in **Section 4.1.8**. These materials will be managed in accordance with the *National Code of Practice* and

National Standard for the storage and handling of dangerous goods, as well as the WA *Dangerous Goods Safety Act 2004* (DGS Act) and WA *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007.* Neoen will implement the Australian Standards (AS) for the management of these materials, such as AS3780 for the storage and handling of corrosive substances and AS1940 for the storage and handling of flammable and combustible liquids. Where these substances exceed the manifest thresholds outlined in the DGS Act, Neoen will liaise with DMIRS in obtaining a Dangerous Goods Site Licence and undertaking a high-level risk assessment to evaluate the potential risk and identify suitable controls.

6.3.3 Noise

The noise assessment undertaken for the Project indicates that noise criteria as per the *Environmental Protection (Noise) Regulations 1997* will not be exceeded at sensitive receptors (nearby residences). However, modelling indicates that there may be periods when the noise generated by the Project will be higher than background environmental noise at two nearby residences. This will only occur when the Project is operating at maximum capacity at the same time as environmental noise is at a minimum, and noise criteria will not be exceeded.

6.3.4 Fire

The Bushfire Management Plan prepared in 2021 identified bushfire risks and appropriate controls for the Project (**Appendix 10**). The Bushfire Attack Level (BAL) assessment completed as part of the BMP identified the immediate bushfire risk to the Project as from the surrounding flat grassland. The Project will achieve BAL-12.5 rating through the installation of a 20 metre Asset Protection Zone (APZ) and other measures described in the BMP, which is considered suitable for land use classified as 'high risk'. The BAL of the Project site can be reduced further by increasing the size of the APZ to achieve a BAL-LOW, should this be deemed necessary by the Shire. As the site is not currently serviced by reticulated water, a 45,000 L fire water tank will be installed on the property with a hardstand of 17.5 metres x 17.5 metres within 3 metres of the outlet. This exceeds the minimum requirement of a 10,000 L fire water tank as recommended in the Bushfire Management Plan. It is expected that these design considerations and the implementation of the Bushfire Management Plan and Emergency Evacuation Plan (**Appendix 10**) will provide sufficient controls to mitigate bushfire risk appropriately.

Controls will be implemented to mitigate the risk of fire at the Project to as low as reasonably practicable (ALARP). These measures include:

- Self-containment of battery modules through highly insulated steel encasing used to encapsulate modules.
- Installation of thermally insulated steel vents within the thermal roof protecting the units from flame impingements and hot gas intrusion.
- Active monitoring and electrical fault safety devices which ensure the units only remain operational within their intended operating environment, with an automated shut-down system.
- Design of the facility with sufficient separation distances between battery modules and other Project infrastructure such that fire will not propagate.

The above measures in combination with the controls implemented on site, such as the BMP and EEP, will reduce fire hazard risk from the Project to within acceptable levels.

6.3.5 Vehicle Movement and Parking

The traffic assessment completed for the Project (**Section 6.1.4**) has identified that the existing road network is sufficient to accommodate the limited volume of traffic generated during the operational stage of the Project. Primary vehicle movements and parking during operations will be related to operational and maintenance staff who are expected to utilise on-site parking and generate minimal traffic volumes. All access to the Site will be via Byrne Road and Brand Highway.

Sufficient parking has been included in the concept design to accommodate the expected number of employees and visitors to the site (see **Appendix 1**).

6.3.6 Surface Water and Groundwater

Potential impacts relating to surface and groundwater during the Project's operational phase primarily relate to degradation of groundwater, water courses, or nearby land due to runoff of infiltration of contaminated water. Groundwater is close to the surface and there is limited separation between natural ground level and the water table, so risks around groundwater contamination will need to be managed. There is no risk of the Project impacting the P1 Gnangara Groundwater Public Drinking Water Source Area (PDWSA), as the P1 area is upgradient of the Project with groundwater flowing to the east of the Project and away from the P1 area.

Contamination of surface water courses or sensitive land uses is not considered to be a significant risk as there are no nearby watercourses or sensitive receptors. Ellen Brook, the nearest water course to the project, is approximately 1.5 kilometres downgradient of the project.

Community members have expressed concern that there is the risk of groundwater contamination from the project, particularly in case of a fire.

Controls to mitigate potential impacts to groundwater or surface water from the Project will include:

- Batteries will be self-contained within encapsulated modules and will not be opened while on site.
- Modules encasing the batteries can contain small leaks in the event of failure.
- The Project will be constructed on a pad of up to 0.5 metres, providing additional separation from groundwater.
- The need for secondary containment of spills or further mitigations will be considered as part of detailed design.
- The Project's Environmental Management Plan will include provisions around monitoring and management of potential spills. This will likely include monitoring of the two shallow groundwater bores that have been constructed upgradient and downgradient of the Project (see **Figure 2.1**, **Section 2.0**).
- Implementation of fire management controls as described in **Section 6.3.3**.

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APPENDIX 1

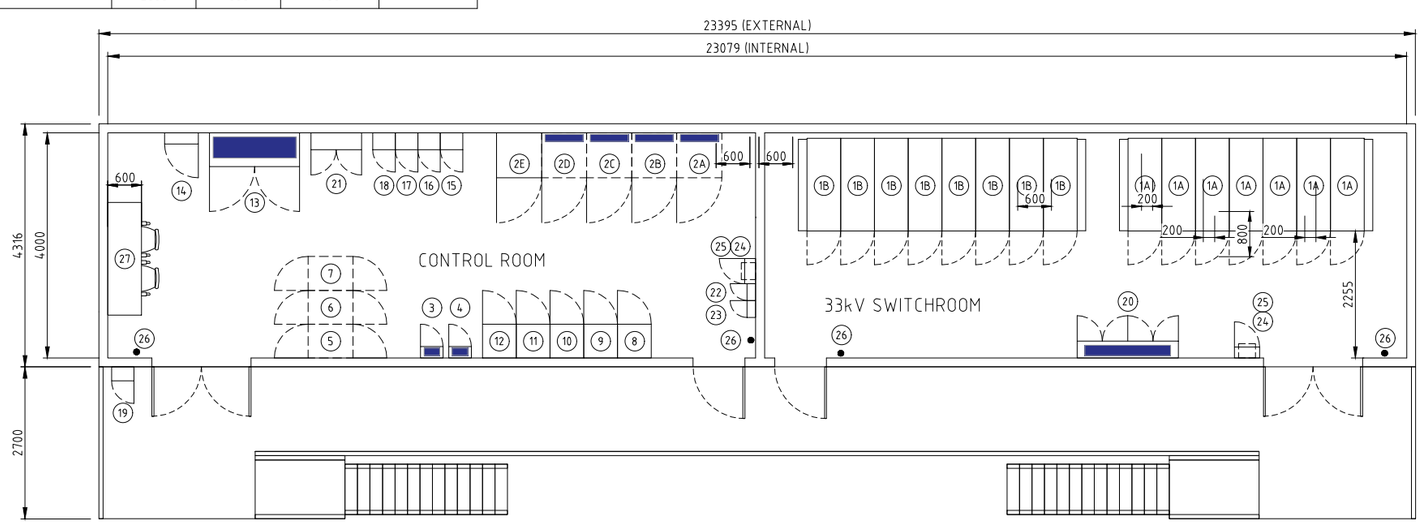
Concept Site Plans and Elevations

SWITCHROOM EQUIPMENT TABLE						
ITEM No.	QTY	DESCRIPTION	WIDTH (mm)	DEPTH (mm)	HEIGHT (mm)	HEAT OUTPUT (W)
1A	7	33kV SWITCHBOARD 8DA10 (SECTION 1)	600	1645	2570	TBC
1B	8	33kV SWITCHBOARD 8DA10 (SECTION 2)	600	1645	2570	TBC
2	5	PROTECTION & CONTROL PANELS	800	800	2300	100
3	1	FOBOT PANEL - OPGW (WALL MOUNTED)	400	200	600	50
4	1	FOBOT PANEL - INTERFACE (WALL MOUNTED)	400	200	600	50
5	1	COMMUNICATIONS PANEL (SUPPLIED BY OTHERS)	600	800	2300	(1000 - TBC)
6	1	SCADA EQUIPMENT PANEL (SUPPLIED BY OTHERS)	600	800	2300	(1000 - TBC)
7	1	IT SERVER EQUIPMENT PANEL(SUPPLIED BY OTHERS)	600	800	2300	(1000 - TBC)
8	1	230V AC No.1 UPS SUPPLY (4kW)	600	600	2400	750
9	1	125V DC No.1 BATTERY CHARGER PANEL	600	600	2400	750
10	1	125V DC No.1 BATTERY STRING PANEL	600	600	2400	250
11	1	125V DC No.2 BATTERY CHARGER PANEL	600	600	2400	250
12		125V DC No.2 BATTERY STRING PANEL				
13	1	415V AC No.1 MAIN SWITCHBOARD (CHANGE-OVER)	1800	600	2200	500
14	1	415V AC SUB-MAIN BOARD/PANEL (LIGHT & POWER)	600	200	800	100
15	1	230V AC UPS DISTRIBUTION BOARD/PANEL	400	300	800	50
16	1	125V DC No.1 DISTRIBUTION BOARD/PANEL	400	300	800	50
17	1	125V DC No.2 DISTRIBUTION BOARD/PANEL	400	300	800	50
18	1	48V DC AUXILIARY DISTRIBUTION BOARD/PANEL	400	300	800	250
19	1	SUBSTATION YARD LIGHTS CONTROL PANEL (IP55)	400	300	600	50
20	1	CABLE TERMINATION CUBICLE - 4 STRIP	1800	300	2100	-
21	1	CABLE TERMINATION CUBICLE - 2 STRIP				
22	1	HVAC CONTROL SYSTEM	300	150	400	100
23	1	BUILDING ACCESS CONTROL SYSTEM	300	150	400	50
24	2	FIP	450	192	650	100
25	2	VESDA	300	250	80	50
26	4	FIRE EXTINGUISHER	TBC	TBC	TBC	-
27	1	DESK & 2 CHAIRS	2000	600	700	-

PROTECTION & CONTROL PANEL TABLE	
ITEM No.	DESCRIPTION
2A	RESERVED FOR 330kV PANELS (SUPPLIED BY OTHERS)
2B	RESERVED FOR 330kV PANELS (SUPPLIED BY OTHERS)
2C	RESERVED FOR 330kV PANELS (SUPPLIED BY OTHERS)
2D	RESERVED FOR 330kV PANELS (SUPPLIED BY OTHERS)
2E	33kV QUALITY OF SUPPLY & METERING CABINET

NOTES:

1. ELEVATED BUILDING PROVIDED IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS AND NCC REQUIREMENTS.
2. BUILDING SUPPORT STRUCTURES TO HAVE A MINIMUM HEIGHT OF 1500mm.
3. BUILDING INTERNAL CEILING HEIGHT TO BE MINIMUM 3200mm FROM FLOOR.
4. FLOORS, WALLS, AND CEILINGS TO PROVIDE A MINIMUM FRL OF 120/120/120 OUTSIDE TO INSIDE.
5. DOORS TO PROVIDE A MINIMUM FRL OF 120/120/120.
6. ALL FLOOR, WALL AND CEILING PENETRATIONS TO RESPECT FRL RATING UNLESS EXPLICITLY PROVIDED FOR VENTING PURPOSES.
7. WALLS AND CEILING TO BE INSULATED TO A MINIMUM OF R2.5 FITTED TO THE INNER AND OUTER SKIN OF THE WALLS AND CEILING.
8. MAIN EARTH BAR LOCATED UNDER SWITCHROOM BUILDING FLOOR, TO BE CONNECTED AT TWO POINTS TO THE SUBSTATION EARTH GRID.
9. A LOW RESISTANCE ELECTRICAL CONNECTION (>70mm^2 GREEN/YELLOW PVC INSULATED) SHALL BE PROVIDED BETWEEN THE LIGHTNING SPIRES AND THE MAIN EARTH BAR.
10. STAIRWAY, HANDRAIL AND PLATFORM DIMENSIONS SHALL BE AS PER AS1657. ALL HANDRAILS TO BE REMOVABLE TYPE.
11. ALL DOORS TO BE FITTED WITH PANIC BARS. EXTERNAL DOORS TO UTILISE DEAD BOLT LOCKS KEYED TO SUIT PROJECT REQUIREMENTS.
12. FLOOR TOLERANCE ±1mm IN ALL DIRECTIONS UNDER 33kV SWITCHGEAR PANELS AND A MAXIMUM OF±3mm OVER THE ENTIRE SWITCHBOARD LENGTH FOR 1M IN FRONT OF SWITCHBOARD.
13. STAIRS TO EXTEND TO A CONCRETE LANDING PROVIDED SEPARATELY AS PER AS1657.
14. WEATHERHOOD TO BE INSTALLED ABOVE ALL EXTERNAL DOORS. INSTALLATION TO BE COMPLETED ON SITE.
15. BUILDING IDENTIFICATION AND MARKING TO BE PROVIDED AS PER AS2067 REQUIREMENTS.
16. CUBICLES/CABINETS WITH ▬ REPRESENT BOTTOM ENTRY CABLE ZONES.



33kV SWITCHROOM & CONTROL ROOM GENERAL ARRANGEMENT

SCALE 1:50

CONCEPT

NOT FOR CONSTRUCTION

DRAWING TO BE SCALED FROM A1 SHEET

DRAWING TO BE PRINTED IN COLOUR

PLEASE NOTE

NEOEN

REV No.	REVISION DESCRIPTION	DRAWN BY	CHECKED BY	APPR'D BY	DATE
A	ISSUED FOR CONCEPT DESIGN	IS	AB	FH	10.02.2022

Downer Relationships creating success

CLIENT: NOEON	PROJECT NUMBER: 3499234	PROJECT NAME: MUCHEA BATTERY ENERGY STORAGE SYSTEM	
DRAWN BY: I.SEIF DATE: 10.02.2022	DESIGNED BY: F.HUOT DATE: 17.12.2021	TITLE: MUCHEA BESS 200 MW/400 MWh BATTERY PLANT CONTROL ROOM LAYOUT	SHEET SIZE: A3
DRG. CHECKED BY: A.BOOL DATE: 10.02.2022	DES. CHECKED BY: H.GEBREMARIUM DATE: 17.12.2021		
CAD FILE No: MUBP-ES-GNA-84-94-0001.dwg	APPROVED: F.HUOT DATE: 10.02.2022	SCALE: 1:SCALE	DRAWING No: MUBP-GN-LAY-80-00-0001 REVISION: A

PLOT DATE: 04 March, 2022 - 4:18pm

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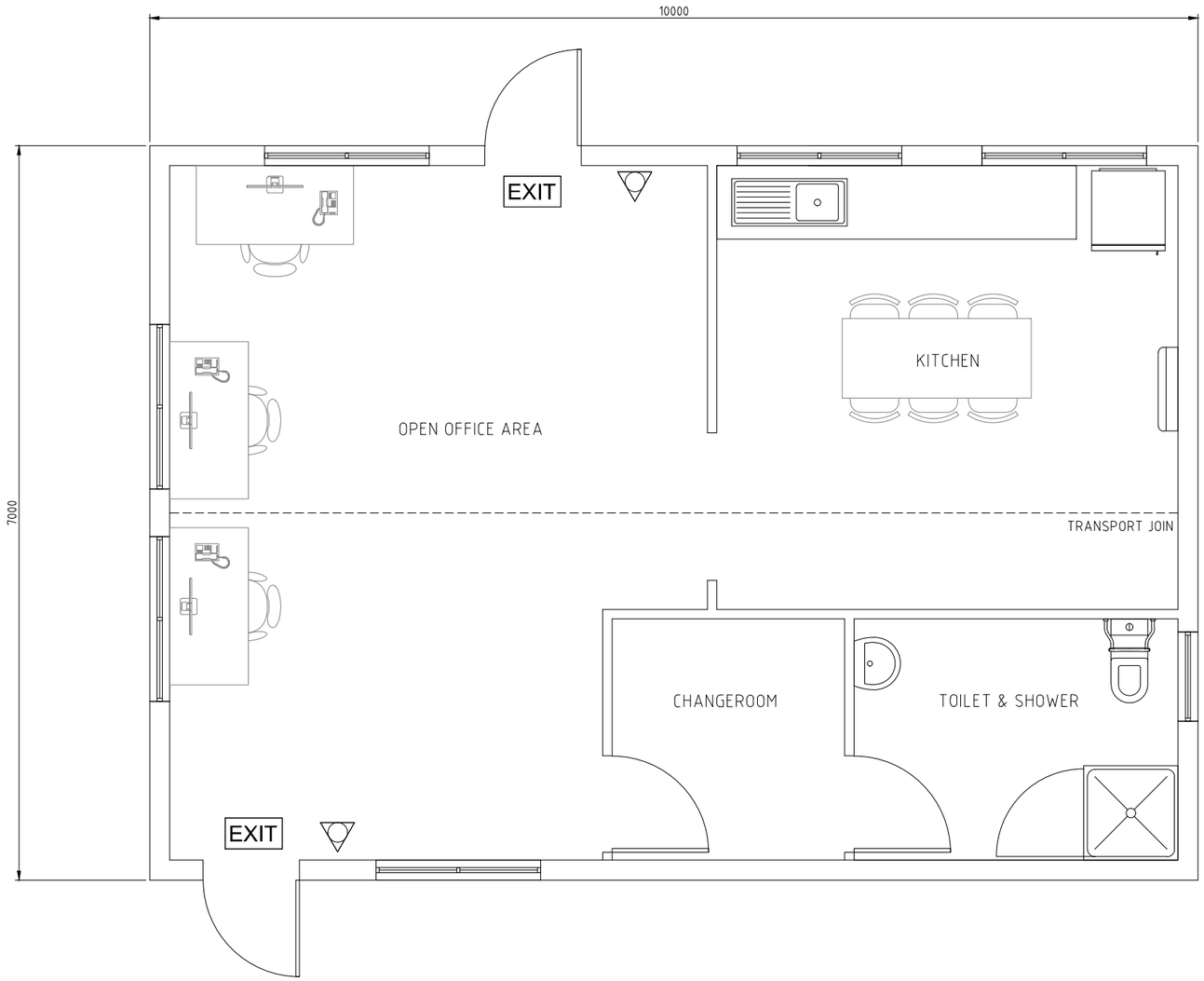

BUILDING LAYOUT
SCALE 1:25

CONCEPT
NOT FOR CONSTRUCTION

DRAWING TO BE SCALED FROM A1 SHEET

DRAWING TO BE PRINTED IN COLOUR

PLEASE NOTE

NEOEN

REV No.	REVISION DESCRIPTION	DRAWN BY	CHECKED BY	APPR'D BY	DATE
A	ISSUED FOR CONCEPT DESIGN	IS	AB	FH	10.02.2022

Downer
Relationships creating success

CLIENT: NOEON		PROJECT NUMBER: 3499234	
DRAWN BY: I.SEIF	DATE: 10.02.2022	DESIGNED BY: F.HUOT	DATE: 17.12.2021
DRG. CHECKED BY: A.BOOL	DATE: 10.02.2022	DES. CHECKED BY: H.GEBREMARIUM	DATE: 17.12.2021
CAD FILE No: MUBP-ES-GNA-86-94-0001.dwg		APPROVED: F.HUOT	DATE: 10.02.2022

PROJECT NAME: MUCHEA BATTERY ENERGY STORAGE SYSTEM

TITLE: MUCHEA BESS
200 MW/400 MWh BATTERY PLANT
O & M BUILDING LAYOUT

SHEET SIZE: A3

SCALE: 1:SCALE

DRAWING No: MUBP-ES-GNA-86-94-0001

REVISION: A

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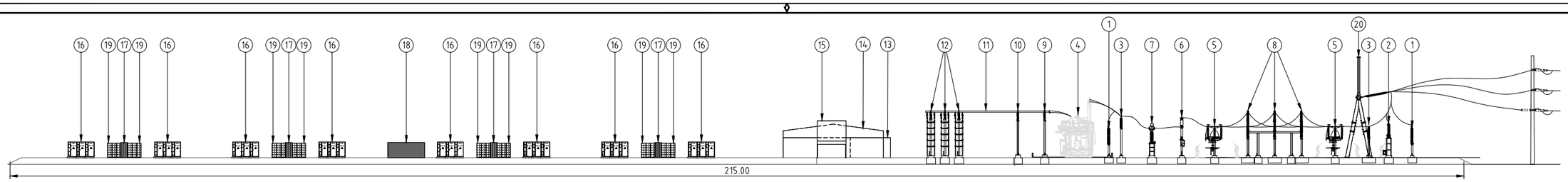

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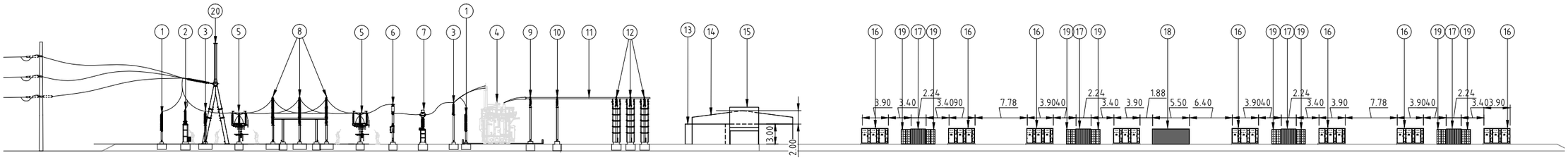
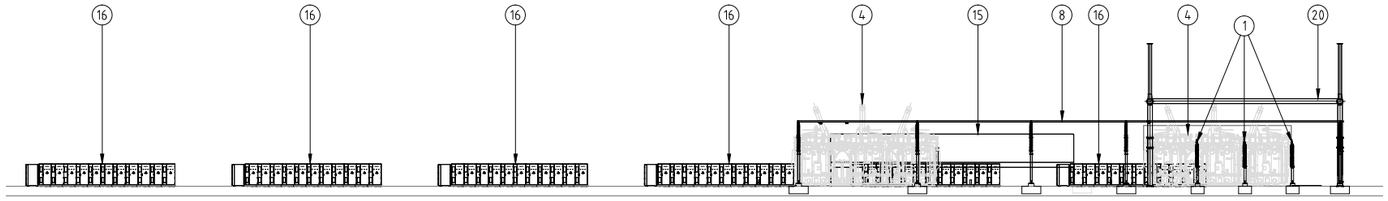


NORTH ELEVATION

SCALE 1:300

NOTES:
1. ALL DIMENSIONS ARE IN METERS.

ITEM	EQUIPMENT	TYPICAL HEIGHTS (mm) - INCLUDING SUPPORT STRUCTURE	NOTES
1	132kV SURGE ARRESTER	4200	-
2	VOLTAGE TRANSFORMER 132kV THREE PHASE	4800	-
3	132kV POST INSULATOR	4500	-
4	POWER TRANSFORMER	8600	INCLUDING BUSHINGS
5	DISCONNECTOR 132kV	4600	-
6	LIVE TANK CIRCUIT BREAKER 132kV	5700	-
7	CURRENT TRANSFORMER 132kV THREE PHASE	4800	-
8	132kV BUSBAR	6600	-
9	33kV SURGE ARRESTER	6600	-
10	33kV POST INSULATOR	6600	-
11	33kV BUSBAR	6600	-
12	33kV CABLE SEALING ENDS	6600	-
13	O&M BUILDING	3000	-
14	MAINTENANCE SHED	5000	-
15	CONTROL BUILDING	5500	-
16	BATTERY BANK	2350	-
17	POWER SKID	2300	-
18	AUXILIARY TRANSFORMER	2300	-
19	PCS	2200	-
20	132kV GANTRY	16000	-



EAST ELEVATION

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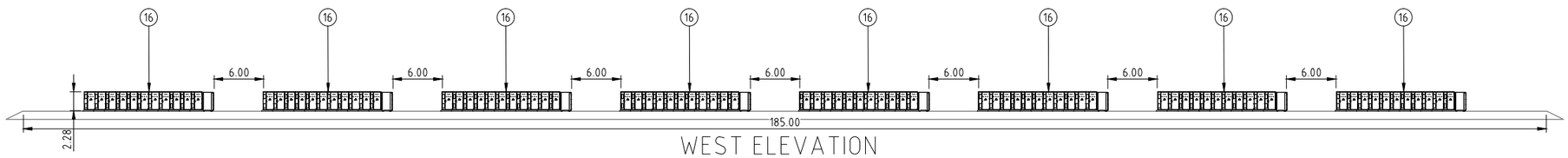

WEST ELEVATION

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CONCEPT

NOT FOR CONSTRUCTION

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DRAWING TO BE PRINTED IN COLOUR

PLEASE NOTE

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REV No.	REVISION DESCRIPTION	DRAWN BY	CHECKED BY	APPR'D BY	DATE
B	UPDATED	IS	AB	FH	04/03/2022
A	ISSUED FOR CONCEPT DESIGN	IS	AB	FH	10.02.2022

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Relationships creating success

CLIENT: NOEON		PROJECT NUMBER: 3499234	PROJECT NAME: MUCHEA BATTERY ENERGY STORAGE SYSTEM
DRAWN BY: I.SEIF	DATE: 04/03/2022	DESIGNED BY: F.HUOT	DATE: 17.12.2021
DRG. CHECKED BY: A.BOOL	DATE: 04/03/2022	DES. CHECKED BY: H.GEBREMARIUM	DATE: 17.12.2021
CAD FILE No: MUBP-GN-LAY_ELEV-80-00-0001.dwg		APPROVED: F.HUOT	DATE: 10.02.2022

TITLE: MUCHEA BESS
200 MW/400 MWh BATTERY PLANT
ELEVATIONS

SHEET SIZE: A3

SCALE: 1:SCALE

DRAWING No: MUBP-GN-ELV-80-00-0001

REVISION: B

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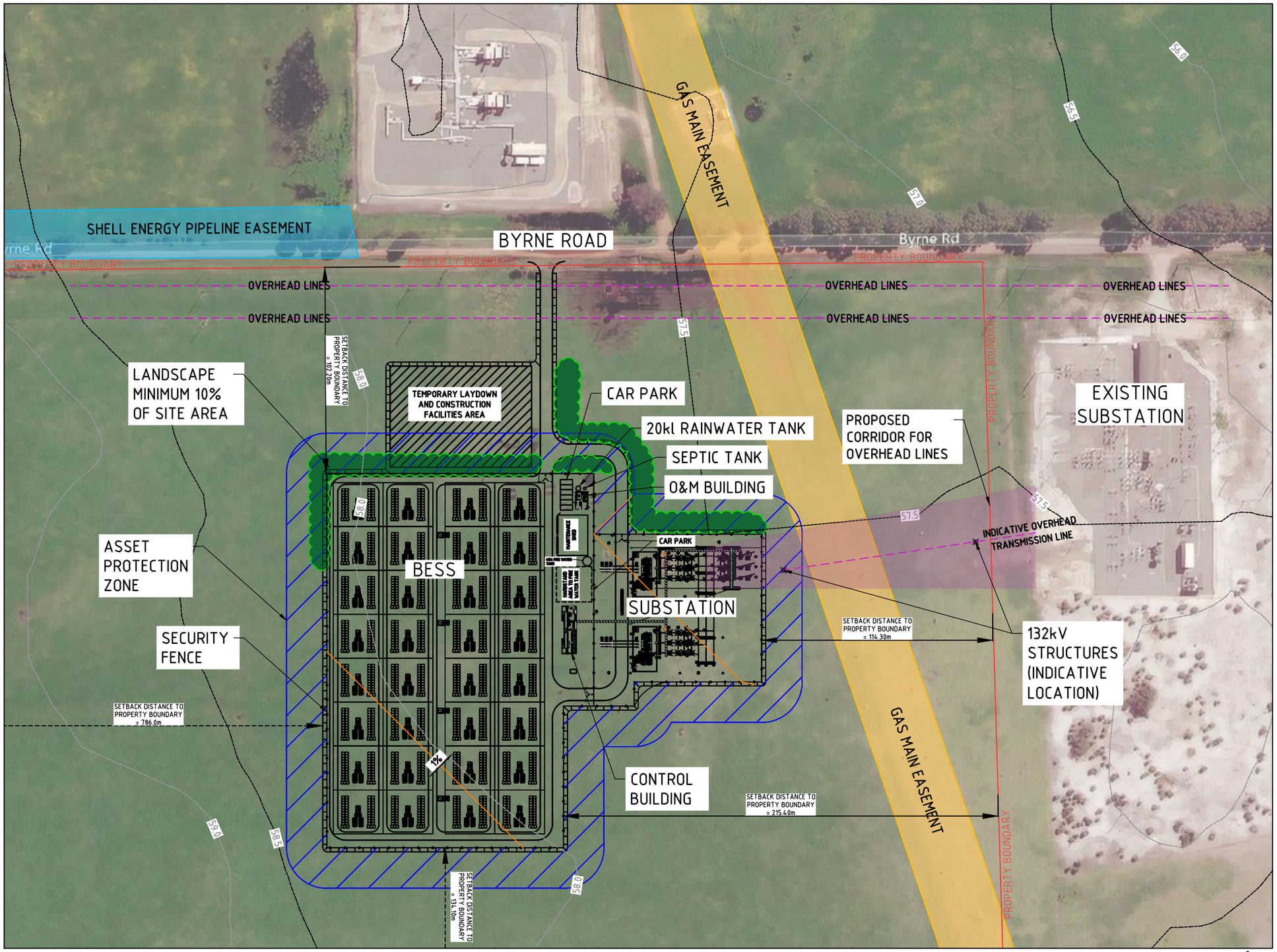

N

DATUM: GDA94
PROJECTION: MGA ZONE 50

LOCATION:

LOT 2364 ON DP124489 - BYRNE ROAD, MUCHEA WA.

NOTES:

1. ALL DIMENSIONS ARE IN METERS.
2. INDICATIVE LAYOUT, SUBJECT TO OEM SELECTION AND PLANT GRID CONNECTION REQUIREMENTS.
3. REFER TO BASIS OF DESIGN REPORT 3499234-DOW-RPT-DM-0001
4. THE OVERHEAD TRANSMISSION LINE CONNECTING THE BATTERY INFRASTRUCTURE INTO THE EXISTING MUCHEA SUBSTATION IS INDICATIVE ONLY. CONNECTION ARRANGEMENT/UPGRADES (IF ANY) ARE BEING ASSESSED BY WESTERN POWER AND WILL BECOME A PART OF CONNECTIONS PROCESS.

SCALE 1:1000 — 0 — 40 — 80 Metres

CONCEPT
NOT FOR CONSTRUCTION

DRAWING TO BE SCALED FROM A1 SHEET

DRAWING TO BE PRINTED IN COLOUR

PLEASE NOTE

NEOEN

REV No.	REVISION DESCRIPTION	DRAWN BY	CHECKED BY	APPR'D BY	DATE
C	ADDING SETBACK DISTANCES	IS	AB	FH	21/03/2022
B	UPDATED	IS	AB	FH	04.03.2022
A	ISSUED FOR CONCEPT DESIGN	IS	AB	FH	10.02.2022

Downer
Relationships creating success

CLIENT: NOEON		PROJECT NUMBER: 3499234	
DRAWN BY: I.SEIF	DATE: 04.03.2022	DESIGNED BY: F.HUOT	DATE: 17.12.2021
DRG. CHECKED BY: A.BOOL	DATE: 04.03.2022	DES. CHECKED BY: H.GEBREMARIUM	DATE: 17.12.2021
CAD FILE No: MUBP-GN-LAY_ELEV-80-00-0001.dwg		APPROVED: AB	DATE: 10.02.2022

PROJECT NAME: MUCHEA BATTERY ENERGY STORAGE SYSTEM

TITLE: MUCHEA BESS
200 MW/400 MWh BATTERY PLANT
CONCEPT LAYOUT

SHEET SIZE: A3

SCALE: 1:SCALE

DRAWING No: MUBP-GN-LAY-80-00-0001

REVISION: C

FILE: C:\Users\Islam.Seif\Desktop\Muchea\MUBP-GN-LAY_ELEV-80-00-0001.dwg

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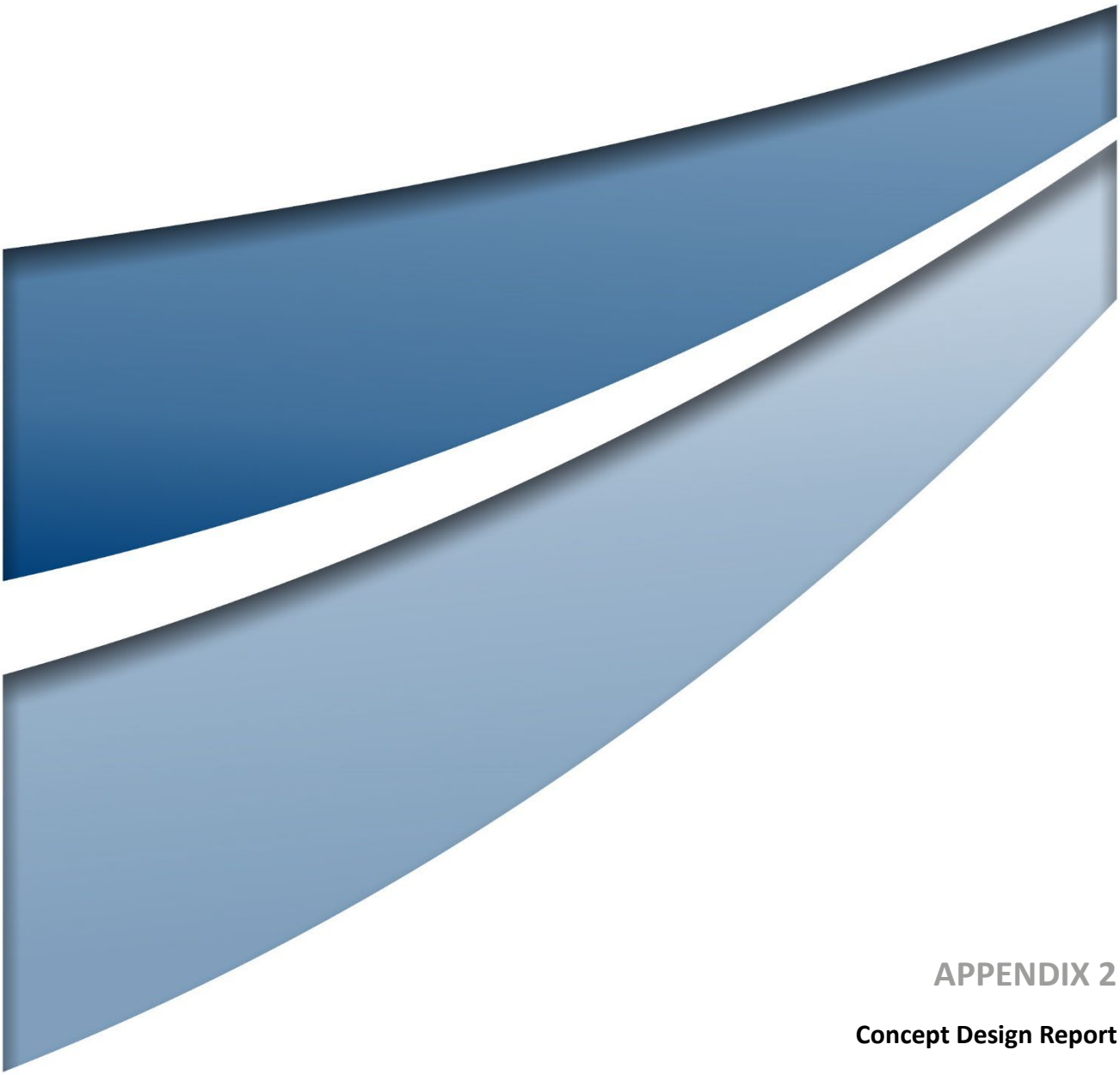


APPENDIX 2

Concept Design Report

Muchea BESS – DS 01

Basis of Design

Document No.: 3499234-DOW-RPT-DM-0001

Contact

Division:	Downer Engineering Services - Industrial Projects
Contact:	Florent Huot
Address:	Level 10, 567 Collins Street, 3000 Melbourne, VIC
Phone:	0439 609 011
Email:	Florent.Huot@downergroup.com
Purchase Order Ref.:	MUBS-DOW-LET-GN-00-0002_B (WO-2)

Documentation Preparation and Control

Date	Function	Position	Name	Initials
21/12/2021	Prepared	Design Manager Secondary Team Lead Civil / Structural Lead - VIC	Florent Huot Henok GebreMariam Derrick Evans	FH HG DE

Amendment Record

Date	Issue	Amendment Description	Name	Initials
21/12/2021	A	Initial Release - Preliminary	Florent Huot	FH
21/01/2022	B	Amended including indicative key equipment list and Bushfire Management plan requirements	Florent Huot	FH

Table of Contents:

1 INTRODUCTION

1.1 Project Background

Neoen Australia Pty Ltd (Neoen) proposes to establish a 200MW/400MWh battery near Perth in the Shire of Chittering. Neoen has identified a location for the battery development (the Project) as a single property (the Study Area) located approximately 2 kilometres (km) north of Muchea. The Study Area is equivalent to Lot 2364 on deposited plan 124489, which covers an area of 57 hectares (ha).

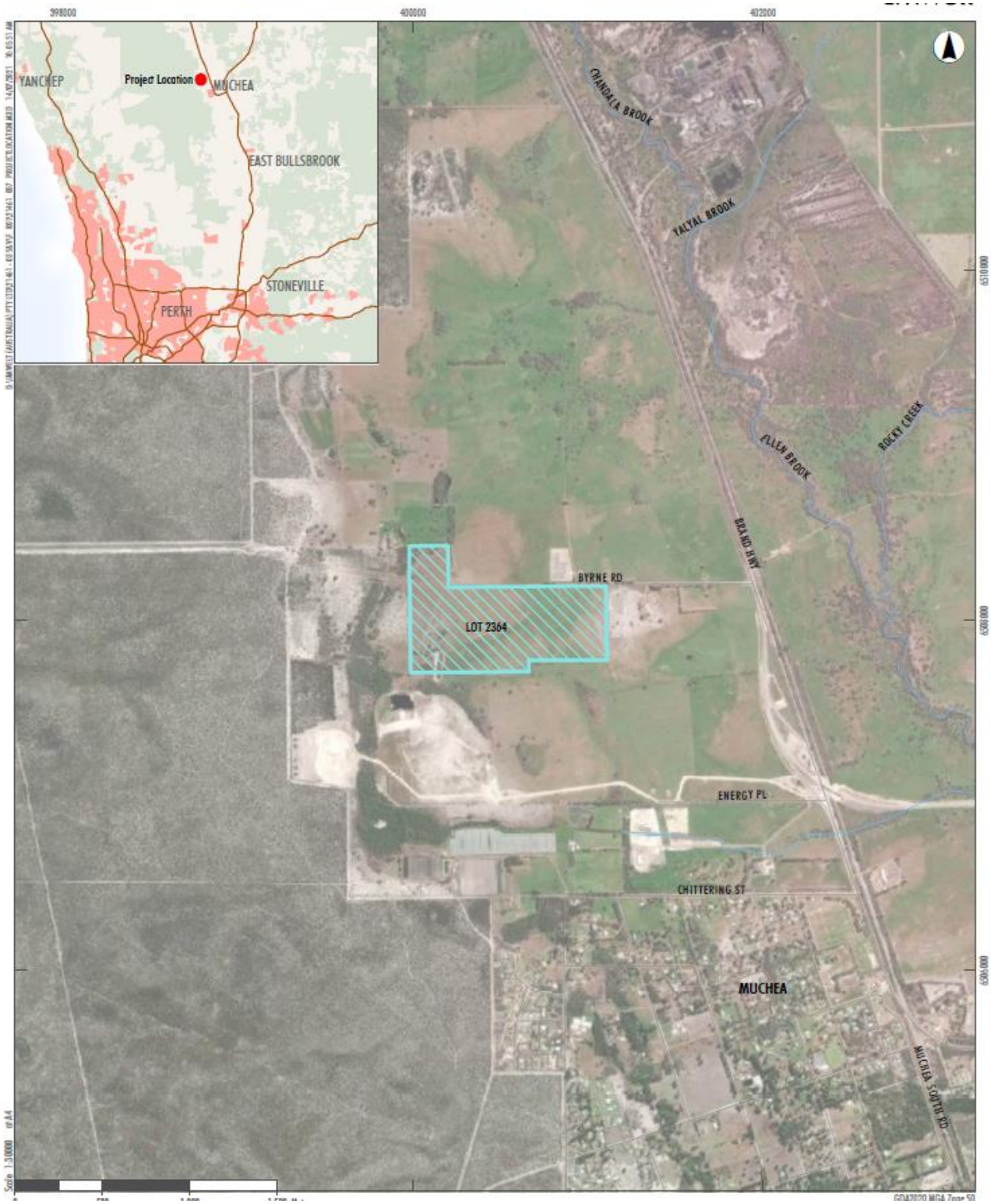


Figure 1 – Site location

The BESS footprint (the Project Area) is proposed to be within a fully cleared indicative 5 ha area adjacent to existing Muchea Substation. The proposed battery will be within a compound of around 2 ha and will include:

- Battery banks, Power Conversion Systems, Power & Auxiliary Transformers and Ring Main Units (RMU).
- Internal access roads and limited car spaces.
- A combined 33kV switchgear and control building, housing protections, metering and control panels.
- A 132kV/33kV substation with step-up power transformers, NERs and 132kV outdoor switchgear.
- 132kV overhead cables assumed to connect directly to the adjacent Muchea Substation.
- A 33kV cable reticulation and earthing networks.
- LV AC cabling for auxiliary supplies and between the PCS and Power Transformers.
- LV DC cabling between the battery banks and the PCS.
- A communication cable network
- An O&M office, storage warehouse and water tank.
- Lightning rods up to 15 metres.
- CCTV cameras and lighting.
- Site perimeter fences and gates.
- Site laydown area and facilities for the project construction.

Neoen have engaged Downer as BESS BOP Designer and Contractor to provide preliminary design inputs as part of their Engineering Development Services to support the project including:

1. Initial concept layout drawing for the BESS and 132/33kV Substation based on an OEM EPC technology that requires larger footprint at this stage, to be customised by the OEM EPC when selected.
2. Sizing of the bench required for the BESS including the substation and the construction compound together with other temporary facilities that may be required.
3. Proposal for bench location based on topography, existing hydrology assessment and project limitations such as the existing gas pipeline.
4. Access layout to the BESS: Proposed entry point and corridor.
5. Basis of Design report (this document) summarising key design assumptions and outcomes.

1.2 Design Predecessors

The following documentation has been used as reference:

DOCUMENTATION AVAILABLE / PREDECESSOR	Available	Comments
Grid Connection - GPS	No	Assumed 200MW at POC.
Grid Connection Arrangement	No	Assumed as per provided corridor to Muchea 132/33kV Substation.
Environmental Impact Assessment	Yes	From Umwelt 21461_Muchea BESS Environmental Risk Assessment.
Environmental Exclusions Map	PDF	From Umwelt 21461_R01_Constraints Analysis and Approvals Pathway_V2.
Cadastral Boundaries Map	KMZ	Provided by Neoen.
Exclusions Map	KMZ	Gas Pipeline Easements provided by Neoen.
Topographic Data	Yes	From Umwelt_20210818_LiDAR data
Flood Data	Preliminary	Ellen Brook 1% AEP Flood Extent
Geotechnical Data	Preliminary	2x 6m Boreholes in P19209_002_LTR_Rev0 Monitoring Well Installation
BESS OEM (EPC) Data	No	To be assumed based on technology requiring lager footprints at this stage.

Table 1 – List of provided design inputs

1.3 Definition and Acronyms

Term	Definition
AC	Alternating Current
AS	Australian Standards
BESS	Battery Energy Storage System
BOD	Basis of Design
BOP	Balance of Plant
BOQ	Bill of Quantities
Client	Refers to **Neoen** in this document.
DA	Development Approval
DC	Direct Current
DS	Development Services
EPC	Engineering, Procurement and Construction
GA	General Arrangement
GPS	Generator Performance Standard
HV / MV / LV	High Voltage / Medium Voltage / Low Voltage
NER	National Electricity Rules Or Neutral Earthing Resistors (in the context of Substation Primary Equipment)
NSP	Network Service Provider
O&M	Operation & Maintenance
OEM	Original Equipment Manufacturer
OH	Overhead
OHL	Overhead Line
POC	Point of Connection
RFI	Request For Information
RMU	Ring Main Unit
SCADA	Supervisory Control and Data Acquisition
SLD	Single Line Diagram
T/L	Transmission Line
UG	Underground
WA	Western Australia

Table 2 – List of Acronyms

2 BESS CONFIGURATION & LAYOUT

2.1 BESS Equipment

The battery plant sizing and site dimensions largely differ based on the expected plant operations, design life and technologies chosen by the BESS OEM. From the various configurations available at present time, Downer has based the current layout on a configuration featuring 'Power Islands' with separate battery banks, AC/DC Power Conversion System (PCS) and MV Power Skids including LV/MV Power Transformer and MV RMUs.

The number of islands has been scaled form recent similar projects including up to 460MVA/920MWh of Battery Storage over a plant design life of 25 years providing an overall conservative footprint at this stage. The sizing of the plant and equipment are to be confirmed by OEM EPC's based on the required performances of the plant.

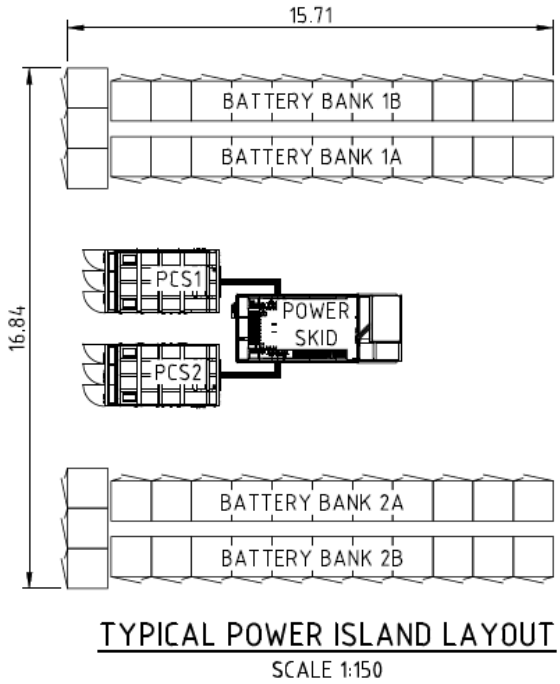


Figure 2 – Typical Power Island with key major equipment located separately

Examples of equipment forming a Power Island configuration are indicatively shown in the figures below:

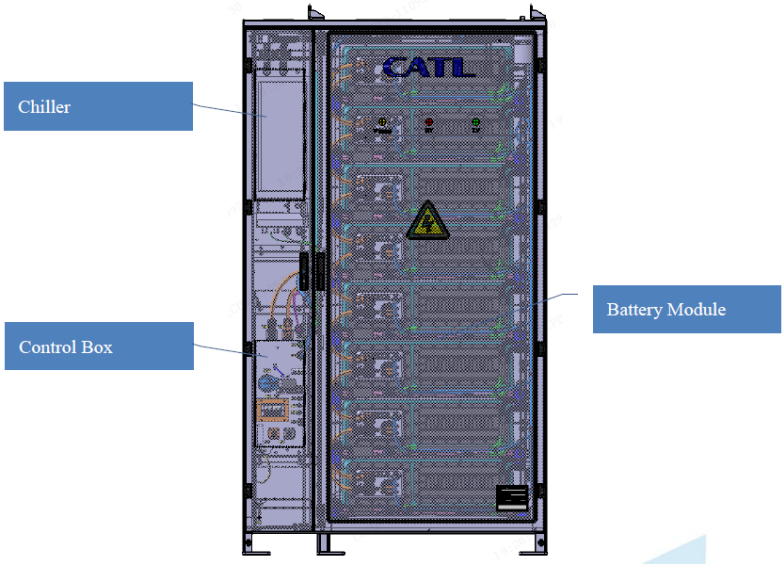


Figure 3 – Example of Battery Bank Rack

Figure 4 – Example of PCS Skid

Figure 5 - Example of MV Power Skid

Alternative configurations including combined containerised modules with Battery Banks and PCS, which can also be assembled to MV Power skids, are expected to be more compact and reduce the overall site footprint.

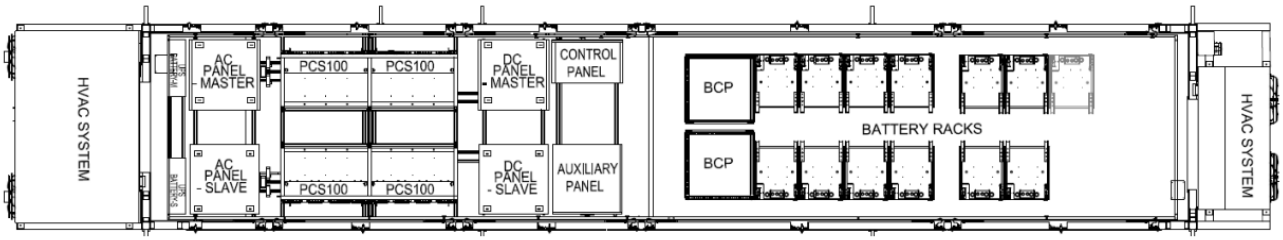


Figure 6 – Example of integrated Battery and PCS Module

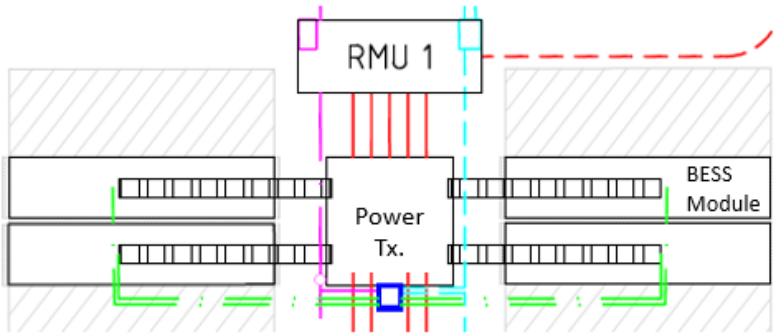


Figure 7 – Typical Compact Arrangement using Integrated Battery and PCS modules

Combined Auxiliary Transformers supplying up to 8 Power Islands each are considered. Each Power Island could alternatively fit a smaller Auxiliary transformer unit, reducing the overall site footprint of the site.

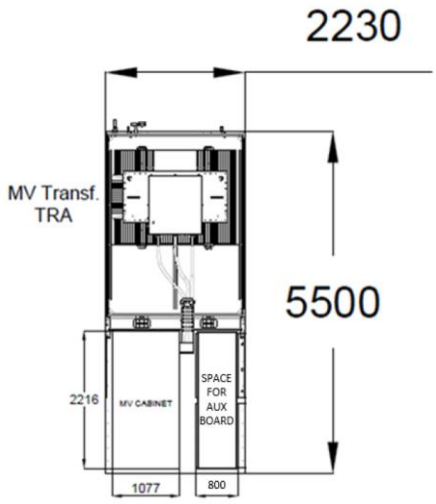


Figure 8 – Auxiliary Transformer Skid (1 per 8 Power Islands)

The network of RMU's in the BESS compound are linked via a 33kV underground cable reticulation system divided in feeders which will be connected to a 33kV indoor switchgear located in a combined, transportable and elevated 33kV switchgear and control building which has been based on similar projects.

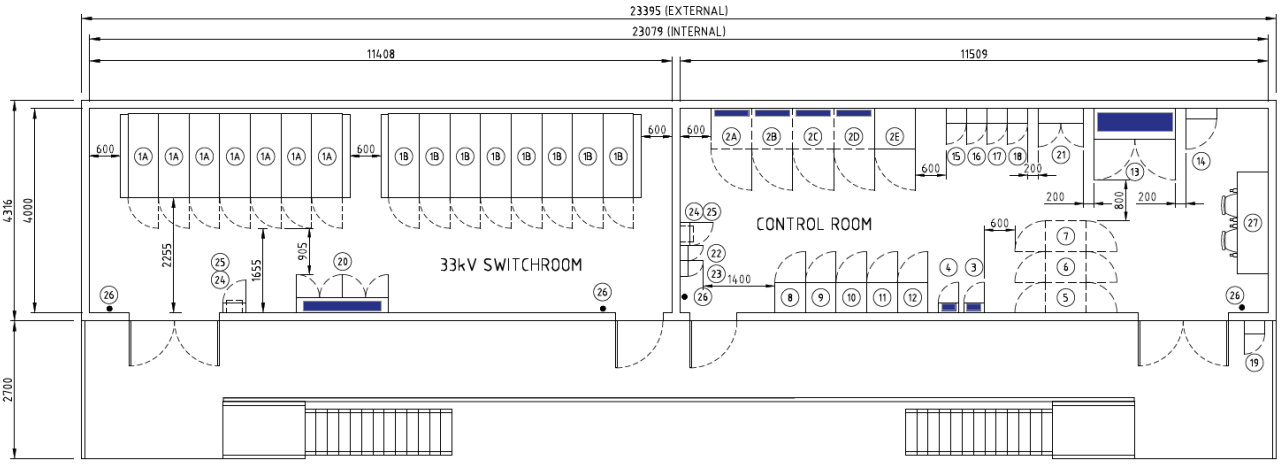


Figure 9 – Typical combined Switchgear and Control Room Building, with 2 sets of 33kV switchgear

The proposed design considers 8x BESS 33kV feeders, grouping each 4x MV Power Skids.

Considering this technology and plant configuration, the following key equipment is anticipated for this solution:

Item	Example	Capacity	Estimated Quantities
Outdoor Liquid Cooling Battery Racks (Battery modules and one control box, chiller, fire protection)	CATL Product O852280-E	280Ah (2h) / 372kWh	1408
BESS Inverters / PCS	PE FREEMAQ PCSK 690V FP4390K	4390 kVA @40degC	64
BESS MV Power Skids - Transformer (33kV/690V) & 33kV RMU	PE Twin_Skid_Compact_Storage_GEN3	8780 kVA @40degC	32
BESS Auxiliary Transformers for BESS LV AC Supply (33kV/400V)	NHΩA EE20035_TS_ SYS_Aux MV skid_r00	TBA depending on configuration	4 (if centralised) or up to 32 (if decentralised)
BESS Auxiliary Transformers for Buildings LV AC Supply (33kV/400V)	NHΩA EE20035_TS_ SYS_Aux MV skid_r00	300kVA	1
BESS Feeders 33kV GIS single-bus Switchgear	Siemens 8DA10		2x of the following sets: - 1x Power Tx. incomer panel - 4x BESS MV feeder panels - 1x VT panel - 1x Bus-tie Panel

Table 3 BESS Key equipment List

The final equipment and quantities will be confirmed in the next phases of the BESS design based on grid connection requirements and the plant technology selection and sizing by the selected OEM.

2.2 BESS Layout

The overall site wide layout is presented on the drawing *MUBP-EP-LAY-80-00-0001 Muchea BESS 200MW/400MWh Battery Plant Concept Layout*. Referring to section 2.1, the layout is currently indicative as depending on the OEM and other requirements to be defined for the project at later stage.

The clearances and spacing between equipment will be reviewed as the design progresses to ensure that access, installation and maintenance is optimised, and risks are mitigated to an acceptable level.

The BESS compound is proposed to be located on the eastern end of the site to minimise the access and grid connection works. This location is located on a flat terrain with a very mild natural slope (~0.5% average) from South-West to North- East reducing earthworks and facilitating site drainage towards the Eastern boundary.

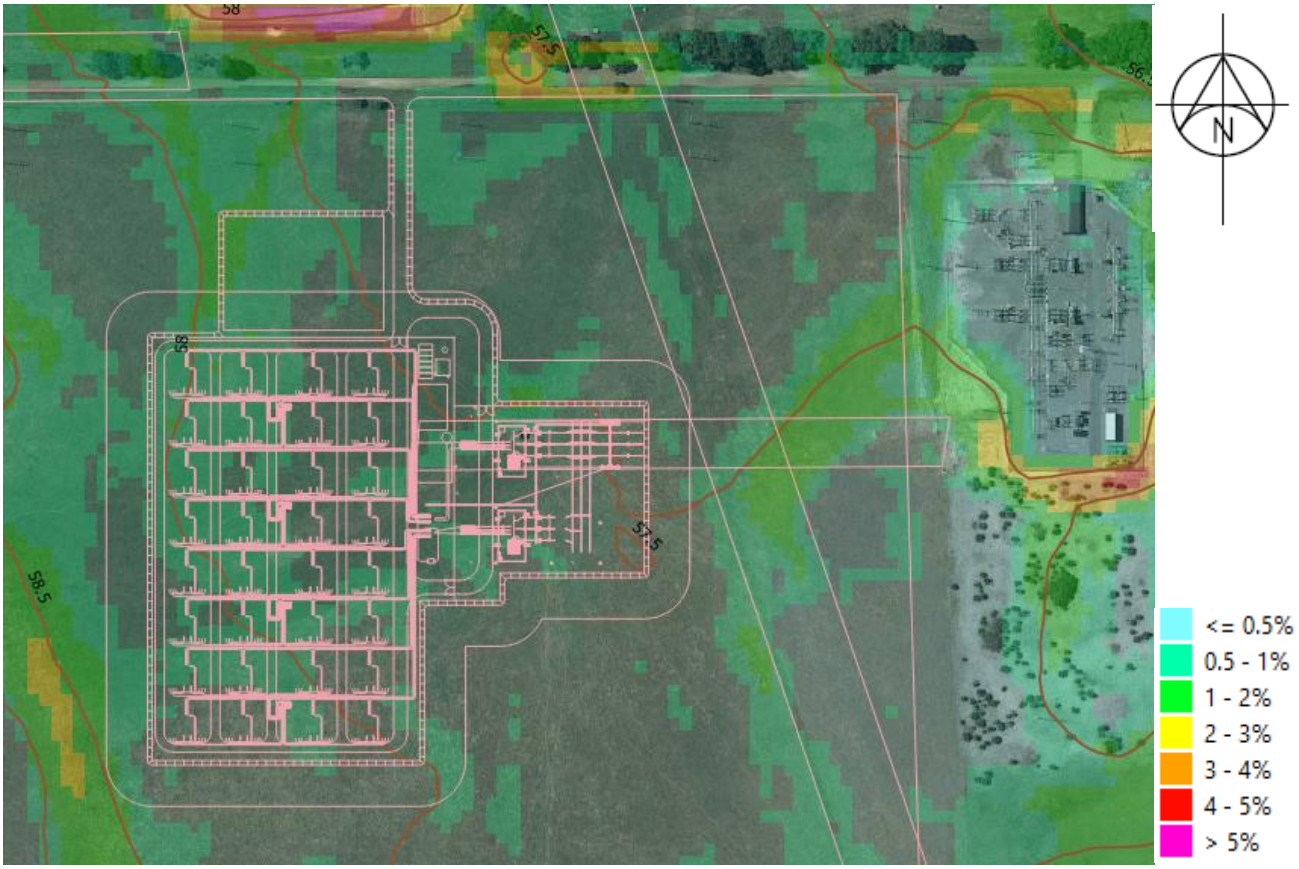


Figure 10 – Slope Analysis and Proposed site location

The switchgear and control building is located towards the substation and close to the East-West centre line of the BESS so that the number of 33kV feeder cables running from the North and the South to the building are evenly distributed, reducing cable crossing and derating.

A transportable O&M office building sized for 2-4 persons with a small car park is located close to the site main entry. A maintenance and storage shed of 15mx20m is currently assumed and proposed to be located between the office and switchgear buildings. These buildings will typically be supplied in LV AC power via an additional auxiliary transformer feeding the switchgear building LV board.

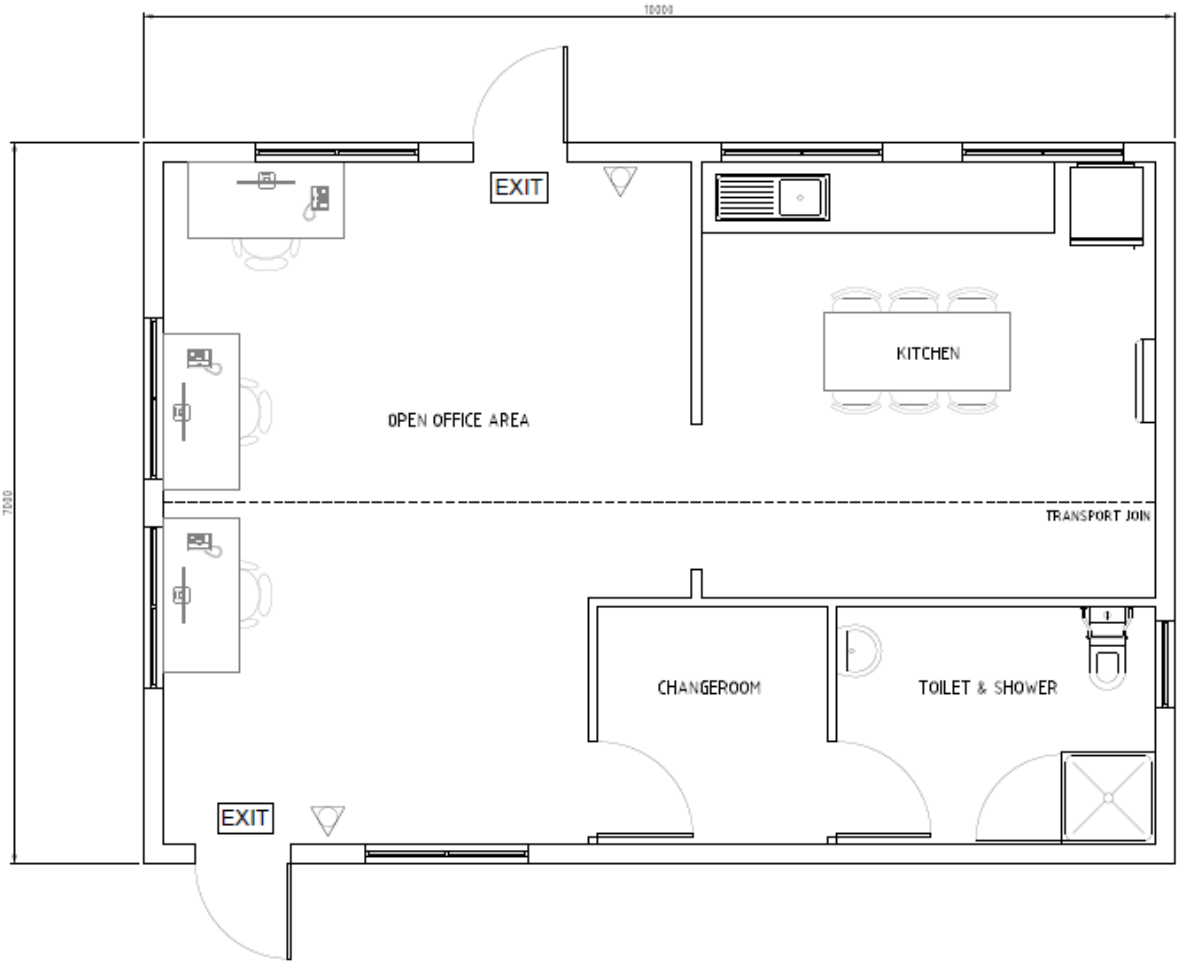


Figure 11 – Typical O&M Office Transportable Building

A 45,000kL Fire Water Tank is included as per proposed location shown on the layout and provided with a hardstand of 17.5m x 17.5m within 3 metres of the outlet as per Bushfire Management Plan requirements. Additional facilities such as vehicle washing bays, and water and septic tanks for the buildings are yet to be included, with enough space allowed on the layout for these elements at this current stage.

2.3 Substation and HV Connection

The current substation configuration assumes one landing gantry for a new incoming overhead 132kV feeder from the adjacent Muchea 132/33kV Substation crossing an existing gas pipeline. At the time of writing the details of the connection arrangements at the existing substation are to be advised by the NSP.

The proposed location adjacent to the BESS compound with a minimum of 20m from the bench batter to the gas pipeline to allow the installation of a 132kV pole for the easement crossing.

The substation layout is based on similar projects and included in *MUBP-EP-LAY-80-00-0001 Muchea BESS 200MW/400MWh Battery Plant Concept Layout*. The substation dimensions currently assume the installation of 2x 175MVA Power Transformers feeding the 33kV switchgear in the BESS area to provide redundancy during the operations of the site. This configuration is subject to future Grid Connection Requirements and the level of redundancy and reliability expected for the Plant.

Each Power transformer is surrounded by an oil bund sized for these units, with minimum separation distances between the two transformers and with all buildings as per AS 2067. Bunds are assumed to be equipped with NER's and oil/water separator systems of the OVIVO type connected to a pump, which feature alarms that can be relayed to operators if the bund reaches capacity during heavy rain events to trigger manual intervention. Alternatively, a buried oil separator system could be allowed for within the substation area.

3 CIVIL DESIGN

3.1 Assumptions and Methodology for Civils

3.1.1 Site layout

The BESS general arrangement layout used for civil design purposes is based on the BESS layout (MUBP-EP-LAY-80-00-0001). It provides a single road access from the existing unsealed track/road network to the site. Within the site, there will be an internal road network to allow for the provision for cranes and their movement of equipment into position as well as for the delivery of equipment. A perimeter access track around the rows of Power Islands is proposed at the BESS site for use during operations and maintenance.

3.1.2 Topographic and Feature Survey

No underground services survey has been provided, hence there are no provisions or allowances to relocate any existing services within the proposed BESS site and this includes any relocation of existing services within the main access road corridor to the BESS site.

High-resolution LIDAR survey data has been provided for the site. These have been found to be generally consistent with publicly available 5m contour line data and have been used to assess the site elevations and slopes to support the proposed site location, as referred to in section 2.2.

3.1.3 Geotechnical data

No geotechnical study or investigations have been performed to date for the site, however initial information is available from the logs of the 2x 6m boreholes available in *P19209_002_LTR_Rev0 Monitoring Well Installation*.

The soil appears to mostly contain silty sand and sand within the first few meters below surface level, with presence of water at 0.5m below ground level and low potential for ASS in the upper 2.3 m silty sand profile.

This is expected to be suitable for shallow strip footing or bored piers foundations (<2.8m deep typically) required for the BESS equipment and buildings.

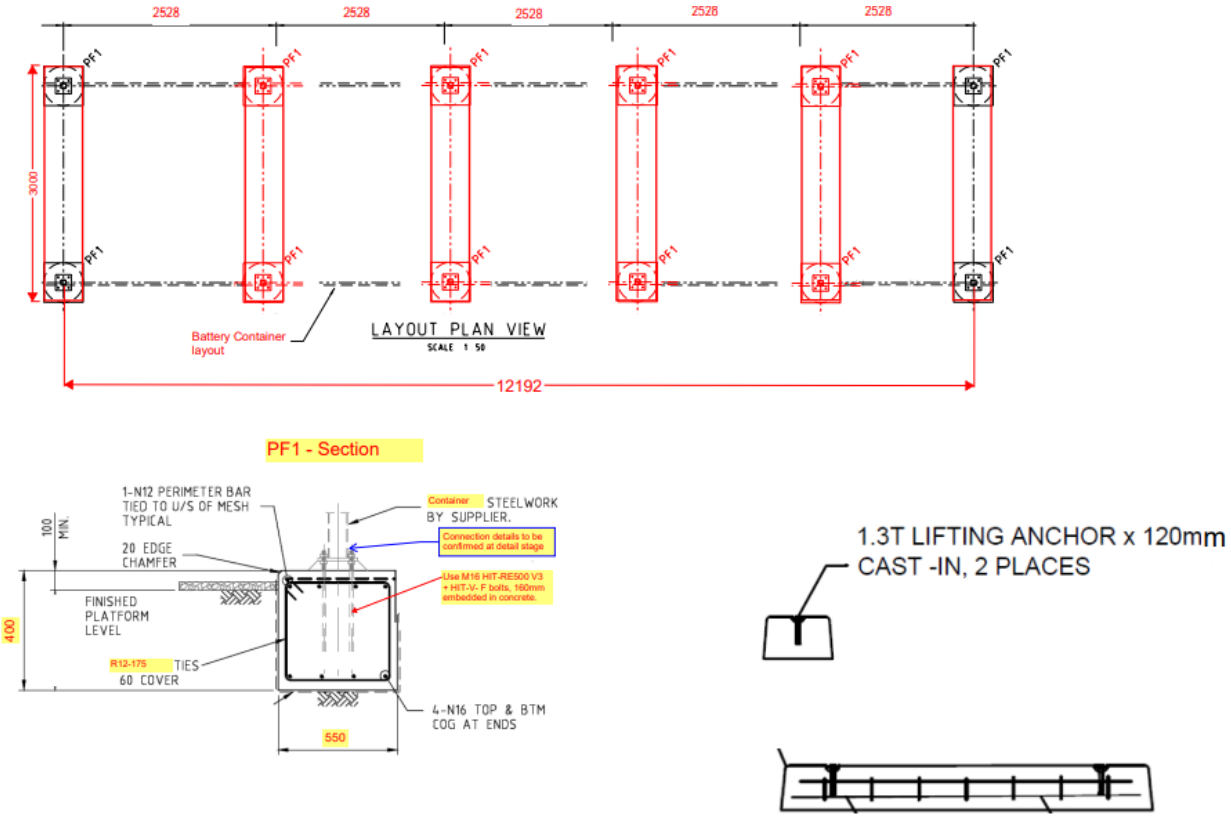


Figure 12 – Example of Strip Footing foundations for battery and power skids

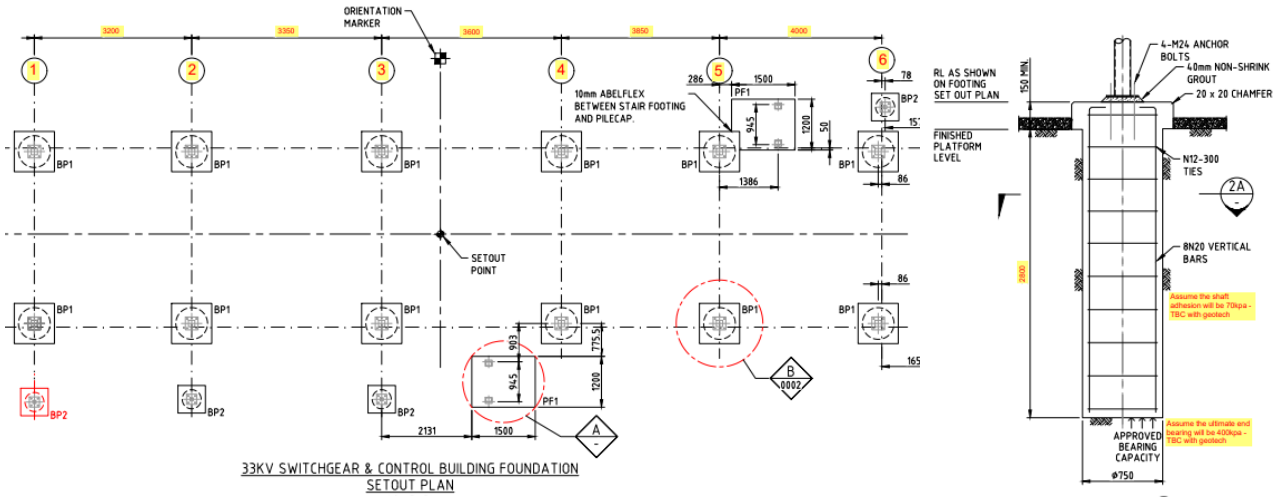


Figure 13 – Example of bored piers foundation for switchgear buildings

It is expected that future site investigations will need to be undertaken to inform the current conditions within the site and testing results will confirm the subsurface conditions for the next phases of the design.

3.1.4 Flood Data

A Hydrology Assessment covering the Ellen Brook tributary to the Swan River running approximately 1.5km away from the site was provided, with no flooding impact on the BESS site. As the hydrology effects within and adjacent to the BESS site are yet to be assessed in detail, the existing level of the bench for the adjacent substation and gas facility is indicative of the requirements necessary to comply with the expected flooding scenarios.

Based on this site information and the low risk of flood, the bench level for the BESS site is presumed to be at a maximum height of 0.5m above the existing natural ground level. The main access road to the site will be constructed at a similar level for the entry area whilst adjustments in the road levels will be undertaken to connect back into the existing road network.

It is anticipated that a detailed Flood Report will be undertaken at later stage to identify the required flood immunity level for the BESS site. The hydrology data will have to consider the existing conditions and a developed case scenario to determine the potential change in flood behaviour from site development.

3.2 Civil Design Concept

3.2.1 Site Preparation

Site clearing and grubbing is typically undertaken for the total fenced area and a nominal 2 metre offset and the main access road area including 2 metre verge offset on each side of the road. Topsoil stripping depth will have to be assessed based on the information provided by the geotechnical investigation campaign.

The elevated site bench will be adequately designed and assessed based on the information provided by the hydrologic investigations and associated flood report engineers to ensure a sufficient, safe flood protected site. At the current project stage, it is expected that the bench batters will fit in a 2-metre corridor around the site perimeter which has been allowed for in *MUBP-EP-LAY-80-00-0001* layout.

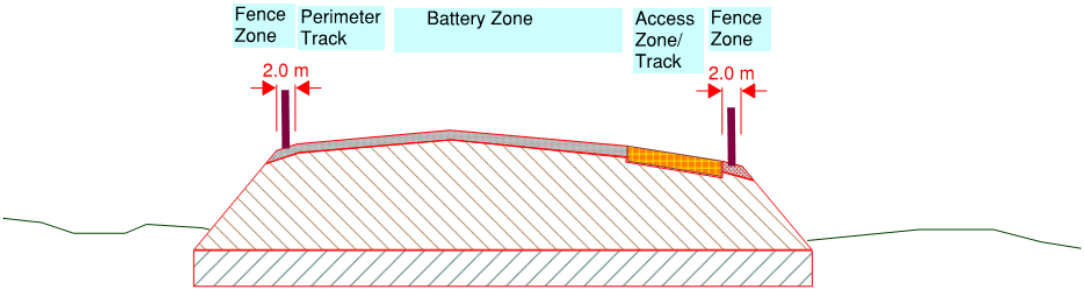


Figure 14 - Typical Bench/Access Track Cross Section

3.2.1 Sediment and Erosion Controls

Temporary sediment basin based on the volumes of earthworks are expected to be undertaken during construction for the formation of the bench. Typical erosion and sediment control devices such as but not limited to silt fences, diversion bunds, rock check dams and construction entry/exit pads are deemed to be suitable. These devices will divert the rainfall runoff into the temporary sediment basin to enable the settlement of silts and suspended solids accordingly.

The existing ground vegetation is expected to maintain surface stability. Consequently, the removal of vegetation should be limited to only those areas in which construction works is required.

It is assumed that such controls can remain in place throughout the BESS construction phase where suitable. The EPC contractor will implement other controls as necessary including small diversion bunds and sediment fences.

3.2.2 Internal and external roadworks

The internal access road network has been developed to suit the proposed BESS layout with a 6m wide main access road from the main gates of the BESS and Substation areas to the access road intersection with Byrne Road. This intersection has been proposed West of an existing intersection to avoid traffic from both directions.

20m meter have been allowed from the main road batter to the existing 132kV poles to maintain a safe clearance. This considers NSP minimum requirements below:

Transmission Lines (Voltages above 33kV)	Clearance Zones		Regrowth Zones		Management Zone
	Horizontal Clearance Zone (m)	Vertical Clearance Zone (m)	Horizontal Regrowth Zone (m)	Vertical Regrowth Zone (m)	
Less than 100m	3	3	3.5	5	10
100m* - 200m	4	4	5	5.5	10
200m - 350m	10	5	6	5.5	15
350m - 450m	13	5.5	6	5.5	15
450m - 650m	25	6	6	5.5	25
650m - 800m	37	6	6	5.5	40
800m and above	47	6	6	5.5	50

*for spans on the limit, apply the above bracked (for 100m spans, horizontal clerance is 4m)

*132kV line on flat terrain and straight line. Variations in the route can have an impact on blowout claculations and the final easement to be applied

Table 4 – NSP Management Zone based on span (~100m 132kV spans based on imagery)

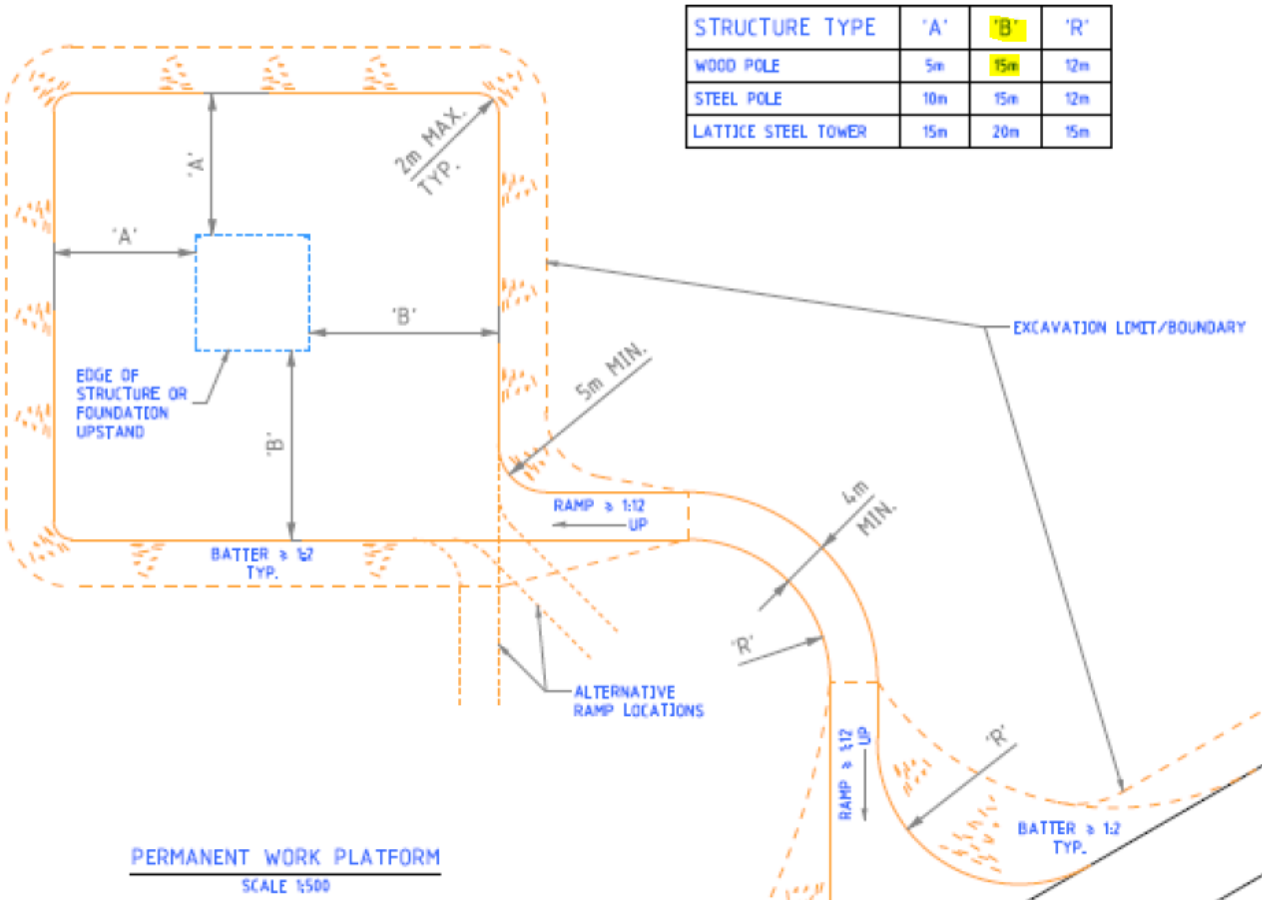


Figure 15 – NSP Easement and Access Track Minimum Requirements for Wood Poles

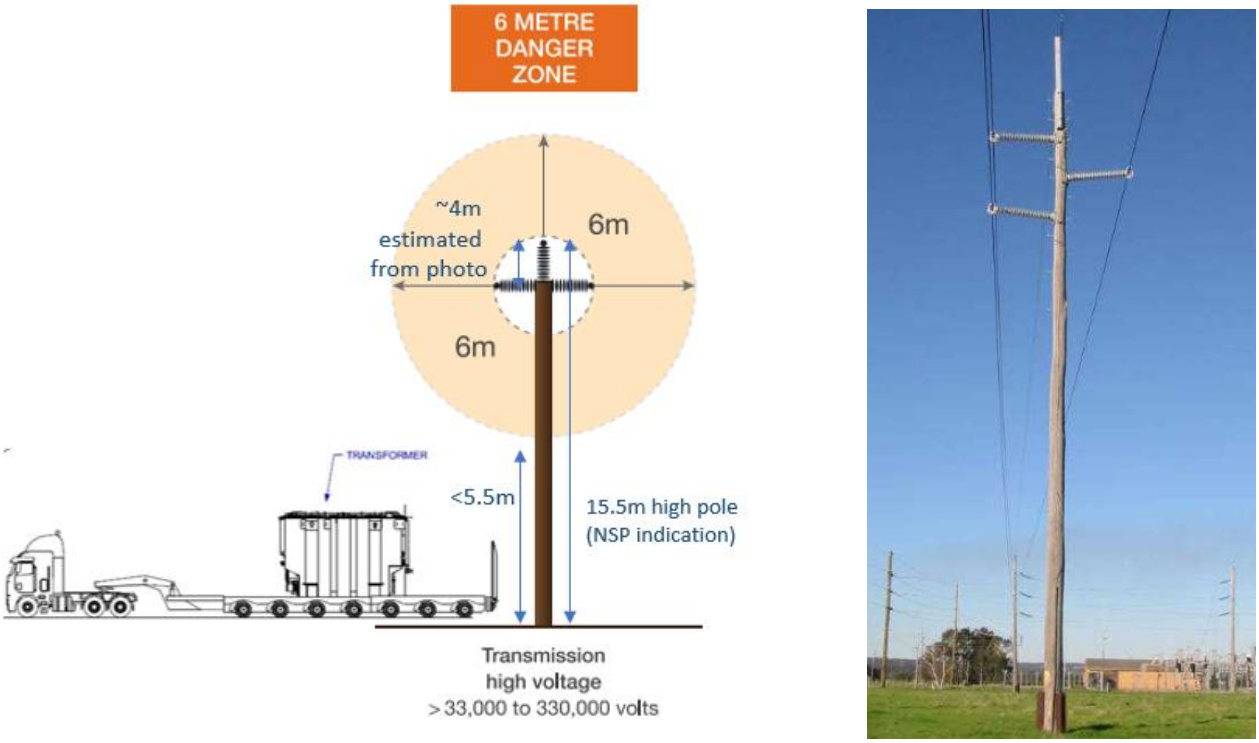


Figure 16 – NSP Pole height indication and conductor buffer zone

A 4m-wide access road network at the BESS site would allow transport vehicle and lifting cranes movement to install all BESS equipment, with a wider road next to the switchgear building for its installation aligned with the main access road connecting to Byrne Road at the North of the site.

A 6m access road between the 33kV cable support structures and the oil bunds in the Substation area has been assumed to allow the delivery and installation of the Power transformers.

Intersections and turning radius are indicative at this stage and subject to further analysis based on expected transport and delivery vehicles during construction. The current roads widths and inner bending radiuses consider the vehicular access technical requirement in Appendix A2 of the Bushfire Management Plan.

Further geotechnical investigations will inform the road design with geotechnical parameters to establish the details of the required earthworks and Pavement materials.

Roads are to be designed and constructed at an elevated level above the existing ground surface to provide a suitable flood immune access. This would also allow the avoidance of roadside drains and culverts which may limit manoeuvrability for vehicles and require more ongoing maintenance.

3.2.3 Construction compound, Site Facilities & Fencing

An additional hardstand for a 50mx50m laydown area and approximately 20mx50m for temporary site facilities including parking area have been included for the BESS construction. This assumes the required roads and foundations for main equipment (battery banks, PCS, power skids and switchgear building) will be completed before the equipment is delivered to site and therefore minimum site storage is required.

This area is proposed to be located approximately 50m from the main road intersection so that it can also be used as vehicle turnaround required in the Bushfire Management Plan.

A site perimeter fence with a vehicles gate to the main access road and a vehicles and pedestrian gate to the substation area have been considered. A separate boundary fence and entry gates to split the two areas of the project and control access of personnel to the HV facilities during the O&M phase.

3.2.4 Exclusions

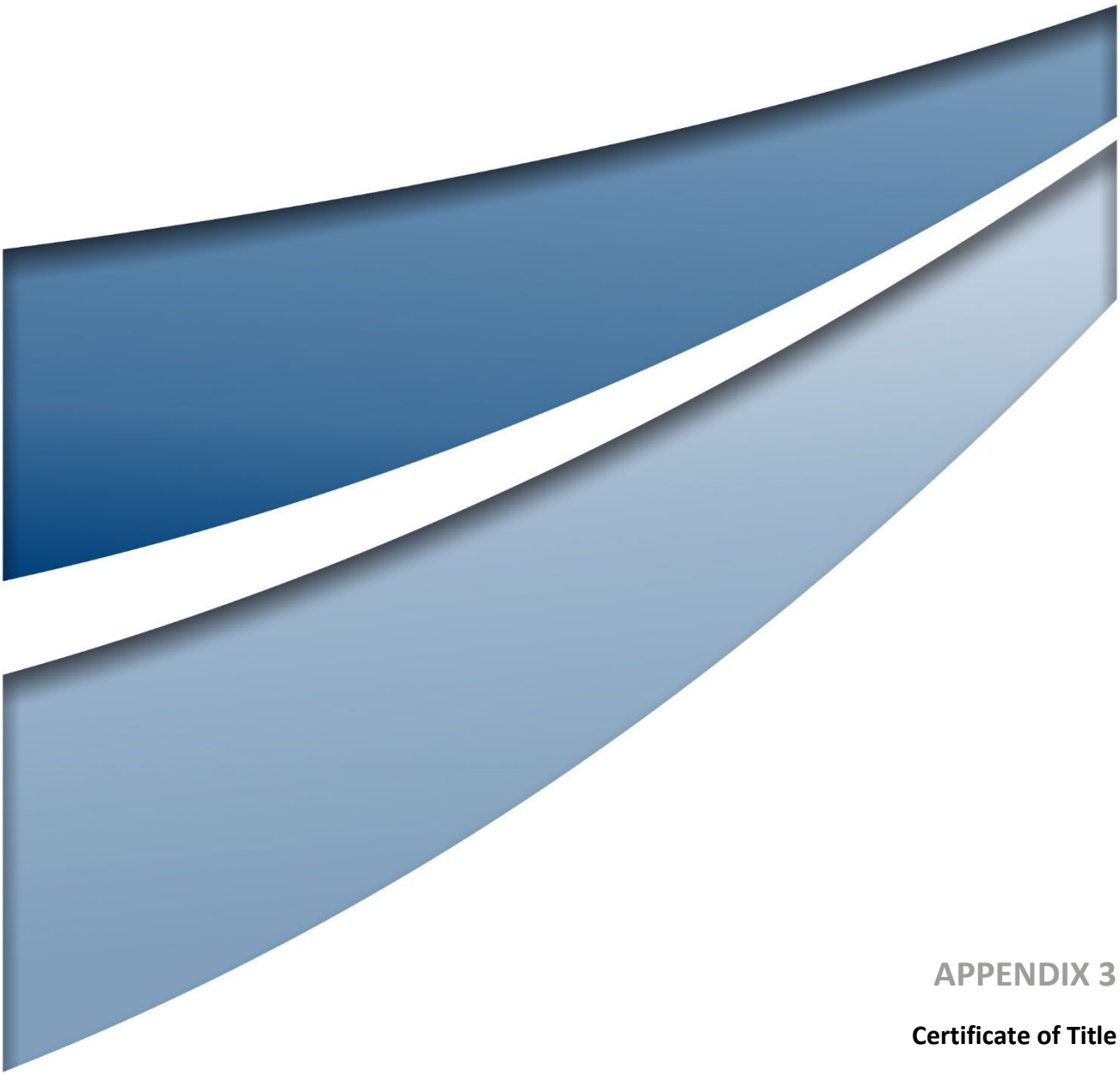
The following civil design items have not been investigated at this stage:

- Environmental management plan & Planning permit applications.
- Intersection design details.
- Sediment and Erosion control measures.
- Wastewater/water service design.
- Earthworks and Pavement design.
- Drainage design.
- Landscape design.
- Road upgrades.
- Structure and Foundation design.
- Flooding assumptions are limited to the site area, future flood assessments to consider upstream external catchments and regional affects.

APPENDIX A – LIST OF DELIVERABLES

The following associated engineering documents have been prepared and submitted with this report:

Document Reference	Site	Subject	Type	Released
MUBP-EP-LAY-80-00-0001-[B].pdf	Muchea BESS	BATTERY PLANT – CONCEPT LAYOUT	Layout	21/01/2022
MUBP-EP-LAY-80-00-0001-[B].kmz	Muchea BESS	BATTERY PLANT – CONCEPT LAYOUT [KMZ]	Layout	21/01/2022



APPENDIX 3

Certificate of Title

WESTERN AUSTRALIA

REGISTER NUMBER	
2364/DP124489	
DUPLICATE EDITION	DATE DUPLICATE ISSUED
1	**11/8/2016**

VOLUME **2908** FOLIO **693**

RECORD OF CERTIFICATE OF TITLE

UNDER THE TRANSFER OF LAND ACT 1893

The person described in the first schedule is the registered proprietor of an estate in fee simple in the land described below subject to the reservations, conditions and depth limit contained in the original grant (if a grant issued) and to the limitations, interests, encumbrances and notifications shown in the second schedule.

BGRoberts

REGISTRAR OF TITLES

REGISTRAR OF TITLES WESTERN AUSTRALIA

LAND DESCRIPTION:

LOT 2364 ON DEPOSITED PLAN 124489

REGISTERED PROPRIETOR:
(FIRST SCHEDULE)

WHITE TORO PTY LTD OF CARE OF DONALD F MUNRO & ASSOCIATES, 25 QUEEN STREET, PERTH
(XA N406140) REGISTERED 11/8/2016

LIMITATIONS, INTERESTS, ENCUMBRANCES AND NOTIFICATIONS:
(SECOND SCHEDULE)

1. C544060 EASEMENT TO THE STATE ENERGY COMMISSION OF WESTERN AUSTRALIA FOR GAS PIPELINE PURPOSES. SEE PLAN 14011. REGISTERED 5/5/1983.
   H604804 SUNDRY. THE GRANTEE OF TRANSFER C544060 IS NOW THE DBNGP LAND ACCESS MINISTER PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. REGISTERED 23/11/2000.
2. E614189 EASEMENT TO THE STATE ENERGY COMMISSION OF WESTERN AUSTRALIA FOR ELECTRICITY AND GAS PIPELINE PURPOSES - SEE SKETCH ON VOL 1448 FOL 479 REGISTERED 23/5/1991.
   H604804 SUNDRY. THE GRANTEE OF TRANSFER E614189 IS NOW THE DBNGP LAND ACCESS MINISTER PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. REGISTERED 23/11/2000.
3. H604804 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 15560 REGISTERED 23/11/2000.
4. I209657 SUNDRY. PORTION OF THE LAND HEREIN IS WITHIN THE DBNGP CORRIDOR PURSUANT TO THE DAMPIER TO BUNBURY PIPELINE ACT 1997. SEE DEPOSITED PLAN 220883 REGISTERED 20/8/2002.
5. *I209658 TAKING ORDER. THE DESIGNATED PURPOSE OF THE INTEREST TAKEN IS STATE CORRIDOR RIGHTS TO THE DBNGP LAND ACCESS MINISTER UNDER PROVISIONS OF THE DAMPIER TO BUNBURY PIPELINE ACT 1997. AS TO THE PORTION SHOWN ON DEPOSITED PLANS 215560 AND 220883 ONLY. REGISTERED 20/8/2002.
6. L297483 EASEMENT TO ERM NEERABUP PTY LTD AND EIT NEERABUP POWER PTY LTD FOR PIPELINE PURPOSES - SEE SKETCH ON DEPOSITED PLAN 59587 REGISTERED 27/4/2010.

Warning: A current search of the sketch of the land should be obtained where detail of position, dimensions or area of the lot is required.
* Any entries preceded by an asterisk may not appear on the current edition of the duplicate certificate of title.

END OF PAGE 1 - CONTINUED OVER

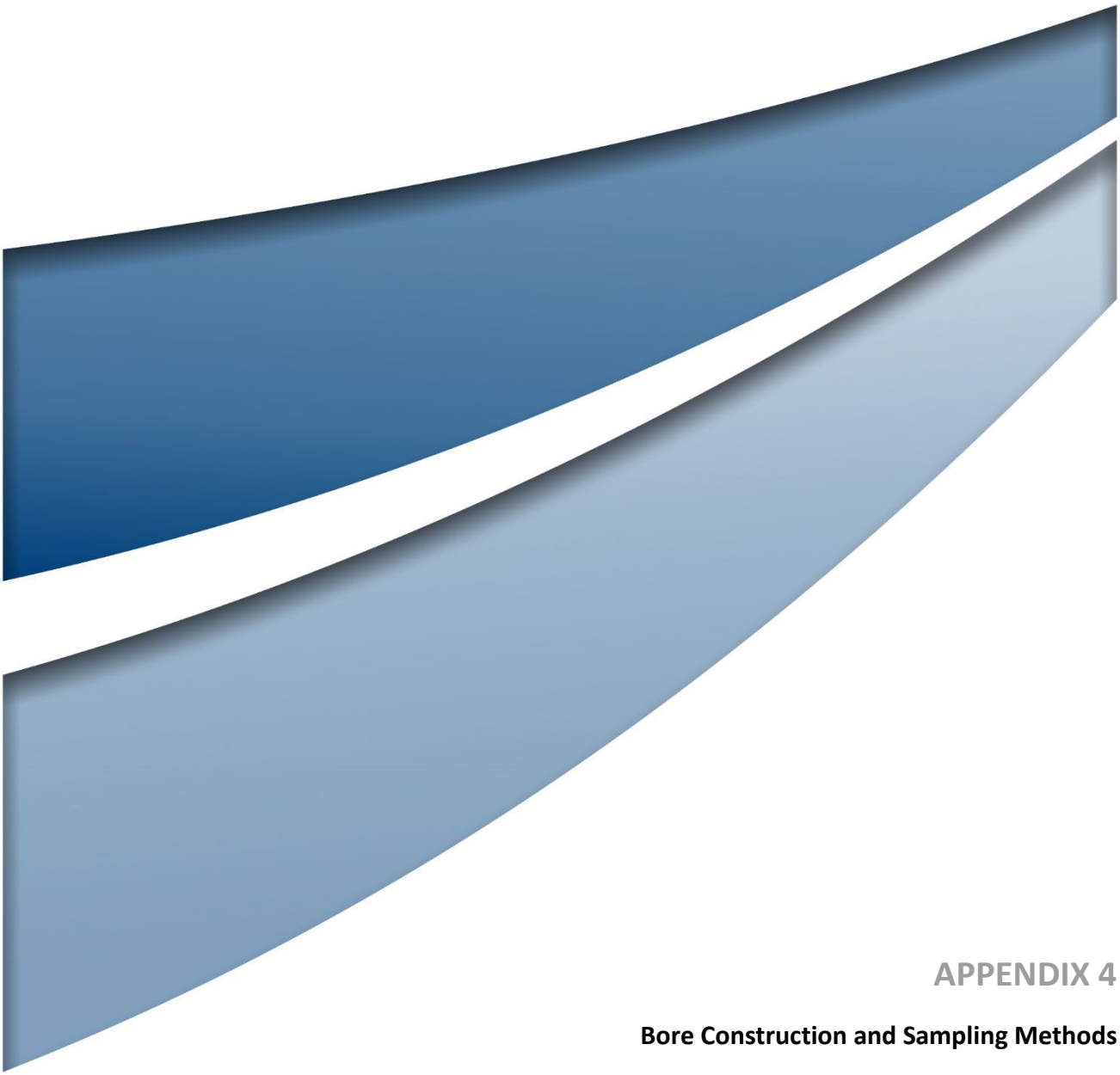
Lot as described in the land description may be a lot or location.

----------END OF CERTIFICATE OF TITLE----------

STATEMENTS:

The statements set out below are not intended to be nor should they be relied on as substitutes for inspection of the land and the relevant documents or for local government, legal, surveying or other professional advice.

SKETCH OF LAND:	1448-479 (2364/DP124489)
PREVIOUS TITLE:	1448-479
PROPERTY STREET ADDRESS:	NO STREET ADDRESS INFORMATION AVAILABLE.
LOCAL GOVERNMENT AUTHORITY:	SHIRE OF CHITTERING



APPENDIX 4

Bore Construction and Sampling Methods

Senversa Pty Ltd
Level 18, 140 St Georges Terrace, Perth, WA 6000
ABN 89 132 231 380 www.senversa.com.au

21 October 2021

Jeremy Comer
Senior Environmental Consultant
Umwelt (Australia) Pty Ltd
PO Box 783
WEST PERTH, WA 6005

Dear Jeremy

Re: Monitoring Well Installation

Proposed Utility Scale Battery – Byrne Road, Muchea

1. Introduction

Senversa Pty Ltd is pleased to provide Umwelt (Australia) Pty Ltd (Umwelt) with this letter report detailing the scope of works, methodology and findings of the recent monitoring well installation works at Neoen's proposed Utility Scale Battery site located on Byrne Road, Muchea (the site).

Senversa was engaged by Umwelt to undertake the works following acceptance of the email proposal dated 2 September 2021. An acid sulfate soils (ASS) investigation was initially proposed in conjunction with the well installation works, however Umwelt informed Senversa that the proposed construction design of the Battery did not trigger the requirement for an ASS investigation and therefore it was not undertaken as proposed. It is noted that the regional ASS mapping classifies the site as having a "moderate to low risk of ASS occurring within 3 m of natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface" (Landgate, 2021).

2. Objective

The objective of the works was to assess the standing groundwater levels (during post-winter conditions) beneath the proposed Battery site to support the development application for the construction of the Battery.

Although an ASS investigation was not undertaken as proposed, Senversa collected representative soil samples (from surface to 2.75 m below ground level (bgl)) from the two drilling locations and submitted them for laboratory analysis of pH (pre and post-oxidation) to gain a preliminary understanding as to whether the site may contain ASS in the upper 2.5 m bgl.

3. Scope of Works

The following scope of works were undertaken as part of the well installation program:

- Sub-surface service clearance of proposed drilling locations.
- Installation of two groundwater monitoring wells to 6 m bgl.
- Collection of soil samples at 0.25 m intervals down to 2.75 m bgl for future laboratory analysis of ASS parameters (i.e. if the requirement for an ASS investigation was triggered at a later date).
- Monitoring well survey (horizontal and vertical) of the wells top of casing (TOC).
- Preparation of this letter report.

4. Methodology

4.1 Relevant Guidance

Drilling and well installation methodologies were undertaken in a manner consistent with the Minimum Construction Requirements for Water Bores in Australia, Edition 4, 2020.

4.2 Subsurface Clearance

Due to the requirement for intrusive works and the potential for unknown services to be present, investigation locations were cleared of underground and overhead services via the following methodology:

- Reviewed available services plans (i.e. DBYD) when determining locations for drilling. These plans were assessed by the underground service locator in consultation with Senversa staff.
- Inspected the site and immediate off-site areas for visible lines of evidence or signage indicating possible service locations.
- Tracing utilities using a CAT and GPR.
- Cleared areas for the proposed monitoring wells.

4.3 Monitoring Well Installation

The well installation works were undertaken on 5 October 2021. The specific well design was requested by Umwelt and included the following:

- Two monitoring wells installed to 6 m bgl using 50 mm class 18 uPVC casing.
- Slotted (screened) interval from 0.5 to 6 m bgl.

The well installation methodology outlined in **Table 1** was implemented for the works.

Table 1: Well Installation Methodology

Task	Methodology
Groundwater Monitoring Well Installations	• Soil lithology was logged in accordance with AS1726:2017. • A photographic record (with relevant bore ID) was provided with each borelog (**Attachment A**). • Groundwater monitoring wells were constructed using 50 mm Class 18 machine slotted uPVC casing, washed filter sand (to 0.1 m above the 5.5 m screen) and a 0.4 m bentonite clay seal. • Wells were backfilled above the bentonite clay seal using cement grout. • Wells were finished with a lockable steel monument standpipe on a concrete block flush with surface, set at ground level.

Task	Methodology
	• After installation, each groundwater monitoring well was developed until multiple lines of evidence indicated that appropriate well development has been achieved (i.e. for at least 15 minutes at each well, 5 well volumes, or until water appeared to be visually free from sediment). Wells were purged using inertial pumps.
Surveying	• The wells were surveyed on the day of installation (5 October 2021) by a licensed surveyor (Handley Surveys) to record position and elevation in m Australian Heigh Datum (AHD), with the aim of achieving vertical position (i.e. ground level and top of casing) accuracy of +/- 5 mm. • The well survey details are presented in **Section 5.2**.

4.4 Soil Sampling and Laboratory Analysis

Samples were collected from the soil cores extracted during drilling of the monitoring wells, as per the methodology presented in **Table 2**.

Table 2: Soil Sampling Methodology

Task	Methodology
Soil Sample Collection	• Soil samples were collected at the surface and every 0.25 m thereafter (or where there was change in soil horizon) through to a maximum depth of 2.75 m bgl. • Soil samples were placed directly into clean sample bags and containers provided by the primary laboratory (ALS Environmental) using disposable nitrile gloves for each sampling location. The samples were placed on ice and submitted to the laboratory on the same day of sampling.
Laboratory Analysis	• Laboratory analysis of soil was undertaken by a National Association of Testing Authorities (NATA) accredited laboratory. • The following tests were carried out by the laboratory at full frequency (i.e. every 0.25 m sample). The results may be used to inform the selection of further ASS testing (in the form of SPOCAS and S_{Cr} analysis) if the requirement for an ASS investigation is triggered in the future: ▪ Soil pH (pH_F) ▪ Peroxide pH test (pH_{FOX}) ▪ Reaction rate classification • The laboratory pH results are presented on the borelogs in **Attachment B** and summarised in **Section 5.1**. Laboratory certificates are provided in **Attachment C**.

5. Findings

5.1 Aquifer Lithology

The generalised lithological profile encountered during installation of the two monitoring wells is summarised in **Table 3**.

The pH results indicated a low potential for ASS to be present in the upper 2.3 m silty sand profile. The pale grey sand material encountered from 2.3 m bgl showed some indications of acidity under oxidising conditions, with a pH_{FOX} of <4 and a delta pH of up to 3.7, suggesting this material may be a potential acid sulfate soil (PASS). Further laboratory testing in the form of SPOCAS and S_{Cr} analysis would be required to confirm the sand material as PASS or otherwise.

Table 3: Superficial Aquifer Lithology

Depth Interval (m bgl)	Lithology	Description	pH Ranges	Photograph
0-2.3	Silty Sand	Fine to medium grained sand, poorly graded, sub-angular to sub-rounded sand, non-plastic silt, dark grey, loose. Moist in upper profile, wet from 0.5 m bgl. Encountered from 5.5 to 6.0 m bgl at MW02 only.	pH_F: 4.7 – 6.4 pH_{FOX}: 4.0 – 5.2 Reaction: Slight to Moderate	
2.3-6.0	Sand	Fine to medium grained, poorly graded, sub-angular to sub-rounded sand, trace silt, very pale grey to white, medium dense, wet.	pH_F: 6.1 – 6.2 pH_{FOX}: 2.5 – 3.8 Reaction: Slight to Moderate	

5.2 Well Construction and Groundwater Levels

The mean standing groundwater level measured between both wells was 0.524 m bgl (58.460 m AHD).

A photograph log of the lithology at each monitoring well location is provided in **Attachment A.** Groundwater well installation logs are provided in **Attachment B** and construction arrangements are summarised in **Table 4.**

The surveyed location of the monitoring wells in relation to the proposed Battery footprint is shown in **Figure 1**.

Table 4: Groundwater Well Construction Summary

Well ID	Installation Date	Top of Casing Elevation (m AHD)	Casing Height (m agl)	Well Depth (m bgl)	Response Zone (m bgl)	Depth to Water 5-Oct-21 (m bgl)	RZ Lithology
MW01	5-Oct-21	59.635	0.610	6.0	0.5-6.0	0.573	Silty Sand: 0.5-2.3 m bgl Sand: 2.3-6.0 m bgl
MW02	5-Oct-21	58.333	0.600	6.0	0.5-6.0	0.475	Silty Sand: 0.5-2.7 m bgl Sand: 2.7-5.5 m bgl Silty Sand: 5.5-6.0 m bgl

Notes:
m AHD – meters Australian Height Datum
m agl – meters above ground level
m bgl – meters below ground level

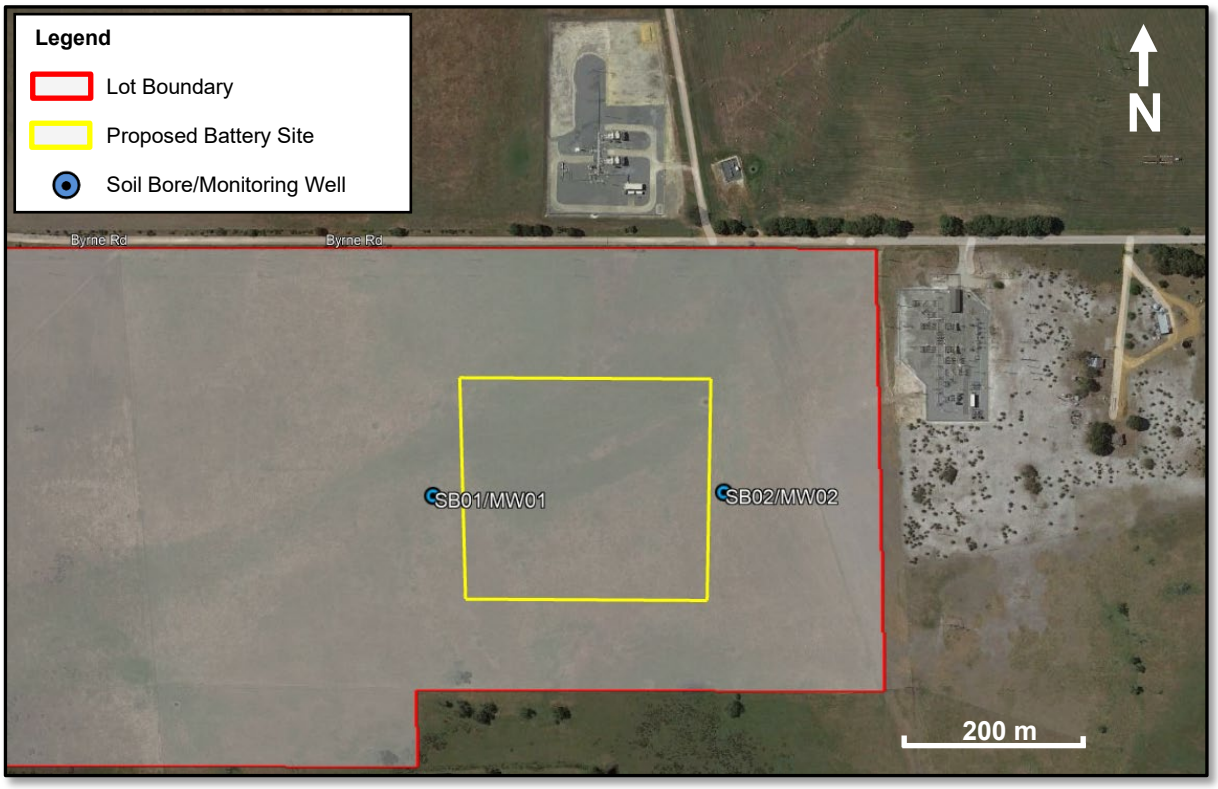


Figure 1: Monitoring Well Locations

6. Closure

If you have any queries, please do not hesitate to contact the undesigned.

Yours sincerely,

Joel Brown
Senior Environmental Scientist

Jeremy Hogben
Senior Principal

Limitations

Senversa has prepared this document for use only by its client for the specific purpose described in its proposal, which is subject to limitations. Matters of possible interest to third parties may not have been specifically addressed for the purposes of preparing this document and Senversa's use of professional judgement for the purposes of the work means that matters may have existed that would have been assessed differently on behalf of third parties.

Attachment 1 – Well Installation Photographs

Photo 1. [5 October 2021]

SB01/MW01 lithological profile

Photo 2. [5 October 2021]

MW01 post-installation

Photo 3. [5 October 2021]

SB02/MW02 lithological profile

Photo 4. [5 October 2021]

Attachment 2 – Monitoring Well Construction Logs

MATERIAL CLASSIFICATION:

ASH	USCS Ash
BASALT	USCS Basalt
CH	USCS High Plasticity Clay
CHALK	USCS Chalk
CL	USCS Low Plasticity Clay
CL-CH	USCS Low to High Plasticity Clay
CLG	USCS Low Plasticity Gravelly Clay
CL-ML	USCS Low Plasticity Silty Clay
CLS	USCS Low Plasticity Sandy Clay
FILL	USCS Fill (made ground)
GC	USCS Clayey Gravel
GM	USCS Silty Gravel
GP	USCS Poorly-graded Gravel
GP-GC	USCS Poorly-graded Gravel with Clay
GP-GM	USCS Poorly-graded Gravel with Silt
GPS	USCS Poorly-graded Sandy Gravel
GW	USCS Well Graded Gravel
GW-GC	USCS Well Graded Gravel with Clay
GW-GM	USCS Well Graded Gravel with Silt
GWS	USCS Well Graded Sandy Gravel
MH	USCS Elastic Silt
ML	USCS Silt
MLG	USCS Gravelly Silt
MLS	USCS Sandy Silt
OH	USCS High Plasticity Organic Silt or Clay
OHSH	USCS High Plasticity Organic Silt or Clay with Shells
OL	USCS Low Plasticity Organic Silt or Clay
OLSH	USCS Low Plasticity Organic Silt or Clay with Shells
PT	USCS Peat
SC	USCS Clayey Sand
SLTSN	USCS Siltstone
SC-SM	USCS Clayey Sand
SM	USCS Silty Sand
SP	USCS Poorly-graded Sand
SPG	USCS Poorly-graded Gravelly Sand
SP-SC	USCS Poorly-graded Sand with Clay
SP-SM	USCS Poorly-graded Sand with Silt
SW	USCS Well-graded Sand
SWG	USCS Well-graded Gravelly Sand
SW-SC	USCS Well-graded Sand with Clay
SW-SM	USCS Well-graded Sand with Silt
TOPSOIL	USCS Topsoil
CONC	USCS Concrete
ASPLT	USCS Asphalt
COAL	USCS Coal

MATERIAL CLASSIFICATION (Continued):

GRANITE	USCS Granite
LIMESTONE	USCS Limestone
SHALE	USCS Shale
SANDSTONE	USCS Sandstone

WELL CLASSIFICATION:

- Bentonite Seal
- Bentonite: Botton of Hole
- Capped Riser
- Cement Seal
- Cement: Bottom of Hole
- Filter Pack
- Filter Pack: Bottom of Hole
- No Backfill (just pipe)
- Pipe Cap
- Slotted Pipe
- Backfill
- Backfill at Bottom of Hole
- Top Cap

MOISTURE CLASSIFICATION:

D.....Dry

M.....Moist

W.....Wet

M-D.....Moist to/becoming Dry

METHOD CLASSIFICATION:

B	Bulldozer Blade
BH	Backhoe Bucket
DT	Diatube
E	Excavator
HA	Hand Auger
N	Natural Exposure
R	Ripper
X	Existing Excavation
AST	Auger Screwing + TC Bit
ADT	Auger Drilling + TC Bit
ASV	Auger Screwing + V Bit
ADV	Auger Drilling + V Bit
CT	Cable Tool
W	Washbore
R	Roller/Tricone
ADB	Auger Drilling + Blank Bit
ASB	Auger Screwing + Blank Bit
PT	Push Tube-Geoprobe
SON	Sonic
DC	Diamond Core

BOREHOLE NUMBER SB01/MW01

senversa

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER P19209 **PROJECT LOCATION** Lot 2364 Byrne Road, Muchea

DATE STARTED 5/10/21 **COMPLETED** 5/10/21 **LOGGED BY** EC **CHECKED BY**

CONTRACTOR Direct Push Probing (DPP) **LOCATION (Easting, Northing, Zone)** 400675.692 6507960.867 50J

EQUIPMENT Hand Auger, Geoprobe 7822DT **DIMENSIONS** 50 mm **INCLINATION** Vertical

GROUNDWATER NOTES Encountered at 0.573 mbgl **CASING LEVEL** 59.635 mAHD **SURFACE LEVEL** 58.999 mAHD

GENERAL NOTES Steel riser installed

DRILLING							FIELD MATERIAL DESCRIPTION				SAMPLING	
Method	Core Recovery (%)	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)		Sample ID & Interval (QA/QC)
HA							SM	Silty SAND: Fine to medium, poorly graded, sub-angular to sub-rounded sand, non-plastic silt, trace rootlets, dark grey, loose, moist (topsoil).				SB01/MW01_0.00 - 0.05 QC01, QC02
							SM	Pale grey, no rootlets observed.	pH (F): 5.1, pH (Fox): 4.3, RR: 'Moderate'			SB01/MW01_0.15 - 0.25
									pH (F): 4.9, pH (Fox): 4.1, RR: 'Moderate'			SB01/MW01_0.40 - 0.50
		▼					SM	Medium dense, wet.	pH (F): 5.0, pH (Fox): 4.1, RR: 'Slight'			SB01/MW01_0.65 - 0.75
				58	1				pH (F): 4.8, pH (Fox): 4.4, RR: 'Slight'			SB01/MW01_0.90 - 1.00
PT									pH (F): 4.8, pH (Fox): 4.4, RR: 'Slight'			SB01/MW01_1.15 - 1.25
									pH (F): 4.7, pH (Fox): 4.3, RR: 'Slight'			SB01/MW01_1.40 - 1.50
							SM	Pale grey to pale brown.	pH (F): 5.0, pH (Fox): 4.3, RR: 'Slight'			SB01/MW01_1.65 - 1.75
				57	2				pH (F): 5.5, pH (Fox): 4.0, RR: 'Slight'			SB01/MW01_1.90 - 2.00
									pH (F): 5.7, pH (Fox): 4.0, RR: 'Slight'			SB01/MW01_2.15 - 2.25
							SP	SAND: Fine to medium, poorly graded, sub-angular to sub-rounded sand, trace silt, very pale grey to white, medium dense, wet.	pH (F): 6.3, pH (Fox): 3.6, RR: 'Slight'			SB01/MW01_2.40 - 2.50
				56	3				pH (F): 6.1, pH (Fox): 3.8, RR: 'Slight'			
				55	4		SP	Pale brown.				
							SP	Pale grey.				
				54	5							
				53	6							
								SB01/MW01 terminated at 6.00 m bgl Target depth achieved				

1. SENVERSA STANDARD P19209.GPJ SENVERSA_GINT.GDT 21/10/21

BOREHOLE NUMBER SB02/MW02

senversa

PROJECT NAME Detailed Site Investigation

PROJECT NUMBER P19209 **PROJECT LOCATION** Lot 2364 Byrne Road, Muchea

DATE STARTED 5/10/21 **COMPLETED** 5/10/21 **LOGGED BY** EC **CHECKED BY**

CONTRACTOR Direct Push Probing (DPP) **LOCATION (Easting, Northing, Zone)** 400954.265 6507966.274 50J

EQUIPMENT Hand Auger, Geoprobe 7822DT **DIMENSIONS** 50 mm **INCLINATION** Vertical

GROUNDWATER NOTES Encountered at 0.475 mbgl **CASING LEVEL** 58.333 mAHD **SURFACE LEVEL** 57.781 mAHD

GENERAL NOTES Steel riser installed

DRILLING							FIELD MATERIAL DESCRIPTION			SAMPLING	
Method	Core Recovery (%)	Water	Well Details	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description	Additional Observations	PID (ppm)	Sample ID & Interval (QA/QC)
HA							SM	Silty SAND: Fine to medium, poorly graded, sub-angular to sub-rounded sand, non-plastic silt, trace rootlets, dark grey, loose, moist (topsoil).			SB02/MW02_0.00 - 0.05 QC03, QC04
							SM	Pale grey, no rootlets observed.	pH (F): 6.1, pH (Fox): 4.9, RR: 'Moderate'		SB02/MW02_0.15 - 0.25
									pH (F): 6.4, pH (Fox): 5.2, RR: 'Moderate'		SB02/MW02_0.40 - 0.50
PT							SM	Medium dense, wet.	pH (F): 5.5, pH (Fox): 4.9, RR: 'Moderate'		SB02/MW02_0.65 - 0.75
				57	1				pH (F): 5.8, pH (Fox): 4.9, RR: 'Moderate'		SB02/MW02_0.90 - 1.00
									pH (F): 5.8, pH (Fox): 5.0, RR: 'Slight'		SB02/MW02_1.15 - 1.25
				56					pH (F): 5.8, pH (Fox): 5.0, RR: 'Slight'		SB02/MW02_1.40 - 1.50
					2				pH (F): 5.5, pH (Fox): 4.5, RR: 'Slight'		SB02/MW02_1.65 - 1.75
									pH (F): 5.6, pH (Fox): 4.8, RR: 'Slight'		SB02/MW02_1.90 - 2.00
									pH (F): 5.6, pH (Fox): 4.8, RR: 'Slight'		SB02/MW02_2.15 - 2.25
									pH (F): 5.9, pH (Fox): 4.9, RR: 'Slight'		
							SM	Brown.	Slight organic odour		SB02/MW02_2.40 - 2.50
							SM	Pale grey.	pH (F): 5.2, pH (Fox): 4.1, RR: 'Slight'		
				55			SP	SAND: Fine to medium, poorly graded, sub-angular to sub-rounded sand, trace silt, very pale grey to white, medium dense, wet.	pH (F): 6.2, pH (Fox): 2.5, RR: 'Moderate'		
					3						
				54							
					4						
				53							
					5		SP	Pale grey.			
							SM	Silty SAND: Fine to medium, poorly graded, sub-angular to sub-rounded sand, non-plastic silt, pale grey brown, medium dense, wet.			
				52	6						
								SB02/MW02 terminated at 6.00 m bgl Target depth achieved			

1. SENVERSA STANDARD P19209.GPJ SENVERSA_GINT.GDT 21/10/21

Attachment 3 – Laboratory Certificates

senversa

Chain of Custody Documentation

Senversa Pty Ltd
www.senversa.com.au
ABN 89 132 231 380

Laboratory: ALS WA
Address: 26 Rigali Way, Wangara WA 6065
Contact: Lauren Biagioni / Client Services Coordinator
Phone: 08 9406 1301

Job Number:	P19209	**Purchase Order:**	N/A
Project Name:	Muchea DSI	**Quote No:**	EN/904/21
Sampled By:	EC	**Turn Around Time:**	Standard
Project Manager:	EC	**Page:**	1 of 1
Email Report To:	joel.brown@senversa.com.au	**Phone/Mobile:**	0422 596 287

Lab ID	Sample Information: Sample ID	Matrix *	Date	Time	Container Information: Type / Code	Total Containers	Analysis Required: ASS Field Screening Analysis (EA037)	Moisture Content (EA055-103)	Drying Only (EN020D)								HOLD	Comments: e.g. Highly contaminated sample, hazardous materials present; trace LORs etc.
1	SB01_0.05	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									Please hold all samples for further analysis.
2	SB01_0.25	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
3	SB01_0.5	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
4	SB01_0.75	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
5	SB01_1.0	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
6	SB01_1.25	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
7	SB01_1.50	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
8	SB01_1.75	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
9	SB01_2.0	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
10	SB01_2.25	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	1	X	X	X									
11	SB01_2.5	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	1	X	X	X									
12	SB02_0.05	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
13	SB02_0.25	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
14	SB02_0.5	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
15	SB02_0.75	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
16	SB02_1.0	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
17	SB02_1.25	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
18	SB02_1.50	Soil	6/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	3	X	X	X									
19	SB02_1.75	Soil	7/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	4	X	X	X									
20	SB02_2.0	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X									
21	SB02_2.25	Soil	5/10/2021		1x 250 mL Jar	2	X	X	X									

Environmental Division
Perth
Work Order Reference
EP2111858

Telephone : -- 61-8-9406 1301

Completed by: _____
Checked by: _____

senversa

Chain of Custody Documentation

Senversa Pty Ltd
www.senversa.com.au
ABN 89 132 231 380

Laboratory: ALS WA
Address: 26 Rigali Way, Wangara WA 6065
Contact: Lauren Biagioni / Client Services Coordinator
Phone: 08 9406 1301

Job Number:	P19209	**Purchase Order:**	N/A
Project Name:	Muchea DSI	**Quote No:**	EN/904/21
Sampled By:	EC	**Turn Around Time:**	Standard
Project Manager:	EC	**Page:**	1 of 1
Email Report To:	joel.brown@senversa.com.au	**Phone/Mobile:**	0422 596 287

Sample Information					Container Information		Analysis Required													Comments: e.g. Highly contaminated sample; hazardous materials present; trace LORs etc.
Lab ID	Sample ID	Matrix *	Date	Time	Type / Code	Total Containers	ASS Field Screening Analysis (EA037)	Moisture Content (EA055-103)	Drying Only (EN020D)										HOLD	
22	SB02_2.5	Soil	5/10/2021		1x 250 mL Jar	2	X	X	X											
23	SB02_2.75	Soil	5/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	2	X	X	X											
24	QC01	Soil	6/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	3	X	X	X											
25	QC03	Soil	7/10/2021		1x 250 mL Jar, 1x ASS ziplock bag	4	X	X	X											
Total						54	25	25	25	0	0						0			

Sampler: I attest that proper field sampling procedures in accordance with Senversa standard procedures and/or project specifications were used during the collection of these samples:

Sampler Name: Egan Churchill-Gray **Signature:** ECG **Date:** 5/10/2021

Relinquished By:			**Method of Shipment (if applicable):**	**Received by:**	
Name/Signature:	Egan Churchill-Gray	Date:	Carrier / Reference #:	Name/Signature: EG	Date: 06/10
Of:	Senversa	Time:	Date/Time:	Of: ALS	Time: 9:46
Name/Signature:		Date:	Carrier / Reference #:	Name/Signature:	Date:
Of:		Time:	Date/Time:	Of:	Time:
Name/Signature:		Date:	Carrier / Reference #:	Name/Signature:	Date:
Of:		Time:	Date/Time:	Of:	Time:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Acid (HNO_3) Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide (NaOH)/Cadmium (Cd) Preserved; S = Sodium Hydroxide Preserved Plastic; STH = Sodium thiosulfate preserved plastic; V = VOA Vial Hydochloric Acid (HCl) Preserved; VS = VOA Vial Sulphuric Preserved; VSA = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; UA = Unpreserved Amber Glass; L=Lugol's iodine preserved white plastic bottle; SW= sulfuric acid preserved wide mouth glass jar

Completed by: _____
Checked by: _____

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **EP2111858**

Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Joel Brown	Contact	: Rhiannon Steere
Address	: LEVEL 25, 108 ST GEORGES TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
E-mail	: joel.brown@senversa.com.au	E-mail	: rhiannon.steere@alsglobal.com
Telephone	: 0422 596 287	Telephone	: 08 9406 1306
Facsimile	: ----	Facsimile	: +61-8-9406 1399
Project	: P19209 Muchea DSI	Page	: 1 of 3
Order number	: ----	Quote number	: EP2021SENVER0024 (EP/904/21)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: Egan Churchill-Gray		

Dates

Date Samples Received	: 05-Oct-2021 15:40	Issue Date	: 05-Oct-2021
Client Requested Due Date	: 12-Oct-2021	Scheduled Reporting Date	: **12-Oct-2021**

Delivery Details

Mode of Delivery	: Client Drop Off	Security Seal	: Not Available
No. of coolers/boxes	: 2	Temperature	: 5.8 - Ice present
Receipt Detail	:	No. of samples received / analysed	: 25 / 25

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- Please see scanned COC for sample discrepencies: extra samples , samples not received etc.
- Please direct any queries related to sample condition / numbering / breakages to Sample Receipt (Samples.Perth@alsglobal.com)
- Analytical work for this work order will be conducted at ALS Environmental Perth.
- Please direct any turnaround / technical queries to the laboratory contact designated above.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months) from receipt of samples.
- **pH analysis should be conducted within 6 hours of sampling.**
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA037 ASS Field Screening Analysis	SOIL - EA055-103 Moisture Content
EP2111858-001	05-Oct-2021 00:00	SB01_0.05	✓	✓
EP2111858-002	05-Oct-2021 00:00	SB01_0.25	✓	✓
EP2111858-003	05-Oct-2021 00:00	SB01_0.5	✓	✓
EP2111858-004	05-Oct-2021 00:00	SB01_0.75	✓	✓
EP2111858-005	05-Oct-2021 00:00	SB01_1.0	✓	✓
EP2111858-006	05-Oct-2021 00:00	SB01_1.25	✓	✓
EP2111858-007	05-Oct-2021 00:00	SB01_1.50	✓	✓
EP2111858-008	05-Oct-2021 00:00	SB01_1.75	✓	✓
EP2111858-009	05-Oct-2021 00:00	SB01_2.0	✓	✓
EP2111858-010	05-Oct-2021 00:00	SB01_2.25	✓	✓
EP2111858-011	05-Oct-2021 00:00	SB01_2.5	✓	✓
EP2111858-012	05-Oct-2021 00:00	SB02_0.05	✓	✓
EP2111858-013	05-Oct-2021 00:00	SB02_0.25	✓	✓
EP2111858-014	05-Oct-2021 00:00	SB02_0.5	✓	✓
EP2111858-015	05-Oct-2021 00:00	SB02_0.75	✓	✓
EP2111858-016	05-Oct-2021 00:00	SB02_1.0	✓	✓
EP2111858-017	05-Oct-2021 00:00	SB02_1.25	✓	✓
EP2111858-018	05-Oct-2021 00:00	SB02_1.50	✓	✓
EP2111858-019	05-Oct-2021 00:00	SB02_1.75	✓	✓
EP2111858-020	05-Oct-2021 00:00	SB02_2.0	✓	✓
EP2111858-021	05-Oct-2021 00:00	SB02_2.25	✓	✓
EP2111858-022	05-Oct-2021 00:00	SB02_2.5	✓	✓
EP2111858-023	05-Oct-2021 00:00	SB02_2.75	✓	✓
EP2111858-024	05-Oct-2021 00:00	QC01	✓	✓
EP2111858-025	05-Oct-2021 00:00	QC03	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

Joel Brown

- *AU Certificate of Analysis - NATA (COA)	Email	joel.brown@senversa.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	joel.brown@senversa.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	joel.brown@senversa.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	joel.brown@senversa.com.au
- Chain of Custody (CoC) (COC)	Email	joel.brown@senversa.com.au
- EDI Format - ESDAT (ESDAT)	Email	joel.brown@senversa.com.au
- EDI Format - XTab (XTAB)	Email	joel.brown@senversa.com.au

SUPPLIER ACCOUNTS

- A4 - AU Tax Invoice (INV)	Email	supplieraccounts@senversa.com.au

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EP2111858**	Page	: 1 of 7
Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Joel Brown	Contact	: Rhiannon Steere
Address	: LEVEL 25, 108 ST GEORGES TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: 0422 596 287	Telephone	: 08 9406 1306
Project	: P19209 Muchea DSI	Date Samples Received	: 05-Oct-2021 15:40
Order number	: ----	Date Analysis Commenced	: 06-Oct-2021
C-O-C number	: ----	Issue Date	: 08-Oct-2021 13:40
Sampler	: Egan Churchill-Gray		
Site	: ----		
Quote number	: EP/904/21		
No. of samples received	: 25		
No. of samples analysed	: 25		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Daniel Fisher	Inorganics Analyst	Perth ASS, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- ASS: EA037 (Rapid Field and F(ox) screening): pH F(ox) Reaction Rate: 1 - Slight; 2 - Moderate; 3 - Strong; 4 - Extreme
- EA037 ASS Field Screening: NATA accreditation does not cover performance of this service.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01_0.05	SB01_0.25	SB01_0.5	SB01_0.75	SB01_1.0
			Sampling date / time	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EP2111858-001	EP2111858-002	EP2111858-003	EP2111858-004	EP2111858-005
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
pH (F)	----	0.1	pH Unit	5.1	4.9	5.0	4.8	4.8
pH (Fox)	----	0.1	pH Unit	4.3	4.1	4.1	4.4	4.4
Reaction Rate	----	1	-	Moderate	Moderate	Slight	Slight	Slight
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	10.5	7.7	6.9	9.2	19.3

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01_1.25	SB01_1.50	SB01_1.75	SB01_2.0	SB01_2.25
			Sampling date / time	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EP2111858-006	EP2111858-007	EP2111858-008	EP2111858-009	EP2111858-010
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
pH (F)	----	0.1	pH Unit	4.7	5.0	5.5	5.7	6.3
pH (Fox)	----	0.1	pH Unit	4.3	4.3	4.0	4.0	3.6
Reaction Rate	----	1	-	Slight	Slight	Slight	Slight	Slight
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	15.5	13.3	17.9	14.1	16.7

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB01_2.5	SB02_0.05	SB02_0.25	SB02_0.5	SB02_0.75
			Sampling date / time	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EP2111858-011	EP2111858-012	EP2111858-013	EP2111858-014	EP2111858-015
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
pH (F)	----	0.1	pH Unit	6.1	6.1	6.4	5.5	5.8
pH (Fox)	----	0.1	pH Unit	3.8	4.9	5.2	4.9	4.9
Reaction Rate	----	1	-	Slight	Moderate	Moderate	Moderate	Slight
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	20.5	15.2	9.6	15.6	19.4

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB02_1.0	SB02_1.25	SB02_1.50	SB02_1.75	SB02_2.0
			Sampling date / time	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EP2111858-016	EP2111858-017	EP2111858-018	EP2111858-019	EP2111858-020
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
pH (F)	----	0.1	pH Unit	5.8	5.8	5.5	5.6	5.6
pH (Fox)	----	0.1	pH Unit	5.0	5.0	4.5	4.8	4.8
Reaction Rate	----	1	-	Slight	Slight	Slight	Slight	Slight
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	20.6	20.5	18.8	21.3	19.8

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	SB02_2.25	SB02_2.5	SB02_2.75	QC01	QC03
			Sampling date / time	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00	05-Oct-2021 00:00
Compound	CAS Number	LOR	Unit	EP2111858-021	EP2111858-022	EP2111858-023	EP2111858-024	EP2111858-025
				Result	Result	Result	Result	Result
EA037: Ass Field Screening Analysis								
pH (F)	----	0.1	pH Unit	**5.9**	**5.2**	**6.2**	**5.2**	**6.0**
pH (Fox)	----	0.1	pH Unit	**4.9**	**4.1**	**2.5**	**4.1**	**5.0**
Reaction Rate	----	1	-	**Slight**	**Slight**	**Moderate**	**Moderate**	**Moderate**
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	0.1	%	**19.7**	**16.4**	**19.4**	**12.6**	**14.5**

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EP2111858**	Page	: 1 of 3
Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Joel Brown	Contact	: Rhiannon Steere
Address	: LEVEL 25, 108 ST GEORGES TERRACE PERTH 6000	Address	: 26 Rigali Way Wangara WA Australia 6065
Telephone	: 0422 596 287	Telephone	: 08 9406 1306
Project	: P19209 Muchea DSI	Date Samples Received	: 05-Oct-2021
Order number	: ----	Date Analysis Commenced	: 06-Oct-2021
C-O-C number	: ----	Issue Date	: 08-Oct-2021
Sampler	: Egan Churchill-Gray		
Site	: ----		
Quote number	: EP/904/21		
No. of samples received	: 25		
No. of samples analysed	: 25		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Chris Lemaitre	Laboratory Manager (Perth)	Perth Inorganics, Wangara, WA
Daniel Fisher	Inorganics Analyst	Perth ASS, Wangara, WA

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EA037: Ass Field Screening Analysis (QC Lot: 3945613)									
EP2111858-001	SB01_0.05	EA037: pH (F)	----	0.1	pH Unit	5.1	5.1	0.0	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	4.3	4.2	0.0	0% - 20%
EP2111858-010	SB01_2.25	EA037: pH (F)	----	0.1	pH Unit	6.3	6.2	0.0	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	3.6	3.5	0.0	0% - 20%
EA037: Ass Field Screening Analysis (QC Lot: 3945614)									
EP2111858-021	SB02_2.25	EA037: pH (F)	----	0.1	pH Unit	5.9	5.9	0.0	0% - 20%
		EA037: pH (Fox)	----	0.1	pH Unit	4.9	4.9	0.0	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3941147)									
EP2111858-001	SB01_0.05	EA055: Moisture Content	----	0.1	%	10.5	10.5	0.0	0% - 20%
EP2111858-010	SB01_2.25	EA055: Moisture Content	----	0.1	%	16.7	16.9	1.1	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 3941148)									
EP2111858-021	SB02_2.25	EA055: Moisture Content	----	0.1	%	19.7	19.5	0.8	0% - 20%

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

- **No Method Blank (MB) or Laboratory Control Spike (LCS) Results are required to be reported.**

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EP2111858**	Page	: 1 of 4
Client	: **SENVERSA PTY LTD**	Laboratory	: Environmental Division Perth
Contact	: Joel Brown	Telephone	: 08 9406 1306
Project	: P19209 Muchea DSI	Date Samples Received	: 05-Oct-2021
Site	: ----	Issue Date	: 08-Oct-2021
Sampler	: Egan Churchill-Gray	No. of samples received	: 25
Order number	: ----	No. of samples analysed	: 25

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA037: Ass Field Screening Analysis							
Snap Lock Bag - frozen (EA037)							
SB01_0.05, SB01_0.25, SB01_0.5, SB01_0.75, SB01_1.0, SB01_1.25, SB01_1.50, SB01_1.75, SB01_2.0, SB01_2.25, SB01_2.5, SB02_0.05, SB02_0.25, SB02_0.5, SB02_0.75, SB02_1.0, SB02_1.25, SB02_1.50, SB02_1.75, SB02_2.0, SB02_2.25, SB02_2.5, SB02_2.75, QC01, QC03	**05-Oct-2021**	**06-Oct-2021**	03-Apr-2022	✓	**06-Oct-2021**	03-Apr-2022	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
SB01_0.05, SB01_0.25, SB01_0.5, SB01_0.75, SB01_1.0, SB01_1.25, SB01_1.50, SB01_1.75, SB01_2.0, SB01_2.25, SB01_2.5, SB02_0.05, SB02_0.25, SB02_0.5, SB02_0.75, SB02_1.0, SB02_1.25, SB02_1.50, SB02_1.75, SB02_2.0, SB02_2.25, SB02_2.5, SB02_2.75, QC01, QC03	**05-Oct-2021**	**----**	----	----	**06-Oct-2021**	19-Oct-2021	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
ASS Field Screening Analysis	EA037	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Moisture Content	EA055	3	25	**12.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
ASS Field Screening Analysis	EA037	SOIL	In house: Referenced to Acid Sulfate Soils Laboratory Methods Guidelines. As received samples are tested for pH field and pH fox and assessed for a reaction rating.
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).

Preparation Methods	Method	Matrix	Method Descriptions
Drying only	EN020D	SOIL	In house

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Chain of Custody Documentation

Senversa Pty Ltd
www.senversa.com.au
ABN 89 132 231 380

Laboratory: Eurofins WA
Address: 46-48 Banksia Road, Welshpool WA 6106
Contact: Rob Johnson / Analytical Services Manager
Phone: 08 9251 9692

Job Number:	P19209	**Purchase Order:**	N/A
Project Name:	Muchea DSI	**Quote No:**	N/A
Sampled By:	Egan Churhcill-Gray	**Turn Around Time:**	Standard
Project Manager:	Joel Brown	**Page:**	1 of 1
Email Report To:	joel.brown@senversa.com.au	**Phone/Mobile:**	0422 596 287

Sample Information					Container Information		Analysis Required											Comments: e.g. Highly contaminated sample; hazardous materials present; trace LORs etc.
Lab ID	Sample ID	Matrix *	Date	Time	Type / Code	Total Containers	ASS field screening (pHF and pHFOX)	Moisture Content									HOLD	
	QC02	Soil	5/10/2021		1x 250 mL Jar, 1x ASS Ziplock Bag	2	X	X										Please hold all samples for further analysis
	QC04	Soil	5/10/2021		1x 250 mL Jar, 1x ASS Ziplock Bag	2	X	X										
Total						4	2	2									0	

829775

5/10/21 16:20

Sampler: I attest that proper field sampling procedures in accordance with Senversa standard procedures and/or project specifications were used during the collection of these samples:

Sampler Name: Egan Churchill-Gray **Signature:** **Date:** 5-Oct-21

Relinquished By:			Method of Shipment (if applicable):	Received by:	
Name/Signature:	Egan Churchill-Gray	Date:	Carrier / Reference #:	Name/Signature: Rob Johnston	Date: 5/10/21
Of:	Senversa	Time:	Date/Time:	Of: Eurofins	Time: 16:20
Name/Signature:		Date:	Carrier / Reference #:	Name/Signature:	Date:
Of:		Time:	Date/Time:	Of:	Time:
Name/Signature:		Date:	Carrier / Reference #:	Name/Signature:	Date:
Of:		Time:	Date/Time:	Of:	Time:

Water Container Codes: P = Unpreserved Plastic; N = Nitric Acid (HNO_3) Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide (NaOH)/Cadmium (Cd) Preserved; S = Sodium Hydroxide Preserved Plastic; STH = Sodium thiosulfate preserved plastic; V = VOA Vial Hydochloric Acid (HCl) Preserved; VS = VOA Vial Sulphuric Preserved; VSA = Sulphuric Preserved Amber Glass; H = HCl Preserved Plastic; HS = HCl Preserved Speciation Bottle; SP = Sulphuric Preserved Plastic; F = Formaldehyde Preserved Glass; Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; UA = Unpreserved Amber Glass; L=Lugol's iodine preserved white plastic bottle; SW= sulfuric acid preserved wide mouth glass jar

Completed by: _____
Checked by: _____

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43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Sample Receipt Advice

Company name:	Senversa Pty Ltd WA
Contact name:	Joel Brown
Project name:	MUCHEA DSI
Project ID:	P19209
Turnaround time:	5 Day
Date/Time received	Oct 5, 2021 4:20 PM
Eurofins reference	829775

Sample Information

✓	A detailed list of analytes logged into our LIMS, is included in the attached summary table.
✓	All samples have been received as described on the above COC.
✓	COC has been completed correctly.
✓	Attempt to chill was evident.
✓	Appropriately preserved sample containers have been used.
✓	All samples were received in good condition.
✓	Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.
✓	Appropriate sample containers have been used.
N/A	Sample containers for volatile analysis received with zero headspace.
✗	Split sample sent to requested external lab.
✗	Some samples have been subcontracted.
N/A	Custody Seals intact (if used).

Notes

Contact

If you have any questions with respect to these samples, please contact your Analytical Services Manager:

Rhys Thomas on phone : (+61) 8 9251 9602 or by email: RhysThomas@eurofins.com

Results will be delivered electronically via email to Joel Brown - joel.brown@senversa.com.au.

Note: A copy of these results will also be delivered to the general Senversa Pty Ltd WA email address.

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web: www.eurofins.com.au
email: EnviroSales@eurofins.com

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Company Name: Senversa Pty Ltd WA
Address: Level 18, 140 St Georges Terrace
Perth
WA 6000

Project Name: MUCHEA DSI
Project ID: P19209

Order No.:
Report #: 829775
Phone: 0863240200
Fax: 0396060074

Received: Oct 5, 2021 4:20 PM
Due: Oct 12, 2021
Priority: 5 Day
Contact Name: Joel Brown

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QC02	Oct 05, 2021		Soil	L21-Oc08657	X	X
2	QC04	Oct 05, 2021		Soil	L21-Oc08658	X	X
Test Counts						2	2

Senversa Pty Ltd (WA)
Level 18, 140 St Georges Terrace
Perth
WA 6000

Attention: **Joel Brown**

Report **829775-S**
Project name MUCHEA DSI
Project ID P19209
Received Date Oct 05, 2021

Client Sample ID			**QC02**	**QC04**
Sample Matrix			**Soil**	**Soil**
Eurofins Sample No.			**L21-Oc08657**	**L21-Oc08658**
Date Sampled			**Oct 05, 2021**	**Oct 05, 2021**
Test/Reference	LOR	Unit		
Acid Sulfate Soils Field pH Test				
pH-F (Field pH test)*	0.1	pH Units	7.2	7.7
pH-FOX (Field pH Peroxide test)*	0.1	pH Units	5.9	6.4
Reaction Ratings*[S05]	0	-	2.4	2.3
% Moisture	1	%	15	14

Sample History

Where samples are submitted/analysed over several days, the last date of extraction is reported.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Acid Sulfate Soils Field pH Test	Welshpool	Oct 06, 2021	7 Days
- Method: LTM-GEN-7060 Determination of field pH (pHF) and field pH peroxide (pHFOX) tests			
% Moisture	Welshpool	Oct 06, 2021	14 Days
- Method: LTM-GEN-7080 Moisture			

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IANZ # 1290

Company Name:	Senversa Pty Ltd WA	**Order No.:**		**Received:**	Oct 5, 2021 4:20 PM
Address:	Level 18, 140 St Georges Terrace Perth WA 6000	**Report #:**	829775	**Due:**	Oct 12, 2021
		Phone:	0863240200	**Priority:**	5 Day
		Fax:	0396060074	**Contact Name:**	Joel Brown
Project Name:	MUCHEA DSI				
Project ID:	P19209				

Eurofins Analytical Services Manager : Rhys Thomas

Sample Detail						Acid Sulfate Soils Field pH Test	Moisture Set
Perth Laboratory - NATA # 2377 Site # 2370						X	X
Melbourne Laboratory - NATA # 1261 Site # 1254							
Sydney Laboratory - NATA # 1261 Site # 18217							
Brisbane Laboratory - NATA # 1261 Site # 20794							
Mayfield Laboratory - NATA # 1261 Site # 25079							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	QC02	Oct 05, 2021		Soil	L21-Oc08657	X	X
2	QC04	Oct 05, 2021		Soil	L21-Oc08658	X	X
Test Counts						2	2

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient
WA DWER	Sum of PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC - Acceptance Criteria

The acceptance criteria should be used as a guide only and may be different when site specific Sampling Analysis and Quality Plan (SAQP) have been implemented

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

NOTE: pH duplicates are reported as a range not as RPD

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs..

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM where no positive PFAS results have been reported have been reviewed and no data was affected.

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QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling. Therefore, laboratory analysis is unlikely to be completed within holding time.Analysis will begin as soon as possible after sample receipt.
4. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of recovery the term "INT" appears against that analyte.
5. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
6. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Acid Sulfate Soils Field pH Test				Result 1	Result 2	RPD			
pH-F (Field pH test)*	L21-Oc05824	NCP	pH Units	11	11	pass	30%	Pass	
pH-FOX (Field pH Peroxide test)*	L21-Oc05824	NCP	pH Units	11	11	pass	30%	Pass	
Reaction Ratings*	L21-Oc05824	NCP	-	5.1	5.1	pass	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	L21-Oc08657	CP	%	15	15	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
S05	Field Screen uses the following fizz rating to classify the rate the samples reacted to the peroxide: 1.0; No reaction to slight. 2.0; Moderate reaction. 3.0; Strong reaction with persistent froth. 4.0; Extreme reaction.

Authorised by:

Rhys Thomas Analytical Services Manager

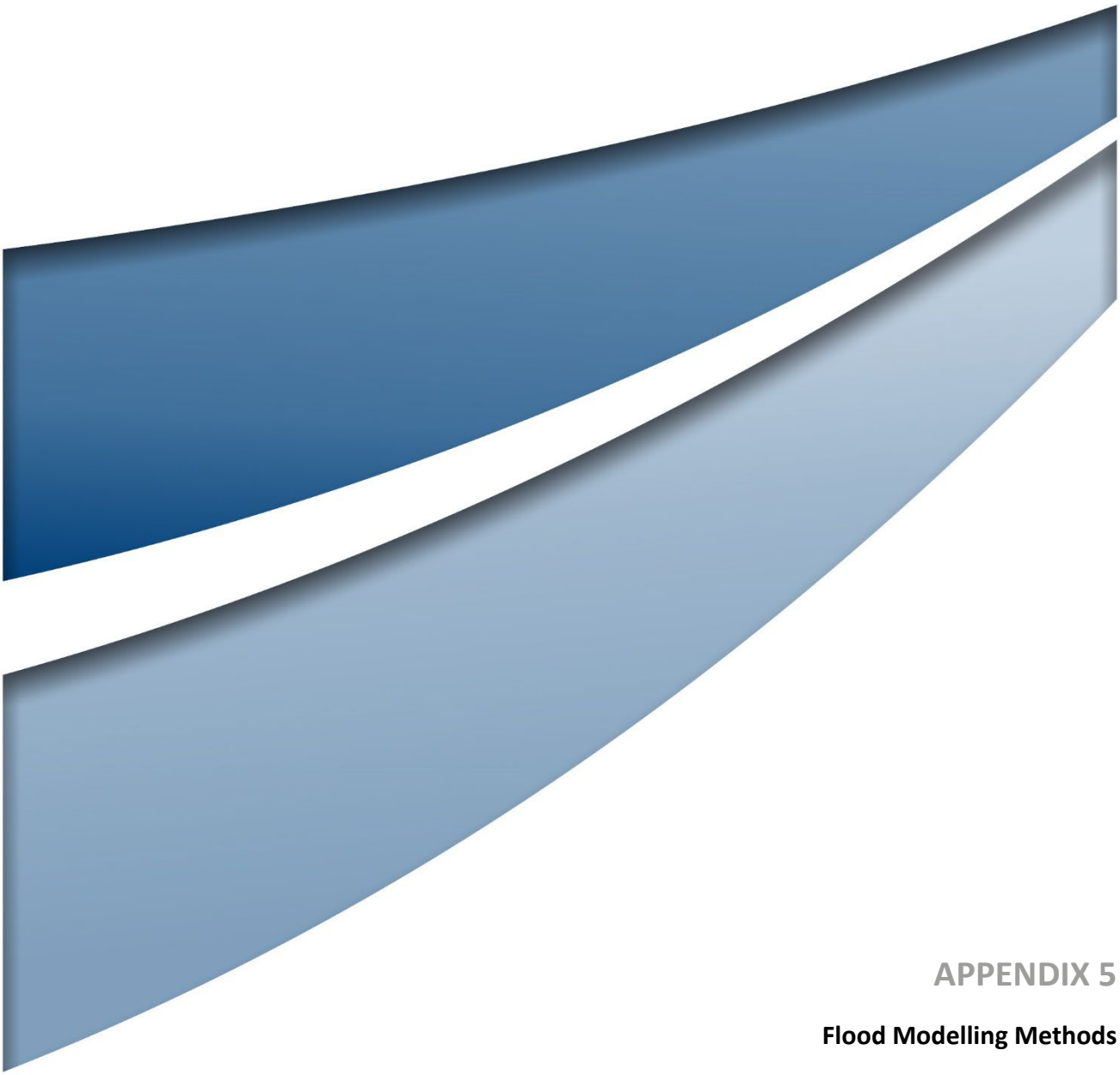
Kim Rodgers
Business Unit Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request



APPENDIX 5

Flood Modelling Methods

umwelt
Environmental & Social Consultants

Inspired People
Dedicated Team
Quality Outcomes

Briefing Note

To: Rob Karelse

From: Darren Lyons

Author: Darren Lyons

Date: 14 December 2021

Subject: Neoen Muchea Battery Energy Storage System (BESS) Project Flood Risk Assessment

1.0 Introduction

This Flood Risk Assessment (FRA) is undertaken to inform the proposed Neoen Muchea Batter Energy Storage System (BESS) project. The primary objective of the FRA is to characterise flooding within Ellen Brook and the overland flow environment draining through the Project area. The FRA is underpinned by the development of hydrological and hydraulic models to estimate design flood conditions. The modelling and mapping outputs contribute to:

- defining the existing flood behaviour from local catchment flooding in the defined study area;
- informing the development of the Project Layout including location and form of infrastructure and planning requirements associated with flood risk related development control; and
- providing baseline conditions and a tool for assessing potential impacts of the Project on the existing flooding behaviour.

2.0 Background Flood Information

The Project is located adjacent to the Ellen Brook, a tributary of the Swan River. Review of the Department of Water and Environmental Regulation (DWER) online flood mapping tool (Floodplain mapping tool (water.wa.gov.au)) indicates no existing mapping for this reach of Ellen Brook. The limit of existing flood mapping for Ellen Brook is at Rutland Road, Bullsbrook, some 11 km downstream of the Site as shown in **Figure 2.1**.

The flood mapping downstream of the Site is derived from a wider flood study for the Swan and Helena Rivers undertaken by BMT WBM and HARC for DWER. This study did not extend to detailed mapping along the full length of the Ellen Brook tributary. The *Swan and Helena Rivers Flood Study: Hydrology* (HARC, 2016) report noted that although the Ellen Brook catchment is a significant size in its own right (640 km^2), it is likely to only provide a very minor contribution to Swan River floods due to differences in critical storm duration.

The HARC (2016) hydrology study utilised hydrological modelling of the Ellen Brook catchment to derive design peak flow estimates as tributary inflows to the major Swan system. The reporting did not document the relative inflows along Ellen Brook, including near the Project area.

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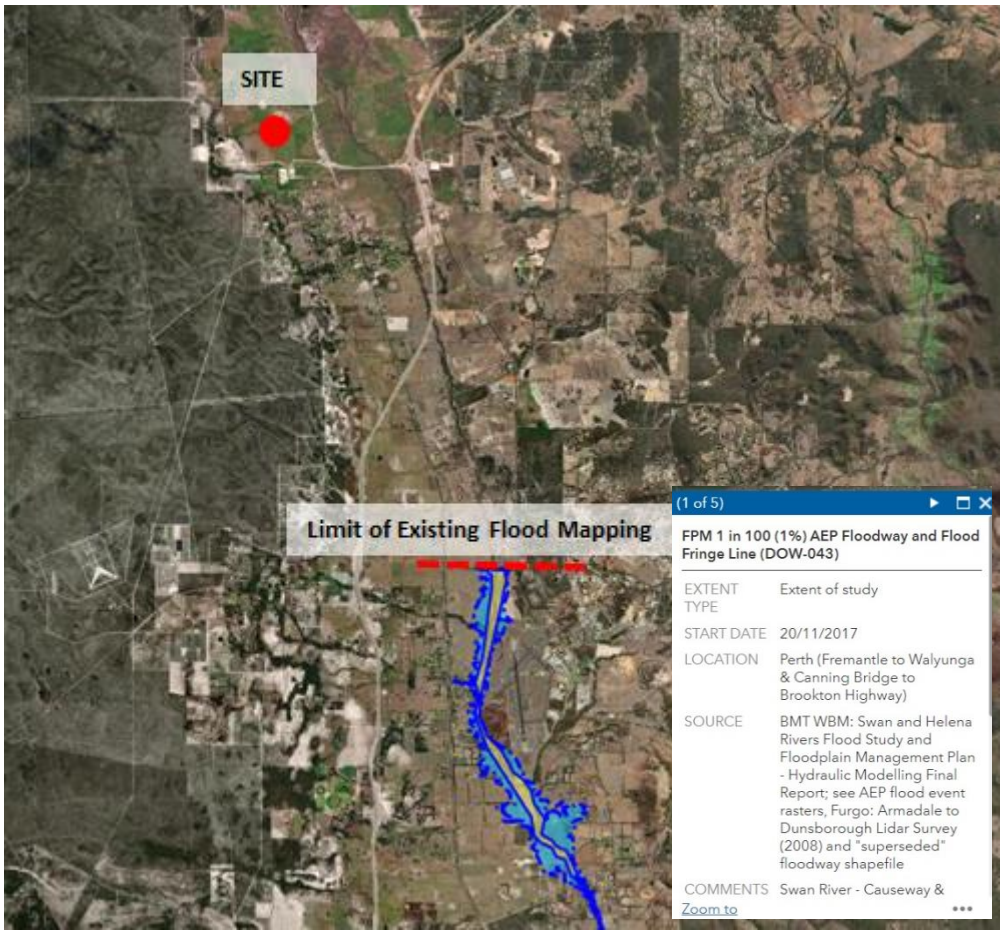


Figure 2.1 Extract of Existing Flood Mapping ([Floodplain mapping tool (water.wa.gov.au)]

The *Ellen Brook Flood Study Hydrology* (Water Authority of Western Australia, 1987) incorporated hydrological modelling to derive flood hydrographs for Ellen Brook and associated tributaries. A combination of rainfall-runoff modelling software (RORB and FLOUT) and flood frequency analysis was applied to provide peak flow estimates for a range of design magnitude events including the 1% Annual Exceedance Probability (AEP).

The sub-catchment delineation employed in the modelling provided for progressive accumulation of flow along the Ellen Brook from tributary and local catchment inputs. Peak design flow estimates for selected locations were summarised in the reporting, providing some reference of design flows for the current study. Being a hydrological study only, no flood level estimation is included in the study outputs.

With no existing flood mapping available for the Project area, the flood risk assessment includes the development of appropriate models to estimate design flood conditions.

3.0 Modelling Approach

Review of aerial imagery of the Project area indicates its proximity to some local surface water features and drainage depressions, and as such may be susceptible to overland flooding through this surface water network in addition to the mainstream Ellen Brook flooding. Accordingly, the developed models are configured to simulate both flooding mechanisms.

Given the availability of LiDAR data, a local TUFLOW two-dimensional (2D) hydraulic model of a local reach of the Ellen Brook and the local overland drainage catchments around the Project area has been developed. The 2D model provides a spatial distribution of flood inundation extent, flow depth and velocity within the waterway network and surrounding overbank areas.

The setup and configuration of the TUFLOW model is outlined below.

3.1 Model Domain and Topography

A TUFLOW 2D model of the Ellen Brook floodplain was developed extending from 4km upstream of the Project to 11km downstream. The downstream model extent coincides with the limit of existing DWER flood mapping at Bullsbrook to provide some general validation of the inundation extents derived for mainstream Ellen Brook flooding.

The ability of the model to provide an accurate representation of the flow distribution on the floodplain ultimately depends upon the quality of the underlying topographic model. For this study, a 5m gridded Digital Elevation Model (DEM) was available using the LiDAR survey datasets from Geosciences Australia. The model topography was developed from the LiDAR data available for the site.

A TUFLOW 2D domain model resolution of 5m was adopted for study area. It should be noted that TUFLOW samples elevation points at the cell centres, mid-sides and corners, so a 5m cell size results in DEM elevations being sampled every 2.5m.

The model extents and local topography is shown in **Figure 3.1**. The Project area is located to the west of Ellen Brook, some 1.5km from the waterway alignment. The approximate ground levels at the Project area are around 58m AHD with adjacent Ellen Brook channel elevations at around 48m AHD. The model domain incorporates the local overland flow catchment to the west of the Project area, extending from the remnant sand dunes evident in the topography.

The LiDAR data was acquired prior to the Granary Drive/Brand Highway deviation road works. Accordingly, the current road alignment and associated embankments are not represented in the modelled DEM. Review of the modelling results provided in **Section 4.0** indicates that the modifications to the road network will have limited influence on flood conditions at the Project area.

3.2 Hydraulic Roughness

The development of the TUFLOW model requires the assignment of different hydraulic roughness zones for modelling the variation in flow resistance. Typically, these zones are delineated from aerial photography and cadastral data identifying different land-use and surface coverage type (e.g. roads, urban areas, park lands, vegetation etc.)

Given the largely rural nature of the modelled Ellen Brook floodplain, a simplified hydraulic roughness distribution was adopted comprising the following Manning's 'n' roughness values:

- General cleared floodplain 'n' 0.05
- Riparian and floodplain vegetation 'n' 0.08

Further refinement of the simplified composite Manning's 'n' may be undertaken to provide a more detailed local distribution depending on sensitivity of simulated flood conditions and impact on the Project.

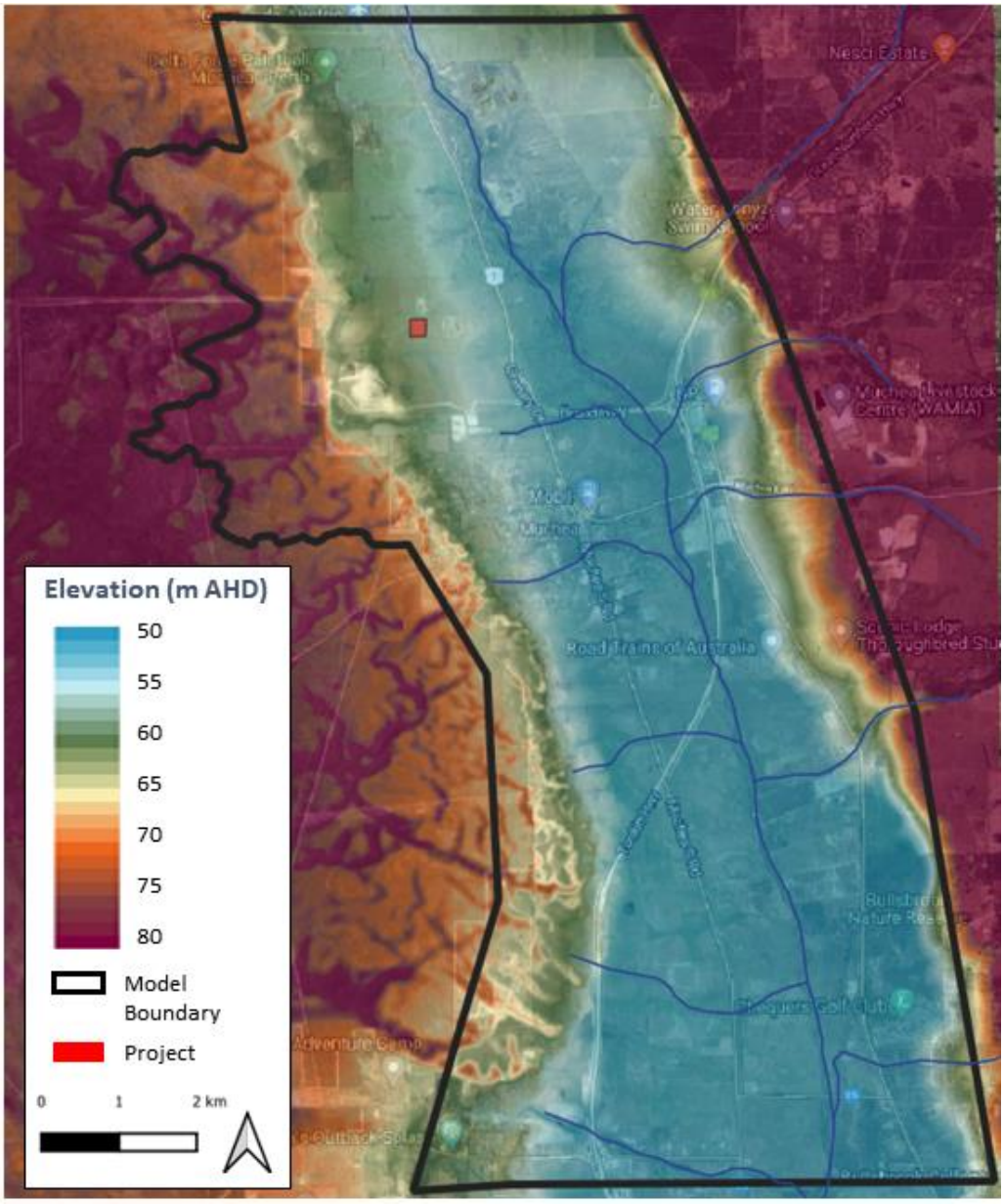


Figure 3.1

3.3 Hydraulic Structures

Given the high-level risk assessment being undertaken, only a simplified representation of major road and rail cross drainage was incorporated in the hydraulic model. Detailed data on bridge/culvert configurations and dimensions was not acquired for the study.

Clear span cross drainage openings were provided at the locations of bridges/culverts identified through aerial photography and the topographic data. In some instances, the LiDAR data provides for clear spans between abutments (i.e. deck removed) through major road embankment crossings of Ellen Brook.

For smaller structures, including the local catchment cross drainage culverts along the Brand Highway, the culverts were modelled as a clear span opening through the road embankments by adjusting of the model ground elevations.

No additional hydraulic loss parameters were applied to structures. It is noted that the principal inclusion of the structures in the model is to provide flow continuity across road/rail embankment structures, rather than a detailed analysis of structure performance

As noted, the LiDAR data was acquired prior to construction of Granary Drive/Brand Highway deviation works. Nevertheless, it is expected that the road deviation design provided for appropriate cross drainage structure capacity.

3.4 Boundary Conditions

The model configuration provides for the following boundary condition application:

- Ellen Brook Design Inflows – upstream model boundary inflows to the Ellen Brook Channel and floodplain
- Local Catchment Rainfall – direct rainfall input to the model within the local catchment derived for the Project area
- Ellen Brook Water Levels – a water level boundary at the downstream model extent derived from stage-discharge relationship

The derivation of the Ellen Brook inflows and design rainfall inputs are discussed in the following sections.

3.4.1 Ellen Brook Design Flows

The design model inflows for Ellen Brook are derived from the Ellen Brook Flood Study Hydrology (Water Authority of Western Australia, 1987). At this stage of the risk assessment, it was considered additional hydrological analysis was not required and the existing flow data fit for purpose. In the event that the Project is sensitive to the Ellen Brook flood behaviour, refinement of the Ellen Brook hydrology may be undertaken comprising elements of rainfall modelling and flood frequency analysis in accordance with ARR2019 guidelines (Ball et al, 2019).

The Ellen Brook Flood Study Hydrology does not provide a detailed flow output for each modelled sub-catchment. Peak design flow estimates are documented for Ellen Brook at Rutland Road which corresponds to the adopted downstream boundary in the TUFLOW model. The estimated 1% AEP design flow is 81m^3/s. This design flow estimate corresponds to the 48-hour design event identified as the critical duration for the catchment.

The 81m^3/s design flow is applied as a steady-state inflow at the TUFLOW model upstream boundary. It is noted that this design flow estimate is derived for the Rutland Road location further downstream and accordingly may represent a conservative design flow input for the study with the inclusion of the additional downstream local catchment inflows.

3.4.2 Design Rainfall and Losses

The developed TUFLOW model includes simulation of the rainfall-runoff response for the local overland flow catchments impacting on the Project area. A direct rainfall (rainfall on grid) modelling approach is applied.

The Intensity-Frequency-Duration (IFD) design rainfall is derived using the 2016 ARR IFD analysis available from the Bureau of Meteorology (http://www.bom.gov.au/water/designRainfalls/revised-ifd/). Table 1 summarises the design 1% AEP rainfall depths for short duration events.

The critical duration for overland flooding at the Project area from local catchment rainfall will be considerably shorter than the 48-hour duration derived from the mainstream Ellen Brook inflows. A uniform design rainfall was adopted (i.e. no spatial variation) given the size of the local catchment.

Table 1 Design 1% AEP Rainfall Estimates (2016 IFD)

Duration	Rainfall Depth (mm)
30min	33.5
1 hour	43.2
1.5 hour	50.5
2 hour	56.7
3 hour	67.3
6 hour	90.4
9 hour	106
48 hour	154

Design storm rainfall losses are estimated using the ARR2019 datahub. The following losses for rural areas (i.e. not urban areas) are provided as standard rainfall losses for the Muchea locality:

- Storm Initial Loss (IL) – 42mm
- Storm Continuing Loss (CL) – 4mm/hr

Note that median preburst depths for the short duration (<3hrs) 1% AEP events are nominally between 5 and 6mm (Burst Loss = Storm Loss – Preburst).

The standard rainfall losses coupled with the rainfall depths noted above would provide for very little effective rainfall contributing to surface runoff generation. Accordingly, consideration of more conservative rainfall losses is given in the flood risk assessment. This may be representative of an extremely wet antecedent condition and high groundwater levels which can limit infiltration losses and contribute to higher surface flows.

4.0 Flood Risk Assessment

The developed model has been simulated to estimate the 1% AEP design flood conditions comprising the coincident flooding conditions of:

- Mainstream Ellen Brook flooding (indicative 48-hour critical duration)
- Local catchment overland flow (indicative <3hr critical duration)

The flood model results provide the distribution of peak flood level, depth, velocity and hazard across the Project Area. A depth mapping limit of 5 cm has been applied such that these very shallow areas with depth less than 5cm are filtered from the results.

The 1% AEP design flood inundation extents and flood depth distribution is shown in **Figure 4.1.**

The Project Area is not subject to inundation from Ellen Brook at the 1% AEP flood level. The peak flood inundation extents along Ellen Brook are confined to east of the Brand Highway. The simulated Ellen Brook flood extents adjacent to the Project area are consistent with the general widths of floodplain inundation in the DWER mapping for the reach downstream of Bullsbrook. The downstream limit of the mapping shown in **Figure 4.1** correspond to the upstream limit of the DWER mapping.

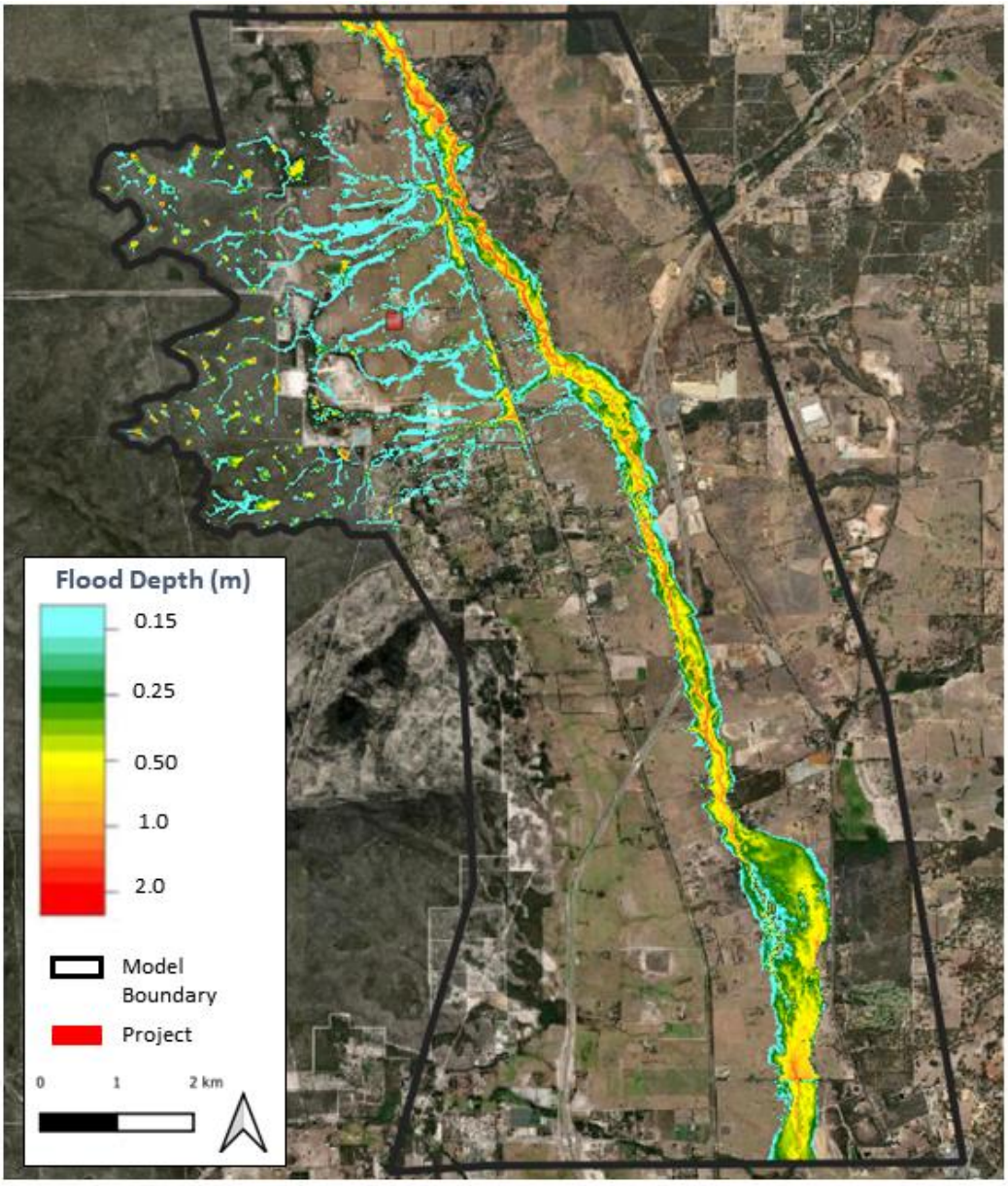


Figure 4.1 Design 1% AEP Flood Inundation Extents – Mainstream Flooding

Figure 4.2 and **Figure 4.3** show the local overland flooding condition around the Project Area for the adopted standard and conservative rainfall losses respectively. The conservative losses simulation adopts zero initial and continuing losses.

Overland flow is derived from the local catchment areas west of the Project area. There are constructed drainage lines to south of the Project Area with other drainage paths following the local topographical depressions. Given the limited local catchment area local runoff generation only provides for shallow overland flow around the Project Area which would be expected to be managed through typical site drainage provisions. Overland flow depths are typically of the order of 0.1m.

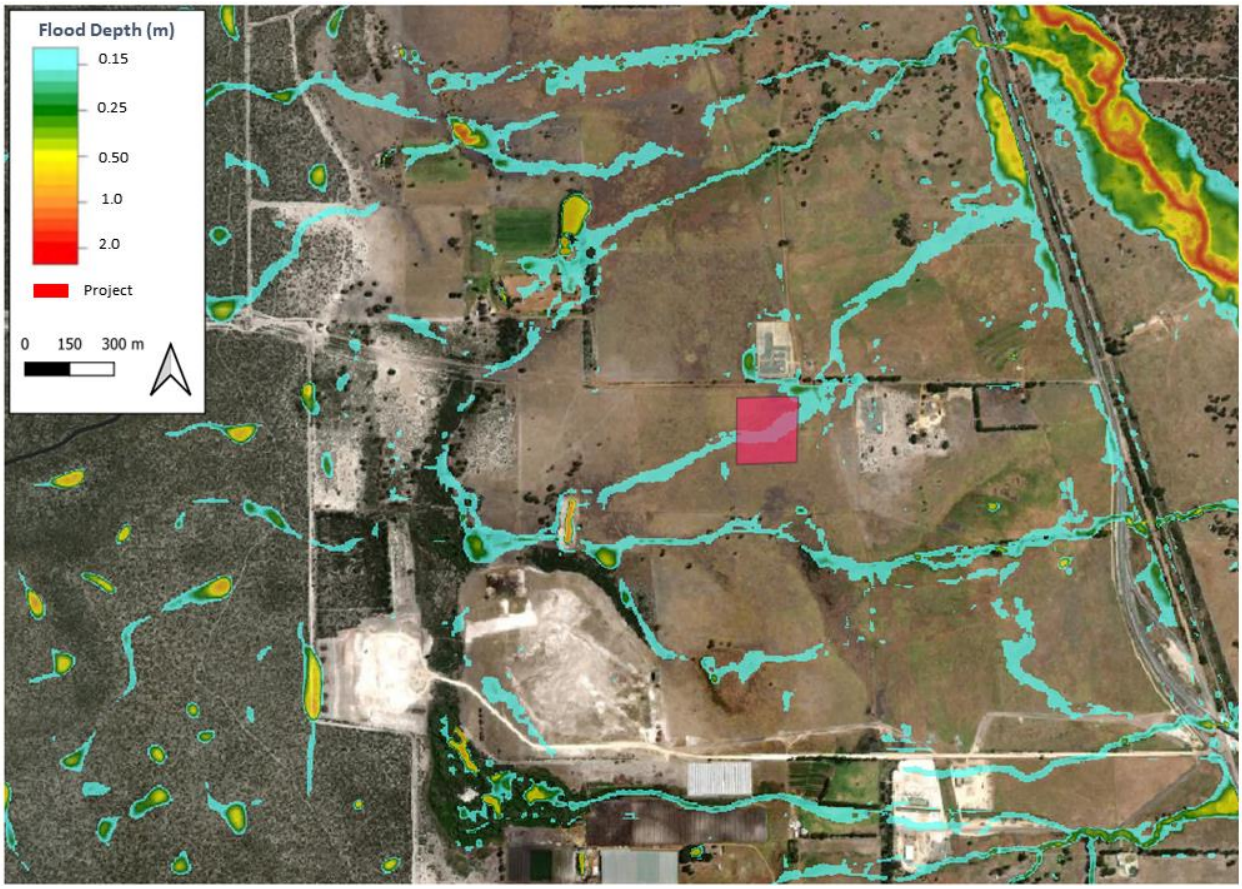


Figure 4.2 **Design 1% AEP Flood Inundation Extents – Local Catchment (Standard Losses)**

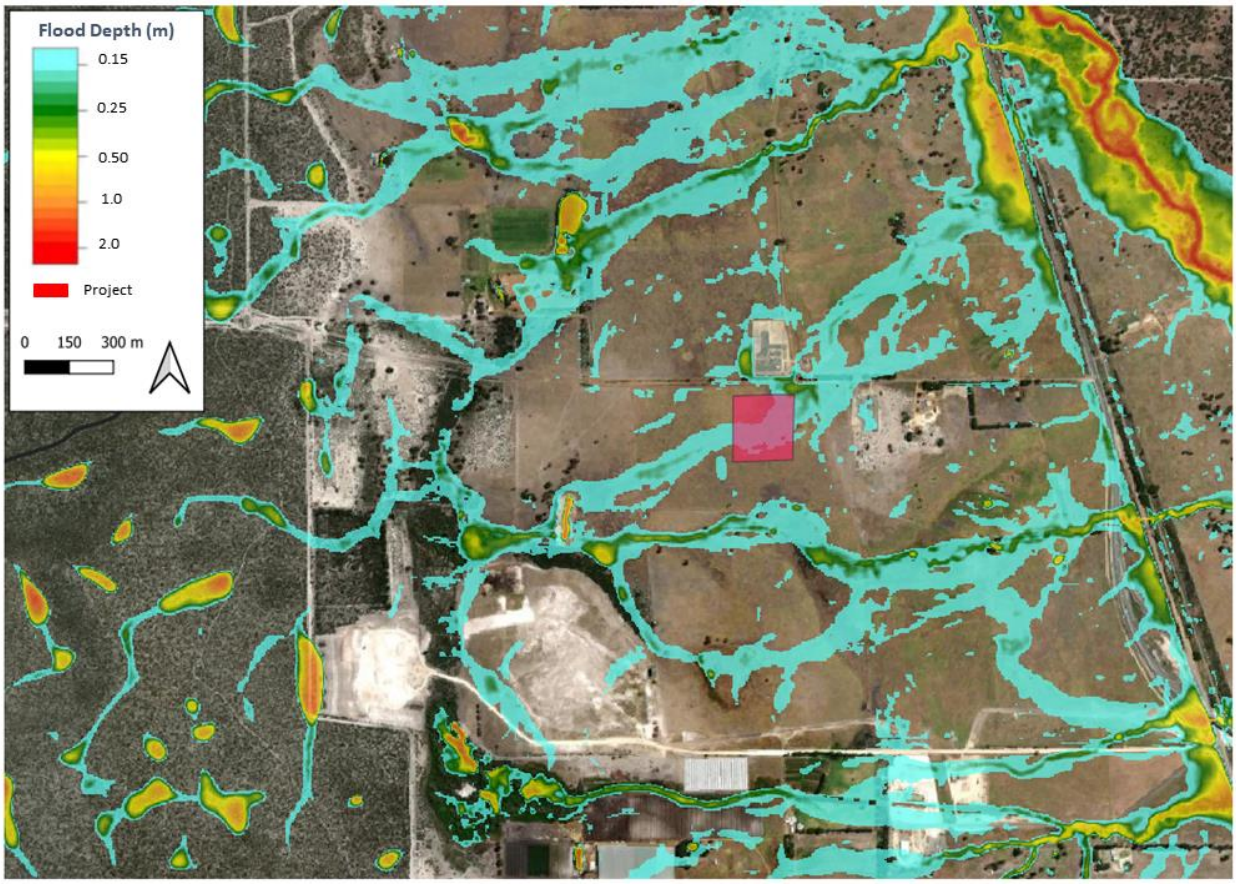


Figure 4.3 **Design 1% AEP Flood Inundation Extents – Local Catchment (Conservative Losses)**

The flood hazard level is determined on the basis of the predicted flood depth and velocity. The flood hazard of the site was assessed in accordance with ARR 2019, which defines six hazard categories as depicted in **Figure 4.4**. A high flood depth will cause a hazardous situation while a low depth may only cause an inconvenience. High flood velocities are dangerous and may cause structural damage while low velocities generally have no major threat. Given the low flood depths associated with the overland flow from the local catchments, the flood risk at the Project area is classified as low risk (class H1-H2).

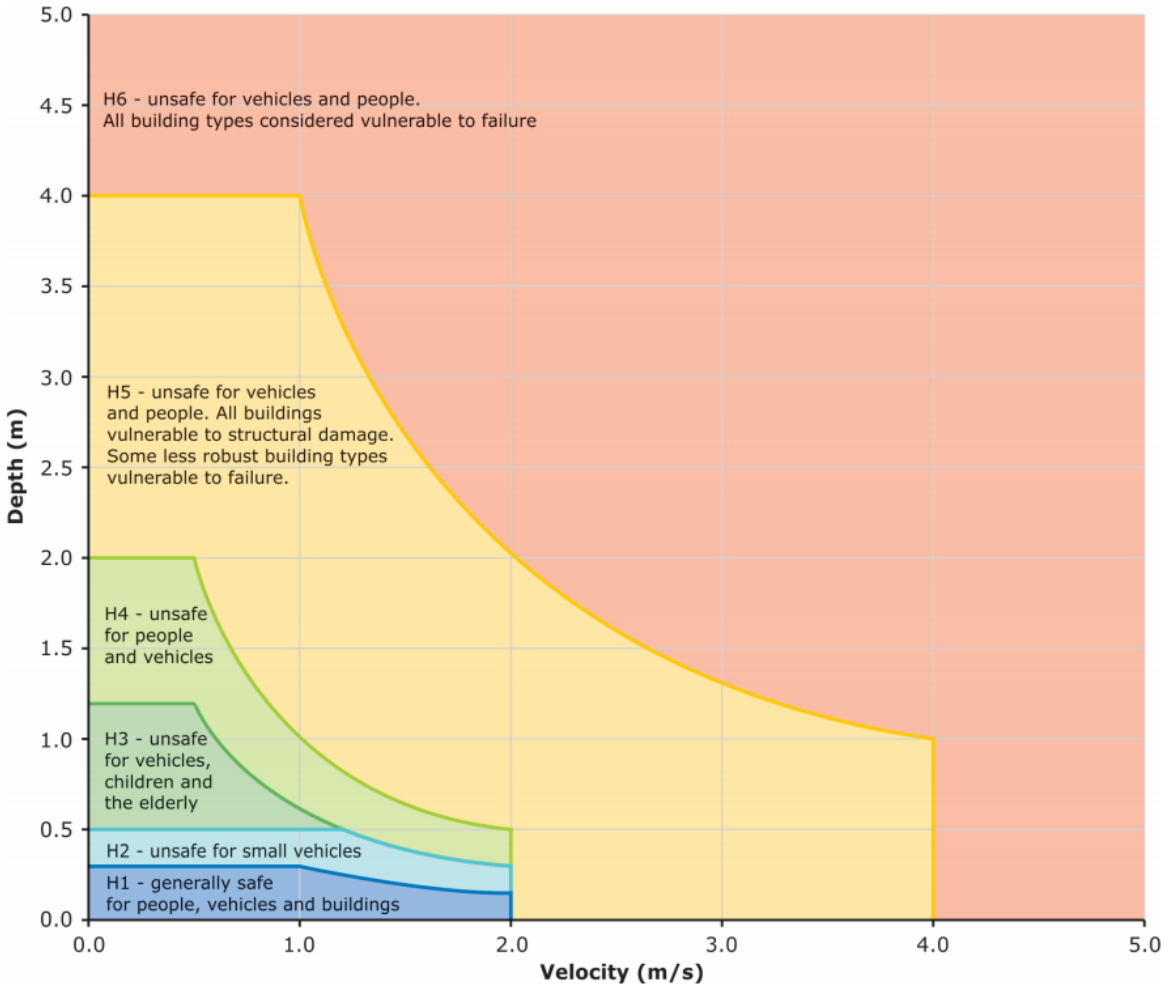


Figure 4.4 Combined Flood Hazard Curves (AIDR, 2017))

5.0 Conclusion

The development of a numerical flood model (TUFLOW software) has been undertaken to define the existing flood behaviour from mainstream Ellen Brook and local catchment overland flooding in the defined study area. The model has been used to simulate the design 1% AEP flood inundation extents and associated hydraulic properties (depth, velocity, hazard) to consider flood risk to the proposed Project.

The Project is not impacted by Ellen Brook flooding and no specific flood provisions would apply for this flooding mechanism. The estimated mainstream flood extents are limited to east of the Brand Highway at this location.

The local stormwater runoff around the Project Area would typically only provide for shallow overland flow through local depressions. This represents only a low risk to site which would be expected to be accommodated in the engineering design.

6.0 References

Australian Institute for Disaster Resilience (AIDR), Australian Disaster Resilience Handbook 7 Managing the Floodplain: A Guide to Best Practice in Flood Risk Management in Australia, Flood Hazard Guideline 7-3 (2017)

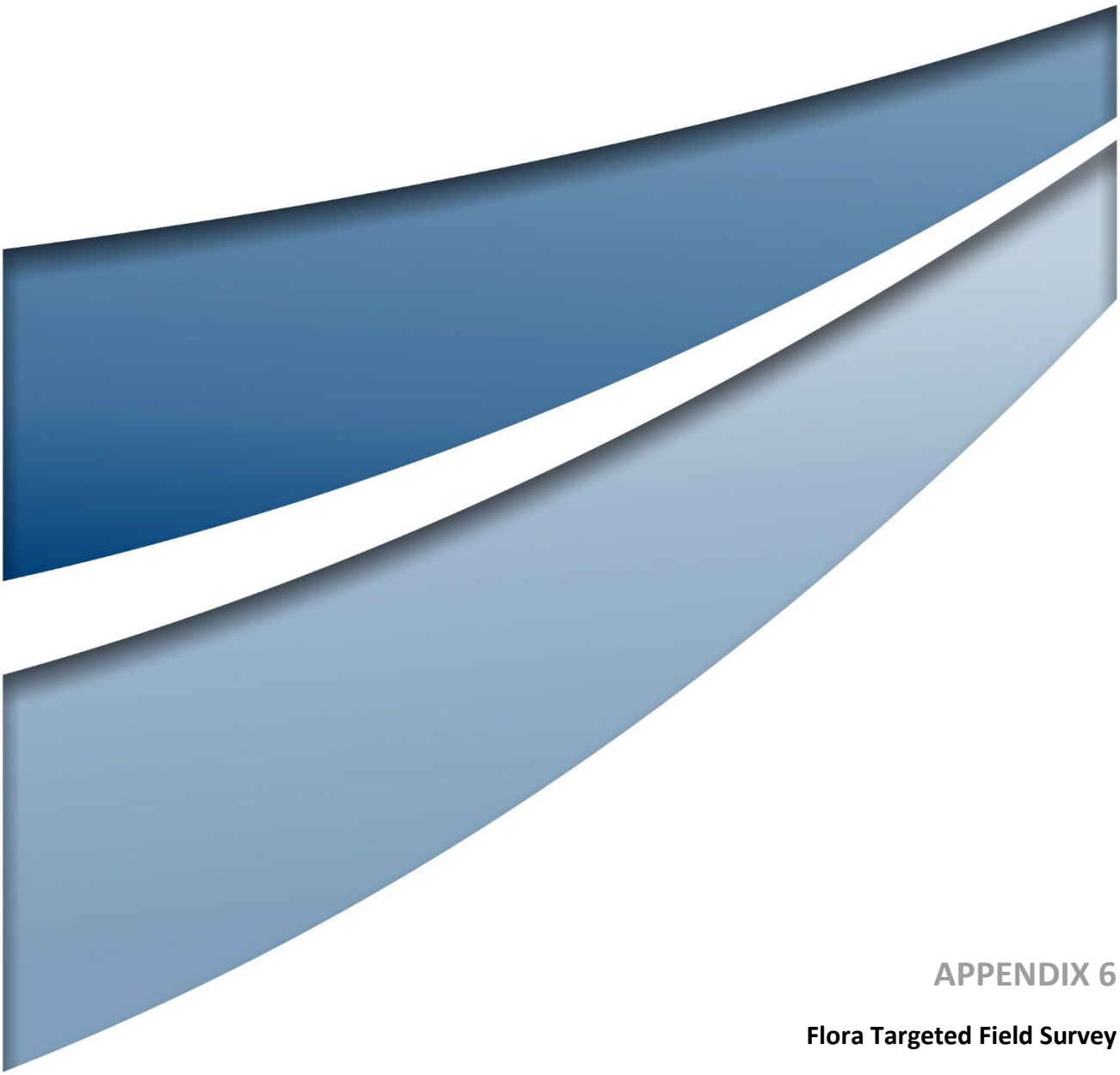
Australian Rainfall and Runoff Data Hub Home | ARR Data Hub (arr-software.org)

Ball J, Babister M, Nathan R, Weeks W, Weinmann E, Retallick M, Testoni I, (Editors), 2019, *Australian Rainfall and Runoff: A Guide to Flood Estimation,* Commonwealth of Australia

DWER Floodplain mapping Tool https://www.water.wa.gov.au/maps-and-data/maps/flood-maps

HARC 2016, *Swan and Helena Rivers Flood Study: Hydrology*, Department of Water

Water Resources Directorate (1987), *Ellen Brook Flood Study Hydrology*, Water Authority of Western Australia



APPENDIX 6

Flora Targeted Field Survey

Inspired People.
Dedicated Team.
Quality Outcomes.

Briefing Note

To: Rob Karelse

From: Kim Kershaw

Date: 15 December 2021

Subject: **Muchea Battery - Flora and Vegetation Assessment**

In this document

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1.0 Background

Neoen Australia Pty Ltd (Neoen) is proposing to establish a Battery Energy Storage System (BESS) near Perth in the Shire of Chittering. Neoen has identified a location for the battery development (the Project) as a single property (the Study Area) located approximately 2 kilometres (km) north of Muchea. The Study Area is equivalent to Lot 2364 on deposited plan 124489, which covers an area of 57 hectares (ha) as presented on **Figure 1.1**. The battery footprint (the Project Area) is proposed to be located within a cleared area in a compound of between 2 and 5 ha.

Neoen commissioned Umwelt Australia (Umwelt) to undertake a reconnaissance and Targeted flora and vegetation assessment of the Study Area. This report presents the results of this assessment. The above works have been undertaken in accordance with the Environmental Protection Authority's (EPA) Technical Guide – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a) and Environmental Factor Guideline – Flora and Vegetation (EPA 2016b), with specific regard to the Targeted Survey guidance.

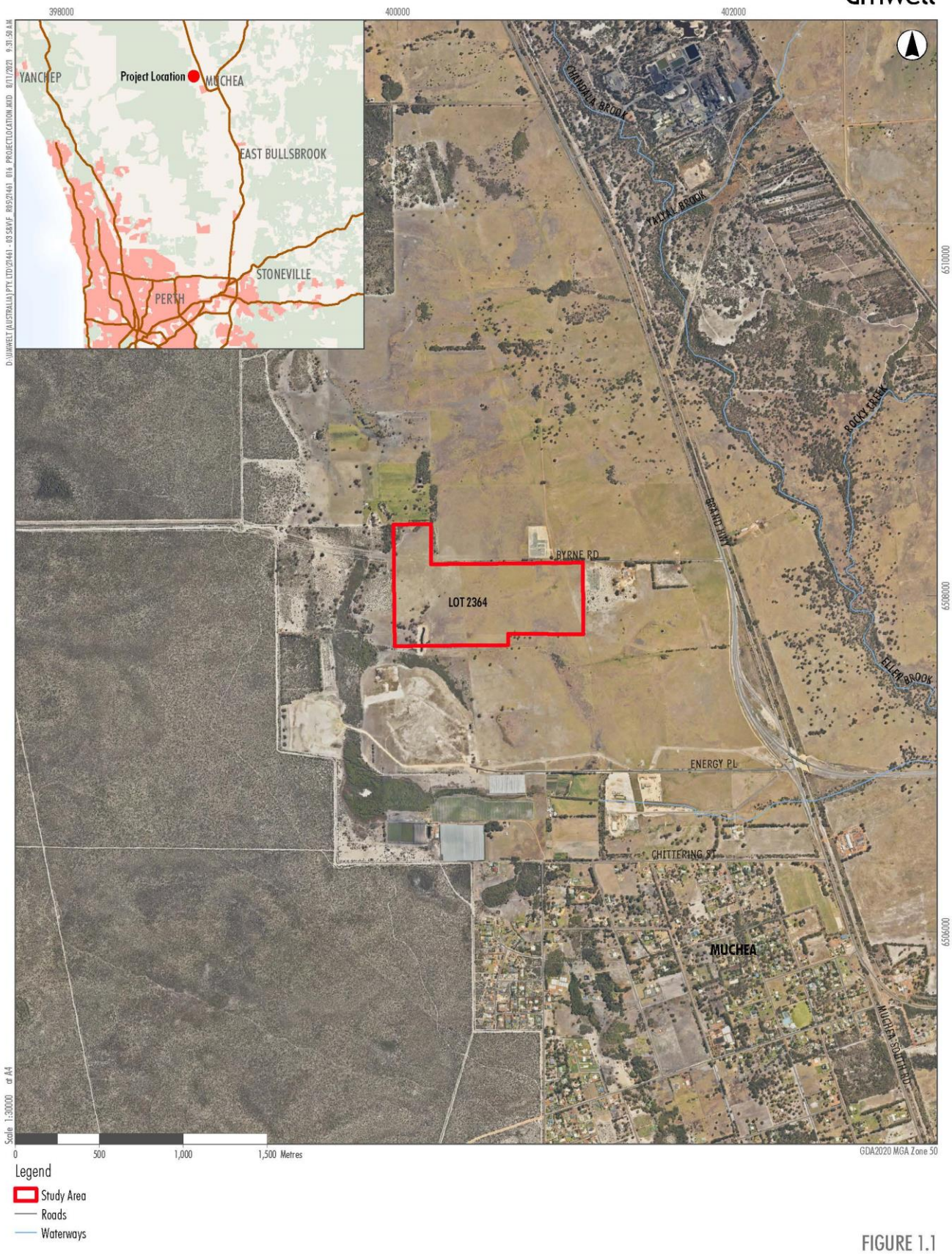

FIGURE 1.1

Project Location

Image Source: Landgate (2021) Data source: Landgate (2021), MRWA (2020)

2.0 Methods

2.1 Desktop Assessment

For the purposes of conducting the desktop review, database searches were undertaken to include the Study Area with a buffer of approximately 5 km. Data sources relating to environmental values of the Study Area are listed in **Table 1**.

Table 1 Searches Undertaken for the Desktop Review of the Study Area

Source	Search Attributes	Search Purpose
DBCA Threatened and Priority Ecological Communities Database (DBCA 2021a)	Database interrogated using Desktop Study Area boundary. No additional buffer applied.	Obtain records of DBCA-classified TECs and/or DBCA-classified PECs within the Desktop Study Area
DBCA TEC and PEC lists (DBCA 2018; DBCA 2021c)	Review of current DBCA TEC and PEC lists	Identify whether there are any additional DBCA listed TECs or PECs that could occur within the Desktop Study Area
DBCA Significant Flora Databases (WA Herbarium specimen database (WAHerb) and Threatened and Priority Flora (TPFL) database) (DBCA 2021b)	Database interrogated using Desktop Study Area boundary. No additional buffer applied.	Obtain records of listed significant flora within the Desktop Study Area
Department of Agriculture, Water and the Environment (DAWE) Species Profile and Threats (SPRAT) Database (interrogated using the Protected Matters Search Tool (DAWE 2021a))	Database interrogated using approximate Desktop Study Area boundary (exact boundary cannot be used) Co-ordinates of database search provided in **Appendix A**; buffer 1km.	Identify Matters of National Environmental Significance (MNES), including Threatened flora and TECs, listed under the EPBC Act, that occur or have the potential to occur within the Desktop Study Area
DBCA *NatureMap* (WA Herbarium and TPFL records) (DBCA 2007–)	Database interrogated using approximate Desktop Study Area boundary (exact boundary cannot be used)	Obtain records of listed significant flora and introduced flora within the Desktop Study Area
2018 Statewide Vegetation Statistics (formerly the CAR Reserve Analysis) (Government of Western Australia 2019a)	Study Area	Identify extent of Vegetation System Associations within the Study Area

2.2 Personnel and Licensing Information

Table 2 lists the personnel involved in fieldwork for the survey. The Field Manager has extensive experience (> 10 years) in conducting similar flora surveys in the Swan Coastal Plain region. All plant material was collected under the Flora Taking (Biological Assessment) licences and Authorisation to Take or Disturb Threatened Species pursuant to the *Biodiversity Conservation Act 2016*, sections 40, 274 and 275.

Table 2 Personnel and Licensing Information

Personnel	Flora Collecting Permit (BC Act/WC Act)	Role
Kim Kershaw	FB62000054,TFL 22-1819	Field manager

2.3 Flora and Vegetation Field Survey Methods

The flora and vegetation survey was undertaken during one field visit on 22 October 2021. The timing of the survey was selected to coincide with the most appropriate time to survey in the Swan Coastal Plain; this is considered to be Spring as most of the taxa in these regions flower at this time. This includes the majority of significant taxa that potentially occur in the Study Area (see **Section 3.1.2**).

A total of five relevés were undertaken during the survey. Aspects recorded at each relevé included dominant flora taxa, GPS (Global Positioning System) coordinates, vegetation condition (as per the scale presented in **Section 2.6**) and site photograph.

Targeted survey for significant flora taxa was undertaken as part of the survey, with a list of significant flora taxa likely to be encountered compiled as part of the desktop study. Intact native vegetation was traversed on foot. If populations of known significant flora taxa were identified, a representative collection of material was made, and the abundance and spatial distribution (using GPS coordinates) of individuals within each population was recorded. Plant taxa were also recorded opportunistically to develop a list of the common taxa present within the Study Area. Observations on the extent of vegetation present and the condition of the vegetation was also recorded.

Traverses and sites undertaken as part of the field survey in the Study Area are presented on **Figure 2.1**.

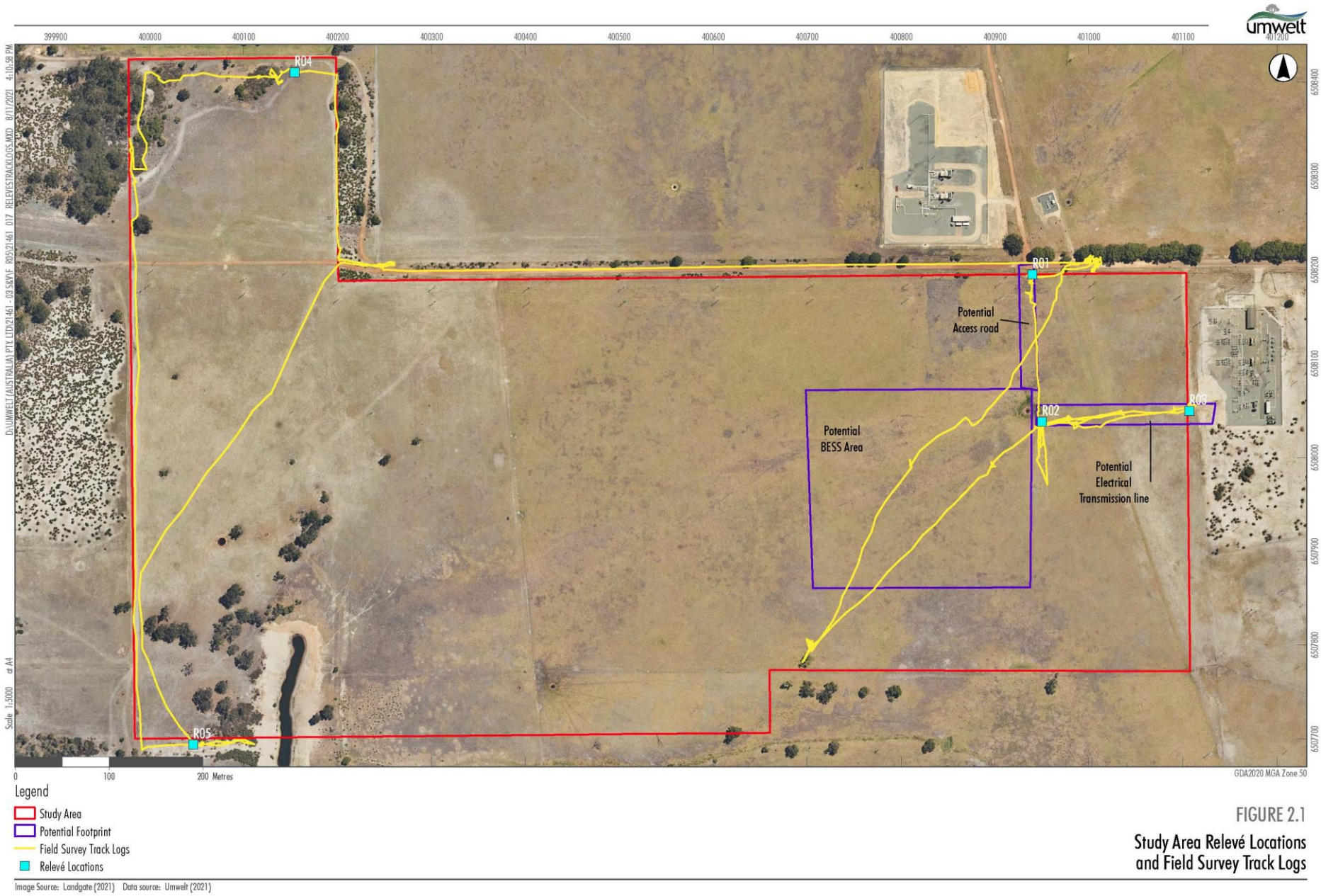

FIGURE 2.1

Study Area Relevé Locations and Field Survey Track Logs

2.4 Plant Collection and Identification

Specimens of any unknown taxa that were collected were pressed for later identification. Taxon nomenclature generally follows *FloraBase* (WA Herbarium 1998) with all names checked against the current DBCA Max database to ensure their validity. However, in cases where names of plant taxa have been published recently in scientific literature but have not yet been adopted on *FloraBase* due to time constraints (WA Herbarium 1998), nomenclature in the published literature is followed. The conservation status of each taxon was checked against *FloraBase*, which provides the most up-to-date information regarding the conservation status of flora taxa in Western Australia.

2.5 Vegetation Definition, Mapping and Description

Vegetation in the Study Area was mapped and described using structural vegetation classification as described in Section 8.1 of the EPA Technical Guidance (EPA 2016a). Vegetation community descriptions have been adapted from the National Vegetation Information System (NVIS) Australian Vegetation Attribute Manual Version 6.0 (Executive Steering Committee for Australian Vegetation Information (ESCAVI) 2003), as stipulated by EPA (2016a). This model follows nationally-agreed guidelines to describe and represent vegetation types, so that comparable and consistent data are produced nation-wide.

The locations of relevés were used in conjunction with aerial photograph interpretation and field notes taken during survey to develop vegetation community polygon boundaries. Mapping boundaries were selected using aerial photography. These vegetation mapping polygon boundaries were then digitised using Geographic Information System (GIS) software.

2.6 Vegetation Condition

Vegetation condition within the Study Area was described using the vegetation condition scale presented in EPA (2016a) as presented in **Table 3**.

Table 3 Vegetation Condition Scale for the South-West and Interzone Botanical Provinces (EPA 2016B)

Condition Ranking	Description
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees and shrubs.

2.7 Significant Flora and Vegetation

2.7.1 Significant Flora

As per EPA (2016b), flora taxa may be significant for a range of reasons, including, but not limited to the following:

- Being identified as a Threatened or Priority species (formally listed significant taxa – includes taxa listed under both State and Commonwealth legislation, and classified as Priority by DBCA)
- Locally endemic or associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems)
- New species or species with anomalous features that indicate a potential new species
- Representative of the range of a species (particularly at the extremes of range, recently discovered range extensions, or isolated outliers of the main range)
- Unusual species, including restricted subspecies, varieties or naturally occurring hybrids
- Relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

2.7.2 Significant Vegetation

As per EPA (2016b), vegetation may be significant for a range of reasons, including, but not limited to the following:

- Being identified as a TEC or PEC (formally listed significant vegetation – includes vegetation listed under Commonwealth legislation, endorsed as a TEC by the Western Australian Government, or classified as a PEC by DBCA)
- Having restricted distribution
- Degree of historical impact from threatened processes
- A role as a refuge and
- Providing an important function required to maintain ecological integrity of a significant ecosystem.

3.0 Results

3.1 Desktop Assessment

3.1.1 Regional Vegetation

The Study Area is located within the Swan Coastal Plain Interim Biogeographic Regionalisation for Australia (IBRA) region, specifically within the SWA02 Perth IBRA subregion (Commonwealth of Australia 2012). The Study Area intersects two vegetation system associations as defined by Shepherd et al. (2002), (Government of Western Australia 2019) including Bassendean_949 and Pinjarra_1018. The majority of the Study Area including the entire Potential Footprint is within Pinjarra_1018. A small area in the north-west of the Study Area is within Bassendean_949. **Table 4** presents the current extent of each vegetation system association (VSA) in relation to its pre-European extent within the state, and the percentage of the current extent of each VSA currently protected for conservation within the state.

Table 4 Vegetation System Associations Occurring in the Study Area

Vegetation System Association	Description	Current Extent (ha)	Percentage of Pre-European Extent Remaining	Percentage of Current Extent Protected for Conservation
Bassendean_949	Low woodland; banksia	69,992.3	60.8	34.3
Pinjarra_1018	Mosaic: Medium forest; jarrah-marri/Low woodland; banksia/Low forest; teatree/Low woodland; *Casuarina obesa*	1,249.7	20.6	7.1

3.1.2 Significant Flora

A summary of significant flora taxa known from 5 km of the Study Area is presented in **Table 5**. This list has been compiled from the results of the desktop searches (including DBCA database searches (DBCA 2021b) and DAWE's SPRAT Database (DAWE 2021a - Appendix A)) (only those with actual records within 5 km of the Study Areas have been included in **Table 5**). A total of 12 significant flora taxa are known to occur within 5 km of the Study Area including four Threatened taxa (under the BC Act and EPBC Act) and eight DBCA-classified Priority taxa. There are no records of significant flora within the Study Area itself.

Table 5 Significant Flora Known from within 5 km of the Study Area

Significant Flora Taxon	Status	Habitat (WAHerb 1998-).	Source
Acacia anomala	Threatened	Lateritic soils. Slopes.	DBCA (2021b)
Acacia drummondii subsp. affinis	P3	Lateritic gravelly soils.	DBCA (2021b)
Chamaescilla gibsonii	P3	Winter-wet flats, shallow water-filled claypans.	DBCA (2021b)
Cyathochaeta teretifolia	P3	Grey sand, sandy clay. Swamps, creek edges.	DBCA (2021b)
Darwinia foetida	Threatened	Plains, flats and drainage lines with grey/brown sand or sandy loam	DAWE (2021a), DBCA (2021b)
Diuris drummondii	Threatened	Low-lying depressions, swamps.	DBCA (2021b)
Grevillea curviloba	Threatened	Grey sand, sandy loam. Winter-wet heath.	DAWE (2021a), DBCA (2021b)
Hypolaena robusta	P4	White sand. Sandplains.	DBCA (2021b)
Isotropis cuneifolia subsp. glabra	P3	Sand, clay loam. Winter-wet flats.	DBCA (2021b)
Leucopogon squarrosus subsp. trigynus	P2	Plains, flats, depressions and slopes with grey/white sand.	DBCA (2021b)
Ornduffia submersa	P4	Wetlands, creeks with grey/black sand or sandy clay.	DBCA (2021b)
Verticordia serrata var. linearis	P3	White sand, brown loam, gravel. Slopes, often with laterite.	DBCA (2021b)

3.1.3 Significant Vegetation

The interrogations of the DBCA TEC and PEC Database for the Study Area (DBCA2021a) and DAWE's SPRAT Database (DAWE 2021a) returned six significant communities within 5 km of the Study Area (**Table 6**). There are no records of significant vegetation known from within the Study Area itself.

Table 6 Significant Vegetation Known from within 5 km of the Study Area

Community	Conservation Status (W.A.)	EPBC Act Ranking	Source
Banksia dominated woodlands of the Swan Coastal Plain	Priority 3	Endangered	DAWE (2021a), DBCA (2021a)
Communities of Tumulus Springs (Organic Mound Springs, Swan Coastal Plain)	Critically Endangered	Endangered	DBCA (2021a)
Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain	Endangered	Endangered	DBCA (2021a)
SCP 23b- Swan Coastal Plain *Banksia attenuata* - Banksia menziesii woodlands	Priority 3	Endangered	DBCA (2021a)
SCP 25 - Southern E*ucalyptus gomphocephala-Agonis flexuosa* woodlands	Priority 3	Critically Endangered	DBCA (2021a)
Tuart (*Eucalyptus gomphocephala*) Woodlands and Forests of the Swan Coastal Plain	Priority 3	Critically Endangered	DAWE (2021a)

3.2 Field Survey

3.2.1 Flora

A total of 43 discrete vascular flora taxa were recorded in the Study Area by this survey representing 14 families and 38 genera. The majority of flora taxa recorded were introduced taxa (weeds), with a total of 31 weed taxa (of the total 43 taxa) recorded in the Study Area. No significant flora taxa were recorded in the Study Area. A full list of taxa recorded during the field survey is presented in **Appendix B**.

Two Declared Pests were recorded in the Study Area, being Arum Lily (*Zantedeschia aethiopica*) and One-leaf Cape Tulip (*Moraea flaccida*). These are Declared Pests under *the Biosecurity and Agriculture Management Act 2007* (BAM Act) for the whole of state (DAWE 2021b) and require management in accordance with the BAM Act. The locations of these Declared Pests are presented on **Figure 3.1** with GPS locations presented in **Appendix C**.

3.2.2 Vegetation

The majority of the Study Area consisted of cleared paddock which was Completely Degraded. Two vegetation communities were recorded in the Study Area as presented on **Figure 3.1**. These were small pockets of Degraded vegetation occurring on the north-western and south-western corners of the Study Area located outside of the Potential Footprint. These are described below.

Community 1 (Degraded): Low woodland of *Melaleuca preissiana* over tall shrubland of *Astartea scoparia* and *Kunzea glabrescens* over mixed pasture weeds on flats and depressions with black sandy loam.

Community 2 (Degraded): Mid open woodland of *Corymbia calophylla* over low open woodland of *Melaleuca preissiana* over tall open shrubland of *Astartea scoparia* and *Kunzea glabrescens* over mid shrubland of *Regelia ciliata* and *Xanthorrhoea preissii* over mixed pasture weeds on flats with grey sand.

No vegetation in the Study Area was representative of any listed TECs or PEC and was not considered to be significant under the EPA Technical Guidance or Factor Guideline (EPA 2016a, b).

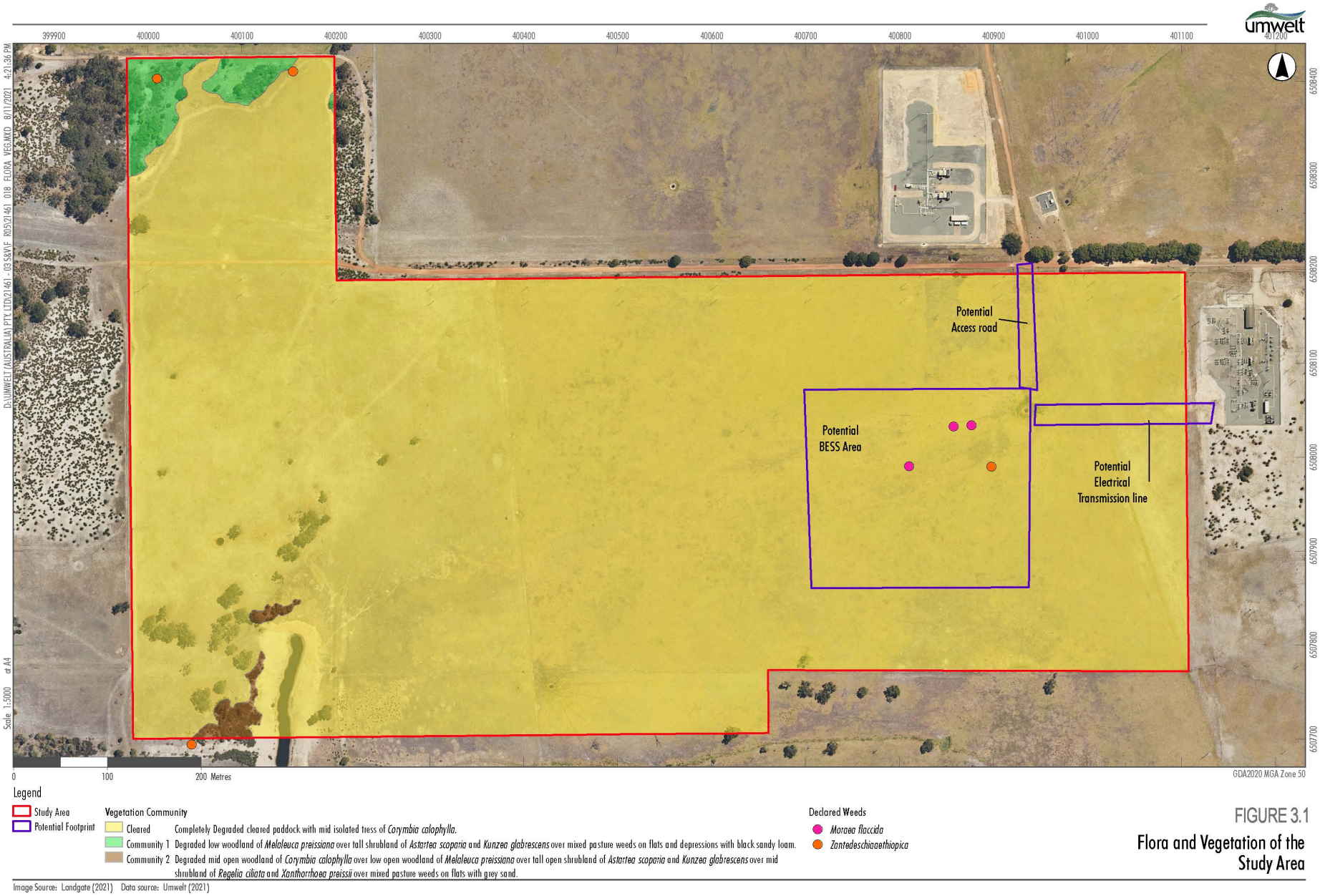

FIGURE 3.1
Flora and Vegetation of the Study Area

4.0 References

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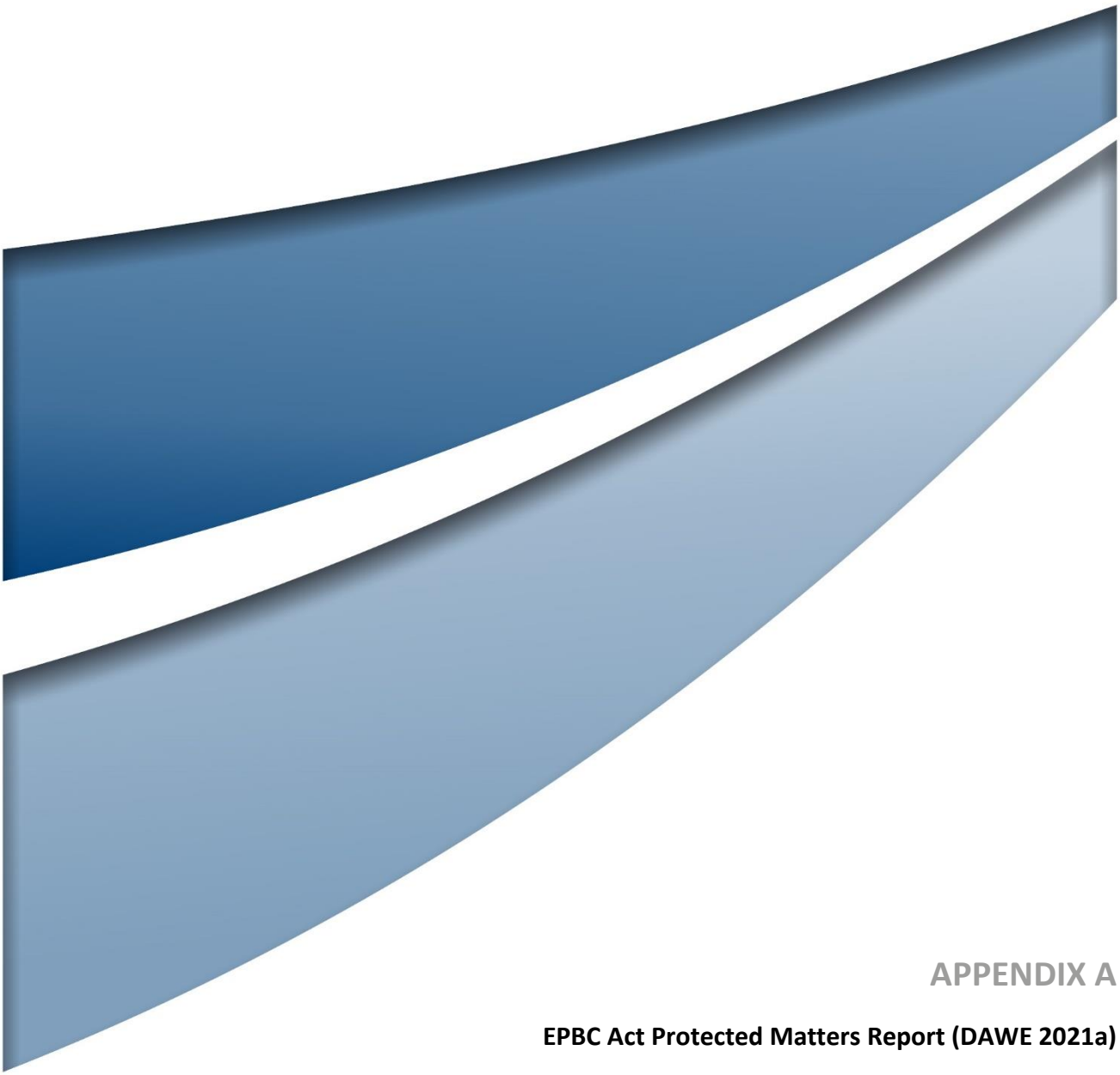

APPENDIX A

EPBC Act Protected Matters Report (DAWE 2021a)

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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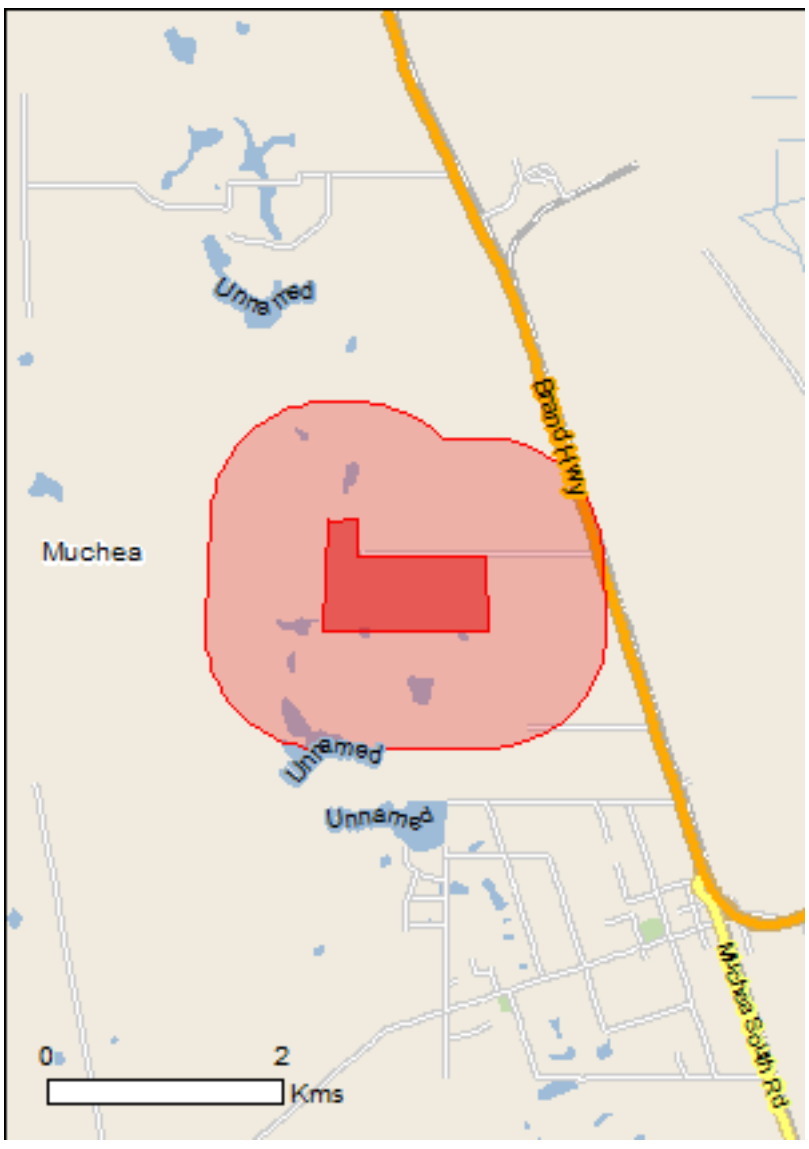
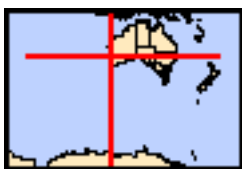


Coordinates

Buffer: 1.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	21
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	12
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	33
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris Carnaby's Cockatoo, Short-billed Black-Cockatoo [59523]	Endangered	Species or species habitat known to occur within area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Fish		
Galaxiella nigrostriata Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area
Insects		
Hesperocolletes douglasi Douglas' Broad-headed Bee, Rottnest Bee [66734]	Critically Endangered	Species or species habitat may occur within area
Mammals		

Name	Status	Type of Presence
[Dasyurus geoffroii](#) Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area
Plants		
[Andersonia gracilis](#) Slender Andersonia [14470]	Endangered	Species or species habitat likely to occur within area
[Anigozanthos viridis subsp. terraspectans](#) Dwarf Green Kangaroo Paw [3435]	Vulnerable	Species or species habitat likely to occur within area
[Caladenia huegelii](#) King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid [7309]	Endangered	Species or species habitat may occur within area
[Chamelaucium sp. Gingin (N.G.Marchant 6)](#) Gingin Wax [88881]	Endangered	Species or species habitat may occur within area
[Darwinia foetida](#) Muchea Bell [83190]	Critically Endangered	Species or species habitat likely to occur within area
[Diuris purdiei](#) Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area
[Drakaea elastica](#) Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat likely to occur within area
[Eleocharis keigheryi](#) Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area
[Grevillea curviloba subsp. curviloba](#) Curved-leaf Grevillea [64908]	Endangered	Species or species habitat known to occur within area
[Grevillea curviloba subsp. incurva](#) Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat known to occur within area
[Thelymitra stellata](#) Star Sun-orchid [7060]	Endangered	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
[Apus pacificus](#) Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
[Motacilla cinerea](#) Grey Wagtail [642]		Species or species habitat may occur within area
Migratory Wetlands Species		
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Defence - MUCHEA ARMAMENT RANGE

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos		
Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus		
Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis		
Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata		
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea		
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos		
Pectoral Sandpiper [858]		Species or species habitat may occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat may occur within area
Merops ornatus		
Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea		
Grey Wagtail [642]		Species or species habitat may occur within

Name	Threatened	Type of Presence
		area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Streptopelia senegalensis Laughing Turtle-dove, Laughing Dove [781]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Funambulus pennantii Northern Palm Squirrel, Five-striped Palm Squirrel [129]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]		Species or species habitat likely to occur within area
Brachiaria mutica Para Grass [5879]		Species or species habitat may occur within area
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Genista linifolia Flax-leaved Broom, Mediterranean Broom, Flax Broom [2800]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Olea europaea Olive, Common Olive [9160]		Species or species habitat may occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Tamarix aphylla Athel Pine, Athel Tree, Tamarisk, Athel Tamarisk, Athel Tamarix, Desert Tamarisk, Flowering Cypress, Salt Cedar [16018]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-31.55482 115.94636,-31.554783 115.948549,-31.557051 115.948591,-31.557087 115.958205,-31.561914 115.958462,-31.561951 115.945888,-31.554747 115.946317,-31.55482 115.94636

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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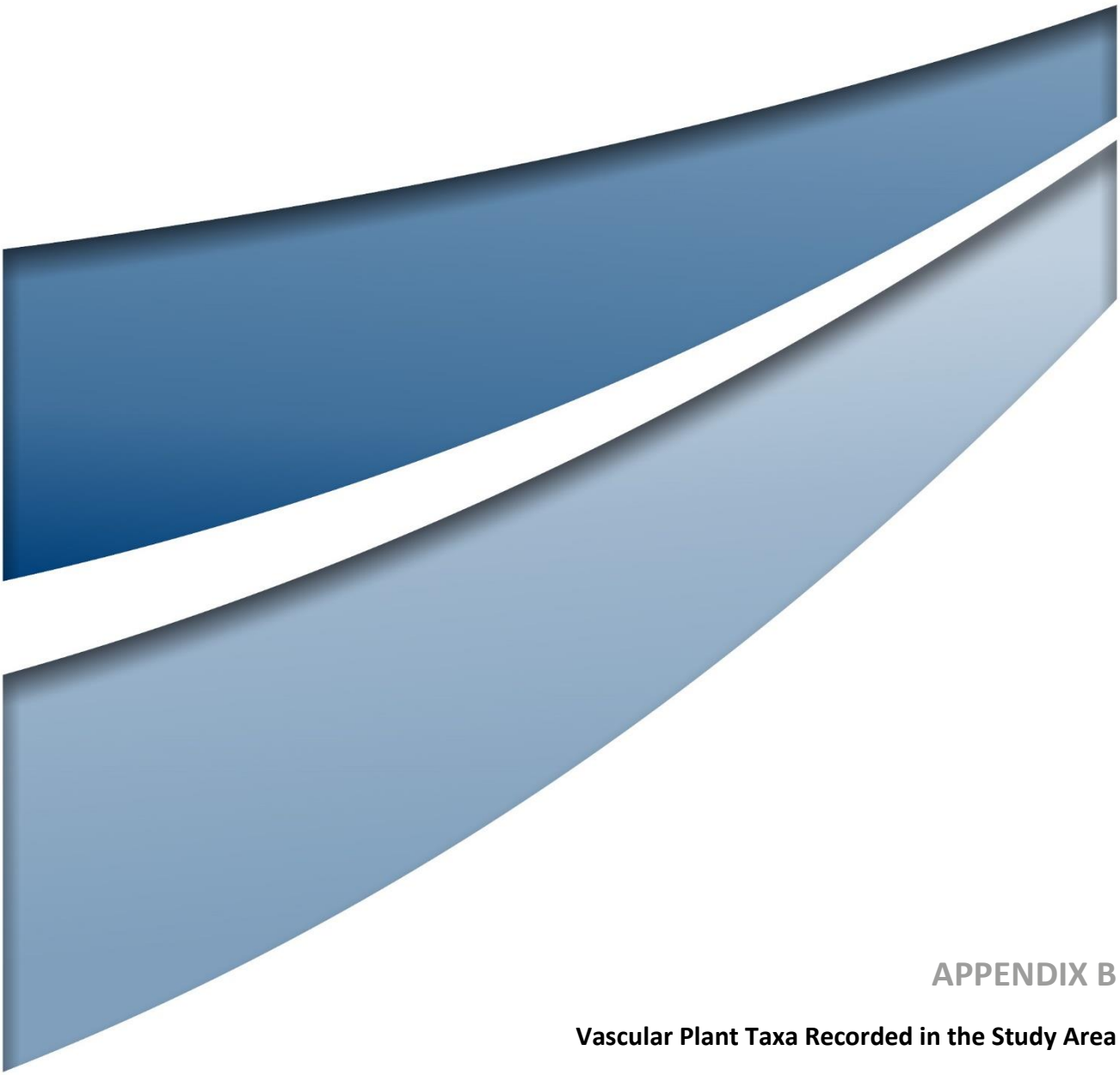
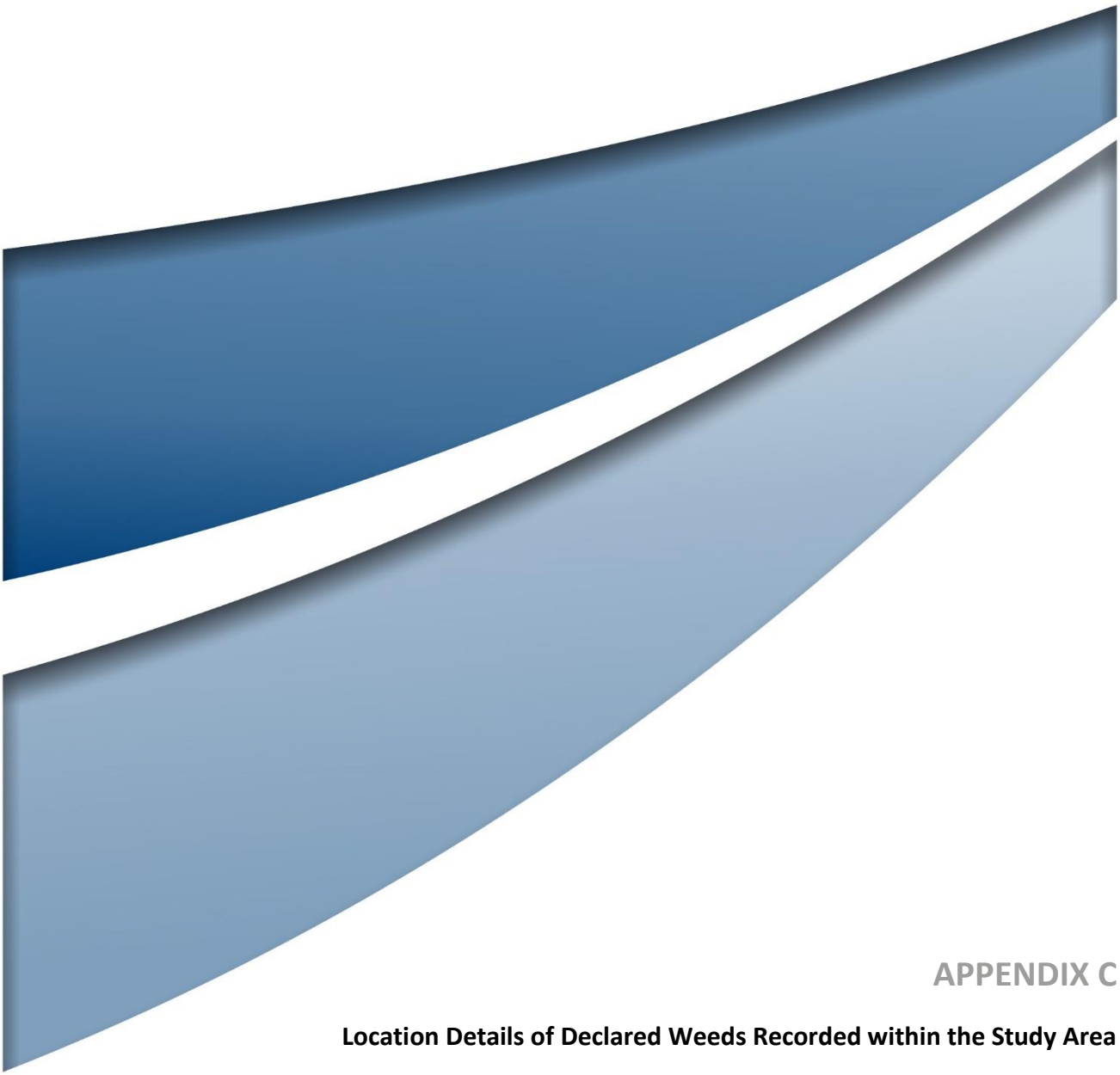


APPENDIX B

Vascular Plant Taxa Recorded in the Study Area

Araceae	*Zantedeschia aethiopica
Asteraceae	*Arctotheca calendula *Hypochaeris glabra Podotheca gnaphalioides *Ursinia anthemoides
Campanulaceae	*Wahlenbergia capensis
Crassulaceae	Crassula decumbens var. decumbens *Crassula natans var. minor
Cyperaceae	Isolepis marginata
Fabaceae	*Lotus subbiflorus *Lupinus cosentinii *Ornithopus compressus *Trifolium campestre *Trifolium hirtum *Trifolium repens *Trifolium subterraneum
Geraniaceae	*Erodium botrys
Iridaceae	*Moraea flaccida *Romulea rosea
Myrtaceae	Astartea scoparia Corymbia calophylla Eucalyptus rudis Kunzea glabrescens Melaleuca preissiana Regelia ciliata
Orobanchaceae	**Orobanche minor*
Poaceae	*Bromus diandrus *Cenchrus clandestinus *Cynodon dactylon *Ehrharta longiflora *Holcus lanatus *Hordeum leporinum Lolium spp. *Pentameris pallida *Poa annua *Polypogon monspeliensis *Rostraria cristata *Vulpia bromoides *Vulpia myuros
Polygonaceae	Persicaria decipiens *Rumex acetosella
Restionaceae	Desmocladus ?flexuosus
Xanthorrhoeaceae	Xanthorrhoea preissii

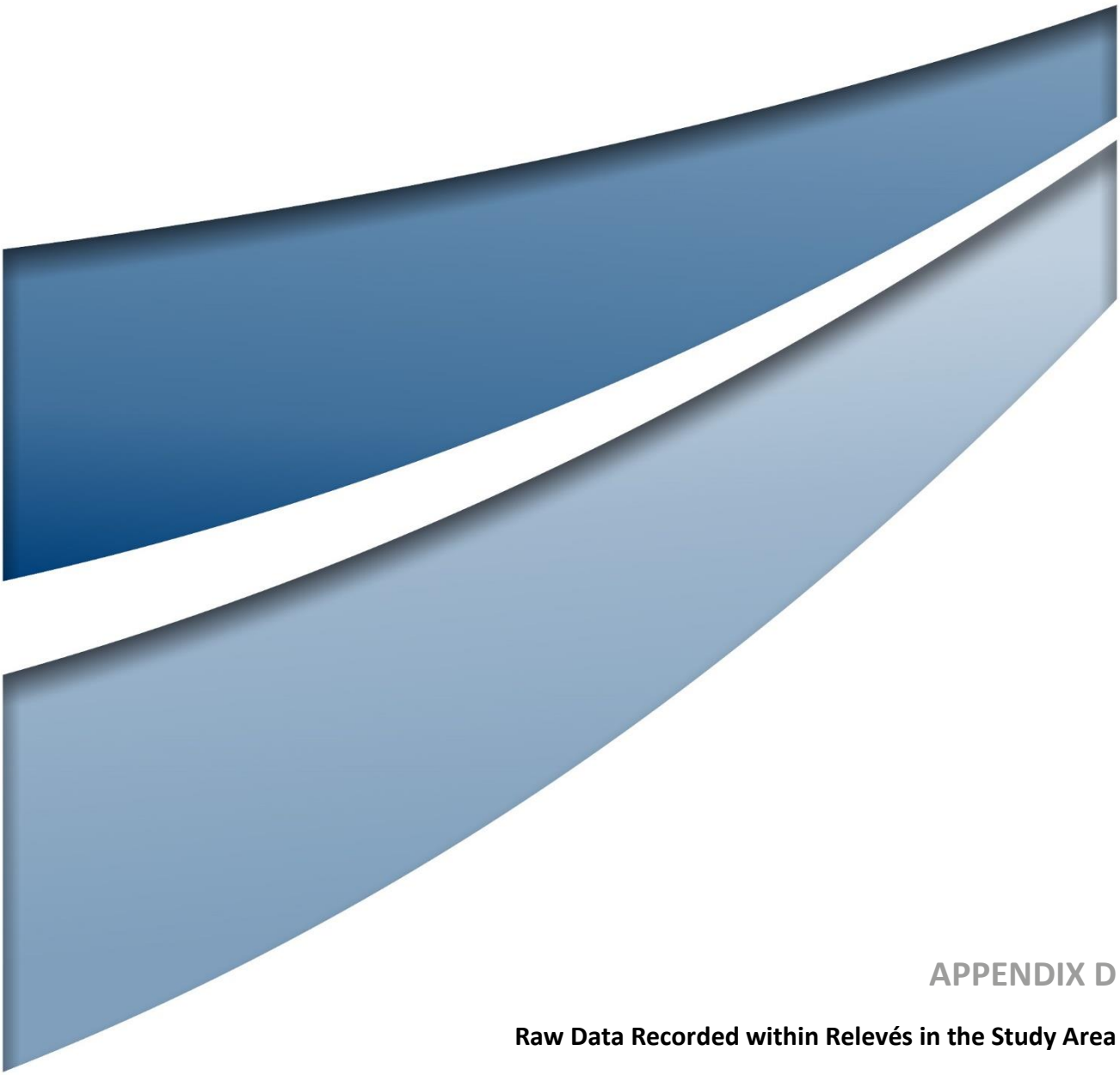


APPENDIX C

Location Details of Declared Weeds Recorded within the Study Area

Taxon	Easting	Northing	Count
Moraea flaccida	400897	6507990	30
Moraea flaccida	400810	6507990	30
Moraea flaccida	400857	6508033	30
Moraea flaccida	400876	6508034	50
Zantedeschia aethiopica	400897	6507990	1
Zantedeschia aethiopica	400010	6508403	10
Zantedeschia aethiopica	400155	6508410	30
Zantedeschia aethiopica	400047	6507694	10

Note all GPS locations are GDA94, Zone 50



APPENDIX D

Raw Data Recorded within Relevés in the Study Area

Site Name: R01
Site Type: RESERVE
Survey Date: 22/10/2021
GPS Location: GDA94 Zone 50 400939.89E 6508195.01N
Soil Type: Sandy clay loam (other)
Soil Colour: Black
Vegetation Condition: Southern Vegetation Condition - 6 - Completely Degraded

SPECIES LIST

Taxon Name	Avg. Height	Cover Alive
**Arctotheca calendula*		1
**Bromus diandrus*		0.3
**Cenchrus clandestinus*		85
Crassula decumbens var. decumbens		0.2
**Crassula natans var. minor*		0.1
**Cynodon dactylon*		2
**Hordeum leporinum*		0.3
**Hypochaeris glabra*		0.1
Isolepis marginata		0.5
**Lolium spp.*		5
**Lotus subbiflorus*		2
Persicaria decipiens		0.3
**Poa annua*		5
**Romulea rosea*		0.1
**Rumex acetosella*		0.1
**Trifolium repens*		0.2
**Vulpia bromoides*		0.2

Site Name: R02
Site Type: RELEVE
Survey Date: 22/10/2021
GPS Location: GDA94 Zone 50 400950.12E 6508038.14N
Landform Type: Flat
Soil Type: Sand
Soil Colour: Black
Vegetation Condition: Southern Vegetation Condition - 6 - Completely Degraded

SPECIES LIST

Taxon Name	Avg. Height	Cover Alive
***Cenchrus clandestinus**		80
***Hordeum leporinum**		5
***Lolium spp.**		5
***Moraea flaccida**		
***Orobanche minor**		
***Polypogon monspeliensis**		
***Trifolium campestre**		
***Trifolium hirtum**		
***Trifolium subterraneum**		
***Vulpia myuros**		

Site Name: R03
Site Type: RELEVE
Survey Date: 22/10/2021
GPS Location: GDA94 Zone 50 401106.8254033E 6508049.38750029N
Landform Type: Flat
Soil Type: Sand
Soil Colour: Black
Vegetation Condition: Southern Vegetation Condition - 6 - Completely Degraded

SPECIES LIST

Taxon Name	Avg. Height	Cover Alive
***Cenchrus clandestinus**		80
***Erodium botrys**		
***Lolium spp.**		10
***Lupinus cosentinii**		
***Rostraria cristata**		

Site Name: R04
Site Type: RELEVE
Survey Date: 22/10/2021
GPS Location: GDA94 Zone 50 400154.71478819E 6508410.19868741N
Landform Type: Open Depression
Soil Type: Sandy Loam
Soil Colour: Black
Vegetation Condition: Southern Vegetation Condition - 5 – Degraded

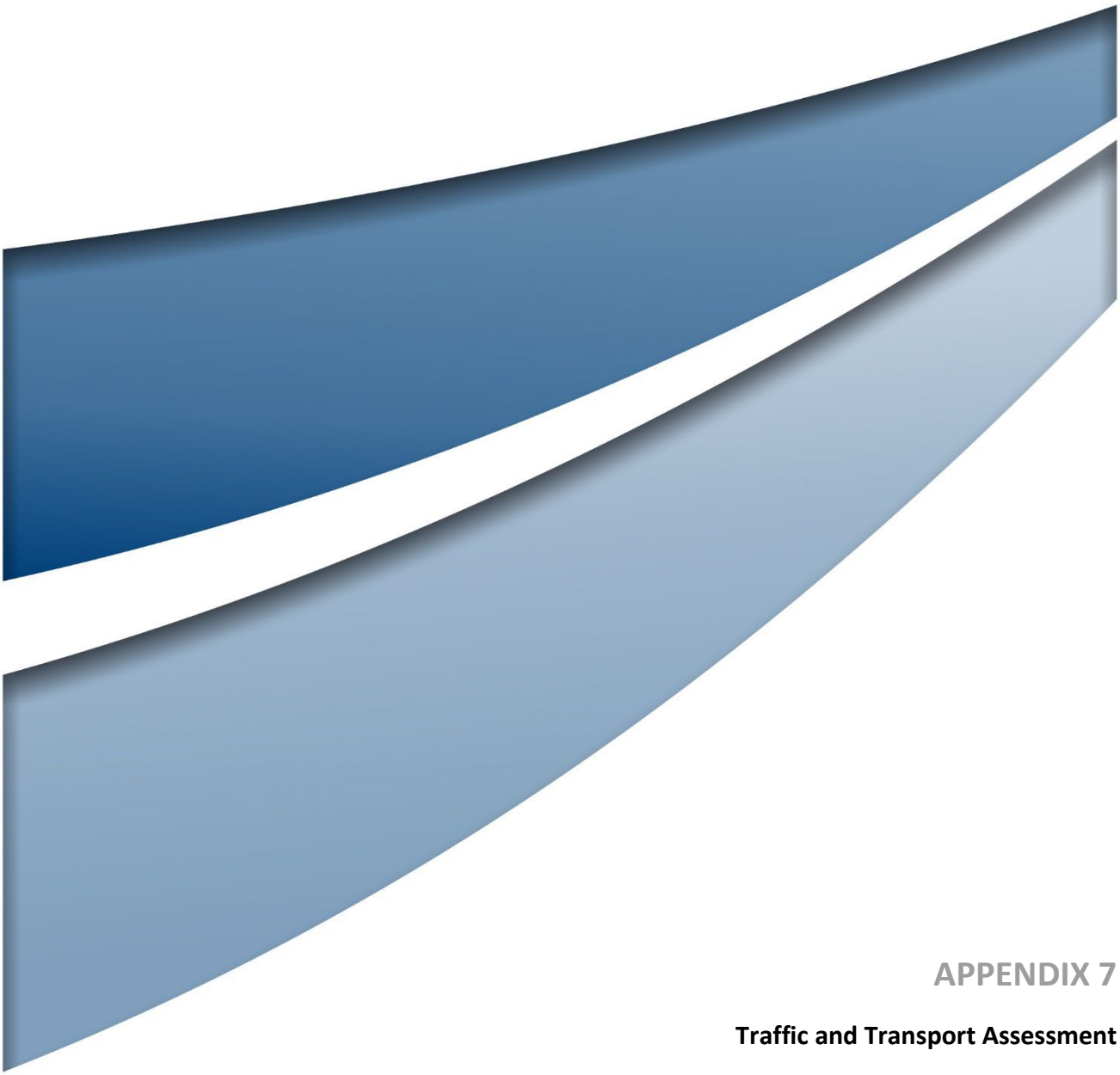
SPECIES LIST

Taxon Name	Avg. Height	Cover Alive
Astartea scoparia		
****Bromus diandrus***		
Desmocladus ?flexuosus		
****Ehrharta longiflora***		
Eucalyptus rudis		
****Holcus lanatus***		
****Hypochaeris glabra***		
Kunzea glabrescens		
****Lotus subbiflorus***		
Melaleuca preissiana		
****Ornithopus compressus***		
Podotheca gnaphalioides		
****Romulea rosea***		
****Rumex acetosella***		
****Ursinia anthemoides***		
****Vulpia myuros***		
****Wahlenbergia capensis***		
****Zantedeschia aethiopica***		

Site Name: R05
Site Type: RELEVE
Survey Date: 22/10/2021
GPS Location: GDA94 Zone 50 400046.74410389E 6507694.26604298N
Landform Type: Flat
Soil Type: Sand
Soil Colour: Grey
Vegetation Condition: Southern Vegetation Condition - 5 – Degraded

SPECIES LIST

Taxon Name	Avg. Height	Cover Alive
Astartea scoparia		
Corymbia calophylla		
Kunzea glabrescens		
Melaleuca preissiana		
****Pentameris pallida***		
Regelia ciliata		
Xanthorrhoea preissii		
****Zantedeschia aethiopica***		



APPENDIX 7

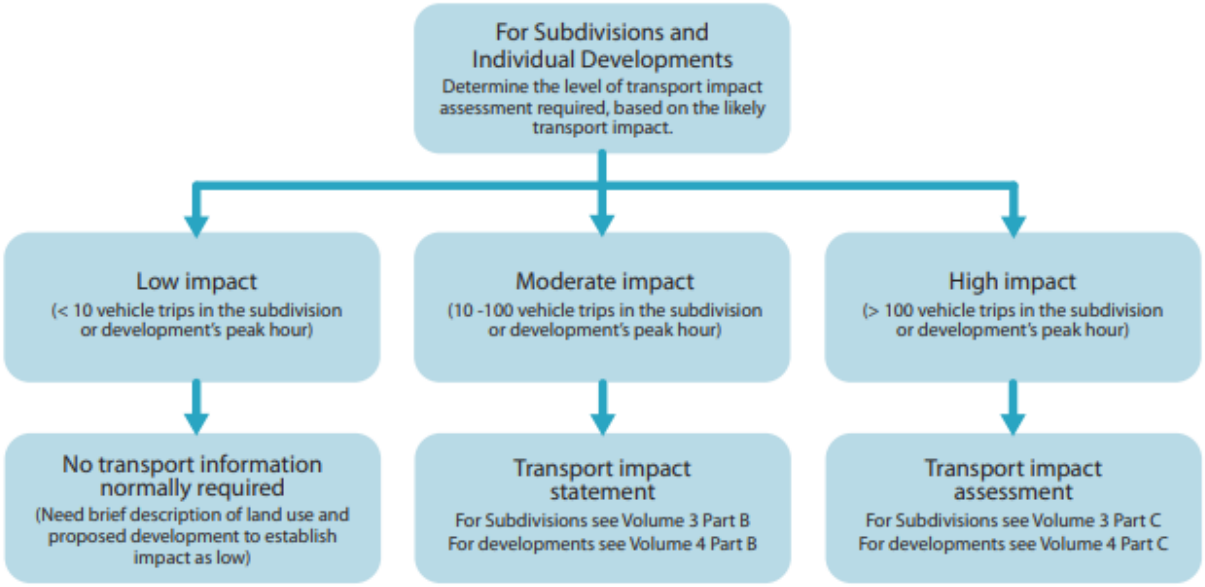
Traffic and Transport Assessment

Technical Note	81113-681-FLYT-TEN-0002
Project	Lot 2364, Byrne Road, Muchea
Date Issued	3 November 2021

1. INTRODUCTION

This Technical Note address potential transport impacts of a proposed development of a Battery Project located at Lot 2364, Byrne Road, Muchea. This note covers off construction and operational implications. The key issue relating to the construction implications is site access for vehicles, with the operational stage of the project only generating between 2 and 5 vehicle trips per day. Given the formal requirements of the Western Australian Planning Commission (WAPC) shown below, the level of assessment required is a Low Impact.

Figure 2: Level of assessment required



2. SITE

The subject site is located on Byrne Road, Muchea, as shown in Figure 1. Byrne Road is an Access Road under the Main Roads WA road classification hierarchy, with Brand Highway classified as a Primary Distributor Road under the control of Main Roads WA. Access via Byrne Road is the only way in and out of the site. Access to existing rural and power generation land uses are provided from Byrne Road. Existing traffic generation is minimal and sporadic.

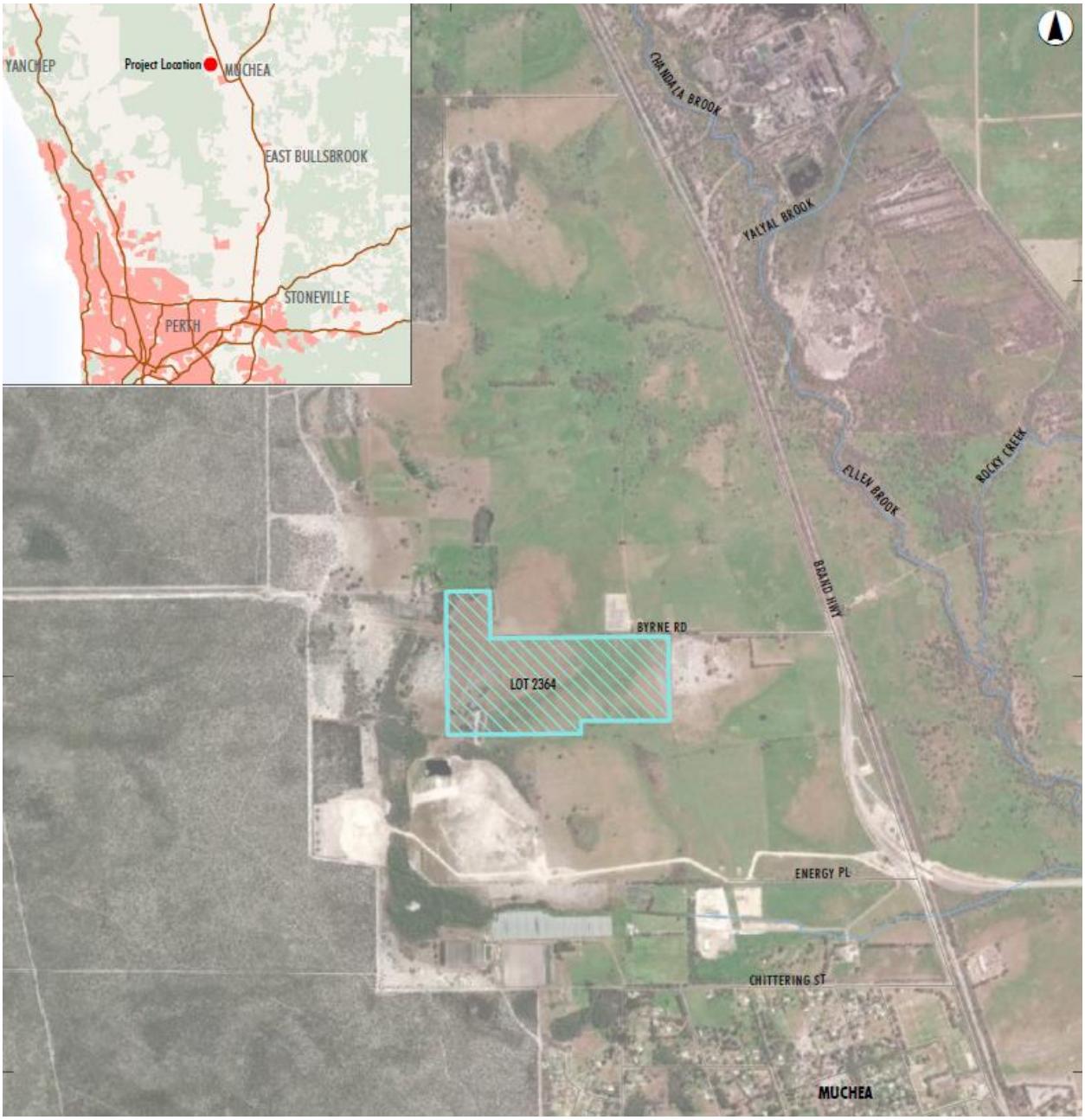


Figure 1 Site location (source: Umwelt)

2.1 Key Transport Issues

There are three key issues relating to access and egress for the site, as set out below:

- Access for construction vehicles and traffic generation
- Sight Line Assessment
- Over Sized, Over Mass movements.

These issues are examined within the following sections.

2.1.1 Access for Construction Vehicles and Traffic Generation

Based on information provided by the developer of the site, Neoen, traffic generated by the site will be split into three key stages. The volume of vehicles associated with each phase are broadly noted as:

- Stage 1 – earthworks, civil and concrete works
- Stage 2 – equipment delivery and commission (combined Stage 1 and 2 – 40 LV and 300 HV trips over the full 9-12 month construction period, HV predominantly 19m Semi-trailer except for individual OSOM movements discussed in section 2.1.3)
- Stage 3 – operation – Less than 5 per day, more likely 1-2.

Existing traffic volumes along Brand Highway north of Byrne Road have been extracted from the Main Roads WA Traffic Map for 2020. Average weekday movements of all traffic, split between light vehicles and heavy vehicles, are shown in Figure 2 with an average total daily weekday volume (both directions) of 4,571. The volume of traffic to be generated by the proposed development would not have a material impact on the operation of Brand Highway.

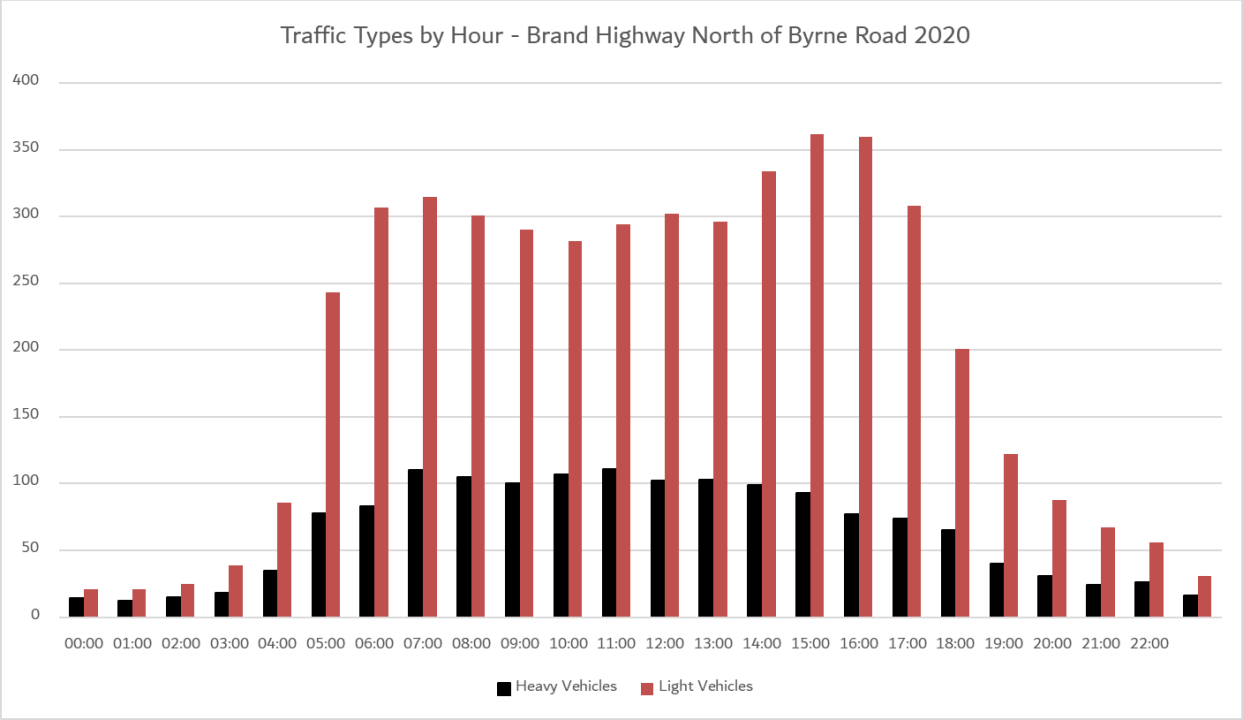


Figure 2 Traffic volume per hour Brand Highway by class (source: Main Roads WA)

The intersection of Byrne Road with Brand Highway is a paved, give way marked intersection. The approach from the south is through an 80km/h posted speed limit zone that is a transitional zone between the 70km/h posted

speed limit to the south and the 110km/h zone to the north of Byrne Road. The posted speed limits are set out in Figure 3.

Figure 3 Posted speed limits (source: MRWA)

The approach from the south is shown in Figure 5 and the approach from the north is shown in Figure 6. The approach from the south has a sealed hard stand area for turning vehicles to utilise for deceleration. The turning movement to the north has a sealed acceleration shoulder. Turning imprints of heavy vehicles heading south from Byrne Road along Brand Highway are evident from tyre markings shown in Figure 5.

Brand Highway transitions from a double white line centre line control from the south to a broken white line/solid white line configuration to the north. This configuration extends past the posted speed limit zone of 110km/h to ensure passing traffic heading southbound along Brand Highway does not encroach on to the northbound lane prior to the overpass. There is an access crossover to a rural property around 65m to the north of the intersection on the opposite side of Brand Highway, as evident in Figure 4.

Figure 4 Intersection of Byrne Road with Brand Highway (source: Nearmap)

Figure 5 View from Byrne Road looking south along Brand Highway (source: Flyt)

Figure 6 View from Byrne Road looking north along Brand Highway (source: Flyt)

2.1.2 Sight Lines

The existing intersection was assessed for stopping sight distance (for vehicles approaching the intersection to be able to observe another vehicle at or within the intersection and react or stop if necessary) and entering sight distance (for vehicles entering Brand Highway from Byrne Road to see a sufficient gap in oncoming traffic to allow a vehicle to clear the intersection safely). These sight distances have considered restricted access vehicles, with their greater lengths and lower acceleration capacity. The required sight distances are outlined in Table 1. These sight distances were obtained from the 2014 issue of the Main Roads RAV Route Assessment Guidelines. The 2018 issue of this document has reduced the sight distance requirements, therefore the more conservative values from the earlier document have been used.

To the north of Byrne Road, there is a 1.9km straight and level section of Brand Highway. Even with a 110 km/h speed limit, all the required sight distances are available.

To the south of Byrne Road, Brand Highway curves to the east as it approaches the intersection with Tonkin Highway and Great Northern Highway. The curvature starts approximately 250m to the south of the intersection with Byrne Road. Due to the reduced speed limits to the south, the required sight distances are available.

Table 1 Required sight distances (source: Main Roads WA)

Approach	Speed Limit (km/h)	Sight Distance Type	Vehicle Size	Minimum Distance (m)
Brand Hwy north	110	Stopping Sight Distance	RAV 2-6	232
			RAV 7-8	261
			RAV 9-10	294
		Entering Sight Distance	RAV 2-4	367
			RAV 5-8	382
			RAV 9-10	397
Brand Hwy south	80	Stopping Sight Distance	RAV 2-6	167
			RAV 7-8	187
			RAV 9-10	206
		Entering Sight Distance	RAV 2-4	220
			RAV 7-8	231
			RAV 9-10	242

The crash history of the intersection of Byrne Road and Brand Highway and the surrounding road network was examined. The Main Roads Crash Statistics database was interrogated for issues that could be evident. The outputs of the mapping database are shown in Figure 7. There are no issues evident along this section of Brand Highway and the recent construction in the location has upgraded signage, lighting, road markings and overall carriageway standard.

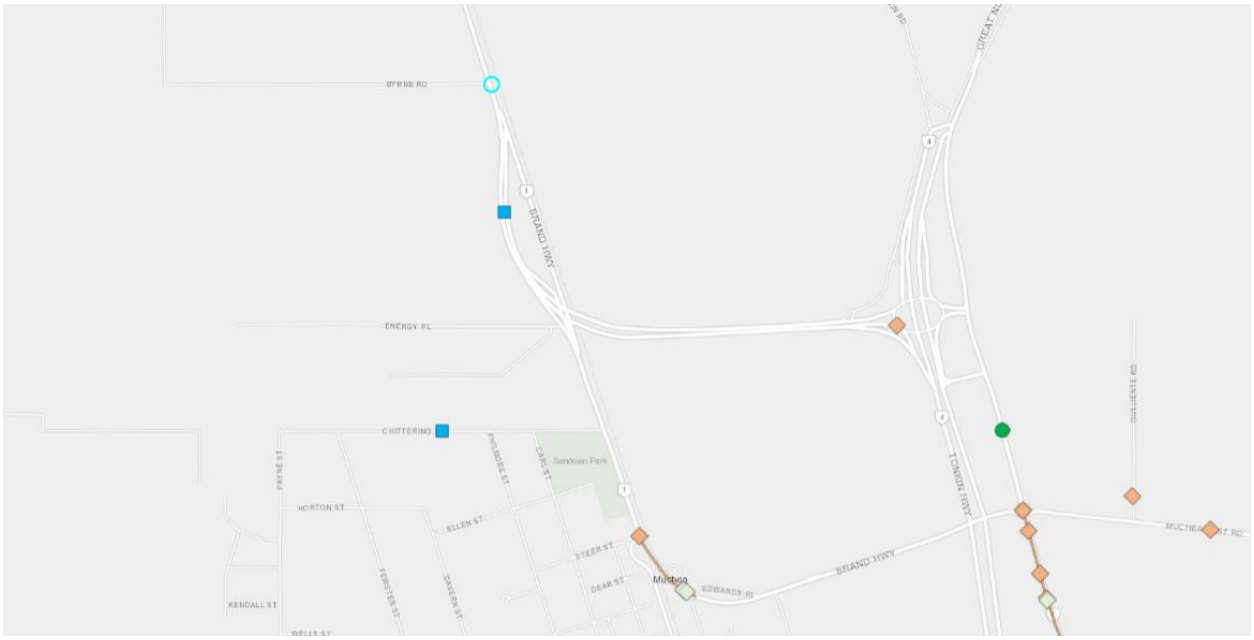


Figure 7 Crash statistics outputs 2016-2020 (source: Main Roads WA)

2.1.3 OSOM Movements

During the construction stage of the project, it is anticipated that the site would require delivery of large indivisible components using an Over Size Over Mass (OSOM) vehicle. The form of vehicle that would be required would likely be a RAV 7 length, with an Over Width trailer of 4.3m. This vehicle would cater for the delivery of the HV/MV power transformer at the substation (without oil tank, fittings and oil) and the switch room / control building unit which is around 25m long and 50 tonnes. These two deliveries would be one-off movements under permits and management and come from the south along Brand Highway.

At present, Brand Highway is classified as a RAV Network 7 road without conditions (shown in Figure 8) and caters for Over Width vehicles of 6.5m without specific conditions as shown in Figure 9. Brand Highway allows vehicles up to 8m wide through this area.

Individual movements of over sized vehicles would be subject to permit requirements through Main Roads WA when construction commences. This would be subject to completion of all relevant forms and processes.

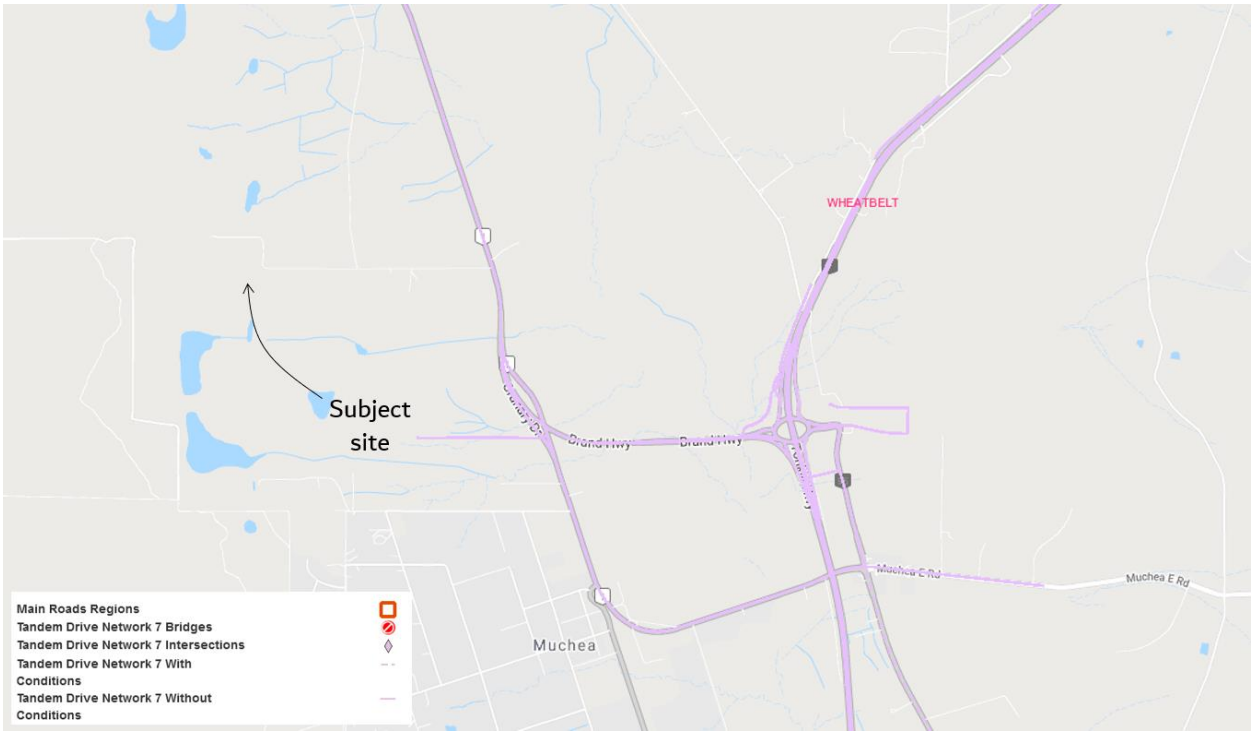


Figure 8 RAV Network classification (source: Main Roads WA)

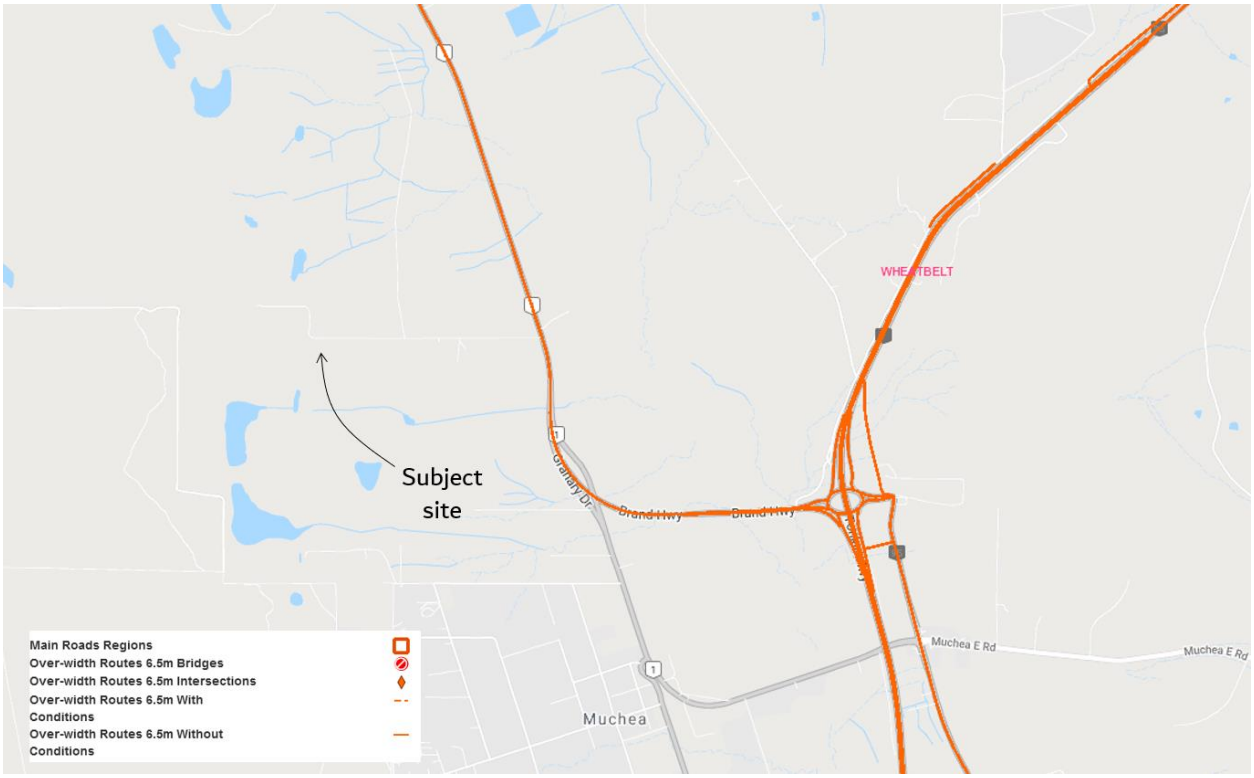


Figure 9 Over Width Routes (source: Main Roads WA)

3. CONCLUSIONS

This note has addressed the three potential transport related impacts of a proposed development of a Battery Project located at Lot 2364, Byrne Road, Muchea, being:

- Access for construction vehicles and traffic generation
- Sight Line Assessment
- Over Sized, Over Mass movements.

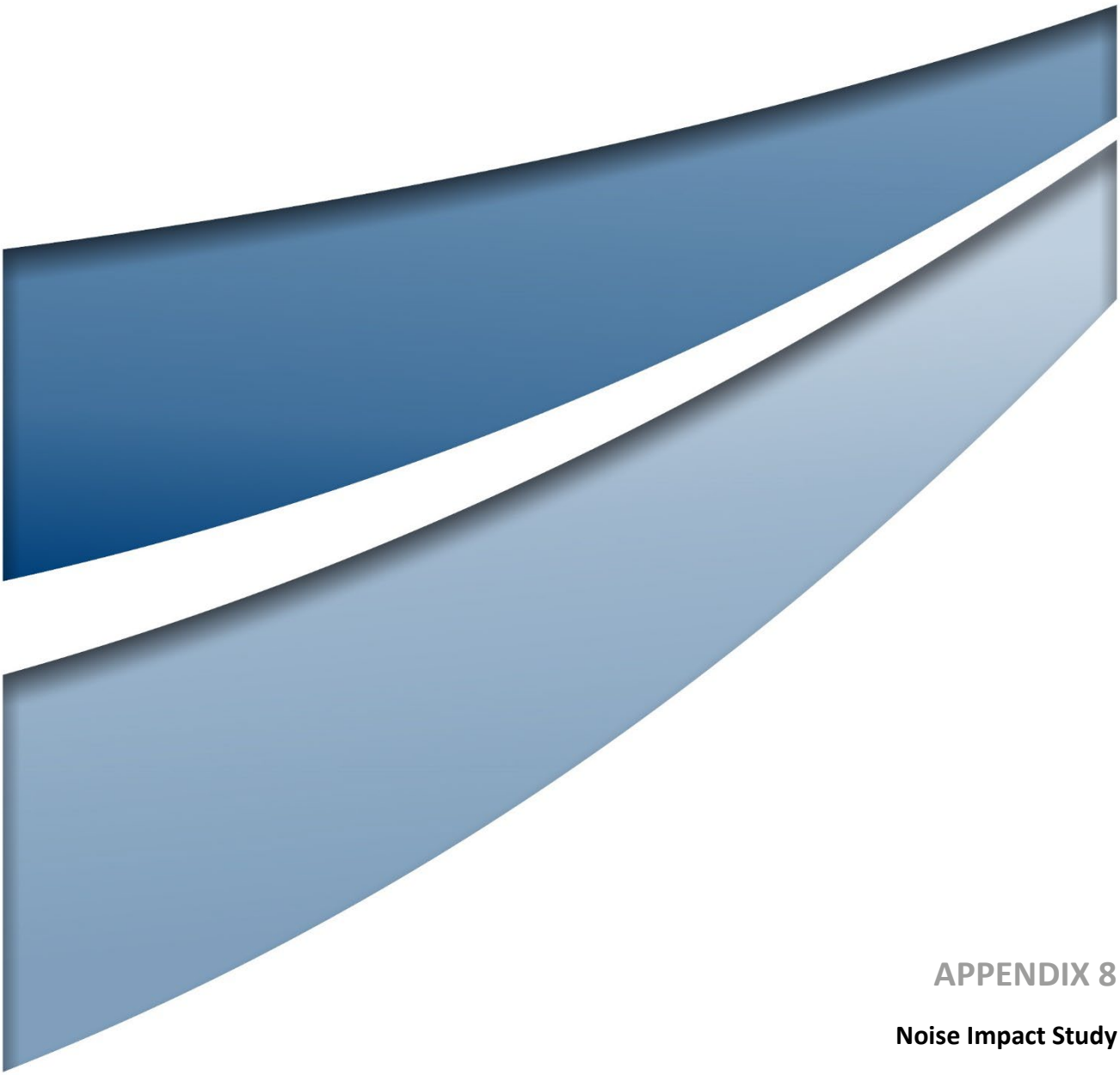
In terms of traffic generation, the site will generate minimal movements during both construction and operational phases. All access will be via Byrne Road and Brand Highway in Muchea. The volume of traffic generated can be accommodated on the existing network.

The sight line analysis has determined that the existing configuration of the intersection of Byrne Road and Brand Highway, as well as the approaches, are considered appropriate.

The site would require delivery of materials during the construction stages that would require use of RAV Network 7 vehicles and a small number of Over Width truck movements. Brand Highway is a RAV 7 Network road that is

capable of catering for most over sized deliveries to the site, with specialised delivery of indivisible loads of 4.3m wide requiring permits through Main Roads WA to ensure they are managed.

The overall traffic impact of the site is low.



APPENDIX 8

Noise Impact Study

Design
for a better
future /

NEOEN AUSTRALIA PTY LTD

ENVIRONMENTAL NOISE IMPACT ASSESSMENT

MUCHEA BATTERY ENERGY STORAGE SYSTEM

wsp

MARCH 2022

Question today
Imagine tomorrow
Create for the future

Environmental Noise Impact Assessment
Muchea Battery Energy Storage System

NEOEN Australia Pty Ltd

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Perth WA 6000
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Cloisters Square WA 6850

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wsp.com

REV	DATE	DETAILS
A	02/03/2022	Noise impact assessment

	NAME	DATE	SIGNATURE
Prepared by:	Shane Ryan	02/03/2022	
Reviewed by:	Andrew Boladz	02/03/2022	
Approved by:	Zhang Lai	02/03/2022	

TABLE OF CONTENTS

1 INTRODUCTION

WSP has been appointed by NEOEN Australia Pty Ltd (NEOEN) to undertake a preliminary environmental noise assessment of a proposed Battery Energy Storage System (BESS) to be located at Muchea, Western Australia.

The aims of the study are:

- Provide a description of the proposed BESS based on the project information provided by NEOEN, identifying the main sources of noise associated with the BESS operation.
- Identify nearby potentially-affected sensitive receivers.
- Provide a description of the environmental noise criteria relevant to the BESS.
- Assess the potential noise impacts associated with the BESS on the nearest sensitive receivers.

2 BACKGROUND INFORMATION

2.1 PROJECT DESCRIPTION

NEOEN proposes to establish a 200MW/400MWh battery at Muchea in the Shire of Chittering. The proposed BESS is to be located at Lot 2364 Byrne Road approximately 2 kilometres (km) north of Muchea.

The BESS footprint (the Project Area) is proposed to be within a fully cleared indicative 5 ha area adjacent to the existing Muchea Substation. The proposed battery will be within a compound of around 2 ha and will include:

- Battery banks, Power Conversion Systems (PCS), Power and Auxiliary Transformers and Ring Main Units (RMU).
- Internal access roads and limited car spaces.
- A combined 33kV switchgear and control building, housing protections, metering and control panels.
- A 132kV/33kV substation with step-up power transformers, NERs and 132kV outdoor switchgear.
- 132kV overhead cables assumed to connect directly to the adjacent Muchea Substation.
- A 33kV cable reticulation and earthing networks.
- LV AC cabling for auxiliary supplies and between the PCS and Power Transformers.
- LV DC cabling between the battery banks and the PCS.
- Communication cable network.
- Office, storage warehouse and water tank.
- Lightning rods up to 15 metres.
- CCTV cameras and lighting.
- Site perimeter fences and gates.
- Site laydown area and facilities for the project construction.

2.2 PROJECT LOCATION

The location of the proposed site and nearest noise sensitive receivers are shown in Figure 2.1. The proposed site layout plan is provided in Appendix A2.

The nearest identified residential noise sensitive receivers are located at:

- 472 Brand Highway approximately 1 km East of the site.
- 162 Chittering Street approximately 1.2 km South of the site.
- Multiple properties along the south of Chittering Street, Muchea townsite approximately 1.5 km South of the site.
- 195 Byrne Road approximately 1 km West of the site.

The BESS is proposed to operate 24 hours a day, seven days per week.

Figure 2.1 Site and noise sensitive receiver locations

2.3 EXISTING NOISE ENVIRONMENT

All measurements were conducted using the 'A-weighting' filter and 'slow' response. All items of acoustic instrumentation employed during the noise monitoring surveys were designed to comply with Australian Standard AS IEC 61672 "Electroacoustics - Sound level meters". Noise measurements were conducted at a height of approximately 1.2 metres (m) above ground level.

2.3.1 UNATTENDED MONITORING

Continuous unattended noise monitoring was conducted simultaneously for seven days at a selected free field representative location between 2 and 10 February 2022. The noise logging was undertaken in order to understand the existing background noise environment.

The noise logger was located at 162 Chittering Street (as highlighted in Figure 2.1).

The unattended noise monitoring equipment used during the survey is shown in Table 2-1; the calibration certificates are available on request.

Table 2-1 Unattended noise logging equipment

EQUIPMENT TYPE	SERIAL NO	CALIBRATION DUE DATE
Logger	RION NL-42 EX	2/02/2023
Calibrator Pulsar 105	91763	9/02/2023

The logger was programmed to record various statistical noise levels over consecutive 15 minute intervals. The logger was checked for calibration before and after the survey and no significant drift (greater than 0.5 decibels (dB)) was detected.

The daily weather conditions at the Bureau of Meteorology (BOM) weather station, Pearce 9053, during the measurement period can be viewed in Table 2-2. Based on the observations, wind speeds were likely to have had a significant influence on the noise logging results.

Table 2-2 Daily weather conditions

DATE	RAIN mm	MAX WIND GUST km/h	9.00 AM					3.00 PM				
			Temp °C	RH %	Wind Direction	Wind Speed km/h	Pressure hPa	Temp °C	RH %	Wind Direction	Wind Speed km/h	Pressure hPa
2/02/2022	0	74	23	35	ENE	24	1012	33	17	ENE	31	1010
3/02/2022	0	61	29	23	NE	26	1011	39	11	NE	17	1007
4/02/2022	0	46	33	15	NNE	26	1009	41	11	WSW	19	1006
5/02/2022	0	59	36	13	NNE	9	1008	42	9	WSW	31	1004
6/02/2022	0	52	26	65	WSW	17	1003	27	42	WSW	31	1002
7/02/2022	1	41	23	38	SW	24	1010	24	35	WSW	35	1011
8/02/2022	0	41	22	41	ESE	15	1015	28	33	SW	24	1012
9/02/2022	0	46	23	52	SE	19	1014	29	34	SSW	30	1011
10/02/2022	0	35	26	36	E	24	1010	39	14	SSW	9	1006

The results of the noise logging are shown in Table 2-3. These results are also presented graphically in Appendix A3. Note, that half hourly weather data was not recorded between 2/02/2022 and 5/02/2022 and as such, is not shown on the graphs in Appendix A3.

Noise loggers continuously measure ambient noise, which includes all noise sources present at the time. The L_{A90} (see Appendix A1) is a good indicator of background noise as it is relatively insensitive to noises that are short term in duration.

Table 2-3 Unattended noise monitoring results

PERIOD	L_{A90} (dB)	L_{A10} (dB)	L_{AMAX} (dB)
Night (10.00 pm to 7.00 am)	35	44	53
Day (7.00 am to 7.00 pm)	44	54	65
Evening (7.00 pm to 10.00 pm)	35	43	55
Sunday Day (9.00 am to 7.00 pm)	46	56	68

2.3.2 OPERATOR ATTENDED MONITORING

Operator-attended noise measurements were undertaken at locations around the site and township in order to understand the composition of the current noise environment and to supplement the noise logger data.

The instrumentation used during the operator-attended noise monitoring is shown in Table 2-4.

Table 2-4 Attended noise monitoring equipment

EQUIPMENT TYPE	SERIAL NO	CALIBRATION DUE DATE
Sound Level Meter: Cirrus CR-171B	G300681	16/12/2022
Calibrator: Pulsar 105	91763	9/02/2022

All noise measurements were obtained over a sufficient duration to provide a representation of the typical noise emissions.

The sound level meter was calibrated before and after the survey with the calibrator. No significant drift (greater than 0.5 dB) in calibration was detected.

The attended measurement locations are highlighted in Figure 2.1.

The results of the attended noise measurements are shown in Table 2-5.

Table 2-5 Attended noise measurements

LOCATION	DATE	TIME	L_{A90} dB	L_{A10} dB	L_{AMAX} dB	COMMENTS
162 Chittering Street (AM1)	2/02/2022	10.52 am	44	54	57	Wind induced foliage dominant 50 – 57 dBA. Occasional birds 44 – 46 dBA. Traffic 44 – 53 dBA. Aircraft flyover 45 – 49 dBA. Paused for: Occasional dog barks 50 dBA.
162 Chittering Street (AM1)	10/02/2022	10.41 am	32	41	62	Wind induced foliage 36 – 49 dBA. Occasional birds (some paused) 32 – 62 dBA. Distant traffic 32 – 34 dBA. Paused for: Resident vehicle 42 dBA. Aircraft flyover 42 – 53 dBA. Distant aircraft 39 – 45 dBA.
105 Chittering Street (AM2)	10/02/2022	11.22 am	28	40	49	Occasional birds (some paused) 28 – 49 dBA. Distant traffic (some paused) 33 – 48 dBA. Dog barks 31 – 35 dBA. Vehicle passby 44 – 71 dBA. Aircraft flyover 32 – 54 dBA. Wind induced foliage 34 – 40 dBA.
472 Brand Highway (AM3)	10/02/2022	11.51 am	28	40	48	Vehicle passby (some paused) ≥48 dBA. Wind induced foliage 37 46 dBA. Occasional birds 24 – 35 dBA. Distant traffic 25 – 28 dBA.
195 Byrne Road (AM4)	10/02/2022	12.16 pm	22	40	49	Distant traffic 25 – 28 dBA. Wind induced foliage 37 46 dBA. Occasional birds 23 – 35 dBA. Aircraft flyover 48 – 53 dBA.

3 NOISE CRITERIA

The applicable statutory requirements for noise emissions are contained within the *Environmental Protection Act 1986* (the Act) and the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations).

The Noise Regulations require that noise emitted from any premises must comply with assigned noise levels when received at any other premises and be free of the intrusive characteristics of tonality, modulation and impulsiveness. In addition, the noise emissions must not "significantly contribute" to an exceedance of the assigned levels. A noise emission is generally understood to "significantly contribute" if it is higher than a level which is 5 dB below the assigned level at the point of reception.

Assigned noise levels

Assigned noise levels are the levels of noise allowed to be received at a premises at a particular time of the day.

The assigned levels are specified according to the type of premises receiving the noise. There are different assigned levels for noise sensitive, commercial and industrial premises. The assigned levels for noise sensitive premises vary depending on the time of the day. The assigned noise levels always apply at the premises receiving the noise.

For noise sensitive premises, the assigned levels are adjusted by the addition of an influencing factor to account for the existing acoustic environment. The influencing factor increases with the amount of commercial and industrial premises in the vicinity of the noise sensitive receiver as well as the presence of any major or secondary roads. This is calculated by considering areas within 100 m and 450 m radius of the noise sensitive receiver location.

The table of assigned levels, shown in Table 3-1 identifies three types of assigned levels: L_{Amax}, L_{A1} and L_{A10}.

Table 3-1 Table of assigned noise levels

TYPE OF PREMISES RECEIVING NOISE	TIME OF DAY	ASSIGNED LEVEL dB		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises at locations within 15 m of a building directly associated with a noise sensitive use	7.00 am to 7.00 pm Monday to Saturday	45 + Influencing factor	55 + Influencing factor	65 + Influencing factor
	9.00 am to 7.00 pm Sunday and public holidays	40 + Influencing factor	50 + Influencing factor	65 + Influencing factor
	7.00 pm to 10.00 pm All days	40 + Influencing factor	50 + Influencing factor	55 + Influencing factor
	10.00 pm on any day to 7.00 am Monday to Saturday and 9.00 am Sunday and public holidays	35 + Influencing factor	45 + Influencing factor	55 + Influencing factor
Noise sensitive premises at locations further than 15 m from a building directly associated with a noise sensitive use	All hours	60	75	80
Commercial premises	All hours	60	75	80

As there are no industrial or commercial premises or applicable roads within 450 m of the nearest noise sensitive receiver the influencing factor is zero and the criteria within Table 3-1 are therefore unchanged.

Intrusive characteristics

If noise emitted from any premises when received at any other premises cannot reasonably be free of intrusive characteristics of tonality (e.g. drone or pitch), modulation (e.g. siren) or impulsiveness (e.g. bang), then a series of adjustments must be added to the emitted levels (measured or calculated) and the adjusted level must comply with the assigned level. The adjustments are detailed in Table 3-2.

Table 3-2 Table of adjustments

ADJUSTMENT WHERE NOISE EMISSION IS NOT MUSIC THESE ADJUSTMENTS ARE CUMULATIVE TO A MAXIMUM OF 15 dB		
Where tonality is present	Where modulation is present	Where impulsiveness is present
+5 dB	+5 dB	+10 dB

Representative Assessment Period

The assigned levels are statistical noise levels over a Representative Assessment Period (RAP). For this assessment, a RAP of 15 minutes has been selected as an appropriate period for assessing the noise from the site.

As the noise from the facility will be generally constant the L_{10} will be used for the assessment of the noise levels at the receivers.

Contribution to exceedance of assigned noise levels

Based on the existing noise environment survey, whilst the measured L_{A10} noise levels were above the assigned levels these were from sources such as wind induced foliage, fauna, traffic and aircraft these sources are not covered by the Noise Regulations. Therefore, noise emissions from the site will not contribute to an existing exceedance of the Noise Regulations at the nearby receivers.

4 METHODOLOGY

A noise model was prepared using the SoundPLAN 8.2 Industrial Module, a commercial software system developed by Braunstein and Bernt Gmbh in Germany.

The software allows the use of various internationally recognised noise prediction algorithms. The CONCAWE method, developed in the Netherlands for assessment of large industrial plants, has been selected for this assessment as it enables meteorological influences to be assessed.

The CONCAWE algorithm included the typical worst case meteorological parameters outlined in the Western Australian Department of Water and Environmental Regulation Draft Guidelines Assessment of Environmental Noise May 2021. These parameters are highlighted in Table 4-1. The modelling assumed a worst-case scenario wind direction from the source to the receiver.

Table 4-1 Meteorological conditions used in the noise predictions

TIME OF DAY	TEMPERATURE	RELATIVE HUMIDITY	WIND SPEED	PASQUIL STABILITY CATEGORY
Night	15°C	50%	3 m/s	F

The potential for machinery to emit noise is quantified as the sound power level (SWL) expressed in decibels (dB re $1x10^{-12}$ W). At the receiver, the noise is quantified as the sound pressure level (SPL) expressed in decibels (dB re 20 µPa).

The third octave SWLs used in the model were established based on supplied client information and the WSP database and are detailed in Appendix A4. The data was primarily provided as broadband SPLs which have been converted to SWLs and a 1/3 octave spectrum applied from generic spectrum data within the WSP database.

Key parameters used in establishment of the noise model and execution of the noise predictions are summarised in Table 4-2.

Table 4-2 Noise model - key parameters used

ITEM	DESCRIPTION
3-dimensional ground topography data for the future design ground level of the assessment area	Topography surrounding site sourced from Intergovernmental Committee on Surveying and Mapping website in 5 m contours. Site topography has been established based on elevation of the area and flattened to match average elevation.
Ground absorption	Ground absorption factor of 0.2 has been applied to site. Ground absorption factor of 1 has been applied all other areas. (0=hard ground, 1=soft ground)
Noise receivers	Single point receivers modelled 1.5 meter above ground level
Equipment noise emissions and layout	Indicative site layout outlined in Appendix A2 and SWLs in Appendix A4.

ITEM	DESCRIPTION
Assumptions used	— Transformers and cooling fans modelled as point sources. — Inverters and battery enclosures modelled as industrial buildings area sources. — All sources are operating simultaneously on full load (assumed to be conservative and represents worst case) . — All noise sources are assumed to be omnidirectional. — The predicted SPLs presented in this report represent the L_{A10} emission level for the RAP. — No solid fences/ noise barriers are modelled around the site.

5 ASSESSMENT

5.1 INTRUSIVE CHARACTERISTICS

The predicted 1/3 octave band noise levels received at the worst affected premises (Byrne Road) as presented in Figure 5.1, have been analysed for intrusive characteristics (tonality, modulation and impulse) as defined by the Noise Regulations. Whilst the spectrum appears tonal at 160 Hz it is not expected that this would be audible above the existing background noise levels measured at this location and it is below the threshold where you would expect disturbance from a low frequency noise.

Therefore, based on analysis of the data, the predicted noise emitted from the proposed BESS site is not expected to have an audible intrusive characteristic, as such, a penalty has not been applied to the modelled results.

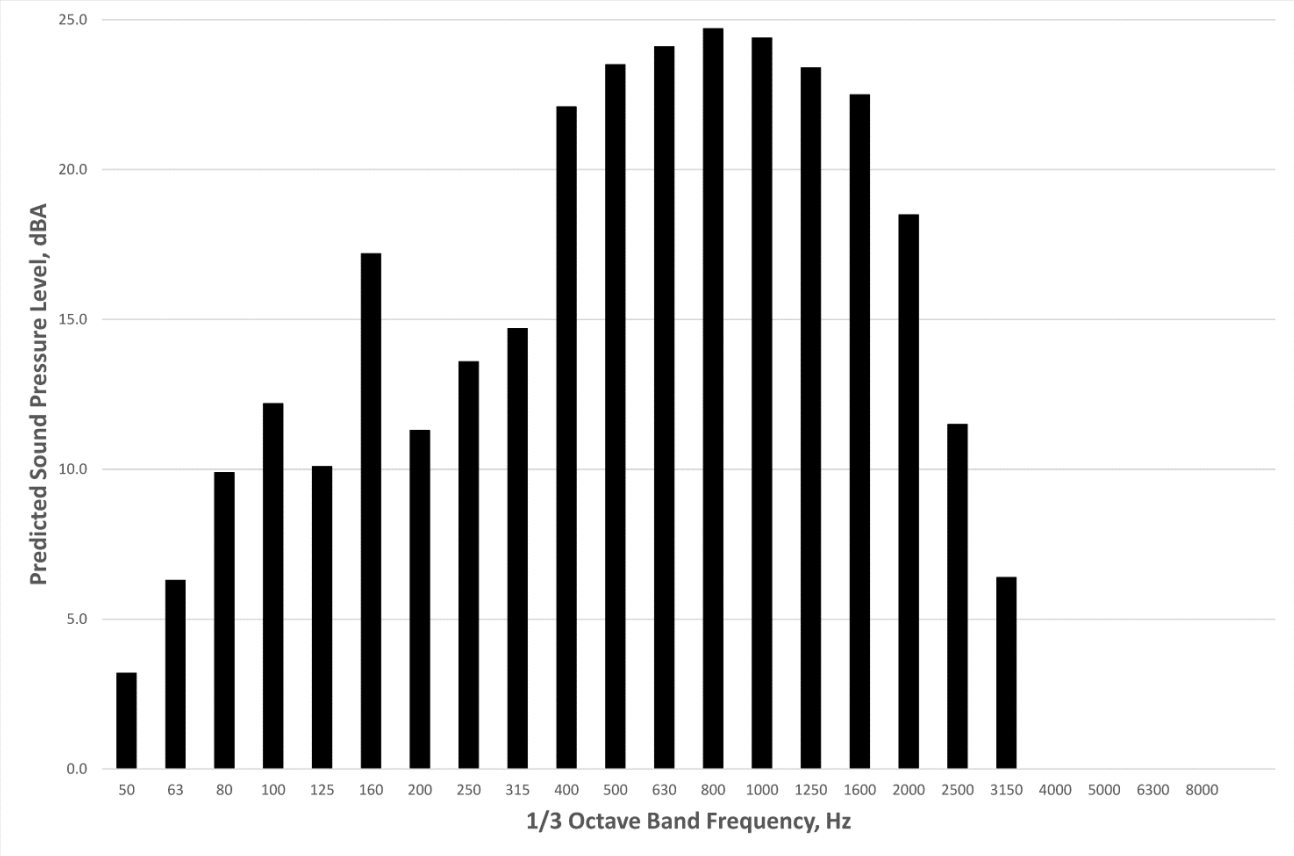


Figure 5.1 Predicted 1/3 octave sound pressure levels received at 195 Byrne Road

It should be noted that this assessment is based on the supplied noise data and where 1/3 octave band data was not available generic 1/3 octave band spectrums were used for the plant items. It is recommended that a further study is undertaken into potential intrusive characteristics once more complete noise data becomes available and equipment selections are confirmed.

5.2 ASSESSMENT AGAINST CRITERIA

Predicted noise levels emitted from the proposed BESS site compared to the night time noise criteria (most stringent criteria) at nearby noise sensitive receivers are shown in Table 5-1. A noise contour map extending to the nearest residential noise sensitive receivers is shown in Appendix A5.

Table 5-1 Predicted noise levels – night time period

RECEIVER	PREDICTED L_{A10} dB	CRITERIA L_{A10}	COMPLIANT
195 Byrne Road	33	35	Yes
472 Brand Highway	32		
162 Chittering Street	31		
105 Chittering Street	27		

The predicted L_{A10} noise levels from the proposed BESS site indicates compliance with the assigned levels at all the identified nearest noise sensitive receivers. As per Section 5.1 no penalty for intrusive characteristics has been applied to the predicted noise levels.

5.3 PREDICTED NOISE LEVELS – CIRCUIT BREAKERS

When triggered, circuit breakers have the potential to induce very short term (< 0.5 seconds each event) but high level noise impact. The occurrence of the event is unclear and would need to be confirmed as project progresses. In other BESS projects, it is noted that such occurrence is typically in an emergency situation only and typically not more than one per year. On this basis and if applicable to this project, noise events associated with the circuit breakers are expected to be insignificant.

The predicted L_{Amax} noise levels for these noise events are presented in Table 5-2.

Table 5-2 Predicted maximum noise levels

RECEIVER	PREDICTED L_{AMAX} dB	CRITERIA L_{AMAX} dB	COMPLIANT
195 Byrne Road	38	55	Yes
472 Brand Highway	41		
162 Chittering Street	39		
105 Chittering Street	35		

The predicted L_{Amax} noise levels from the proposed BESS site indicates compliance with the assigned levels at all the identified nearest noise sensitive receivers.

5.4 PREDICTED NOISE LEVELS COMPARED TO EXISTING NOISE ENVIRONMENT

The predicted noise levels are compared to the measured existing background (L_{A90}) noise levels in Table 5-3.

Table 5-3 Predicted noise levels compared to measured noise levels

RECIEVERS	PREDICTED L_{A10} dB	ATTENDED MEASUREMENT L_{A90} dB	UNATTENDED MEASUREMENT L_{A90} dB
162 Chittering Street	31	32 - 44	Ranged from 35 – 46 (See Table 2-3)
195 Byrne Road	33	22	n/a
472 Brand Highway	32	28	
105 Chittering Street	27	28	

At the Byrne Road and Brand Highway receivers the predicted noise levels (L_{A10}) have the potential to be louder than the background noise levels (L_{A90}) during periods of calm weather and low background noise. Therefore, noise from the proposed BESS is likely to be faintly audible at those receiver locations during periods of low background noise.

6 CONCLUSION

WSP Australia was appointed by NEOEN to conduct an environmental noise impact assessment relating to the proposed BESS at Muchea. The noise assessment was conducted in accordance with the requirements of the Western Australia Environmental Protection (Noise) Regulations 1997.

The proposed BESS site was assessed against the assigned levels within the Noise Regulations at the nearest noise sensitive receivers and was found to be compliant without any additional mitigation.

Subjectively the BESS has the potential to be audible at the Byrne Road and Brand Highway receivers during periods of low background noise.

A1. ACOUSTIC TERMINOLOGY

SOUND PRESSURE LEVEL (SPL)

The basic unit of sound measurement is the sound pressure level. The pressures are converted to a logarithmic scale and expressed in decibels (dB).

SOUND POWER LEVEL (SWL)

The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure may be likened to an electric radiator, which is characterised by a power rating, but influences the surrounding environment that can be measured in terms of a different parameter, temperature.

A-WEIGHTING

A frequency weighting devised to attempt to consider the fact that human response to sound is not equally sensitive to all frequencies; it consists of an electronic filter in a sound level meter, which attempts to build in this variability into the indicated noise level reading so that it will correlate, approximately, with human response.

STATISTICAL NOISE LEVELS

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAN, where LAN is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time, and so on.

Of particular relevance, are:

L_{A1} - The noise level exceeded for 1% of the 15 minute interval.

L_{A10} - The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} - The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

L_{Aeq} - The A-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

MODULATION

A modulating noise is characterised by a variation in the emission that is regular, cyclic and audible.

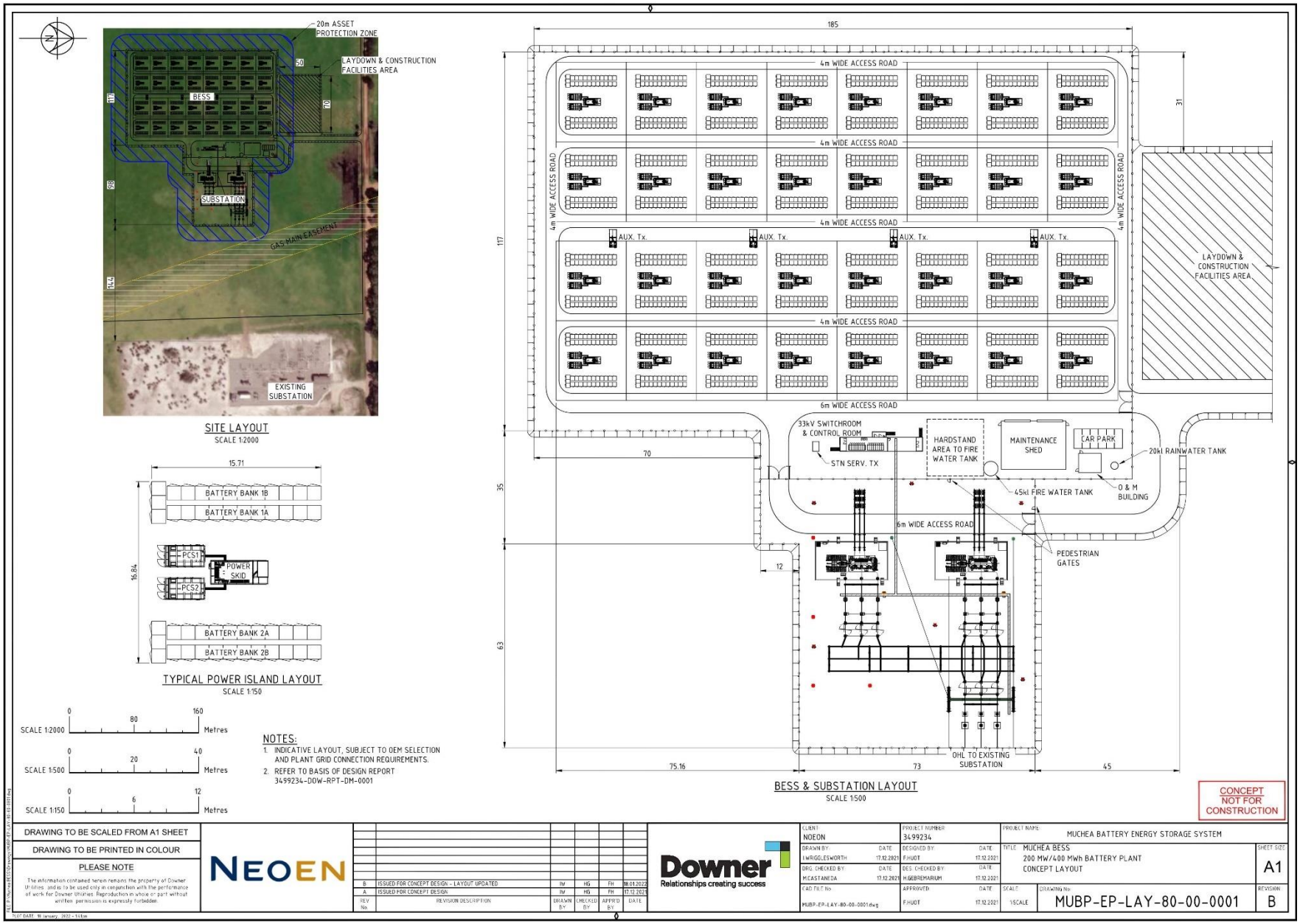
TONALITY

Tonal noise contains one or more prominent tones (i.e. distinct frequency components), and is normally regarded as more offensive than “broad band” noise.

IMPULSIVENESS

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

A2. SITE LAYOUT


20m ASSET PROTECTION ZONE
LAYDOWN & CONSTRUCTION FACILITIES AREA
BESS
SUBSTATION
GAS MAIN EASEMENT
EXISTING SUBSTATION
SITE LAYOUT
SCALE 1:2000
15.71
BATTERY BANK 1B
BATTERY BANK 1A
PCS1
POWER SKID
PCS2
16.84
BATTERY BANK 2A
BATTERY BANK 2B
TYPICAL POWER ISLAND LAYOUT
SCALE 1:150
185
4m WIDE ACCESS ROAD
AUX. Tx.
6m WIDE ACCESS ROAD
33kV SWITCHROOM & CONTROL ROOM
STN SERV. TX
HARDSTAND AREA TO FIRE WATER TANK
MAINTENANCE SHED
CAR PARK
20kl RAINWATER TANK
45kl FIRE WATER TANK
O & M BUILDING
PEDESTRIAN GATES
OHL TO EXISTING SUBSTATION
LAYDOWN & CONSTRUCTION FACILITIES AREA
75.16
73
45
BESS & SUBSTATION LAYOUT
SCALE 1:500
SCALE 1:2000 0 80 160 Metres
SCALE 1:500 0 20 40 Metres
SCALE 1:150 0 6 12 Metres
NOTES:
1. INDICATIVE LAYOUT, SUBJECT TO OEM SELECTION AND PLANT GRID CONNECTION REQUIREMENTS.
2. REFER TO BASIS OF DESIGN REPORT 3499234-DOW-RPT-DM-0001
CONCEPT NOT FOR CONSTRUCTION
DRAWING TO BE SCALED FROM A1 SHEET
DRAWING TO BE PRINTED IN COLOUR
PLEASE NOTE
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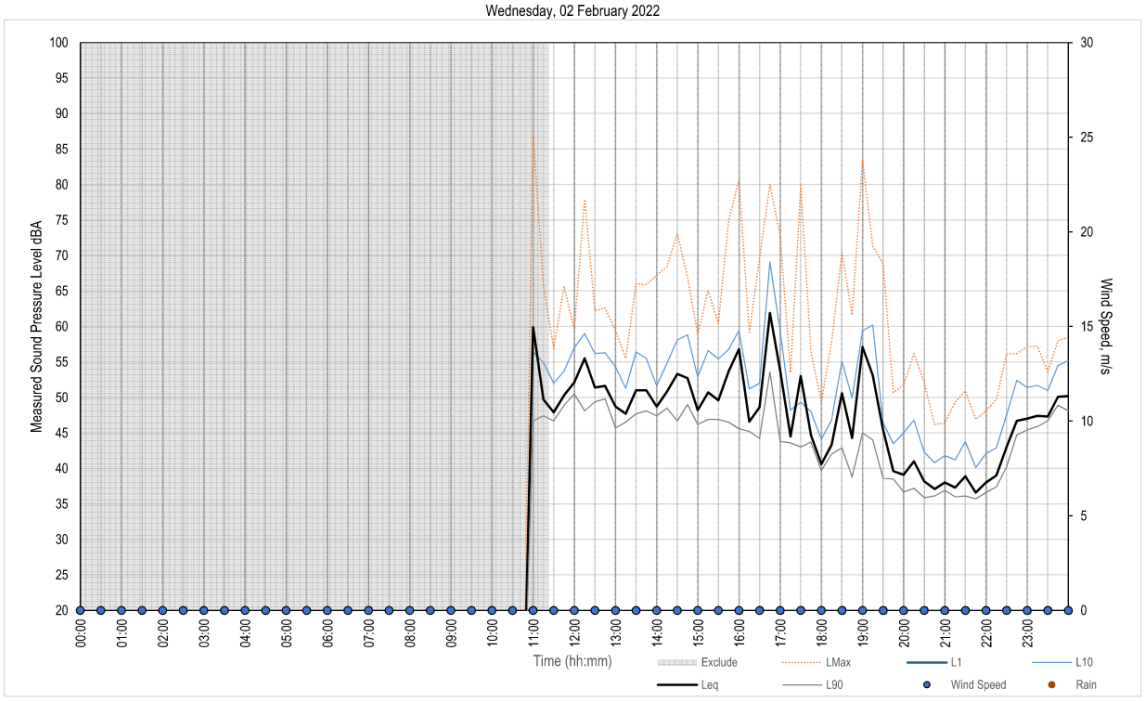
NEOEN
B ISSUED FOR CONCEPT DESIGN - LAYOUT UPDATED JW HG FH 18.01.2022
A ISSUED FOR CONCEPT DESIGN JW HG FH 17.12.2021
REV No. REVISION DESCRIPTION DRAWN BY CHECKED BY APPR'D BY DATE
Downer Relationships creating success
CLIENT: NOEON
PROJECT NUMBER: 3499234
PROJECT NAME: MUCHEA BATTERY ENERGY STORAGE SYSTEM
DRAWN BY: L.WRIGGLESWORTH 17.12.2021
DESIGNED BY: F.HUOT 17.12.2021
DRG. CHECKED BY: M.CASTANEDA 17.12.2021
DES. CHECKED BY: H.GEBREMARIUM 17.12.2021
CAD FILE No: MUBP-EP-LAY-80-00-0001.dwg
APPROVED: F.HUOT 17.12.2021
TITLE: MUCHEA BESS 200 MW/400 MWh BATTERY PLANT CONCEPT LAYOUT
SHEET SIZE: A1
SCALE: 1:SCALE
DRAWING No: MUBP-EP-LAY-80-00-0001
REVISION: B

A3. EXISTING NOISE ENVIRONMENT

Measured Noise Levels - 162 Chittering Street

Wednesday, 02 February 2022

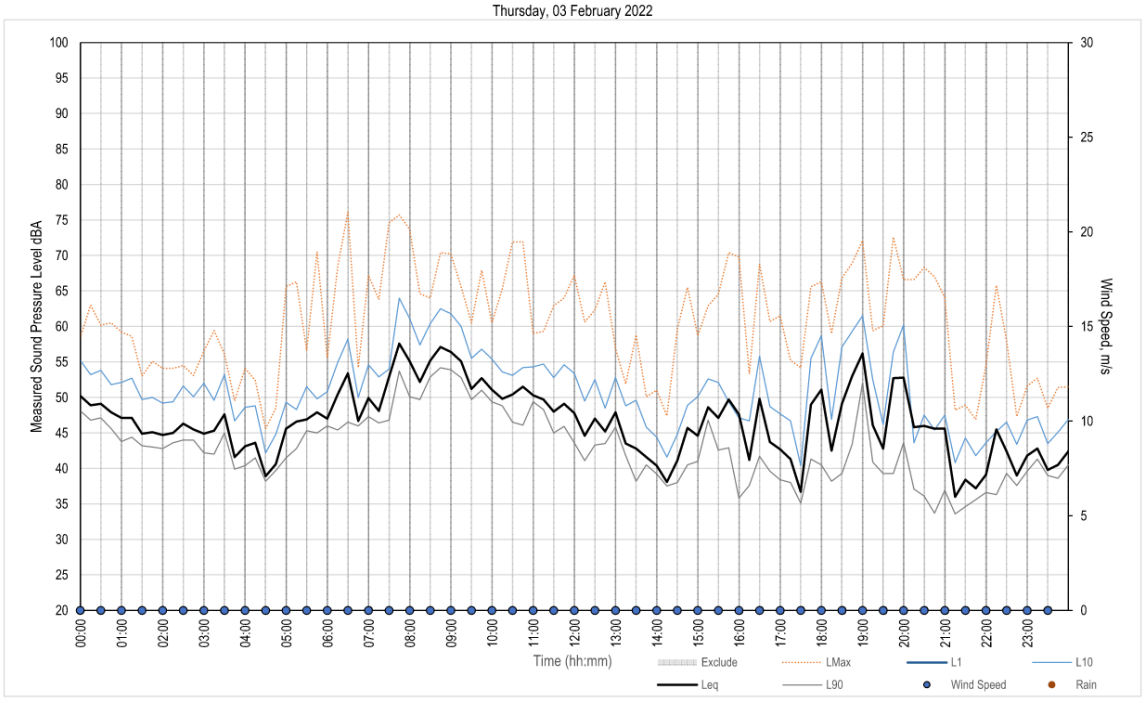


20220210 Logger Grapher WA v1.3_aSR | DAY1

Noise Logger Results

Measured Noise Levels - 162 Chittering Street

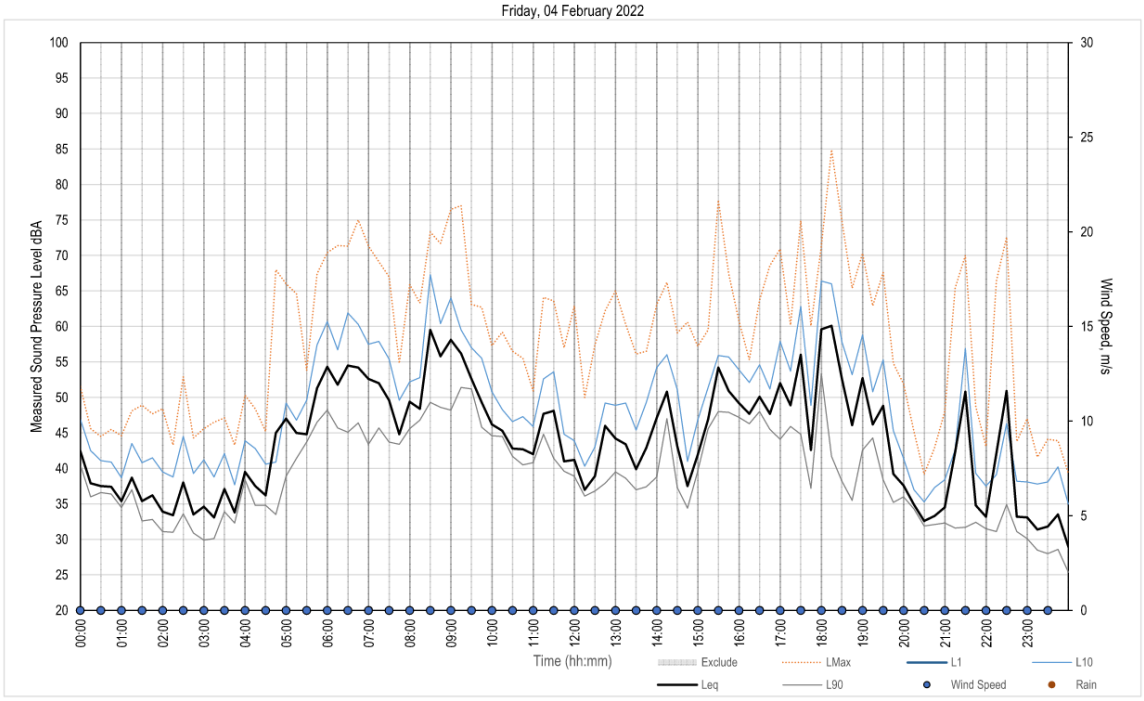
Thursday, 03 February 2022



20220210 Logger Grapher WA v1.3_aSR | DAY2

Measured Noise Levels - 162 Chittering Street

Friday, 04 February 2022

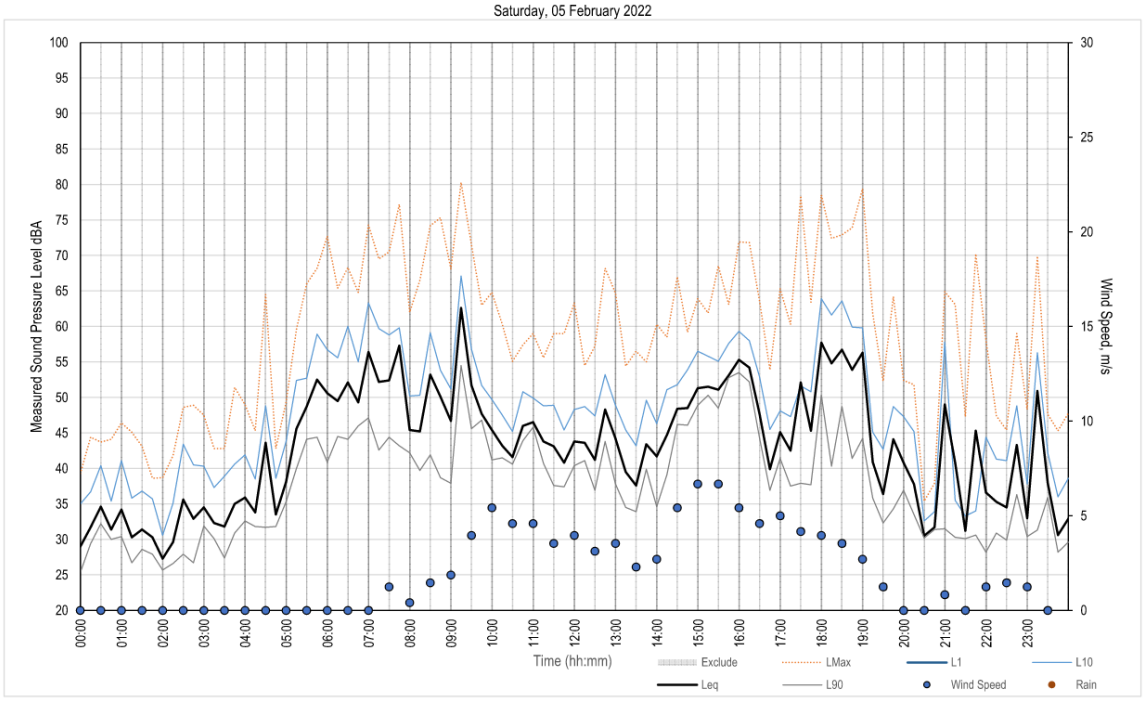


20220210 Logger Grapher WA v1.3_aSR | DAY3

Noise Logger Results

Measured Noise Levels - 162 Chittering Street

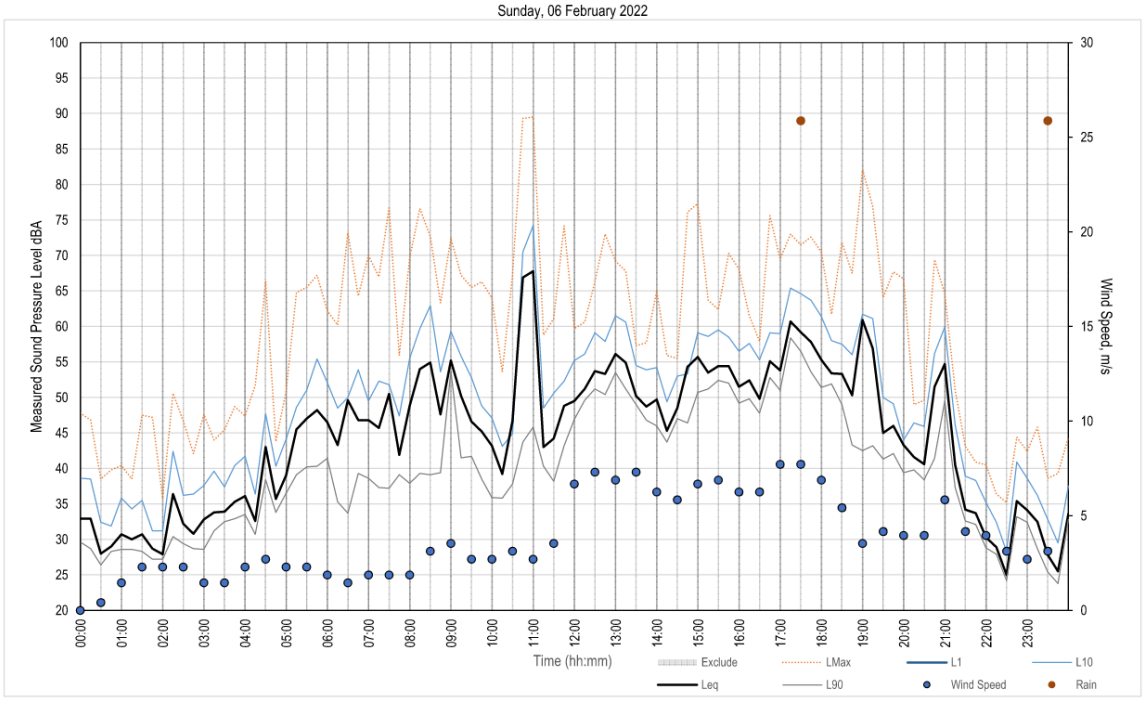
Saturday, 05 February 2022



20220210 Logger Grapher WA v1.3_aSR | DAY4

Measured Noise Levels - 162 Chittering Street

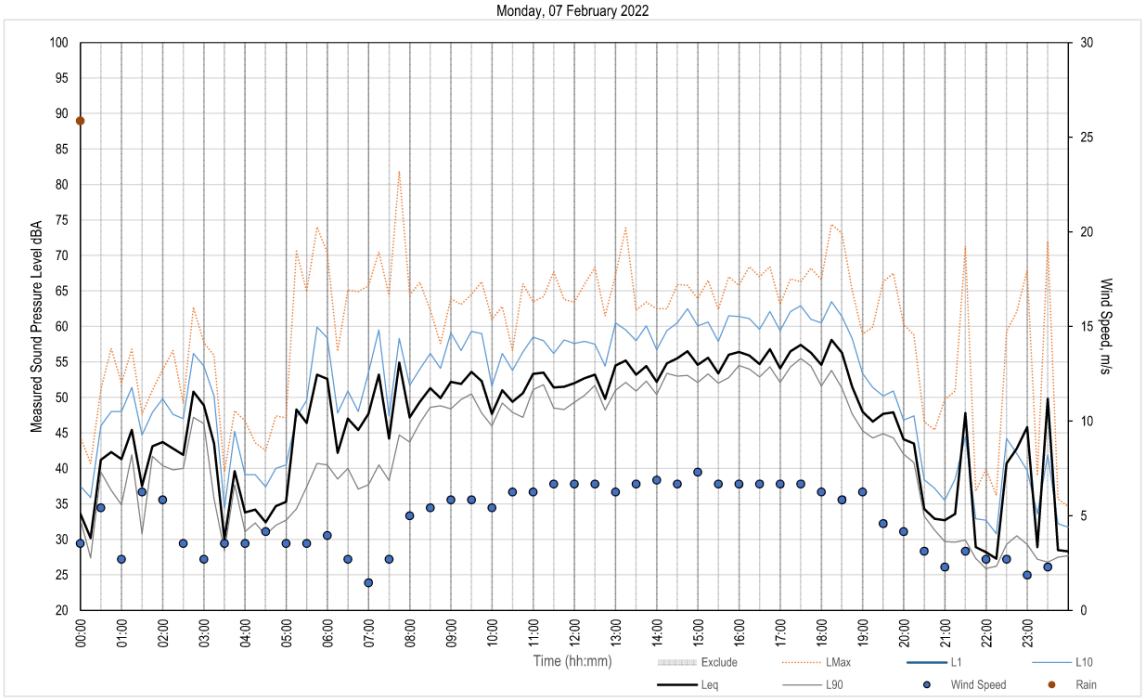
Sunday, 06 February 2022



20220210 Logger Grapher WA v1.3_aSR | DAY5

Measured Noise Levels - 162 Chittering Street

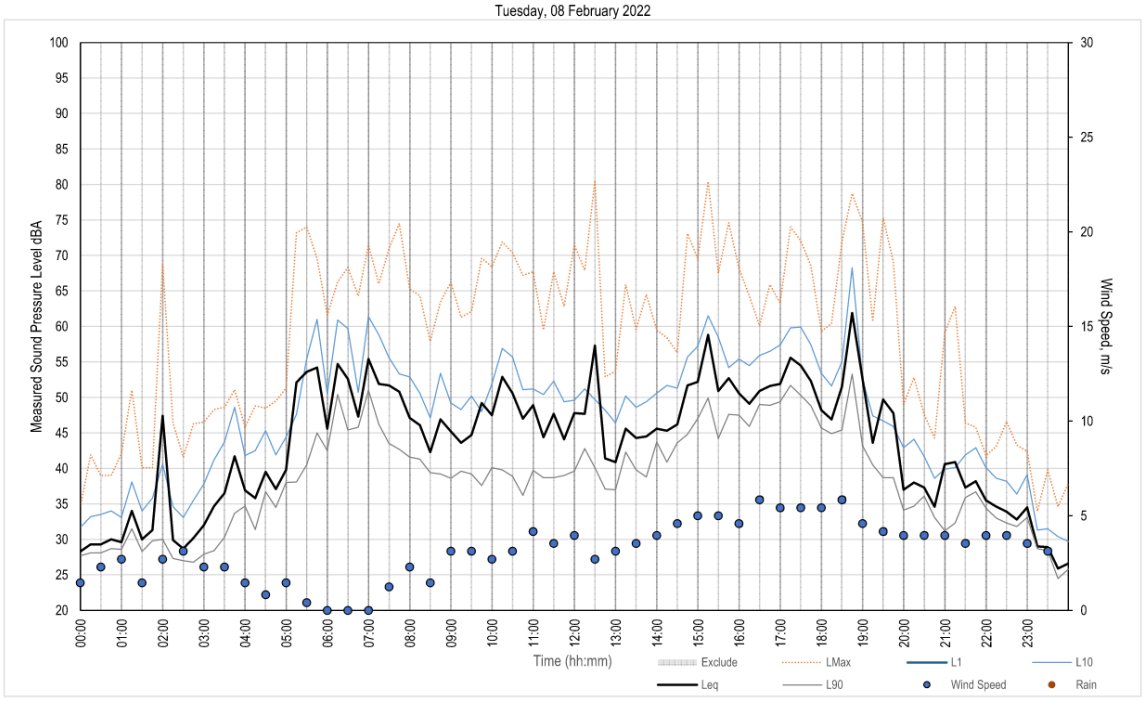
Monday, 07 February 2022



20220210 Logger Grapher WA v1.3_aSR | DAY6

Measured Noise Levels - 162 Chittering Street

Tuesday, 08 February 2022

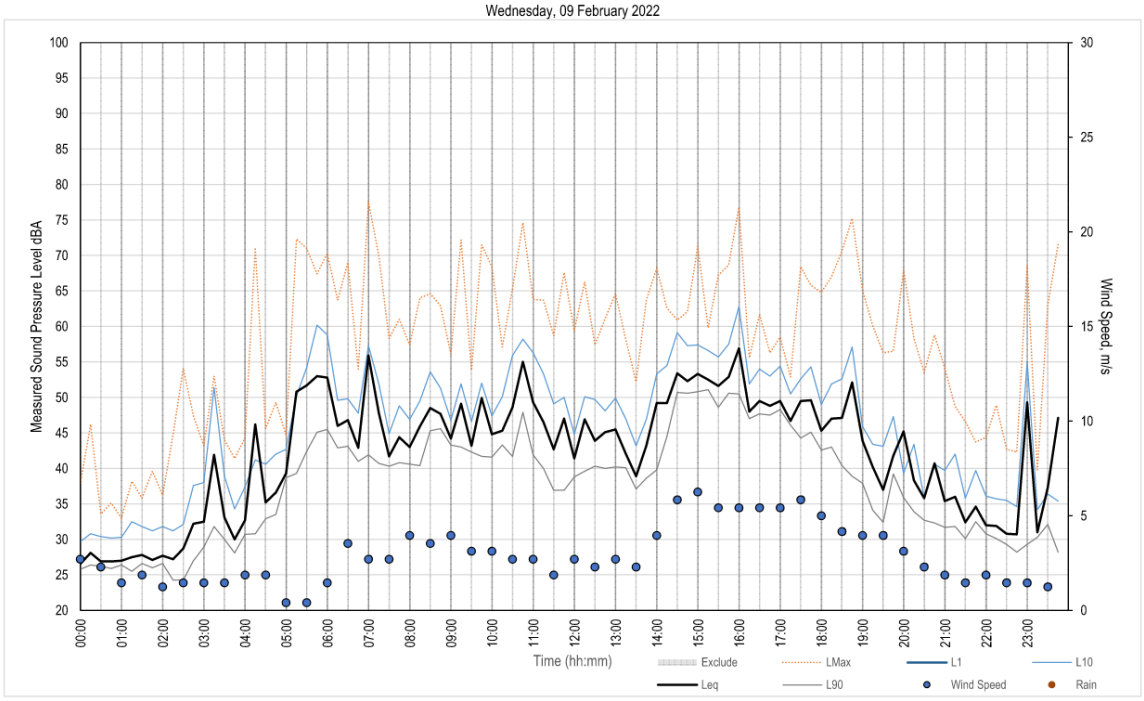


20220210 Logger Grapher WA v1.3_aSR | DAY7

Noise Logger Results

Measured Noise Levels - 162 Chittering Street

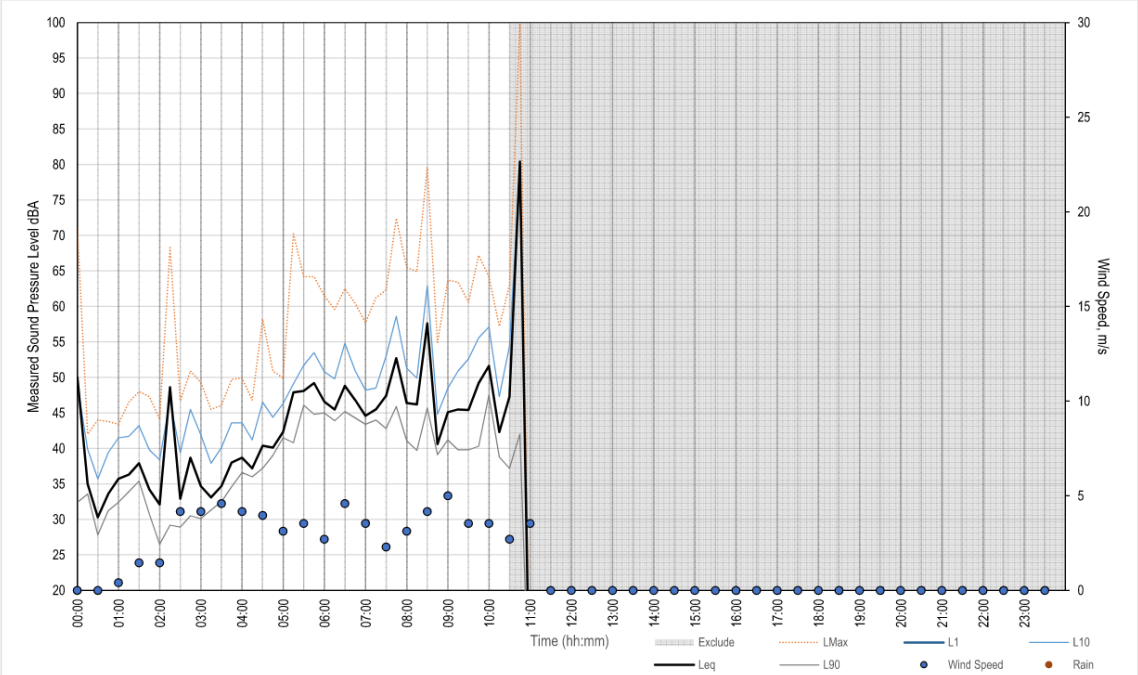
Wednesday, 09 February 2022



20220210 Logger Grapher WA v1.3_aSR | DAY8

Measured Noise Levels - 162 Chittering Street

Thursday, 10 February 2022

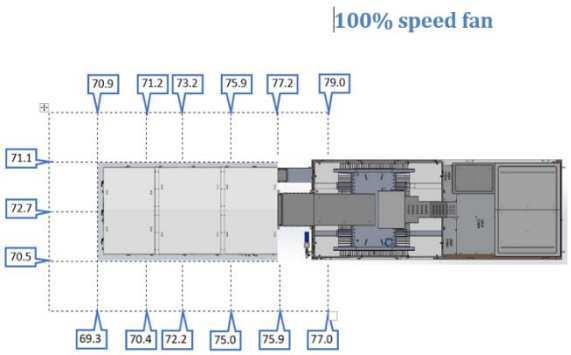
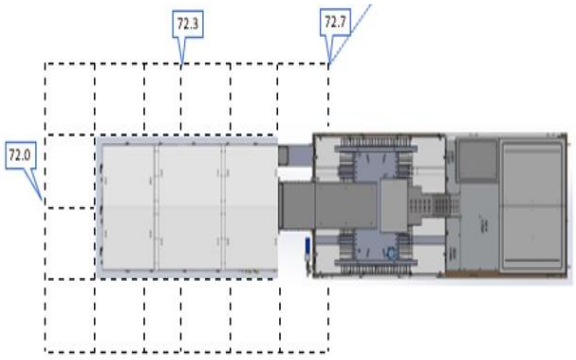


20220210 Logger Grapher WA v1.3_aSR | DAY9

A4. MODELLED SOUND POWER LEVELS

The Sound Pressure Levels provided by NEOEN are summarised in the Table A1 these are indicative as equipment selections are still to be confirmed. Based on these levels the 1/3 Octave Sound Power Levels used in the modelling are outlined in Table A2.

Table A1 Provided Sound Pressure Levels – Project Equipment

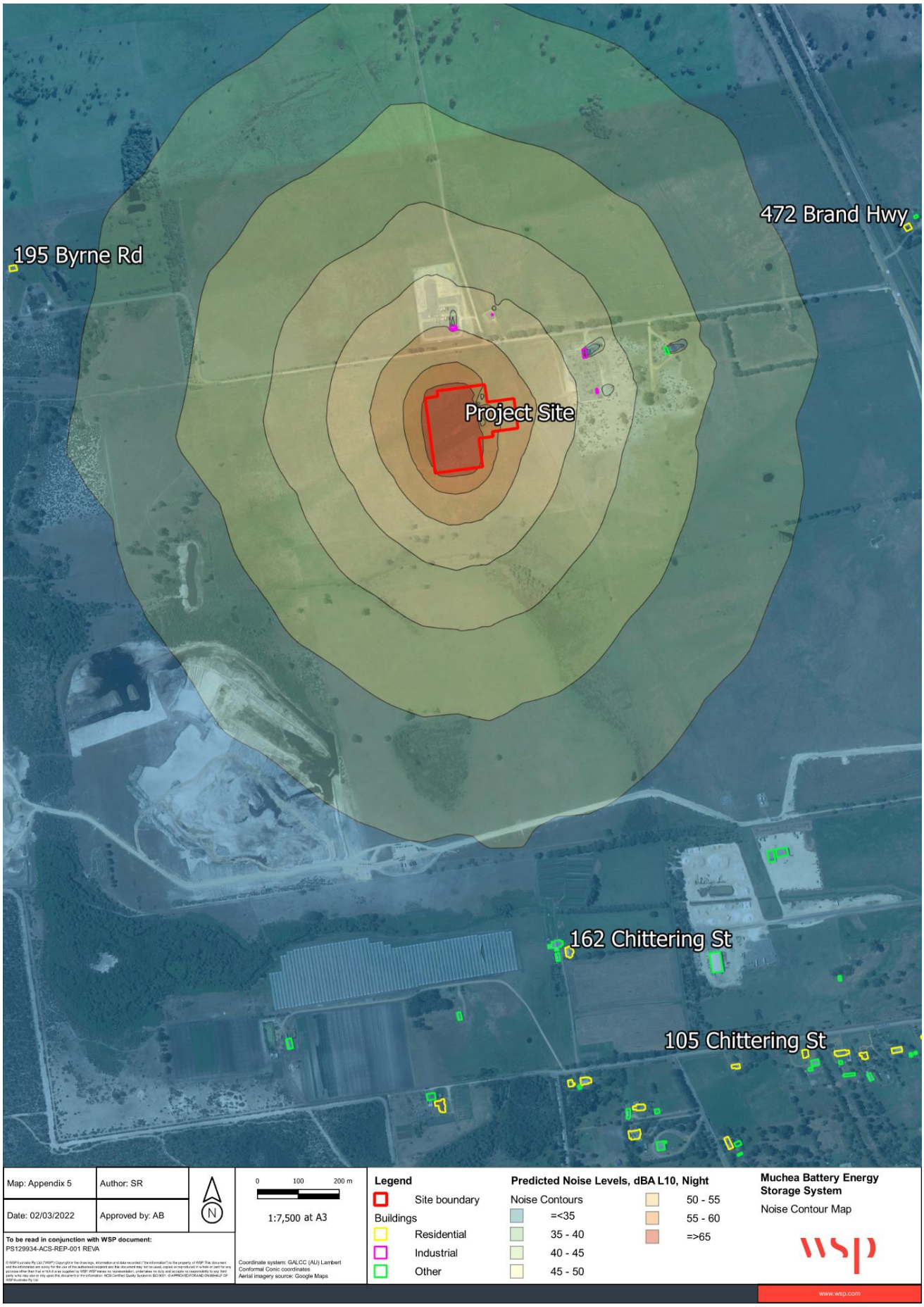
NOISE SOURCE	QUANTITY	REFERENCE SOUND PRESSURE LEVEL INFORMATION	DIMENSIONS (M) LxWxH
Inverter Unit	64	Day 100% cooling operation: (dBA at 1m) 	3.7 x 2.2 x 2.0
	64	Night 70% cooling operation: (dBA at 1m)  (63.1 dBA at 5 m; 58.3 at 10 m)	
Battery Rack	22 per inverter (1)	Any time (force-cooling system/ heating mode, fixed speed): 63.6 to 71.5 dBA at 1m, depending on location	1.3 x 1.3 x 2.3
MV Transformer (3800kVA)	32	53 dBA (LpA) at 1 m (information received 7 July 2021)	2.1 x 1.8 x 2.2

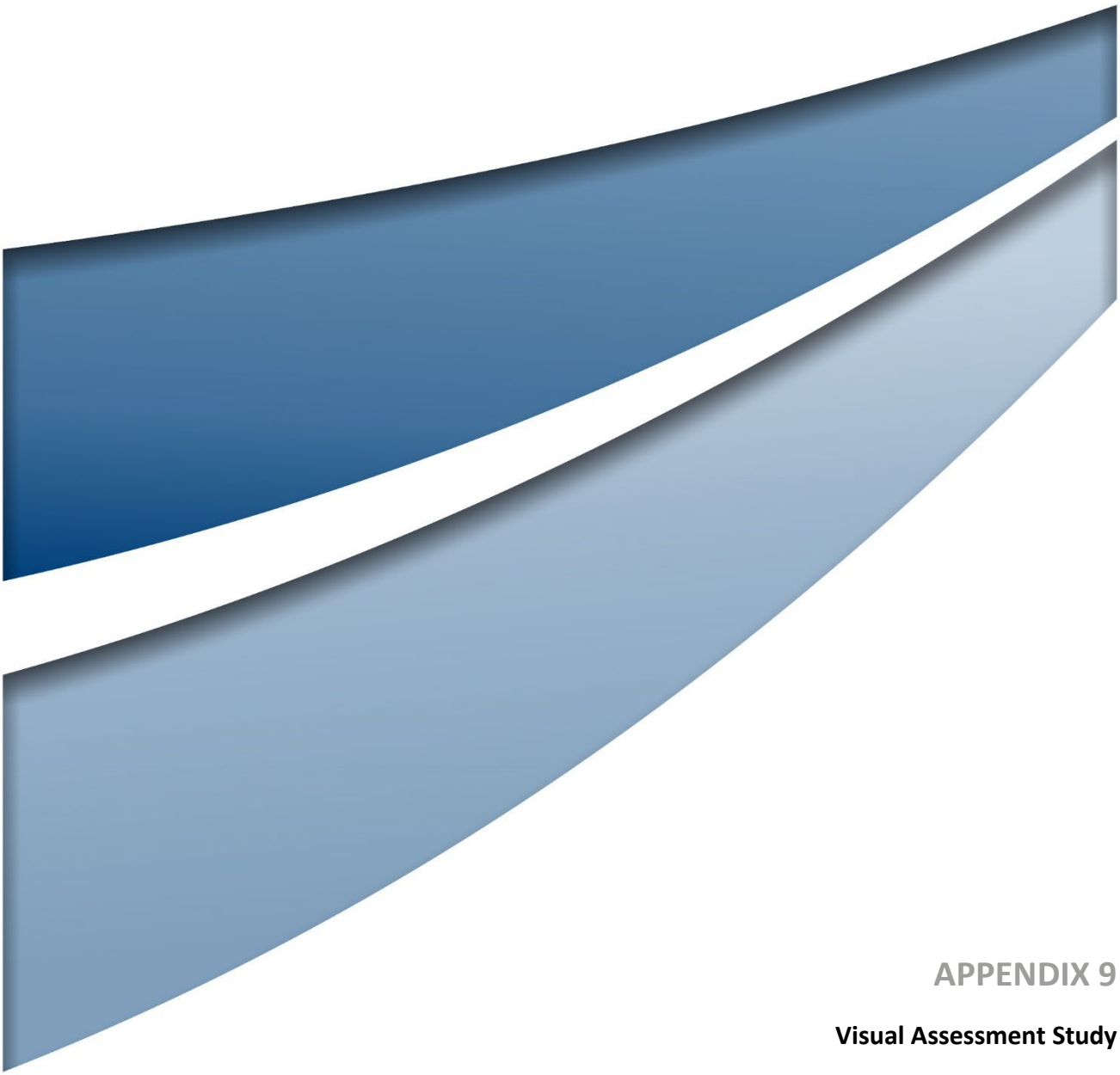
(1) 22 battery racks are grouped together per inverter giving a total of 1408 Battery Racks

Table A2 Modelled Sound Power Levels

ITEM	1/3 OCTAVE SOUND POWER LEVEL dBL																							TOTAL dBA
	50	63	80	100	125	160	200	250	315	400	500	630	800	1k	1.2k	1.6k	2k	2.5k	3.1k	4k	5k	6.3K	8K	
Liquid Cooling Battery Racks CATL 0852280-E Front	64	64	64	69	65	69	63	63	63	64	64	64	62	61	60	61	58	56	54	53	50	48	46	71
Liquid Cooling Battery Racks CATL 0852280-E Back	71	71	71	76	72	76	70	70	70	71	71	71	69	68	67	68	65	63	61	60	57	55	53	78
PCS/Inverter PE FREEMAQ PCSK 690V FP4390K Front and Back	41	49	51	50	51	51	58	64	59	63	67	68	68	68	69	70	69	66	66	61	50	59	58	78
PCS/Inverter PE FREEMAQ PCSK 690V FP4390K Sides	52	60	62	61	62	62	69	75	70	74	78	79	79	79	80	81	80	77	77	72	61	70	69	89
Power Skid MV Transformer	69	53	58	75	52	50	67	52	62	55	47	39	31	29	24	21	17	12	9	10	6	6	7	61
HV Transformer	71	59	67	88	68	69	88	75	87	82	76	69	62	61	57	54	50	45	42	43	39	38	38	84

A5. NOISE CONTOUR MAP


195 Byrne Rd
472 Brand Hwy
Project Site
162 Chittering St
105 Chittering St
Map: Appendix 5
Author: SR
Date: 02/03/2022
Approved by: AB
N
To be read in conjunction with WSP document:
PS129934-ACS-REP-001 REVA
0 100 200 m
1:7,500 at A3
Coordinate system: GALCC (AU) Lambert Conformal Conic coordinates
Aerial imagery source: Google Maps
Legend
Site boundary
Buildings
Residential
Industrial
Other
Predicted Noise Levels, dBA L10, Night
Noise Contours
=<35
35 - 40
40 - 45
45 - 50
50 - 55
55 - 60
=>65
Muchea Battery Energy Storage System
Noise Contour Map
wsp
www.wsp.com



APPENDIX 9

Visual Assessment Study

Inspired People.
Dedicated Team.
Quality Outcomes.

Briefing Note

To: Rob Karelse

From: Ian Kennedy

Date: 22 November 2021

Subject: **Muchea BESS Visual Assessment Summary**

In this document:

Figures:

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ABN 18 059 519 041

T| 1300 793 267
E| info@umwelt.com.au

www.umwelt.com.au

1.0 Purpose and scope

The purpose of this visual assessment is to determine the areas within and surrounding the project area which could potentially be impacted visually from the proposed development.

2.0 Method

Utilising available elevation data (LiDAR – Geoscience Australia) to create a digital elevation model, a viewshed analysis was performed on 5 viewpoints surrounding the project area. Each analysis reflects what would be visible from that point (each point is 1.7m above ground level to reflect the average height of a person) with the corresponding display representing visible ground surface to the extent of the model.

3.0 Key findings

Each viewpoint location had some level of visibility of the project area. Topography aided in reducing this impact in places and as the model only reflects natural surface, existing tree screening from adjoining properties particularly to the south of the project area will contribute to further reduction in visibility.

Largely due to proximity, viewpoint location 1 will have a higher level of impact. Again, existing tree screening will reduce this impact.

The proximity of the project area to viewpoint location 1 will need to be considered and mitigated. Further tree screening along Byrne Road and the north-eastern portion of the project area would help reduce this impact.

Utilising the accompanying figures to determine the most appropriate location within the project area for placement of the battery footprint will assist in reducing visibility as will further consideration for a broader screening program.

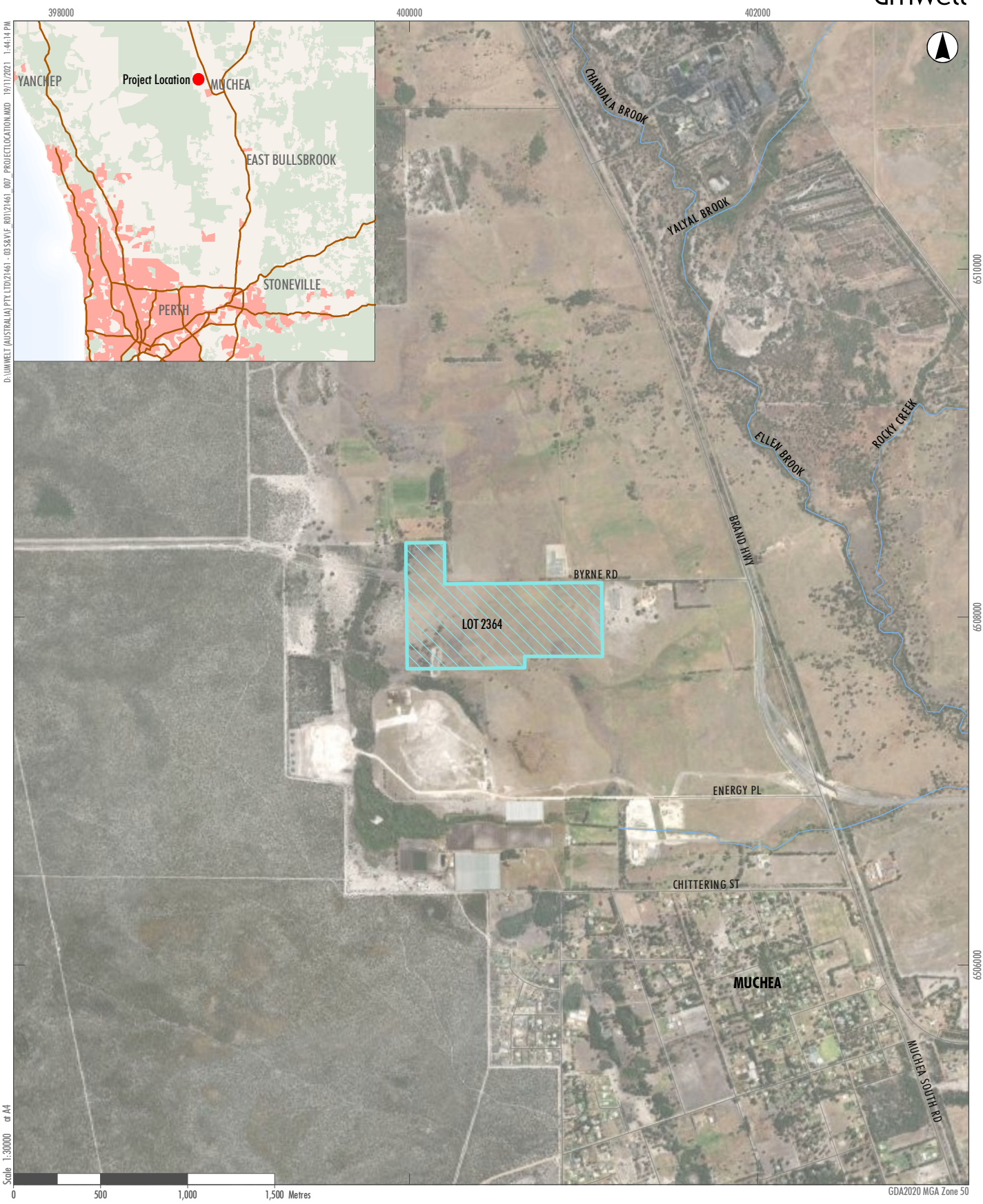
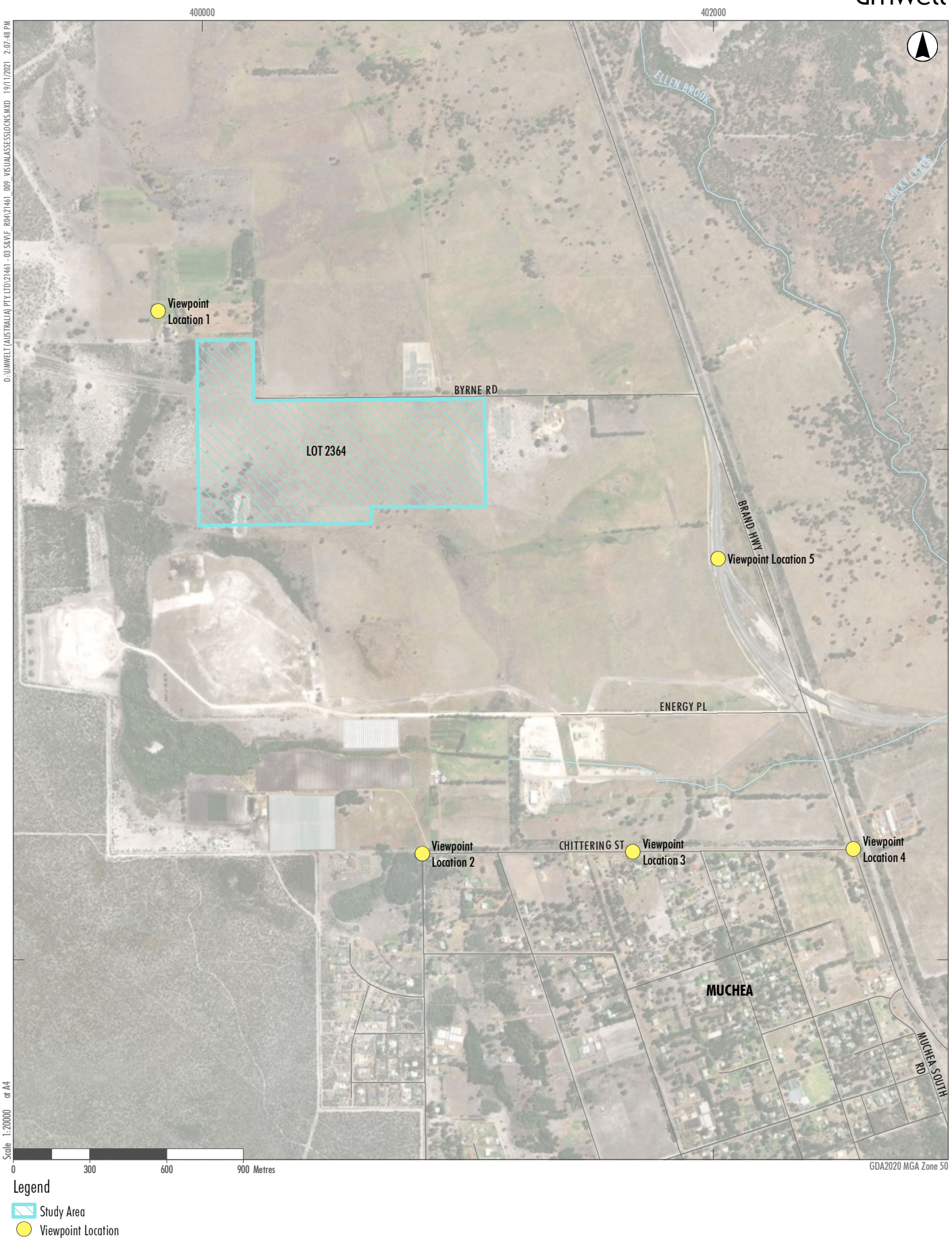


FIGURE 3.1

Project Location

Image Source: ESRI Basemap Data source: Landgate (2021b)



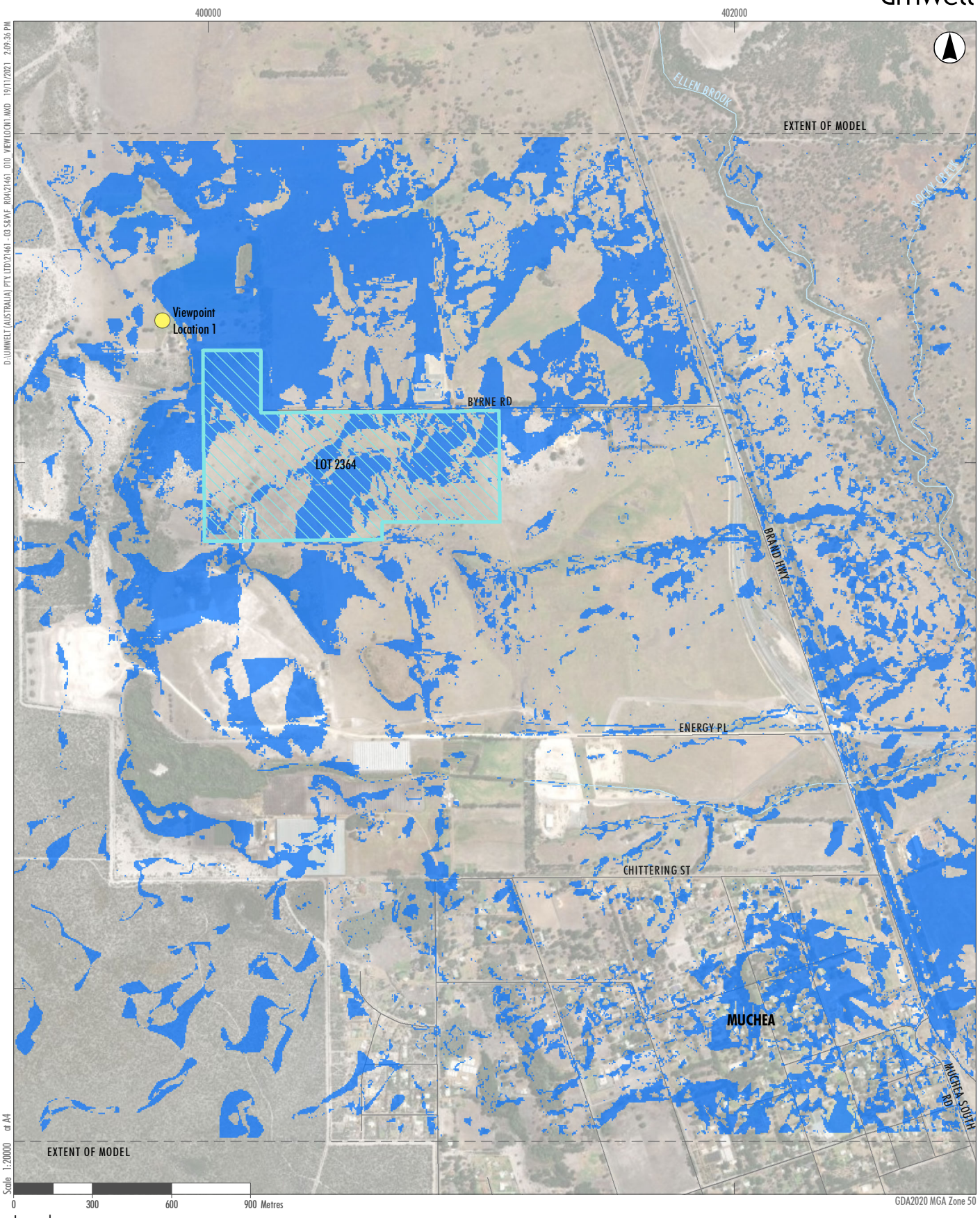
Legend

- Study Area
- Viewpoint Location

FIGURE 3.2

Visual Assessment Locations

Image Source: ESRI Basemap Data source: Landgate (2021b)



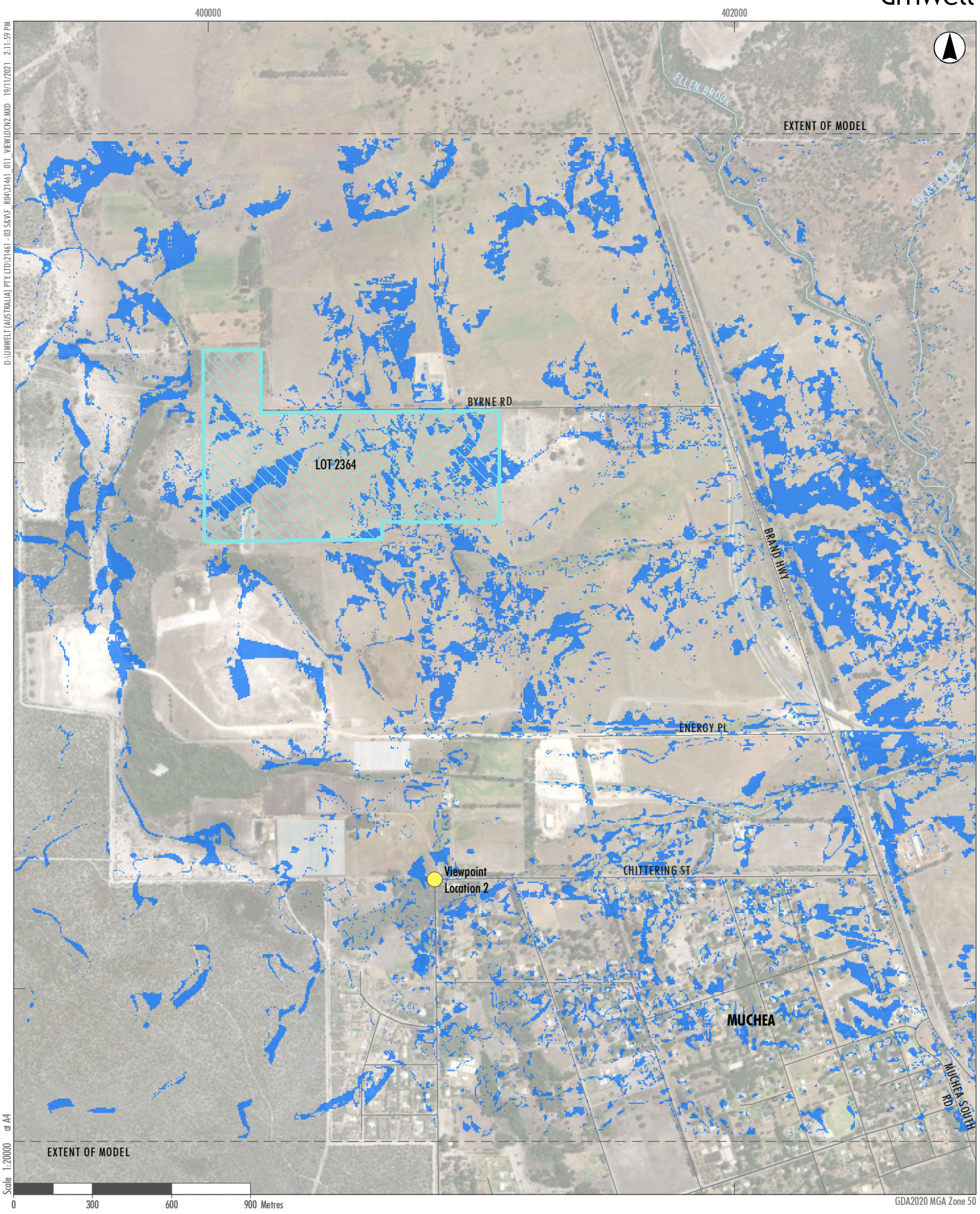
Legend

- Study Area
- Viewpoint Location 1
- Visible terrain from Viewpoint (1.7m above surface level)

FIGURE 3.3

Viewpoint Location 1

Image Source: ESRI Basemap Data source: Landgate (2021b), ELVIS - Geoscience Australia



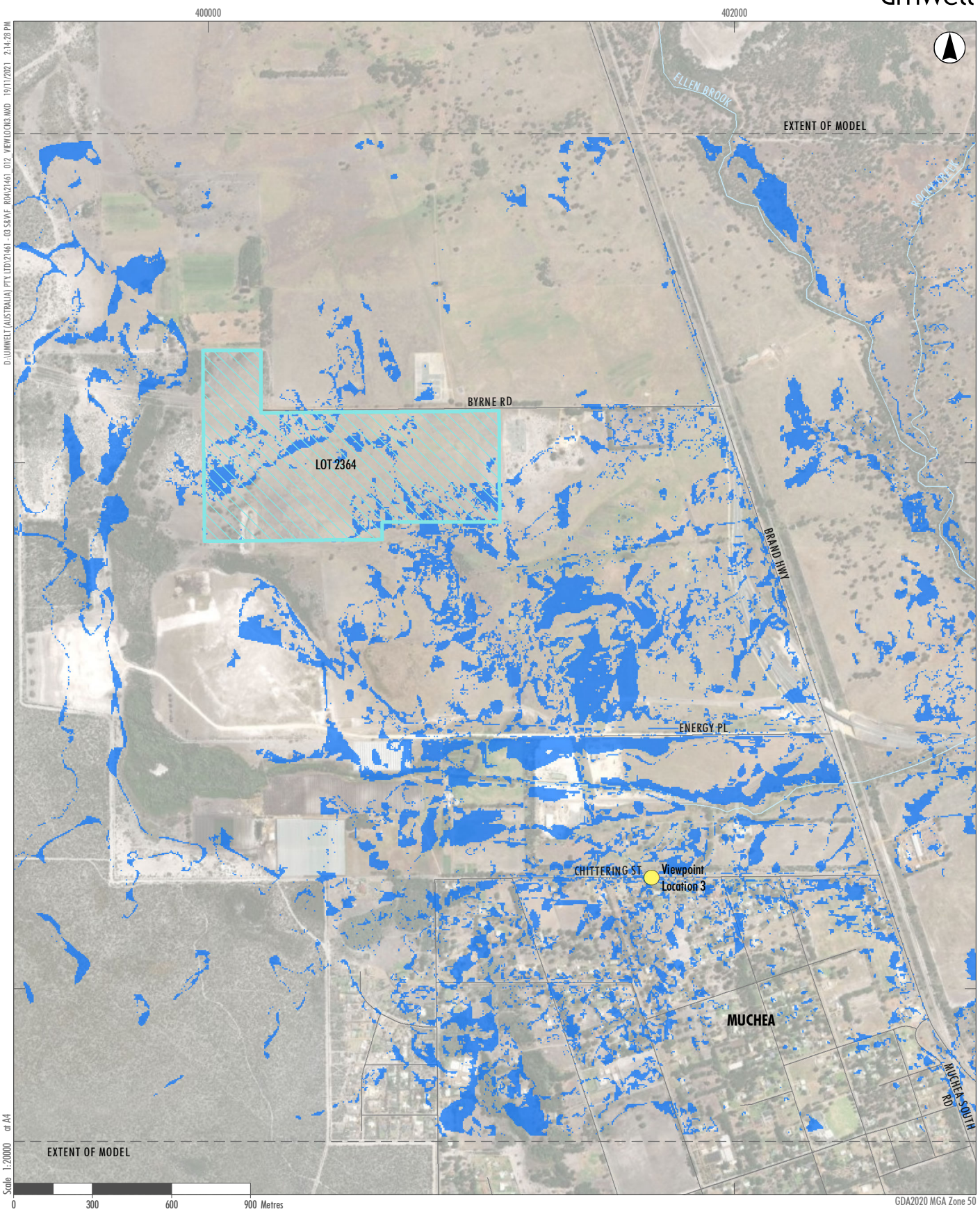
Legend

- Study Area
- Viewpoint Location 2
- Visible terrain from Viewpoint (1.7m above surface level)

FIGURE 3.4

Viewpoint Location 2

Image Source: ESRI Basemap Data source: Landgate (2021b), ELVIS - Geoscience Australia



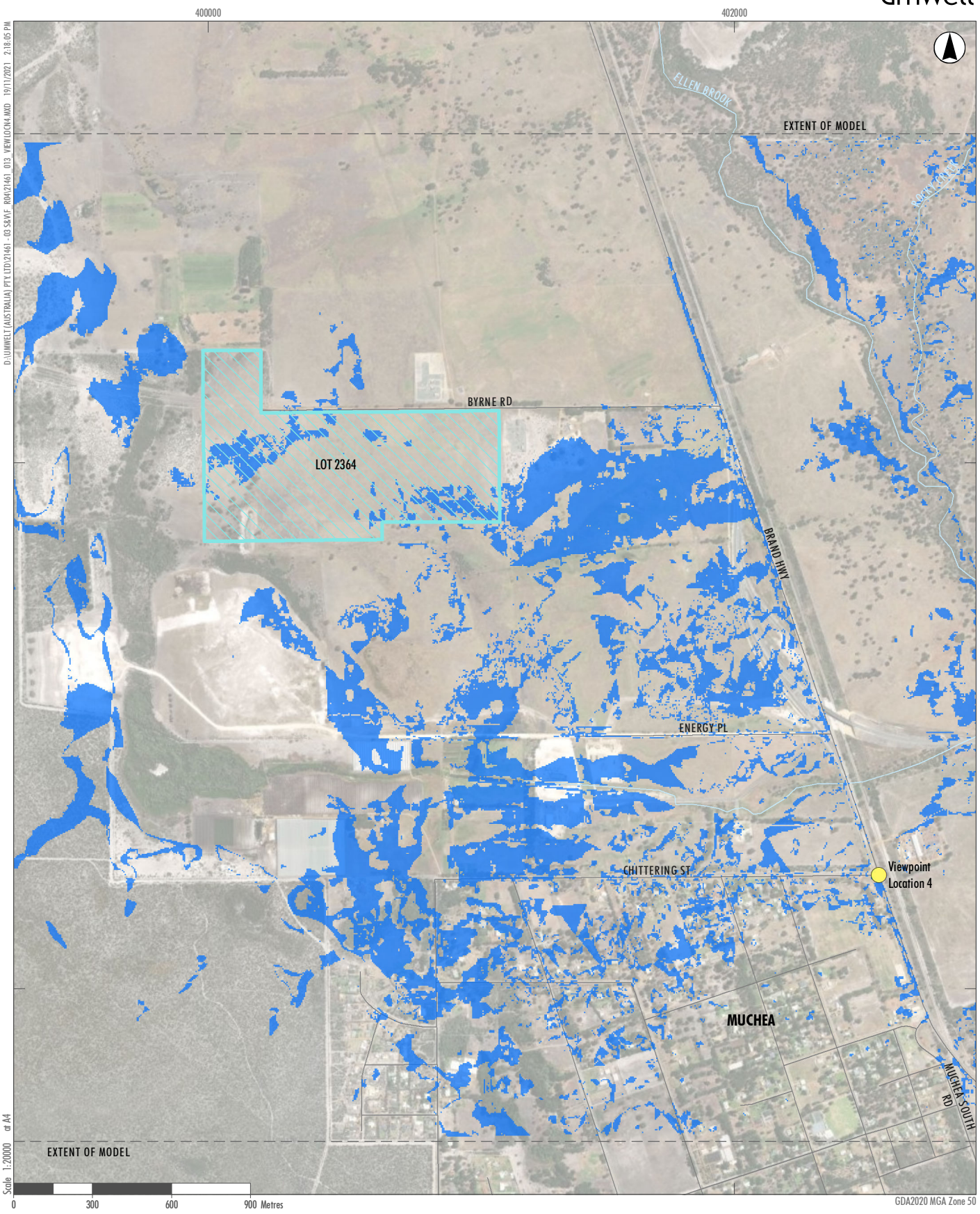
Legend

- Study Area
- Viewpoint Location 3
- Visible terrain from Viewpoint (1.7m above surface level)

FIGURE 3.5

Viewpoint Location 3

Image Source: ESRI Basemap Data source: Landgate (2021b), ELVIS - Geoscience Australia



Legend

- Study Area
- Viewpoint Location 4
- Visible terrain from Viewpoint (1.7m above surface level)

FIGURE 3.6

Viewpoint Location 4

Image Source: ESRI Basemap Data source: Landgate (2021b), ELVIS - Geoscience Australia

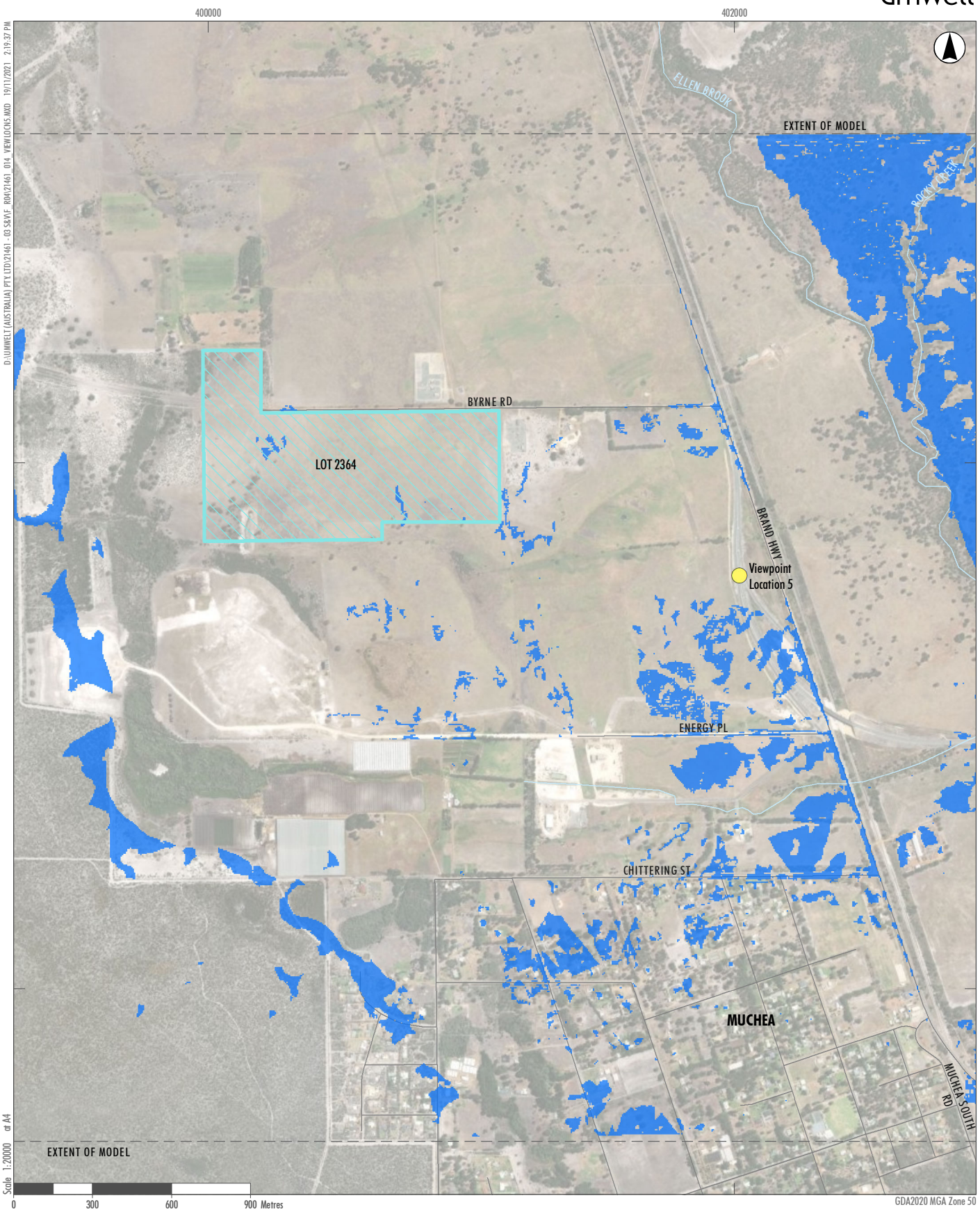
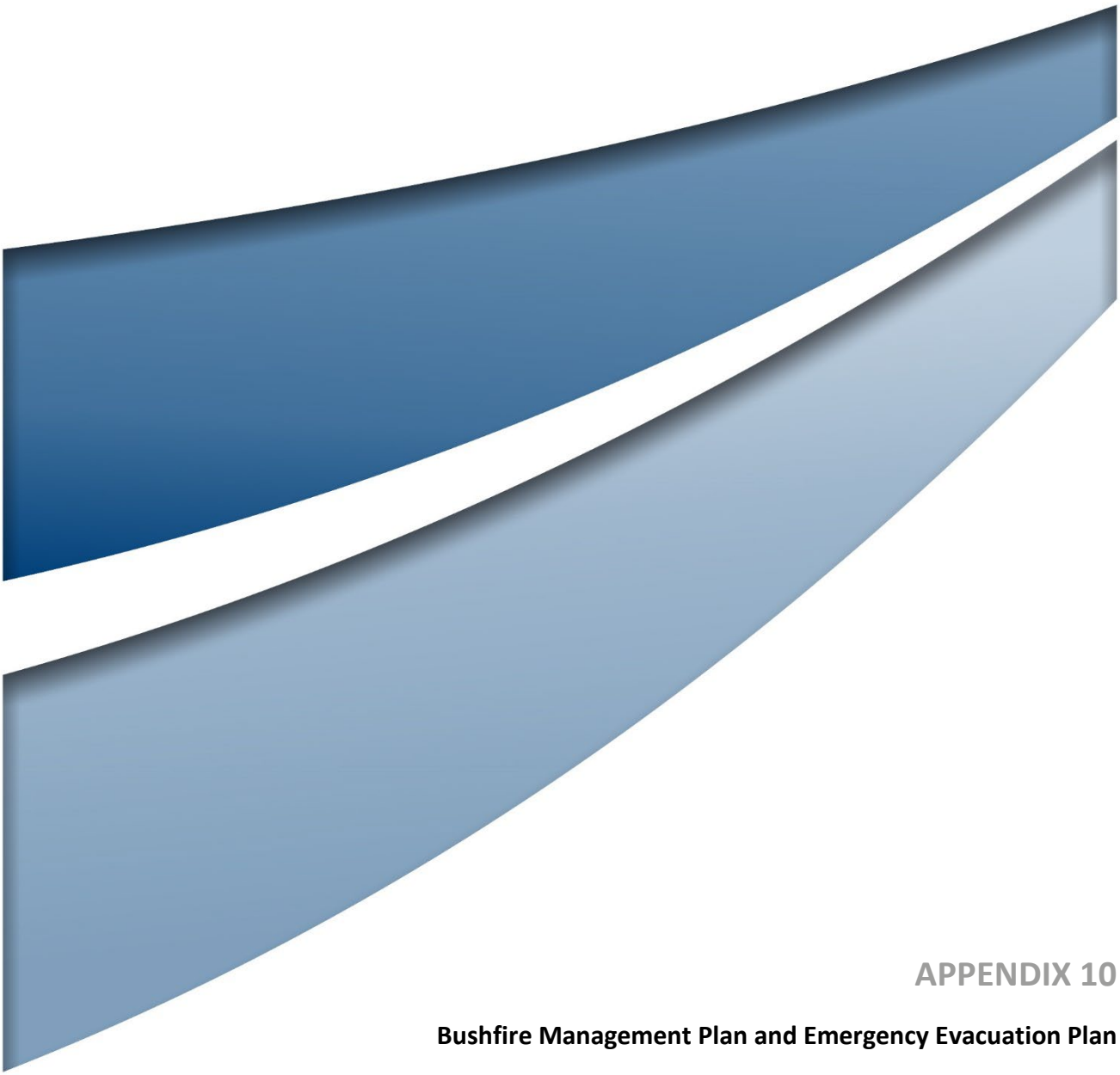


FIGURE 3.7

Viewpoint Location 5

Image Source: ESRI Basemap Data source: Landgate (2021b), ELVIS - Geoscience Australia



APPENDIX 10

Bushfire Management Plan and Emergency Evacuation Plan

Bushfire management plan/Statement addressing the Bushfire Protection Criteria coversheet

Site address: Lot 2364 Byrne Road, Muchea

Site visit: Yes ☑ No ☐

Date of site visit (if applicable): Day 6th Month October Year 2021

Report author: Gavin Fancote

WA BPAD accreditation level (please circle):

Not accredited ☐ Level 1 BAL assessor ☐ Level 2 practitioner ☑ Level 3 practitioner ☐

If accredited please provide the following.

BPAD accreditation number: 37922 Accreditation expiry: Month September Year 2022

Bushfire management plan version number: 1

Bushfire management plan date: Day 29th Month November Year 2021

Client/business name: Neoen Australia (Pty Ltd)

	Yes	No
Has the BAL been calculated by a method other than method 1 as outlined in AS3959 (tick no if AS3959 method 1 has been used to calculate the BAL)?		✔
Have any of the bushfire protection criteria elements been addressed through the use of a performance principle (tick no if only acceptable solutions have been used to address all of the bushfire protection criteria elements)?		✔

Is the proposal any of the following (see SPP 3.7 for definitions)?	Yes	No
Unavoidable development (in BAL-40 or BAL-FZ)		✔
Strategic planning proposal (including rezoning applications)		✔
Minor development (in BAL-40 or BAL-FZ)		✔
High risk land-use	✔	
Vulnerable land-use		✔

None of the above ☐

Note: Only if one (or more) of the above answers in the tables is yes should the decision maker (e.g. local government or the WAPC) refer the proposal to DFES for comment.

Why has it been given one of the above listed classifications (E.g. Considered vulnerable land-use as the development is for accommodation of the elderly, etc.)?

High-risk land-use due to battery installation.

The information provided within this bushfire management plan to the best of my knowledge is true and correct:

Signature of report author  Date 29/11/2021

Bushfire Management Plan

Prepared for Lot 2364 Byrne Road, Muchea 6501 WA

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List of appendices

Document control

Report Version	Purpose	Author/reviewer and accreditation details	Date Submitted
Revision 0	For Approval and Implementation	Gavin Fancote 37922	15/10/2021
Revision 1	For Approval and Implementation	Gavin Fancote 37922	29/11/2021

Disclaimer

This report is based on the site conditions surveyed at the time the document was prepared. The assessment of the bushfire threat made in this report is made in good faith based on the information available to Entire Fire Management at the time.

The recommendations contained in this report are considered to be minimum standards and they do not guarantee that a building or assets will not be damaged in a bushfire. In the making of these comments and recommendations it should be understood that the focus of this document is to minimise the threat and impact of a bushfire.

Finally, the implementation of the adopted measures and recommendations within this report will contribute to the amelioration of the potential impact of any bushfire upon the development, but they do not and cannot guarantee that the area will not be affected by bushfire at some time.

Section 1: Proposal Details

This BMP has been developed in support of a Utility scale battery development application for the property located at Lot 2364 Byrne Road, Muchea.

Figure 1: Copy of the Planning Proposal

*KML file provided by Umwelt, depicting indicated development site in dark blue, access road and power corridor in yellow.
As of publication date, plans and final location are yet to be finalised.

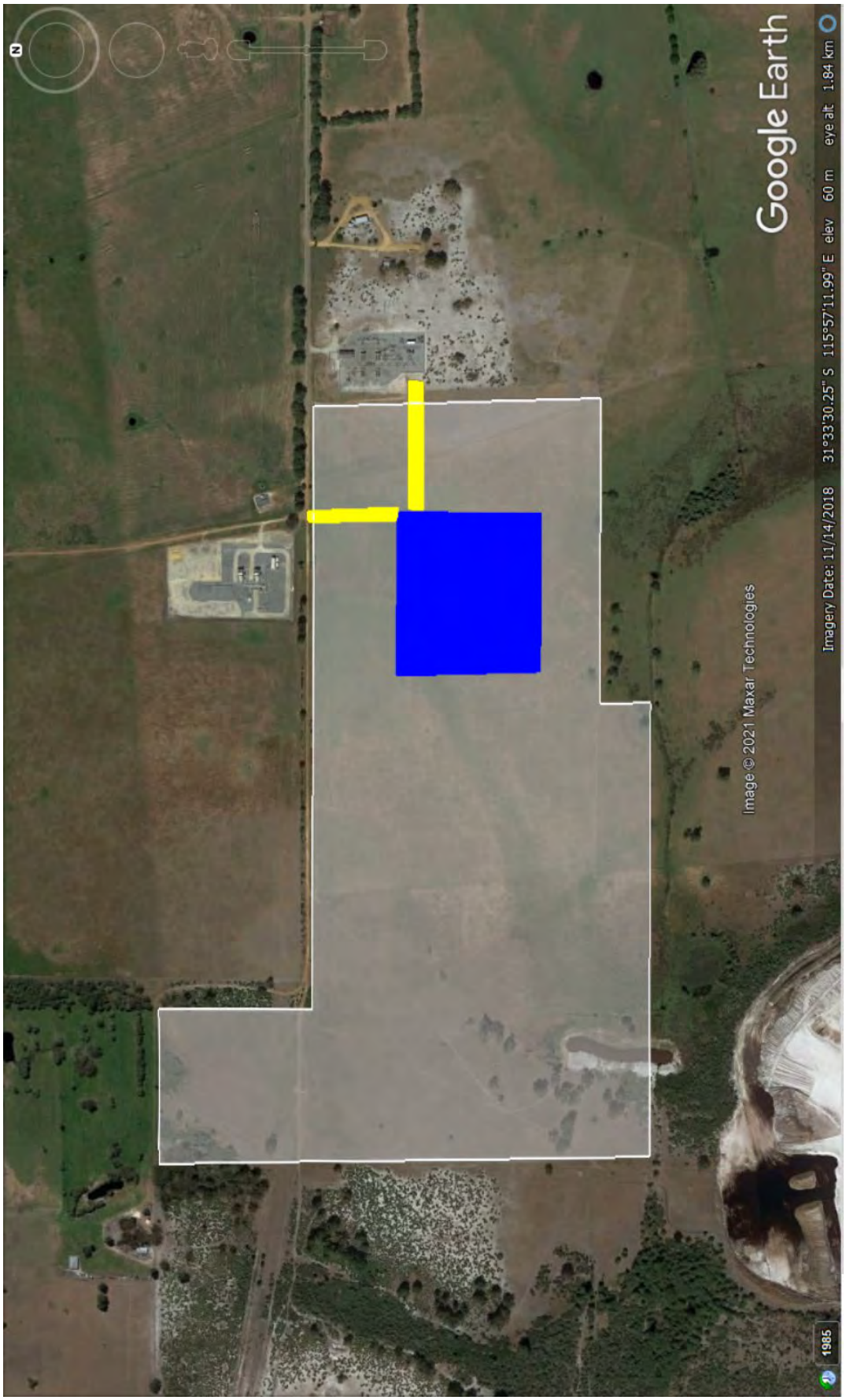
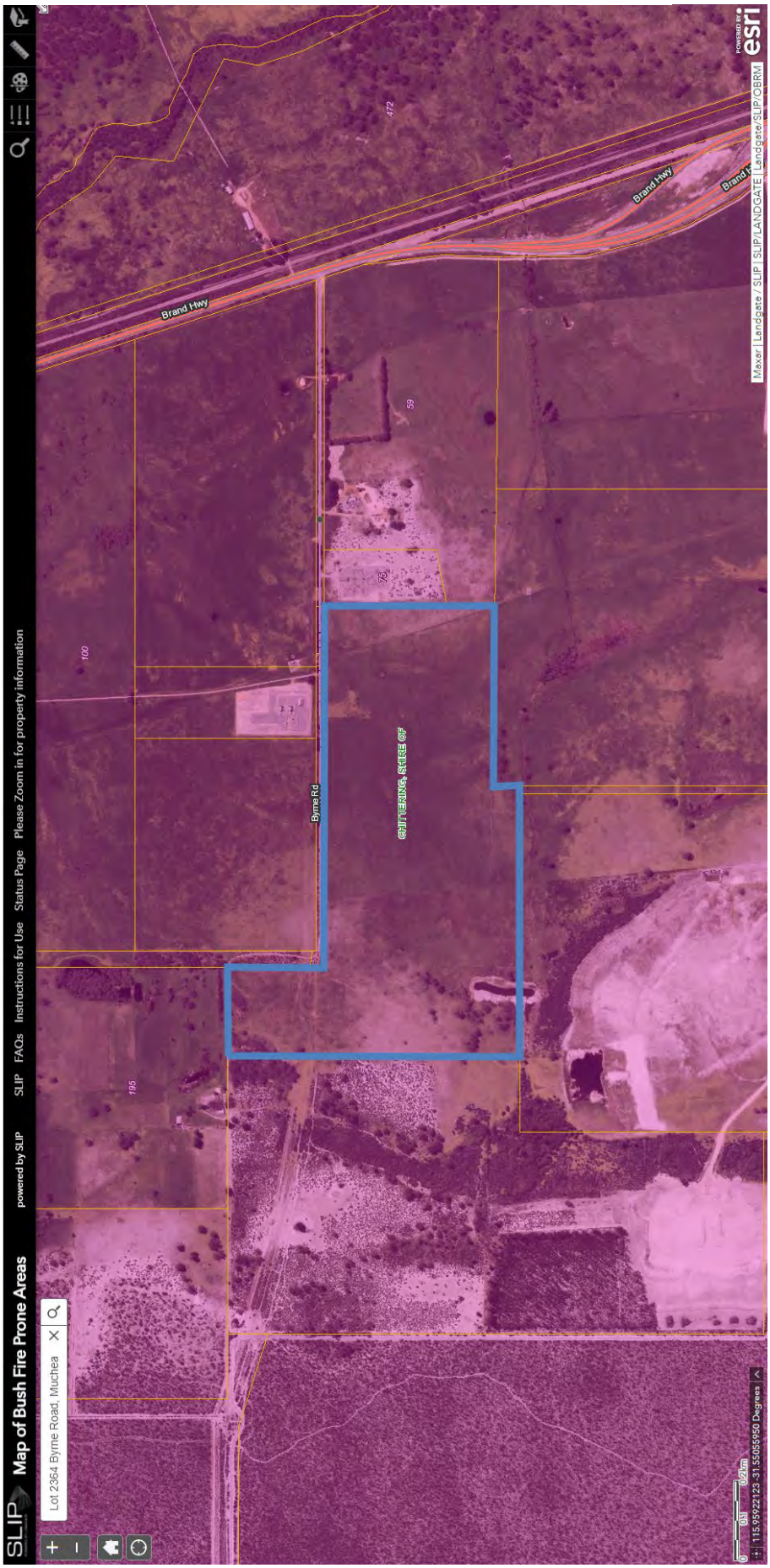


Figure 2: Map of Bushfire Prone Areas for Subject Site



Section 2: Environmental Considerations

The proposed development site has been assessed for environmental values using the national database set *www.nationalmap.gov.au* to ensure that any clearing of native vegetation for bushfire protection does not adversely affect recognised conservational elements.

Datasets explored within NationalMap include the following:

Table 1: Datasets Explored within the National Map Database

Data sets checked	Identified	Consideration required	Comment
Department of Biodiversity, Conservation and Attractions:			
- Threatened Ecological Communities (DBCA-038)	No	No	Not required to seek advice from Local Government Environmental Officer.
- Carnabys Cockatoo Confirmed Roost (DBCA-050)	No	No	Not required to seek advice from Local Government Environmental Officer.
- Black Cockatoo Roosting Site (DBCA-064)	No	No	Not required to seek advice from Local Government Environmental Officer.
Department of Planning, Lands Heritage:			
- Bush Forever Areas 2000 (DPLH-019)	No	No	Not required to seek advice from Local Government Environmental Officer.
Department of Water and Environmental Regulation			
- Clearing Regulations – Environmentally Sensitive Areas (DWER-046)	No	No	Not required to seek advice from Local Government Environmental Officer.

The Visual representation is shown on the following page & is taken from the NationalMap data base.

Proposed Asset Protection Zones (APZ) and placement of buildings should not require clearing of trees, subject to final placement of development.

The APZ is to be maintained to APZ guidelines as per Appendix 1.

Figure 3: National Map Environmental Considerations for Subject Site - DBCA

Figure 4: National Map Environmental Considerations for Subject Site – DPLH & DWER

Subsection 2.1: Native Vegetation – Modification and Clearing

The proposed Building envelope and Asset Protection Zone should not require the removal of native vegetation. The site is mainly Class G - Grassland vegetation which has an existing grazing operation on the property.

Subsection 2.2: Re-vegetation/Landscape Plans

N/A

Section 3: Bushfire Assessment Results

A Bushfire Attack Level (BAL) Assessment Report has been prepared to support the proposed development application.

The following BAL Map has been prepared in accordance with AS 3959 and provides evidence and justification gathered during a site assessment that was conducted to determine the potential BAL rating associated with the proposed development.

AS 3959 Bushfire Attack Level (BAL) Assessment Report

Site Details			
Address:	Lot 2364 Byrne Road		
Suburb:	Muchea	**Postcode:**	6501
Local Government Area:	Shire of Chittering		
Description of Building Works:	Utility scale Battery		

Report Details			
Report Number:	4812	**Report Revision:**	1
Assessment Date:	6/10/2021	**Report Date:**	29/11/2021

BPAD Accredited Practitioner Details		
Name:	Gavin Fancote	I hereby declare that I am a BPAD accredited bushfire practitioner. BPAD Bushfire Planning & Design Accredited Practitioner Level 2
Company Details:	Entire Fire Management	Accreditation No. BPAD37922
I hereby certify that I have undertaken the assessment of the above-mentioned site and determined the Bushfire Attack Level stated above in accordance with the requirements of AS 3959 -2018 (Method 1)		Signature: *Authorised Practitioner Stamp*

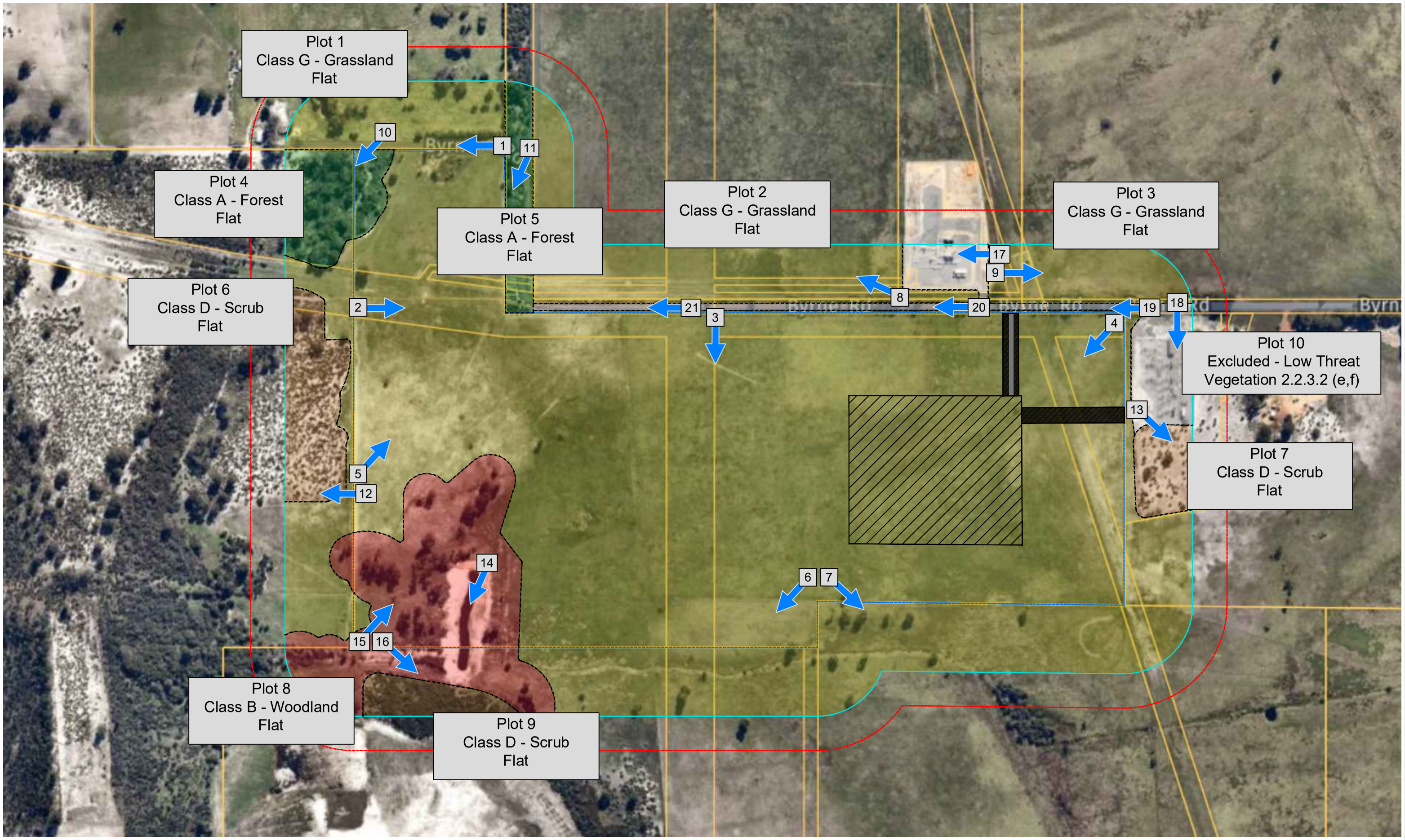
Reliance on the assessment and determination of the Bushfire Attack Level contained in this report should not extend beyond a period of 12 months from the Assessment date. If the assessment was completed more than 12 months ago, it is recommended that the validity of the determination be confirmed with the Accredited Practitioner and where required an updated report issued.

1.1.1 Site Assessment & Site Plans

(Attached as page 2 of this report)

The assessment of this site / development was undertaken on the above-mentioned date by an Accredited BPAD Practitioner for determining the Bushfire Attack Level in accordance with AS 3959 - 2018 Simplified Procedure (Method 1).

Figures 5 : Vegetation Classification map is shown on the following page.



ENTIRE FIRE MANAGEMENT

Entire Empire Pty Ltd
ABN: 63 468 728 651
Office: (08) 9498 0056
Address: 6 Potts Road Forrestdale Business Park
Forrestdale WA 6112

Project	Lot 2364 Byrne Road, Muchea		
Title	Vegetation Classification		
Size A3	Scale 1:5000	Sheet 4812	Rev 1
Name Lee Galer		Date 29/11/2021	

Legend

- Subject Property
- 150m Exclusion Zone
- 100m Exclusion Zone
- Photo Location
- Development Site
- Vegetation Plot Boundary
- Class A - Forest
- Class B - Woodland
- Class D - Scrub
- Class G - Grassland
- Excluded c2.2.3.2(e,f)
- Transmission lines

Notes

0 200 400 Meters

Vegetation Classification

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	1	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G – Grassland			
Description			
Grassland (pasture) with a single row of trees (windbreak).			

Photo ID:	2	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Photo ID:	3	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Vegetation Classification (continued)

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	4	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Photo ID:	5	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Photo ID:	6	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Vegetation Classification (continued)

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	7	**Plot no:**	1
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Photo ID:	8	**Plot no:**	2
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Photo ID:	9	**Plot no:**	3
Vegetation Classification or Exclusion Clause			
Class G - Grassland			
Description			
Grassland (pasture).			

Vegetation Classification (continued)

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	10	**Plot no:**	4
Vegetation Classification or Exclusion Clause			
Class A - Forest			
Description			
Trees up to 16m tall; Canopy cover 30-70%; Dominated by eucalypts and melaleucas; Contains shrubs and scrub.			

Photo ID:	11	**Plot no:**	5
Vegetation Classification or Exclusion Clause			
Class A - Forest			
Description			
Trees up to 16m tall; Canopy cover 30-70%; Dominated by eucalypts and melaleucas; Contains shrubs and scrub.			

Photo ID:	12	**Plot no:**	6
Vegetation Classification or Exclusion Clause			
Class D - Scrub			
Description			
Grasstrees and shrubs up to 4m tall; Nutrient-poor, sandy soil.			

Vegetation Classification (continued)

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	13	**Plot no:**	7
Vegetation Classification or Exclusion Clause			
Class D - Scrub			
Description			
Grasstrees and shrubs up to 4m tall; Nutrient-poor, sandy soil.			

Photo ID:	14	**Plot no:**	8
Vegetation Classification or Exclusion Clause			
Class B - Woodland			
Description			
Trees up to 16m tall; 10-30% canopy cover; Dominated by eucalypts and melaleuca; Prominent grassy understorey.			

Photo ID:	15	**Plot no:**	8
Vegetation Classification or Exclusion Clause			
Class B - Woodland			
Description			
Trees up to 16m tall; 10-30% canopy cover; Dominated by eucalypts and melaleuca; Prominent grassy understorey.			

Vegetation Classification (continued)

All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	16	**Plot no:**	9
Vegetation Classification or Exclusion Clause			
Class D - Scrub			
Description			
Grasstrees and shrubs up to 4m tall; Nutrient-poor, sandy soil.			

Photo ID:	17	**Plot no:**	10
Vegetation Classification or Exclusion Clause			
Excluded: 2.2.3.2 (e, f)			
Description			
Gas substation, access and compound clear of vegetation.			

Photo ID:	18	**Plot no:**	10
Vegetation Classification or Exclusion Clause			
Excluded: 2.2.3.2 (e)			
Description			
Electricity substation, access and compound clear of vegetation.			

Vegetation Classification (continued)
All vegetation within 100m of the site / proposed development was classified in accordance with Clause 2.2.3 of AS 3959-2018. Each distinguishable vegetation plot with the potential to determine the Bushfire Attack Level is identified below.

Photo ID:	19	**Plot no:**	10
Vegetation Classification or Exclusion Clause			
Excluded: 2.2.3.2 (e, f)			
Description			
Byrne Road looking west, single row of trees on grassed verge.			

Photo ID:	20	**Plot no:**	10
Vegetation Classification or Exclusion Clause			
Excluded: 2.2.3.2 (e, f)			
Description			
Byrne Road looking west, single row of trees on grassed verge.			

Photo ID:	21	**Plot no:**	10
Vegetation Classification or Exclusion Clause			
Excluded: 2.2.3.2 (e, f)			
Description			
Byrne Road looking west, single row of grasstrees on grassed verge.			

Relevant Fire Danger Index

The Fire Danger Index (FDI) is determined based on the Forest Fire Danger Index calculated by the McArthur Mk 5 Forest Fire Danger Meter using the equations published by Noble, I.R, Bary, G.AV. and Gill, A.M 1980.
While also using Grass Fire Danger Index calculated by the McArthur Mk 4 Grassland Fire Danger Meter using the equations published by Purton, C.M., 1982. or otherwise determined in accordance with a jurisdictional variation applicable to the site.

This site has been determined in accordance Australian Standards 3959 : Construction of buildings in bushfire prone areas (AS3959). Table 2.1 presents Australian states and there relevant Fire Danger Index.

Excerpt from Table 2.1-Jurisdictional and Regional Values for FDI.

State	FDI
Western Australia	80

With correct application of Western Australia's FDI rating 80 & AS3959 the appropriate table to determine the Bushfire Attack Level (BAL) with Western Australia is Table 2.5, found within AS3959.
This table has been used to determine the appropriate BAL rating specific to the vegetation, distance and slope for the development at Lot 2364 Byrne Road, Muchea.

Fire Danger Index FDI 80 Table 2.5

Potential Bushfire Impacts

The potential bushfire impact to the site / proposed development from each of the identified vegetation plots are identified below.

The below distances are based upon the indicated development site, actual distances are subject to final confirmation of installation location.

Table 2: Potential Bushfire Impacts

Plot	Vegetation Classification	Effective Slope	Distance	BAL Rating
1	Class G - Grassland	Flat	0m	FZ
2	Class G - Grassland	Flat	135m	LOW
3	Class G - Grassland	Flat	134m	LOW
4	Class A – Forest	Flat	732m	LOW
5	Class A – Forest	Flat	475m	LOW
6	Class D – Scrub	Flat	729m	LOW
7	Class D – Scrub	Flat	164m	LOW
8	Class B - Woodland	Flat	478m	LOW
9	Class D – Scrub	Flat	538m	LOW
10	Excluded - Low Threat Vegetation	Flat	125m	LOW
Determined Bushfire Attack Level				**FZ**

Determined Bushfire Attack Level (BAL)

The Determined Bushfire Attack Level (highest BAL) for the site / proposed development has been determined in accordance with clause 2.2.6 of AS 3959-2018 using the above analysis.

Section 4: Identification of Bushfire Hazard Issues

Based on indicated development site, the immediate bushfire hazard presents from flat grassland. With appropriate mitigation measures the threat may be reduced to BAL- 29 or below.

Section 5: Assessment Against the Bushfire Protection Criteria

The proposed plan for development at Lot 2364 Byrne Road, Muchea has been assessed against WAPC's Guidelines for Planning in Bushfire Prone Areas - Bushfire Protection Criteria.
The table on the following pages assess each element of the criteria and indicates how compliance can be achieved for each.

Table 3: Assessment Against the Bushfire Protection Criteria

Bushfire protection criteria	Method of Compliance Acceptable solutions	Proposed bushfire management strategies
Element 1: Location	A1.1 Development location	The proposed development can be located sufficiently to be provided with an area at BAL-29 or below, subject to final location. With installation of an APZ of 20m surrounding the development, it is possible to achieve BAL-12.5. Final BAL rating is subject to final location of development.
Element 2: Siting and design	A2.1 Asset Protection Zone	An Asset Protection Zone must be installed in accordance with **Figure 8** and Appendix 1: APZ Standards.
Element 3: Vehicular access	A3.1 Two access routes.	Byrne Road is a cul-de-sac, so can only provide one access-route to Brand Highway. From the Brand Highway (which provides access to the greater road network) it is approximately 830m to the property boundary. Between the property and Brand Highway there are currently no residential properties, with a power installation and farm shed existing south of Byrne Road. It is the understanding of Entire Fire Management that the installation will not be occupied by staff for long periods of time. **Consideration to be given.**
	A3.2 Public road	All existing roads meet the minimum technical requirements set out in column 1 of Appendix 2: Vehicular access technical requirements.
	A3.3 Cul-de-sac (including a dead-end-road)	Byrne Road is a cul-de-sac of approximately 1.7km length. From the Brand Highway (which provides access to the greater road network) it is approximately 830m to the property boundary. It therefore cannot comply. **Consideration to be given.**
	A3.4 Battle-axe	N/A
	A3.5 Private driveway longer than 50 m A private driveway is to meet detailed requirements (refer to the Guidelines for detailed private driveway requirements).	The driveway is likely to exceed 50m, and possibly 200m. It must comply with Table 6, Element 3 within the Guidelines, with ample space to provide the 6m horizontal clearance, 17.5m turnaround within 50m of the site and passing bays of minimum 6m width and 20m length at 200m intervals required.
	A3.6 Emergency access way	N/A
	A3.7 Fire service access routes (perimeter roads)	N/A
	A3.8 Firebreak width	3m wide in accordance with the Local Government Firebreak and Fuel hazard Reduction Notice.

Element 4: Water	A4.1 Reticulated areas	N/A
	A4.2 Non-reticulated areas	The site is not serviced by reticulated water. A minimum of 10,000L Fire Water Tank must be installed on the property and provided with a hardstand of 17.5m x 17.5m within 3 metres of the outlet.
	A4.3 Individual lots within non-reticulated areas (Only for use if creating 1 additional lot and cannot be applied cumulatively)	N/A

In order to yield the target BAL rating 12.5, the development should be placed no closer than the distances listed below to the property boundaries as referenced in the provided KML file, as depicted in Figure 1. (with appropriate APZ as listed in Table 3).

Provided the development site is placed within the BAL-12.5 contour (as depicted within Figure 8 in blue) the development may achieve BAL-12.5, provided a 20m APZ is constructed.

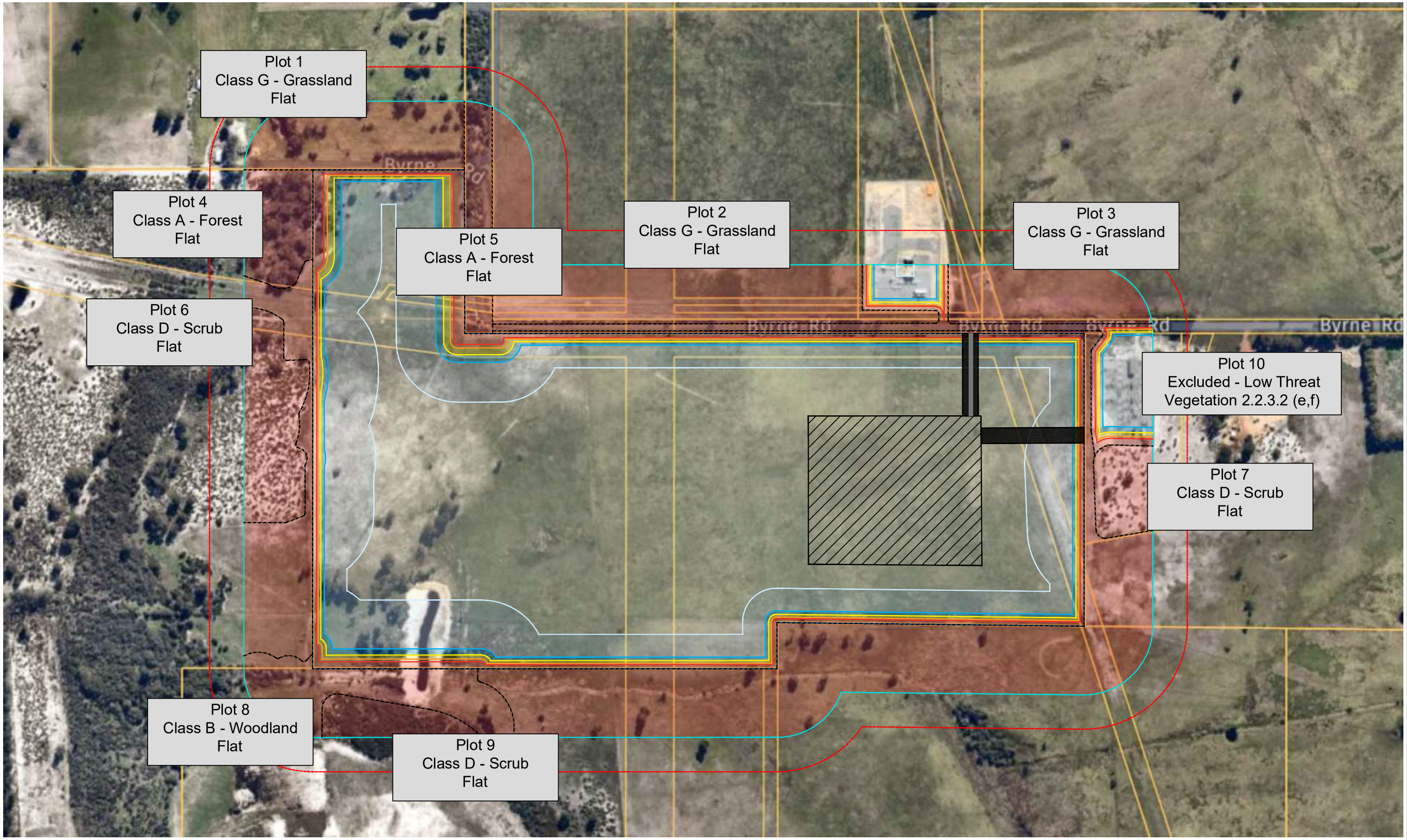
Table 4: Offsets and APZ requirements for proposed development to achieve a Target BAL rating of 12.5.

Property Boundary	**Offset for BAL-12.5**
Northern	17m
Eastern	17m
Southern	17m

Development Boundary	**APZ required for BAL-12.5**
Northern	20m
Eastern	20m
Southern	20m
Western	20m

Figures 6 & 7: BAL Contour Assessment maps have been provided on the following 2 pages. Theses figures present the Potential Bushfire threat emanating externally onto the Subject Lot. Should the development be relocated, this may be used to identify BAL 29 or below areas within the Lot.

Figure 8: Spatial representation of the Bushfire Mitigation Strategies demonstrates the required measures to ensure BAL 12.5 is achieved and maintained, are shown on the following page.



Entire Empire Pty Ltd
ABN: 63 468 728 651
Office: (08) 9498 0056
Address: 6 Potts Road Forrestdale Business Park
Forrestdale WA 6112

Project: Lot 2364 Byrne Road, Muchea

Title: BAL Contour Assessment

Size	Scale	Sheet	Rev
A3	1:5000	BAL 4812	1

Name: Lee Galer

Date: 29/11/2021

Legend

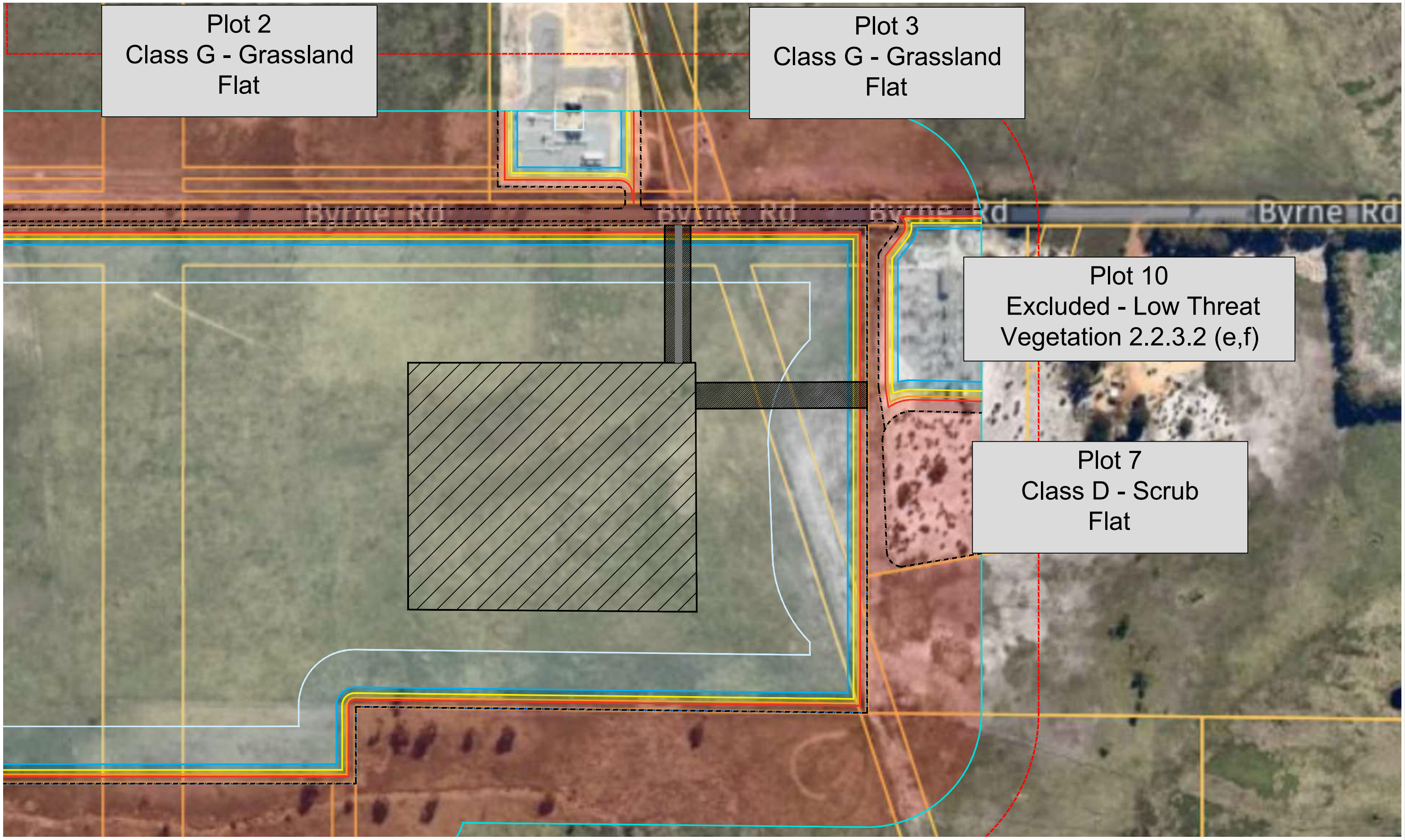
- Property Boundary
- Development Site
- 100m Exclusion Zone
- 150m Assessment area
- Vegetation Plot Boundary
- Transmission lines

Indicative Bushfire Attack Levels:

- BAL-LOW
- BAL-12.5
- BAL-19
- BAL-29
- BAL-40
- BAL-FZ

Notes

0 200 400 Meters



Entire Empire Pty Ltd
ABN: 63 468 728 651
Office: (08) 9498 0056
Address: 6 Potts Road Forrestdale Business Park
Forrestdale WA 6112

Project	Lot 2364 Byrne Road, Muchea		
Title	BAL Contour Assessment		
Size A3	Scale 1:3000	Sheet BAL 4812	Rev 1
Name Lee Galer		Date 29/11/2021	

Legend

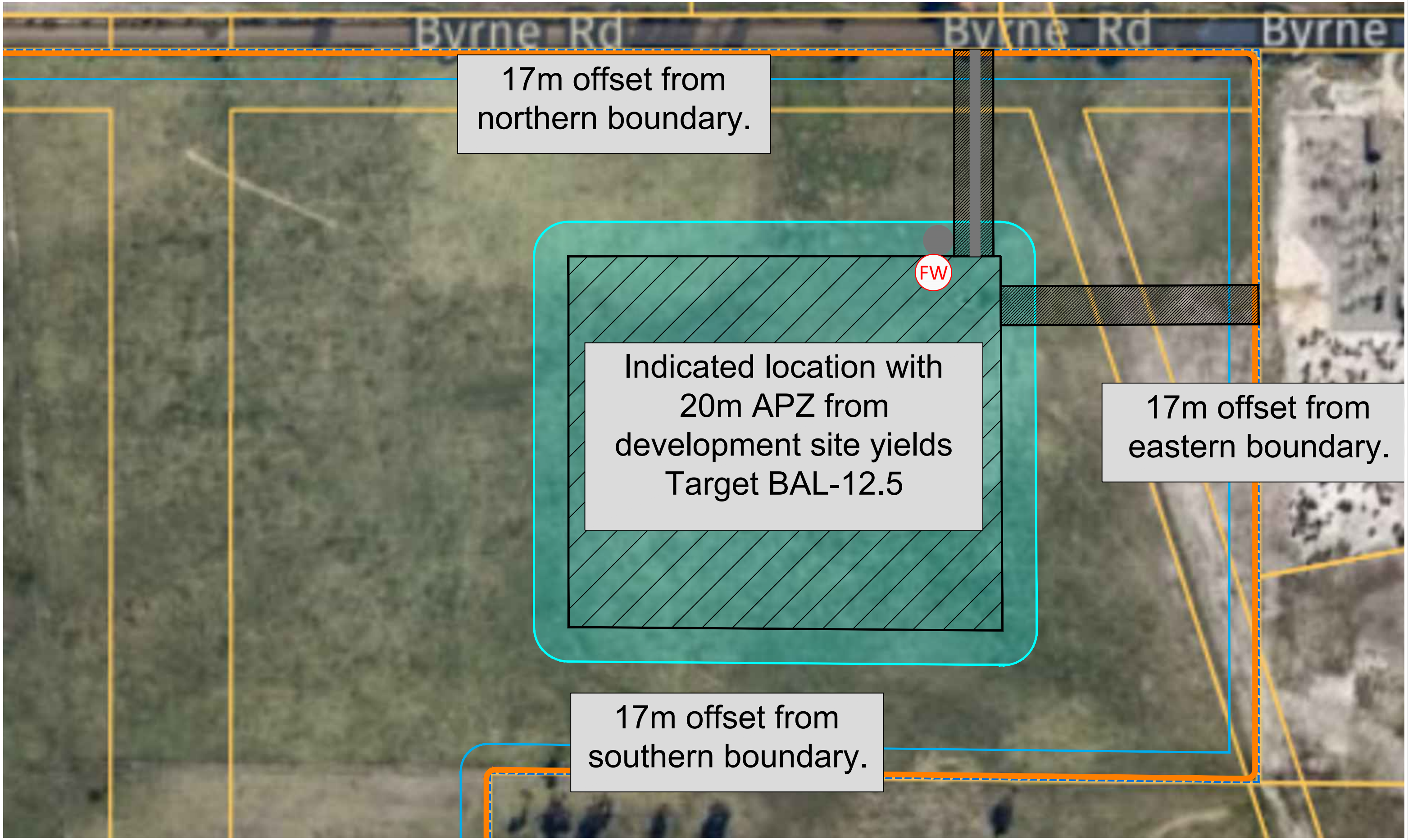
- Property Boundary
- Development Site
- 100m Exclusion Zone
- 150m Assessment area
- Vegetation Plot Boundary
- Transmission lines

Indicative Bushfire Attack Levels:

- BAL-LOW
- BAL-12.5
- BAL-19
- BAL-29
- BAL-40
- BAL-FZ

Notes

0 — 120 — 240 Meters



Entire Empire Pty Ltd
ABN: 63 468 728 651
Office: (08) 9498 0056
Address: 6 Potts Road Forrestdale Business Park
Forrestdale WA 6112

Project: Lot 2364 Byrne Road, Muchea

Title: Mitigation Map

Size	Scale	Sheet	Rev
A3	1:2000	MIT 4812	1

Name: Lee Galer

Date: 29/11/2021

Legend

- Subject Property
- Development Site
- Asset Protection Zone
- Firebreak
- FW — Fire Water Tank (location TBA)
- Transmission lines
- 17.5m Turnaround Bay
- Access TBD
- BAL-12.5 within, 17m from property boundary

Notes

0 80 160 Meters

Section 6: Responsibilities for Implementation & Management of the Bushfire Measures

Table 5: Developer's Responsibilities

DEVELOPER – PRIOR TO CONSTRUCTION OF INSTALLATION	
No.	**Implementation action**
1	Land occupier shall install an Asset Protection Zone in accordance with **Figure 8** and to comply with the Asset Protection Zone standards provided in Appendix 1 of this BMP.
2	Notification is to be placed on title of the lot that the land is within a designated bushfire prone area and is subject to an existing Bushfire Management Plan.
3	A minimum of 10,000L Fire Water Tank must be installed on the property and provided with a hardstand of 17.5m x 17.5m within 3 metres of the outlet.

Table 6: Ongoing Management Obligations

LANDOWNER/OCCUPIER – ONGOING MANAGEMENT	
No.	**Management action**
1	Landowner - Property owner shall maintain the Asset Protection Zone in accordance with the standards provided in Appendix 1 of this BMP.

A1: APZ - Asset Protection Zone Guidelines

The siting and design of the strategic planning proposal, subdivision, or development application, including roads, paths, and landscaping, is appropriate to the level of bushfire threat that applies to the site. That it incorporates a defendable space and significantly reduces the heat intensities at the building surface thereby minimising the bushfire risk to people, property, and infrastructure, including compliance with AS 3959-2018 if appropriate.

To achieve compliance with this Element the following acceptable solution must be met.

A2.1 Asset Protection Zone (APZ)

Every habitable building is surrounded by, and every proposed lot can achieve, an APZ depicted on submitted plans, which meets the following requirements:

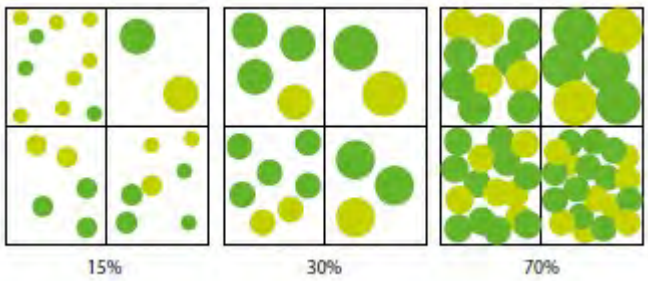
- **Width:** Measured from any external wall or supporting post or column of the proposed building, and of sufficient size to ensure the potential radiant heat output does not exceed 29KW/m² (BAL-29) in all circumstances.
- **Location:** the APZ should be contained solely within the boundaries of the lot on which the building is situated, except in circumstances where the neighbouring lot or lots will be managed in a low-fuel state on an ongoing basis, in perpetuity.
- **Management:** the APZ is managed in accordance with the requirements of 'Standards for Asset Protection Zones'.

Design of Asset Protection Zone

The proportion of the APZ reflects the distance from the hazard to ensure adequate separation is achieved.

Standards for Asset Protection Zones

- **Fences:** within the APZ are constructed from non-combustible materials (e.g. iron, brick, metal post and wire). It is recommended that solid or slatted non-combustible perimeter fences are used.
- **Objects:** within 10 metres of a building, combustible objects must not be located close to the vulnerable parts of the building i.e. windows and doors.
- **Fine Fuel Load:** combustible dead vegetation matter less than 6 millimetres in thickness reduced to and maintained at an average of two tonnes per hectare.
- **Trees (>5 metres in height):** trunks at maturity should be a minimum distance of 6 metres from all elevations of the building, branches at maturity should not touch or overhang the building, lower branches should be removed to a height of 2 metres above the ground and or surface vegetation, canopy cover should be less than 15% with tree canopies at maturity well spread to at least 5 metres apart as to not form a continuous canopy.



Tree Canopy Cover – Ranging from 15 to 70 percent at maturity

- **Shrubs (0.5 metres to 5 metres in height):** should not be located under trees or within 3 metres of buildings, should not be planted in clumps greater than 5m² in area, clumps of shrubs should be separated from each other and any exposed window or door by at least 10 metres. Shrubs greater than 5 metres in height are to be treated as trees.
- **Ground Covers (<0.5 metres in height):** can be planted under trees but must be properly maintained to remove dead plant material and any parts within 2 metres of a structure, but 3 metres from windows or doors if greater than 100 millimetres in height. Ground covers greater than 0.5 metres in height are to be treated as shrubs.
- **Grass:** should be managed to maintain a height of 100 millimetres or less.

Reference; WAPC Guidelines for Planning in Bushfire Prone Areas – V1.3

A2: Vehicular Access Technical Requirements

TECHNICAL REQUIREMENTS	1 Public road	2 Cul-de-sac	3 Private driveway	4 Emergency access way	5 Fire service access routes
Minimum trafficable surface (m)	6*	6	4	6*	6*
Horizontal clearance (m)	6	6	6	6	6
Vertical clearance (m)	4.5	N/A	4.5	4.5	4.5
Maximum grade <50 metres	1 in 10	1 in 10	1 in 10	1 in 10	1 in 10
Minimum weight capacity (t)	15	15	15	15	15
Maximum crossfall	1 in 33	1 in 33	1 in 33	1 in 33	1 in 33
Curves minimum inner radius (m)	8.5	8.5	8.5	8.5	8.5
*Refer to E3.2 Public roads: Trafficable surface					

EMERGENCY EVACUATION PLAN

Name of facility: Neoen Australia (Pty Ltd) Battery Installation - UPDATE

Address: Lot 2364 Byrne Road, Muchea

Prepared by: (Bushfire planning practitioner) Gavin Fancote

Owner/operator: Neoen Australia (Pty Ltd)

Date: (date/month/year) 29 / November / 2021 Plan version: 1

Document Control

Version	Date	Details	Undertaken by
0	14/10/2021	Document creation	Gavin Fancote
1	29/11/2021	Amendments	Gavin Fancote
2		Document completion for submission	TBA

Emergency Management Team

Name	Organisation	Contact details
TBA	Neoen Australia (Pty Ltd)	TBA

Contents

NOTE: EEP DETAILS WILL BE COMPLETED PRIOR TO COMMENCING PROJECT CONSTRUCTION

Version: 1.1 (October 2019)

FACILITY DETAILS

This plan is for: (Insert name of facility) Neoen Australia (Pty Ltd) Battery Installation - UPDATE

and has been designed to assist management to protect life and property in the event of a bushfire.

This plan outlines procedures for both **evacuation** and **shelter-in-place** to enhance the protection of occupants from the threat of a bushfire.

The primary action to follow in a bushfire emergency is to (tick which is applicable):

EVACUATE ✔ **SHELTER-IN-PLACE**

Name of on-site contact person: TBA

Position/role of contact person: Owner Operator

Phone number: TBA

Type of facility: Battery Installation

Number of buildings: TBA

Number of employees: TBA

Number of occupants: TBA

Number of occupants with support needs: N/A

Provide description of support needs:

Version: 1.1 (October 2019)

RESPONSIBILITIES

The following outlines who has responsibility for implementing the emergency procedures in the event of a bushfire.

Position	Name of person	Building/area of responsibility	Responsibilities	Mobile phone number
Example: *Manager*	*John Blank*	*Fire warden and initial contact*	• *Respond and take control as appropriate* • *Determine the nature of the emergency and implement appropriate action.*	*0400 000 000*
TBC				

EMERGENCY CONTACTS

Name or organisation	Office/contact	Contact details
Fire, Police, Ambulance	Fire or Emergency	000
Department of Fire & Emergency Services	Emergency information	13 DFES (13 33 37)
EmergencyWA	Warnings and incidents	www.emergency.wa.gov.au
TBC		

Secondary Contacts

Name or organisation	Office/contact	Contact details
TBC		

Version: 1.1 (October 2019)

PREPAREDNESS

Ongoing, just prior and during the bushfire season

Bushfire season: (date/month) 1 / December to 31 / March

Actions	Frequency	Responsible person
Ongoing		
1. Maintain asset protection zones around all buildings.	Yearly	Onsite staff name- TBC
2. Ensure roof and gutters are free from leaf litter and debris.	Yearly	Onsite staff name- TBC
3.		
To be completed just prior to the bushfire season by: (date/month) 01 / November to 30 / November		
1. Review Emergency Action Plan -Procedures and contact details	Yearly	Onsite staff name- TBC
2. Ensure Emergency bag is prepared & contents havent expired	Yearly	Onsite staff name- TBC
3. Ensure employees and occupants are informed of procedure.	Yearly	Onsite staff name- TBC
4. Current site layout visible and current.	Yearly	Onsite staff name- TBC
5. Ensure offsite location and routes are still a safe option.	Yearly	Onsite staff name- TBC
6. Confirm off-site location(s) can be used during emergency	Yearly	Onsite staff name- TBC
7. Ensure firefighting equipment is serviceable and available.	Yearly	Onsite staff name- TBC
8. Ensure no hazards are present that could contribute to fire risk.	Yearly	Onsite staff name- TBC
9. Ensure property access is kept clear and easily trafficable.	Yearly	Onsite staff name- TBC
10. Ensure the Emergency Evacuation Plan is up to date.	Yearly	Onsite staff name- TBC
To be completed during the bushfire season between: (date/month) 1 / December to 31 / March		
1. Maintain asset protection zones.	Yearly	Onsite staff name- TBC
2. Maintain spaces around buildings and assembly points.	Yearly	Onsite staff name- TBC
3. Maintain situational awareness DFES,ABC radio,EmergencyWA	Daily	Onsite staff name- TBC
4. Look outside for any signs of smoke or fire in the area.	Daily	Onsite staff name- TBC
5. Inform occupants of the fire situation.	Situational	Onsite staff name- TBC
6.		
7.		
8.		
9.		
10.		

(Note: Add or delete rows as required)

AWARENESS AND PRE-EMPTIVE PROCEDURES

The following table outlines actions to be undertaken to ensure the facility maintains situational awareness of a possible bushfire approaching and pre-emptive procedures (if applicable). This will assist with the assessment of the bushfire situation and whether the triggers identified in the evacuation/sheltering-in-place procedures have occurred.

Actions	Frequency	Responsible person
Days forecast Very High or Severe Fire Danger rating		
1. Review Emergency Action Plan -Procedures and contact details	Daily	Onsite staff name- TBC
2. Monitor Emergencywa & DFES	Hourly	Onsite staff name- TBC
3. Follow advice given by Emergencywa & DFES	As directed	Onsite staff name- TBC
Days forecast Extreme Fire Danger rating		
1. Review Emergency Action Plan -Procedures and contact details	Hourly	Onsite staff name- TBC
2. Monitor Emergencywa & DFES	ASAP	Onsite staff name- TBC
3. Follow advice given by Emergencywa & DFES	As directed	Onsite staff name- TBC
Days forecast Catastrophic Fire Danger rating		
1. Monitor Emergencywa, DFES and other alert services	ASAP/hourly	Onsite staff name- TBC
2. Apply Emergency Evactuation Plan	ASAP	Onsite staff name- TBC
3. Evacuate the premises	ASAP	Onsite staff name- TBC
An 'Advice,' 'Watch and Act' or 'Emergency Warning' alert or other communication has been issued by an emergency service authority		
1. Monitor Emergencywa & DFES	ASAP/hourly	Onsite staff name- TBC
2. Contact Supervisor & prepare to leave	ASAP	Onsite staff name- TBC
3. Follow advice given by Emergencywa & DFES	ASAP	Onsite staff name- TBC

(Note: The above break downs by the different types of fire danger rating day forecasts is included as an example of how different actions may want to be shown and can be amended to suit your facility. It is recommended that if actions under the example breakdown headings are the same, to combine the breakdown headings as one rather than repeating the same information under two separate breakdown headings. Ensure the Emergency Evacuation Plan is concise and not repetitive.)

EMERGENCY PROCEDURE LOCATION AND TRANSPORT DETAILS

Evacuation

Designated evacuation assembly point(s):

1. North of Driveway, Byrne Road
2. Broader road network, via Brand Highway
3.

Primary off-site location

Name of venue: NA

Address of venue: North of Driveway, Byrne Road

Nearest cross-street: Byrne Road & Brand highway Map references: 3133246S11558004E

Venue phone number: TBC

Primary route to location: (e.g. via north on xx Highway) East on Byrne Rd to Brand Hwy.

Secondary route to location: (e.g. via xx Road) NA

Primary transportation arrangements

Number of vehicles required: TBC/NA

Name of organisation providing transportation: TBC/NA

Contact phone number: TBC/NA

Time required for transportation to arrive: TBC/NA

Estimated travelling time to destination: TBC/NA

Secondary off-site location

Name of venue: TBC/NA

Address of venue: TBC/NA

Nearest cross-street: TBC/NA Map references: TBC/NA

Venue phone number: TBC/NA

Primary route to location: TBC/NA

Secondary route to location: TBC/NA

Secondary transportation arrangements

Number of vehicles required: TBC/NA

Name of organisation providing transportation: TBC/NA

Contact phone number: TBC/NA

Time required for transportation to arrive: TBC/NA

Estimated travelling time to destination: TBC/NA

Shelter-in-place

Designated on-site building:

1.

Not recommended.

EMERGENCY RESPONSE

Procedures for evacuation and shelter-in-place in the event of a bushfire.

(Note: Early evacuation should always be the primary action – you should never 'wait and see what happens'. Sheltering-in-place during a bushfire should be a last option when there is insufficient time to evacuate. In some limited circumstances such as in remote locations or facilities with people with morbidity issues, early evacuation may be difficult to implement and sheltering-in-place may be the safest action).

The **primary action** to follow with an imminent bushfire threat is to (tick which is applicable):

EVACUATE ✔ **SHELTER-IN-PLACE** ☐

Trigger	Action	Responsible person
1. Bushfire advice	Monitor Emergencywa & DFES	Owner operator TBC
2. Watch & Act	Evacuate Premises	Owner operator TBC
3. Emergency	Evacuate Premises	Owner operator TBC
4. Seeing Fire	Follow Evacuate plan & contact 000	Owner operator TBC
5.		
6.		
7.		
8.		

RECOVERY

Procedures following the bushfire if EVACUATED

Actions	Responsible person
1. Contact Manager/Owner & relevant organisations.	Owner operator TBC
2. Follow advice from Emergency personnel, EmergencyWA, DFES	Owner operator TBC
3. Do not return until "all clear has been given"	Owner operator TBC
4.	
5.	
6.	

Procedures following the bushfire if SHELTERED-IN-PLACE

Actions	Responsible person
1. Not advised.	
2.	
3.	
4.	
5.	
6.	

Attachments

- ☐ Occupants/employee register
- ☐ Parent/guardian contact register
- ✔ Site layout of premise

EMERGENCY EVACUATION PLAN

Lot 2364 Byrne Road, Muchea

R

RESCUE:
- yourself.
- other customers and staff.

A

Raise the ALARM:
- Alert the Fire Brigade by calling 000.
- Notify staff onsite.

C

CONTAIN the fire:
- To the room or space of origin.
- Close the doors behind you.

E

EXTINGUISH or EVACUATE:
- Follow instructions.
- Go to Assembly Area.
- Only attempt to extinguish if safe, you're trained and it is safe to do so.

000 EMERGENCY

LEGEND

- Primary Evacuation Path
- Assembly Area
- Evacuation Path to greater road network

Evacuation route to broader public road network.

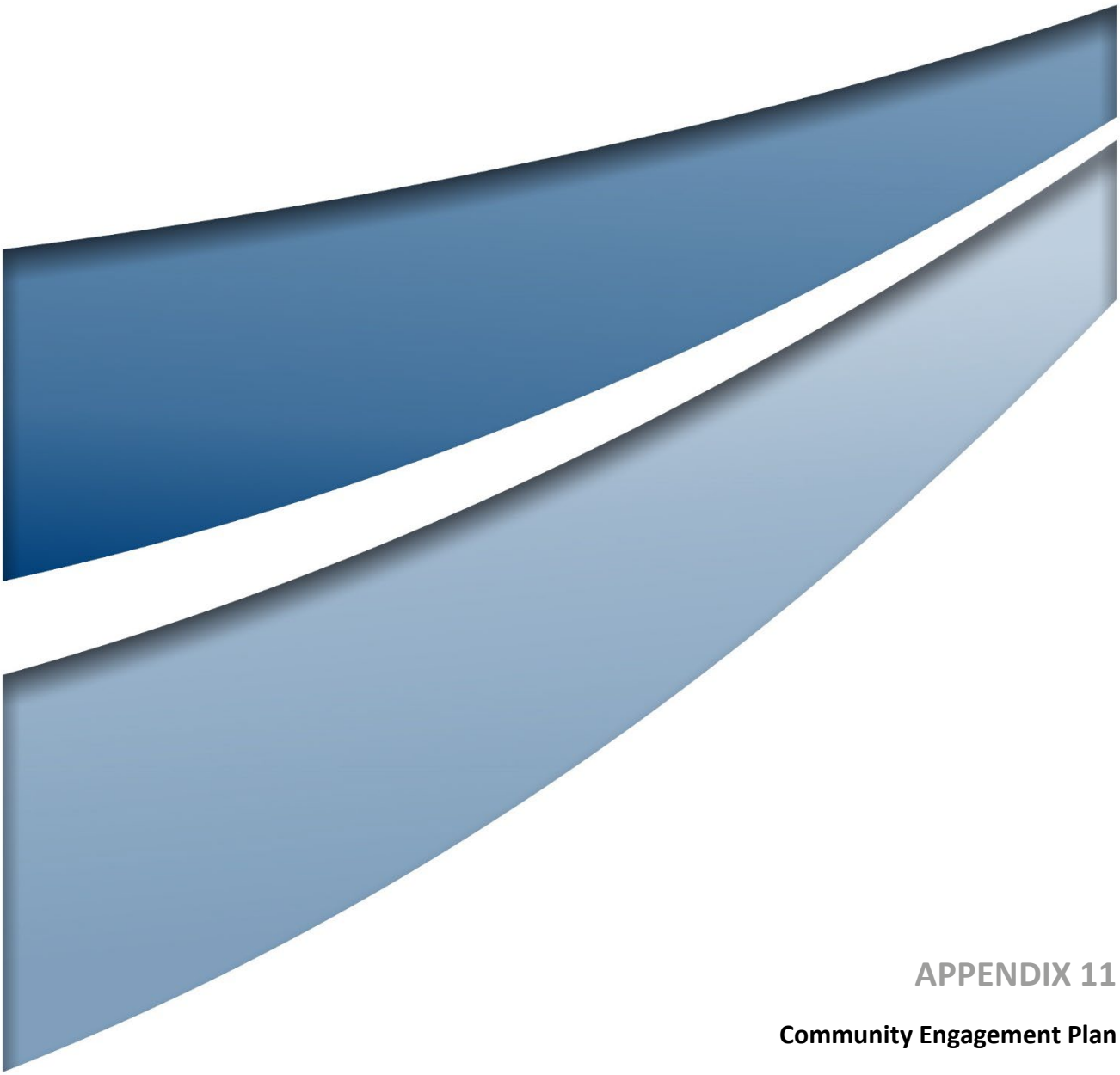
Primary muster and evacuation route

Site layout TBA

Created by:

ENTIRE FIRE MANAGEMENT

Version 1
Date Issued: 29/11/2021 Valid until: 29/11/2026



APPENDIX 11

Community Engagement Plan

NEOEN

MUCHEA BATTERY COMMUNITY ENGAGMENT PLAN

Version	V01
Released	06 04 2022
Document Owner	Aniruddha Deshpande, Project Manager

Document Control

Author	
Position:	Development Manager
Incumbent:	Aniruddha Deshpande
Reviewed by	
Position:	Head of Community and Engagement
Incumbent:	Lisa Stiebel
Review Date:	04/04/2022
Approved by	
Position:	Head of Development
Incumbent:	Garth Heron
Approval Date:	06/04/2022
History	
Version:	v01
Nature of change:	Creation
Author:	Aniruddha Deshpande
Date:	04/04/2022

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CONTENTS

PURPOSE

This Community Engagement Plan (CEP) was developed during the Development Application phase by Aniruddha Deshpande, Project Manager with oversight from the Lisa Stiebel, Head of Communications & Engagement in April 2022.

This document identifies the community engagement approach and objectives for the Muchea Battery and surrounding communities. It was developed in accordance with the global best practice guidelines. It outlines the overall framework across the phases of the project lifecycle (from development through construction to operations) and proposed plans. It also provides a summary of the key stakeholders including landholders, neighbours, local community, and local government.

Neoen understands that the success of the Muchea Battery is dependent to a large extent on the development of genuine, open, and ongoing relationships with key stakeholders and members of the local community. We recognise the importance of ensuring a "no surprises" dynamic with the local community and are committed to developing and nurturing long-term relationships between our team and the various project stakeholders.

The CEP is a key element of the Community Engagement Toolkit depicted in Table 1. It is one of the three tools, along with the stakeholder register and the project website, that will accompany the project from early feasibility stage to decommissioning.

Safety First

Neoen have a policy of safety first across all our projects and activities. Staff and community safety is a baseline essential to ensure engagement can proceed. Wherever there is a conflict between the approach and guidelines outlined in this Community Engagement Plan and the safety of our staff or the general public then appropriate safe practices will take priority.

Distribution

It is intended that the CEP is part of the hand over from project manager to project manager as the project progresses from development to construction to operations. It should also be shared with nominated EPC and O&M contractors so that it can be incorporated into their site management plans to ensure our approach is consistent and coordinated. It is also designed to be a useful backgrounder for new Neoen staff members or those attending future community events.

Review

Once developed, the CEP is a live document which will be updated progressively during the project's development phase and then reviewed and handed over at the following project milestones:

- Financial close (handover to Construction Manager)
- Completion of construction (handover to Asset Manager)

It will also be informed by changing circumstances, community feedback and ongoing improvements in Neoen's community engagement approach, so that our communication and engagement remain:

- Relevant to the project's evolving needs, issues, and outcomes
- Responsive and tailored to the needs of key stakeholders and local community
- At the leading edge of industry and global best practice

NEOEN

Community Engagement Toolkit by Project Stage

DEVELOPMENT | CONSTRUCTION | OPERATION

1	2	3	4	5	6	7	8
Site Selection	Feasibility	Planning & Approvals	Post DA Lodgement	Pre-Construction	Construction	Operation	Decommissioning
Host landowner information & FAQ's Social Feasibility Scan Stakeholder Register	Stakeholder Register Community Engagement Plan Neighbour information & FAQ's, benefit options Council & stakeholder Presentation Social Risk Matrix Benefit Calculators Website (template)	Stakeholder Register Community Engagement Plan Website Feedback Survey 1800 number Community Info Day Checklist & templates Job interest register Benefit-sharing program models & matrix	Stakeholder Register Community Engagement Plan Website 1800 number Job Interest Register Indigenous Participation Plan Local Participation Plan Newsletter template	Stakeholder Register Community Engagement Plan Website 1800 number Complaints Register Benefit-sharing Program finalised Job interest register Local and Indigenous Participation Plan Local Employment & Networking Session Handover to Construction Manager & EPC	Stakeholder Register Community Engagement Plan Website 1800 number Complaints Register Indigenous Participation Plan Local Participation Plan Site Tour information pack Event sponsorship Guidelines Handover to Asset Manager & O&M	Stakeholder Register Community Engagement Plan Website 1800 number Complaints Register Indigenous Participation Plan Local Participation Plan Community Celebration Benefit-sharing Program delivery Visitor information pack	Stakeholder Register Community Engagement Plan Website 1800 number Complaints Register End of Project Life information pack

Responsibility

Over the many years of the Muchea Battery's development and lifecycle, the people responsible for and engaged in the implementation of the CEP will change.

Table 1 outlines the movement in responsibility across the project lifecycle.

Table 1: Responsibility for CEP

Stage	Project Stages	Proposed Timing	Responsibility for CEP
1	Site selection	Q3 2021	Aniruddha Deshpande Development Manager
2	Feasibility	Q3/Q4 2021	Aniruddha Deshpande Development Manager
3	Planning and approvals	Q1/Q2 2022	Aniruddha Deshpande Development Manager
4	Post DA lodgement	Q3 2022 – Q2 2023	Aniruddha Deshpande Development Manager
5	Pre-construction	Q3 2023	Aniruddha Deshpande Development Manager
6	Construction	Q3/Q4 2023	As per Construction Environmental Management Plan (CEMP)
7	Operation	Q4 2024	As per Operation Environmental Management Plan (OEMP)
8	Decommissioning	2044	As per Decommissioning Environmental Management Plan (DEMP)

1. COMMUNITY ENGAGEMENT APPROACH

1.1 Our approach

Stakeholder and community engagement are led by Neoen's project managers with support from community engagement specialists. We consider it important that trusting relationships are developed between the people on the ground who know the project the best, and the stakeholders that are part of and connected to their region and local community. Due to the rural nature of the community, our overall approach to consultation for the Muchea Battery will be open, relaxed, flexible and responsive.

Neoen have a vertically integrated business model, meaning that we 'develop to own' our projects. This model is unusual in the industry, affording us a clear advantage over our competitors in respect to community engagement – our starting point is the clear understanding that we will be long term neighbours and participants in the local community for the lifetime of the project. As such we are able to establish and nurture relationships, embrace partnerships and innovation, confident that we will be there to see projects and benefits to fruition.

1.2 Our values

As a company Neoen has a clear set of values that underpin and guide our work. How these internal values translate into our external approach to building relationships with communities is described in Table 2.

Integrity
We operate with integrity, whatever we do, whenever and wherever we do it.
We work with partners who abide by the same rules.

Commitment
We uphold all our commitments, internal and external.
We believe in hard work and take pleasure in seeing a good job well done.

Audacity
We believe we can become a world leader in renewable energy.
We have the audacity to operate globally, imagining, designing and implementing competitive, effective energy solutions.

Esprit de corps
We are loyal to each other and form a close-knit team.
We are proud of our company, our goals and our accomplishments.

Table 2: Principles and practice

Value & Principle	In practice
Integrity Mutual Respect	– We provide a space for genuine dialogue where people can participate in respectful discussions.
Integrity Transparency	– We demystify the development process for local stakeholders and clearly communicate which points, when and to what extent they are able to influence decisions. – We are transparent about how and why decisions are made.
Integrity Inclusiveness	– We reach out to involve key stakeholders and the local community so they can play a part in decisions that affect them. – We provide a range of opportunities and avenues for ongoing and meaningful dialogue, allowing for detailed and timely discussions.
Commitment Responsiveness	– We communicate well and are responsive to emerging issues, concerns and ideas.

	– We provide timely information and ensure people have time to digest information, understand the project and make informed decisions.
Commitment Mutual Benefit	– We seek shared outcomes of mutual benefit for the local host community over the long term.
Audacity Innovation	– We deliver engagement beyond regulatory conditions and compliance – We are open to and pursue bold and creative ideas and solutions tailored to and driven by the local context of the project.
Esprit de corps Relationship building	– We build and nurture long term local relationships and make meaningful links with local leaders and organisations. – We provide many avenues for interaction across the project lifecycle.
Esprit de corps Celebration	– We value and celebrate community; our own and those of the communities we work with. – We enjoy celebrating our successes together.

1.3 Industry Best Practice

Our approach to engaging stakeholders is informed by the Public Participation Spectrum developed by the International Association of Public Participation (IAP2) and widely adopted as a framework for structuring consultation by the renewables industry. The approaches and spectrum are represented in the Table 3.

Table 3: Spectrums of engagement

Spectrum	Inform	Consult	Involve	Collaborate	Empower
Community engagement objective	– Provide balanced and objective information – assist the community in understanding all aspects of the project, including possible problems/issues	– Obtain feedback from the community on plans, options and/or decisions	– Work directly with the community throughout all stages of the project – ensure community concerns and aspirations are consistently understood and considered	– Partner with the community in each aspect of planning, development and decision- – making, including the development of alternatives and the identification of the preferred solution	– Community leads the development of the renewable energy project – Place decision-making in the hands of the community
Promise to community	– Keep the community informed through all stages of development, including issues and delays	– Keep the community informed – listen and acknowledge suggestions and concerns – provide feedback on how input	– Work with the community to ensure concerns and aspirations are directly reflected in the alternatives developed	– Look to the community for direct advice and innovation in formulating solutions – incorporate advice and recommendations into	– Implement what the community decides

		influenced the decision	– provide feedback on how input influenced the decision	decisions to the maximum extent possible	
Community engagement outcomes	– Securing a good site to install the renewable energy facility – gaining planning permission – meeting compliance regulations	– Minimising objections – effectively managing complaints – good stakeholder relations – a level of community awareness and trust in the project	– Long-term broad local social acceptance and knowledge of the project – strengthened local relationships and trust – local advocates for renewable energy	– Broad community participation, support and awareness – some sense of local ownership – greater community benefit and strong local relationships and trust – timely development and easier planning approval – some sharing of benefits beyond investors	– Benefit sharing program tailored to the local context – Harness the skills and capital of the community – Upskill community members to manage the project – Largely community owned and controlled

This CEP aims to move our engagement activities and benefit sharing approach along the spectrum listed above so that across our project portfolio we are:

- **Involving** the community in the development, construction and operation of the Battery farm
- **Collaborating** with the community to ensure that local advice and insights are shaping our approach to engagement and benefit sharing
- **Empowering** the community to shape key elements of the project, such as co-designing the long-term framework of the shared benefits program

1.4 Emerging trends

Table 3 in the prior section shows that differing levels of participation are legitimate, depending on the goals, timeframes, resources and levels of interest/concern in the decision to be made. At all levels of engagement, it is fundamental to define the promise and ensure it is clearly understood by both the

decision makers and the stakeholders to be engaged. The following figure[1] shows the emergent key elements of best practice as at 2018.

Stakeholders groups are likely to have differing communication and engagement needs. A level of engagement is therefore necessarily assigned to each stakeholder identified. It is possible for the level of engagement to alter at different milestones of the project; as a consequence, some stakeholders will be assigned more than one level of engagement. Each level of engagement is a valid one, provided it is delivered in a meaningful way and to a group that expects to be engaged with at that level.

The project team will engage broadly but understands there are stakeholders seeking different levels of engagement in the project. Stakeholder level of interest will evolve over the duration of the project and this analysis will be updated regularly to reflect changes and emerging issues or opportunities. A detailed Stakeholder Register incorporating the stakeholders and communities affected and/or interested in the project is maintained by the manager responsible for the CEP.

[1] Lane, T., Wood, E. Hall, N., Webb, A. and Mey, F. Enhancing Social Outcomes from Wind Development in Australia: Evaluating Community Engagement and Benefit Sharing. Clean Energy Council, Melbourne.

1.5 Objectives

1. Foster a transparent and open approach to the development of Muchea Battery and ensure 'no surprises' for the local community.

2. Keep the community and stakeholders informed about Muchea Battery through the provision of accurate, timely and factual project information.

3. Identify and address community and stakeholder concerns and maintain transparency in the project design, implementation and ongoing operations

4. Involve stakeholders and community regarding key decisions.

5. Identify opportunities for local business involvement and local employment in the construction and operations of Muchea Battery and where appropriate develop a Local Participation Plan.

6. Identify opportunities for Indigenous Participation and employment in the construction and operations of Muchea Battery and where appropriate co-develop and implement an Indigenous Participation Plan.

7. Co-design, develop and deliver a benefit sharing program in collaboration with the community, and in partnership with local stakeholders where possible.

8. Develop long-term relationships and partnerships with community and stakeholders.

1.6 Community Engagement Framework

An eight-phased approach will guide the implementation of community engagement strategy in alignment with each of the project stages.

Key project activities and milestones are outlined on the page below, with the associated community engagement activities on the following page.

Section 3 provides detailed project-specific information on the community engagement approach and strategy for Muchea Battery.

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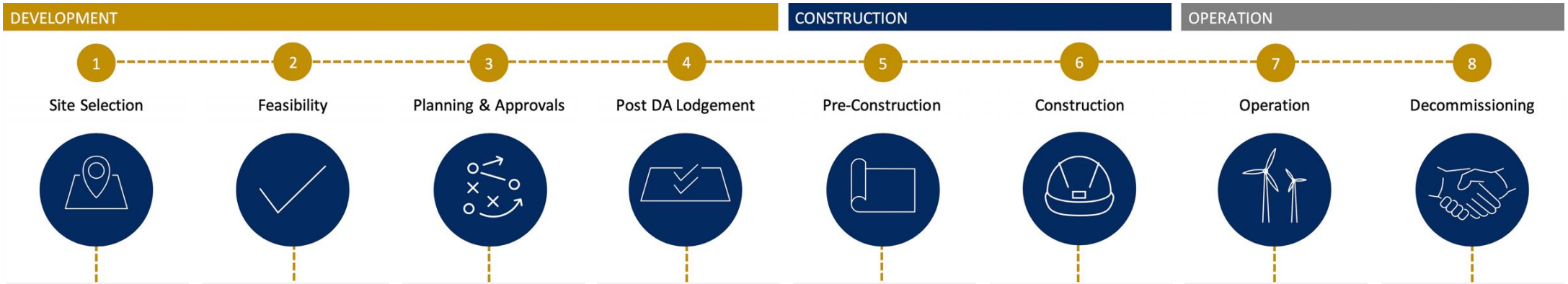
Project Activities and Milestones by Stage



Site Selection	Feasibility	Planning & Approvals	Post DA Lodgement	Pre-Construction	Construction	Operation	Decommissioning
Desktop survey Identify potential landowners Fatal flaw assessment Meet and negotiate with landowners Enter options to lease	Meet and discuss with neighbours Mapping of site constraints Commence development application (DA) studies Preliminary project design Internal approval to proceed	Completion of studies and surveys Preparation of DA Investigate power purchase agreement (PPA) options Connection inquiries Refining detailed project design	Begin procurement process Finalise detailed design Commence PPA negotiations Commence grid connection application process	DA approval Finalise procurement and appoint EPC and O&M contractor Finalise connection agreement Finalise PPA agreement Secure project finance leading to 'financial close' Development Manager hands over to Construction Manager	Mobilise on site Civil, mechanical & electrical installation Commissioning Generation commences Construction Manager hands over to Asset Manager	Ongoing asset maintenance and management Generation and revenue tracking & optimisation	Explore business case for site renewal Cease or extend landowner contracts Removal of infrastructure Site rehabilitation

NEOEN

Community Engagement Activities by Stage

DEVELOPMENT | CONSTRUCTION | OPERATION

1 Site Selection

- Undertake host landowner engagement (one-on-one)
- Social Feasibility Scan
- Initial stakeholder mapping

2 Feasibility

- Engage with neighbours (one-one-one), decide on neighbour benefit options
- Engage with Traditional owners
- Council & MPs briefings
- Mapping of political context
- Establish stakeholder register

3 Planning & Approvals

- Develop Community Relations Plan (CEP) & Social Risk Matrix
- Launch website including project email, 1800#, job interest register & feedback survey
- Hold Community Information session(s)
- Undertake council briefings
- Identify options for Community Benefit-sharing Scheme
- Hold host landowner dinners & updates

4 Post DA Lodgement

- Update website with progress & news
- Email updates to stakeholders & subscribers
- Presentation to local business & community groups
- Co-develop Indigenous Participation Plan
- Hold host landowner dinners & updates
- Establish Complaints Register

5 Pre-Construction

- Hold Local Employment & supplier networking session
- Finalise Community-Benefit sharing Scheme
- Update website with progress & news
- Email newsletter to stakeholders & subscribers
- Organise start of construction event for host landowners
- Introduce Construction Manager & EPC Contractor to key stakeholders

6 Construction

- Regular & ongoing host & neighbour communication
- Community updates via briefings, website & newsletters
- Manage complaints register
- Sponsorship of local events
- Establish Community Benefit-sharing Scheme
- Introduce Asset Manager to key stakeholders

7 Operation

- Organise launch & community celebration event
- Review community engagement & lessons learnt
- Website & newsletter updates
- Manage complaints register
- Delivery of Community Benefit-sharing Scheme
- Facilitate site visits, educational tours & open days

8 Decommissioning

- Landowner & council briefings
- Update website
- Communicate decommissioning process
- Engagement with local landcare groups

2. COMMUNITY ENGAGEMENT STRATEGY

2.1 Needs-based approach

Each key stakeholder has a different need across each phase of the [insert project] lifecycle. To address this nuance, a needs-based approach is described for each of the key stakeholders to this project in Table 5.

Table 4: Key stakeholders

Stakeholder Group	Overview	Objectives – Needs based approach	Activities – per development phase
Host Landowners	Residents who are hosting Battery on their land.	Ongoing communication and discussions as project progresses. Contribution to the project's progress, ability to provide local knowledge, advice and input. Involvement in development and of Community Benefit-sharing Scheme	One-on-one meetings Landowner updates & dinners Letterbox drops Invitations & involvement in community events
Near neighbours	Residents adjacent project site have the potential to be affected by the visual impact of the battery technology, the noise and heavy vehicle traffic associated with the construction phase.	To create and maintain a close connection with neighbours adjacent to the Muchea Battery. To keep neighbours informed about the project from early in the project planning process and provide opportunities to raise issues and provide feedback.	One-on-one engagement Letterbox drop project updates Community Information Sessions Invitation to community events
Neighbourhood	The local people living within the Muchea township adjacent to the project.	To keep neighbours informed about the project from early in the project planning phase To provide opportunities to raise issues and provide feedback To share the benefits of the project with the local community in ways that are tailored to local needs	Letterbox drop Project Updates Community Information Sessions Input into community benefit-sharing scheme design Invitation to community events

Local Government	We will work with the Shire of Chittering to shape the Community Engagement Strategy and Benefit Sharing Program.	To ensure a positive and collaborative relationship with the LGA that can support the long-term goals of the community.	One-on-one engagement Project briefings & updates Community Information Sessions Pre-DA meeting
State MP	Mr Ronald (Shane) Shane Love, Member of Legislative Assembly for Moore We will work with the WA Government to shape the Community Engagement Strategy	To ensure the local member is kept updated about the project and its progress To ensure a positive and collaborative relationship with the WA Government	One-on-one engagement Project briefing & Updates Invitation to community events
Federal MP	Hon. Christian Porter Federal Member for Pearce	To ensure the local member is kept updated about the project and its progress	One-on-one engagement Project briefing & Updates Invitation to community events
Traditional Owners – Indigenous communities	The Whadjuk-Noongar represented through the Southwest Aboriginal Land and Sea Council (SWALSC) We will seek to engage and understand what elements of the project are culturally relevant and/or sensitive.	Engaging with local Aboriginal groups beyond planning requirements, such as Cultural Heritage Management Plans.	Invitation to co-design Indigenous Participation Plan Invitation to community events
Local Fire Authority	Local volunteers representing the Local Fire Authority	To ensure project activities abide by safety and regulatory requirements	Provide indicative design plans and updates on the project to prepare for any local fire and emergency safety requirements
Schools, TAFEs and Universities	Local schools Local TAFE	To ensure organisations are updated on education and vocational opportunities associated with the project. To use the opportunity of a local renewable project to dovetail relevant & practical educational content into the syllabus.	Information and project updates provided and invitation to future networking engagement Opportunities for site visits for local schools.
Business groups / industry stakeholders	We will seek to engage and collaborate with local businesses and business	To ensure Neoen is creating of local renewable energy projects.	To ensure project activities abide by safety and regulatory requirements

	networks around what opportunities may be available such as sourcing for the Battery farm development.		
Battery farm opponents	We will seek to identify those issues that are of concern to local Battery farm opponents.	To be accessible, help to address concerns proactively, and to have a best practice complaints system in place.	Complaints process implemented and transparent.

2.2 Sustained engagement across project lifecycle

As well as being oriented towards the needs of individual stakeholder groups, the engagement is also planned and staged in line with the project's eight phases.

A summary of proposed activities is shown on page 12, noting that this will change as the project progresses.

2.3 Facilitating opportunities for involvement

Local Participation

One of our key areas of focus for the broader local community is facilitating the involvement of local jobseekers and businesses in the construction and operation of the Battery farm to ensure a strong regional economic benefit.

During feasibility & planning/approvals phases expressions of Interest for work are invited and received through adverts, information days and the project website. A job register for internal use is created to ensure reference during construction and operation phases can be made to list of interested workers.

In the pre-construction phase a Local Employment & Supplier Networking Session will be held in Muchea, WA, with invitations going out to those on the job register and local employment agencies, ensuring they have the opportunity to meet with the appointed construction contractors.

A more detailed Local Participation Plan will be developed following development application determination

Indigenous Participation

During the development stage we engage with traditional owners and depending on local context and requirements we co-develop a Cultural Heritage Management Plan or a Cultural Heritage Arrangement.

We also explore the option of co-developing an Indigenous Participation Plan with the Indigenous community. Participation incorporates the following three elements:

1. Indigenous employment by EPC and second/ third tier contractors during construction/operations.
2. Indigenous suppliers providing works packages in construction/operations.
3. Indigenous workplace training & education pathways in partnership with local schools and colleges.

A more detailed Indigenous Participation Plan may be developed following development application determination.

Education

We explore opportunities to work with local schools and colleges, both at primary and secondary, to support education in renewable energy generation, the electricity grid and electricity market.

In Feb 2022 Neoen launched its online Learning Hub, suite of curriculum-linked electricity and renewable energy content for yrs. 6 and 8, which will be combined with opportunities for site visits once the battery is up and running

2.4 Sharing benefits with local community

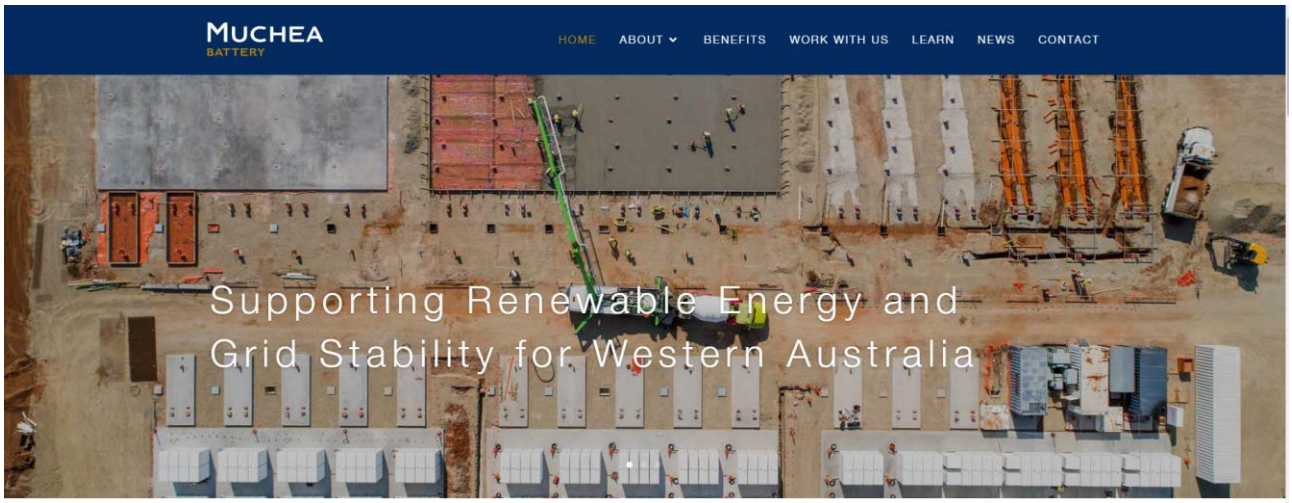
Benefit-sharing with the local community is integral to our approach to community engagement and this element is outlined in greater detail in Section 3 below.

3. COMMUNITY ENGAGEMENT ACTIVITY

3.1 Engagement Channels

3.1.1 Project Website

The Muchea Battery project website was set up at www.mucheabattery.com.au during the early stages of development to provide clear and accessible information about the project to the community. The project website will be regularly updated with project updates throughout the full lifecycle of the project. This is managed and overseen by the Muchea Battery's Project Manager.



The project website also provides information on other project contact points and suggests a number of ways for people to provide comment on the project. These include, but are not limited, to:

- Email us contact@mucheabattery.com.au or call 1800 966 102
- Complete a feedback survey
- Details about community events (including the project Community Information Session)
- A complaints page that is added once the project receives development consent
- A 'visit us' will be included on the page, once the project is constructed and under operation
- See project documents, including project maps (Concept Plan and location)

3.1.2 Project e-mail

The project's e-mail is contact@mucheabattery.com.au. The e-mail remains with the project for its lifetime.

E-mails sent to this address can be accessed from the e-mail domain and are also forwarded to the e-mail of the Project Manager.

3.1.3 1800 Number

The project's 1800 number is 1800 966 102. The number remains with the project for its lifetime.

Calls to this number is forwarded to mobile of the Project Manager. They are forwarded during office hours Mon-Friday 9am-5.30pm, with a project specific recorded answering message at other times. Messages are sent to the project email address.

Local Media Advertising

The Muchea Battery's Community Information Session event was advertised to the general public in local media via the Northern Valleys News. The community information sessions were held on the 9th and 12th of February 2022.

A flyer outlining key project information and advertising the project's Community Information Session was published in the Northern Valleys newspaper on 13th of Jan 2022 and 3rd of Feb 2022. The same flyers were also delivered to about 200 PO boxes withing the township of Muchea. The shire of Chittering assisted us to advertise by including this flyer on their website and in a post on their Facebook page.

See Appendix A for a copy of the flyer that was advertised in local media

3.2 Community Information Session

On 9th and 12th of February 2022, Neoen hosted a Community Information Session with an open invite to the general public. The event was advertised through local media (with the Northern Valleys) and neighbouring suburbs were directly invited via letterboxed flyers.

A total of 20 people attended, including a few of key stakeholders and representatives from the Council and local area.

See Appendix B for a copy of the Community Information Booklet that was distributed at the Community Information Session, and also printed on A1 corflute posters for community viewing. Additionally, a largescale map of the project location and concept plan were provided to the community.

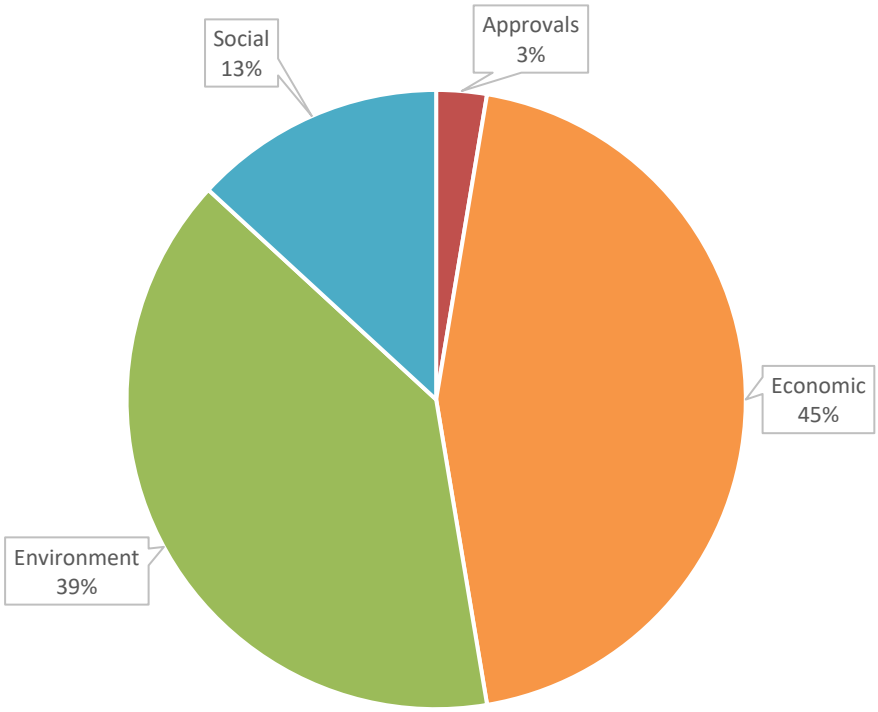
After the event, the community was invited to provide comments and feedback on the project via the project's SurveyMonkey feedback form, as also shared on the website. A link to the feedback form was shared via email to the participants on a voluntary basis.

The Community Information Session was held at the Muchea Community Hall, in Muchea. Neoen and the venue provider made sure the session was COVID-19 safe.

3.3 Summary of response

Community members that participated in the consultation sessions attended from Bindoon in the North of the shire to Lower Chittering in its South. Overall, the participants of the community sessions indicated a high level of interest for the project which was primarily a result of their nearby residential location and personal interest in renewable energy development. On average, respondents scored their interest in the project as a 7 on a scale of 1 out of 10 with 10 representing the greatest level of interest; and their attitude towards the project as an 8 on a scale of 1 out of 10.

Around 80% of respondents cited their residential location nearby in Muchea as the primary reason for interest followed by 40% who also cited renewable energy as a source for their interest. Further discussions with stakeholders at community sessions revealed that as residents of the local community, participants were primarily concerned with aspects of the Project relating to economic benefits and potential environmental impacts. The overall themes raised by participants throughout discussions at both community sessions are shown in figure below



Question themes raised during community consultation

Please see Appendix C for a more detailed summary on Muchea Battery Stakeholder Engagement by Umwelt. Umwelt were engaged by Neoen to undertake stakeholder engagement activities in relation to the proposed utility-scale battery energy storage system (BESS) in Muchea.

4. COMMUNITY BENEFIT SHARING

To ensure both short and long-term benefits flow through to the community as a result of the establishment and operation of Muchea Battery, we establish an annual Community Benefit Fund (CBF).

The CBF will be designed to deliver benefits to key stakeholders in the community in a way that aims to meet their needs and aspirations. Specifically, our objectives are to:

- deliver significant and meaningful improvements to the community surrounding Muchea Battery;
- ensure a wide range of different stakeholder groups benefit from Muchea Battery;
- empower the community to shape the design and implementation of the different initiatives;
- build support for renewable energy in the Muchea locality.

The majority of initiatives will be delivered during the construction and operations phase.

In alignment with Neoen's organisational vision, it is important that the benefit be a true benefit and be tailored to meet each distinct communities' need.

This CBF does not include:

- required activities under our permit conditions
- annual council rates payments or fire levies (where applicable)
- host landowner payments
- the value of local jobs and investment.

However, it is worth noting that these activities will all deliver significant value to the community.

For the Muchea Battery the community benefit fund is still under development.

Table 5: Options for benefit sharing

Option	Pros	Cons	Requirements	Constraints
 Community Benefit Fund	Can create strong regional economic development outcomes. Can create a strong legacy in community. Can provide funding to the community projects in local area to boost sustainability, environmental, biodiversity and education.	Local government can negotiate to 'own' the fund – which may result in a higher cost of administration and potential politicisation of the program. There can be a lack of sophisticated local programs or projects to apply to fund– may need to co-develop.	Strong governance with community representation. Strong evaluation and acquittal. Flexible funding streams to enable longer term projects to access the fund. Consider other existing regional funding bodies and look to enhance or offer point of difference.	Not applicable to committed activities funded by any level of government. A goal of the fund to be allocated to projects within Muchea local community.

5. COMPLAINTS MANAGEMENT PROCESS

The following process has been developed in accordance with the Australian / New Zealand Standard Guidelines for complaint management in organisations and in consideration of recommendations from publications by the National Wind Farm Commissioner, who has also reviewed Neoen's process:

The process for managing complaints and concerns raised by community members involves several key steps including receiving, registering, investigating, responding to, and addressing complaints stakeholders.

Contact details for complaints made via telephone or in written form are contained in Table 13.

Table 6: Complaint lodging contact details

Project website	www.mucheabattery.com.au
Telephone number (toll-free)	1800 966 102
E-mail	contact@mucheabattery.com.au
Mail	Level 6 / 16 Marcus Clarke Street, Canberra, ACT 2601

The contact details in Table 9 will be published on the project's public website, alongside an outline of the complaints and investigation process if and when the development application has been approved. This information will also be made available in community consultations that occur in the lead up to construction commencement, and at any community consultation that is held during the construction period.

Step 1: Receive and register a complaint

Contact is received from community members may be received through the following methods: verbally either in person or via telephone or in written form via electronic mail and/or via the website.

It may be an inquiry, a concern, or a complaint. If it is an inquiry or a concern, we will respond directly to this and simply record this interaction in the stakeholder register/stakeholder relationship management (SRM) database.

If it is a complaint, then the following procedure is followed:

Upon the receipt of a complaint, a set of standardised information will be collected, recorded, and filed to ensure an efficient and standardised process.

The following information will be collected from community members:

- The complainant's name and address;
- A unique reference number is to be communicated to the complainant.
- Any applicable reference number;
- The complainant's concerns including date, time, prevailing conditions and description of the complaint

This information must then be recorded in the project's SRM

Step 2: Acknowledging complaints

A non-urgent complaint will be acknowledged by the responsible Project Manager (see Table 1) within 3 business days of the complaint being submitted. If it's an urgent complaint then a response will be within 24 hours. This acknowledgement will be made via phone or email with any written correspondence dated and kept on file.

The acknowledgement will include:

- A summary of the complaint; with a reference number provided
- The opportunity to clarify issues relating to the complaint or a request for further information if required.
- The proposed investigation approach; and
- An estimated timeframe in which the stakeholder can expect to receive a response.

Where a complaint can be easily resolved or is better categorised as a request by stakeholder for additional information, it may be appropriate for the Project Manager to immediately respond to the stakeholder.

Step 3: Investigating complaints

The Project Manager is responsible for ensuring all complaints are investigated and that all reasonable attempts to seek a resolution are made. The investigation may be delegated to an appropriate Neoen staff member. Accurate records of the investigation must be maintained including records of meetings, discussions and activities.

The investigation may involve:

- Site visits, particularly in the instance of reported property damage;
- Consultation with Neoen staff or contractors, including senior management when required;
- Acquiring monitoring data and evidence (e.g. for noise or dust complaints); and
- Contacting external stakeholders.

Step 4: Responding to stakeholder/complainant

Following the investigation, the results, including details of the findings and proposed resolution, will be clearly explained to the complainant. In most circumstances, it will be at this stage that the complainant will determine if the resolution is satisfactory.

Step 5: Closing the complaint

If the process has been concluded appropriately then the Project Manager will close the complaint and make a file-note to this effect in the Complaints Register. Formal written correspondence must also be issued to the complainant confirming that the complaint has been closed.

If the complainant is not satisfied with the investigation and resolution then the complainant has a right of review. This will be undertaken by the Head of Communications and Engagement to ensure that the complaint process has been properly followed.

If the complainant is not satisfied with Neoen's investigation and proposed resolution, the complainant will be advised by Neoen that they have the ability to contact the Australian Energy Infrastructure Commissioner. Neoen will provide complainants with the relevant contact details, as seen in Table 7.

Table 7: Alternative complaint contacts

State body	Email / number
Australian Energy Infrastructure Commissioner (https://www.aeic.gov.au/)	aeic@aeic.gov.au
Shire of Chittering	chatter@chittering.wa.gov.au (08) 9576 4600

Step 6: Recording and registering the complaint

Upon the closing of a complaint, the following information will be updated in the Complaints Register with the additional following details:

- The process of investigation that was undertaken to resolve the complaint;
- What the proposed resolution was:
- Whether this was accepted and how it was implemented;
- Whether or not the complaint has been resolved to the satisfaction of the complainant.
- The reason why the complaint was closed;

6. REPORTING& EVALUATION

This plan will be monitored and updated to reflect the themes and issues emerging from engagement.

Neoen is committed to continually improving the approach to and identifying opportunities for the community to shape future plans and initiatives. Where possible, monitoring and evaluation activities will be designed to complement other engagement activities.

Evaluation is not a stand-alone or isolated process rather; evaluation is an integral and on-going component of every communication and engagement activity or process. Consequently, evaluation at the beginning of the consultation planning process is as important as it is during and following implementation. Evaluation is a vital element for forward planning and can provide a strategic basis for decisions about issues, including the allocation of resources.

The evaluation process consists of two components (as seen in Table 11):

1. Outcomes – increased satisfaction, awareness or attitudinal change
2. Outputs – measuring and monitoring what is actually produced, released or implemented

Table 8: Evaluation Process - Outcomes and Outputs to be achieved

Evaluation	What will be achieved?
Outcomes	– General community awareness and understanding of the project. – Long term broad local social acceptance of the Battery farm – Widespread understanding among project team, employees, residents, stakeholders and broader community of Neoen's commitment to engaging with the community – General satisfaction among stakeholders that they have been given the opportunity to express their views and that they have been heard – Expectations and issues managed effectively through communications and meaningful engagement – Strong local relationships and trust
Outputs	– Data collected from Feedback Survey – Regular departmental meetings and reporting – Progress meetings with applicant and government – Issue timely and relevant media releases, project bulletins, email broadcasts, direct mail letters and FAQs – Update website with timely and relevant information (ensure email enquiries are logged and responded to) – Schedule for Community Information Days, Open Day, Site Tours, Neighbouring Landholder Forums and other face-to-face engagement events and briefings – Schedule regular briefings with key stakeholders i.e. Council. – Ensure Stakeholder Database is regularly updated, so that relevant stakeholders receive project updates – Complaints register – Benefits sharing model tailored to the local context –

8.1 Objectives of evaluation

The objectives of monitoring and evaluating the delivery of the activities outlined in this CEP are to:

– identify opportunities to improve the approach;

- ensure key stakeholders including the community, partners, and contractors have a clear understanding of the progress and performance of key initiatives;
- identify opportunities for the community to shape future plans and initiatives;
- ensure a current understanding of community concerns and to track any complaints;
- report back to key stakeholders about the performance of Muchea Battery and associated programs

APPENDICES

APPENDIX A. Community Information Session Advertisement

MUCHEA
BATTERY

COMMUNITY DROP-IN SESSION

Wednesday 09 FEBRUARY, 6pm-8pm
& Saturday 12 FEBRUARY, 10am-12pm

MUCHEA HALL
48 Archibald St, Muchea WA 6501

Keeping the community informed

Neoen, a leading renewable energy producer, will be holding a Community Drop-In Session to share project information and hear your thoughts on the proposed Muchea Battery.

The proposed project would be a 200MW/400MWh battery facility to be located 2km north of Muchea on Byrne Road.

Come along to meet members of our project team, view maps and learn more about the project. The Muchea Battery is expected to bring significant community benefits and investment to the local and regional economy.

If you cannot attend one of the sessions above but would like further information, please contact us on the details below or visit our project website at:
https://mucheabattery.com.au/

For more information:

contact@mucheabattery.com.au
1800 966 102
www.neoen.com

APPENDIX B. Community Information Booklet

MUCHEA
BATTERY

Community Information Booklet

NEOEN

mucheabattery.com.au

Aniruddha Deshpande, Project Manager

contact@mucheabattery.com.au

1800 966 102

CONTENTS

NEOEN

GLOBALLY

The company is headquartered in Paris, France, and has four Australian offices – in Sydney, Adelaide,Canberra and Perth.

We operate across renewable energy technologies including solar, wind and storage in Europe, the Americas, Africa, and Australia.

Neoen's total capacity in operation and under construction is currently 4.8 GW and we are aiming for 10 GW by the end of 2025.

LOCALLY

Neoen Australia began operations in 2012. Over the last nine years the company has initiated the development of more than 2GW of solar and wind projects through organic growth, local partnerships and strategic acquisitions.

Neoen produce clean electricity from renewable sources such as sunlight and wind using mature, tried and tested technologies. We are also leaders in energy storage.

WORLD'S FIRST BIG BATTERY
HORNSDALE POWER RESERVE

FIRST STAGE TOOK LESS THAN SIX MONTHS TO BUILD

- 150MW Lithium-ion battery located next to Hornsdale Wind Farm
- Owned and operated by Neoen
- Installed and maintained by Tesla

- Provides grid stability services
- Saved SA energy consumers over $150 million in its first two years
- Now testing grid scale inertia services in a world-first

REDUCES RISK OF BLACKOUT IN SOUTH AUSTRALIA

NEOEN

DELIVERING CHEAPER ENERGY FOR INDUSTRY

LAVERTON STEELWORKS
VICTORIA

Laverton Steelworks have agreed to take power from Neoen's 128 MW Numurkah Solar Farm under a 15-year deal. GFG Alliance's Executive Chairman said the deal would help lower energy costs at Laverton.

DEGRUSSA MINING
WESTERN AUSTRALIA

DeGrussa is the largest off-grid solar battery storage project in Australia. It powers a gold and copper mine in remote WA. Commissioned in June 2016, it provides a solar and storage solution to the majority of the mine's daytime electricity requirements, offsetting up to 20% of total diesel consumption annually.

COLES
AUSTRALIA-WIDE

Coles has signed an agreement that will source large-scale generation certificates (LGCs) from Neoen's portfolio of renewables located across New South Wales, Queensland, Victoria, South Australia and Western Australia. The deal will help Coles towards its target of 100% renewable energy by 2025.

DELIVERING CHEAPER ENERGY TO RETAILERS

ENERGY AUSTRALIA
COLEAMBALLY SOLAR FARM

Providing energy output of 100 MW of the 150 MW solar farm for 12 years.

EnergyAustralia
LIGHT THE WAY

SIMPLY ENERGY
PARKES & GRIFFITH SOLAR FARM

Providing 100% of the energy output of the two solar farms for 13 years.

Simply energy

ACT Government
HORNSDALE WIND FARM

Providing 100% of the energy output of the 309 MW wind farm for 20 years, powering ACT's transition to 100% renewables.

ACT Government

WHAT DOES A BIG BATTERY LOOK LIKE?

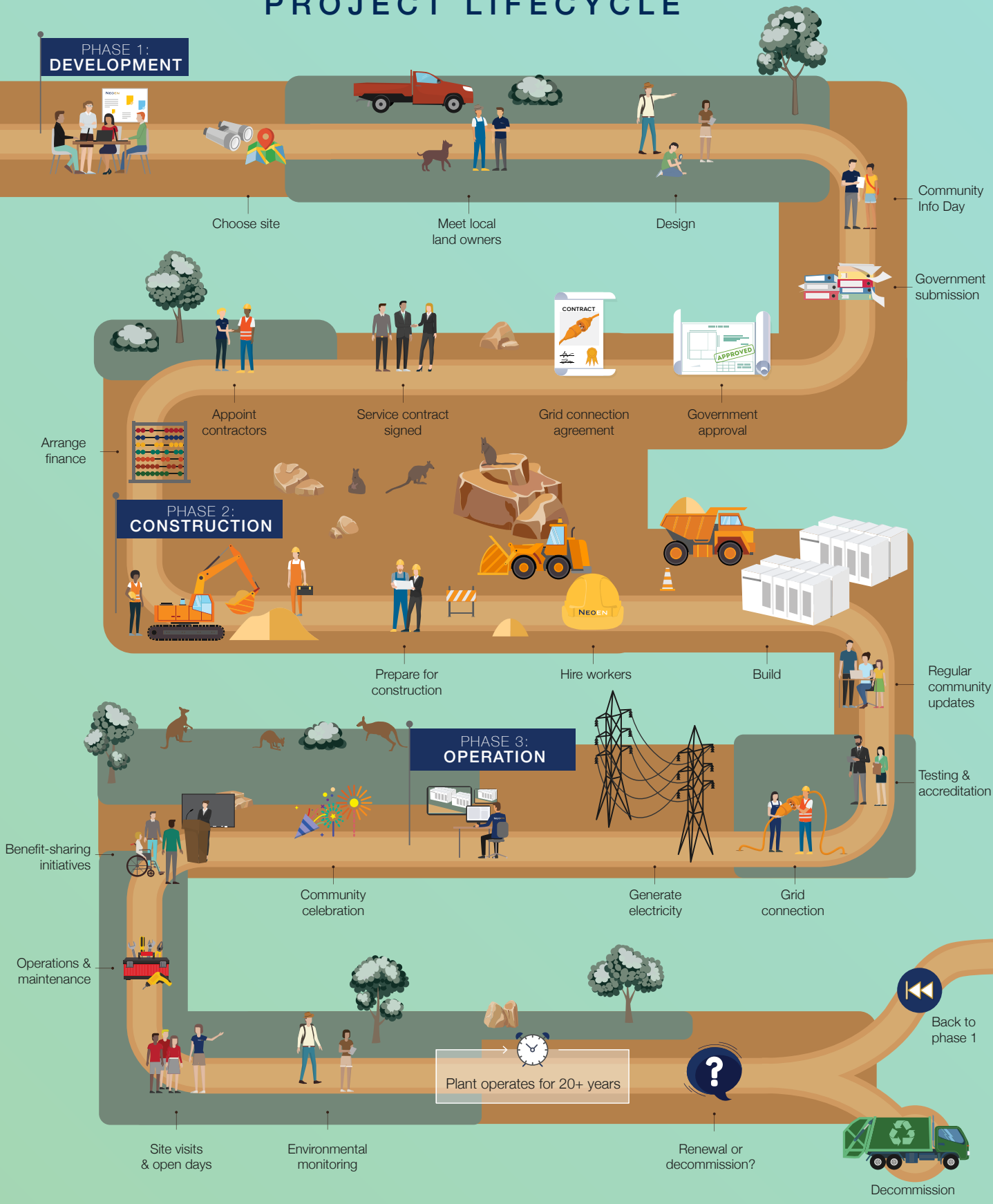
HORNSDALE
POWER RESERVE

Our 150MW battery outside Jamestown, SA co-located with Hornsdale Wind Farm

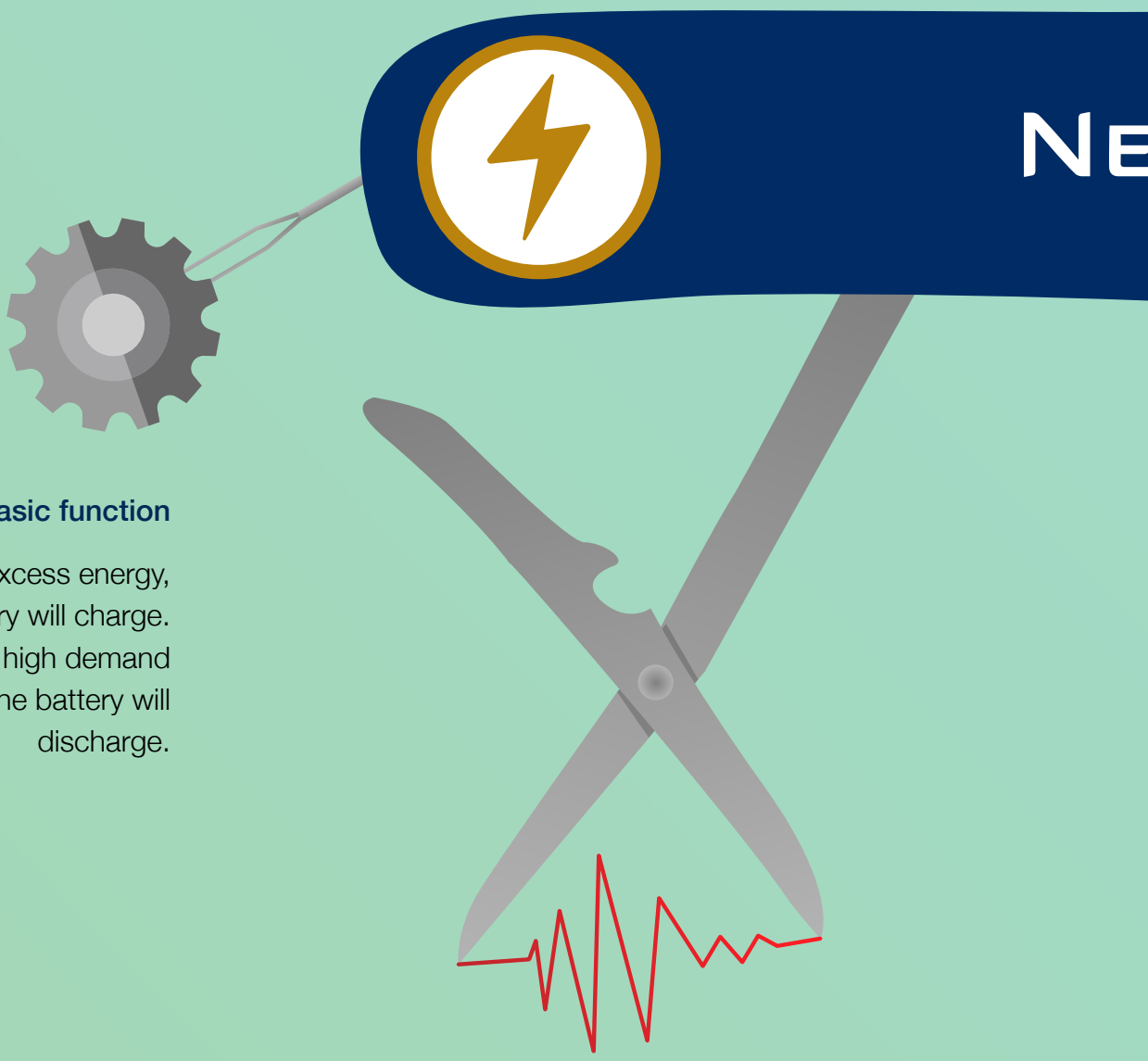
BULGANA
GREEN POWER HUB

Our 20MW battery near Bulgana, Victoria located next to our Bulgana Wind Farm

PROJECT LIFECYCLE



WHAT CAN A BIG



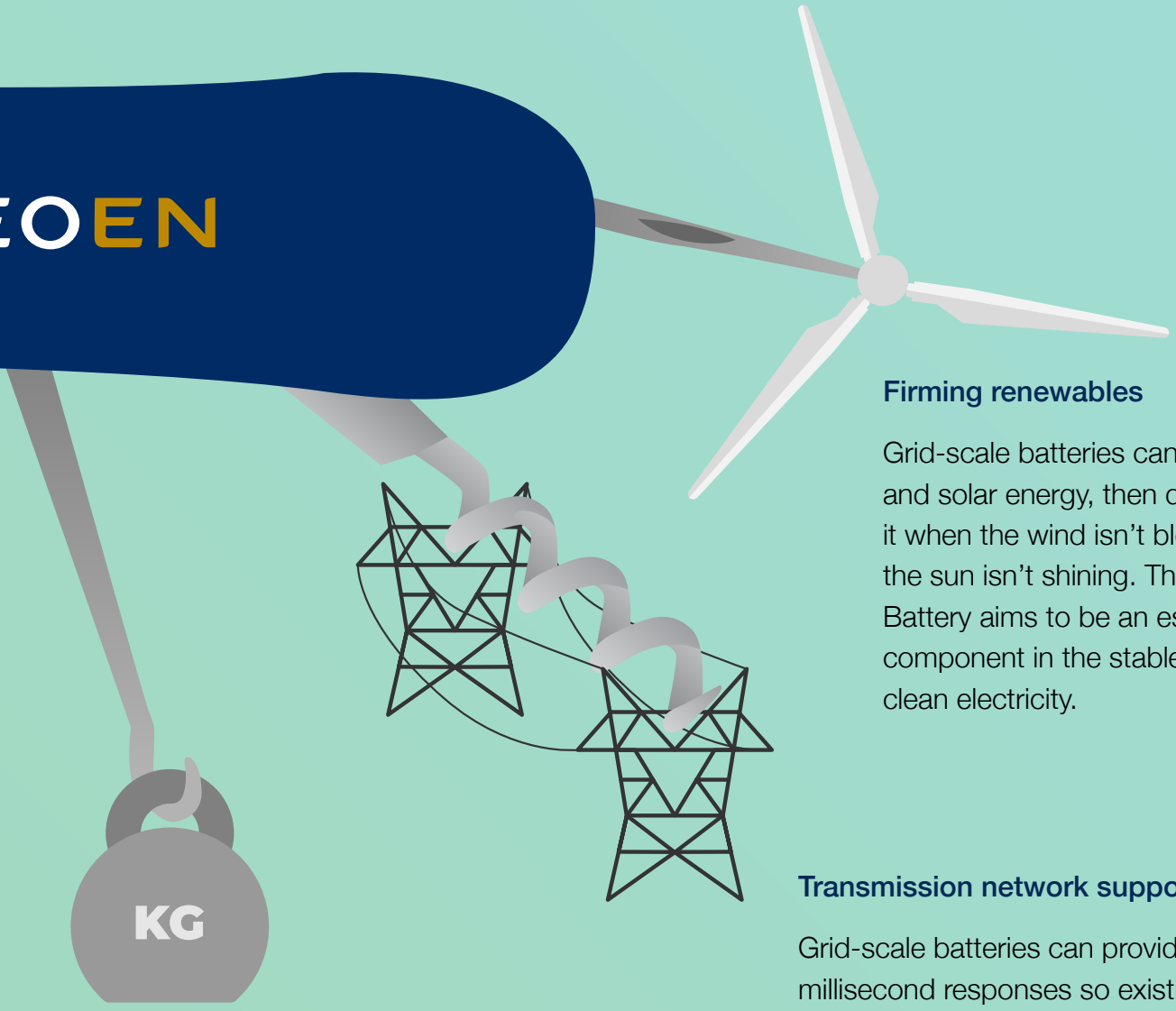
Basic function

When there is excess energy, the battery will charge. When there is high demand for energy, the battery will discharge.

Frequency support

To maintain the stability of the system, the grid requires frequency control services. The battery discharges electrical power into the network in response to frequency changes. The battery can lower the cost of these service markets which results in lower electricity prices for everyday consumers.

BATTERY DO?



Firming renewables

Grid-scale batteries can store wind and solar energy, then discharge it when the wind isn't blowing and the sun isn't shining. The Muchea Battery aims to be an essential component in the stable transition to clean electricity.

Inertia

As with vehicle suspension on an uneven road, inertia services are essential for stabilising the grid. The advanced power inverters associated with a big battery can emulate the inertia services that are currently provided by an ageing fleet of fossil fuel power plants. This service is currently being trialled at our Hornsdale Power Reserve.

Transmission network support

Grid-scale batteries can provide dynamic millisecond responses so existing transmission lines can operate at full capacity. Like adding another lane to a freeway, the battery can unlock additional capacity on existing transmission networks – saving customers millions of dollars in expensive transmission line upgrades.

MUCHEA BATTERY FACTS & FIGURES

Up to
200MW
power capacity

Up to
400MWh
energy storage

Up to
30,000x
more capacity than a household battery

BATTERY TECHNOLOGY

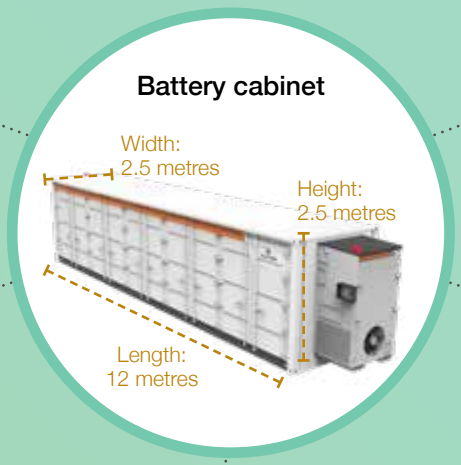
Battery packs are enclosed in custom designed, dust and waterproof 'cabinets' made of galvanised steel. Cabinet colour is white or light coloured to assist with heat management and each cabinet has its own internal thermal management system.

Will conform to electricity industry standards

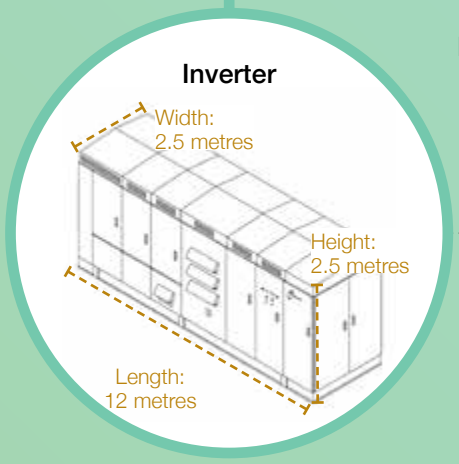
Likely to be lithium-ion battery packs enclosed in steel cabinets, similar to shipping containers

Will use an industrial inverter to convert DC power to AC when discharging (vice versa when charging)

Will meet all safety and bushfire risk requirements

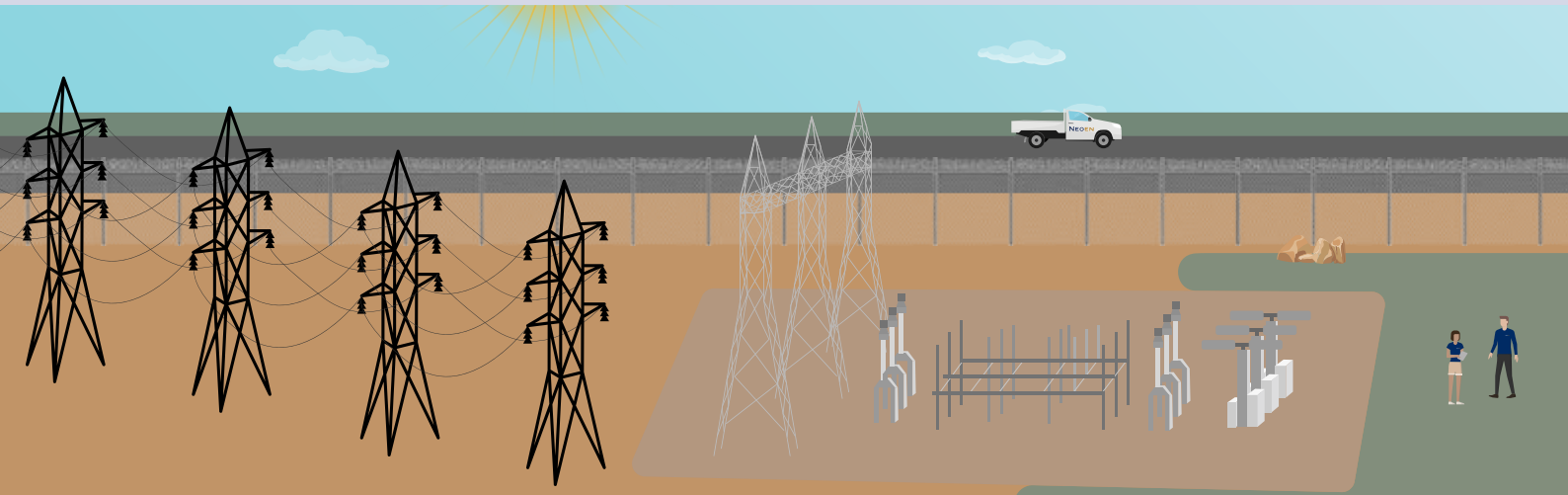


Battery brand to be determined



Inverters are made from galvanised steel, and may exist as one single 20ft container or a few outdoor cabinets on concrete slabs.

CHOOSING THE SITE



1) Good grid location

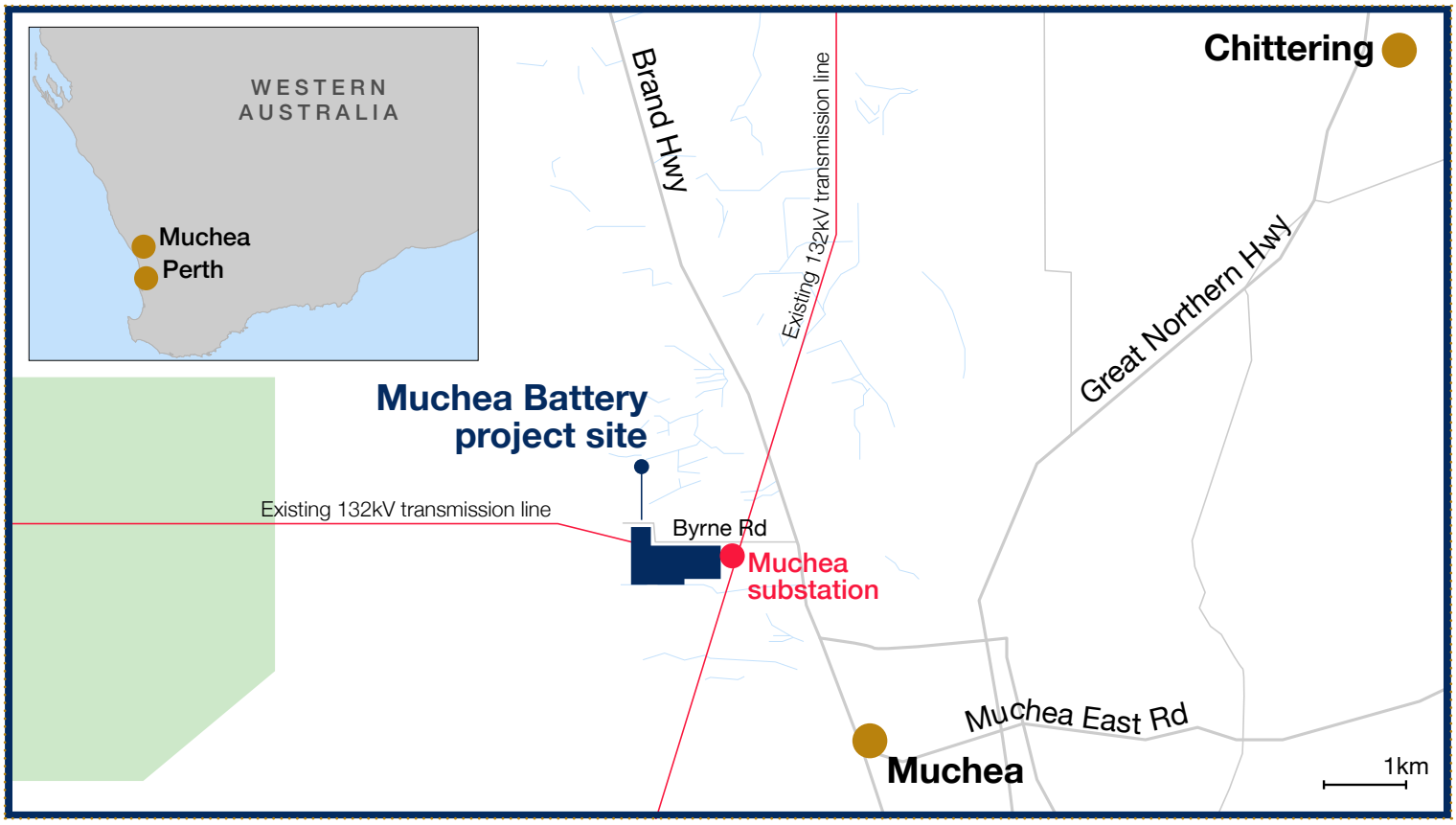
The Muchea Battery will be located approximately 2km north of Muchea – 43km north-east of Perth within the Shire of Chittering.

2) Proximity to substation

It will connect into the Muchea substation at 132kV. The advantage of the close proximity to the substation is that electrical connection infrastructure is minimsed which increases the performance and minimises cost.

3) Site history

Studies of the proposed site location have found little to no presence of significant ecology systems, reducing potential impacts on the local environment.



WE OWN & OPERATE OUR PROJECTS

Muchea Battery

The Muchea Battery will be managed from Neoen's 24/7 Operational Control Centre in the Canberra, which currently operates our 12 existing projects across Australia. This office coordinates with local maintenance contractors for safe, effective and compliant operations.

Neoen's Portfolio

Neoen develops renewable energy projects to own and operate them – not to on-sell them. With over 2GW of operating projects connected to Australia's National Electricity Market (NEM), our asset and operations team play an important role in managing our power plants.

Our Operational Control Centre oversees our interactions with the wholesale electricity market (WEM): a wholesale electricity market in the Southwest Interconnected System.

The WEM commenced operation in September 2006. Its purpose is to supply electricity to homes and businesses in the South West of Western Australia efficiently and securely (through the South West Interconnected System or SWIS). Electricity retailers purchase electricity from generators either directly or indirectly through the WEM.

COMMUNITY BENEFITS

Community benefit fund

The funds would be allocated to local community projects through a competitive annual grants process.

Educational resources

Develop educational resources for local schools to support learning about renewables and our future energy system.

Local tourism

Develop a local tourism initiative centred on batteries or renewable energy

Local jobs

Community co-investment is common overseas and just starting in Australia

Tell us your ideas

To submit your ideas, please fill out our online survey: **surveymonkey.com/r/mucheabattery**

ABOUT STORAGE

Q1. How long will it take to build the battery?
Construction of the Muchea Battery will take around 16 months.

Q2. How big will it be?
Once completed, the battery and associated infrastructure will cover up to 5 hectares of land. The battery cubicles are normally around 2.5 meters tall.

Q3. Where will it be located and why?
The Muchea Battery will be located near the existing Muchea Substation, approximately 2km north of Muchea.

The land is ideal because it is flat, in a rather isolated area and very close to the Substation.

The Muchea Battery will support in stabilizing the grid and the increasing number of renewable projects in WA.

Q4. What technology is being used for the project?
The Muchea Battery will utilise Lithium-Ion batteries and associated equipment from leading manufacturers. These manufacturers are selected through a separate competitive tender process.

In principle, the facility will be an orderly arrangement of battery cabinets, inverters and control systems including electrical and data cabling. The battery packs are enclosed in custom designed, dust and waterproof 'cabinets' made of steel. The cabinet colour will be white, or light coloured to assist with heat management and each cabinet has its own internal thermal management system.

Q5. What is the life cycle of the Battery?
Current battery technology comes with an industry-leading 20-year warranty. The batteries will still retain the majority of their capacity during this period and will be capable of operating beyond it depending on market conditions and other factors.

Q6. How does it work?
The Muchea Battery will store energy in times of high production and release energy in times of high demand, similar to how a battery on a home solar system works. It will also help to stabilise the grid in a few different ways – it has an emergency response mode to prevent blackouts and it can maintain voltage and frequency levels.

Q7. What are the benefits of battery energy storage?
In making the transition from fossil fuels to renewables, the ability to store and dispatch energy will play a key role. Pumped hydro is an example of longer-term storage that is suitable for storing energy and releasing it over days or weeks. However, pumped hydro has a relatively slow 'ramping' time and is less suitable for providing rapid-response services to grid contingency events such as outages or heat waves (with high demand created by air-conditioning). Battery storage, such as lithium-ion technology, fills this key short-term response role.

These are some of the functions a grid-scale lithium-ion battery may be expected to perform:

- Network security services including Frequency Control Ancillary Services, and Network Loading Control Ancillary Services
- System Restart Ancillary Services
- Arbitrage (spot market trading)
- Peak shaving
- Block/load shifting
- Renewable firming and smoothing
- Virtual inertia

Many of these services have been provided by coal and gas generators in the past, but as their business models become unviable and they close down, battery energy storage can, and is, being used to deliver these critical services.

ECONOMIC

Q8. Who will pay for it?
The project will be privately financed by Neoen.

Q9. How is the battery reducing costs for consumers?
Muchea Battery can reduce costs for consumers in three ways:

1. supporting more wind and solar, which are now the cheapest forms of power
2. increasing competition in ancillary markets which lowers (or reduces) electricity prices
3. helping to avoid blackouts and the associated costs

Q10. Will local jobs be created?
It is expected the Muchea Battery will create a significant volume of construction jobs and a number of full-time ongoing positions.

We will also provide opportunities for local suppliers, businesses, schools, and community groups.

LOCAL

Q11. I live nearby – what impact will this have on me?
During construction, we expect some localised traffic, noise, and dust impacts. However, we will be managing these to minimise them as much as possible. Following installation, the battery will be visible at the site and will look like an enclosure of white containers.

Q12. How will construction impact the surrounding area?
As with most projects of this size, there will be some impacts during construction. We will work with the community, neighbours, and council to minimise these impacts.

Q13. How can I have my say on the project?
We will be working with the community throughout the project to understand local concerns and aspirations, and ensure we minimise any impacts. We encourage the community to provide feedback through completing the survey.

SAFETY AND ENVIRONMENT

Q14. What approvals are required for the project?
The project requires a development permit from the Shire of Chittering and Development Assessment Panels

Q15. Will the battery increase the risk of fire?
The Muchea Battery will meet all relevant standards for fire safety, and we are working with the local fire authority to ensure the project also meets their requirements.

Q16. What happens to the batteries when they reach the end of their life?
We make a commitment that all above-ground infrastructure will be removed, and the site rehabilitated when the project ceases to operate. After removal, a large percentage of the material in the batteries will be reclaimed or recycled; over 60% of materials especially critical minerals will be recovered for re-use.

Q17. Are there any health risks?
The Muchea Battery is using similar technology to the batteries that are being increasingly installed in homes, just on a larger scale. There are no known health risks associated with properly maintained large-scale battery installations.

Q18. Is the project reducing air quality?
Monitoring of dust levels during construction is a basic requirement of each project. Dust generating activities are assessed during windy conditions and are stopped and rescheduled where adequate control of dust generation cannot be achieved.

Visual observation of machinery is undertaken during site inspections in addition to daily pre-start checks which ensure all machinery has appropriate emission control devices, is in good working order and is maintained correctly.

MUCHEA
BATTERY

mucheabattery.com.au

Aniruddha Deshpande, Project Manager

contact@mucheabattery.com.au

1800 966 102

APPENDIX C: Muchea Battery Stakeholder Engagement Summary

Inspired People.
Dedicated Team.
Quality Outcomes.

Briefing Note

To: Aniruddha Deshpande, Project Manager, Neoen Australia Pty Ltd

E | aniruddha.deshpande@neoen.com

Cc: Nathan Ling, WA State Leader, Neoen Australia Pty Ltd; Rob Karelse, Environmental Manager WA, Umwelt

E | nathan.ling@neoen.com

From: Karen Lamb, Social Work Area Manager, Umwelt

Date: 10 March 2022

Subject: **Muchea Battery Stakeholder Engagement Summary**

Purpose

This briefing note provides an overview of the stakeholder engagement process undertaken as part of the planning application for the proposed Muchea battery energy storage system (BESS) in the Shire of Chittering (the Project). Community consultation sessions were conducted on the 9th and 12th of February 2022 at the Muchea Community Centre to provide an opportunity for input from local residents and businesses. Other targeted consultation was also completed with nearby landholders and relevant government agencies. This briefing note outlines the process taken to consult and engage stakeholders, the outcomes of these discussions, and the planning considerations made to address any concerns.

In this document:

Umwelt (Australia) Pty Limited

ABN 18 059 519 041

T| 1300 793 267
E| info@umwelt.com.au

www.umwelt.com.au

1.0 Introduction

Umwelt were engaged by Neoen to undertake stakeholder engagement activities in relation to the proposed utility-scale battery energy storage system (BESS) in Muchea. The BESS is expected to have an output capacity of 200MW and storage capacity of 400MWh.

Engagement activities sought to inform the local community, nearby landholders, and government agencies and seek their views on the proposed Project. The purpose of these activities was to develop genuine and effective relationships with key stakeholders and the local community for the ongoing success of the project and to ensure local priorities and concerns were addressed in the Project's design.

2.0 Study Area

The key stakeholders identified as a part of this process were neighbouring landholders, key special interest groups located within the Shire of Chittering which encompasses the localities of Muchea, Bindoon, Chittering, Lower Chittering, and Wannamal and the broader community of Muchea.

Government agencies that were engaged included those with an interest in the potential approval pathways of the project, such as State Departments, the local shire, and other regulatory agencies.

3.0 Engagement and consultation process

3.1 Aim

The purpose of the community consultation activities undertaken was to inform stakeholders with regards to the proposed Project and its associated activities, to provide a significant level of understanding of local concerns and priorities relating to the Project and to identify areas of interest for the implementation of a community benefit-sharing program over the life of the Project. Detailed understanding of these stakeholder inputs has been critical for ensuring the Project sufficiently addressed any potential impacts and will provide long-term sustainability for operations. Overall, the key objectives of Neoen's stakeholder engagement framework that were addressed through this process were:

1. Foster a transparent and open approach to project development and ensure 'no surprises' for the local community.
2. Keep the community and stakeholders informed about the Project through the provision of accurate, timely and factual project information.
3. Identify and address community and stakeholder concerns and maintain transparency in the Project's design, implementation, and ongoing operations.
4. Involve stakeholders and community regarding key decisions
5. Identify opportunities for local business involvement and local employment in the construction and operation of the Project
6. Co-design, develop and deliver a benefit sharing program in collaboration with the community, and in partnership with local stakeholders where possible.
7. Develop long-term relationships and partnerships with community and stakeholders.

3.2 Stakeholder Analysis

3.2.1 Neighbouring Landholders and Community Groups

Neighbouring landholders were identified as those located within the target area shown in **Figure 1.** To ascertain land ownership, title searchers were conducted via Landgate databases and contact details obtained from public directories. There were a total of 7 private individuals identified as neighbouring landowners to be engaged as part of the stakeholder engagement process. One landholder was identified as the agency overseeing the Dampier to Bunbury Natural Gas Pipeline (which has two easements traversing the Project site), however this stakeholder was engaged with the other government agencies associated with the Project's approval pathway rather than as a neighbouring landholder due to the nature of their potential involvement in obtaining project approval. The input of one community group – the Chittering Landcare Group – was also sought through this process due to their significant involvement with land management in the area.

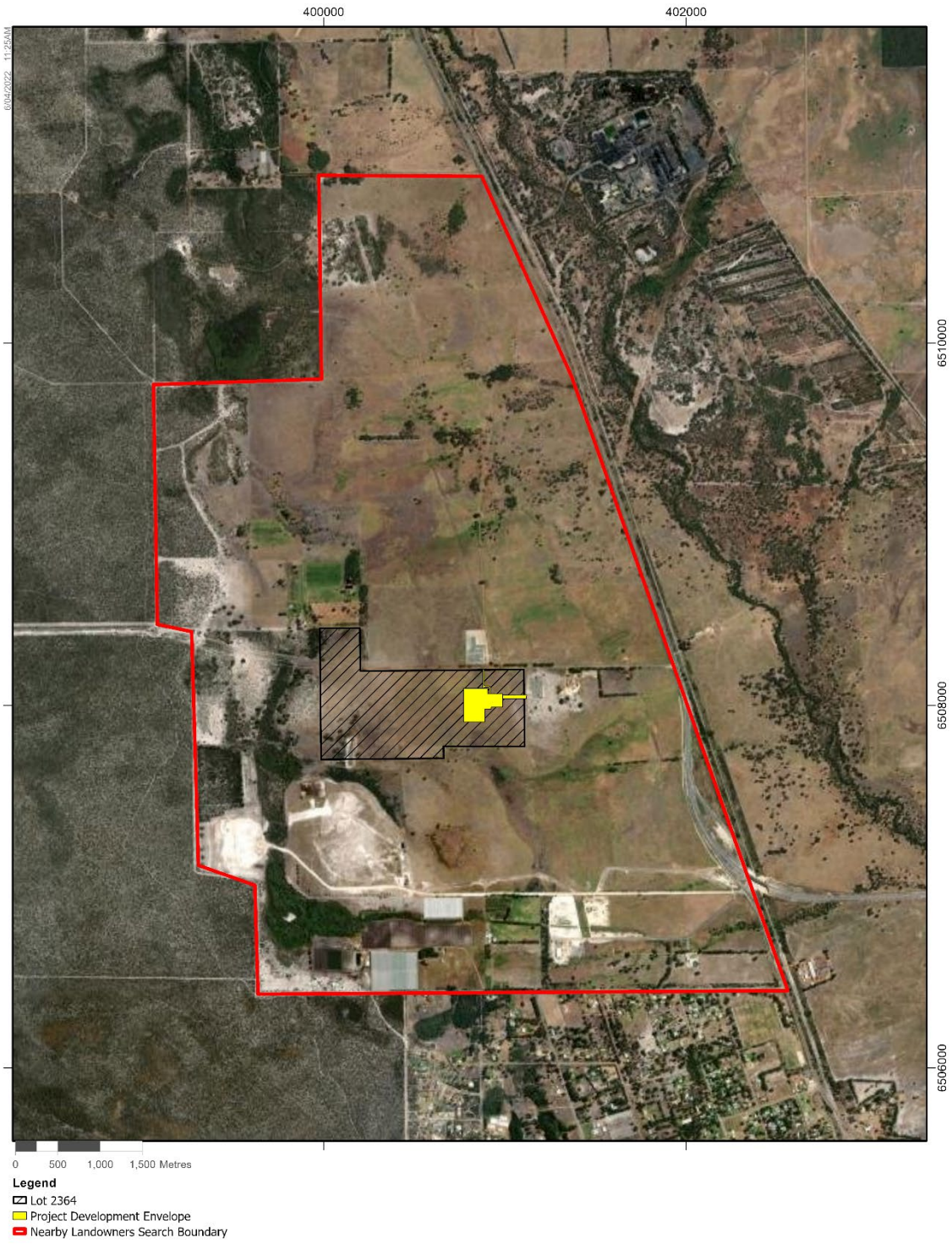


Figure 1. Project Location and Nearby Landowner Boundary

3.2.2 Local Community

The broader community as represented by the township of Muchea (Shire of Chittering) were also involved in the consultation process. Invitation was made for any interested parties to attend either a weekday or weekend consultation session where detailed information on the Project was provided as well as the opportunity to ask further questions from Umwelt consultants and a Neoen representative. Invitations were sent out via post, social media, and local newspapers to ensure a full representation of results across the local community. Further information on mechanisms is provided below.

3.2.3 Government Agencies

Government agencies that were consulted during the stakeholder engagement process included all relevant referring agencies with potential to be involved in the Project's approval pathway. These agencies are listed in **Table 1.**

Table 1. Government Agency Stakeholders Consulted

Stakeholder Agency	Engagement Focus / Objectives
Shire of Chittering	Identify planning approval pathway and areas of interest or concern.
Department of Water and Environmental Regulation (DWER)	Discuss acid sulphate soil risk in the area, potential impacts to water and requirements or considerations for noise impact assessment.
Department of Fire and Emergency Services	Understand unexploded ordinance risk in the Study Area and considerations for bush fire planning.
Main Roads WA (MRWA)	Consult with Main Roads WA regarding proposed site access arrangements, potential impacts or opportunities associated with this and necessary considerations should impacts be identified.
Department of Planning, Lands and Heritage (Development Assessment Panel Secretariat; Aboriginal Heritage)	Discuss Development Assessment Panel (DAP) process. Identify potential risks to Aboriginal heritage in the Study Area and other existing heritage values.
Department of Mines, Industrial Regulation and Safety (DMIRS)	Discuss Special Prospecting Authority with Acreage Options (SPA 34) petroleum tenure and exploration lease (E70/4905) which overlap in the Study Area.
Department of Jobs, Tourism, Science, and Innovation (JTSI)	Discuss alignment with state level strategies around renewable energy and Future Battery Industries
Department of Biodiversity, Conservation and Attractions (DBCA)	Conduct discussions relating to project development being within footprint of Multiple Use Wetland and understand concerns relating to biodiversity impact to identify any referral requirements.
Australian Gas Infrastructure Group (AGIG)/ Department of Planning, Lands and Heritage (DPLH)	Identify planning requirements relating to Dampier-Bunbury Natural Gas Pipeline easement traversing the Project site and approvals pathway where necessary.

3.3 Engagement Timeline

Engagement activities for the purposes of the Development Application commenced in June 2021 and were completed in March 2022. However, Neoen acknowledge that consultation with its stakeholders is an ongoing process and will seek to continue informing and engaging with its stakeholders throughout the project development process as appropriate. **Table 2** provides a timeline of activities undertaken and the relevant stakeholder groups who participated.

Table 2. Timeline of Stakeholder Engagement Activities Undertaken to Date

Date	Relevant Group	Activity	Summary
June 2021 - March 2022	**Government Agencies**	**Initial contact and meetings**	Relevant agencies contacted to discuss the Project and any concerns or opportunities from the perspective of each agency
Dec 2021 - Jan 2022	**Landowners**	**Initial contact via phone and / or letter**	Relevant landowners contacted to provide project information and arrange meetings for further clarification if necessary
Jan 2022	**Local Community**	**Consultation Invitations via newspaper, Shire of Chittering website and Facebook page, and a flyer**	Invitations sent to the local community via multiple mediums to attend consultation sessions held in February
Feb 2022	**Local Community**	**Stakeholder Meetings (Public Consultation Sessions)**	Consultation sessions held at the Muchea Community Centre to provide project information and understand local concerns and priorities from the wider community
Feb 2022	**All**	**Stakeholder Engagement briefing note (this document)**	Results and outcomes of the community engagement activities undertaken are provided in report format and summarised in the final Development Application

3.4 Engagement Mechanisms

The engagement of stakeholders and community groups included a combination of mechanisms which are outlined in **Table 3** and further detailed in the following subsections. Mechanisms included:

- **Consultation and engagement:** To facilitate stakeholder involvement in the identification of issues/impacts, areas of interest/concern and strategies to address the issues raised.
- **Information provision:** To improve knowledge and awareness of the company, its activities, the proposed project.

Table 3. Stakeholder Engagement Mechanisms

Mechanism	Description	Targeted Stakeholder Group
Consultation and Engagement		
Project briefings and key stakeholder meetings	Targeted meetings and briefings with key local and state government agencies as required (as detailed at Table 1 above).	Local Government State Government
Personal letters and phone calls	Attempts to undertaken individual discussions / meetings with neighbouring landholders were made via phone and / or letter where phone details were not available. Letters contained details of the project team should they require further information on the project or want a personal interview.	Neighbouring landholders
Community drop-in information sessions held on 9th Feb and 12th Feb 2022	To provide stakeholders with an overview of the Project and to gather community feedback with regards to potential impacts and opportunities. The sessions included a poster board display of current Project information. Participants were invited to attend the session via: • Flyer delivered to all PO boxes within the township of Muchea (approximately 200). • Inclusion of a post on the Shire of Chittering Facebook page on 2nd Feb. • Added to the Shire of Chittering website events calendar (late Jan). • Advertisements in the Northern Valley News (Jan and Feb editions).	Local community All interested stakeholders 20 attendees across both info sessions
Survey	A survey instrument was used to capture community feedback on the Project. The Survey was offered to participants to complete at the Community Information Sessions. A QR code and link to the survey was also provided in all project documentation, i.e. on the Project website, newspaper advertisements, and in correspondence with neighbouring landholders.	10 completed surveys
Information Provision		
Project information booklet	Development of a Project information booklet available in both hard copy and online detailing the Project and providing contact details for the project team.	Neighbouring landholders and info session attendees

Mechanism	Description	Targeted Stakeholder Group
Newspaper advertisement	Advertisements were placed in the January and February editions of the Northern Valley News (NVN) advising readers with regards to the proposed project and upcoming information sessions.	Wider community NVN has a distribution of 6500 homes and businesses (including those in Muchea)
Project website	Established by Neoen including key project information, project team contacts and a link to the survey.	All interested stakeholders

3.4.1 Nearby Landholders

Nearby landholders were initially contacted using details collected from publicly available databases. Project information was communicated through the Project website established by Neoen, with letters being issued to landholders which introduced the Project and contained addresses for both the Project website. The Project website contains information relating to the project purpose, design and lifecycle and an online survey. Landholders were also invited to attend the community sessions held for the wider community as well as being provided the opportunity to discuss any concerns and questions in detail via private meetings with a Project consultant from Umwelt.

3.4.2 Local Community

Two consultation sessions were held at the Muchea Community Centre in February following invitations being sent out to the local community through local newspapers, mail, and social media. Invitation was sent out in early-January with sessions held on a Wednesday night and late Saturday morning in mid-February to accommodate as many attendees as possible. A project website was established by Neoen to allow interested parties to review Project details prior to attending the consultation sessions, and both a representative for Neoen and 2-3 Umwelt consultants were present at the sessions to discuss the Project design with local community members and provide further information and clarification where needed. Detailed project information was communicated in-person to attendees through a range of media provided by Neoen and Umwelt that included infographics, site maps, project designs, and results collected from the technical studies previously completed. Community members made use of both online and written surveys to provide feedback, with notes also taken by an Umwelt consultant of key points verbally raised by attendees during each session.

3.4.3 Government Agencies

Relevant government authorities or stakeholders with an interest in the Project or potential to be involved in the approval pathway were engaged to discuss the Project and address any concerns. There was also an aim of understanding priorities at both a state and local level to ensure the Project remains aligned with the overall development goals in the region. During discussions, Umwelt provided information on the Project and obtained feedback from representatives of these agencies on potential approval requirements, areas of concern and general considerations relating to their field of interest.

4.0 Engagement Outcomes

4.1 Nearby Landholders

Following preliminary discussions and information provision regarding the project, no neighbouring landholders requested further information or follow-up meetings for clarification. Points of contact were provided to these landholders and their details were recorded in a stakeholder registry to ensure that communication channels remain open and ongoing throughout the lifetime of the Project.

4.2 Local Community

Community members that participated in the consultation sessions attended from Bindoon in the North of the shire to Lower Chittering in its South. Overall, the participants of the community sessions indicated a high level of interest for the project which was primarily a result of their nearby residential location and personal interest in renewable energy development. On average, respondents scored their interest in the project as a 7 on a scale of 1 out of 10 with 10 representing the greatest level of interest; and their attitude towards the project as an 8 on a scale of 1 out of 10.

Around 80% of respondents cited their residential location nearby in Muchea as the primary reason for interest followed by 40% who also cited renewable energy as a source for their interest. Further discussions with stakeholders at community sessions revealed that as residents of the local community, participants were primarily concerned with aspects of the Project relating to economic benefits and potential environmental impacts. The overall themes raised by participants throughout discussions at both community sessions are shown in **Figure 2.**

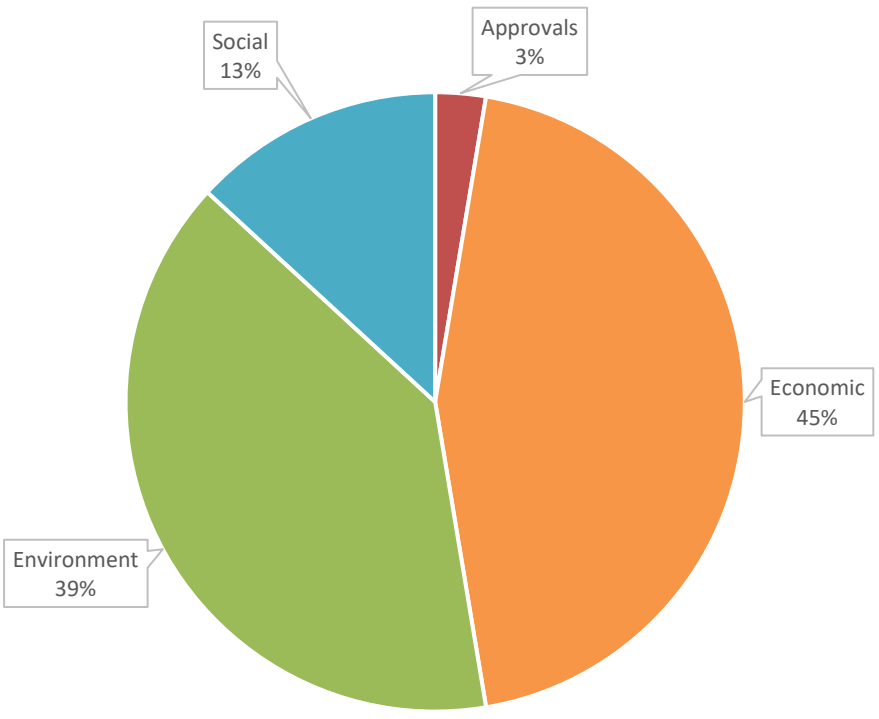


Figure 2. Question Themes Raised During Community Consultation

Environmental concerns raised by residents were related to groundwater impacts from contaminants as a result of spills or leaks and bushfire risk associated with the battery modules themselves. When it came to survey responses, participants further indicated that “fire risks” and long-term safety, “environmental impacts” and “any interference with groundwater” were of key concern. In terms of addressing these, participants identified “careful studies and monitoring”, “environmental reports”, and “communication” as preferred approaches

Regarding groundwater, the Project is located within the Ellen Brook sub-catchment and has both locally and regionally important groundwater resources. Residents were particularly concerned around potential impacts to these groundwater resources from either the construction or operational phases of the Project. These were addressed through the flood risk mapping, hydrological study, and Project design provided by Neoen and Umwelt. Through further discussion, residents also raised the potential of benefits to groundwater resources through some form of investment in conservation activities from the proposed Community Benefit Program.

The Project site is designated as a Bush Fire Prone Area and in their responses, participants also raised concerns about potential risk of the BESS to interact with or lead to a bush fire. This was addressed by Neoen’s site operating strategy which is specifically designed to allow for the quick detection, isolation and decommissioning of any problematic units. The proposed battery module units to be used at the site have an operating temperature of -30°C to 50°C, outside of which they are externally shut down by a 24/7 monitoring facility. Tesla Megapack battery modules, one of two battery models proposed, also have a number of design features such as highly insulated steel encasing used to encapsulate modules, installation of thermally insulated steel vents within the thermal roof protecting the units from flame impingements and hot gas intrusion, as well as active monitoring and electrical fault safety devices. These features in conjunction with Neoen’s site operating strategy ensure that any potential fire event can be quickly detected and isolated from spreading to nearby modules.

Other precautions include completion of a Bushfire Attack Level (BAL) assessment and adoption of appropriate mitigation measures to minimise the risk of bushfire impacting the facility.

Perceived social impacts raised by residents ranged from costs to individual households to noise impacts from the operations of the Project. Some residents were primarily curious as to whether the Project would impact their access to and financial benefit from residential roof-top solar and were reassured that there would be greater capacity for use of solar energy sources in a power grid with a sufficient reserve system. Potential noise impacts from the project were largely raised by participants who knew a resident that had been invited to participate in the ongoing noise impact assessment study. Overall, residents that raised concerns relating to noise impacts were aiming to understand the level of impact expected and any proposed mitigation strategies.

Local economic costs and benefits were also a key factor of the Project raised by local community members that attended consultation sessions. Residents were informed that project finance was being generated solely by Neoen with no local costs associated with the Project. Other questions were mainly neutral and related to the renewable energy industry as a whole and Neoen's business model. The community perception was largely that renewable energy projects were a positive addition to the local economy. Survey participants identified many perceived benefits relating to BESS facilities and 100% of survey respondents indicated that their ability to "support renewable energy" as a benefit followed by “they stabilise the grid and help prevent black-outs” (80%). Other answers such as “They bring investment into the region” and “they help reduce energy costs for consumers” were also popular at 60% each, suggesting

there is wide-ranging support across participants from the local community for BESS projects and renewable energy development in general. Potential opportunities relating to the Project, as identified by survey participants, ranged from energy security produced by a greater renewable energy share to greater rebates being made available for roof-top solar customers. Another suggested opportunity was "becoming a beacon of what can be done environmentally when all aspects considered", which further support the importance that the surrounding environment and its ecological integrity represent to the community and local economy.

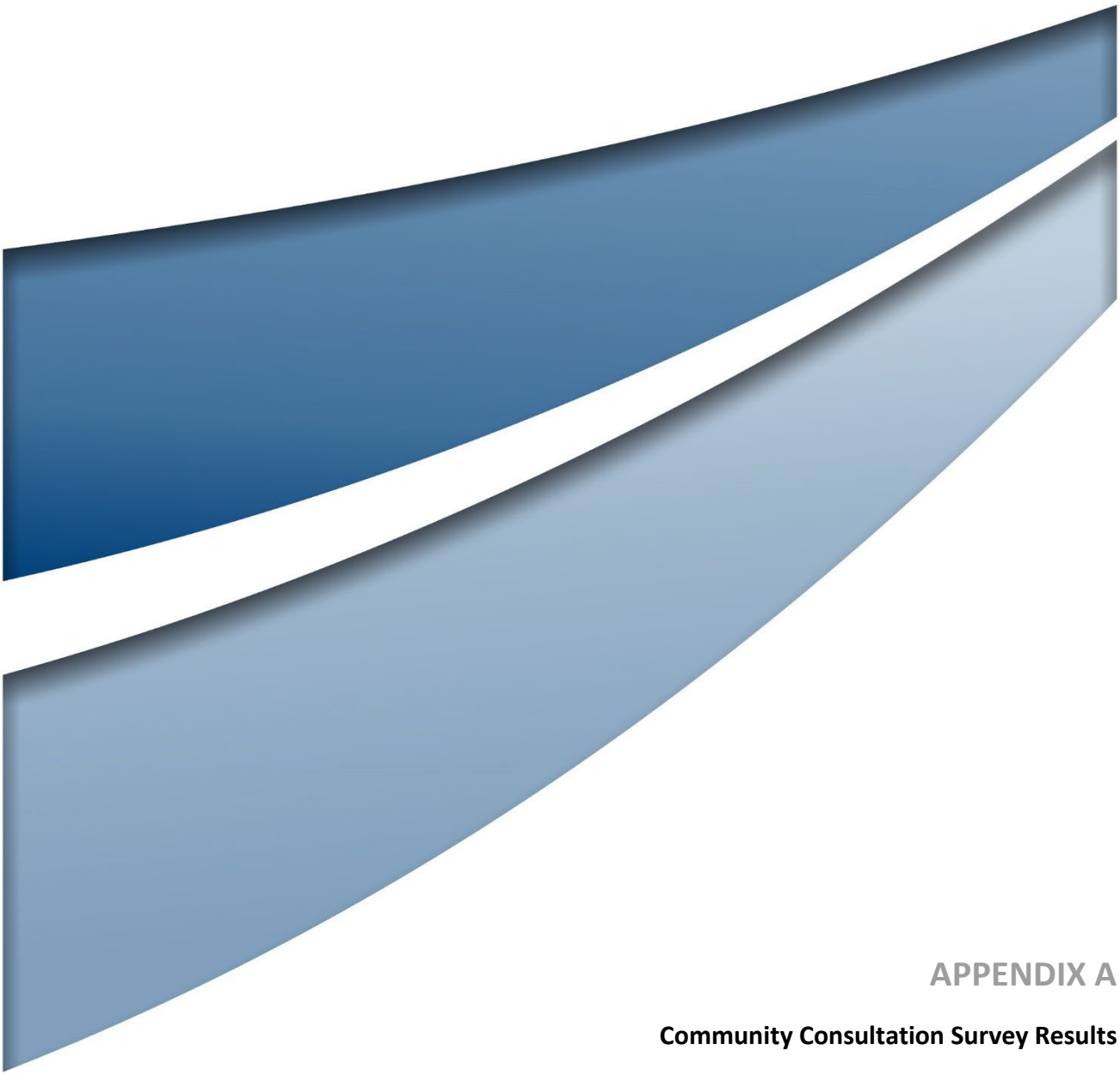
4.3 Government Agencies

Government agencies provided a number of key planning considerations that have been addressed through the development application to ensure a successful and streamlined approvals process. In particular these have included:

- Undertaking the necessary baseline and technical studies to ensure all aspects of the approval application and potential approval conditions were addressed sufficiently.
- Accounting for the Project-specific requirements relating to any existing easements located nearby or within the Project's development envelope.
- Identifying the relevant licences required for approval and the necessary requirements to obtain these.
- The priorities and goals of government stakeholders in relation to the benefits produced by the project and how these can be accommodated.

5.0 Next Steps/Outcomes

As a result of the Stakeholder enagegment mechanisms carried out here, Umwelt has determined there is be broad support and a high level of interest from the local community for the Project. The mechanisms implemented as part of stakeholder consultations has allowed an open and effective dialogue to be established between Neoen, the local community, and government agencies at both a local and state level. This has also engaged stakeholders to understand the Project's development and the range of technical impact studies carried out to address potential risks. Communication channels have also been established and will be maintained throughout the life of the project with nearby landowners to ensure its ongoing success and support, and a number of opportunities have been identified for implementation of a community benefit-sharing program. It is expected this program will further reinforce the benefits generated by the Project and help to direct these to areas of priority for local residents.



APPENDIX A

Community Consultation Survey Results

Muchea Battery - Community Survey

COMPLETE

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Last Modified:	Saturday, January 22, 2022 2:19:57 PM
Time Spent:	00:04:41
IP Address:	1.122.77.106

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6084

Q2

How did you hear about the project ?

In the news

Q3

What is your level of interest in the project ?

7

Q4

What is the reason for your interest in the project ?

I live in the Shire of Chittering

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

6

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

They stabilise the grid and help prevent black-outs

Environmental or biodiversity project

Q8

What, if any, concerns do you have about battery storage ?

Fire risks and battery stability

Q9

How do you think these concerns could be addressed ?

Communication

Q10

What opportunities do you see for battery storage ?

Stable power supply, greater use of renewable energy

Q11

Is there any specific information that would help you to better understand the project ?

Project timeline

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Local media

Muchea Battery - Community Survey

COMPLETE

Started:	Sunday, February 06, 2022 10:24:58 PM
Last Modified:	Sunday, February 06, 2022 10:41:54 PM
Time Spent:	00:16:56
IP Address:	1.127.105.144

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Flyer in letterbox

Q3

What is your level of interest in the project ?

10

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

I'm interested in renewable energy

I live in the Shire of Chittering

Other (please specify):
I am interested in the environmental impact on the surrounding area in case of some kind of catostrophic event- for eg fire, cyclone or earthquake. Admittedly rare, but given the project is to be over 20 years+, not unreasonable.

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

6

They support renewable energy

They bring investment into the region

They stabilise the grid and help prevent black-outs

They help to reduce energy costs for consumers

They can provide educational opportunities

Other / comments:
This COULD bring a great example to our community of wise, environmentally sensitive electrical supply and replenishment of existing under-utilised land, via revegetation+

Q7

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Environmental or biodiversity project

Education about renewable energy for local schools

Support for local community building initiatives

My idea is....:
this could also incorporate a Eco-tourism if done properly.

Q8

What, if any, concerns do you have about battery storage ?

What the batteries will be conatained in-are they safe long term and in all perceived 'situations-fire, winds, quakes+'

Q9

How do you think these concerns could be addressed ?

explanation.
View to immprove current environment and not have any influence on the groundwater beneath. Chittering/ Gingin has become an horticultural hub and so we need to preserve the essence of our existence-Good water quality and availability.

Q10

What opportunities do you see for battery storage ?

becoming a beacon of what CAN be done environmentally when all aspects considered.

Q11

Is there any specific information that would help you to better understand the project ?

1 environmental report(s)?
2 proposed water management
3 future environmental considerations

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Newsletters

Muchea Battery - Community Survey

QUESTION SUMMARIES | DATA TRENDS | INDIVIDUAL RESPONSES

Respondent #3

COMPLETE

Started:	Tuesday, February 15, 2022 11:51:15 AM
Last Modified:	Tuesday, February 15, 2022 11:54:18 AM
Time Spent:	00:03:03
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Social media

Q3

What is your level of interest in the project ?

10

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

10

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

They bring investment into the region

10 responses

Q7

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Education about renewable energy for local schools

Q8

What, if any, concerns do you have about battery storage ?

Fire

Q9

How do you think these concerns could be addressed ?

Good fire suppression

Q10

What opportunities do you see for battery storage ?

N/A

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

QUESTION SUMMARIES | DATA TRENDS | INDIVIDUAL RESPONSES

Respondent #4

COMPLETE

Started:	Tuesday, February 15, 2022 11:55:45 AM
Last Modified:	Tuesday, February 15, 2022 11:57:27 AM
Time Spent:	00:01:41
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Other (please specify):
Local Newspaper

Q3

What is your level of interest in the project ?

10

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

10

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

They bring investment into the region

10 responses

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Environmental or biodiversity project

Q8

What, if any, concerns do you have about battery storage ?

Just environmental impact and bushfire risk

Q9

How do you think these concerns could be addressed ?

Careful studies and monitoring

Q10

What opportunities do you see for battery storage ?

N/A

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

QUESTION SUMMARIES | DATA TRENDS | INDIVIDUAL RESPONSES

Respondent #5

COMPLETE

Started:	Tuesday, February 15, 2022 11:57:51 AM
Last Modified:	Tuesday, February 15, 2022 12:00:37 PM
Time Spent:	00:02:45
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Social media

Word of mouth

Q3

What is your level of interest in the project ?

5

Q4

What is the reason for your interest in the project ?

I'm interested in renewable energy

Other (please specify):
Just north in Gingin

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

7

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

10 responses

Q7

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Environmental or biodiversity project

Education about renewable energy for local schools

Support for local community building initiatives

Q8

What, if any, concerns do you have about battery storage ?

N/A

Q9

How do you think these concerns could be addressed ?

N/A

Q10

What opportunities do you see for battery storage ?

Power payments to roof solar

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

COMPLETE

Started:	Tuesday, February 15, 2022 12:00:55 PM
Last Modified:	Tuesday, February 15, 2022 12:02:23 PM
Time Spent:	00:01:28
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Flyer in letterbox

Q3

What is your level of interest in the project ?

5

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

5

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

They help to reduce energy costs for consumers

Support for local community building initiatives

Q8

What, if any, concerns do you have about battery storage ?

N/A

Q9

How do you think these concerns could be addressed ?

N/A

Q10

What opportunities do you see for battery storage ?

N/A

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

COMPLETE

Started:	Tuesday, February 15, 2022 12:02:33 PM
Last Modified:	Tuesday, February 15, 2022 12:07:45 PM
Time Spent:	00:05:11
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Flyer in letterbox

Q3

What is your level of interest in the project ?

10

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

I'm interested in renewable energy

I live in the Shire of Chittering

Other (please specify):
Love innovation that doesn't create a negative environmental impact.

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

7

Q6

They bring investment into the region

They stabilise the grid and help prevent black-outs

They help to reduce energy costs for consumers

They can provide educational opportunities

Q7

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Environmental or biodiversity project

Education about renewable energy for local schools

Support for local community building initiatives

My idea is....:
Create an eco-tourist type activity to show what can be done on many facets

Q8

What, if any, concerns do you have about battery storage ?

ANY interference with groundwater

Q9

How do you think these concerns could be addressed ?

Environmental report

Q10

What opportunities do you see for battery storage ?

Talking to department of water regulators to see possibility of reinjection of water into aquifer

Q11

Is there any specific information that would help you to better understand the project ?

Just being kept up to date with developments

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Newsletters

Muchea Battery - Community Survey

QUESTION SUMMARIES | DATA TRENDS | INDIVIDUAL RESPONSES

Respondent #8

COMPLETE

Started:	Tuesday, February 15, 2022 12:08:04 PM
Last Modified:	Tuesday, February 15, 2022 12:09:35 PM
Time Spent:	00:01:31
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Other (please specify):
Local Newspaper (Northern Valley)

Q3

What is your level of interest in the project ?

10

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

I'm interested in renewable energy

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

7

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

10 responses

They help to reduce energy costs for consumers

They can provide educational opportunities

Q7

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Environmental or biodiversity project

Education about renewable energy for local schools

Support for local community building initiatives

Q8

What, if any, concerns do you have about battery storage ?

Not sure

Q9

How do you think these concerns could be addressed ?

Not sure

Q10

What opportunities do you see for battery storage ?

Better power supply and renewable energy

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

COMPLETE

Started:	Tuesday, February 15, 2022 12:09:47 PM
Last Modified:	Tuesday, February 15, 2022 12:11:07 PM
Time Spent:	00:01:20
IP Address:	116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Flyer in letterbox

Q3

What is your level of interest in the project ?

5

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

10

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

They bring investment into the region

Q7

We will set up a community benefit-sharing scheme - what kind of community benefits would you like us to explore ?

Environmental or biodiversity project

Education about renewable energy for local schools

Support for local community building initiatives

Q8

What, if any, concerns do you have about battery storage ?

N/A

Q9

How do you think these concerns could be addressed ?

N/A

Q10

What opportunities do you see for battery storage ?

N/A

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

QUESTION SUMMARIES | DATA TRENDS | INDIVIDUAL RESPONSES

Respondent #10

COMPLETE

Started: Tuesday, February 15, 2022 12:11:16 PM
Last Modified: Tuesday, February 15, 2022 12:12:45 PM
Time Spent: 00:01:28
IP Address: 116.240.126.241

Page 1

Q1

Your Contact information:

Full name	[redacted]
Email	[redacted]
Telephone	[redacted]
Address	[redacted]
Postcode	6501

Q2

How did you hear about the project ?

Social media

Q3

What is your level of interest in the project ?

10

Q4

What is the reason for your interest in the project ?

I live nearby in Muchea

Q5

How would you rate your attitude towards the proposed Muchea Battery ?

10

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

They support renewable energy

They stabilise the grid and help prevent black-outs

10 responses

Environmental or biodiversity project

Support for local community building initiatives

Q8

What, if any, concerns do you have about battery storage ?

N/A

Q9

How do you think these concerns could be addressed ?

N/A

Q10

What opportunities do you see for battery storage ?

N/A

Q11

Is there any specific information that would help you to better understand the project ?

N/A

Q12

Would you like us to to keep you informed about the project ?

yes

Q13

If yes, how would you like to be kept informed ?

Email

Muchea Battery - Community Survey

Q1

Your Contact information:

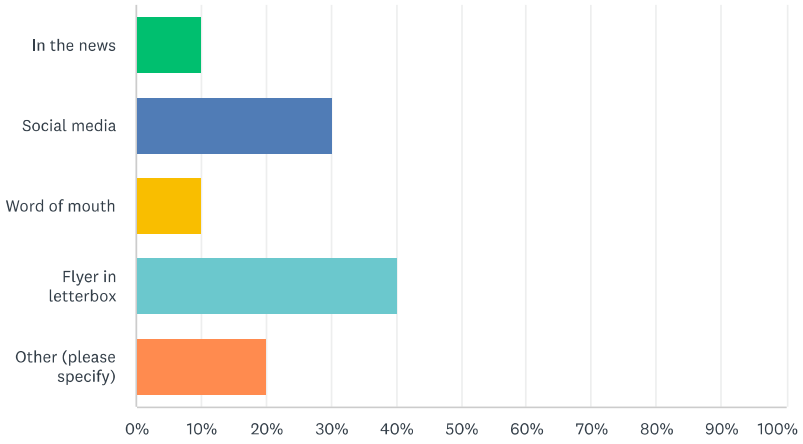
Answered: 10 Skipped: 0

ANSWER CHOICES		RESPONSES	
Full name	Responses	100.00%	10
Email	Responses	100.00%	10
Telephone	Responses	100.00%	10
Address	Responses	100.00%	10
Postcode	Responses	100.00%	10

Q2

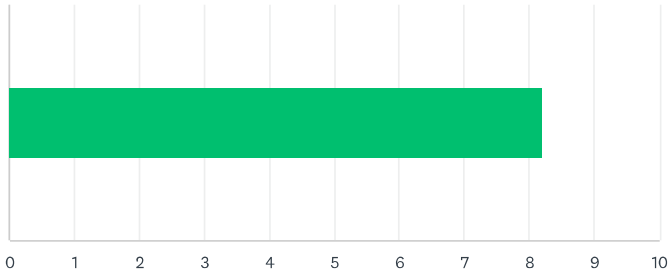
How did you hear about the project ?

Answered: 10 Skipped: 0



ANSWER CHOICES		RESPONSES	
In the news		10.00%	1
Social media		30.00%	3
Word of mouth		10.00%	1
Flyer in letterbox		40.00%	4
Other (please specify)	Responses	20.00%	2

Total Respondents: 10



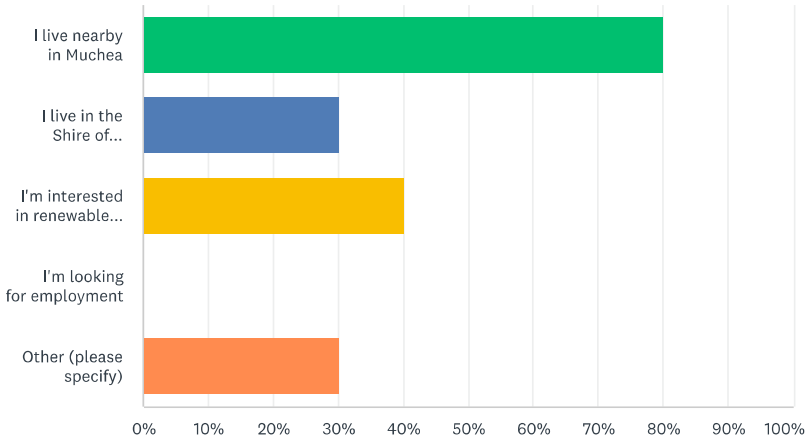
ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
Responses	8	82	10

Total Respondents: 10

Q4

What is the reason for your interest in the project ?

Answered: 10 Skipped: 0

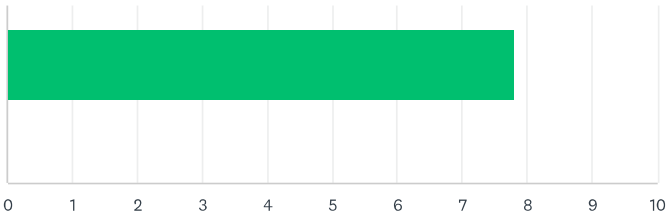


ANSWER CHOICES		RESPONSES	
I live nearby in Muchea		80.00%	8
I live in the Shire of Chittering		30.00%	3
I'm interested in renewable energy		40.00%	4
I'm looking for employment		0.00%	0
Other (please specify)	Responses	30.00%	3

Total Respondents: 10

Q5

How would you rate your attitude towards the proposed Muchea Battery ?



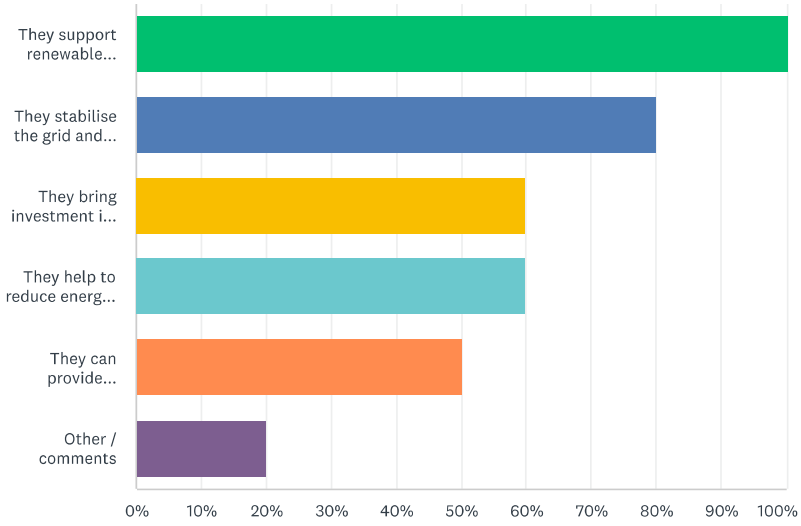
ANSWER CHOICES	AVERAGE NUMBER	TOTAL NUMBER	RESPONSES
Responses	8	78	10

Total Respondents: 10

Q6

What do you consider the benefits of battery storage ? Tick as many as apply.

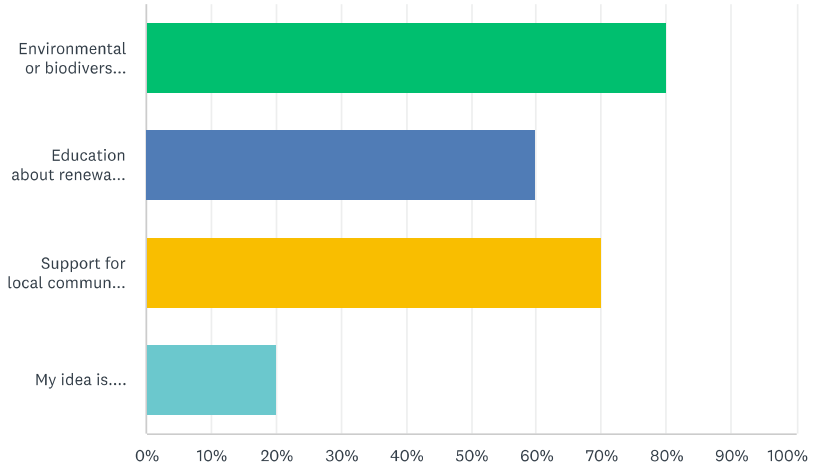
Answered: 10 Skipped: 0



ANSWER CHOICES		RESPONSES	
They support renewable energy		100.00%	10
They stabilise the grid and help prevent black-outs		80.00%	8
They bring investment into the region		60.00%	6
They help to reduce energy costs for consumers		60.00%	6
They can provide educational opportunities		50.00%	5
Other / comments	Responses	20.00%	2

Total Respondents: 10

Q7



ANSWER CHOICES		RESPONSES	
Environmental or biodiversity project		80.00%	8
Education about renewable energy for local schools		60.00%	6
Support for local community building initiatives		70.00%	7
My idea is....	Responses	20.00%	2

Total Respondents: 10

Q8

What, if any, concerns do you have about battery storage ?

Answered: 10 Skipped: 0

N/A

2/15/2022 12:13 PM

N/A

2/15/2022 12:11 PM

Not sure

2/15/2022 12:10 PM

ANY interference with groundwater

2/15/2022 12:08 PM

How do you think these concerns could be addressed ?

Answered: 10 Skipped: 0

N/A	2/15/2022 12:13 PM
N/A	2/15/2022 12:11 PM
Not sure	2/15/2022 12:10 PM
Environmental report	2/15/2022 12:08 PM

Q10

What opportunities do you see for battery storage ?

Answered: 10 Skipped: 0

N/A	2/15/2022 12:13 PM
N/A	2/15/2022 12:11 PM
Better power supply and renewable energy	2/15/2022 12:10 PM
Talking to department of water regulators to see possibility of reinjection of water into aquifer	2/15/2022 12:08 PM

Q11

Is there any specific information that would help you to better understand the project ?

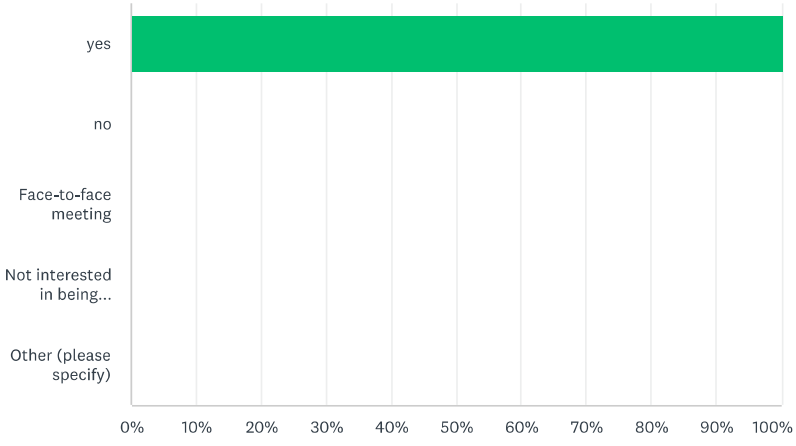
Answered: 10 Skipped: 0

N/A	2/15/2022 12:13 PM
N/A	2/15/2022 12:11 PM
N/A	2/15/2022 12:10 PM
Just being kept up to date with developments	2/15/2022 12:08 PM

Q12

Would you like us to to keep you informed about the project ?

Answered: 10 Skipped: 0



ANSWER CHOICES RESPONSES

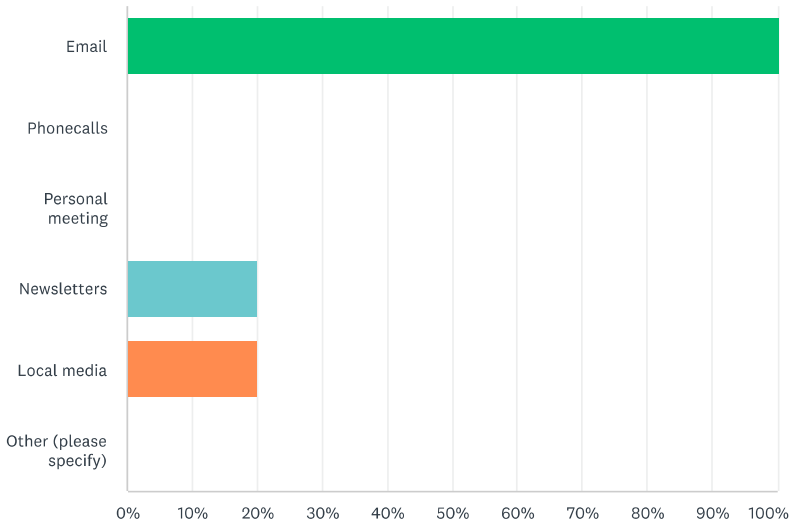
10 responses

Not interested in being informed		0.00%	0
Other (please specify)	Responses	0.00%	0
TOTAL			**10**

Q13

If yes, how would you like to be kept informed ?

Answered: 10 Skipped: 0



ANSWER CHOICES		RESPONSES	
Email		100.00%	10
Phonecalls		0.00%	0
Personal meeting		0.00%	0
Newsletters		20.00%	2
Local media		20.00%	2
Other (please specify)	Responses	0.00%	0
Total Respondents: 10			

umwelt
Environmental & Social
Consultants

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