Initial Contact: Planning Admin
Direct Telephone: 07 4189 9100
Our Reference: MCU24/0032

SOUTH BURNETT REGIONAL COUNCIL

South Burnett Regional Council
ABN 89 972 463 351
PO Box 336
Kingaroy QLD 4610
1300 789 279 or (07) 4189 9100
(07) 4162 4806
info@southburnett.qld.gov.au
www.southburnett.qld.gov.au

10 April 2025

X-Elio
C/- Wsp Australia Pty Ltd &
GPO Box 2907
BRISBANE QLD 4001

Dear Sir/Madam

Decision Notice
Planning Act 2016

I refer to your application and advise that on 3 April 2025, Council decided to approve the application in full subject to conditions.

Details of the decision are as follows:

APPLICATION DETAILS

Application No:	MCU24/0032
Street Address:	1196 Ellesmere Road ALICE CREEK QLD 4610
Real Property Description:	Lot 6 on FY691
Planning Scheme:	South Burnett Regional Council

DECISION DETAILS

Type of Decision:	Approval
Type of Approval:	Development Permit for Material Change of Use for Undefined Use (Battery Energy Storage System (BESS)
Date of Decision:	3 April 2025

CURRENCY PERIOD OF APPROVAL

The currency period for this development approval is six (6) years starting the day that this development approval takes effect. (Refer to Section 85 "Lapsing of approval at end of currency period" of the *Planning Act 2016*.)

INFRASTRUCTURE

Where conditions relate to the provision of infrastructure, these are non-trunk infrastructure conditions unless specifically nominated as a "***necessary infrastructure condition***" for the provision of trunk infrastructure as defined under Chapter 4 of the *Planning Act 2016*.

ASSESSMENT MANAGER CONDITIONS

That South Burnett Regional Council approve the Development Permit for Material Change of Use for an Undefined Use (Battery Energy Storage System) at 1196 Ellesmere Road, Alice Creek (and described as Lot 6 on FY691), subject to the following conditions, including the engagement of an arborist to ensure the appropriate vegetation on the boundary periphery of the block is chosen to reduce fire impacts and maximise noise reduction and enhance visual amenity as amended with the following conditions:

GENERAL

GEN1. The approved development must be maintained generally in accordance with the approved plans and documents, except where amended by the conditions of this permit:

Drawing/ Document Title	Prepared By	Plan No.	Rev.	Date
Site Plan	Not Provided	Haly BESS 00 QLD	5	n.d.
Sections	Not Provided	Haly BESS 00 QLD	5	n.d.
Elevations and Detail	Not Provided	Haly BESS 00 QLD	5	n.d.
Noise Impact Assessment	WSP	211345-WSP-BNE-ACO-REP-001	B	3/09/24
Traffic Impact Assessment (amendment required in accordance with Condition GEN20)	WSP	211345-TPT-REP-001	B	05/09/24

Timing: At all times.

GEN2. The development herein approved may not start until the following development permits have been issued and complied with as required:

- Development Permit for Building Works;
- Development Permit for Operational Work; and
- Compliance Permit for Plumbing & Drainage Work for the installation of on-site Sewerage Facilities in accordance with the Queensland Plumbing and Wastewater Code.

GEN3. The approved development is a Battery Energy Storage System, as shown on the approved plans and does not imply approval for other similar uses.

COMMENCEMENT OF USE

GEN4. Submit to Council a Notice of Intention to Commence the Approved Use. The notice must:

4.1 Be submitted to the Manager, Planning and Development within a minimum of ten (10) business days prior to commencement of the approved use;

4.2 Nominate the day the approved use is intended to commence; and

4.3 Include evidence i.e. copies of decision notice(s), photographic proof, and statement(s) of compliance with the conditions of this approval which demonstrates that all conditions of this approval have been complied with.

Note: Council offers condition compliance inspection, which currently attracts a fee $453.50. However, the actual amount payable will be based on Council's Register of Fees & Charges and the rate applicable at the time of payment.

DECOMISSIONING AND SITE REHABILITATION

GEN5. A Decommissioning and Site Rehabilitation Plan is to be submitted to Council for approval detailing the following at a minimum:

5.1 The timing and staging of the removal of all physical infrastructure and hardstand associated with the BESS;

5.2 The method of removal; and

5.3 The extent and sequence of rehabilitation works.

Decommissioning and site rehabilitation is to occur in accordance with the approved Decommissioning and Site Rehabilitation Plan.

COMPLIANCE, TIMING, AND COSTS

GEN6. All conditions of the approval shall be complied with before the change occurs (prior to the commencement of the use) and while the use continues, unless otherwise noted within these conditions.

GEN7. The development (including landscaping, parking, driveway and other external spaces) shall be maintained in accordance with the Approved Plans, subject to and modified conditions of this approval.

GEN8. Maintain the site in a clean and orderly state at all times.

GEN9. All works, including the repair or relocation of services is to be completed at no cost to Council.

NOISE

MCU1. Implement the recommendations of the Noise impact Assessment prepared by WSP (Revision B dated 3 September 2024) to reduce the sound power levels of the BESS units, including the selection of low-noise-emitting equipment for use during operation.

MCU2. Noise from the construction and operational phases of the activity to which this approval relates must not cause or be likely to cause an environmental nuisance at any sensitive receptor that exceeds the Acoustic Quality Objectives listed in the Environmental Protection (Noise) Policy 2019, when measured at the closest sensitive receptor.

LANDSCAPING

MCU3. A Detailed Landscaping Plan prepared by suitably qualified landscape architect/designer must be submitted to Council prior to any work commencing on site. The landscaping plan must indicate the following:

3.1. A landscaping design that demonstrates the following:

3.1.1. A minimum 5-metre-wide landscape strip along the north-eastern extent of the development footprint comprising of low threat vegetation, as well as a 5-metre-wide firebreak either side of the landscape strip;

3.1.2. A minimum 5-metre-wide landscape strip along the south-eastern extent of the development footprint comprising of low threat vegetation, as well as a 5-metre-wide firebreak either side of the landscape strip; and

3.1.3. A minimum 5-metre-wide landscape strip along the south-western extent of the development footprint comprising of low threat vegetation, as well as a 5-metre-wide firebreak either side of the landscape strip;

3.2. Details about how the vegetated buffers and firebreaks will be maintained;
3.3. A planting schedule, including species, quantity and container size;
3.4. The location and spacing of proposed and any existing trees and shrubs; and
3.5. The retention of existing vegetation along the Ellesmere Road frontage except where removal is necessary to accommodate physical works associated with the development.

Comment: The submitted landscape plan for the vegetation buffer must include the tree selection and how the plantings are placed, irrigated and post planting care in accordance with Council's Branching Out Guide. Please provide the above details referencing suitable plant species, planting and establishment process from the aforementioned document.

Timing: Prior to the use commencing, a suitably qualified Landscape Architect/Designer shall provide written confirmation that the planted vegetation buffer complies with Council's Branching Out Guide and the provided landscaping plan.

WASTE MANAGEMENT

MCU4. Prior to the use commencing operation, confirmation must be provided to Council of the number and type of refuse containers provided on site and the commercial waste collector has been engaged.

LIGHTING

MCU5. All outdoor lighting must be designed, installed, operated and maintained to comply with the requirements of AS4282 – Control of the obtrusive effects of outdoor lighting.

DUST

MCU6. The applicant must construct and operate the project in a manner that minimises dust generation from the site, including wind-blown and traffic-generated dust as far as practicable. The applicant must identity and implement all practicable dust mitigation measures, including cessation of relevant works, as appropriate, such that emissions of visible dust are minimised during severe weather conditions.

STORAGE OF LIQUID CHEMICALS (OTHER THAN FUEL)

MCU7. All liquid chemicals (including flammable liquids (other than fuel), agricultural and veterinary chemicals, waste oil, acid and lube oil) must be stored within dedicated impervious secondary containment stores, structures or devices and in a manner that complies with Australian Standards AS1940 - The storage and handling of flammable and combustible liquids.

ENVIRONMENTAL HARM

MCU8. The *Environmental Protection Act 1994* (EP Act) states that a person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm.

Environmental harm includes environmental nuisance. In this regard persons and entities involved in the civil, earthworks, construction and operational phases of this development are to adhere to their 'general environmental duty' to minimise the risk of causing environmental harm. Environmental harm is defined by the EP Act as any adverse effect, or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value, and includes environmental nuisance.

Therefore, no person should cause any interference with the environment or amenity of the area by reason of the emission of noise, vibration, smell, fumes, smoke, vapour, steam, soot, ash, dust, wastewater, waste products, grit, sediment, oil or otherwise, or cause hazards likely in the opinion of the Administering Authority to cause undue disturbance or annoyance to persons or affect property not connected with the use.

ENGINEERING CONDITIONS

ENG1. Submit to Council, an Operational Work application for all civil works including earthworks, stormwater, roadworks, access and parking, erosion and sediment control and design vehicle manoeuvring.

ENG2. Complete all works approved and works required by conditions of this development approval and/or any related approvals at no cost to Council, prior to commencement of the use unless stated otherwise.

ENG3. Undertake Engineering designs and construction in accordance with the Planning Scheme, Council's standards, relevant design guides, and Australian Standards.

ENG4. Be responsible for the full cost of any alterations necessary to electricity, telephone, water mains, sewer mains, stormwater drainage systems or easements and/or other public utility installations resulting from the development or from road and drainage works required in connection with the development.

LOCATION, PROTECTION AND REPAIR OF DAMAGE TO COUNCIL AND PUBLIC UTILITY SERVICES INFRASTRUCTURE AND ASSETS

ENG5. Be responsible for the location and protection of any Council and public utility services infrastructure and assets that may be impacted on during construction of the development.

ENG6. Repair all damages incurred to Council and public utility services infrastructure and assets, as a result of the proposed development immediately should hazards exist for public health and safety or vehicular safety. Otherwise, repair all damages immediately upon completion of works associated with the development.

CONSTRUCTION MANAGEMENT PLAN

ENG7. Submit to Council for endorsement, a Construction Management Plan for approved development works for the site. The Plan is to cover where applicable, the following:

a) air quality management;
b) noise and vibration management;
c) storm water quality management;
d) erosion and sediment management;
e) vegetation management;
f) waste management;
g) complaint management;
h) community awareness;
i) preparation of site work plans;
j) workers' car parking arrangements; and
k) traffic control during works.

Timing: Prior to commencement of works.

ENG8. Implement the approved Construction Management Plan at all times during construction of the development.

ENG9. Ensure a legible copy of the approved Construction Management Plan is available on-site at all times during construction and earthworks.

STORMWATER MANAGEMENT

ENG10. Design and construct stormwater drainage to ensure that the development will result in no increase in peak discharge from the BESS footprint, and achieve "no nuisance" as described in the Queensland Urban Drainage Manual (QUDM) to all downstream properties including road reserves and the like for design storms up to ARI100.

ENG11. Ensure that adjoining properties and roadways are protected from ponding or nuisance from stormwater as a result of any site works undertaken as part of the proposed development.

WATER SUPPLY

ENG12. Provide an onsite water supply for fire-fighting purposes that includes the following:

12.1. A minimum capacity of 30,000L – 50,000L;
12.2. A minimum pressure and flow of up to 30L/s and a minimum 200kPa;
12.3. Fitted with an outlet pipe (or other fitting) that complies with the standard rural fire brigade connection requirements; and
12.4. Accessible by a fire-fighting vehicle.

ON-SITE WASTEWATER DISPOSAL

ENG13. Connect the development to an on-site wastewater disposal system, in accordance with the AS1547:2012 On-site domestic wastewater management and the Queensland Plumbing and Wastewater Code - 2019.

PARKING AND ACCESS - GENERAL

ENG14. Construct all driveway and parking areas with a dust suppressive gravel.

ENG15. Provide an area to accommodate minimum of five (5) car parking spaces adjacent to the O&M facility.

ENG16. Ensure access to car parking spaces, vehicle loading and manoeuvring areas and driveways remain unobstructed and available for their intended purpose during the hours of operation.

ENG17. Provide longitudinal gradient and crossfall for all driveways to ensure they freely drain.

PARKING AND ACCESS - SERVICING

ENG18. Ensure loading and unloading operations are conducted wholly within the site and vehicles enter and exit the site in a forward direction.

VEHICLE ACCESS - TURNOUT

ENG19. Design and construct vehicle turnout generally in accordance with Council's Standard Drawing No. 00049 Rev B, and sized to accommodate the largest expected vehicle.

HEAVY VEHICLE TRANSPORT ROUTE

ENG20. The approved Heavy Vehicle Transport Route is from the Port of Brisbane Motorway > Gateway Motorway > Bruce Highway > D'Aguilar Highway > Nanango Tarong Road > Kingaroy Cooyar Road > Kumbia Road > Ellesmere Road. No other transport route shall be used for transporting the components of the approved Major Electricity Infrastructure (Battery Energy Storage System), unless otherwise approved by Council.

ENG21. All vehicles supplying materials to the development shall use the relevant section of the transport route in ENG20, or alternative routes identified in an approved construction management plan, unless otherwise approved by Council.

ROAD UPGRADES

ENG22. Kumbia Road section from the Kingaroy-Cooyar intersection to Ellesmere Road:

a) Review of the vertical and horizontal alignment to safely accommodate a PBS Level 1 vehicle up to 20m in length, unless otherwise agreed by Council;
b) Reconstruction of the existing pavement and widening where required to provide 2 x 3.5m lanes with 1m shoulders, including drainage and table drains, curve widening, and any other widening necessary to accommodate the swept path of a PBS Level 1 vehicle up to 20m in length, unless otherwise agreed by Council;
c) Double/Double bitumen seal;
d) Structural assessment of all existing culverts, with replacement and/or extension where required;
e) Changes and upgrades required to all intersections and accesses impacted by the transport route upgrade;
f) tapers to existing road pavement; and
g) road signage and line marking.

Comment: In lieu of carrying out the above upgrades, Council is open to entering into an Infrastructure Agreement for an alternative scope of upgrade, and to reflect the loss of asset life that the development will have on Councils road network.

ENG23. Ellesmere Road:

a) Upgrade Ellesmere Road with a minimum formation width of 7.2m, with minimum 150mm gravel overlay;
b) Upgrade the vertical and horizontal alignment to safely accommodate a PBS Level 1 vehicle up to 20m in length, unless otherwise agreed by Council;
c) Carryout any necessary road maintenance works to Ellesmere Road during the construction period to ensure the Road is kept in an “as new” condition; and
d) Upon completion of the construction period, ensure that a minimum of 150mm gravel is left in place.

Comment: In lieu of carrying out the above upgrades, Council may be open to entering into an Infrastructure Agreement for an alternative scope of upgrade, and to reflect the loss of asset life that the development will have on Councils road network.

ENG24. Upgrade the intersection of Ellesmere Road to accommodate a PBS Level 1 vehicle up to 20m in length, unless otherwise agreed by Council.

ELECTRICITY AND TELECOMMUNICATION

ENG25. Connect the development to electricity and telecommunication services.

EROSION AND SEDIMENT CONTROL - GENERAL

ENG26. Ensure that all reasonable actions are taken to prevent sediment or sediment laden water from being transported to adjoining properties, roads and/or stormwater drainage systems. This includes water quality testing which must be undertaken as follows:

26.1. prior to the commencement of construction;
26.2. upon completion of construction; and
26.3. annually during the operational phase of the development to monitor potential impacts on water quality.

Note: Testing must be conducted by a suitably qualified person and include parameters relevant to the site, such as turbidity, pH, suspended solids, sediment levels and contaminants. Reports detailing the results, including any necessary mitigation measures, must be submitted to Council upon completion of the report and as required by the condition.

ENG27. Remove and clean-up sediment or other pollutants in the event that sediment or other pollutants are tracked/released onto adjoining streets or stormwater systems, at no cost to Council.

ENG28. Construct a sediment basin to capture all stormwater runoff from the BESS footprint to minimise sediment and/or pollutant discharge from the site, or waterway.

REFERRAL AGENCIES

Not Applicable.

APPROVED PLANS

The following plans are Approved plans for the development:

Approved Plans

Plan No.	Rev.	Plan Name	Date
HALY BESS 00 QLD	5	*Site Plan*, prepared by Not Provided	n.d.
HALY BESS 00 QLD	5	*Sections*, prepared by Not Provided	n.d.
HALY BESS 00 QLD	5	*Elevations and Detail*, prepared by Not Provided	n.d.

REFERENCED DOCUMENTS

The following documents are referenced in the assessment manager conditions:

Referenced Documents

Document No.	Rev.	Document Name	Date
211345-WSP-BNE-ACO-REP-001	B	*Noise Impact Assessment*, prepared by WSP	03/09/2024

The following documents require amendment prior to becoming Approved Documents for the development:

Documents Requiring Amendment

Document No.	Rev.	Plan Name	Date
211345-TPT-REP-001	B	*Traffic Impact Assessment*, prepared by WSP	05/09/2024
Amendments	1. in accordance with Condition GEN20		

ADVISORY NOTES

The following notes are included for guidance and information purposes only and do not form part of the assessment manager conditions:

STANDARD ADVICE

ADV1. Section 85(1)(b) of the *Planning Act 2016* provides that if this approval is not acted upon within a period of six (6) years the approval will lapse.

ADV2. This development approval does not authorise any activity that may harm Aboriginal Cultural Heritage. Under the Aboriginal Cultural Heritage Act 2003 you have a duty of care in relation to such heritage. Section 23(1) provides that *"A person who carries out an activity must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal Cultural Heritage."* Council does not warrant that the approved development avoids affecting Aboriginal Cultural Heritage. It may therefore be prudent for you to carry out searches, consultation, or a Cultural Heritage assessment to ascertain the presence or otherwise of Aboriginal Cultural Heritage. The Act and the associated duty of care guidelines explain your obligations in more detail and should be consulted before proceeding. A search can be arranged by visiting https://www.datsip.qld.gov.au and filling out the Aboriginal and Torres Strait Islander Cultural Heritage Search Request Form.

ADV3. Infrastructure charges are now levied by way of an infrastructure charges notice issued pursuant to section 119 of the *Planning Act 2016*.

ADV4. Council is offering a reduction in infrastructure charges payable through the development incentive scheme which is available between 1 December 2020 and 31 December 2025. Eligible development under this scheme is required to be completed by 31 December 2025.

For further information or application form please refer to the rules and procedures available on Council's website.

ADV5. Attached for your information is a copy of Chapter 6 of the *Planning Act 2016* as regards Appeal Rights.

ADV6. Please note that additional temporary works may be required to accommodate Over Size and/or Over Mass (OSOM) vehicles. These works will be conditioned as part of a future OSOM permit.

ADV7. Earthworks per site involving cut or fill with a nett quantity of material greater than $50m^3$, requires an Operational Work application. A future Operational Work application shall detail engineering drawings and information with the Operational Work application including, but not limited to the following:

a) long and cross sections of proposed cut/fill and retaining walls as applicable;
b) existing and proposed surface levels;
c) proposed drainage works to accommodate existing overland flows;
d) proposed haulage route(s) that will be used; and
e) details identifying the source/disposal site(s) for material imported/exported. The site(s) must have a current development approval enabling them to export/accept any material.

PROPERTY NOTES

Not Applicable.

VARIATION APPROVAL

Not Applicable.

FURTHER DEVELOPMENT PERMITS REQUIRED

- Development Permit for Operational Work
- Development Permit for Building Work
- Compliance Permit for Plumbing & Drainage Work for the installation of on-site Sewerage Facilities in accordance with the Queensland Plumbing and Wastewater Code.

SUBMISSIONS

There were [Number of submissions] properly made submissions about the application. In accordance with the *Planning Act 2016*, the name, residential or business address, and electronic address of the principal submitter for each properly made submission is provided and attached.

RIGHTS OF APPEAL

You are entitled to appeal against this decision. A copy of the relevant appeal provisions from the *Planning Act 2016* is attached.

During the appeal period, you as the applicant may suspend your appeal period and make written representations to council about the conditions contained within the development approval. If council agrees or agrees in part with the representations, a "negotiated decision notice" will be issued. Only one "negotiated decision notice" may be given. Taking this step will defer your appeal period, which will commence again from the start the day after you receive a "negotiated decision notice".

OTHER DETAILS

If you wish to obtain more information about Council's decision, electronic copies are available on line at www.southburnett.qld.gov.au, or at Council Offices.

Yours faithfully

DAVID HURSTHOUSE
COORDINATOR DEVELOPMENT SERVICES

Enc: Adopted Infrastructure Charge Notice
Approved Plans/Documents
List of Submitters
Appeal Rights

List of Submitters

PLANNING ACT 2016 & THE PLANNING REGULATION 2017

Only Properly Made Submissions are to be included in this notice

G M Bolck
PO Box 316
KINGAROY QLD 4610

P J & L K Matthews
MS189 1008 Kumbia Road
KINGAROY QLD 4610
Email: pledgestockhorses@hotmail.com

J W Barbeler
331 Bookless Road
HALY CREEK QLD 4610

Appeal Rights

PLANNING ACT 2016 & THE PLANNING REGULATION 2017

Chapter 6 Dispute resolution

Part 1 Appeal rights

229 Appeals to tribunal or P&E Court

(1) Schedule 1 of the *Planning Act 2016* states –
  (a) Matters that may be appealed to –
    (i) either a tribunal or the P&E Court; or
    (ii) only a tribunal; or
    (iii) only the P&E Court; and
  (b) The person-
    (i) who may appeal a matter (**the *appellant***); and
    (ii) who is a respondent in an appeal of the matter; and
    (iii) who is a co-respondent in an appeal of the matter; and
    (iv) who may elect to be a co-respondent in an appeal of the matter.

(Refer to Schedule 1 of the Planning Act 2016)

(2) An appellant may start an appeal within the appeal period.
(3) The ***appeal period*** is –
  (a) for an appeal by a building advisory agency – 10 business days after a decision notice for the decision is given to the agency; or
  (b) for an appeal against a deemed refusal – at any time after the deemed refusal happens; or
  (c) for an appeal against a decision of the Minister, under chapter 7, part 4, to register premises or to renew the registration of premises – 20 business days after a notice us published under section 269(3)(a) or (4); or
  (d) for an appeal against an infrastructure charges notice – 20 business days after the infrastructure charges notice is given to the person; or
  (e) for an appeal about a deemed approval of a development application for which a decision notice has not been given – 30 business days after the applicant gives the deemed approval notice to the assessment manager; or
  (f) for any other appeal – 20 business days after a notice of the decision for the matter, including an enforcement notice, is given to the person.

Note –
See the P&E Court Act for the court's power to extend the appeal period.

(4) Each respondent and co-respondent for an appeal may be heard in the appeal.
(5) If an appeal is only about a referral agency's response, the assessment manager may apply to the tribunal or P&E Court to withdraw from the appeal.
(6) To remove any doubt. It is declared that an appeal against an infrastructure charges notice must not be about-
  (a) the adopted charge itself; or
  (b) for a decision about an offset or refund-
    (i) the establishment cost of trunk infrastructure identified in a LGIP; or
    (ii) the cost of infrastructure decided using the method included in the local government's charges resolution.

230 Notice of appeal

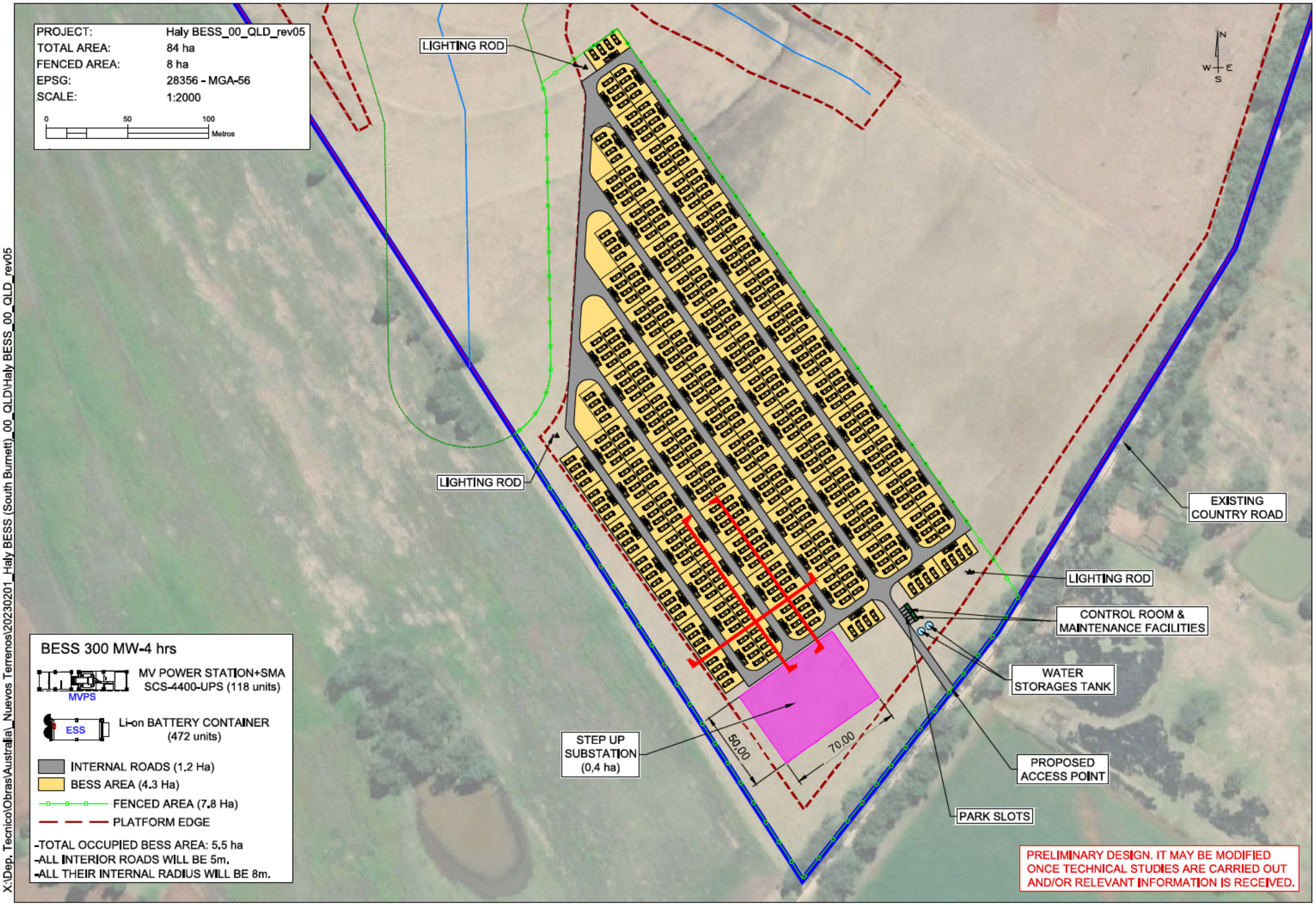
(1) An appellant starts an appeal by lodging, with the registrar of the tribunal or P&E Court, a notice of appeal that-
  (a) is in the approved form; and
  (b) succinctly states the grounds of the appeal.
(2) The notice of appeal must be accompanied by the required fee.
(3) The appellant or, for an appeal to a tribunal, the registrar must, within the service period, give a copy of the notice of appeal to –
  (a) the respondent for the appeal ; and
  (b) each co-respondent for the appeal; and
  (c) for an appeal about a development application under schedule 1, table 1, item 1 – each principal submitter for the development application; and
  (d) for and appeal about a change application under schedule 1, table 1, item 2 – each principal submitter for the change application; and
  (e) each person who may elect to become a co-respondent for the appeal, other than an eligible submitter who is not a principal submitter in an appeal under paragraph (c) or (d); and
  (f) for an appeal to the P&E Court – the chief executive; and
  (g) for an appeal to a tribunal under another Act – any other person who the registrar considers appropriate.
(4) The *service period* is –
  (a) if a submitter or advice agency started the appeal in the P&E Court – 2 business days after the appeal has started; or
  (b) otherwise – 10 business days after the appeal is started.
(5) A notice of appeal given to a person who may elect to be a co-respondent must state the effect of subsection (6).
(6) A person elects to be a co-respondent by filing a notice of election, in the approved form, within 10 business days after the notice of appeal is given to the person.

231 Other appeals

(1) Subject to this chapter, schedule 1 and the P&E Court Act, unless the Supreme Court decides a decision or other matter under this Act is affected by jurisdictional error, the decision or matter is non-appealable.
(2) The *Judicial Review Act 1991*, part 5 applies to the decision or matter to the extent it is affected by jurisdictional error.
(3) A person who, but for subsection (1) could have made an application under the Judicial Review Act 1991 in relation to the decision or matter, may apply under part 4 of that Act for a statement of reasons in relation to the decision or matter.
(4) In this section –
decision includes-
  (a) conduct engaged in for the purpose of making a decision; and
  (b) other conduct that relates to the making of a decision; and
  (c) the making of a decision or failure to make a decision; and
  (d) a purported decision ; and
  (e) a deemed refusal.
non-appealable, for a decision or matter, means the decision or matter-
  (a) is final and conclusive; and
  (b) may not be challenged, appealed against, reviewed, quashed, set aside or called into question in any other way under the Judicial Review Act 1991 or otherwise, whether by the Supreme Court, another court, a tribunal or another entity; and
  (c) is not subject to any declaratory, injunctive or other order of the Supreme Court, another court, a tribunal or another entity on any ground.

232 Rules of the P&E Court

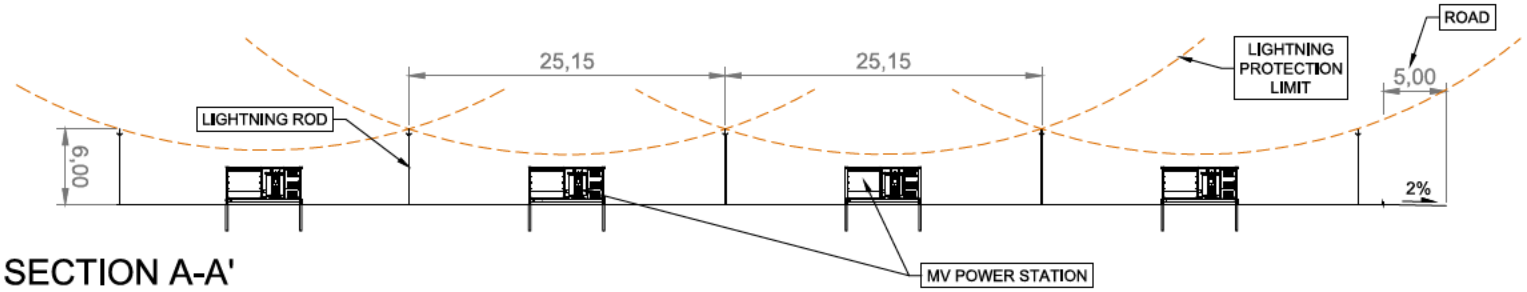
(1) A person who is appealing to the P&E Court must comply with the rules of the court that apply to the appeal.
However, the P&E Court may hear and decide an appeal even if the person has not complied with the rules of the P&E Court.



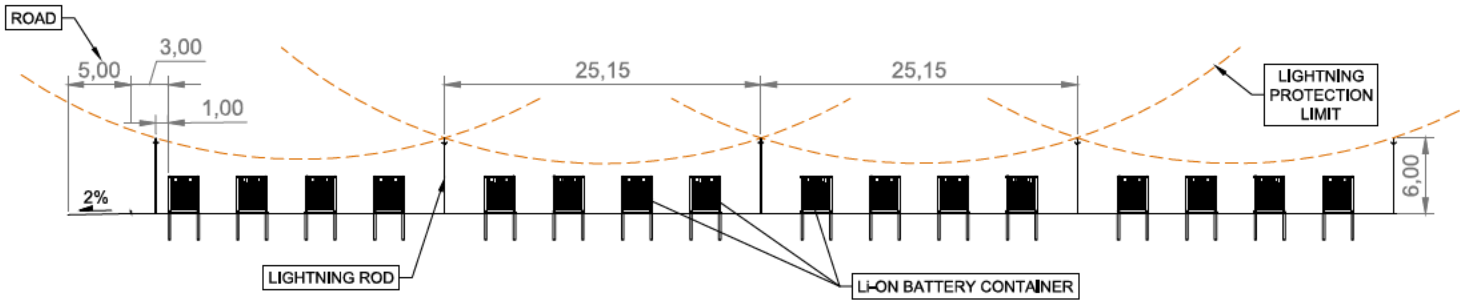
X:\Dep. Tecnico\Obras\Australia_Nuevos Terrenos\20230201_Haly BESS (South Burnett)_00_QLD\Haly BESS_00_QLD_rev05

PROJECT:	Haly BESS_00_QLD_rev05
TOTAL AREA:	84 ha
FENCED AREA:	8 ha
EPSG:	28356 - MGA-56
SCALE:	1:400

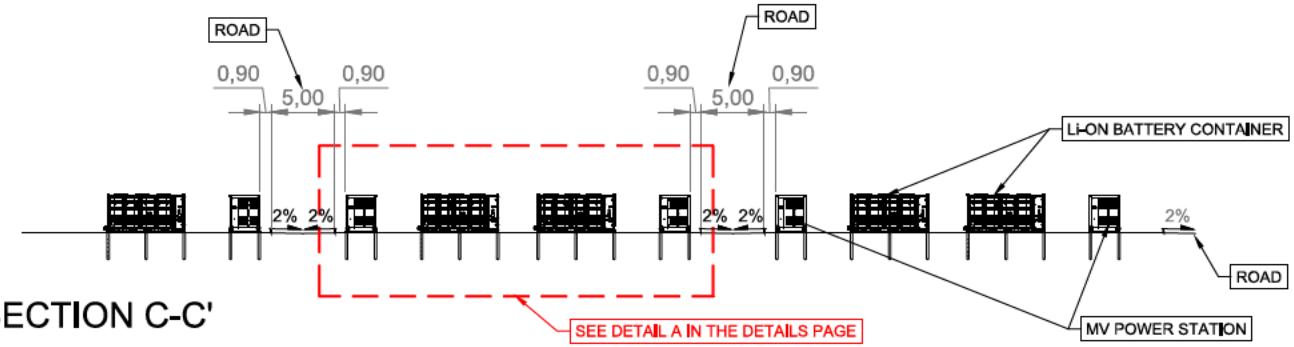
0 10 20 Metros



SECTION A-A'

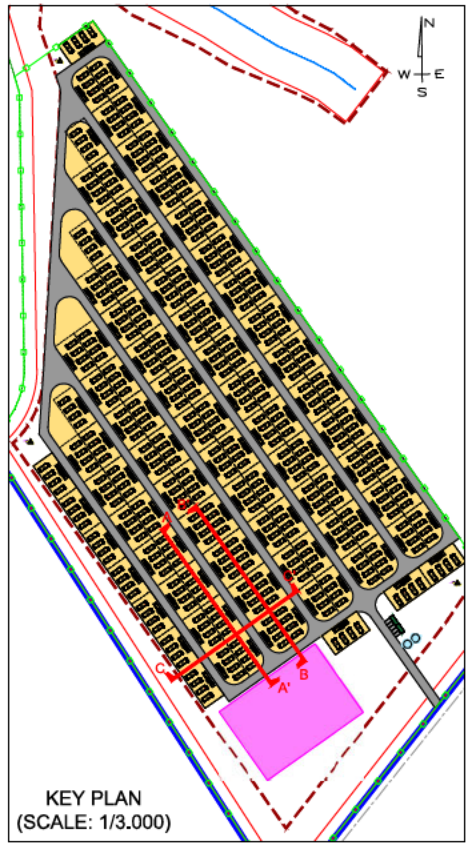


SECTION B-B'



SECTION C-C'

PRELIMINARY DESIGN. IT MAY BE MODIFIED ONCE TECHNICAL STUDIES ARE CARRIED OUT AND/OR RELEVANT INFORMATION IS RECEIVED.



KEY PLAN
(SCALE: 1/3.000)

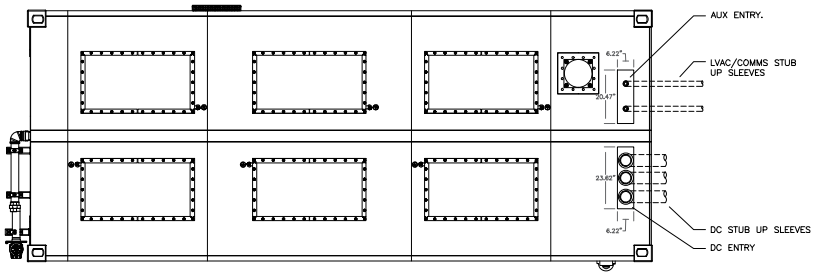
X:\Dep. Tecnico\Obras\Australia_Nuevos Terrenos\20230201_Haly BESS (South Burnett)_00_QLD\Haly BESS_00_QLD_rev05

PROJECT:	Haly BESS_00_QLD_rev05
TOTAL AREA:	84 ha
FENCED AREA:	8 ha
EPSG:	28356 - MGA-56
SCALE:	1:50

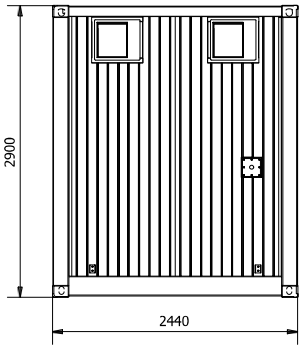
0 1.25 2.5 Metros

Li-ON BATTERY CONATINER

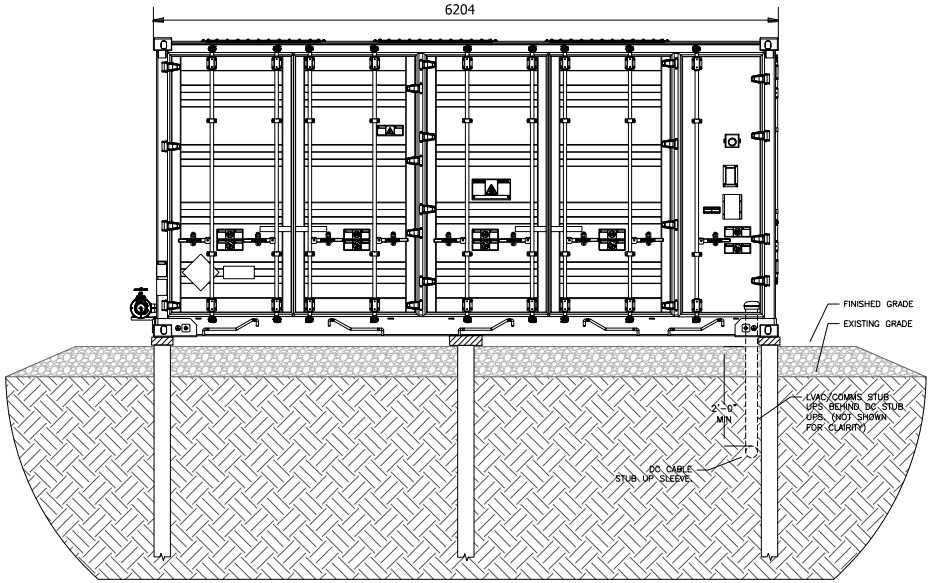
Top View



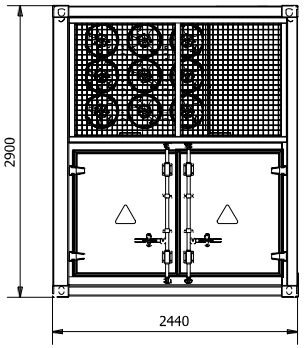
Left View



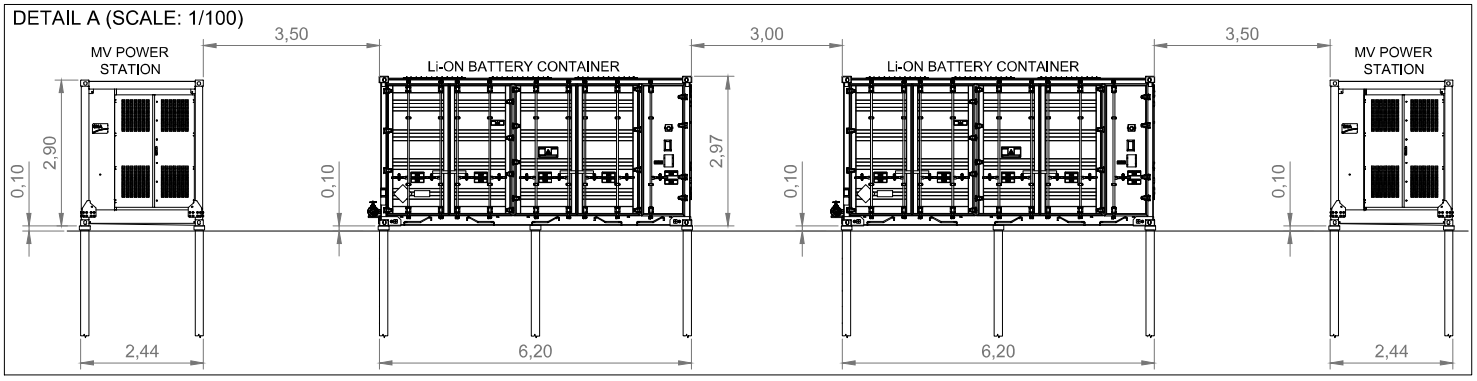
Front View



Right View



DETAIL A (SCALE: 1/100)



PRELIMINARY DESIGN. IT MAY BE MODIFIED ONCE TECHNICAL STUDIES ARE CARRIED OUT AND/OR RELEVANT INFORMATION IS RECEIVED.

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X-Elio

South Burnett Battery Energy Storage System Project

Noise Impact Assessment

Question today
Imagine tomorrow
Create for the future

South Burnett Battery Energy Storage System Project
Noise Impact Assessment

X-Elio

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Rev	Date	Details
A	01/08/2024	
B	03/09/2024	Final

	Name	Date	Signature
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Reviewed by:	Tim Ryan	02/08/2024	[redacted]
Approved by:	Tam Cavallaro	03/09/2024	[redacted]

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

Table of Contents

Executive summary

WSP prepared this Noise Impact Assessment for X-Elio Australia Pty Ltd to support a development application for a Battery Energy Storage System (BESS) in South Burnett Regional Council (SBRC). The primary objectives were to determine requirements, undertake a quantitative assessment of the potential operational noise impact on nearby sensitive receptors, and recommend noise mitigation measures to satisfy these requirements.

The proposed BESS will be developed on a 2-hectare footprint within an 84-hectare lot, approximately 220 km north-west of Brisbane. It will connect to the nearby Powerlink Halys Substation and will be remotely monitored, with local contractors providing site maintenance and first response.

Potential noise-sensitive receivers (NSRs) were identified using aerial imagery. The existing noise environment was characterised based on estimated values from Australian Standard 1055.2, indicating relatively low background noise levels typical of rural areas.

The noise criteria were defined according to the South Burnett Regional Council Planning Scheme 2017 and Environmental Protection (Noise) Policy 2019 to satisfy the intent of the Environmental Protection Act 1994.

Predicted operational noise levels indicated that, without mitigation, noise emissions from the BESS would exceed the proposed project/development specific noise assessment criteria at several locations. The assessment proposed several noise mitigation strategies, including selecting low-noise-emitting equipment, and optimising fan speeds based on ambient temperature fluctuations.

Results indicated that, with recommended mitigation measures, the BESS development can comply with the Environmental Protection (Noise) Policy 2019 and the South Burnett Regional Council Planning Scheme 2017.

1 Introduction

1.1 Purpose of report

WSP have prepared this Noise Impact Assessment on behalf of X-Elio Australia Pty Ltd (the applicant). It supports a development application to South Burnett Regional Council (SBRC) for a Material Change of Use for an undefined use (Battery Energy Storage System) assessable against the South Burnett Regional Council Planning Scheme 2017 (Version 1.4) (Planning Scheme).

This Noise Impact Assessment has the following objectives:

- Determine applicable assessment and approval requirements in accordance with the SBRC Planning Scheme considering applicable acoustic standards and guidelines.
- Undertake a quantitative assessment of the potential operational noise impact from the development on nearby sensitive receptors.
- Where relevant, investigate noise mitigation measures and provide in-principle recommendations to satisfy assessment and approval requirements.
- Summarise outcomes related to the above.

1.2 Project description

X-Elio is proposing to develop a Battery Energy Storage System (BESS) at 6, 220 km north-west of Brisbane, Queensland, Australia. The property is formally described as Lot 6 on FY691 and is shown in Figure 1.1. The proposed BESS will connect to the near-by the Powerlink Halys Substation.

The lot on which the BESS is proposed to be constructed is approximately 84 hectares of cleared agricultural land. The proposed BESS footprint is expected to be 2 Ha. Located in the southern extremity of the lot, close to Ellesmere Road.

During operations the facility will be unmanned and controlled monitored remotely. Site maintenance and first response is proposed to be provided by a local contractor with a performance requirements of 20 minutes response over a 24 hour a day period.

Figure 1.1 Location of the proposed BESS

The development will include the following primary noise generating functional elements:

Battery and inverter modules

75%-80% of the development footprint will comprise groups of battery modules (472 units) and inverters (118 units) similar to the arrangement shown in Figure 2. In appearance and dimensions battery modules are similar to “high cube” 20-foot standard shipping containers. These modules include self- contained cooling and fire detection/ suppressions systems.

Figure 1.2 Typical battery and inverter arrangement

Substation

The site substation connects the BESS to the Powerlink Electricity Grid and both receives power from the Grid to charge battery storage and distributes power to the Grid to satisfy power demand. The substation will be similar in appearance and function to a Powerlink/ergon distribution network substation.

Control Building

The control building houses the BESS control systems and telemetry hub. The operation of the control building is automated and has no permanent staff. The building contains workstations for on-call maintenance and technical staff to undertake diagnostic and maintenance activity.

Substation connection

Note: the works required to connect the BESS to the Halys Substation do not form part of the scope of this development application. Powerlink will provide, own and operate this connecting infrastructure and are responsible for corridor selection and stakeholder consultation, acquisition, coordination with the requirements of other projects and all approvals.

The Halys Substation infrastructure designated property is located approximately 500 m south of the proposed BESS site.

2 Noise Sensitive Receivers (NSRs)

The potential Noise Sensitive Receivers (NSRs) have been identified from aerial imagery. Visible structures have been evaluated without regard to their specific use, whether they are residential dwellings or other types of uninhabited buildings unless specific information was provided. Figure 2.1 and Appendix A show the Project site location and identified NSRs.

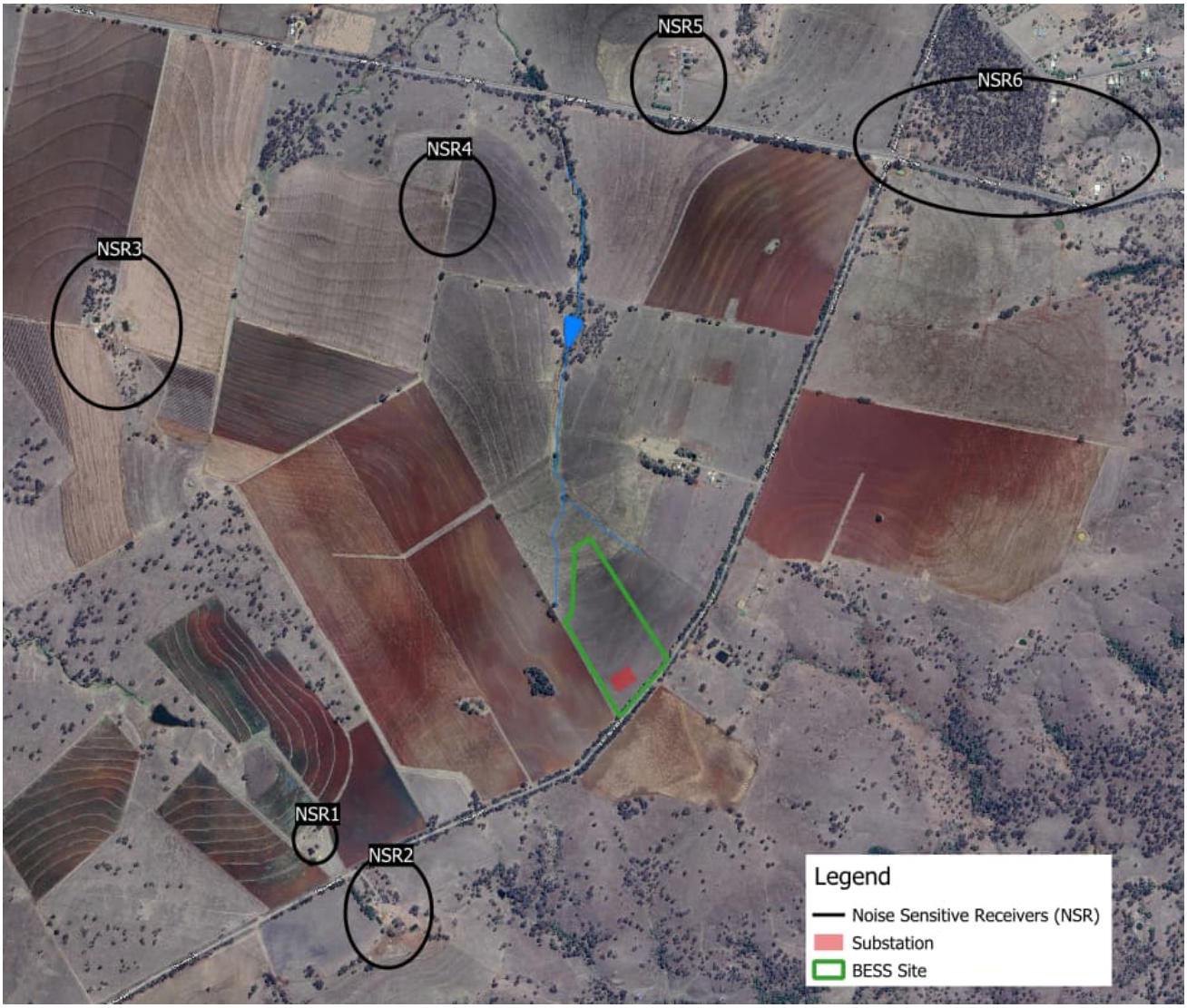

Figure 2.1 Project site location and identified Noise Sensitive Receivers (NSR)

3 Existing noise environment

Table 3.1 presents A-weighted background Sound Pressure Levels (SPLs) proximate to the BESS development site based on estimated values provided in *Australian Standard 1055.2-1997 'Acoustics-Description and measurement of environmental noise - Part 2: Application to Specific Situations*.

Table 3.1 Estimated average background A-weighted sound pressure levels, L_{A90}

Time of day	**Description of neighbourhood**	**Estimated average background A-weighted sound pressure level, L_{A90}**
Day (7 am to 6pm)	Areas with negligible transportation	40
Evening (6pm to 10pm)		35
Night (10pm to 7am)		30

4 Assessment criteria

The Town Planning Report (i.e. *PS211345-PLA-REP-001 RevA, Development Application for Material Change of Use for Battery Energy Storage System (Lot 6 on FY691)*) provides a detailed account of the planning assessment pathway and associated requirements.

In summary, the BESS development satisfies the *Planning Act 2016* definition for a 'Material Change of Use' constituting 'assessable development' that requires an impact assessment. The BESS development site is located in the South Burnett Regional Council local government area and is therefore subject to assessment against the Planning Scheme.

The following section provides an overview of the assessment and approval requirements applicable to the BESS development. Requirements are based upon standards provided in the following documents:

- *South Burnett Regional Council Planning Scheme 2017* (Version 1.4) (Planning Scheme).
- *Environmental Protection (Noise) Policy 1997* (Queensland Government, 1997) (Repealed, see Section 4.1 for relevance)
- *Environmental Protection (Noise) Policy 2008* (Queensland Government, 2008) (Repealed: see Section 4.2.1.1 for relevance)
- *Environmental Protection (Noise) Policy 2019* (Queensland Government, 2019)
- *Environmental Protection Act 1994* (Queensland Government, 1994)

4.1 South Burnett Regional Council Planning Scheme 2017

A BESS is not listed as a 'use definition' in Schedule 1, Table SC1.1.2 of the Planning Scheme and is, therefore, classified as an 'undefined use'.

Figure 4.1 shows the BESS site situated in, and surrounded by, Rural zoned land. In accordance with Schedule 1, Table 5.5.13 of the Planning Scheme, a 'Material Change of Use' for an 'undefined use' in a Rural zone is impact assessable development assessable against the Planning Scheme.

Source: South Burnett Regional Council, Public Interactive Mapping (30/07/2024)

Figure 4.1 Zoning map

Table 4.1 presents relevant performance and acceptable outcomes for the 'Rural' zone Table of Assessment from the Planning Scheme.

Note, Acceptable Outcome (AO) 1.2 refers to a twice repealed version (i.e. 1997) of the *Environmental Protection (Noise) Policy*. The current 'in force' policy is the *Environmental Protection (Noise) Policy 2019*. It includes significant changes to the repealed 1997 policy and is consistent with the object of the *Environmental Protection Act 1994* in relation to the acoustic environment.

On this basis, the noise impact assessment has been undertaken in accordance with the current 'in force' version of the policy i.e. *Environmental Protection (Noise) Policy 2019*.

Table 4.1 Rural zone code

Performance Outcomes	Acceptable Outcomes
Section 1 General	
PO1 Development maintains rural amenity and character.	**AO1.1** Buildings are set back 20m from any collector or higher order road and 10m from any other road frontage. **and** **AO1.2** The use does not cause odour, noise or air emissions in excess of the prescribed limits in the Environmental Protection (Air) Policy 1997 or the ***Environmental Protection (Noise) Policy 1997***.

4.2 Environnemental Protection (Noise) Policy 2019

The purpose of the *Environmental Protection (Noise) Policy 2019* is to achieve the object of the *Environmental Protection Act 1994* in relation to the acoustic environment.

This is achieved by:

- identifying/declaring environmental values of the acoustic environment.
- stating acoustic quality objectives for enhancing or protecting the environmental valuers.
- providing a framework for making consistent, equitable and informed decisions about the acoustic environment.

4.2.1 Acoustic quality objectives

Acoustic quality objectives, represent the maximum cumulative level of noise that should be experienced in an area or place. They are not to be interpreted as project/development specific objectives for the surrounding environment. They assist to inform what project/development specific objectives, as a condition of approval, may be.

It is not intended that, as part of achieving the acoustic quality objectives, any part of the existing acoustic environment be allowed to 'deteriorate'. Therefore, acoustic quality objectives should not be seen as a noise limit without consideration of whether the acoustic environment is 'deteriorating' because the existing acoustic environment is better than the acoustic quality objectives.

Acoustic quality objectives are provided for 'outdoor' and indoor' receptor locations. For this assessment, 'indoor' acoustic quality objectives are converted to equivalent 'outdoor' acoustic quality objectives by applying a correction representative of the building envelope with a partially opened window. While each building/dwelling will be unique in the amount of external-to-internal noise reduction it provides, government publications[1] and industry research[2] indicate a range of approximately 5 to 15 dB subject to building envelope materials, internal room acoustic conditions and window opening size (%). This assessment assumes buildings/dwellings are of timber construction (i.e. conventional 'Queenslander') and internal rooms characterised as having low-to-medium reverberation times. Based on these assumptions, the external-to-internal noise reduction is set at 10 dB.

WSPs experience undertaking noise impact assessments for BESS developments suggests the L_{Aeq} acoustic quality objective will govern over the L_{A10} and L_{A1} acoustic quality objectives. That is, L_{A10} noise emissions from the BESS development are expected to be less than 5 dB above the L_{Aeq} noise emissions. Similarly, L_{A1} noise emissions are expected to be less than 10 dB above the L_{Aeq} noise emissions. On this basis, the following assessment focusses on the $L_{Aeq, adj, 1hr}$ acoustic quality objective.

Acoustic quality objectives, and their associated environmental values relevant to the BESS development, are presented in Table 4.2. As shown, the equivalent 'outdoor' acoustic quality objectives, denoted in bold, are the most stringent for each time of day. Satisfying these objectives will result in compliance against the standard 'outdoor' acoustic quality objectives.

[1] Queensland Government, Environment Protect Agency (2004), *Guideline Noise—Planning for Noise Control.*

[2] Ryan, M., Lanchester, M., & Pugh, S. (2011). *Noise Reduction through Facades with Open Windows*. https://www.acoustics.asn.au/conference_proceedings/AAS2011/papers/p37.pdf

Table 4.2 Acoustic quality objectives

Sensitive receptor	Time of day[1]	Acoustic quality objectives (measured at the receptor) dBA			Environmental value
		$L_{eq,adj,1h}$[2]	$L_{10,adj,1h}$	$L_{1,adj,1h}$	
Residence (for outdoors)	Daytime and evening	50	55	65	Health and wellbeing
Residence (for indoors[3])	Daytime and evening	35 (45)	40 (50)	45 (55)	Health and wellbeing
	Night-time	30 (40)	35 (45)	40 (50)	Health and wellbeing, in relation to the ability to sleep

Note:

1. Daytime refers to the time-period of 7 am on a day to 6 pm on the same day. Evening refers to the time-period of 6 pm on a day to 10 pm on the same day. Night-time refers to the time-period of 10 pm on a day to 7 am on the following day.
2. 'adj' refers to the 'adjustment' of a noise level for tonal characteristics or impulsiveness.
3. Values in parenthesis denote 'equivalent' 'outdoor' acoustic quality objectives.

4.2.1.1 Adjustments made to noise levels with annoying characteristics

Tonal adjustment

If tonal components are significant characteristics of the sound within a measurement time interval, an adjustment shall be applied for that time interval to the measured A-weighted SPL. The value of this adjustment shall be stated. A procedure based on one-third octave band analysis is recommended for determining the tonal adjustment.

NOTE: In some practical cases, a prominent tonal component may be detected in one-third octave spectra if the level of a one-third octave band exceeds the level of the adjacent bands by 5 dB or more, but a narrow-band frequency analysis may be required to detect precisely the occurrence of one or more tonal components in a noise signal. If tonal components are clearly audible and their presence can be detected by a one-third octave analysis, the adjustment may be 5 to 6 dB(A). If the components are only just detectable by the observer and demonstrated by narrow-band analysis, an adjustment of 2 to 3 dB(A) may be appropriate.

Impulse adjustment

If impulsiveness is a significant characteristic of the sound within a measurement time interval, an adjustment shall be made over this time interval. A suggested procedure for determining the impulse adjustment is to take a second measurement using time-weighting 'I' (see AS/NZS IEC 61672.1:2019 [17]). If this latter level is 2 dB(A) or greater, this value shall be added to the component level and should not exceed 5 dB.

4.2.2 Background creep

In addition to satisfying the above acoustic quality objectives, the *Environmental Protection (Noise) Policy 2019* sets out a management intent for noise including the management of 'background creep'. However, the current policy does not provide an objective framework/methodology for the assessment 'background creep'.

It states:

> *(2) To the extent that it is reasonable to do so, noise must be dealt with in a way that ensures—*
>
> *(a) the noise does not have any adverse effect, or potential adverse effect, on an environmental value under this policy; and*
>
> *(b) background creep in an area is prevented or minimised.*

And:

> *(4) In this section—*
>
> *Background creep, for noise in an area or place, means a gradual increase in the total amount of background noise in the area or place as measured under the document called the 'Noise measurement manual' published on the department's website.*

A repealed version (i.e. 2008) of the *Environmental Protection (Noise) Policy 2019* does, however, provide an objective framework/methodology to assess background creep. In lieu of an alternative framework/methodology being offer in the current policy, the following has been adopted for this assessment.

- For noise that varies over time: $L_{Aeq,\ adj,\ T} \leq L_{A90,\ T} + 5$ dBA.
- For noise that is continuous noise: $L_{A90,\ T} \leq L_{A90,\ T} + 0$ dBA.
  - For continuous noise sources, the theoretical $L_{A90,\ T}$ is equal to $L_{Aeq,\ adj,\ T}$. Therefore, the criteria commonly used for continuous noise is $L_{Aeq,\ adj,\ T} \leq L_{A90,\ T} + 0$ dBA.

Operational noise from the BESS development is expected to 'vary' over a 24-hour period due to fluctuating ambient weather conditions and demand from grid. Based on the assumed A-weighted background SPLs in Section 3 and the framework/methodology above, Table 4.3 presents assessment criteria for the control of background creep, denoted in bold.

Table 4.3 Assessment criteria for the control of background creep

Time of day	**Estimated average background A-weighted SPL, L_{A90}**	**Assessment criteria for the control of background creep**
For noise that varies over time		
Day (7 am to 6pm)	40	**45**
Evening (6pm to 10pm)	35	**40**
Night (10pm to 7am)	30	**35**

Note, the *Environmental Protection (Noise) Policy 2019* acknowledges in some situations, it may be reasonable to allow a greater increase to the background noise in an area or place. That may be the case in an area or place with very low background noise where an activity will increase the background noise levels but only to the extent the environmental values of the area are still protected.

4.3 Proposed project/development specific noise assessment criteria

Considering the acoustic quality objectives in Table 4.2 and the background creep assessment criteria in Table 4.3, the proposed noise assessment criteria for the BESS development, denoted in bold, are presented in Table 4.4.

Table 4.4 Proposed project/development specific noise assessment criteria

Time of day	**Proposed noise assessment criteria for the control of:**	
	Acoustic quality objectives	**Background creep**
For noise that varies over time		
Day (7 am to 6pm)	45	45
Evening (6pm to 10pm)	45	40
Night (10pm to 7am)	40	35

5 Operational noise impact assessment

5.1 Methodology

Noise predictions were conducted using the SoundPLAN software package implementing the CONCAWE[3] prediction algorithm. The adopted algorithm considers noise attenuation from geometric spreading, meteorological conditions, atmospheric absorption and ground absorption effect as well as noise shielding from topography. Modelling parameters are shown in Table 5.1.

Table 5.1 Noise modelling parameters

Parameter	Modelling input
Ground absorption	Ground absorption factor is set to soft ground (60% absorptive) which is representative of undeveloped ground with vegetation or agriculture. Ground absorption factor of the site is set to hard ground (100% reflective)
Terrain data	The terrain data were retrieved from Elvis (elevation.fsdf.org.au) with a resolution of 0.5m
Meteorological conditions	Refer section5.3
Buildings	NSRs are modelled as buildings in the noise model.
Receiver height	The receiver heights are set at 1.5 m above ground level.
Location of noise sources	Refer Section 2.
Noise source height	The ventilation equipment of the BESS is set at 3.5 m above ground and the noise sources from the transformers and the inverters are set at 2.3 m above ground level.
Modelled sound power levels	As described in Section 5.5. Detailed information regarding noise sources was not available for all plant, therefore assumptions have been made based on similar projects as indicated.
Assessment parameter/ duration	$L_{Aeq,1h}$
Assumed hours	Operational noise may occur at any time of day (day, evening, night) and is assumed to be continuous.

A three-dimensional representation of the physical environment within the project area was simulated. Modelling inputs include all relevant buildings within the assessment area, noise generated by expected activities at the BESS development site, and other inputs which may have an effect on the noise environment.

5.2 Operational scenario

As indicated in Table 5.1, the BESS development will be required to operate during any time of day (day, evening, night) subject to ambient weather conditions and demand. Furthermore, as the primary noise generating items of plant and equipment are likely to emit constant noise over the 1-hour assessment period, only one operational scenario has been developed. This single 'worst-case' scenario shall be assessed against the proposed noise assessment criteria for each time of day.

[3] CONCAWE, developed by the oil industry association CONCAWE, is a sound modelling method used to assess environmental noise from industrial plants. It includes adjustments for meteorological conditions, octave band analysis, and various attenuation factors, and is based on extensive empirical data.

A description of the operational scenario is listed below:

- The layout of the BESS equipment is provided in Figure 5.1, which shows 4 x Saft - Intensium Shift 300MV Li-On Batteries containers paired with 1x MV Power Station consisting of an inverter Ingecon Sun Storage C630 inverter and a transformer (one ‘block’ as shown in the top right hand corner of the figure). In total, 118 ‘blocks’ have been modelled within the site boundary based on this layout.
- Preliminary BESS plant and associated equipment have been selected. The assessment assumes that all plant is required to operate at 100 % of duty cycle over a 24-hour period (as is typical for BESS facilities to input power into the grid at any time). This assessment doesn’t assume that BESS fan speeds will operate at lower loads even under varying ambient temperatures for the day/evening and night periods.
- It is understood, during typical operations, the facility will be unmanned and monitored remotely. Except for routine and/or emergency site maintenance, vehicle movements (i.e. noise from vehicles) are not considered to be a typical feature of the development. On this basis, vehicle movements have not been included in the assessment.

Figure 5.1 South Burnett BESS layout and Saft BESS block layout (indicative)

5.3 Meteorological conditions

The noise impact assessment considers possible effects of noise enhancing meteorological conditions on sound propagation at the BESS development site. Default meteorological conditions were adopted as CONCAWE modelling inputs for this assessment in accordance with guidance provided in *QLD EPA Planning for Noise Control*

Table 5.2 Meteorological conditions considered in noise predictions

Humidity	Temp	Stability class	Temperature inversion	Wind speed (source to receiver)
70%	10°C	F	3°/100m	3m/s

5.4 Operational equipment

The primary noise generating items of plant and equipment associated with the BESS development are presented in Table 5.3 together with estimated Sound Power Levels (SWLs). Where applicable, and where data is not available, WSP have made assumptions for SWLs, based on previous experience with previous similar projects. Assumptions and descriptions of the source data are outlined in Section 5.4.1.

The following indicative equipment sound power levels do not include adjustments for 'tonal' or 'impulse' characteristics.

Table 5.3 Primary noise generating equipment

Equipment	Make	Number of plant	SWL dBA, per unit (indicative)	Modelled noise source height above ground[1]
Battery Cabinets	Saft Intensium Shift 3.0 MWh	472	94	Modelled as a point source 0.5m above the roof of the Battery cabinet (centred). BESS Cabinet Dimensions (LxWxH): 2.4m x 6.1m x 2.9m
Power Conversion System Inverters	Ingecon Sun storage 3 power Cseries C630	118	85	2.3m
Power Conversion System MV Transformer	Unknown	118	85	2.3m

5.4.1 Description of source data

BESS equipment

The Battery Storage containers are planned to be SAFT Intensium Shift 3.0MWh high-energy Lithium-ion batteries.

The SPLs in four directions at a distance of three meters from the container have been provided as shown in Figure 5.2. Based on these measurements, the SWL of a point source with directivity was calculated to ensure the model validates with the provided data. The sound sources were positioned in the model so that the quietest sides of the containers face the nearest NSRs.

4.10.2 HVAC Sound Pressure Level

The figure below shows the noise level at a distance of 3 m between the HVAC and the measurement point measured with compressor working at 25°C (TBC).

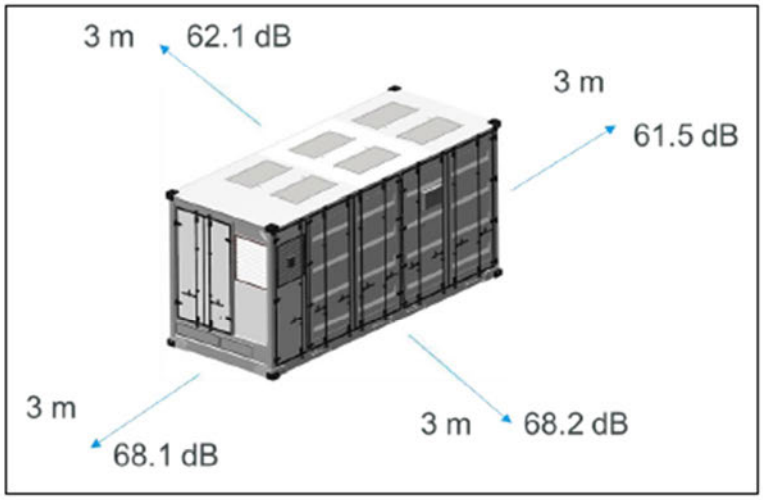

Figure 29: HVAC Sound Pressure Level @3m

Figure 5.2 Sound Pressure Levels at 3m (Source: X-Elio)

Inverter

The inverters chosen for the project are the Ingecon Sun Storage 3Power C series. Sound power levels have been calculated to match the SPL at 10 meters as supplied by the manufacturer in the document *TF-04-IPT_BESS-01_C.pdf.*

MV Transformer

A noise spectrum was not provided to WSP for the MV transformer and WSP has therefore made reasonable assumptions based on previous experience with similar projects.

5.5 Predicted operational noise levels

The noise model was used to predict external noise levels for the operational scenario detailed in Section 5.2. For each Noise Sensitive Area, the most-affected receivers have been used to represent the catchment area and receptor type, shown in Table 5.4. Noise emission contours are also provided in Appendix B for visual reference. It is noted that contours do not have the same degree of accuracy as point-to-point calculations and are to be used for visual reference only.

Table 5.4 Predicted operational noise levels

Noise sensitive receivers	Baseline scenario $L_{Aeq, adj, 1hr}$	Proposed noise assessment criteria		
		Day	Evening	Night
NSR1	45	45	40	35
NSR2	45	45	40	35
NSR3	42	45	40	35
NSR4	46	45	40	35
NSR5	45	45	40	35
NSR6	47	45	40	35

5.5.1 Discussion

The results show that noise levels are exceeding the noise criteria across most locations when no mitigation measures are implemented.

Possible strategies and controls to minimise noise emissions are as follows:

- Noise control at the noise source
  - Select the lowest practicable noise emitting plant/operation (e.g. load duty), including selection to reduce tonal components.
  - Select plant that can operate at different set percentages of duty cycle over a 24-hour period if required. Choosing sound sources with variable fan speeds enables adjustments to the cooling requirements based on ambient temperature fluctuations. During warmer periods, higher fan speeds are necessary to ensure safe operation, whereas lower speeds can be maintained during cooler times. The ability to modulate fan speeds according to the duty cycle helps in managing noise levels more effectively.
  - Installation of silencers around key plant (supplier-specific noise reduction kits are available for various BESS and inverter plant).
- Noise control along the noise transfer path
  - Installation of noise barriers/enclosures.

5.5.2 Recommendations and controls

The following noise mitigation options have been assessed, as these are considered best available and practicable controls for BESS facilities (based on industry knowledge and prior experience from delivery of similar projects):

— **Noise control at the noise source:** reducing sound power levels of BESS units

As noted in Section 5.5.1, electing the lowest practicable noise-emitting equipment or adjusting the BESS fan speeds according to varying ambient temperatures throughout the day, evening, and night can effectively reduce noise levels.

However, due to the lack of data for the BESS unit, noise calculations at different fan speeds could not be performed. Table 5.5 outlines the maximum SWL that each BESS unit should meet to satisfy the proposed noise assessment criteria in Section 4.3. Please note, that these recommended SWL could also be achieved by a combination of at-source controls such as lower fan speed duty in combination with pre-packaged noise silencing kits (supplier specific).

Table 5.5 Recommended maximum sound power level for battery cabinets, $L_{Aeq,\ adj,\ 1hr}$

	Recommended maximum sound power level for battery cabinets to satisfy proposed noise assessment criteria (dBA)		
	Day	**Evening**	**Night**
NSR1	No mitigation	88	81
NSR2	No mitigation	88	81
NSR3	No mitigation	92	86
NSR4	93	87	82
NSR5	No mitigation	89	83
NSR6	92	87	82

6 Conclusion

X-Elio Australia Pty Ltd requested WSP to conduct a noise impact assessment for the proposed Battery Energy Storage System (BESS) in South Burnett Regional Council.

The assessment identified and evaluated noise-sensitive receivers, estimated background noise levels, and established applicable noise criteria in accordance with the South Burnett Regional Council Planning Scheme 2017 and the Environmental Protection (Noise) Policy 2019 to satisfy the intent of the Environmental Protection Act 1994.

Noise predictions were conducted using the SoundPLAN software package implementing the CONCAWE prediction algorithm. Modelling inputs included all relevant buildings within the assessment area, noise generated by the expected BESS and other inputs which may influence the noise environment like topography, wind speeds and temperature inversion.

This assessment demonstrates that, with the implementation of appropriate noise mitigation measures, including selecting low-noise-emitting equipment, and optimizing fan speeds based on ambient temperature fluctuations the project will comply with all relevant noise assessment criteria and regulatory requirements.

7 Limitations

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Appendix A

Project Site location and Identified Noise Sensitive Receivers (NSR)

Map: Google Maps	Author: MB
Date: 01/08/2024	Approved by: TR

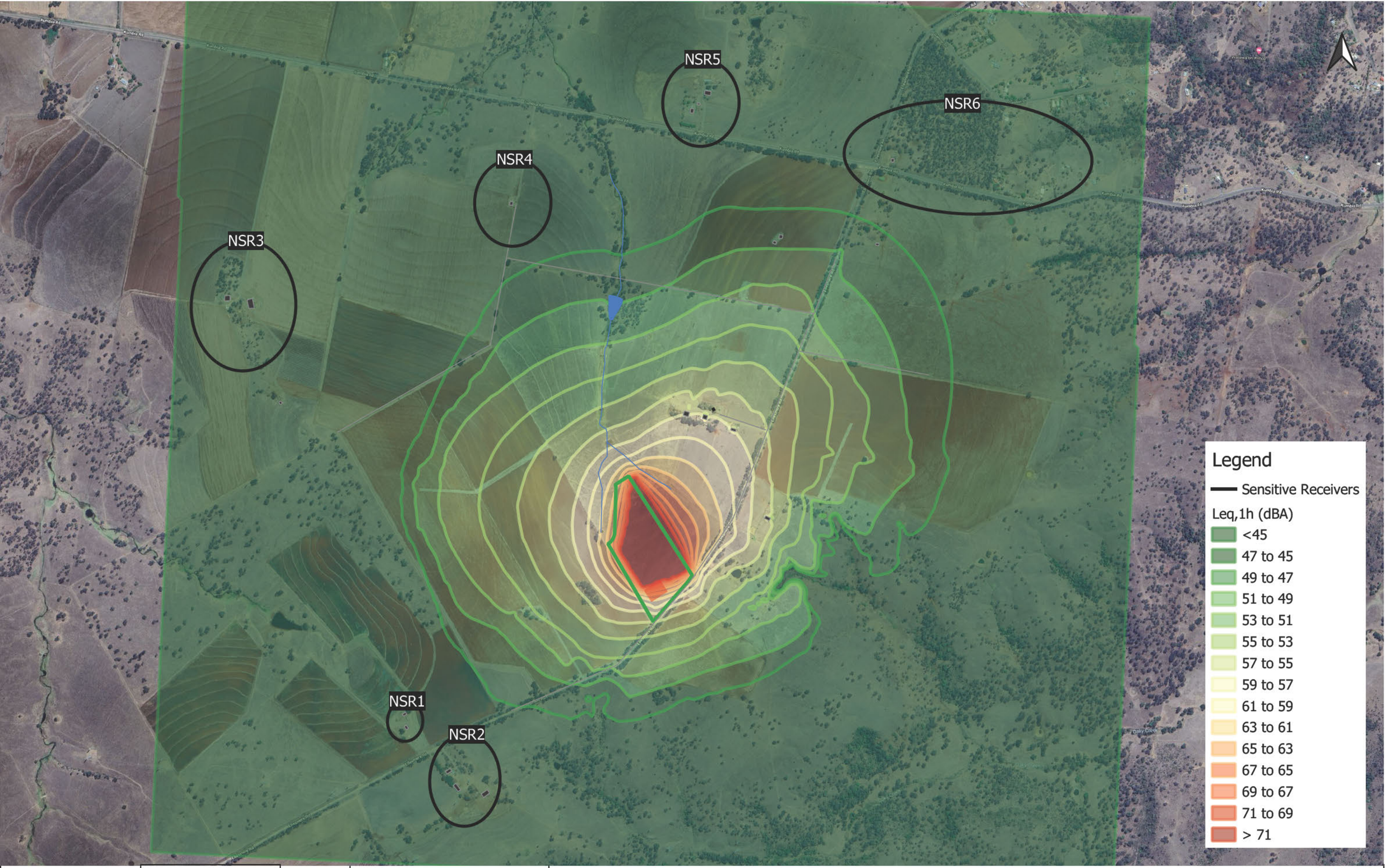
0 100 200 300 400 500 m

South Burnett
Battery Energy Storage System Project

Operational Noise Impact Assessment

Appendix B

Noise emission contours



Map: Google Maps	Author: MB
Date: 01/08/2024	Approved by: GS/TR

0 100 200 300 400 500 m

South Burnett
Battery Energy Storage System Project

Operational Noise Impact Assessment - NO MITIGATION

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South Burnett Battery Energy Storage System (BESS) Development Application (DA)

Traffic Impact Assessment

September 2024

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Rev	Date	Details
A	01/08/2024	Draft submission
B	05/09/2024	Final submission

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Reviewed by:	A.Moore	05/09/2024	[redacted]
Approved by:	T.Cavallaro	05/09/2024	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Abbreviations

AADT	Average Annual Daily Traffic
BAL	Basic Left Turn
BAR	Basic Right Turn
BESS	Battery Energy Storage System
DA	Development Application
ESA	Equivalent Standard Axles
GTIA	Guide to Traffic Impact Assessment
HV	Heavy Vehicle
LV	Light Vehicle
OSOM	Over-size Over-mass
km	Kilometre
SAR	Standard Axle Repetition
SCR	State Controlled Road
SBRC	South Burnett Regional Council
TIA	Traffic Impact Assessment
TMR	Department of Transport and Main Roads
LOS	Level of Service
DOS	Degree of Saturation
RUMP	Road Use Management Plan
SAR	Standard Axle Repetitions

1 Introduction

1.1 Project background

X-Elio is proposing to develop a Battery Energy Storage System (BESS) at 1196 Ellesmere Road, Alice Creek, 220 km north-west of Brisbane, Queensland, Australia. The property is formally described as Lot 6 on FY691. The proposed BESS will connect to the nearby Powerlink Halys Substation.

1.2 Purpose of this report

This report presents the Traffic Impact Assessment (TIA) undertaken to investigate the impacts of the BESS project construction and operation on the surrounding local council roads. The report considers:

- Traffic generating characteristics of the Project (construction and operation phases)
- Existing transport network environment on access routes to the Project site including:
  - key roads and intersections and associated traffic demands
  - crash history
  - heavy vehicle routes
  - public and active transport
- Anticipated impacts of the Project (construction and operation phases) on the surrounding local council roads network including:
  - road link capacity and pavement damage
  - intersection delay
  - heavy vehicle routes
  - public and active transport networks
  - road safety

1.3 Methodology

The TIA follows the methodology detailed in the *Guide to Traffic Impact Assessment* (GTIA) which provides the processes to assess traffic-related impacts created by a proposed development, such as construction and operation. In line with the GTIA, the following methodology has been adopted:

- Review of transport networks to establish existing conditions (i.e., no Project)
- Identification of access routes to the Project site
- Estimation of the traffic generation for the construction and operation phases of the Project and assignment of this traffic to the identified access routes
- Assessment of impacts resulting from the Project-generated traffic to the State and Local Council network in relation to:
  - road link capacity
  - intersection operation

  - pavement damage
  - other transport facilities
  - road safety
- Identification of mitigations measures.

1.3.1 Reference materials and supporting data sources

The reference resources and datasets listed below were used to guide and inform this assessment:

- Guide to Traffic Impact Assessment (TMR 2018)
- Guide to Traffic Impact Assessment Practise Note: Pavement Impact Assessment (TMR 2018)
- Guide to Traffic Impact Assessment Case Studies (TMR 2017)
- Austroads Guide to Traffic Management: Part 6 – Intersections, Interchanges and Crossings Management (Austroads 2020)
- TMR Annual Average Daily Traffic (AADT) traffic census data (2021)
- Queensland Globe:
  - Heavy vehicle routes
  - Principal cycle routes
  - Crash data
- The Project construction and operations activities and traffic generation (provided by X-Elio).

2 Development Profile

2.1 Project activities

2.1.1 Construction

During construction of the BESS, the client has advised that following activities are to be assumed in the analysis:

- Preparation of site
- Installation of temporary construction compound and ancillary construction equipment
- Bulk earthworks
- Construction of project bench, hardstand areas and access tracks where required
- Installation of drainage systems
- Trenching
- Cabling, earthing and grid connection
- Delivery of project components and materials
- Delivery, assemble and commission of BESS, ancillary sub-station, and O&M facility
- Connection to substation
- Decommissioning of temporary compound and removal of ancillary construction equipment

Construction activities should be assumed to occur within the following time periods:

- Monday to Friday: 7:00 am to 6:00 pm:
  - Worker vehicle trips are expected to occur between the hours 6:00 am and 7:00 am in the morning peak, and 6:00 pm to 7:00 pm in the evening peak.
- Saturday: 7:00 am to 1:00pm:
  - Worker vehicle trips are expected to occur between the hours of 6:00 am and 7:00 am in the morning peak, and 1:00 pm and 2:00 pm in the afternoon peak.
- No trips expected on Sundays and public holidays.

Peak workforce is estimated by the client to be approximately 100 – 150 full time equivalent (FTE) employees, with localised workforces to be prioritised. Kingaroy is the preferred location for the workforce.

2.1.2 Operation

The operation of the Project will require regular on-site maintenance, as well as key upgrades, updates, and quality checks to be undertaken throughout the year or following significant weather or disturbance events (for a project operational lifetime of approximately 25 years).

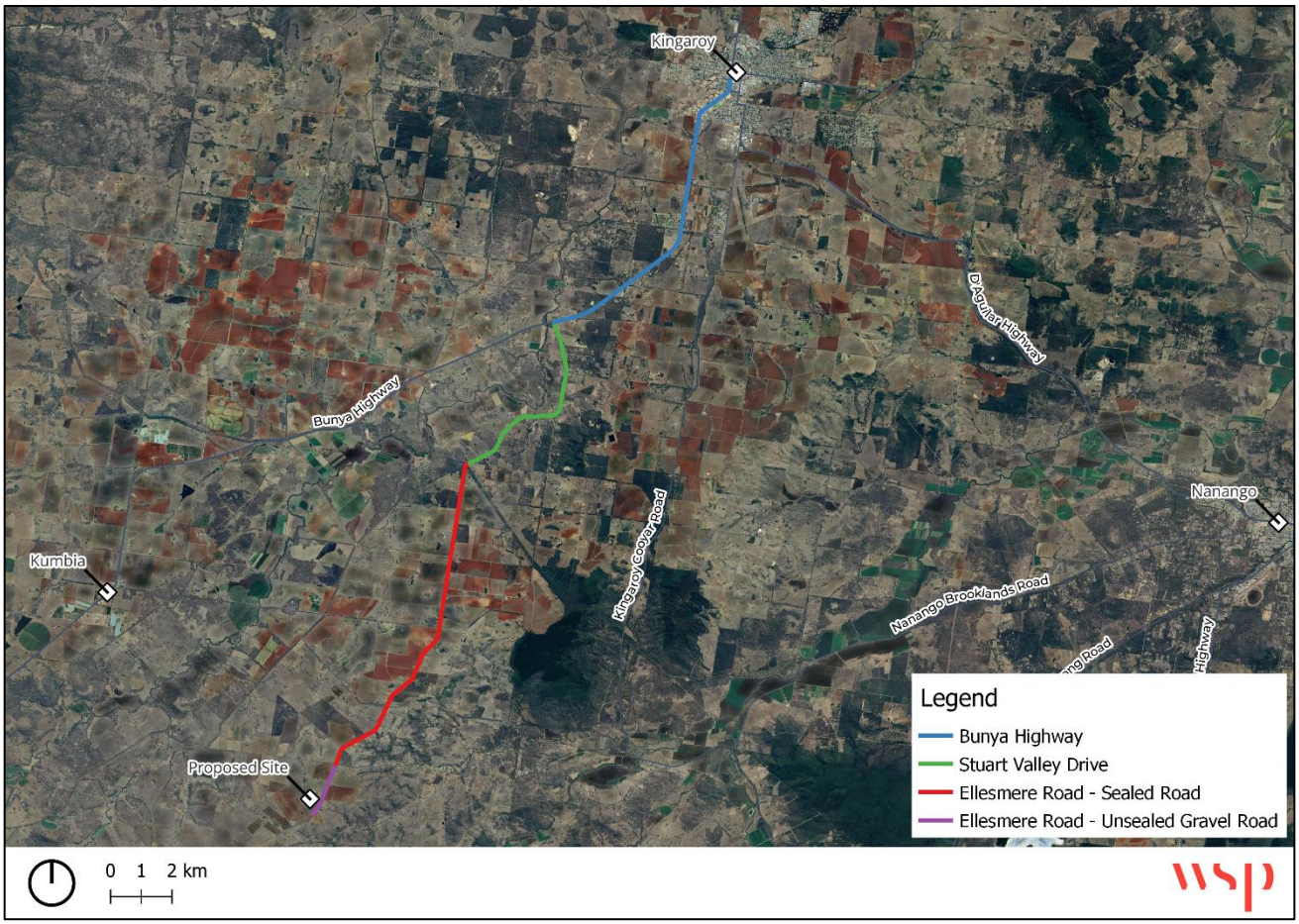
2.2 Access routes

The site will be accessed from Kingaroy (preferred location for the workforce) by:

- Travelling approximately 11 km south on the Bunya Highway (State Controlled Road (SCR)).

- Vehicles then turn left onto Stuart Valley Drive (South Burnett Regional Council (SBRC) controlled road).
- After travelling approximately 6 km south on Stuart Valley Drive, the road (at the Stuart Valley Drive and Old Taabinga Road intersection) becomes Ellesmere Road (SBRC controlled road).
- Vehicles travel south on Ellesmere Road for approximately 11 km before they approach the intersection of Ellesmere Road and Kumbia Road.
- Proceeding south through the intersection, vehicles then travel approximately 1.5 km on a section of unsealed gravel road (Ellesmere Road) before reaching the proposed access to the BESS site.

The proposed access route to site from Kingaroy has been displayed in Figure 2.1 below.



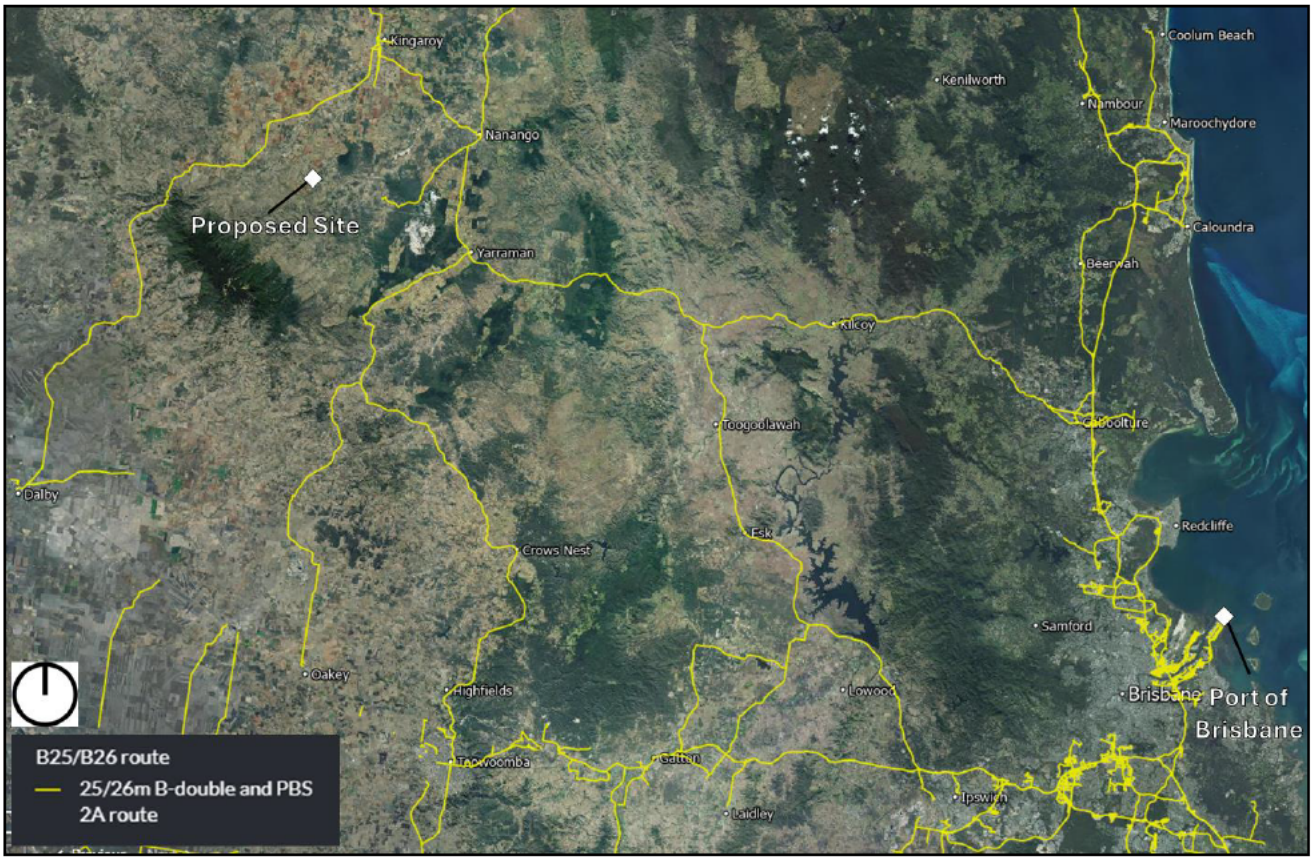
Source: Google Maps, 2024

Figure 2.1 Proposed access route to site from Kingaroy

Detailed planning for the Project construction is yet to be undertaken; however, the client has advised that components will likely arrive via the Port of Brisbane. Delivery vehicles are assumed to travel to site from Brisbane by either:

1. Travelling north on the Bruce Highway, then heading west from Caboolture on the D'Aguilar Highway
2. Travelling west on the Warrego Highway, then heading north from Ipswich on the Brisbane Valley Highway

Figure 2.2 below shows heavy vehicles (B-double and PBS) approved routes in the region between Brisbane and the site. The map indicates the approval of these heavy vehicle types on the proposed routes listed approve. However, approval from SBRC will be required for the use of B-doubles and OSOM's on local council owned road.



Source: *Queensland Globe*

Figure 2.2 B-Double and PBS routes

2.3 Traffic generation

2.3.1 Construction

The client has advised that vehicles movements to the site during the lifecycle of the construction period should be based on other similar BESS development projects that WSP has been engaged on in similar jurisdictions / Councils in Queensland.

2.3.1.1 Vehicle movements

Vehicles movements to and from the site during the lifecycle of the construction period are shown in Table 2.1.

Table 2.1 Construction vehicle requirements over the lifecycle of the construction period

Vehicle Type	Number of Trips
Passenger vehicles	Up to 100 daily return trips
Heavy vehicles (B-double)	1,000 return trips through-out the construction work phase
Over-sized over-mass (OSOM)	20 return trips through-out the construction work phase

2.3.1.2 Peak activity

Based on the construction vehicle movements throughout the construction work phase, for the purpose of this report, the peak vehicular activity during construction is assumed to include:

— 100 passenger vehicle daily return trips to site

— 10 heavy vehicle daily return trips to site

— 1 OSOM daily return trip to site

2.3.1.3 Heavy vehicles

Expected heavy vehicle (HV) volumes for the Project's construction stage are detailed in Table 2.3. According to Austroads vehicle classification system, B-doubles are classified as class 10. While over-sized over-mass (OSOM) vehicles aren't defined within the classification system, it is assumed they are a class 12 (largest loaded Standard Axle Repetition (SAR)). The SAR values have been taken from the *Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment*.

The majority of the road network in Queensland has a granular pavement with a thin bituminous surface. It is therefore assumed that the sealed access routes to the site are granular pavements with a thin bituminous surface. Therefore, the SAR4 damage value has been used as per Table 1 of the guide shown in Table 2.2.

Table 2.2 Pavement types and load damage exponent

Pavement type		TMR pavement type	Type of damage	Load damage exponent	Damage unit
Granular pavement with thin bituminous surfacing	Granular pavement (GN)	Sprayed seal over flexible pavement, including cement modified and lime stabilised layer types C4 and C5	Overall pavement damage	4	ESA / SAR4

Source: Guide to Traffic Impact Assessment Practice Note: Pavement Impact Assessment

Table 2.3 Project construction generated SAR4s during entire project

Vehicle Class – SAR4s (Loaded/Unloaded)	Total Return Trips (In & Out)	Stage SAR4s In (NB)	Stage SAR4s Out (SB)
B-double (Austroads Vehicle Class 10) SAR4s 6.3 (Loaded) / 0.53 (Unloaded)	1,000	6,300	530
Over-sized over-mass (Austroads Vehicle Class 12) SAR4s 11.75 (Loaded) / 0.58 (Unloaded)	20	235	12
TOTAL	1,020	6,535	542

2.3.2 Operations

The Project is expected to be in operation for approximately 25 years, pending technology selection. During this time, the Project is expected to generate minimal traffic associated with its operation services. On average, the Project is expected to generate four passenger vehicle daily return trips and two heavy vehicle return trips per month through-out the operational lifetime.

3 Existing Environment

3.1 Road network

3.1.1 Road Link

3.1.1.1 Bunya Highway

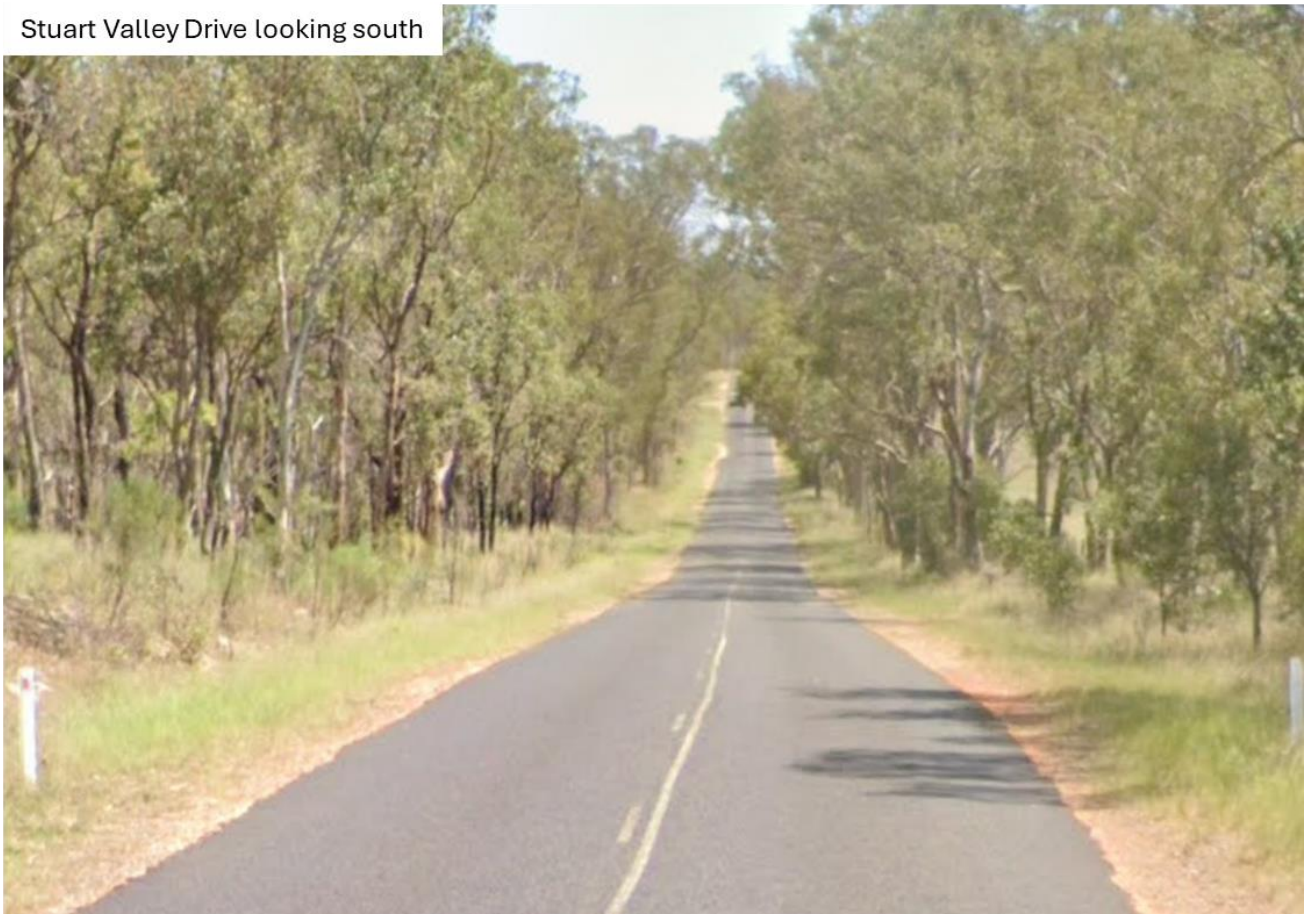
The Bunya Highway is a north-south running state-controlled highway that runs from Goomeri to Kingaroy (45B) and Kingaroy to Dalby (45A). The section of road is a two-lane formation with narrow sealed shoulders. The posted speed limit of the highway is predominantly 100 km/hr, with 60 km/hr to 80 km/hr speed zones in residential areas. A typical cross section of the Bunya Highway from Kingaroy to Dalby is shown in Figure 3.1. The image is taken at the Bunya Highway and Stuart Valley Drive intersection.

Source: Google Maps, August 2022

Figure 3.1 Bunya Highway looking east at the Bunya Highway and Stuart Valley Drive intersection

3.1.1.2 Stuart Valley Drive

Stuart Valley Drive is a SBRC controlled road that runs between the Bunya Highway in the north and Ellesmere Road in the south. The road is sealed and is predominately used to access rural properties. The posted speed limit on the road is 100 km/hr. Stuart Valley Drive facing south at Boonenne is shown in Figure 3.2.



Source: Google Maps, November 2020

Figure 3.2 Stuart Valley Drive looking south (at Boonenne)

3.1.1.3 Ellesmere Road – Sealed Road

Ellesmere Road is a SBRC controlled road that runs between Stuart Valley Drive in the north and Kumbia Road in the south. The part of Ellesmere Road shown in Figure 3.3 below is sealed and is predominately used to access rural properties. The posted speed limit on the road is 100 km/hr.

Source: Google Maps, November 2020

Figure 3.3 Ellesmere Road (Sealed road) looking north at the Ellesmere Road and Kumbia Road intersection

3.1.1.4 Ellesmere Road – Unsealed Gravel Road

South from the Ellesmere Road and Kumbia Road intersection, Ellesmere Road becomes an unsealed gravel road. This section of road will be used to access the proposed site. In addition, the road is used to access rural properties as well as the 'S002 Halys Substation'.

The unsealed gravel road has a formed cross section with adequate longitudinal drainage to minimise the risk of water ponding on the road in wet weather. An assessment of the gravel pavement and sub-base has not been undertaken to confirm whether they have sufficient structural strength and for heavy vehicle use in all weather conditions. However, an in person visual inspection indicated that the road is in a well-maintained condition. A typical cross section of this road is shown in Figure 3.4.

Source: WSP site visit, 20th June 2024

Figure 3.4 Ellesmere Road (unsealed gravel road) looking north near proposed access to site

3.1.1.5 Kumbia Road

Kumbia Road is a SBRC controlled road that runs between Kumbia in the west and Brookland in the east. The road is sealed and is predominately used to access rural properties. The posted speed limit on the road is predominantly100 km/hr, with 80 km/hr speed zones in residential areas. Kumbia Road facing east at the Ellesmere Road and Kumbia Road intersection is shown in Figure 3.5.

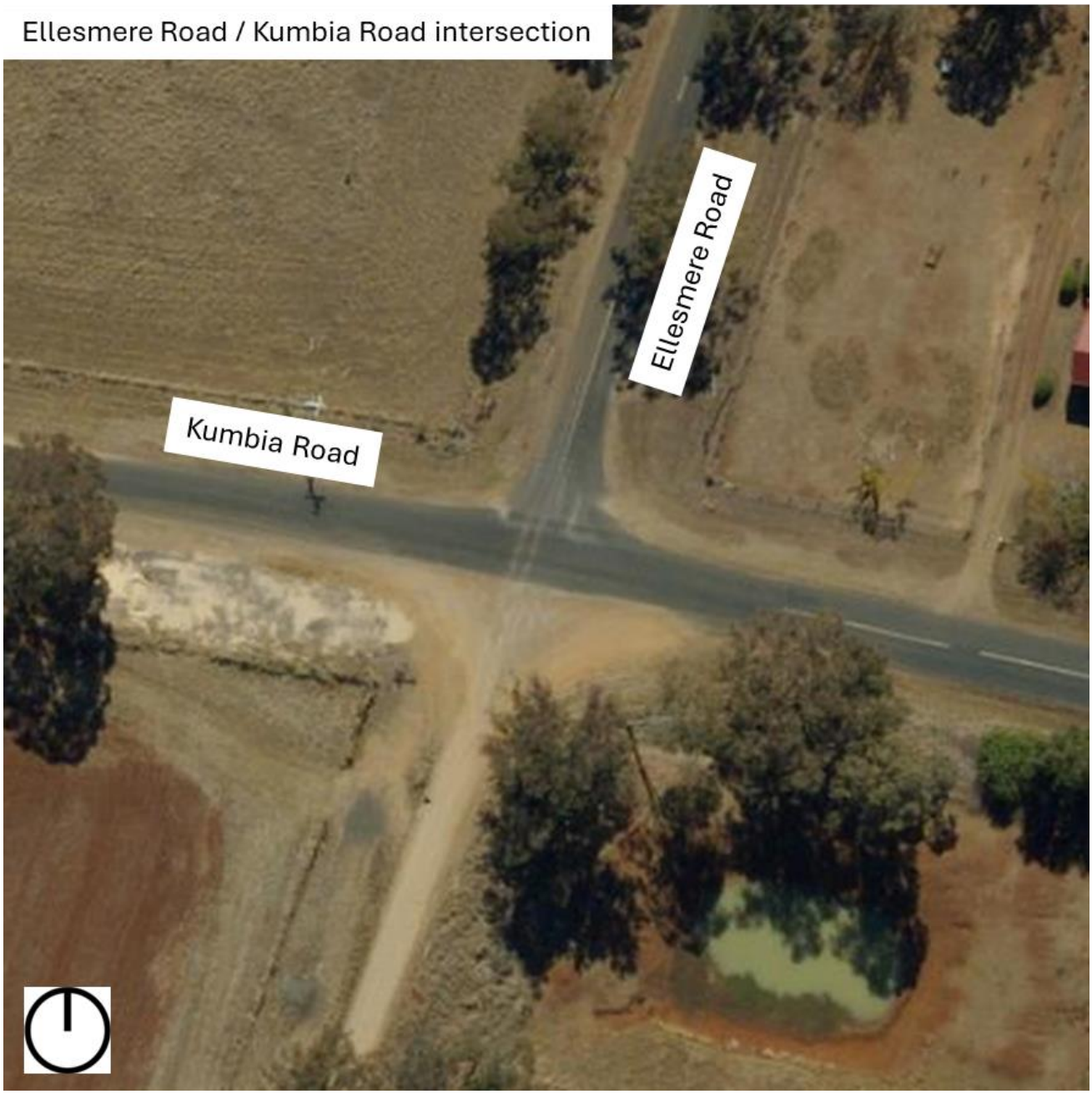
Source: Google Maps, November 2020

Figure 3.5 Kumbia Road looking east at the Ellesmere Road and Kumbia Road intersection

3.1.2 Intersections

3.1.2.1 Ellesmere Road and Kumbia Road intersection

The Ellesmere Road and Kumbia Road intersection forms part of the site access route. It is a four-way unsignalised intersection with basic right and left turns (BAR/BAL) on all approached. The aerial layout of the intersection is shown in Figure 3.6 with an at grade photo of the intersection shown in Figure 3.7.



Source: Queensland Globe, 2024

Figure 3.6 Satellite imagery of Ellesmere Road / Kumbia Road intersection

Ellesmere Road / Kumbia Road intersection looking east

Source: WSP site visit, 20th June 2024

Figure 3.7 Ellesmere Road and Kumbia Road intersection looking east

3.1.3 Traffic demands

Available traffic counts on the SBRC controlled roads surrounding the Project site were provided by SBRC and have been shown in Table 3.1. An assumed annual growth rate of 3% p.a. has been applied to the average annual daily traffic (AADT) volumes to extrapolate to an assumed 2025 construction year.

Table 3.1 Available volumes (AADT) on council-controlled roads

Count Location	Collection Date	Volumes (AADT) on collection date	Volumes (AADT) extrapolate to 2025	HV%
Stuart River Bridge on Kumbia Road	July 2014	84	116	17
Kumbia Road (just south of Enderby Street intersection)	June 2020	101	117	10

The proximity of the traffic counts to the Project site has been displayed in Figure 3.8 below.

Figure 3.8 Proximity of counts locations to project site

Despite traffic counts being unavailable for other SBRC controlled roads, it is an assumption that these roads (e.g. Stuart Valley Drive and Ellesmere Road) would have similar traffic volumes to those observed on Kumbia Road.

3.2 Public transport

There are no public transport services operating in the vicinity of the Project site. Private bus service (Pursers Coaches and Coast & Country Buses) operates school transport for the following areas:

- Pursers Coaches: Murgon, Wondai, Coolabunia, Nanango, Blackbutt, Wattle Camp, Tingoora, Taabinga, Goodger, Stuart Valley, Ellesmere
- Coast & Country Buses: Kumbia town, Wooroolin, Inverlaw, Crawford, Gordonbrook, Memerambi, Barkers Creek Rd

3.3 Active transport

Due to the rural nature of the area, no dedicated active transport infrastructure is located in the vicinity of the Project site. Pathways for walking and cycling are provided in Kingaroy.

4 Impact Assessment

4.1 Construction stage

4.1.1 Link capacity assessment

An assessment of the increase to AADT traffic volumes on the SBRC controlled roads in the vicinity of the site as a result of the Project's construction traffic generation has been undertaken. The assessment has assumed that all council-controlled roads in the vicinity of the site have similar AADT volumes to what was observed at the two count locations on Kumbia Road in Table 3.1. This analysis represents a worst-case capacity assessment of link volume increases, investigating a day of peak construction:

- 100 passenger vehicle return trips to site
- 10 heavy vehicle (B-double) return trips to site
- 1 OSOM return trip to site

The results of this analysis are presented in Table 4.1. During the peak construction, the development generated traffic volume exceeds 5% of the background AADT volumes on the council-controlled roads (an increase of 190%). The TMR assessment guide considers that an increase of more than 5% over the base value is considered to be an impact. However, given the low base volumes on the council-controlled roads, there will be little overall change to overall link capacity and vehicle speed.

As such, the Project will not have a significant impact on link capacity and no further analysis is required.

Table 4.1 Link capacity assessment (2025 – Construction year)

Road Link	Base AADT (NB and SB)	Construction Daily volume (in and out)	% increase (in and out)
SBRC controlled roads	117	222	190%

4.1.2 Pavement impact assessment

An assessment to determine potential pavement impacts resulting from the Project's construction generated HV traffic has been undertaken for the council-controlled roads. The initial assessment identified any road links where the total development SARs are expected to exceed 5% of the background traffic SARs in either direction during the year of construction.

According to the GTIA, Standard Axle Repetitions (SAR) refers to "a measure defining the cumulative damaging effect to the pavement of the actual traffic, it is expressed in terms of the equivalent number of 80kN axles passing over the pavement up to the design horizon". For the purpose of this assessment, a SAR4 value has been adopted for the Gregory Highway with an average SAR4 value of 3.2 (as per the *Guide to Traffic Impact Assessment Practise Note: Pavement Impact Assessment* (TMR 2018)) applied to background HV traffic volumes. A SAR4 was determined based on the pavement type (granular pavement) and hence a SA4 value of 3.2 was adopted. The results of this analysis are shown in Table 4.2. This analysis assumed an equal split of in/out traffic, with the worst case HV % of 17% taken from Table 3.1.

This analysis concluded that the total SAR4s generated by the Project does exceed 5% of the construction year background SAR4s in the 'in' direction on council-controlled roads. However, given the low base volumes on the council-controlled roads, the Project will not have a significant impact on pavements and no further analysis of pavement impacts is required. However, as a recommended mitigation, it is suggested that a Road Dilapidation Survey could be undertaken to assess the impacts the construction activities will have on the SBRC controlled roads.

Table 4.2 Pavement impact assessment (2025 – Construction year)

Road Link	Base Daily HV (In)	Base Yearly SAR4 (In)	Construction Total HV (In)	Construction Total SAR4 (In)	% increase (In)	Base Daily HV (Out)	Base Yearly SAR4 (Out)	Construction Total HV (Out)	Construction Total SAR4 (Out)	% increase (Out)
SBRC controlled roads	10	11,274	1020	6535	58	10	11,274	1020	542	5

4.1.3 Intersection assessment

4.1.3.1 Turn warrant assessment

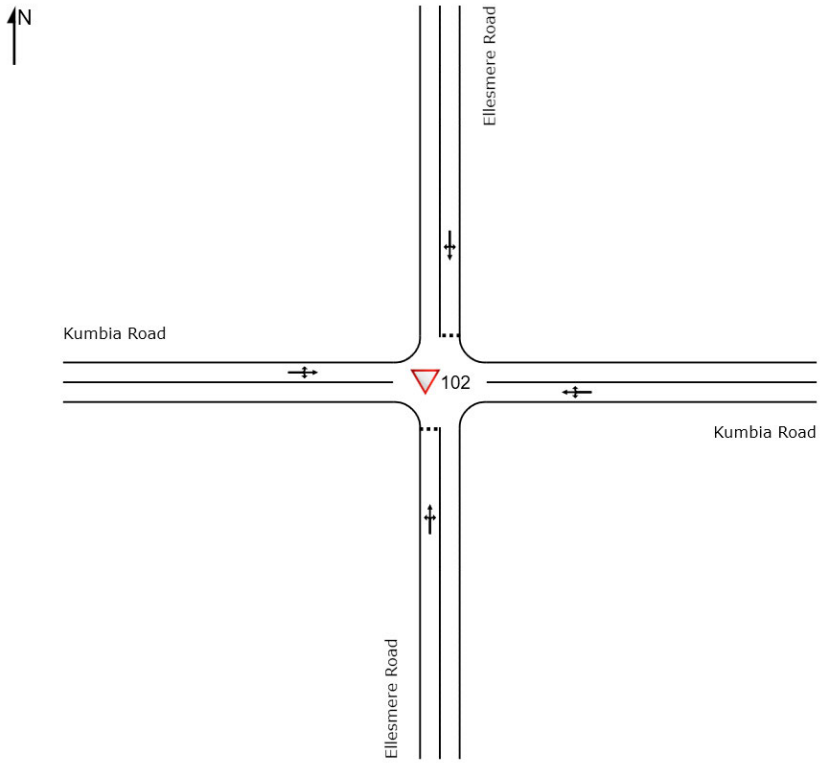
The intersection of Ellesmere Road and Kumbia Road does not include any turning provision. Current traffic volumes are low (117 vehicles per day) and assumed construction traffic volume is also low (222 vehicles per day). These low traffic volumes do not warrant intersection upgrades of the intersection in accordance with *Austroads Guide to Traffic Management: Part 6* to cater for turning vehicles. However, temporary warning signs should be introduced on the intersection approach during the construction period to provide road users advanced warning of turning construction HV's.

4.1.3.2 SIDRA analysis

A SIDRA analysis on the Ellesmere Road and Kumbia Road intersection was completed to assess the impact of the Project generated construction traffic on the intersection during the 2025 construction year. For the purpose of this analysis, the following information was used:

- AADT observed traffic volumes and HV percentages was observed from Table 3.1 for council-controlled roads.
- For background traffic, an even split of traffic data was assumed to travel in each direction. While for construction traffic, assume a worst-case scenario where all construction traffic enters the site in the AM peak and all leave in the PM peak.
- Assumed that 10% of AADT would travel in each peak period (AM and PM periods).

The layout is illustrated in Figure 4.1.



Source: *SIDRA Intersection 9*

Figure 4.1 Intersection: Ellesmere and Kumbia Road intersection layout

The AM and PM peak hour intersection performance results for the Ellesmere Road and Kumbia Road intersection are summarised for 'with the Project' traffic demands (Table 4.3). The results show that when the Project is operating, no impacts to the intersection performance occurs. With the intersection during the construction period operating at an acceptable level with the worst approach level of service (LOS) of A and all degree of saturation (DOS) below 0.101 in both peak periods. Figure 4.2 below details the given performance of an intersection operating at LOS A through to E. At LOS A, an intersection is running at "good operation".

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

Figure 4.2 Level of service criteria for intersections (Source: RTA Guide to Traffic Generation Development).

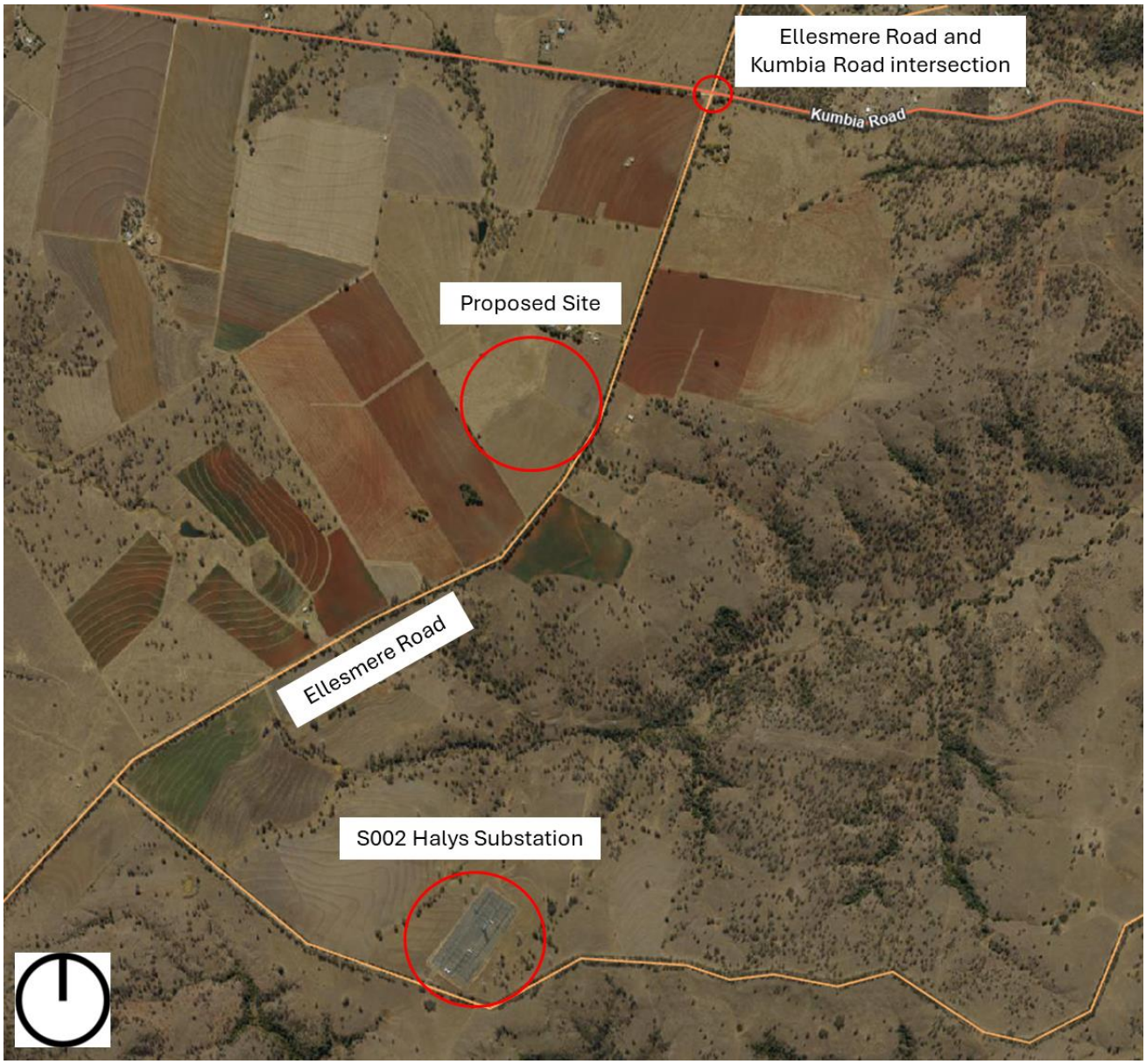
Table 4.3 Ellesmere Road and Kumbia Road intersection – 2025 AM and PM peak hour SIDRA output – With project traffic demands

Approach	AM & PM Peak Hour			
	LOS	DOS	Avg Delay (Sec)	95th% Queue (m)
Ellesmere Road (S)	A	0.005	4.9	0.1
Kumbia Road (E)	N/A	0.004	1.9	0.1
Ellesmere Road (N)	A	0.101	4.4	3.1
Kumbia Road (W)	N/A	0.004	1.9	0.1
Total Intersection	N/A	0.101	4.2	3.1

4.1.4 Other transport impacts

4.1.4.1 Proximity of the Project site to the 'S002 Halys Substation'

Given Ellesmere Road will be used to access both the Project site and the 'S002 Halys Substation' (as shown in Figure 4.3), consideration should be made for the potential impacts. There is the potential for interaction between the substation operational vehicles and the Projects construction vehicles, particularly at the intersection of Ellesmere Road and Kumbia Road. Temporary signage is required during construction and ongoing communication should be kept with the substation operators to inform them of vehicle movements due to the construction.



Source: *Queensland Globe, 2024*

Figure 4.3 Proximity of proposed site to 'S002 Halys Substation'

4.1.4.2 Heavy vehicle routes

For SBRC controlled roads in the proximity of the project site, current AADT traffic volumes indicate that there are approximately 20 heavy vehicle trips using the road during a peak day. The project is expected to generate 11 heavy vehicle return trips at its peak. Given the low base volumes, HV trips generated by the project are not expected to impact the operation of existing heavy vehicles movements on SBRC controlled roads.

4.1.4.3 Public transport

Due to the relatively low traffic volumes generated by the Project construction activities (primarily worker force movements from Kingaroy plus up to 1,000 heavy vehicle deliveries for the project), impact to public transport will be minimal.

4.1.4.4 Active transport

Whilst there will be increased traffic from construction worker vehicles originating in Kingaroy, the increase is minor and no impact to existing active transport movements in the Kingaroy urban area is expected.

4.1.5 Road safety assessment

A risk assessment of impacts resulting from the Project construction activities has been undertaken. This assessment has identified the following key risks:

- Increases in traffic volumes on the SBRC network resulting in congestion.
- Increase risk of collision due to driver fatigue.
- Risk of collisions occurring at the Ellesmere Road and Kumbia Road intersection.
- Risk of collision between BESS construction vehicles and substation operational vehicles.

These risks have been assessed using the risk assessment framework as detailed in the GTIA with the results presented in Table 4.4.

Table 4.4 Risk assessment

Risk Item	With development			Mitigation measure	With development and mitigation		
	Likelihood	Consequence	Risk Score		Likelihood	Consequence	Risk Score
Increases in traffic volumes on the Council and State controlled road network resulting in congestion	1	2	L	Encourage carpooling or coach transfer for workforce travel	1	2	L
Increase risk of collision due to driver fatigue	4	5	H	Monitor workforce hours and driver behaviour, capture within the project specific Road Use Management Plan (RUMP)	2	5	M
Risk of collisions occurring at the Ellesmere Road and Kumbia Road intersection	2	5	M	Temporary warning signs should be introduced on the intersection approach during the construction period to provide road users advanced warning of turning construction HV's.	1	5	M
Risk of collision between BESS construction vehicles and substation operational vehicles on Ellesmere Road	2	5	M	Close consultation with substation operational staff to coordinate construction delivery and activities. Temporary warning signs should be introduced on the approach of the intersection to provide road users advanced warning of turning construction vehicles.	1	5	M

4.2 Operational stage

4.2.1 *Traffic generation*

As detailed in section 2.3.2, due to the nature of the Project, minimal traffic is expected to be generated as a result of the operation of the BESS.

4.2.2 *Impacts*

As the construction activities were not found to have any significant impact on the transport network, and operational traffic is significantly less than that generated by construction activities, the operation of the Project will have negligible impact on:

- Link capacity and pavement
- Intersection operation
- Heavy vehicle routes
- Active or public transport networks
- General road safety

4.3 Mitigations

The following mitigations are recommended to be implemented to reduce risks and manage the potential impacts resulting from the Project construction activities:

- Temporary warning signs be introduced on the approaches to the Ellesmere Road and Kumbia Road intersection to provide road users advanced warning of turning construction vehicles.
- Develop a safe operations plan for construction vehicles accessing the site and ensure all construction workers and heavy vehicle drivers are provided with a safety induction that includes the safe operations plan. The plan should cover applicable safety measures for driving to and from site.
- Use of coach services from Kingaroy to transport workers to site, reducing the number of passenger vehicles being used and the risk of fatigue-related crashes.
- For workers not using coach services, encouraging workers to carpool from Kingaroy to the site, reducing the number of passenger vehicles being used and the risk of fatigue-related crashes.
- Close consultation with the nearby substation operators to coordinate construction delivery and activities.
- Use of watering trucks on the unsealed section of Ellesmere Road during construction periods to reduce dust levels caused by construction vehicles travelling on this road.
- A Road Dilapidation Survey suggested to be undertaken to assess the impacts the construction activities will have on the SBRC controlled roads.

Due to the low generated traffic volumes associated with the Project operational activities there are limited mitigation measures required during the operational phase. These include:

- Develop a safe operations plan for vehicles accessing the site and ensure all workers and heavy vehicle drivers are provided with a safety induction that includes the safe operations plan. The plan should cover applicable safety measures for driving to and from site.

5 Conclusion

This TIA has defined the Project's activities and associated trip generation during its construction and operation phases, identified suitable access routes, and collated road network traffic data. The TIA provided an assessment as per the GTIA (TMR 2018) of likely impacts of the Project on the SBRC controlled network during the construction and operations stages. The key findings of this assessment are summarised as:

- The Project is expected to generate:
    - 100 passenger vehicles daily return trips
    - 10 heavy vehicles (B-double where possible) daily return trips
    - 1 OSOM daily return trips
    - During the approximate 25 years operational lifetime of the Project, expected traffic generation will be:
        - 4 passenger vehicle daily return trips
        - 2 heavy vehicle return trips per month
- An assessment of the proposed traffic volumes generated by the construction and operation of the Project indicates that no impacts to the SBRC network, intersection of Ellesmere Road and Kumbia Road, pavement condition, or public and active transport facilities are expected. This mainly is due to the low base volumes being currently observed on the council-controlled roads in the proximity of the Projects site.
- The following mitigations are recommended to reduce safety risks associated with the construction phase of the Project:
    - Temporary warning signs be introduced on the approaches to the Ellesmere Road and Kumbia Road intersection to provide road users advanced warning of turning construction vehicles.
    - Develop a Safe Operations Plan for construction vehicles accessing the site and ensure all construction workers and heavy vehicle drivers are provided with a safety induction that includes the Safe Operations Plan. The Plan should cover applicable safety measures for driving to and from site.
    - Use of coach services from Kingaroy to transport workers to site, reducing the number of passenger vehicles being used and the risk of fatigue-related crashes.
    - For workers not using coach services, encouraging workers to carpool from Kingaroy to the site, reducing the number of passenger vehicles being used and the risk of fatigue-related crashes.
    - Close consultation with the nearby substation operators to coordinate construction delivery and activities.
    - Use of watering trucks on the unsealed section of Ellesmere Road during construction periods to reduce dust levels caused by construction vehicles travelling on this road.
    - A Road Dilapidation Survey suggested to be undertaken to assess the impacts the construction activities will have on the SBRC controlled roads.

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