

Environment Impact Statement

29-Apr-2025
Steel River East Battery Energy Storage System

Environment Impact Statement

Client: Ausgrid

ABN: 78 508 211 731

Prepared by

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Declaration

Project details		
Project name:	Steel River East Battery Energy Storage System	
Application number:	SSD-77450458	
Address of the land in respect of which the development is made:	The Project involves construction, operation and maintenance of a Battery Energy Storage System (BESS). The proposed location of the BESS (the site) is at 1 McIntosh Drive, Mayfield West, which is located on Lot 16, Deposited Plan No. (DP) 270249. All construction, operation and maintenance will be contained within the site.	
Applicant details		
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Registration number:	R80013	
Organisation registered with:	Environment Institute of Australia and New Zealand	
Declaration	The undersigned declares that this EIS: • Has been prepared in accordance with the Environmental Planning and Assessment Regulation 2021 • Contained all available information relevant to the environmental assessment of the development, activity or infrastructure to which the EIS relates • Does not contain information that is false or misleading • Addresses the Planning Secretary's environmental assessment requirements (SEARs) for the project • Identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments	

Project details	
	• Has been prepared having regard to Department's State Significant Development Guidelines – Preparing an Environmental Impact Statement • Contains a simple and easy to understand summary of the project as a whole, having regard to the economic, environmental and social impacts of the Project and the principals of ecologically sustainable development • Contains a consolidated description of the Project in a single chapter of the EIS • Contains an accurate summary of the findings of any community engagement • Contains an accurate summary of the detailed technical assessment of the impacts of the Project as a whole.
Signature:	
Date:	29 April 2025

Table of Contents

Declaration	i
Table of Contents	vi
Glossary	
Summary	
1.0 Introduction	1
1.1 Overview	1
1.2 The Applicant	1
1.3 The Project	5
1.4 Project location and description	6
1.5 Site constraints	7
1.6 Purpose and structure of this EIS	9
2.0 Strategic context	11
2.1 Project benefits	11
2.2 Project alternatives	12
2.3 Site suitability	13
2.4 Consistency with government plans and policies	14
2.5 Key features of the site and surrounds	19
2.6 Cumulative impacts	21
2.7 Agreements	21
3.0 Project Description	24
3.1 Project overview	24
3.2 Project description	26
3.3 Project construction	32
3.4 Operation	35
3.5 Decommissioning	35
3.6 Estimated Development Cost	35
4.0 Statutory context	36
4.1 Introduction	36
4.2 Environmental Planning and Assessment Act 1979	39
4.3 Mandatory considerations	39
5.0 Community and stakeholder engagement	54
5.1 Introduction	54
5.2 Approach to engagement	54
5.3 Stakeholder identification	62
5.4 Engagement tools and activities	63
5.5 Engagement activities and outcomes	64
5.6 Future consultation and engagement	70
5.7 Future consultation during construction and operation	71
6.0 Assessment of environmental impacts	72
6.1 Biodiversity	72
6.2 Aboriginal heritage	98
6.3 Soils and land	108
6.4 Visual amenity	119
6.5 Noise and vibration	132
6.6 Traffic and transport	156
6.7 Surface water, groundwater and flooding	168
6.8 Hazards and risk	182
6.9 Social and economic	192
6.10 Other issues	204
6.11 Cumulative impacts	217
7.0 Justification and conclusion	225
7.2 Consistency with the objectives of the EP&A Act	227
7.3 Summary of project impacts	229
7.4 Ecologically sustainable development	233
7.5 Conclusion	234
8.0 References	236

Appendix A	A
SEARs Compliance Table	
Appendix B	B
Statutory Compliance Table	
Appendix C	C
Community Engagement Table	
Appendix D	D
Proposed Mitigation Measures	
Appendix E	E
Biodiversity Development Assessment Report	
Appendix F	F
Aboriginal Cultural Heritage Assessment Report	
Appendix G	G
Detailed Site (Contamination) Assessment	
Appendix H	H
Noise and Vibration Impact Assessment	
Appendix I	I
Traffic Impact Assessment	
Appendix J	J
Water Impact Assessment	
Appendix K	K
Preliminary Hazard Analysis	
Appendix L	L
Social and Economic Impact Assessment	
Appendix M	M
Visual Impact Assessment	
Appendix N	N
Estimated Development Cost	
Appendix O	O
Embodied Carbon Calculations and Technical Note	

List of Tables

Table 1-1: Applicant details	2
Table 1-2: Structure and content of the EIS	9
Table 1-3: EIS appendices	9
Table 3-1: Project overview summary	24
Table 3-2: Site infrastructure	28
Table 3-3: Construction overview	32
Table 3-4: Indicative construction schedule	35
Table 3-5: Indicative plant and equipment for operation	35
Table 4-1: Summary of statutory requirements	36
Table 4-2: Pre-conditions to granting development consent	37
Table 4-3: Mandatory considerations	39
Table 4-4: Relevant approvals under sections 4.41 and 4.42 of EP&A Act	44
Table 4-5: LEP provisions	49
Table 4-6: Results of the EPBC Act PMST	53
Table 5-1: Ausgrid engagement principles for the Steel River BESS	55
Table 5-2: Community participation objectives	55

Table 5-3: Consistency of engagement process with DPHI guidelines	59
Table 5-4: Requirements for effective engagement	60
Table 5-5: Relevant stakeholders identified for the Project (Ausgrid, 2024)	62
Table 5-6: Engagement tools and activities	63
Table 5-7: Scoping stage engagement activities (AECOM, 2024)	64
Table 5-8: Early consultation - EIS preparation table	69
Table 5-9: Key stakeholder issues	70
Table 5-10: Stage three engagement method	71
Table 6.1-1: Relevant SEARs - biodiversity	72
Table 6.1-2: Field survey dates	73
Table 6.1-3: Landscape features	74
Table 6.1-4: MNES search results	78
Table 6.1-5: PCTs identified within the site	79
Table 6.1-6: PCT 3437 Hunter Coast Lowland Spotted Gum Dry Forest	79
Table 6.1-7: Vegetation integrity scores (Wildthing, 2025)	82
Table 6.1-8: Presence of candidate credit species	82
Table 6.1-9: Avoidance and minimisation of impact (Wildthing, 2025)	84
Table 6.1-10: Summary of direct construction impacts	89
Table 6.1-11: Summary of proposed indirect impacts to biodiversity (Wildthing, 2025)	90
Table 6.1-12: Summary of the prescribed impacts to biodiversity	92
Table 6.1-13: Species at risk of an SAI (Wildthing, 2025)	94
Table 6.1-14: Ecosystem credit class and matching credit profile	95
Table 6.1-15: Priority weed species recorded within the site (Wildthing, 2025)	96
Table 6.1-16: Mitigation and management measures - biodiversity	96
Table 6.2-1: Relevant SEARs – Aboriginal heritage	98
Table 6.2-2: Regional archaeological assessments in broader Newcastle region since 1982	103
Table 6.2-3: Mitigation and management measures – Aboriginal heritage (Apex, 2024)	107
Table 6.3-1: Relevant SEARs - land	108
Table 6.3-2: Aerial photographs summary (RCA, 2025)	110
Table 6.3-3: Fieldwork summary (RCA, 2025)	114
Table 6.3-4: Soil results above the relevant ecological criteria RCA, 2025)	115
Table 6.3-5: E4 General Industrial' land use zone objectives	116
Table 6.3-6: Mitigation and management measures - land and soils (RCA, 2025)	117
Table 6.4-1: Relevant SEARs - visual	119
Table 6.4-2: Viewpoint magnitude ratings (Aurecon, 2025)	123
Table 6.4-3: Viewer sensitivity determination matrix (Aurecon, 2025)	123
Table 6.4-4: Impact determination matrix (Aurecon, 2025)	124
Table 6.4-5: Representative viewpoint locations (Aurecon, 2025)	127
Table 6.4-6: Visual impact summary	131
Table 6.4-7: Mitigation and management measures - visual amenity (Aurecon, 2025)	131
Table 6.5-1: Relevant SEARs - noise	132
Table 6.5-2: Road traffic noise assessment criteria	134
Table 6.5-3: Noise catchment areas	134
Table 6.5-4: Construction noise management levels - residential receivers	135
Table 6.5-5: Construction noise management levels – non-residential receivers	135
Table 6.5-6: Construction assessment staging and scheduling	136
Table 6.5-7: Recommended $L_{Aeq, 15 \text{ minute}}$ intrusive noise criteria levels from industrial noise sources	137
Table 6.5-8: Recommended L_{Aeq} amenity noise levels from industrial noise sources	138
Table 6.5-9: High traffic project amenity noise levels for residential receivers from industrial sources (AECOM, 2024b)	138
Table 6.5-10: Project specific noise levels (AECOM, 2024b)	139
Table 6.5-11: Night-time sleep disturbance screening levels (AECOM, 2024b)	139
Table 6.5-12: Existing background (L_{A90}) and ambient (L_{Aeq}) noise levels (AECOM, 2024b)	139
Table 6.5-13: Attended noise measurements (AECOM, 2024b)	140
Table 6.5-14: Assessment receiver locations (AECOM, 2024b)	140
Table 6.5-15: Predicted construction noise levels - standard hours (residential receivers) (AECOM, 2024b)	144

Table 6.5-16: Predicted construction noise levels - standard hours (non-residential receivers) (AECOM, 2024b)	146
Table 6.5-17: Existing traffic flows and additional construction traffic flows outside road network peak hours (AECOM, 2024b)	150
Table 6.5-18: Predicted operational noise levels	151
Table 6.5-19: Plant items sound power levels	154
Table 6.5-20: Mitigation and management measures – noise (AECOM, 2025)	155
Table 6.6-1: Relevant SEARs - transport	156
Table 6.6-2: Road network (Amber, 2025)	157
Table 6.6-3: Intersection summary (Amber, 2025)	158
Table 6.6-4: Shared accessway traffic volumes	159
Table 6.6-5: Bus services operating within the vicinity of the site (Amber, 2025)	159
Table 6.6-6: Crash history (Amber, 2025)	162
Table 6.6-7: Traffic generation during construction period (Amber, 2025)	163
Table 6.6-8: Summary of SIDRA results – construction peak hours	164
Table 6.6-9: Traffic volumes – construction peak hour vs road network peak hour (Amber, 2025)	164
Table 6.6-10: Mitigation and management measures – traffic and transport (Amber, 2025)	166
Table 6.7-1: Relevant SEARs - water	168
Table 6.7-2: Groundwater monitoring bores (WaterNSW, 2024)	174
Table 6.7-3: Modelled existing flood conditions for the site	176
Table 6.7-4: Water quality treatment train assessment (GHD, 2025)	180
Table 6.7-5: Mitigation and management measures – surface water, groundwater and flooding (GHD, 2025)	180
Table 6.8-1: Relevant SEARs – hazards and risks	182
Table 6.8-2: Risk matrix	183
Table 6.8-3: Tesla BESS minimum clearances	183
Table 6.8-4: Off-site receptors	184
Table 6.8-5: Preliminary risk screening summary	185
Table 6.8-6: Summary of hazards and events	186
Table 6.8-7: PHA findings	188
Table 6.8-8: Risk assessment (Sherpa, 2024)	189
Table 6.8-9: Assessment against HIPAP No. 4 qualitative risk criteria (Sherpa, 2024)	189
Table 6.8-10: Mitigation and management measures - hazards and risks	191
Table 6.9-1: Relevant SEARs – social and economic	192
Table 6.9-2: Social impact assessment data sources	193
Table 6.9-3: Social impact significance matrix (RPS, 2025)	193
Table 6.9-4: Demographic, transport and housing in the social locality (RPS, 2025)	196
Table 6.9-5: Vulnerable communities within the social locality	197
Table 6.9-6: Local features and values	198
Table 6.9-7: Community infrastructure within the social locality	198
Table 6.9-8: Assessment of social impacts associated with the construction of the Project	199
Table 6.9-9: Assessment of economic impacts associated with the construction of the Project	201
Table 6.9-10: Assessment of social impacts associated with the operation of the Project	201
Table 6.9-11: Assessment of economic impacts associated with the operation of the Project	202
Table 6.9-12: Mitigation and management measures - social and economic	203
Table 6.10-1: Relevant SEARS – non-Aboriginal heritage	204
Table 6.10-2: Mitigation and management measures - non-Aboriginal heritage	205
Table 6.10-3: Relevant SEARS - waste	206
Table 6.10-4: NSW EPA waste classification guidelines	206
Table 6.10-5: Key waste streams	208
Table 6.10-6: Mitigation and management measures - waste	209
Table 6.10-7: MMS air quality data (NSW EPA, 2025)	210
Table 6.10-8: Mitigation and management measures – air quality	212
Table 6.10-9: Relevant SEARS - aviation	212
Table 6.10-10: Mitigation and management measures - aviation	213
Table 6.10-11: Mitigation and management measures – embodied carbon emissions (AECOM, 2025)	216
Table 6.10-12: Relevant SEARS - bushfire	216

Table 6.11-1: Relevant SEARs - cumulative impacts	217
Table 6.11-2: Relevant future projects for cumulative impact assessment	220
Table 6.11-3: Summary of potential construction cumulative impacts - transport	223
Table 6.11-4: Summary of potential construction cumulative impacts - hazards	223
Table 6.11-5: Summary of potential construction cumulative impacts - visual	224
Table 7.2-1: Consistency with the objectives of the EP&A Act	227
Table 7.3-1: Summary of environmental impacts	229

List of Figures

Figure 1-1: Regional setting	3
Figure 1-2: Project location	4
Figure 1-3: Site constraints	8
Figure 2-1: Land zoning	22
Figure 2-2: Sensitive receivers	23
Figure 3-1: Indicative Site Layout	25
Figure 3-2: Tesla Megapack	26
Figure 3-3: A typical BESS site	27
Figure 3-4: A typical operations building	27
Figure 3-5: Project sequencing	29
Figure 3-6: Services and utilities	30
Figure 3-7: Environmental constraints	31
Figure 6.1-1: Assessment Area	76
Figure 6.1-2: Native vegetation extent within Assessment Area	77
Figure 6.1-3: Vegetation zones	81
Figure 6.3-1: Soil landscapes within the Operational Footprint	113
Figure 6.4-1: Detailed visual impact assessment process (DPHI, 2022)	121
Figure 6.4-2: ZTV and viewpoint locations	122
Figure 6.4-3: Topography surrounding the site	125
Figure 6.4-4: VP1 McIntosh Drive looking east towards the Project (Aurecon, 2025)	129
Figure 6.4-5: VP2 McIntosh Drive, looking northeast towards the Project (Aurecon, 2025)	129
Figure 6.4-6: VP3 Tourle Street, looking northwest towards the Project (Aurecon, 2025)	129
Figure 6.4-7: VP4 Industrial Drive, looking north towards the Project (Aurecon, 2025)	129
Figure 6.5-1: Noise Sensitive receivers	142
Figure 6.5-2: Construction noise contours – scenario 1 (site establishment)	147
Figure 6.5-3: Construction noise contours – scenario 2 (civil works)	148
Figure 6.5-4: Construction noise contours – scenario 5 (landscaping)	149
Figure 6.5-5: Operational noise contours - day	152
Figure 6.5-6: Operational noise contours - night	153
Figure 6.6-1: Approved Road Network to the site	161
Figure 6.7-1: Hunter River catchment	172
Figure 6.7-2: Climate statistic – SILO grid points 32.90 S, 151.75 E (GHD, 2025)	173
Figure 6.7-3: PMF of area surrounding the site	177
Figure 6.9-1: Social locality in relation to the Project	195
Figure 6.10-1: Breakdown of material quantities and embodied emissions (AECOM, 2025)	215

Glossary

Term/Acronym	Definition
A43	Pacific Highway
ABCP	Air Base Command Post
ABL	Assessment background level
ABS	Australian Bureau of Statistics
ACHAR	Aboriginal Cultural Heritage Assessment Report
AEMO	Australian Energy Market Operator
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information System
AHIP	Aboriginal Heritage Impact Permit
Airports Act	Airports Act 1996
Airports Regulation	Airports (Protection of Airspace) Regulation 1996
ALR Act	Aboriginal Land Rights Act 1983
AS/NZS 5139	<i>AS/NZS 5139: Electrical installations – Safety of battery systems for use with power conversion equipment</i>
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Plan
ATSIHP	Aboriginal and Torres Strait Islander Heritage Protection Act 1984
B63	Tourle Street
BAM	Biodiversity Assessment Method
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
BESS	Battery Energy Storage System
BMS	Battery Management System
BoM	Bureau of Meteorology
BP	Before present
CASA	Civil Aviation Safety Authority (CASA)
CBD	Central Business District
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CER	Clean Energy Regulator
CHR	Channelised Right Turn Lane
CIA	Cumulative Impact Assessment
CIV	Capital Investment Value
CLM Act	Contaminated Land Management Act 1997
CNMP	Construction Noise Management Plan

Term/Acronym	Definition
CRG	Community Reference Group
CRSCCS	Centre for Road Safety Crash and Casualty Statistics
CTMP	Construction Traffic Management Plan
DA	Development Application
dB(A)	A-weighted decibel
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DECC	Department of Environment and Conservation
DEH	Department of Environment and Heritage
DISER	Department of Industry Science and Resources
DNSP	Distribution Network Service Provider
DP	Deposit Plan
DPE	Department of Planning and Environment
DPHI	Department of Planning, Infrastructure and Housing
DPIE	Department of Planning and Environment
EDC	Estimated Development Cost
EIS	Environmental Impact Statement
EMF	Electromagnetic Fields
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EPIs	Environmental Planning Instruments
EPL	Environmental Protection Licence
EST	Energy Security Targets
GDEs	Groundwater Dependent Ecosystem
GDP	Gross Domestic Product
GHG	Greenhouse Gasses
GNMP	Greater Newcastle Metropolitan Plan 2036
GSWnp	General solid waste – non-putrescible
GSWp	General solid waste – putrescible
GWh	Gigawatt Hours
ha	Hectares
HAZID	Hazard Identification
HIPAP	Hazardous Industry Planning Advisory Paper
HV	High Voltage
ICNG	Interim Construction Noise Guideline
ICNIRP	International Commission of Non-Ionising Radiation Protection
IEMA	Institute of Environment Management and Assessment
ILUA	Indigenous Land Use Agreements

Term/Acronym	Definition
ISP	Integrated System Plan
km	Kilometre
km ²	Square kilometres
kV	Kilovolt
LALC	Local Aboriginal Land Councils
LEP	<i>Newcastle Local Environmental Plan 2012</i>
LETS	Low Emissions Technology Statements
LGA	Local Government Area
LiFePO ₄	Lithium iron phosphate
LOS	Level of Service
m	Metre
M1	Pacific Motorway
MCA	Multi-Criteria Analysis
ML	Megalitres
MLRA	Multi-level Risk Assessment
mm	Millimetres
MMS	Mayfield monitoring station
MNES	Matter of National Environmental Significance
NLSPS	Newcastle Local Strategic Planning Statement
MV	Medium Voltage
MW	Megawatts
MWh	Megawatt-hours
NAHA	Non-Aboriginal Heritage Assessment
NBN	National Broadband Network
NCA	Noise Catchment Area
NCSP	Newcastle Community Strategic Plan
NEM	National Electricity Market
NFPA	National Fire Protection Association
NML	Noise management level
NPfi	NSW Policy for Industry (2017)
NPI	National Pollutant Inventory
NPW Act	National Parks and Wildlife Act 1974
NSHA	National Seismic Hazard Assessment
NSW	New South Wales
NSWALC	New South Wales Aboriginal Land Council
NT Act	Native Title Act 1993
NVIA	Noise and Vibration Impact Assessment

Term/Acronym	Definition
NZP	Net Zero Plan
ODP	Optimal Development Path
OEH	Office and Environment and Heritage
OH&S	Occupational Health and Safety
OSOM	Oversize Overmass
PAH	Polycyclic Aromatic Hydrocarbons
PASS	Potential Acid Sulfate Soils
PCT	Plant Community Types
PFAS	Polyfluoroalkyl Substance
PHA	Preliminary Hazard Analysis
PMF	Probable maximum flooding
PMST	Protected Matters Search Tool
POEO Act	Protection of the Environment Operations Act 1997
RAAF	Royal Australian Air Force
RAP	Registered Aboriginal Party
RAV	Restricted Access Vehicles
RBL	Rating background level
RET	Renewable Energy Target
REZ	Renewable Energy Zone
RMU	Ring Main Units
RNP	Road Noise Policy
Roads Act	Roads Act 1993
SAII	Significant and Irreversible Impacts
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register
SIA	Social Impact Assessment
SIS	State Infrastructure Strategy
SISD	Safe Intersection Site Distance
SPA	Swept Path Assessment
SPV	Special Purpose Vehicles
SSD	State Significant Development
SSI	State Significant Infrastructure
SWL	Sound Power Level
SWMP	Soil and Water Management Plan
TEC	Threatened Ecological Community

Term/Acronym	Definition
TfNSW	Transport for New South Wales
TIA	Traffic and Transport Impact Assessment
TIR	Technology Investment Roadmap
TNSP	Transmission Network Service Provider
UNFCCC	United Nations Framework Convention on Climate Change
VI	Vegetation Integrity
VIA	Visual Impact Assessment
VP	Viewpoint
WM Act	Water Management Act 2000
ZTV	Zone of theoretical visibility

Summary

Overview

Over the past two decades the contribution of renewable energy to the national electricity market (NEM) has increased from effectively zero to around 38%. As this continues to grow the need for short term storage becomes increasingly important, allowing the intermittency of renewable energy to be evened out across daily load cycles. Ausgrid aims to address this through the development of battery energy storage systems (BESS) using available land within their existing property portfolio across New South Wales (NSW).

Ausgrid, is the largest distributor of electricity in eastern Australia, providing power to 1.8 million customers and powers around 60% of NSW's Gross Domestic Product. Ausgrid's network is made up of substations, transmission lines, underground cables and power poles, spanning 22,275 square kilometres (km²) throughout the Sydney, Central Coast and Hunter Regions.

Ausgrid is seeking development consent to construct, operate and maintain the Steel River East BESS (the Project) adjacent to the existing Ausgrid 132 kilovolt (kV) Mayfield West Zone Substation at Mayfield West, NSW. The Project would involve the installation of the BESS and its connection, via a 33 kV underground cable, to the existing substation infrastructure. The BESS would be located in the eastern portion of the site, with the existing substation occupying the western portion. An existing data centre occupies the central portion.

The Project is considered State Significant Development (SSD) under the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). As such, this Environmental Impact Statement (EIS) has been prepared in accordance with the relevant provisions of the EP&A Act. This EIS addresses the Secretary's Environmental Assessment Requirements (SEARs) as well as the requirements of the *Environmental Planning and Assessment Regulation 2021*, and the NSW Government State significant development guidelines – Appendix B – preparing an environmental impact statement (DPIE, 2022).

The Project

Key features and components of the Project would include:

- Construction and operation of a BESS with a capacity of 200 MW and storage of 400 MWh
- Containerised battery units (112 Megapacks) and associated infrastructure, including inverters and 56 medium transformers
- A 33 kV underground cable connection between the BESS and the Mayfield West zone substation infrastructure
- A new switch room and control room building
- Eight ring main units
- An onsite workshop facility
- Two auxiliary transformers
- Backup diesel generator
- Other ancillary infrastructure including fire suppression, stormwater management, 2.4 m high boundary security chain wire fencing, lighting and close circuit television (CCTV).

A detailed description of the Project is provided in **Chapter 3.0**.

Strategic context

The key strategic driver for the Project is to support the aim of the National Electricity Market (NEM) to transition away from fossil fuels and primarily towards renewable energy. This is driven by the decommissioning of coal-fired power plants in the coming years and the alignment with the Commonwealth's commitment under the Paris Agreement and the Net Zero Plan, to achieve net zero-emissions by 2050.

The Project also aligns with other key government strategies, including Australia's Long-Term Emissions Reduction Plan, NSW Electricity Infrastructure Roadmap 2019, Hunter Regional Plan 2041, 2024 Integrated System Plan. These strategies support environmental prosperity and transitioning Australia to a primarily renewable energy economy.

The Project is expected to provide the following benefits to the State and local community:

- Supporting the energy transition
- Improving grid stability for NSW
- Job creation and investment for City of Newcastle.

The site for the Project was chosen based on the following characteristics:

- Proximity to the electricity transmission network
- The existing transmission network supports the integration of the Project
- Availability of skilled construction and operational workforce in the region.

Statutory context

The Project is classified as SSD (SSD-77450458) based on Schedule 1 of *State Environmental Planning Policy (Planning Systems) 2021*. As such, development consent is required for the Project under Part 4 of the NSW EP&A Act. This EIS complies with the objectives of the EP&A Act and has been prepared to support the SSD. This EIS addresses the SEARs issued on 20 November 2024.

Consultation

Ausgrid has undertaken consultation with a variety of key stakeholders through the duration of the Project to date, including:

- Government agencies
- Landowners
- The local community
- Aboriginal stakeholders.

A detailed account of the consultation undertaken to date is provided in **Chapter 5.0** and **Appendix D: Community engagement table**.

Consultation with the community and key stakeholders will continue throughout the Project via the Project website, newsletters and community meetings.

The EIS will be placed on public exhibition in accordance with the requirements of the EP&A Act. During the exhibition, community members and stakeholders have the opportunity to submit feedback to the NSW DPHI. This feedback will be considered and responded to within the submissions report, which Ausgrid will prepare for the Project.

Environmental assessment

This EIS has assessed the potential environmental, social and economic impacts associated with its construction and operation of the Project. A summary of these impacts is provided below:

Aspect	Summary
Biodiversity	A Biodiversity Development Assessment Report has been prepared for the Project. This was supported by fieldwork and assessed impacts relevant to both the <i>Biodiversity Conservation Act 2016</i> (NSW) (BC Act) and the <i>Environment and Protection and Biodiversity Conservation Act 1999</i> (Cth) (EPBC Act). The potential impacts on biodiversity primarily relate to vegetation removal.

Aspect	Summary
	The Project would involve the removal of: • 2.51 ha of hunting habitat for <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle) • 0.11 ha of PCT 3437 – Hunter Coast Lowland Spotted Gum Dry Forest • 0.46 ha of Planted native/introduced species • 1.94 ha of non-native vegetation. Mitigation measures would help minimise the potential impacts to biodiversity values, and as such, no residual impacts to biodiversity are expected to result from the Project.
Aboriginal heritage	An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared to identify the Aboriginal cultural heritage values of the site. The ACHAR involved consultation with Aboriginal stakeholders and conducting archaeological survey and site investigations. The results of the ACHAR indicated that there are no items or sites of Aboriginal cultural significance within the site. As such, no impacts to Aboriginal cultural heritage are expected from the Project. In the instance of any unexpected discoveries of Aboriginal cultural heritage sites or items within the site, an unexpected finds protocol would be followed.
Soils and land use	<u>Soils</u> A detailed site contamination assessment was undertaken to assess the potential risk of soil contamination within the site. The assessment determined that the following contaminants were above their relevant ecological criteria: • Chromium • Total recoverable hydrocarbons (TRH) • Benzo(a)pyrene • Nickel. No contaminants exceeded human health criteria. The above contaminants are not considered to pose any ongoing risk to ecological populations or human health. The site was found to have historically contaminated soil under a capping layer to a depth of 2 m throughout the site, but no contaminants within the capping layer pose risk to human health or ecological populations. <u>Land use</u> A desktop assessment determined that the Project would not adversely affect the surrounding land use, as it complies with the objectives of the <i>E4 General Industrial</i> objectives as outlined in the Newcastle LEP and is generally contained in nature.

Aspect	Summary
Visual amenity	A Visual Impact Assessment was undertaken for the Project. The construction of the Project would be generally screened by existing vegetation and not visible to most sensitive receivers. The Project would however be visible to motorists travelling along Industrial Drive or McIntosh Drive. Overall, the visual impact of the Project during construction and operation is expected to be low to negligible. This is driven by the generally low magnitude of change and low visual sensitivity of nearby receptors. There was one viewpoint deemed to have moderate sensitivity, however since the magnitude of change was deemed negligible, the overall impact at this viewpoint is negligible. Despite the low overall impact appropriate mitigation measures are proposed, which are expected to be effective in limiting the overall visual amenity impact.
Noise and vibration	A Noise and Vibration Assessment (NVIA) was undertaken to assess potential noise, and vibration impacts during construction and operation of the Project. No sensitive receivers are expected to experience noise levels above the construction noise management levels for the three modelled scenarios: site establishment, civil works and landscaping. Similarly, construction traffic is not expected to result in a noticeable increase in traffic noise on the surrounding road network. There is no vibration generating equipment expected to be used for the Project and as such there would be no vibration impacts. Based on noise modelling undertaken of the Project, operational noise levels are not expected to exceed the daytime or nighttime trigger levels for nearby receivers. There would also be no noticeable increase in road traffic noise. Based on these results and the mitigation measures proposed, operational noise impacts are not expected.
Traffic and transport	A Traffic Impact Assessment was prepared for the Project to assess the potential construction and operational traffic impacts. The main transport routes to the site during construction and operation would be Industrial Drive, Steel River Boulevard, McIntosh Drive and M1 Pacific Motorway. During peak construction (a 6-month period), up to 154 vehicle trips per day (136 light vehicle trips and 18 vehicle trips) are expected. This would reduce to 79 vehicle trips per day during the average construction period. The additional vehicles associated with construction are not expected to result in any substantial congestion amongst the broader road network, nor would any road upgrades be required. Only an additional four traffic movements per week are expected during operation, which is considered negligible.
Surface water, groundwater and flooding	A Water Impact Assessment (WIA) was undertaken to determine the potential hydrological impacts associated with the Project. Surface water quality impacts from soil disturbance or spills of hazardous materials are possible, particularly if these mobilised materials enter downstream waterways. However, the risk of these impacts is expected to be adequately managed through the application of the proposed mitigation measures. No groundwater impacts are expected as the standing water level is measured at 7.95 m, which is too deep to be disturbed by the Project's construction.

Aspect	Summary
	Modelling of future flooding scenarios was conducted as part of the assessment. The modelling concluded that any future flood waters would likely disperse from the site to the surrounding drainage network and that the risk of flooding during the life cycle of the Project would be low.
Hazards and risk	A Preliminary Hazard Analysis was undertaken for the Project to assess any potential hazards and risks that may arise. Potential hazards were identified in accordance with the <i>Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis</i>. The following identified hazards may occur during the construction or operation of the Project: • Fire due to ignition of the BESS units (onsite) • Jemena gas pipeline rupture and resulting fire (offsite). Considering the likelihood and severity of each of the hazards, the overall risk was assessed to be low to very low, provided the appropriate mitigation measures are implemented.
Social and economic	A Social and Economic Impact Assessment was undertaken for the Project. The assessment outlined the benefits of the Project, such as supporting the integration of renewable energy into the electricity grid, job opportunities and general community economic benefits. Stakeholders have voiced concerns over visual amenity, operational and construction noise, and interruption to their way of life. These potential impacts have been assessed to be low to negligible and can be managed through application of the proposed mitigation measures.
Non-Aboriginal heritage	Non-Aboriginal heritage (historic heritage) impacts were considered through a desktop assessment. Based on this assessment, it was determined that one historic heritage site that was located within the vicinity of the site: <i>Remnant Garden</i> (I692), 80 m southwest of the site. As works are not anticipated to extend beyond the site, this item is not expected to be affected. Mitigation measures are in place should future historic heritage sites be discovered during construction, operation or decommissioning of the Project.
Air quality	A desktop qualitative assessment was conducted to determine the air quality impacts associated with the Project. The assessment determined that construction is likely to generate emissions from the movement of heavy vehicles, and from ground disturbance works such as excavation. Minor dust and vehicle emissions are expected during operation of the Project, mainly from travel to and from the site and any maintenance activities. However, these emissions would be minor and would not adversely affect the overall air quality of the surrounding area.
Waste	Waste expected to be generated during construction includes vegetative waste, wastewater, construction waste, contaminated fill, personnel waste and demolition materials. During operation, waste is expected to be limited to office generated waste, operational equipment waste and worker generated waste. Mitigation measures have been provided to ensure any waste during construction and operation is appropriately managed with respect to relevant NSW government policy and guidance.
Aviation	A desktop assessment was conducted to determine any impacts to aviation. This assessment was informed by the <i>Airports Act 1996</i> , the <i>Airports (Protection of Airspace) Regulation 1996</i> and the AC 139-07(2) – CASA Advisory Circular – Reporting of Tall Structures (Advisory Circular).

Aspect	Summary
	During construction, the Project would temporarily involve the use of tall structures such as cranes, however these are not expected to exceed the 30 m threshold (as outlined by the Advisory Circular for developments within 15 kilometres (km) of airports). As such no adverse aviation impacts are expected.

Cumulative impacts

Cumulative impacts occur when the residual impacts of projects overlap to create more significant impacts. Five nearby projects were identified as having the potential for cumulative impacts with the Project, however only two projects were screened into the cumulative impact assessment: Tomago BESS and Hunter Valley Hydrogen Hub.

There is a potential for cumulative impacts associated with hazards, visual amenity and traffic volumes on the surrounding road network. The proximity of the Project to the Tomago BESS and Hunter Valley Hydrogen Hub meant there was a very low likelihood of cumulative impacts associated with hazards. The Tomago BESS and Hunter Valley Hydrogen Hub with the Project were determined to not have overlapping visual receivers. Haulage routes for the Project and the Tomago BESS and Hunter Valley Hydrogen Hub are not expected to overlap, which determined that transport and traffic cumulative impacts are not expected.

Justification of the Project

The NEM is in the process of transitioning from fossil fuel-based electricity baseload to a grid based primarily on renewable energy. This is supported by the planned decommissioning of coal-fired power plants in coming years, as well as by the need to decarbonise our economy more generally. The Project aims to increase stability of the electricity grid, support its transition to primary renewable energy generation and provide the services to stabilise the wider transmission network.

Potential impacts associated with the Project have been assessed and it has been determined that any residual impacts would have a low to negligible effects on environmental, social and economic factors. Appropriate measures have been proposed to mitigate or manage potential impacts during construction, operation and decommissioning.

The Project would provide environmental, social and economic benefits to the greater Newcastle region and NSW, including:

- Alignment with Commonwealth, state and local policies, strategies and statutory requirements
- Additional energy storage capacity to support the broader increase in renewable energy generation across the electricity grid, directly addressing projected shortfalls due to the retirement of coal fired generators
- Improved network stability, by providing system services to help stabilise the wider transmission network
- Job creation and investment for the City of Newcastle and NSW more broadly.

The environmental, social and economic benefits of the Project are deemed to outweigh any temporary impacts that would result from the Project's construction and operation. It is therefore recommended that the Project be granted development consent.

1.0 Introduction

1.1 Overview

Over the past two decades the contribution of renewable energy to the national electricity market (NEM) has increased from zero to around 38%. As this continues to grow the need for short term storage becomes increasingly important, allowing the intermittency of renewable energy to be evened out across daily cycles. Ausgrid aims to address this through the development of Battery Energy Storage Systems (BESS) using available land within their existing property portfolio across New South Wales (NSW).

Ausgrid is seeking development consent to construct, operate and maintain the Steel River East BESS (the Project) adjacent to the existing Ausgrid 132 kilovolt (kV) Mayfield West Zone Substation located within Mayfield West, NSW.

Figure 1-1 shows the location of the Project in its regional setting. The BESS would have a capacity of 200 megawatts (MW) over a two-hour duration (i.e. 400 megawatt hours (MWh)). The Project would be in the eastern part of the same lot as the substation, being Lot 16, Deposited Plan No. (DP) 270249 (the site). The boundary of the site is shown on **Figure 1-2**.

BESS projects are defined as '*electricity generating works*' under *State Environmental Planning Policy (Transport and Infrastructure) 2021* (Transport and Infrastructure SEPP). Section 2.36 of this policy states that development for the purpose of electricity generating works may be carried out by any person with consent on any land in a prescribed non-residential zone. The Project is located within the 'E4 General Industrial' land use zone, which is one of the prescribed non-residential zones for this land use. On this basis, the Project is permissible with development consent.

Further to this, the Project would be considered State Significant Development (SSD) as it will have an estimated development cost (EDC) of more than \$30 million (as defined within State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP).

This report satisfies the requirement for an Environmental Impact Statement (EIS) for the SSD. This EIS has been prepared in accordance with form and content prescribed by the *Environmental Planning Assessment Regulation (2021)* (EP&A Regulation), as well as the NSW Government State significant development guidelines – Appendix B – *preparing and environmental impact statement* (DPHI, 2022). The structure of the EIS is further detailed in **Section 1.6**.

The content of this EIS has been prepared based on the Secretary's Environmental Assessment Requirements (SEARs) issued for the Project on 20 November 2024 (See **Appendix A**).

1.2 The Applicant

The applicant is Ausgrid, who is the largest distributor of electricity in eastern Australia, providing power to 1.8 million customers and powering 60% of NSW's Gross Domestic Product (GDP). Ausgrid's network is made up of substations, transmission lines, underground cables and power poles, spanning 22,275 square kilometres (km²) throughout Sydney, the Central Coast and the Hunter Region.

The NSW Treasury holds the largest stake in the Ausgrid business (49%), with the remainder made up of institutional investors.

Ausgrid operates in the NEM as both a Distribution Network Service Provider (DNSP) and a Transmission Network Service Provider (TNSP), servicing Sydney, Central Coast and the Hunter Valley. Ausgrid actively operates, maintains, repairs and builds its electricity network with a focus on safety and reliability. **Table 1-1** provides further information on Ausgrid.

Table 1-1: Applicant details

Item	Details
Applicant	Ausgrid
Address	24-28 Campbell Street, Sydney, NSW, 2000
ABN	78 508 211 731

FIGURE 1-1:
REGIONAL CONTEXT



Legend

- The Site
- LGA boundary
- Ramsar wetland
- Industrial area
- National Park/Reserve
- Local park
- Primary road
- Railway
- Railway station

Transmission Lines

- 330 kV
- 132 kV

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**FIGURE 1-2:
PROJECT LOCATION**



Legend

-  The site
-  Project Area
-  Construction footprint
-  Operational footprint
-  HV connection infrastructure (area subject to separate approvals process)

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1.3 The Project

1.3.1 Background to the Project

The increasing contribution of renewable energy to the NEM brings challenges in relation to aligning energy generation and demand. This is important with the daily cycle of renewable energy generation, which is at its peak in the middle of the day, and consumer demand, which peaks in the afternoon and evening, when generation from some renewable sources has ceased.

Ausgrid has identified the opportunity to leverage their existing property portfolio to provide a solution through the construction and operation of BESS in strategic locations across NSW. This addresses the generation and demand issue directly, whilst bolstering physical infrastructure of the renewable energy transition in NSW in the context of recent and planned closures of coal powered electricity generation assets.

The Project is also driven by numerous plans, policies and strategies at all levels of government, including the *Hunter Regional Plan 2041* (DPHI, 2022).

The design of the Project has aimed to avoid, minimise and offset the potential impacts it may have on the surrounding physical, biological and social environments. This included a site selection process, siting the Project immediately adjacent to an existing substation to avoid the need for transmission infrastructure whilst minimising amenity impacts to surrounding receivers.

1.3.2 Project objectives

The objectives of the Project are:

- To provide storage capacity to the NEM to increase the stability of the electricity network
- To support the transition from fossil fuel to renewable energy by providing firming capability to support increasing levels of renewable energy generation
- Where applicable, provide system services to help correct and/or stabilise the wider transmission network, e.g. frequency stabilisation.

1.3.3 Key features of the Project

The key features of the Project would include:

- Construction, operation and maintenance of a BESS adjacent to the Mayfield West Zone Substation. The BESS would be comprised of containerised Lithium Iron Phosphate chemistry (LiFePO_4) battery units (112 Megapacks) and associated infrastructure, including inverters and 56 medium voltage (MV) transformers. The Project would have a 200 MW maximum power output capacity with 2-hour duration (i.e. 400 MWh)
- Connection of the BESS via a 33 kV underground cable connection from the control switch room to the existing substation infrastructure
- Ancillary infrastructure such as:
 - A combined switch room and control room building
 - Eight Ring Main Units (RMU)
 - On-site workshop facility
 - Two auxiliary transformers
 - Backup diesel generator
 - Two spaces for on-site car parking.

Other ancillary infrastructure, including, fire suppression, stormwater management, security fencing, lighting, and CCTV.

1.4 Project location and description

1.4.1 Regional context

The Project is located within the City of Newcastle Local Government Area (LGA). **Figure 1-1** shows the location of the Project within its broader regional context.

The City of Newcastle LGA has an area of 187 km² and an estimated population of 168,873 (ABS 2021). The closest town centre to the Project is Mayfield, about 2 kilometres (km) to the southeast. The site is located approximately 7 km north-west of the Newcastle central business district (CBD).

The major transport routes within the local area include Tourle Street (B63), located adjacent to the site, and the Pacific Highway (A43), around 1.4 km to the south.

Public transport near the site includes the route number 47 bus service 500 m south of the site on Gregson Avenue. This service connects Jesmond to Marketown via Warabrook. The closest rail connection is Warabrook Station, located approximately 2 km west of the site.

The Hunter Estuary Wetlands are located approximately 2.5 km north of the site. The wetlands are classified as a Ramsar Wetland and consist of Kooragang Nature Reserve and Shortland Wetlands, located 2.8 km west of the site.

1.4.2 Project location

For the purpose of this EIS, the definitions used to describe the physical boundaries of the Project include the **site**, the **Project** and the **Operational Footprint**. These are described further as follows.

- **The site** comprises the area of land owned by Ausgrid forming Lot 16, Deposited Plan (DP) 270249, covering an area of 5.06 hectares (ha). The address is 1 McIntosh Drive, Mayfield West, NSW 2304. Existing features of the site include the existing 132 kV Mayfield West Zone Substation and the Leading Edge Data Centre (leased on Ausgrid owned land), vacant grassland and vacant vegetated land. The Project would be located in the eastern part of the site, to the east of the Mayfield West Zone Substation
- **The Project Area** is located within the site and constitutes the development footprint i.e. the area that will be physically disturbed for the construction and operation of the Project. The Project Area is around 2.741 ha
- **The Construction Footprint** represents the area occupied by the Project during construction. The Construction Footprint is around 2.741 ha
- **The Operational Footprint** represents the area occupied by the Project's permanent operational infrastructure. The Operational Footprint is around 1.586 ha.

The extent of the site, the Project Area and the Operational Footprint is shown on **Figure 1-2**.

The Project is located on land zoned as *E4 General Industrial* under the *Newcastle LEP 2012*.

The site is bordered by McIntosh Drive to the south, B63 Tourle Street to the east and existing industrial properties to the north and west. The land is relatively flat, with a slight south-north slope. The site has been previously disturbed by industrial activities and is dominated by introduced exotic grasses and other common weeds. Planted native trees are present in the southeastern portion of the site.

1.4.3 Related development

The Project is located adjacent to the existing Mayfield West 132 kV/11 kV Zone Substation. The BESS would connect to this infrastructure via an underground 33 kV underground cable connection.

To prepare its infrastructure for new and changing customer connections as part of renewable energy transition, Ausgrid plans to augment the Mayfield West substation to include an additional transformer and connection. Substation augmentation works would be assessed and determined by Ausgrid separately in accordance with Part 5 of the EP&A Act. The area subject to substation augmentation works is shown on **Figure 1-2**.

1.5 Site constraints

Several easements have been identified within or adjacent to the site, as shown on **Figure 1-3**. These are in the process of being relinquished or modified by Ausgrid for the purposes of the Project.

Vegetation present within the Project Area will require removal to accommodate the Project. Impacts on biodiversity is detailed in **Section 6.1**.

An agreement is required for the use of the existing driveway shared with Benedict Recycling (see **Section 2.6**) to ensure that access is not impeded either by vehicles or equipment.

**FIGURE 1-3:
SITE CONSTRAINTS**



Legend

-  The site
-  Project Area
-  Primary road
-  Local road
-  Existing easement for electricity purposes (including transmission lines), rights of way, drainage, and underground cables

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1.6 Purpose and structure of this EIS

The purpose of this EIS is to provide a detailed description of the Project, the existing environment and the potential direct, indirect and cumulative impacts arising from its construction and operation. The EIS also identifies measures and strategies to be implemented to avoid, minimise, mitigate, offset and/or monitor potential impacts. The structure of this EIS is outlined in **Table 1-2**.

This EIS has been prepared to address the requirements issued by the Secretary on 20 November 2024. These requirements, including how they have been addressed, are outlined in **Appendix A: SEARs Table**.

Table 1-2: Structure and content of the EIS

Chapter	Description
Summary	Concise description of the proposed works, environmental assessments, and findings of the EIS.
Chapter 1.0: Introduction	Provides a brief description of the Project and relevant background information.
Chapter 2.0: Strategic context	Provides the strategic context and explains the need for the Project.
Chapter 3.0: Project description	Provides a summary of the Project, including the key components of the Project, design requirements and alignments.
Chapter 4.0: Statutory context	Outlines the statutory requirements and approvals required to support the Project.
Chapter 5.0: Community and stakeholder engagement	Outlines the consultation activities undertaken to date, key issues raised and how these have been addressed.
Chapter 6.0: Assessment of environmental impacts	Provides the results of the environmental assessments and outlines appropriate mitigation measures.
Chapter 7.0: Justification and conclusion	Provides a conclusion to the EIS, including justification for the Project and whether the Project achieves the objectives.
Chapter 8.0: References	Summarises the supporting material that was referenced in preparing this EIS.

The EIS is supported by several appendices, as listed in **Table 1-3**.

Table 1-3: EIS appendices

Appendix	Description	Author
A	SEARs compliance table	AECOM
B	Statutory compliance table	AECOM
C	Community engagement table	RPS
D	Proposed mitigation measures	AECOM
E	Biodiversity Development Assessment Report	Wildthing Ecology
F	Aboriginal Cultural Heritage Assessment Report	Apex Archaeology
G	Detailed Site (Contamination) Assessment	RCA Australia
H	Noise and Vibration Impact Assessment	AECOM

Appendix	Description	Author
I	Traffic Impact Assessment	Amber Traffic
J	Water Impact Assessment	GHD
K	Preliminary Hazard Analysis	Sherpa
L	Social and Economic Impact Assessment	RPS
M	Visual Impact Assessment	Aurecon
N	Estimated Development Cost	AECOM
O	Embodied Carbon Calculations and Technical note	AECOM

2.0 Strategic context

2.1 Project benefits

The Project is expected to create benefits at community level, State level and across the wider National Electricity Market (NEM), which extends across eastern and southern parts of Australia. These benefits include:

- Supporting the energy transition
- Improve grid stability for NSW
- Job creation and investment.

2.1.1 Supporting the energy transition

Presently, a significant portion of the NEM's electricity generation is from fossil fuel sources. In 2023, fossil fuels contributed to 65% of total electricity generation, made up of coal (46%), gas (17%) and oil (2%) (DCCEE, 2024).

The NSW and Australian Governments have introduced legislation and strategies intended to guide the energy sector to transition towards an increased proportion of electricity generation from renewable sources. This aligns with Australia's commitment to the Paris Agreement (Australian Energy Market Operator (AEMO), 2022) to achieve net zero emissions by 2050.

Since 2012, ten large coal-fired power stations have retired, with the most recent being AGL's Liddell Power Station which closed in April 2023. Retirements have been announced for all but one of the remaining coal-fired fleet, with approximately half expected to close by 2035 and the rest by 2051 (AEMO, 2024). AEMO's 2024 Integrated System Plan (ISP) (further described in **Section 2.4.10**) forecasts that the remaining coal fleet will close two to three times faster than those announcements (AEMO, 2024). The closure of these coal-fired power stations will require a substantial increase in renewable energy sources being introduced to the NEM.

BESSs are becoming an integral part of the NEM with the withdrawal of coal-fired generation, given their increasingly important role providing firming capacity to support intermittent renewable generation and improving the strength and reliability of the network.

The delivery of a BESS would provide additional energy storage capacity to support the broader increase in renewable energy generation across the NEM, directly addressing projected shortfalls.

2.1.2 Improving grid stability for NSW

The energy landscape in the grid is evolving, with fundamental changes required to avoid potential projected future supply shortfalls.

AEMO have been charged with delivering Energy Security Target (EST) Monitor Reports, to assess whether the grid's firming capacity is projected to be met as forecast by the *Electricity Infrastructure Investment Act 2020*. The most recent EST Monitor Report was released in October 2023. Based on existing and committed future projects, it predicts there will be a breach in capacity (i.e. a shortfall in generation to meet anticipated demand) from 2025-26 until the forecasting period ends in 2032-33 (AEMO, 2023). By 2032-33 the shortfall in capacity is projected to be 676 MW, which coincides with projected closures of coal-fired power stations.

Energy storage technologies such as BESS play a crucial role by providing firming capacity, facilitating increased penetration of renewable energy and enhancing grid stability. By storing excess energy generated during periods of low demand and high renewable output, BESSs can release energy during higher demand times or when renewable sources are less productive, such as during heatwaves or storms. This capability helps to balance supply and demand, reducing the risk of power outages and maintaining a consistent electricity supply.

Additionally, in the event of natural disasters or other emergencies, BESSs can provide critical backup power to essential services and infrastructure, by providing rapid response to grid disturbances, as well as absorbing or dispatching power as needed to stabilise voltage and frequency. This flexibility is essential for mitigating the impacts of extreme weather events, ensuring that the grid remains resilient and reliable.

2.1.3 Job creation and investment for City of Newcastle

The construction of the Project would create investments in local and regional economies, as well as flow-on benefits to local businesses and the local community in the Greater Newcastle region.

The EDC for the Project is \$208 million (**Appendix N**). Major components of this amount include the purchase of the battery units and associated components, as well as civil, electrical and cable construction activities. The Project would also deliver direct economic benefit to the local area and the broader region through job creation. During the construction phase, which is anticipated to occur over a period of around 26 months, up to 100 Full-Time Equivalent (FTE) roles would be created. These jobs would boost the local economy by increasing demand for services needed by construction workers.

Once operational, the Project would provide up to five part-time roles, equating to one FTE, which would provide a direct ongoing economic benefit to the local economy.

The combination of temporary construction jobs and permanent operational roles would contribute to diversifying the local job market, offering new career pathways and promoting economic resilience in the area.

2.2 Project alternatives

Ausgrid has considered a range of options to meet the Project's strategic need and objectives. As part of the broader consideration of the constraints and opportunities present within the site, the following alternatives were considered:

- The "do nothing approach"
- Site location alternatives
- BESS technology and provider alternatives.

2.2.1 The "do nothing" approach

The 'do nothing' option has been considered as it represents the least possible change and maintains the existing environment. Doing nothing would involve not constructing and operating the Project. This option would avoid potential environmental impacts associated with the construction and operation of the Project and would retain the site in its current state.

However, the 'do nothing' option would result in the Project's benefits not being realised. Specifically, the 'do nothing' option would neglect the opportunity to deliver substantial storage capacity on the distribution network to enable the continued growth of renewable energy within Australia's energy system.

This option would also not support the transforming of the energy grid to meet Australia's net zero commitments and the electrification and decarbonisation of the economy. Doing nothing would also fail to provide grid-scale storage at a pace that is faster, lower cost and has less environmental and community impacts.

As such, the 'do nothing' approach is not considered a feasible option.

2.2.2 Location alternatives

In selecting a location for the BESS, Ausgrid completed a detailed site selection process, including rating potential alternative locations based on key selection criteria, including environmental, social and technical parameters.

A key criterion was the location of the BESS in relation to the distribution network. By locating grid-scale storage on the distribution network close to customers, Ausgrid is able to deliver improved network resilience during extreme weather and network events and potentially help to defer network investment over time. Additionally, constructing the Project in proximity to an existing Ausgrid substation has the benefit of containing the impacts of the Project to an existing operating industrial location.

Environmental and amenity factors were also considered for each location, noting the various sensitivities in proximity to each candidate location.

Alternative sites were discounted based on:

- Environmental impacts and/or
- The potential increased costs associated with acquiring property and/or
- The increased extent of connection infrastructure between the BESS and the substation.

2.2.3 Alternative configurations

As described in **Section 1.5**, the selected Project Area has undergone numerous refinements to further enhance its suitability. The Project Area has been adjusted to avoid existing easements and utility infrastructure within the site. The Project has been adjusted to minimise potential biodiversity impacts, avoid existing easements and utility infrastructure within the site and to utilise the existing driveway shared with Benedict Recycling to access the site.

2.2.4 Alternative BESS technology vendors

Ausgrid undertook a review and evaluation of the available solutions in the market to select a BESS Original Equipment Manufacturer (OEM). This detailed technical assessment considered efficiency, system reliability, inverter readiness and integrator compatibility. More than 20 vendors were considered as part of this process. Vendors were assessed and shortlisted based on a multi-criteria analysis (MCA). This assessment prioritised the following aspects of the BESS technology:

- **Inverters:** the inverters convert the stored energy into electricity that can be readily used in households and commercial properties. The ability of the inverter to quickly perform this process was the highest priority
- **Integrators:** the integrators are responsible for combining the various components of the BESS technology to ensure that they operate together sufficiently. This factor was given a high weighting in the MCA process.

Following this assessment, Tesla were identified by Ausgrid as their preferred OEM for the Project, as their design would be more space efficient than other vendors and performed highly on the inverter and integrator assessments. Tesla also has significant experience in this market, being the largest current provider of BESS technology for utility-scale projects within the NEM.

2.3 Site suitability

The selected site possesses several key attributes that make it an optimal location for the development of a BESS.

Firstly, its proximity to the electricity transmission network and high electricity demand centres ensures efficient energy distribution and minimises transmission losses.

Secondly, the capacity of the existing transmission network supports the integration of the BESS without requiring significant infrastructure upgrades. The area of land available is sufficient to accommodate a BESS and associated infrastructure and is already suitably zoned. The land surrounding the Project comprises compatible existing land uses including a mix of industrial and commercial uses, major arterial roads and port facilities.

The presence of an existing suitable road network and driveway to the site for the delivery of heavy construction loads simplifies transport logistics and eliminates the need for transport infrastructure upgrades and associated costs.

Finally, the availability of a skilled construction and operational workforce in the region ensures that the Project can be constructed and maintained effectively.

Considering these attributes and given that the Project is situated on land owned by Ausgrid, the site is highly suitable for the development and operation of a BESS.

2.4 Consistency with government plans and policies

The construction and operation of the Project would facilitate Australia's ongoing transition towards sustainable renewable energy sources, as described in **Section 2.1**. The development would align with the objectives of numerous plans and policies at the international, commonwealth, state, and regional levels. A summary of these relevant plans and policies is provided below.

2.4.1 United Nations Framework Convention on Climate Change (The Paris Agreement)

The *United Nations Framework Convention on Climate Change* (UNFCCC) Paris Agreement (the Paris Agreement) is an international agreement for addressing global climate change. The agreement commits the participating parties to greenhouse gas (GHG) reduction targets in a step-phase approach. Developed countries are charged with establishing a precedence and standard for the rest of the world and are also encouraged to provide financial and other resource assistance to those who require it.

Australia is a signatory to the Paris Agreement, with this being enacted in Australian law through the *Climate Change Act 2022*. The *Climate Change Act 2022* legislates the Australian Government's responsibility to reduce GHG emissions, by providing a set of short and long-term targets, using 2005 GHG levels as a reference point. Key targets include the reduction of emissions by 43% below 2005 levels by the year 2030, moving to net-zero emissions nationally by 2050. The plan for reaching these targets is established in *Australia's Long Term Reduction Plan* (DISER, 2021), as detailed in **Section 2.4.2**.

To achieve these targets, Australia's renewable energy generation will need to increase substantially, with BESS technology playing a crucial role in enhancing the effectiveness and reliability of renewable energy sources by balancing supply and demand. BESS technology is therefore integral to the transition towards a more sustainable and resilient energy future and achievement of Australia's Paris Agreement commitments.

2.4.2 Australia's Long-Term Emissions Reduction Plan

Australia's whole-of-economy *Long-Term Emissions Reduction Plan* (DCCEEW, 2022a) is focused on technology and sets out how Australia will achieve net zero emissions by 2050. One of the key principles of the plan is keeping energy prices down with affordable and reliable power. The plan outlines how the Australian Government will:

- Drive down the cost of low emissions technologies (including battery storage)
- Deploy these technologies at scale
- Help regional industries and communities seize economic opportunities in new and traditional markets
- Work with other countries on the technologies needed to decarbonise the world's economy.

The *Technology Investment Roadmap* (TIR) is the foundation of the *Long-Term Emissions Reduction Plan* and sets a process to develop and deploy low emissions technologies (including battery storage). By prioritising government investment, it aims to make these emerging technologies cost competitive with existing high emission technologies (DCCEEW, 2022b). Importantly, the TIR includes a requirement to prepare Low Emissions Technology Statements (LETs), which review, refine and evaluate the government's investment in low carbon emission technologies (DCCEEW, 2021).

The current LETS (2021) includes energy storage as an existing priority technology for government investment. Specifically, the LETS indicates that broad deployment of electrical energy storage will facilitate further integration of low-cost solar and wind energy in the NEM. The LETS states that energy storage will provide network security services and a source of reliable, dispatchable electricity.

The Project would help reduce the electricity prices during peak demand periods for consumers in the Ausgrid distribution network. As the Project intends to provide a source of reliable, dispatchable electricity, it would be consistent with the principles of the Long-Term Emissions Reduction Plan.

2.4.3 Net Zero Plan

The Australian Government established the *Net Zero Plan* (NZP) to guide the transition to the legislated net zero emissions target by 2050. The NZP achieves this by setting out the government's guidelines and priorities to reduce emissions and support investment in low emissions and renewable activities.

The plan incorporates six sectoral emissions reduction plans that capture the full breadth of the economy: electricity and energy, transport, industry, agriculture and land, resources, and the built environment. The NZP combines these individual plans to support the Australian Government's aim to for a climate resilient nation.

The Project supports the NZP by facilitating an increase in the supply of renewable energy to the NEM, which contributes to the target of achieving a net zero Australia.

2.4.4 NSW Climate Change Policy Framework

The NSW Government developed the *NSW Climate Change Policy Framework* (OEH, 2016) as a response to the Australian Government's commitments under the Paris Agreement. This framework outlines the NSW Government's commitment to achieving net zero emissions across the state by 2050.

The framework responds to our changing climate by making NSW more resilient to the impacts of climate change through the provision of opportunities for the introduction of alternative energy sources to the NEM.

The Project supports the overall goals of the framework as it increases the resilience of the NEM by allowing renewable energy to be stored until demand requires it to be released to consumers. This is also beneficial in the event of power outages that may occur during extreme climate-related events, further bolstering the climate resilience of the NEM.

2.4.5 NSW Net Zero Plan Stage 1: 2020-2030

The *NSW Net Zero Plan Stage 1: 2020-2030* outlines the plan for how NSW aims to achieve net zero emissions by 2050. The priorities of this plan include:

- Drive uptake of proven emissions reduction technologies
- Empower consumers and businesses to make sustainable choices
- Invest in the next wave of emissions reduction innovation
- Ensure the NSW Government leads by example.

Combined with the *NSW Electricity Infrastructure Roadmap* (refer to **Section 2.4.8**) the *NSW Net Zero Plan* will help generate 9,000 jobs and up to \$37 billion in private investment.

The Project helps meet the goals of identified in *NSW Net Zero Plan Stage 1: 2020-2030* through the provisions of technology that can store and introduce renewable energy into the NEM, at periods of peak demand. The Project also demonstrates NSW leading by example through the implementation of energy efficient technology.

2.4.6 NSW Transmission Infrastructure Strategy 2018

The *NSW Transmission Infrastructure Strategy* (NSW Government, 2018) aims to address the need for the State to enhance the capacity of the electricity grid by connecting various energy sources. This strategy was developed to address the following five driving principles:

- Lower energy bills for NSW households and businesses
- A technology neutral approach to new energy generation projects
- Private sector-led investment in transmission and generation
- Regional economic growth and increased job opportunities
- Ongoing secure and reliable energy to power the NSW economy.

The *NSW Transmission Infrastructure Strategy* sets out a plan to facilitate private sector investment in priority transmission infrastructure projects, which can deliver least-cost energy to customers by 2040 and beyond. The Strategy forms part of the NSW Government's broader plan to make energy more affordable, secure investment in new power stations and network infrastructure, and ensure new technologies deliver benefits for consumers.

The Project facilitates private-led transmission infrastructure, with this technology enabling a secure and reliable energy source to power the NSW economy, as the BESS will be able to store electricity to be distributed as required, which helps to enhance the firming capacity of the NEM.

The Project would improve the reliability of electricity supply through periods of high demand, helping to facilitate lower-cost electricity which benefits consumers. The construction and operation of the Project diversifies industry and would provide additional job opportunities in the Greater Newcastle region. The Project therefore strongly aligns with the principles of the *NSW Transmission Infrastructure Strategy*.

2.4.7 NSW Electricity Strategy 2019

The *NSW Electricity Strategy* (NSW Government, 2019) is the NSW Government's plan for a reliable, and sustainable electricity future that supports a growing economy. This strategy is designed to complement the *NSW Transmission Infrastructure Strategy*, and the work of the NEM's regulatory bodies.

The strategy outlines three approaches for the NSW Government to meet these objectives:

- Support the market to deliver reliable electricity at the lowest price, while protecting the environment
- Set an Energy Security Target to ensure that the State has sufficient generation capacity to cope with unexpected generator outages during periods of peak demand, such as during heat waves, and
- Ensure the State has sufficient power to deal with an electricity emergency if one arises.

The strategy outlines the cheapest and most efficient way to develop a modern and complex energy system to replace coal-fired generators is to build a mix of low-cost renewables, gas-fired generators and other storage options, such as batteries and pumped hydro. The strategy also outlines the projected changing patterns of electricity usage, with more consumers and businesses utilising solar generation.

It is noted that the peak supply of solar energy, during the middle of the day, does not align with peak demands, which continue into the evening. The implementation of electricity storage allows electricity prices to be managed for consumers, whilst aiding the NSW government's plan for reliable and sustainable electricity supply for the future.

2.4.8 NSW Electricity Infrastructure Roadmap 2019

The *NSW Electricity Strategy* (DPIE, 2019) is intended to be implemented through the *NSW Electricity Infrastructure Roadmap* (DPIE, 2020). The Roadmap envisions a modern electricity system in NSW built on the following five pillars:

1. *"Driving investment in regional NSW: supporting our regions as the State's economic and energy powerhouse.*
2. *Delivering energy storage infrastructure: supporting stable, long-term energy storage in NSW.*
3. *Delivering Renewable Energy Zones: co-ordinating regional transmission and renewable generation in the right places for local communities.*
4. *Keeping the grid secure and reliable: backing the system with gas, batteries or other reliable sources as needed.*
5. *Harnessing opportunities for industry: empowering new and revitalised industries with cheap, reliable and low emissions electricity".*

The Project is wholly in keeping with the vision of the *NSW Electricity Infrastructure Roadmap* in that it:

- Represents a private regional investment, delivers energy storage
- Is appropriately zoned and uses existing transmission infrastructure
- Provides security to the NEM, and
- Provides cost effective and reliable electricity with negligible additional emissions.

2.4.9 Renewable Energy Target

The *Renewable Energy Target (RET)* is a scheme established by the Australian Government that aims to deliver an extra 33,000-gigawatt hours (GWh) of electricity from renewable sources, every year from 2020 to 2030.

In 2019, the Clean Energy Regulator (CER) announced that Australia had met the RET more than a year ahead of schedule. Despite this, the scheme will continue to require high-energy users to meet their obligations under the policy until 2030.

Although the Project would not generate renewable energy, it will facilitate the introduction of a greater amount of renewable energy to the NEM.

2.4.10 2024 Integrated System Plan

The Integrated System Plan (ISP) is a whole-of-system plan that provides a coordinated generation and transmission investment plan to transition the NEM over the next 30 years. The Australian Energy Market Operator (AEMO) updates the ISP every two years, with the most recent ISP for the NEM being published in June 2024. Under the 'Step Change' scenario, identified in the 2024 ISP as the most likely scenario, the NEM will need to cater for significant investment in generation capacity, storage and transmission augmentation as coal generation withdraws - a process that is occurring two to three times faster than anticipated (refer to **Section 2.1.1**).

The ISP sets out an optimal development path (ODP) for reliability and affordability. The ODP comprises the following:

- Transition to renewable generation
- Actionable and other network investments
- Storage and gas to firm renewables.

The Project supports the ISP ODP by increasing the ability to store energy within the NEM.

2.4.11 State Infrastructure Strategy 2022-2042

The *NSW State Infrastructure Strategy 2022-2042* (Infrastructure NSW, 2022) (SIS) builds on the NSW Government's major long-term infrastructure plans, as initially outlined within *NSW State Infrastructure Strategy 2012*. The SIS sets out the government's priorities for the next 20 years, and highlights that ongoing investment is required to keep pace with population growth, ensure competitiveness of NSW industry and meet the government's social and economic goals.

Some of the relevant objectives and strategic directions of the SIS include:

- Embedding energy reliability and resilience
- Achieve an orderly and efficient transition to net zero
- Adopting new technologies to improve infrastructure efficiency
- Boosting economy-wide productivity
- Supporting sustainable growth and development.

The strategy highlights the need for reliable and resilient infrastructure. The BESS would directly address this through the provision of backup power during outages and by stabilising the grid.

The BESS would also support the transition to net zero by enabling the storage and use of renewable energy, reducing reliance on fossil fuels.

The Project would also contribute to the reduction in energy costs and improvement in the economic competitiveness of NSW, which aligns with the Strategy's goals.

2.4.12 Hunter Regional Plan 2041

The *Hunter Regional Plan 2041* (the Regional Plan) is a 20-year land use plan prepared under the EP&A Act. The Regional Plan applies to the nine Local Government Areas (LGAs) of the lower Hunter (including Newcastle), as well as the Councils within the Upper Hunter. The Regional Plan sets the strategic land use framework for continued economic growth and diversification in one of Australia's most diverse and liveable regions. The plan aims to unlock sustainable growth opportunities and investments, as well as housing choice and lifestyle opportunities to retain the Hunter's position as a leading regional economy in Australia. The Regional Plan includes four principles, which include:

- Growth – Support a net zero emissions economy and foster employment growth, competitiveness and innovation
- Community – Promote places to be together by weaving nature into our towns and cities which have welcoming and safe streets and public spaces
- Resilience – Reduce risks associated with place-based shocks and stresses to improve the community's ability to withstand, recover from and adapt to changes and become more resilient
- Equity – Ensure communities are safe and healthy with residents having opportunities for economic advancement, housing choices and a secure retirement.

To support the delivery of these core principles, the Regional Plan contains nine objectives, which are enforced through several strategies. Of relevance to this Project is Objective 1 and Objective 7, being:

- Objective 1: "Diversify the Hunter's mining, energy and industrial capacity"
- Objective 7: "Reach net zero and increase resilience and sustainable infrastructure".

Each objective, and the relevance to the Project, is described in further detail below.

2.4.12.1 Objective 1: Diversify the Hunter's mining, energy and industrial capacity

The Hunter is an economic powerhouse, driven by the mining, energy and manufacturing sectors. The Hunter-Central Coast is one of at least five REZs in NSW. The development of the REZ would take advantage of existing transmission infrastructure, transport links, water resources and a skilled workforce. To support the delivery of the Hunter and Central Coast, the Regional Plan includes Strategy 1.2, which states:

- Following completion of the Hunter-Central Coast REZ, local strategic planning should consider:
 - Opportunities to leverage new employment in related manufacturing and energy intensive industries that benefit from proximity to the energy infrastructure within the REZ.
 - The proximity of sensitive land uses to ensure sensitive land uses do not encroach on activities within the REZ.

The site has been chosen due to being strategically located adjacent to a substation, which is owned and operated by Ausgrid and within the Steel River Industrial Estate. The Project would support the energy requirements of future employment growth in the area, contributing to further industrial development of the Mayfield West area and achieving the objectives of the Hunter REZ. Being within an existing industrial setting and close to transmission infrastructure ensures the Project is consistent with Objective 1 under the Regional Plan.

2.4.12.2 Objective 7: Reach net zero and increase resilience and sustainable infrastructure

The *NSW Electricity Infrastructure Roadmap* sets out the NSW Governments 20-year plan for the generation, storage, firming and transmission infrastructure needed for clean, cheap and reliable power. The Regional Plan supports the delivery of the *NSW Electricity Infrastructure Roadmap* through the identification of opportunities to grow emerging industries in areas ready to accommodate this change.

The areas identified within the Regional Plan include:

- Liddell and Bayswater power stations regionally significant growth area
- Tomago industrial area, and
- Eraring Power Station.

The Project is located within the Steel River Industrial Estate, which is approximately 7km away from the Tomago industrial area and less than 100km from the above-mentioned power stations. The Project, being a grid scale energy storage system would support the transition to a net-zero emissions economy. BESS infrastructure provides energy security by being able to store energy until it is either needed due to a grid outage, or when consumer demand requires the energy. Therefore, the Project is in line with Objective 7 of the Hunter Regional Plan.

2.4.13 Greater Newcastle Metropolitan Plan 2036

The *Greater Newcastle Metropolitan Plan 2036* (GNMP) sets out strategies and actions that will drive sustainable growth across the LGAs (including Newcastle LGA), which together make up Greater Newcastle. Furthermore, the GNMP helps to achieve the vision set in the Regional Plan for the Hunter to be the leading regional economy in Australia with a vibrant new metropolitan city at its heart.

One of the outcomes of the GNMP, is to: *“Enhance environment, amenity and resilience for quality of life”* and Strategy 15 within that outcome is: *“Plan for a Carbon Neutral Greater Newcastle by 2050”*. The Project would be maximising the renewable energy input by storing it outside of periods of peak production and then dispersing that electricity back to the grid when consumer demand dictates. The Project supports the outcomes and strategies of the GNMP by helping the objectives of creating a carbon neutral Greater Newcastle.

2.4.14 Newcastle Local Strategic Planning Statement 2021

The *Newcastle Local Strategic Planning Statement 2021* (NLSPS) is City of Newcastle’s plan to guide land use over the next 20 years. The NLSPS outlines planning priorities to achieve the City of Newcastle’s land use planning vision.

One of the strategies of the NLSPS is: *“A Green City”*, one of the outcomes under this strategy states: *“We are a resilient city, with capacity to mitigate and adapt to climate change risks to our local environment, community and economy”*. The Project would support the outcomes and strategies of the NLSPS by helping achieve the objective of creating a resilient electricity grid, while also addressing the need to alleviate climate change risks by introducing more renewable energy into the NSW energy market.

2.4.15 Newcastle Community Strategic Plan 2018-2028

The *Newcastle Community Strategic Plan 2018-2028* (City of Newcastle, 2021) (NCSP) sets out the strategies and actions for the community of Newcastle. The NCSP states that: *“In 2030, Newcastle will be a smart, liveable and sustainable global city”*. The plan breaks its vision down into several priorities and goals, one of which is: *“Sustainable - refers to both environmental and financial sustainability. Sustainability is about meeting the needs of the present generation without compromising the ability of future generations to meet their needs.”*

The Project would help to achieve this goal by providing alternative measures to storing energy. Long term energy storage provided by the BESS can assist the current population by wholesale electricity price reductions, long term grid security and an increased firming capacity, which provides greater grid stability for future generations.

2.5 Key features of the site and surrounds

2.5.1 Environmental context

The environmental context of the site is shaped by its urban and industrial surroundings, as well as its proximity to significant infrastructure and natural features.

The site is located in the Steel River Industrial Estate on McIntosh Drive opposite to Hymix Steel River Plant, which processes concrete. It is also situated adjacent to major roads, including Industrial Drive

and Tourle Street. As the Project is located close to the roads and industrial uses, there is significant existing background noise.

Whilst the site and its surrounds are primarily industrial in nature, comprising commercial and industrial land uses as well as energy infrastructure, the site is located in proximity to recreational spaces such as Stevenson Park, and sports fields to the southwest. Residential areas are also located south of Industrial Drive, within 400 m of the site.

The closest body of water to the site located 300 m north is the Hunter River, which feeds into Hunter Estuary Wetlands, which is a Ramsar Wetland, located approximately 2.5 kilometres (km) from the Project.

There are hazards and risks associated with installation, commissioning and operation of the Project, including overheating, fire and hazardous gas emissions. The existing Mayfield West substation also poses the potential risk of electromagnetic field (EMFs). The hazards and risks associated with the Project were assessed in a Preliminary Hazard Analysis (PHA).

Due to the urban nature and disturbance associated with former land uses, there has been no identification of Aboriginal heritage sites within 200 m of the Project, with little potential for archaeological remains. Overall, the environmental context of the Project Area and its surrounds reflect a mix of industrial activity and energy infrastructure.

2.5.2 Surrounding land uses and sensitive receivers

The Project is located in land zoned as *E4 General Industrial* under the Newcastle LEP. The surrounding land use is largely industrial and commercial, with minimal sensitive receivers within the vicinity of the Project. Land use zones are shown on **Figure 2-1**.

2.5.2.1 Residential

The nearest residential receivers are located approximately 400 m south of the site, and this area is zoned as *Low-Density Residential* (R2) under the Newcastle LEP. There are 1,112 residential receivers within 1 km of the Project Area, as shown in **Figure 2-2**.

2.5.2.2 Infrastructure

The site is immediately adjacent to Tourle Street, which runs north-south on the eastern side of the site. This road is classified as *General Infrastructure (SP2 – Classified Road)* under the Newcastle LEP. Tourle Street is a bi-directional, two lane road that connects Mayfield West to north of the Hunter River in Kooragang. Industrial Drive, which is zoned as *SP2 – Classified Road* under the Newcastle LEP, is located approximately 350 m south of the site. Industrial Drive is a bi-directional, two lane road that runs east west and connects to the Pacific Highway to the west of the site.

2.5.2.3 Industrial and commercial

The primary land use that surrounds and is within the site is industrial, with the site zoned as *E4 General Industrial* under the Newcastle LEP. Land east of the site, and north of the Hunter River is zoned as *Special Activities (SP1)* where the Newcastle Port is located. Newcastle Port facilitates shipping, storage of raw materials, coal storage, and petroleum and gas storage recycling plants.

Industries within the *E4 General Industrial* zoned land in proximity to the site include:

- Recycling
- Transportation and haulage
- Metal fabrication and galvanising
- Manufacturing
- Commercial construction
- Data centres.

There are two sensitive receivers identified within this E4 zoned land - Imagine Early Learning and Childcare centre (~340 m) and the Grainery Church (~360 m).

2.5.2.4 Recreational and conservation land

There is no recreational or environmental land within or adjacent to the Project Area.

The nearest recreational zoned land is Stevenson Park, approximately 450 m southwest of the Project Area. Stevenson Park is zoned *RE1 Public Recreation* under the Newcastle LEP. Publicly accessible recreational land located in Mayfield West and surrounding suburbs within 1 km of the Project include:

- Bull and Tourle Street Reserve
- Gregson Avenue Reserve
- Terry Park
- Casuarina Circuit Reserve.

The nearest environmental zoned land is 1.2 km west of the Project, zoned *C3 Environmental Management*, which is the Warabrook Wetlands Reserve.

2.6 Cumulative impacts

The *Cumulative Impact Assessment Guidelines for State Significant Projects* (DPE, 2022) require consideration of the cumulative impacts of the Project when considered alongside other existing and planned projects.

A search of the DPHI Major Projects database was undertaken on 29 August 2024 to identify other state significant projects within the vicinity of the Project that may contribute to cumulative impacts. A search was also completed on the City of Newcastle Development Activity database for Development Applications with 1km of the Project. The projects that identified are:

- Clean Energy Precinct Concept DA - Application number: SSD-62423490
- Tomago Battery Energy Storage System / Newcastle Power Station - Application number: SSD-57107216/SSI-9837
- Hunter Valley Hydrogen Hub - Application number: SSD-48655719
- Light industrial Units – 60 Riverside Drive, Mayfield West – Application number: DA2023/00661
- Modification 3 Relocation of Acid Sulfate Soil Activity – 80 Tourle Street, Mayfield West – Application number: SSD-7698-Mod-3.

A detailed assessment of cumulative impacts has been undertaken in **Section 6.11**.

2.7 Agreements

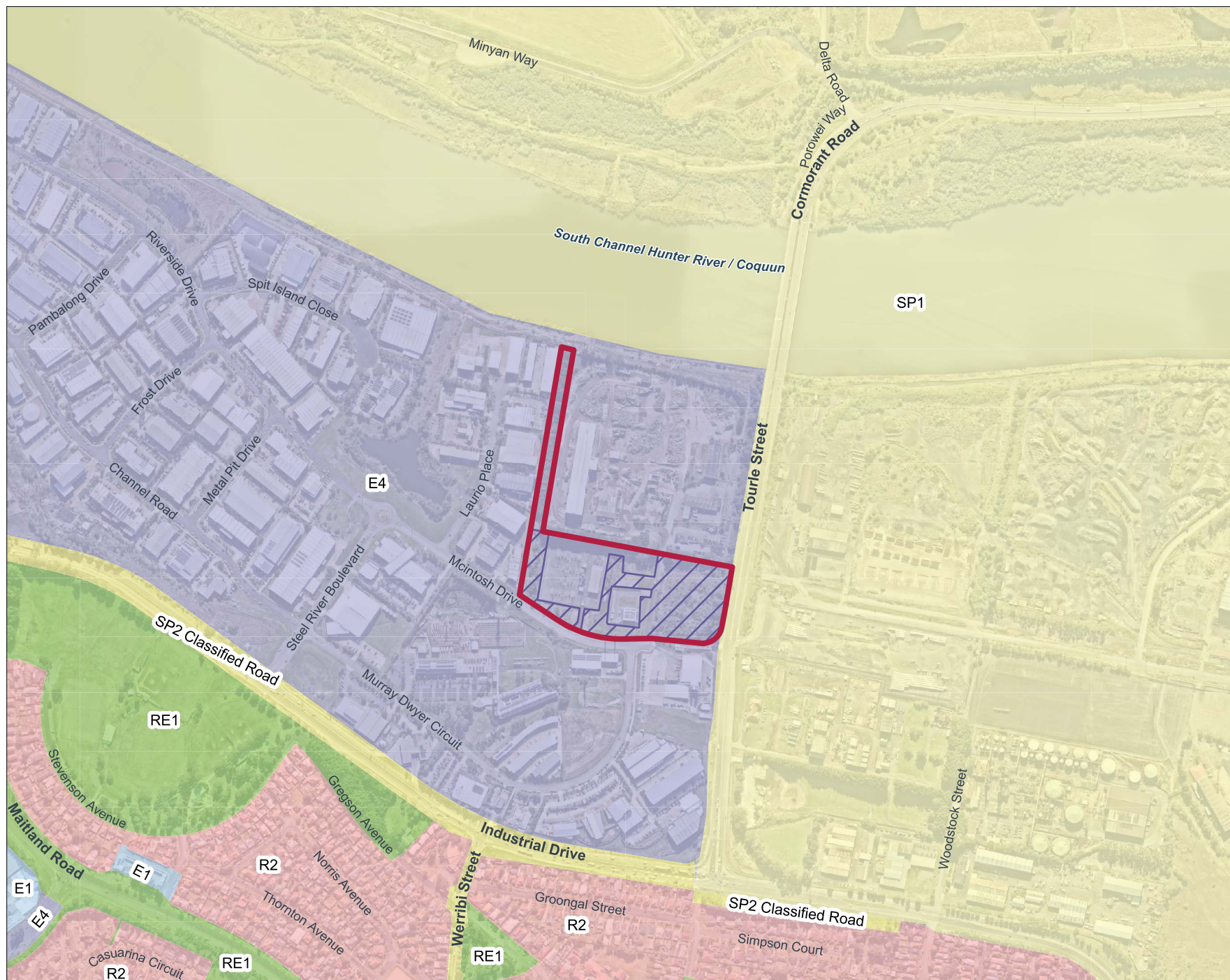
Construction and operation of the Project will be undertaken on property that is owned by Ausgrid, however a portion of the site is leased to Leading Edge data centre.

There is an easement located over the shared driveway off McIntosh Drive, that will be used for site access and is also used for access by Benedict Recycling and Leading Edge.

A further easement runs along the eastern boundary of the site in favour of Lot 1 DP1022687. This easement was owned by the previous landholder BHP Limited. The easement now favours Benedict Recycling. Ausgrid are in negotiation with Benedict Recycling and agreement will need be reached prior to construction.

Figure 1-3 shows the Project relative to the land ownership within and outside the Project Area. Further details are included in **Section 6.3**.

FIGURE 2-1:
SURROUNDING LAND ZONES



Legend

- The site
- Project Area

LEP Land Zoning

- E1 - Local Centre
- E4 - General Industrial
- R2 - Low Density Residential
- RE1 - Public Recreation
- SP1 - Special Activities
- SP2 - Infrastructure

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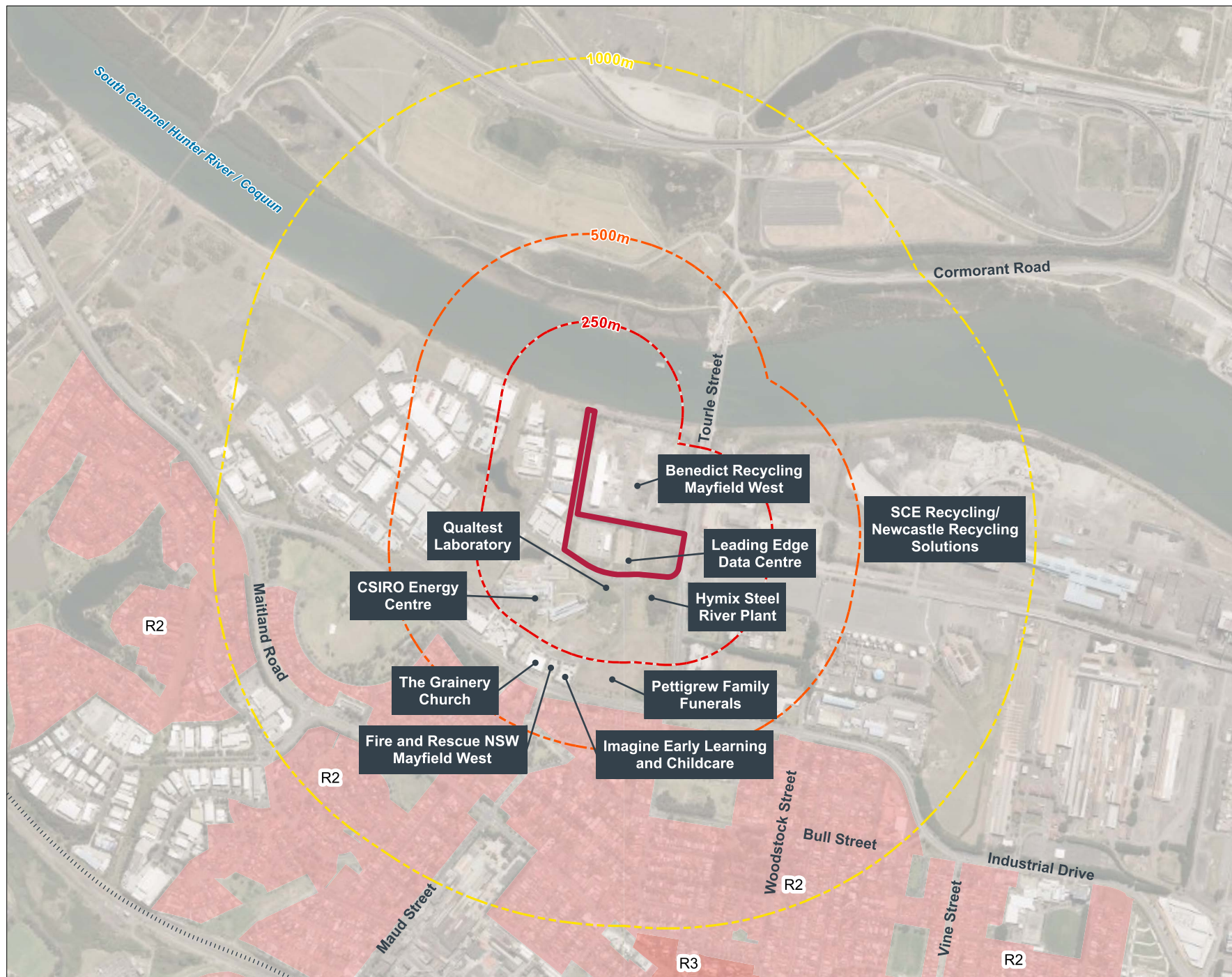
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FIGURE 2-2:
SENSITIVE RECEIVERS



Legend

- The site
- 250 m buffer from the site
- 500 m buffer from the site
- 1000 m buffer from the site
- Railway

Residential Land Zoning

- R2 - Low Density Residential
- R3 - Medium Density Residential

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3.0 Project Description

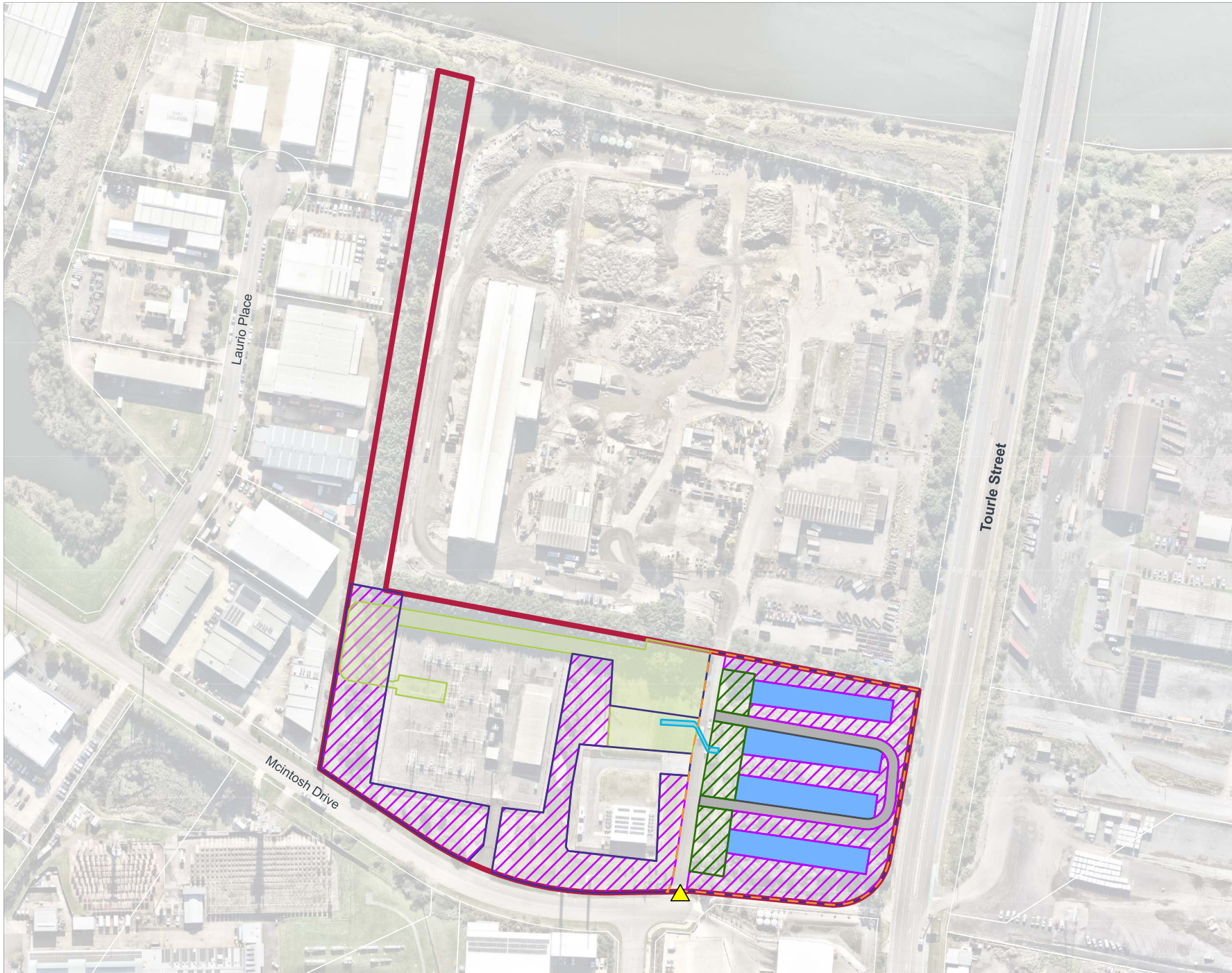
3.1 Project overview

Ausgrid proposes to construct, operate and maintain a 200 MW (2-hour duration, i.e. 400 MWh) BESS adjacent to the Mayfield West zone substation, in the Steel River Industrial Estate (the Project). The Project would comprise a BESS to store energy from the grid, releasing it during high demand periods. The BESS would also perform other ancillary services for the grid.

A summary of the Project's features is provided in **Table 3-1**. The Project is mapped in **Figure 3-1**.

Table 3-1: Project overview summary

Feature	The Project
Proposed development	- Construction, operation, and maintenance of a BESS with a 200 MW maximum power output capacity with 2-hour duration (i.e. 400 MWh) - Containerised battery units (112 Megapacks) and associated infrastructure, including inverters and 56 medium voltage transformers 33kV underground cable connection from the battery units to Mayfield West zone substation infrastructure - Combined switch room and control room building - Eight Ring Main Units (RMU) - Onsite workshop facility - Two auxiliary transformers - Backup diesel generator - Two spaces for onsite car parking - Other ancillary infrastructure including fire suppression, stormwater management, 2.4m high boundary security chain wire fencing, lighting and CCTV.
Site description	The site is located with Lot 16, DP 270249 being 1 McIntosh Drive, Mayfield West, NSW 2304. The Project would be located in the eastern extent of the property.
Disturbance Area	The total area of disturbance on the site would be approximately 2.74 ha.
Access	Access to the site would be via an existing Ausgrid owned, shared driveway off McIntosh Drive. McIntosh Drive is a sealed single lane, two-way council owned road which connects to Steel River Boulevard and onward to Industrial Drive (A43).
Grid connection	The Project would be connected to the NEM through Mayfield West zone substation infrastructure via a 33kV underground cable.
Estimated Development Cost (EDC)	The total EDC for the project would be \$208million.
Operational life expectancy	The BESS is intended to operate for 50 years with component replacements. At the end of this period the BESS would be decommissioned and the site rehabilitated. Any extension to the life of the BESS would be subject to a separate approval at the time.
Operational workforce	The BESS would operate 24 hours a day, seven days a week as an unmanned facility. Staff activity at the site would be limited to planned and unplanned maintenance only.



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**FIGURE 3-1:
INDICATIVE SITE
LAYOUT**

Legend

- The site
- Project Area
- Operational footprint
- Proposed underground 33kV grid connection
- HV connection infrastructure (area subject to separate approvals process)
- Laydown area
- Ancillary facilities
- BESS infrastructure
- Internal site road
- Site access

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3.2 Project description

3.2.1 Battery Energy Storage System

The BESS technology would consist of a series of containerised LiFePO₄ battery units (112 Megapacks). These would stand at a height of approximately 2.75 m, with a footprint of 1.65 m by 8.8 m and would be mounted on a compacted gravel base, screw piles or a concrete slab.

The prefabricated units (containing the battery cells, inverters and cooling systems) would be arranged in a series of rows to minimise cable run lengths and maintain appropriate separation distances as per the manufacturer's requirements to manage fire risks and provide access for maintenance.

The units would have a minimum back-to-back separation distance of 460 millimetres (mm) and a clearance of 2.44 m would be required in front of each unit to facilitate ongoing maintenance access.

The units would connect to 56 medium voltage (MV) transformers, 8 ring main units (RMU) and control systems. In addition, they would be connected to a Battery Management System (BMS), which would:

- Prevent overcharging, overheating and current surges into and out of the BESS
- Maintain voltage levels and automatically cut-out the BESS in the event of electrical shorts.

A combined control and switch room (30 m x 5 m height), as well as an onsite workshop facility would be located within the site. The workshop would be used to repair and maintain the BESS components and ancillary infrastructure.

An indicative site concept layout is provided in **Figure 3-1**. **Figure 3-2**, **Figure 3-3** and **Figure 3-4** show a Tesla Megapack, typical BESS facility and typical operations building.



Figure 3-2: Tesla Megapack



Figure 3-3: A typical BESS site



Figure 3-4: A typical operations building

3.2.2 Services and infrastructure

Table 3-2 summarises the existing infrastructure within proximity of the site as well as the augmentation of this infrastructure that would be required to facilitate the Project. These services are shown in **Figure 3-6**.

Table 3-2: Site infrastructure

Infrastructure	Detail
Stormwater	New stormwater drainage would be constructed to service the Project. This would be separate to the existing stormwater infrastructure servicing the substation due to the topography of the site.
Potable water	For Project operation, a new potable water metered connection would be installed. There is existing potable water supply on site connected to the existing substation. During construction, potable water would be supplied by imported truck supply.
Sewer	There is an existing sewer connection to the substation. However, a new connection would be sought for the Project.
Electricity	Ausgrid would install a new electricity metered connection at the site.
Telecommunications	The site would utilise the existing Ausgrid fibre from the adjacent substation and a secondary connection via NBN or cellular 4G.
Fire services	Fire water would be provided on site via fire hydrants. Any additional fire water requirements from the Fire Safety Study will be incorporated prior to construction.
Security	The existing substation is currently fenced, and access controlled. There is also signage around the perimeter. A 2.4m high chain wire security fence would be constructed around the perimeter of the BESS facility. This would be augmented with security gates to facilitate authorised access only. CCTV would also be installed.
Access and circulation	See Table 3-1 for the existing access scenario. Access to site would not require upgrade as part of the Project. Industrial Drive would be used as a connecting road to the M1 Pacific Motorway, which would be commonly used as an access route for construction vehicles. Figure 3-6 indicates internal roads of the operation phase of the project which would enable vehicular access around the site.
Parking and workforce	Section 3.3.3.3 indicates parking and workforce requirements during construction. Section 3.4.3 indicates parking and workforce requirements during operation.

3.2.3 Project sequencing

The Project will move through various phases as it moves through construction. **Figure 3-5** highlights what these different phases will be. These phases are described in more detail within **Sections 3.3.3** and **3.3.4**.

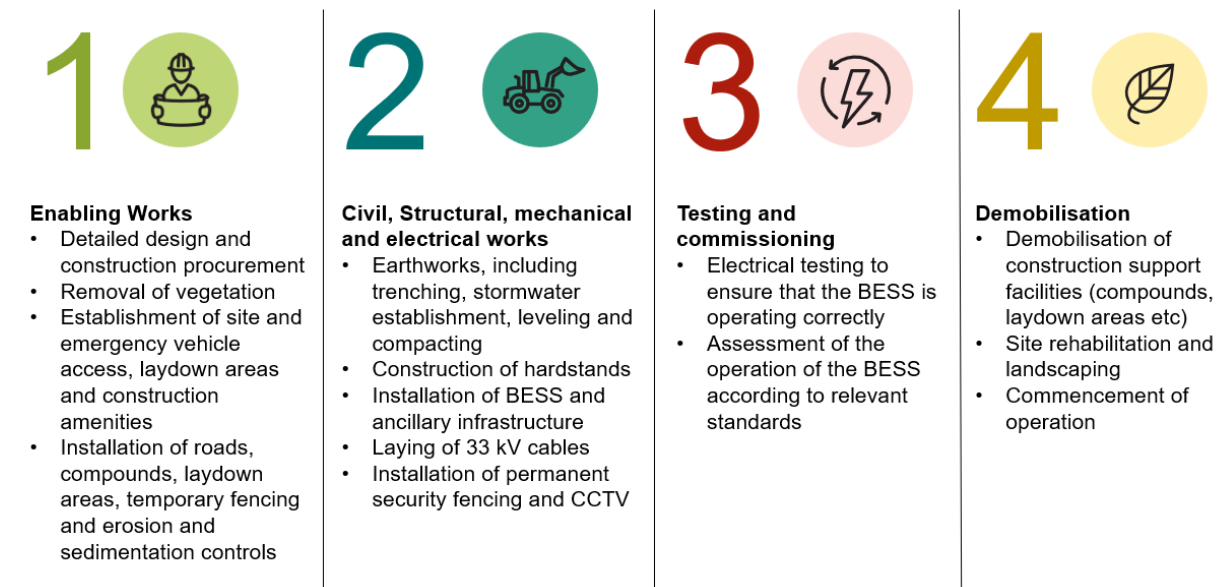


Figure 3-5: Project sequencing

3.2.4 Environmental Constraints

Latter chapters within this EIS provide further detail on the environmental constraints within the site and surrounds, these constraints have shaped the design of the Project. **Figure 3-7** maps the key environmental constraints. The design of the Project has been shaped by the following environmental considerations:

- Results of the PHA
- Potential for noise impacts on sensitive receivers
- Biodiversity values
- Water quality from stormwater runoff
- Impacts on traffic.

FIGURE 3-6:
SERVICES AND UTILITIES



Legend

- The Site
- ▨ Project Area

Existing Utilities

Transmission Lines

— 330 kV

Ausgrid Network

— 132 kV

— 11 kV

— 415 V

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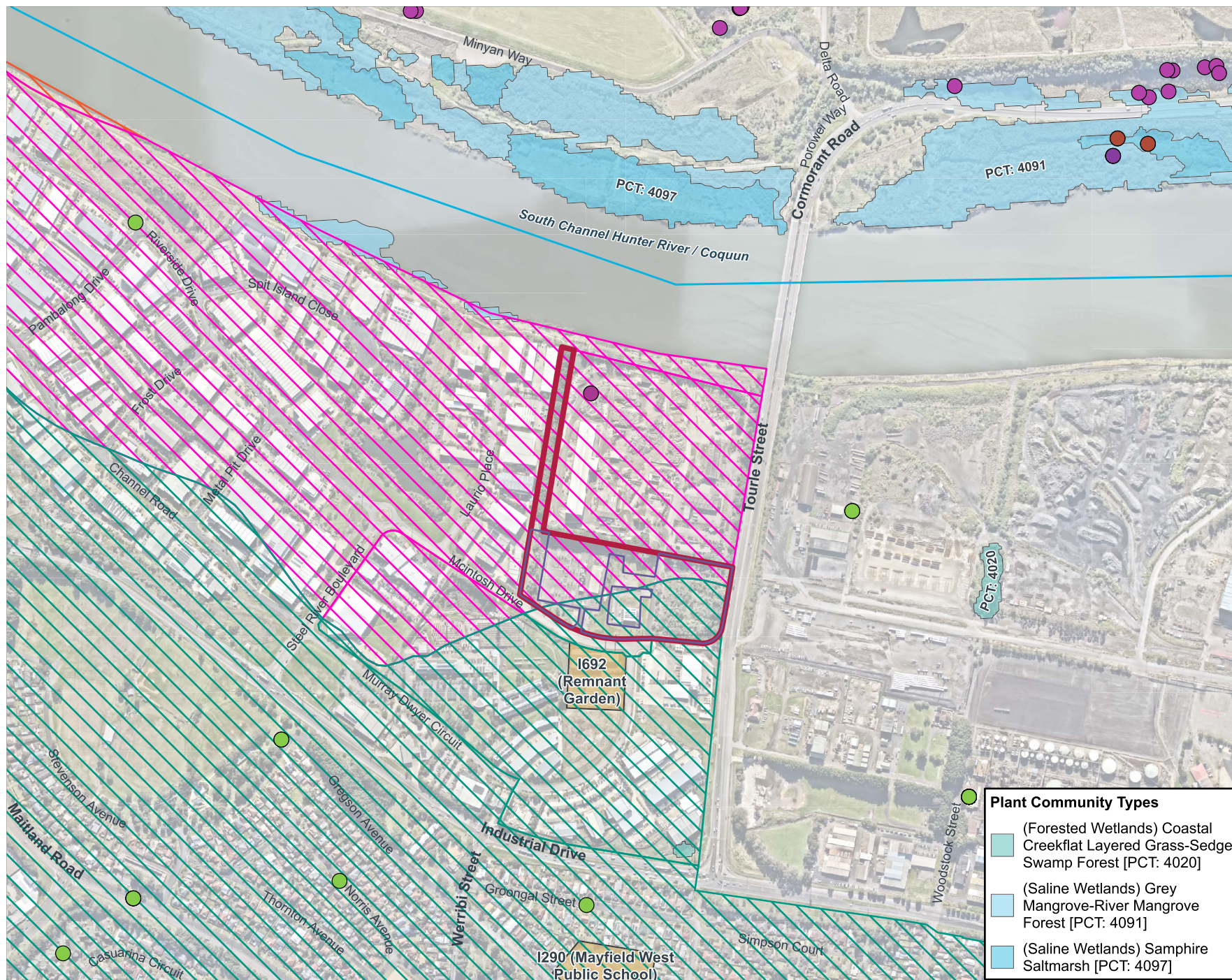
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**FIGURE 3-7:
ENVIRONMENTAL
CONSTRAINTS**



Legend

- The site
- Project Area

Heritage

- General heritage item

Acid Sulfate Soils

- Class 1
- Class 2
- Class 5

BioNet Threatened Species Records

- Green and Golden Bell Frog
- Grey-headed Flying-fox
- Large Bent-winged Bat
- Little Bent-winged Bat
- Masked Owl
- Southern Myotis

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Plant Community Types

- (Forested Wetlands) Coastal Creekflat Layered Grass-Sedge Swamp Forest [PCT: 4020]
- (Saline Wetlands) Grey Mangrove-River Mangrove Forest [PCT: 4091]
- (Saline Wetlands) Samphire Saltmarsh [PCT: 4097]

3.3 Project construction

3.3.1 Overview

Table 3-3 provides an overview of the construction works.

Table 3-3: Construction overview

Construction	
Construction activities	Construction would involve: • Enabling works • Civil, structural, mechanical and electrical works • Testing and commissioning • Demobilisation Construction laydown areas would be provided on the site.
Plant and equipment	The indicative plant and equipment have been listed below. • Enabling works: • Front end loaders • Dump trucks • Road trucks • Water trucks • Excavators • Graders • Compactors • Light vehicles. Civil, structural, mechanical and electrical works: • Front end loaders • Road trucks • Graders • Concrete trucks and pumps • Dump trucks • Excavators • Bobcats • Compactors and rollers • Elevated work platforms • Cranes • Concrete saws and grinders • Water trucks • Light vehicles • Backhoe • Generators. Testing and Commissioning: • Elevated work platforms • Cranes • Generators • Light vehicles. Demobilisation: • Water trucks • Compactors • Backhoe • Light vehicles.
Construction duration	It is anticipated that construction of the Project would commence in Q3 2025 and be completed by Q1 2027 (approximately 18 months). However, these dates are subject to change pending equipment lead times and availability.

Construction	
Construction workforce	Up to 100 construction workers (at peak) would be required. These workers would be sourced locally where appropriate skill sets are available.
Construction hours	Proposed construction would occur during standard working hours as outlined in the <i>Interim Construction Noise Guideline</i>, being: - Monday to Friday 7.00 am to 6.00 pm - Saturday 8.00 am to 1.00 pm - No works on Sundays and Public Holidays. Activities that may be required to be completed outside of those standard hours would be completed in accordance with an Out of Hours Work procedure and may include (but not be limited to): - Electrical commissioning and testing - Emergency situations where work is required to prevent harm to persons or property - Any works on the access road or which would block access to neighbouring properties.
Construction traffic volumes	Up to 136 light vehicles and 18 heavy vehicles per day at peak.

3.3.2 Materials, stockpiling and laydown areas

Prior to construction commencing, stockpiling and laydown areas would be confirmed, along with locations specified for the following:

- Spoil handling and storage area(s)
- Dangerous goods storage area(s)
- Workshop and equipment storage area(s)
- Onsite parking area(s)
- Construction compound including site offices and staff amenities
- Site access and egress.

Temporary construction laydown areas would be required within the site. These areas would provide a location to store plant, materials and equipment during construction, and may, be covered with temporary roofing to protect stored equipment. The likely location of the laydown areas in relation to the site is indicated on **Figure 3-1**. As the land is generally flat, no additional earthworks would be needed to construct these laydown areas. There will a hardstand layer applied that will be removed once construction is complete.

3.3.3 Construction stages

3.3.3.1 Enabling Works

Enabling works would be carried out to prepare the site for construction and would generally include:

- Establishment of site and emergency vehicle access, laydown areas and construction amenities (including temporary offices, lunchrooms, storage areas and washrooms)
- Installation of erosion and sediment controls and marking out of no-go areas
- Clearing of vegetation within the site
- Installation of temporary fencing
- Establishment of temporary construction services including site diesel generators
- Installation of temporary site drainage and underground services.

3.3.3.2 Civil, structural, mechanical and electrical works

Following the enabling works, the following works would be required:

- Construction of internal site roads, consisting of either compacted gravel or road base
- Earthworks and site levelling to form a suitable pad for the battery units and ancillary infrastructure
- Appropriate foundations for the battery enclosures, MV transformers and ring main units
- Delivery and installation of BESS facility components
- Internal fit out of the switch room and control room
- Stormwater drainage.

The proposed connection from the BESS to the high voltage (HV) transformer would be installed below ground. The construction of the cable connection would include:

- Excavation of a cable trench
- Laying of cables within trench
- Connecting cable to the HV transformer
- Backfilling of trench and rehabilitation of the cable easement.

Soils along the route of these trenches would be excavated and stockpiled nearby, or within the designated construction laydown areas for the Project. Excavation would be completed in a progressive manner to minimise the amount of material stockpiled and to reduce the potential for erosion.

3.3.3.3 Construction workforce and traffic

During the peak of construction, it is estimated around 100 workers per day would enter and exit the site. This number would vary throughout construction, with commissioning only requiring up to five workers.

Access to the site is via a shared driveway off McIntosh Drive. Surrounding facilities that use the same shared driveway include the Leading Edge Data Centre and Benedict Recycling. This driveway would be used for construction, operation and ongoing maintenance once the Project is operational.

Up to 20 heavy vehicles per day would require access to the site during construction. These vehicles may arrive and leave at any point during the day, but most likely would arrive in the early morning. Parking would be provided within the site for heavy vehicles. These vehicles would not remain on site overnight.

During construction, up to 20 parking spaces would be provided within the site. Any overflow of workers' vehicles would utilise on street parking on McIntosh Drive. A Construction Traffic Management Plan (CTMP) would be prepared as part of the CEMP and would be implemented prior to the commencement of construction.

3.3.4 Post construction works

3.3.4.1 Testing & Commissioning

Commissioning works would include electrical testing to ensure that the BESS is operating correctly. This would include assessment of the operation of the BESS according to relevant standards.

3.3.4.2 Demobilisation

Prior to operation all temporary construction equipment and facilities would be removed, and all unoccupied disturbed land would be rehabilitated generally in accordance with the existing nature of the site. **Table 3-3** outlines the equipment required for commissioning and demobilisation.

3.3.5 Construction program

An indicative schedule for construction is provided in **Table 3-4**. It is expected that the peak construction period will occur after the enabling works for a period of up to six months.

Table 3-4: Indicative construction schedule

Task/stage	Date/duration
Enabling works	Late 2025 – 1-3 months
Civil, structural, mechanical and electrical works	Late 2025 – 6-12 months
Testing and Commissioning	Mid to late 2026 – 12-18 months
Demobilisation	Mid to late 2027 – 1-3 months

3.4 Operation

3.4.1 Operational activities

During operation, activities would include:

- Operation, maintenance, testing and management of the BESS and its associated infrastructure
- General office activities
- Receipt of goods
- Waste removal
- General site maintenance (e.g. mowing).

3.4.2 Operational plant and equipment

Table 3-5 provides an indicative list of operational plant and equipment.

Table 3-5: Indicative plant and equipment for operation

Equipment to be used during operation	
Light vehicles	Elevated work platforms
Whipper snipers	Tractors
Chainsaws	Generators

3.4.3 Operational workforce and hours

The Project would operate 24 hours a day, seven days a week as an unmanned facility. The BESS would be managed remotely and staffed as required during both planned and unplanned maintenance periods. The Project would provide up to five part-time roles, equating to one FTE, during operation.

Adequate parking would be provided onsite for the operation of the Project with two spaces to be provided to accommodate low-operational staffing requirements.

3.5 Decommissioning

The BESS is intended to have an operational life of up to 50 years, with component replacement during this period. Any extension of this would be subject to additional approvals at the time, if necessary. During decommissioning above ground components would be removed and recycled where possible, and land rehabilitated. The battery units would either be disposed of, repurposed or recycled at a licensed disposal facility.

3.6 Estimated Development Cost

The total EDC for the Project is \$208 million.

4.0 Statutory context

4.1 Introduction

This chapter outlines the relevant statutory requirements for the Project. Specifically, it identifies:

- The relevant planning pathway under which consent is sought
- Relevant state approvals beyond the *Environmental Planning and Assessment Act 1979*, including those that are not required for SSD projects (section 4.41 of the Act), and those that cannot be refused and must be substantially consistent with the approved SSD project (section 4.42 of the Act)
- Mandatory matters for consideration, including relevant state and local environmental planning instruments (EPIs)
- Relevant Commonwealth approvals.

A summary of the statutory requirements for the Project is provided in **Table 4-1** with further detail provided in **Section 4.1.1 to Section 4.3.5**. A detailed assessment of the statutory requirements is provided in the relevant sections of the environmental impact assessment (**Chapter 6.0**) and a statutory compliance table is provided in **Appendix B**.

Table 4-1: Summary of statutory requirements

Category	Requirement
Power to grant approval	The Project is considered SSD under the EP&A Act as it satisfies the SSD requirements of section 2.6 of the Planning Systems SEPP. Being SSD, the Project would be assessed under Part 4, Division 4.7 of the EP&A Act (refer to Section 4.2.2). Under section 4.5(a) of the EP&A Act, the consent authority for the Project would be the Minister for Planning and Public Spaces or the Independent Planning Commission (IPC). The IPC would be the consent authority in the event that more than 50 public objections to the application are received, or the local council objects, or a reportable political donation has been made by the proponent in the two years prior to application being lodged.
Permissibility	The definition of “electricity generating works” under Section 2.35 of the <i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (Transport and Infrastructure SEPP) includes “electricity storage”. The Project meets this definition and is therefore considered to be “electricity generating works” for the purpose of this policy. The Project is located on land zoned ‘<i>E4 General Industrial</i>’ under the Newcastle LEP. “Electricity generating works” are not permissible with consent under the Newcastle LEP within this land use zone, however, section 2.36(1) of the Transport and Infrastructure SEPP provides for “electricity generating works” to be carried out by any person with consent on land within a prescribed non-residential zone. ‘<i>E4 General Industrial</i>’ land is included in the definition of a prescribed non-residential zone under section 2.35 of the Transport and Infrastructure SEPP. As such, the Project is permissible with development consent on the basis that the Transport and Infrastructure SEPP prevails over the Newcastle LEP to the extent of any inconsistency (as specified in section 2.5 of the Transport and Infrastructure SEPP).
Other approvals	There are no other approvals required for the completion of the Project.

Category	Requirement
Pre-condition to exercising the power to grant consent	Pre-conditions to grant of development consent include consideration of matters discussed in further detail in Section 4.1.1 , and Table 4-2 .
Mandatory matters for consideration	Section 4.15 of the EP&A Act requires the consent authority to consider the following relevant matters: • Relevant EPIs • Relevant development control plans • Any planning agreement that has been or will be entered into the regulations • The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality • The suitability of the site for the development • The public interest. These and other relevant matters are considered in Sections 4.3.2, 4.3.3 and 4.3.4 below.

4.1.1 Pre-conditions to grant development consent

Pre-conditions for the consent authority in exercising the power to grant development consent for the Project are provided in **Table 4-2**.

Table 4-2: Pre-conditions to granting development consent

Statutory reference	Pre-condition	Relevance	Chapter/Section in EIS
<i>State Environmental Planning Policy (Resilience and Hazards) – section 3.7</i>	Section 3.7 of this policy requires that relevant circulars and guidelines be considered when determining if a development is potentially hazardous or offensive. If a development is determined to be either, or both, potentially hazardous or offensive, a Preliminary Hazards Analysis (PHA) must be prepared.	The Project has not been assessed as potentially hazardous or potentially offensive development; however, the SEARs require that a Preliminary Hazard Analysis (PHA) be prepared. The PHA concluded that the Project does not pose any potential offsite risk. Recommendations from the PHA are included in Section 6.8 and Appendix D of this EIS.	Section 6.8 Appendix L Appendix D

Statutory reference	Pre-condition	Relevance	Chapter/Section in EIS
<i>State Environmental Planning Policy (Resilience and Hazards) – section 4.6</i>	Section 4.6 of this policy requires that before determining an application for development consent, the consent authority must consider whether the land is contaminated and if so, they must consider a report prepared by the applicant outlining the findings of a preliminary investigation of the land. This report must be prepared in accordance with the contaminated land guidelines.	The Preliminary Site Investigation prepared for the Project has not identified any potentially contaminated locations within the Project Area that are above the human health criteria. An assessment of land use and soils has been conducted as part of this EIS.	Section 6.4 Appendix H
<i>State Environmental Planning Policy (Transport and Infrastructure)</i>	Section 2.119(2) of this policy specifies that the consent authority must not grant consent to development on land that has a frontage to a classified road unless certain conditions are satisfied.	Given the Project fronts Tourle Street (a classified road) the requirements of section 2.119 of the Transport and Infrastructure SEPP have been considered. Note that no vehicle access to the development is proposed from this road.	Section 6.6 Appendix H
<i>State Environmental Planning Policy (Sustainable Buildings) – section 3.2</i>	Section 3.2 of the Sustainable Buildings SEPP seeks to encourage non-residential developments to be designed in accordance with sustainability objectives. When deciding whether to grant development consent, the consent authority must consider the development's application of energy efficiency and waste reduction principles, as well as the use of renewable resources.	The Project's application of energy efficiency and waste reduction principles and renewable resources have been considered in this EIS.	Section 6.10 Section 6.11
Newcastle LEP 2012	The Newcastle LEP sets out the environmental planning provisions applicable to the Newcastle LGA, including land use zoning.	The requirements of the Newcastle LEP have been considered in this EIS.	Section 4.3.3

4.2 Environmental Planning and Assessment Act 1979

4.2.1 Overview

The EP&A Act and EP&A Regulation provide the framework for land use planning and development control in NSW. The EP&A Act and the Regulation are supported by a number of EPIs, including State Environmental Planning Policies (SEPPs) and LEPs.

Part 4 of the EP&A Act establishes a framework for the assessment of development that requires consent and categorises development as either 'exempt development', 'complying development', 'development that requires consent', or 'prohibited development'. The term 'development' is defined under section 1.5 of the EP&A Act.

4.2.2 Planning approval pathway

The Project meets the definition of 'development' under Section 1.5 of the EP&A Act as it involves the use of land and the erection of a building. BESS are considered electricity storage and are defined as 'electricity generating works' under the Transport and Infrastructure SEPP, being a building or place used for the purpose of electricity storage.

Section 2.36 of the Transport and Infrastructure SEPP states that development for the purpose of electricity generating works may be carried out by any person with consent on land within a prescribed non-residential zone. The Project is located within the *E4 General Industrial* land use zone under the Newcastle LEP, which is a prescribed non-residential zone under section 2.35 of the Transport and Infrastructure SEPP. On this basis, the Project is permissible with development consent.

Section 4.36 of the EP&A Act defines development that is SSD and notes that development can be declared as such by an EPI. Under the Planning Systems SEPP, 'electricity generating works' are deemed to be SSD if they have an EDC of more than \$30 million. The Project will have an EDC in excess of \$30 million and is therefore considered SSD.

In line with section 4.5 of the EP&A Act, the consent authority for the Project would be the NSW Minister for Planning and Public Spaces or the Independent Planning Commission (IPC). The IPC would become the consent authority in the event that more than 50 public objections to the application are received, Newcastle City Council objects, and/or the applicant has made reportable political donations in the two years prior to submitting the application.

As noted in section 4.40 of the EP&A Act, SSD applications are evaluated and determined in line with the requirements of section 4.15 of the EP&A Act. Matters for consideration specified in this section include relevant EPIs, likely impacts to the built and natural environment and social and economic impacts, submissions made on the application, site suitability and the public interest. These matters have been considered and presented within this EIS (see **Section 4.3** below).

4.3 Mandatory considerations

Relevant mandatory considerations for the Project are summarised within **Table 4-3** and described further in **Section 4.3.2**.

Table 4-3: Mandatory considerations

Statutory document	Section reference	Mandatory consideration	Section in EIS
Considerations under the EP&A Act and EP&A Regulation			
<i>Environmental Planning and Assessment Act 1979</i>	Section 1.3	Relevant objects of the Act.	Section 7.2
	Section 1.5	The definition of the term "development".	Section 4.2
	Section 4.12 (8)	Development application for SSD is to be accompanied by an EIS prepared by or on behalf of the applicant in the form prescribed by the regulations.	This document

Statutory document	Section reference	Mandatory consideration	Section in EIS
	Section 4.15	(1) Matters for consideration – general In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:	
		The provisions of – i) Any relevant environmental planning instruments, and [...] iv) The regulations (to the extent that they prescribe matters for the purposes of this paragraph), that apply to the land to which the development application relates.	This EIS chapter and the EIS document generally
		The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality.	Chapter 6.0
		The suitability of the site for the development.	Section 1.3.2
		e) The public interest	Chapter 7.0
	Section 4.40	SSD applications are to be evaluated in accordance with section 4.15 requirements.	This EIS chapter and the EIS document generally
	Section 4.41	Authorisations that are not required for SDD.	Table 4-4
	Section 4.42	Authorisations that cannot be refused for SSD and must be applied consistently.	This EIS chapter and the EIS document generally.
	Section 4.5	Designation of consent authority.	Section 4.2.2
<i>Environmental Planning and Assessment Regulation 2021</i>	Section 24	(1) A development application must – a) Be in the approved form, and Contain all of the information and documents required by: i) The approved form, and ii) The Act of this Regulation, and b) Be submitted on the NSW planning portal	This EIS will be submitted via the NSW planning portal and has been prepared in the approved form.
	Section 190	(1) An EIS must contain the following information -	
		a) The name, address and professional qualifications of the person who prepared the statement,	Certification page.
		b) The name and address of the responsible person	Table 1-1

Statutory document	Section reference	Mandatory consideration	Section in EIS
		c) The address of the land – (1) To which the development application relates, or (2) On which the activity or infrastructure to which the statement relates will be carried out,	Table 1-1
		d) A description of the development, activity or infrastructure,	Chapter 3.0
		e) An assessment by the person who prepared the statement of the environmental impact of the development, activity or infrastructure, dealing with the matters referred to in this Division.	Table 4-3
		(2) The person preparing the statement must have regard to -	
		a) For State significant development – the <i>State Significant Development Guidelines</i>	Section 1.1 and the EIS document generally
		(3) An environmental impact statement must also contain a declaration by the person who prepared the statement of the following -	
		a) the statement has been prepared in accordance with this Division, and b) the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure, and c) the information contained in the statement is not false or misleading.	Certification page
	Section 192	(1) an environmental impact statement must contain the following	
		a) a summary of the environment impact statement	Summary
		b) a statement of the objectives of the development, activity or infrastructure	Section 1.2
		c) an analysis of feasible alternatives to the carrying out of the development, activity or infrastructure, considering its objectives, including the consequences of not carrying out the development, activity or infrastructure,	Section 2.2.2
		d) an analysis of the development, activity or infrastructure, including -	
		i) a full description of the development, activity or infrastructure, and	Chapter 3.0

Statutory document	Section reference	Mandatory consideration	Section in EIS
		ii) a general description of the environment likely to be affected by the development, activity or infrastructure and a detailed description of the aspects of the environment that are likely to be significantly affected, and	Section 2.5 Chapter 6.0
		iii) the likely impact on the environment of the development, activity or infrastructure, and	Chapter 6.0 Appendix F Appendix M
		iv) a full description of the measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and	Chapter 6.0 Appendix E
		v) a list of the approvals that must be obtained under another Act or law before the development, activity or infrastructure may lawfully be carried out,	This chapter Appendix B
		e) a compilation, in a single section of the EIS, of the measures referred to in paragraph (d)(iv),	Appendix E
		f) the reasons justifying the carrying out of the development, activity or infrastructure, considering biophysical, economic and social factors, including the principles of ecologically sustainable development set out in Section 193.	Chapter 7.0
Mandatory relevant considerations under EPIs			
State Environmental Planning Policy (Planning and Systems) 2021	Section 2.6	(1) Whether the development is SSD.	Section 4.3.2
	Section 2.7	Consideration must be given to whether the Independent Planning Commission is a consent authority of the SSD	Section 4.3.2
	Section 2.10	Applicability of the Development Control Plans (DCPs)	Section 4.3.2
State Environmental Planning Policy (Biodiversity and Conservation) 2021	Part 2.3	Identifies the land within which Chapter 2 (Vegetation in non-rural areas) applies	Section 4.3.2
	Section 2.6	(1) Clearing of non-rural vegetation without obtaining a permit from council (2) Clearing of native vegetation in a non-rural area that exceeds the biodiversity offsets scheme threshold	Section 4.3.2 Section 2.2 Appendix F
	Section 4.8	Consideration must be given to the council's determination of the alignment of the development application and the "koala plan of management that applies to the land".	Section 4.3.2
State Environmental Planning Policy	Section 2.10	Consideration on the impacts of the Project on the physical, social and cultural environments.	Chapter 6.0
	Section 2.10	Consideration of whether the Project has proposed reasonable mitigation measures.	Chapter 6.0

Statutory document	Section reference	Mandatory consideration	Section in EIS
<i>(Resilience and Hazards)</i>	Section 2.11	Consideration of the impacts that the Project has on coastal land use areas.	Chapter 6.0
	Section 3.2	Whether the development is potentially hazardous or offensive.	Section 6.8 Appendix L
	Section 3.7	Consideration of current circulars or guidelines published by DPHI relating to hazardous or offensive development.	Section 6.8 Appendix L
	Section 4.6	A consent authority must consider whether the land to be developed is contaminated For a change of use on any of the land, the consent authority must consider a report specifying the findings of a preliminary investigation of the land concerned.	Section 6.3 Appendix H
<i>State Environmental Planning Policy (Transport and Infrastructure)</i>	Section 2.36	Permissibility of Project with consent with consideration to its land use zone.	Section 4.3.2
	Section 2.48	The impact on the electricity transmission network.	Chapter 6.0
	Section 2.119	Consider the Project in relation to adjacent road networks.	Section 4.3.2 Section 6.6 Appendix H
<i>State Environmental Planning policy (Sustainable Buildings)</i>	Section 3.2	(1) Consider whether the Project can minimise resource waste and intake and maximise renewable output (2) Quantified embodied carbon emissions for non-residential development	Section 6.10 Appendix O
<i>Newcastle Local Environmental Plan 2012</i>	Land Use Table	The land use zone of the site.	Section 4.3.2
	Clause 4.3	Height of buildings.	Section 4.3.3
	Clause 4.4	Floor space ratio.	Section 4.3.3
	Clause 5.10	Heritage conservation.	Section 4.3.3
	Clause 5.21	Flood planning.	Section 4.3.3
	Clause 6.1	Presence of acid sulfate soils.	Section 4.3.3
Mandatory relevant considerations under other NSW Legislation			
<i>Aboriginal Land Rights Act 1983</i>	Section 166	Consider the presence of claimable Crown Land.	Section 6.3
<i>National Parks and Wildlife Act 1974</i>	Section 90	The requirement of an Aboriginal Heritage Impact Permit (AHIP).	Section 4.3.2 Appendix H
<i>Water Management Act 2000</i>	Section 91	The distance of the Project to rivers, lakes and estuaries.	Section 4.3.2 Section 6.7 Appendix M
<i>Protection of the Environment Operations Act 1997</i>	Chapter 3	Consider the need for an environment protection licence.	Section 4.3.2

Statutory document	Section reference	Mandatory consideration	Section in EIS
<i>Contaminated Land Management Act 1997</i>	Section 60	Consider the level of contamination of the site.	Section 6.3 Appendix I
<i>Biodiversity Conservation Act 2016</i>	Section 7.9(2)	Consider the need for a BDAR.	Section 6.1 Appendix G
<i>Biosecurity Act 2015</i>	Entirety of the Act	Consider the presence of pests, diseases and weeds within the Project Area.	Section 6.1 Appendix F
<i>Roads Act 1993</i>	Section 138	Consider whether the Project will impact roadways.	Section 6.6 Appendix H
<i>Heritage Act 1997</i>	Entirety of the Act	Consider the presence of heritage items.	Section 6.2 Section 6.11
Mandatory considerations under Commonwealth Legislation			
<i>Aboriginal and Torres Strait Islander Heritage Act 1984</i>	Entirety of the Act	Consider whether declarations have been made to protect the site.	Section 4.3.5 Section 6.8
<i>Airports Act 1996 and Airports (Protection of Airspace) Regulations 1996</i>	<i>Airports Act 1996 and Airports Part 12</i>	Consider the location of the Project in relation to airports.	Section 4.3.5
	<i>Airports (Protection of Airspace) Regulations AC 139-07(2)</i>	Consider the height of structures or equipment used in the Project and the distance of those to surrounding airports.	Section 4.3.5
<i>Environment Protection and Biodiversity Conservation Act 1999</i>	Section 18	Consider the level of impact the Project will have on Matters of Environmental Significance (MNES).	Section 6.1
<i>Native Title Act 1993</i>	Entirety of the Act	Consider the presence of possible native title or native title claims that may be affected by the Project.	Section 6.2

4.3.1 Authorisations under sections 4.41 and 4.42 of the EP&A Act

Sections 4.41 and 4.42 of the EP&A Act identify authorisations that are not required for a SSD, and authorisations that cannot be refused, if necessary, for carrying out a SSD, respectively. These authorisations, and their applicability to the Project are outlined in **Table 4-4**.

Table 4-4: Relevant approvals under sections 4.41 and 4.42 of EP&A Act

Approval	Comment
Authorisations that are not required under section 4.41 of the EP&A Act	
A permit under section 201, 205 or 219 of the <i>Fisheries Management Act 1994</i>	A permit under the <i>Fisheries Management Act</i> is not required for this Project.
An approval under Part 4, or an excavation permit under section 139 of the <i>Heritage Act 1977</i>	An approval under the <i>Heritage Act 1997</i> is not required for this Project.

Approval	Comment
An Aboriginal heritage impact permit under section 90 of the <i>National Parks and Wildlife Act 1974</i>	An Aboriginal heritage impact permit is not required for this Project.
A bush fire safety authority under section 100B of the <i>Rural Fires Act 1997</i>	A bushfire safety authority under the <i>Rural Fires Act 1997</i> is not required for this Project.
A water use approval under section 89, a water management work approval under section 90 or an activity approval (other than an aquifer interference approval) under section 91 of the <i>Water Management Act 2000</i> .	A water management approval or an activity approval are not required for the Project under the <i>Water Management Act 2000</i> .
Authorisations that cannot be refused under section 4.42 of the EP&A Act	
An aquaculture permit under section 144 of the <i>Fisheries Management Act 1994</i>	The Project would not involve aquaculture. Therefore, no aquaculture permit would be required.
An approval under the Coal Mine Subsidence Compensation Act 2017, section 22	The Project is not located within a mine subsidence district. An approval under section 15 of the <i>Mine Subsidence Compensation Act 1961</i> would not be required.
A mining lease under the <i>Mining Act 1992</i>	The Project does not include any mining activities. A mining lease would not be required.
A production lease under the <i>Petroleum (Onshore) Act 1991</i>	The Project would not involve petroleum production.
An Environment Protection Licence (EPL) under Chapter 3 of the <i>Protection of the Environment Operations Act 1997</i> (for any of the purposes referred to in Section 43 of that Act)	The Project would not include any scheduled activities under the POEO Act and as such an EPL is not required.
Consent under Section 138 of the <i>Roads Act 1993</i>	The site is located on McIntosh Drive, which is a local road managed by Newcastle City Council. The Project does not require any new vehicle access points and will utilise the existing driveway off McIntosh Drive. As such no approval under the Roads Act would be required.
A licence under the <i>Pipelines Act 1967</i>	No pipelines would be required for the Project and therefore a licence would not be required.

4.3.2 State Environmental Planning Policies

SEPPS relevant to the Project are discussed in detail below.

4.3.2.1 State Environmental Planning Policy (Planning Systems) 2021

The *State Environmental Planning Policy (Planning Systems)* (Planning Systems SEPP) applies to the whole of NSW.

Chapter 2 of the Planning Systems SEPP (State and Regional development) identifies and regulates development that is significant to the State. Part 2.2 of this policy relates to development that is declared SSD. Pursuant to section 2.6(1) of this policy, development is declared to be SSD for the purposes of the EP&A Act if:

- The development on the land concerned is, by the operation of an environmental planning instrument, not permissible without development consent under Part 4 of the [EP&A] Act, and
- The development is specified in Schedule 1 or 2 [of the Planning Systems SEPP].

As discussed in **Section 4.2.2**, the Project is declared as SSD under section 2.6 of the Planning Systems SEPP. Furthermore, section 2.10 of this SEPP states that DCPs do not apply to SSD projects.

4.3.2.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021

The following chapters of *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP) are relevant to the Project:

Chapter 2 Vegetation in non-rural areas

Chapter 2 of the Biodiversity and Conservation SEPP relates to vegetation in non-rural areas. The aims of Chapter 2 are the protection of the biodiversity values of trees and other vegetation in non-rural areas of the State and the preservation of the amenity of non-rural areas of the State through preserving trees and other vegetation.

The Biodiversity and Conservation SEPP applies to Newcastle LGA, and land use zones contained under section 2.3, which includes land zoned *E4 General Industrial*.

Section 2.6(1) of this policy states that 'a person must not clear vegetation in any non-rural area of the State to which Part 2.3 applies without the authority conferred by a permit granted by the council'. In addition, section 2.6(2) states that 'a person must not clear native vegetation in any non-rural area of the State that exceeds the biodiversity offset scheme threshold without the authority conferred by an approval of the Native Vegetation Panel under Part 2.4.'

Part 2.3 of the Biodiversity and Conservation SEPP applies to vegetation in any non-rural area of the State that is declared by a development control plan to be vegetation to which that part applies. As detailed in the Planning Systems SEPP section, the Project constitutes SSD and as such DCPs do not apply. By extension, the requirement to consider vegetation under the Newcastle DCP is not applicable.

Chapter 4 Koala habitat protection 2021

The aim of Chapter 4 of this policy is to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. This chapter applies to the LGAs listed in Schedule 2, which includes the City of Newcastle.

The NSW government has created koala management areas (KMAs). The KMA applicable to the Project is the Central Coast Koala Management Area. As an approved koala management plan is in place, reference is made to section 4.8 of this policy, which provides guidance regarding development in these areas.

Section 4.8(2) is relevant to this Project, which states:

(2) the council's determination of the development application must be consistent with the approved koala plan of management that applies to the land.

Given that the Project is SSD (see **Section 4.2.2**) the Project would not be determined by council, and therefore the requirements of this chapter do not apply.

Notwithstanding the above, impacts to koalas and their habitat have been considered in accordance with the requirements of the *Biodiversity Conservation Act 2016* (BC Act) through the preparation of a BDAR (discussed further in **Section 4.3.4**). The outcomes of the BDAR have been summarised in **Section 6.2** of the EIS.

4.3.2.3 State Environmental Planning Policy (Resilience and Hazards) 2021

The objective of *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP) is to provide a state-wide planning approach to resilience and hazards. The following chapters of this policy are relevant to the Project:

Chapter 2 Coastal Management

The aim of this chapter is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objectives of the *Coastal Management Act 2016*.

The site is located within land mapped as the Coastal Environment Area and the Coastal Use Area. As such, this EIS has considered the Project in accordance with the relevant matters contained under section 2.10(1), section 2.10(2) and section 2.11(1) of this policy (refer to **Chapter 6.0**).

Chapter 3 Hazardous and offensive development

Chapter 3 of the Resilience and Hazards SEPP outlines the approach to planning and assessing the risks and hazards associated with the development of potentially hazardous or offensive industry. The Resilience and Hazards SEPP outlines matters for consideration for a project which are linked to its safety and pollution control performance. Chapter 3 applies to all projects that fall under the policy's definition of 'potentially hazardous industry' or 'potentially offensive industry'.

For projects classified as 'potentially hazardous industry' the policy establishes a comprehensive test by way of a preliminary screening assessment and PHA to determine the risk to people, property and the environment. This preliminary screening assesses the storage of specific dangerous goods classes that have the potential for significant offsite effects. Specifically, the assessment involves the identification of classes and quantities of all dangerous goods to be used, stored or produced on site, or transport to and from the site.

In response to the SEARs, a PHA has been prepared to assess potential hazards and risks associated with the Project. The PHA is provided as **Appendix L** with relevant sections summarised in **Section 6.8**.

Chapter 4 Remediation of Land

Chapter 4 of the Resilience and Hazards SEPP provides a State-wide planning approach for the remediation of contaminated land and aims to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or the environment. Chapter 4 restricts consent authorities from issuing development consent on land that may be contaminated, unless the consent authority is satisfied that the land in question is suitable for the development proposed to be carried out or would be suitable if appropriate remediation is undertaken.

A review of the NSW Environment Protection Authority (EPA) Contaminated Land Register under section 58 of the *Contaminated Land Management Act 1997* (CLM Act) and the list of NSW contaminated sites notified to the NSW EPA under section 60 of CLM Act was undertaken on 10 February 2025. This review confirmed fourteen locations within Mayfield West, Mayfield North and Mayfield as potentially requiring regulation, according to the NSW EPA. Only four of these locations currently require contamination regulation, including:

- Koppers Coal Tar, east of Woodstock Street and Tourle Street (approximately 500 m southeast of the Project)
- BHP Steel River, 'The Buffer Zone' (approximately 300 m north of the Project)
- OneSteel (BHP), Industrial Drive, Mayfield (approximately 900 m east of the Project)
- BHP Closure site and bed sediments of Hunter River (approximately 2.3 km southeast of the Project).

Section 6.3 discusses the risk of existing contamination within the Project Area and the potential for the Project to result in new contamination.

4.3.2.4 State Environmental Planning Policy (Transport and Infrastructure)

The objective of Chapter 2 of the *State Environmental Planning Policy (Transport and Infrastructure)* (Transport and Infrastructure SEPP) is to facilitate the effective delivery of infrastructure across the State.

The site is zoned *E4 General Industria'* under the Newcastle LEP. This land use zone is defined as a 'prescribed non-residential zone' for the purpose of considering the permissibility of electricity generating works. Section 2.36 of the Transport and Infrastructure SEPP provides that the Project is permissible with consent at the site on the basis of the site's existing land use zoning.

Section 2.48 of this policy relates to determination of development applications that are likely to affect an electricity transmission or distribution network. Specifically, section 2.48(1) states that:

This section applies to a development application... for development comprising or involving any of the following:

- (a) The penetration of ground within 2m of an underground electricity power line or an electricity distribution pole or within 10m of any part of an electricity tower,
- (b) Development carried out-
 - a. Within or immediately adjacent to an easement for electricity purposes (whether or not the electricity infrastructure exists), or
 - b. Immediately adjacent to an electricity substation, or
 - c. Within 5m of an exposed overhead electricity power line.
- (c) [not relevant]
- (d) Development involving or requiring the placement of power lines underground, unless an agreement with respect to the placement underground of power lines is in force between the electricity supply authority and the council for the land concerned".

Before determining an application to which section 2.48 relates, the consent authority must:

- (a) Give written notice to the electricity supply authority for the area in which the development is to be carried out, inviting comments about potential safety risks, and
- (b) Take into consideration any response to the notice that is received within 21 days after the notice is given.

As the Project would potentially trigger one or more of the above thresholds it is expected the consent authority would consult with the relevant electricity supply authority (which is the same as the applicant).

Section 2.119 of the Transport and Infrastructure SEPP relates to development in or adjacent to road corridors and road reservations. This section restricts the consent authority from granting consent to development on land that has a frontage to a classified road unless certain conditions are met.

As mentioned in **Section 3.1**, the classified road Tourle Street traverses the eastern boundary of the site, though no vehicle access is proposed at this frontage as there is no existing access. Despite this, the requirements of section 2.119 of this policy have been considered in the Traffic Impact Assessment (**Appendix J**), which is summarised in **Section 6.6**.

4.3.2.5 State Environmental Planning Policy (Sustainable Buildings) 2022

State Environment Planning Policy (Sustainable Buildings) 2022 (Sustainable Buildings SEPP) aims to improve the overall sustainability of buildings in NSW, including through the recording and monitoring of relevant metrics and the implementation of improved techniques to improve energy, GHG, water and thermal performance.

Section 3.2(1) of this policy provides the following requirements for non-residential development:

In deciding whether to grant development consent to non-residential development, the consent authority must consider whether the development is designed to enable the following:

- (a) the minimisation of waste from associated demolition and construction, including by the choice and reuse of building materials
- (b) a reduction in peak demand for electricity, including through the use of energy efficient technology
- (c) a reduction in the reliance on artificial lighting and mechanical heating and cooling through passive design
- (d) the generation and storage of renewable energy
- (e) the metering and monitoring of energy consumption
- (f) the minimisation of the consumption of potable water.

Furthermore section 3.2(2) indicates that development consent must not be granted unless the consent authority is satisfied with the embodied emissions relating to the development have been quantified.

The Project may be able to provide energy storage for renewable energy. Waste, energy consumption and water use during construction and operation have been considered in **Section 6.10**.

4.3.3 Newcastle Local Environmental Plan 2012

The site is located on land that is zoned *E4 General Industrial* under the Newcastle LEP. The objectives of the *E4 General Industrial* land use zone are:

- *To provide a range of industrial, warehouse, logistics and related land uses*
- *To ensure the efficient and viable use of land for industrial uses*
- *To minimise any adverse effect of industry on other land uses*
- *To encourage employment opportunities*
- *To enable limited non-industrial land uses that provide facilities and services to meet the needs of businesses and workers*
- *To support and protect industrial land for industrial uses*
- *To ensure non-industrial land uses do not prejudice the viability of industrial land or other centres.*

As stated in **Section 4.2.2**, the Project is characterised as “electricity generating works”, which is not permissible with consent in this land use zone under the LEP. However, permissibility for the Project is achieved through the application of section 2.36 of the Transport and Infrastructure SEPP, which prevails to the extent of any inconsistency with the LEP.

The principal development standards and other local provisions under the LEP have been considered in **Table 4-5** below.

Table 4-5: LEP provisions

LEP Provision	Compliance
Clause 4.3 Height of buildings	The site does not have a maximum building height under the LEP. As such, this principal development standard does not apply to the Project.
Clause 4.4 Floor space ratio	The site does not have a floor space ratio under the LEP. As such, this principal development standard does not apply to the Project.
Clause 5.10 Heritage conservation	The site is not mapped under the LEP to contain any objects, items or sites of heritage significance. A search of the Aboriginal Heritage Information System (AHIMS, 2022) in April 2024 identified no registered Aboriginal sites within the map extent. An Aboriginal Cultural Heritage Assessment has been completed by Apex Archaeology and is discussed further in Section 6.4 .
Clause 5.21 Flood planning	The site is not mapped as flood affected under the LEP. As such, this principal development standard does not apply to the Project. Despite this, the EIS considers flooding impacts in Section 6.7 .
Clause 6.1 Acid sulphate soils	The site is mapped under the LEP as being potentially affected by Class 2 and 5 Acid Sulfate Soils. Section 6.3 of the EIS considers matters relevant to this clause.

4.3.4 Other relevant NSW Legislation

4.3.4.1 Aboriginal Land Rights Act 1983

The *Aboriginal Land Rights Act 1983* (ALR Act) was established to return land in NSW to Aboriginal peoples through lodging claims for certain Crown land. The Act, administered by the NSW Department of Aboriginal Affairs is a compensatory regime, which recognises that land is of spiritual, social, cultural and economic importance to Aboriginal people.

The ALR Act establishes the NSW Aboriginal Land Council (NSWALC) and a network of over 120 Local Aboriginal Land Councils (LALCs) and requires these bodies to:

- Take action to protect the culture and heritage of Aboriginal persons in the LALC's area, subject to any other law
- Promote awareness in the community of the culture and heritage of Aboriginal persons in the LALC's area.

LALCs constituted under the ALR Act can make claims in respect of 'claimable Crown land'. The Registrar of the ALR Act must maintain the Register of Aboriginal Land Claims under section 166 of the ALR Act. All land claims that have been made under the ALR Act are recorded in the Register.

The site is owned by Ausgrid and there is no active Aboriginal Land Claim over the Project Area.

4.3.4.2 National Parks and Wildlife Act 1974

The *National Parks and Wildlife Act 1974* (NPW Act), administered by NSW DCCEEW, and is the primary legislation for the protection of Aboriginal cultural heritage in NSW. The NPW Act gives the Chief Executive responsibility for the proper care, preservation and protection of 'Aboriginal objects' and 'Aboriginal places', defined as follows:

- *An Aboriginal object is any deposit, object or material evidence (that is not a handicraft made for sale) relating to Aboriginal habitation of the area that compromises NSW, being habitation before concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction (and includes Aboriginal remains)*
- *An Aboriginal place is a place so declared by the Ministers under section 84 of the NPW Act because in the opinion of the Minister, the place is or was of special significance with respect to Aboriginal culture. It may or may not contain Aboriginal objects.*

Part 6 of the NPW Act provides specific protection for Aboriginal objects and places by making it an offence to harm them and includes a 'strict liability offence' for such harm. A 'strict liability offence' does not require someone to know that it is an Aboriginal object or place they are harming to be prosecuted. Defences against the 'strict liability offence' in the NPW Act include the carrying out of certain 'Low Impact Activities', prescribed in clause 58 of the *National Parks and Wildlife Amendment Regulation 2019*, and the demonstration of due diligence.

An AHIP is required under section 90 of the NPW Act before harming or desecrating an Aboriginal object, otherwise, such action is an offence under the NPW Act. Despite this, under section 4.41 of the EP&A Act, an AHIP is not required for SSD. Instead, potential impacts to Aboriginal heritage are typically managed under Aboriginal Cultural Heritage Assessment Reports (ACHAR), required under relevant conditions of consent.

An ACHAR has been completed for the Project, with the results summarised in **Section 6.2**.

4.3.4.3 Water Management Act 2000

The *Water Management Act 2000* (WM Act) establishes a framework for the responsible management of the water resources in NSW, for the benefit of present and future generations.

Freshwater sources in NSW are managed via water sharing plans (WSP) established under the WM Act. A WSP can dictate when licence holders can access water and how it can be traded.

The site is within the WSP for Hunter Unregulated and Alluvial Water Sources 2022 (Newcastle Water Source), made under section 50 of the WM Act. The Project will not require the use of water from this source and will therefore not require a licence under this Act.

The WM Act specifies certain activities as controlled activities when carried out on waterfront land. This is defined as within 40 metres (m) of the banks of a river, lake or estuary (or as prescribed by the regulations). The Project is not within 40 m of a river, lake or estuary, and therefore a controlled activity approval is not required under section 91 of the WM Act. The potential for the Project to affect waterways is discussed in **Section 6.7**.

Section 4.41 of the EP&A Act does not remove the requirement for obtaining an aquifer interference approval, however this is only relevant if there is more than 3 megalitres (ML) of water extracted from an aquifer in a year. The Project will not extract groundwater and therefore an aquifer interference approval will not be required.

4.3.4.4 Protection of the Environment Operations Act 1997

The objectives of the Protection of the *Environment Operations Act 1997* (POEO Act) include to rationalise, simplify, and strengthen the regulatory framework for environment protection. Chapter 3 and Schedule 1 of the POEO Act outlines the specific circumstances under which an environment protection licence (EPL) must be obtained for a development.

Clause 17 of Schedule 1 lists general electricity works as a scheduled activity where they exceed the capacity to generate 30 MW. However, the Project only stores electricity rather than generating it, and therefore an EPL is not required for the Project.

4.3.4.5 Contaminated Land Management Act 1997

The general object of the *Contaminated Land Management Act 1997* (CLM Act) is to establish a process for investigating and (where appropriate) remediating land that the EPA considers to be contaminated enough to require regulation under Division 2 of Part 3.

A search of the NSW EPA contaminated land database (undertaken on 9 January 2025) confirmed that the Project Area is not listed as a notified contaminated site under the CLM Act. Nonetheless, a detailed site contamination assessment was conducted and the results are provided in **Section 6.3** which details the risk of existing contamination within the site and potential for the Project to result in contamination impacts to any receiving environments.

4.3.4.6 Biodiversity Conservation Act 2016

The purpose of the *Biodiversity Conservation Act 2016* (BC Act) is to maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future.

Section 7.9(2) of the Biodiversity Conservation Act states that a development application for SSD is to be accompanied by a BDAR (as defined under section 7.1 of the BC Act), unless both the Planning Secretary and the Environment Agency Head determine that the proposed development is not likely to result in a significant impact on biodiversity values.

A BDAR has been prepared for the Project in accordance with the Biodiversity Assessment Method (BAM) 2020 (see **Appendix F** and summary in **Section 6.1**).

The BDAR outlines the avoidance, management and mitigation measures that have been incorporated into the Project design or would be employed during construction, operation or completion of the Project to avoid, reduce or offset impacts on biodiversity values.

The BDAR includes an outline of the biodiversity credits required to offset the impacts of the Project.

On the basis that the mitigation measures provided in **Appendix E** are implemented, the Project is considered consistent with the objectives of the Biodiversity Conservation Act.

4.3.4.7 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) manages the risk of biosecurity risks across the State in an integrated manner.

The Biosecurity Act includes a general biosecurity duty for all individuals who deal with plants known or likely to pose a biosecurity risk. This includes a duty to prevent, eliminate or minimise the risk posed by a prohibited matter (priority weed) as outlined in Schedule 2 of the Biosecurity Act so far as is reasonably practicable.

Section 6.1 considers weeds declared as priority weeds in the Newcastle LGA that occur within and surrounding the site and provide measures to manage this.

4.3.4.8 Roads Act 1993

An objective of the *Roads Act 1993* (Roads Act) is to confer certain functions (in particular, the function of carrying out road work) on Transport for NSW (TfNSW) and on other roads authorities. Section 7 defines the respective road authorities depending on the classification of the road. Of relevance to this Project is McIntosh Drive, a local road and Tourle Street, a classified road under the Roads Act.

Section 138 of the outlines that a person must not erect a structure or carry out a work in, on or over a public road otherwise than with the consent of the appropriate road's authority. The Project would not require works within road reserve areas. As such, approval under section 138 would not be required.

4.3.4.9 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) aims to promote an understanding of heritage, encourage conservation and provide for protection of NSW State heritage. Heritage significance can relate to historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values of a place, building, work, relic, moveable object or precinct.

One heritage item was identified within 80 m of the Project, which is *Remnant Garden (1692)*. 1692 is not within the site and is not expected to be impacted by the Project and as such the provisions of this Act are not relevant to the Project.

4.3.5 Commonwealth Legislation

4.3.5.1 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* (ATSIHP Act) provides for the preservation and protection of places, areas and objects of particular significance to Indigenous Australians. The ATSIHP Act can override state and territory laws in situations where a state or territory has approved an activity, but the Commonwealth Minister prevents the activity from occurring by making a declaration to protect an area or object.

No declarations relevant to the site have been made under the ATSIHP Act.

4.3.5.2 Airports Act 1996 and Airports (Protection of Airspace) Regulations 1996

The *Airports Act 1996* (Airports Act) and the *Airports (Protection of Airspace) Regulation 1996* (Airports Regulation) establish a framework for the protection of airspace at and around airports. As the Newcastle Airport and RAAF Williamtown base do not meet the definition of "core regulated airport" to which Part 12 of the Airports Act applies, the Airports Act and Airports Regulation do not apply.

Notwithstanding the above, the Project would involve the temporary use of tall equipment such as cranes during construction. Guidance related to the operation of cranes and tall structures in the vicinity of Newcastle Airport is provided by the Civil Aviation Safety Authority (CASA), pursuant to AC 139-07(2) – CASA Advisory Circular – Reporting of Tall Structures (Advisory Circular). The Advisory Circular provides instructions to seek approval from the Air Base Command Post (ABCP) to erect a crane or tall structure (exceeding 30 m above ground level) within 15 km of Newcastle Airport/ RAAF Williamtown. The Advisory Circular requires that applicants provide an application to the ABCP at least two business days prior to the intended use of a crane or the erection of a tall structure.

The site is located approximately 14 km south-east of Newcastle Airport. As such, the requirements of the Advisory Circular have been considered in this EIS (see **Section 6.11**).

4.3.5.3 Environmental Protection and Biodiversity Conservation Act 1999

Section 18 of the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) requires a proponent of a development or activity to obtain approval from the Commonwealth Minister for the Environment and Water when undertaking an activity which is likely to cause a significant impact to a Matter of National Environmental Significance (MNES). MNES include threatened species or ecological communities listed under the EPBC Act, among others.

If the Project is likely to result in a significant impact on a MNES, a referral to the Commonwealth Minister for the Environment and Water would be required to determine whether the Project is a controlled action or can be undertaken in a particular manner to adequately mitigate potential impacts. If the Project constitutes a controlled action the action will be subject to further assessment before a determination is made by the Commonwealth Minister for the Environment and Water regarding whether the action can be carried out, including under certain conditions.

A search of the EPBC Act Protected Matters Search Tool was undertaken on 9 January 2025 for a 10 km buffer around the Project Area. The search identified the matters as outlined in **Table 4-4** below. The Protected Matters search report is included in **Appendix F**.

Table 4-6: Results of the EPBC Act PMST

Matter	MNES within 10 km of the Project Area
World heritage properties	None
National heritage places	None
Wetlands of International Importance (listed under the Ramsar Convention)	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	8
Listed Threatened Species	103
Listed Migratory Species	74

The BDAR (as summarised in **Section 6.1** and provided in **Appendix F**) has identified threatened or migratory biodiversity listed under the EPBC Act that may be potentially affected by the Project. The BDAR outlines that the Project is not expected to significantly impact on any MNES and therefore a referral would not be required.

4.3.5.4 Native Title Act 1993

The *Native Title Act 1993* (NT Act) provides for the recognition and protection of native title for Aboriginal peoples and Torres Strait Islanders. The NT Act recognises native title for land over which native title has not been extinguished and where persons are able to establish continuous use, occupation or other classes of behaviour and actions consistent with a traditional cultural possession of those lands. The NT Act also makes provision for Indigenous Land Use Agreements (ILUA) to be formed, as well as a framework for notifying native title stakeholders for certain future acts on land where native title has not been extinguished.

A search of the National Native Title Tribunal Register was undertaken on 13 January 2025 using the National Native Title Tribunal online system. The search returned no active or historic claims associated with the site. As all land within the site is either freehold or the subject of a 'previous exclusive possession act', native title rights will not be affected by the Project.

5.0 Community and stakeholder engagement

5.1 Introduction

This chapter summarises the engagement activities undertaken by Ausgrid throughout the development of the Project and this EIS. Engagement commenced with AEMO in July 2024 and the community and stakeholders in August 2024. Consultation will continue throughout the development of the Project.

Ausgrid are committed to establishing and maintaining authentic relationships with interested stakeholders and the community through effective communication and engagement. Ausgrid has aimed to demonstrate a commitment to transparency and accountability and meaningful community engagement that adequately informs the community, solicits relevant feedback and contributes to shaping the design and development of the Project.

5.2 Approach to engagement

5.2.1 Engagement objectives

The engagement objectives for the Project, include:

- *Adjoining landholders, stakeholders and local communities are provided with timely and relevant information about the program, in plain English, and have opportunity to provide feedback*
- *Communication to and from landholders and other community stakeholders is adequately documented*
- *All interested stakeholders are provided with a responsive point of contact for any enquiries, complaints, or suggestions*
- *Stakeholders with potential interest in the projects are identified and provided with consistent messages about the project and opportunity to be heard*
- *Minimal disruption to landholders, other impacted stakeholders, and the wider community*
- *Engagement activities support the program to meet planning approval requirements and secure the required approvals from regulators and decision makers in a timely manner*
- *Communications procedures and protocols are followed (Ausgrid 2024).*

5.2.2 Engagement approach

The approach to engagement for this Project has been guided by a set of engagement principles developed by Ausgrid, which have been designed to align with the following guidance documents:

- The Project's SEARs
- *Ausgrid's Community Engagement Handbook (Ausgrid, 2023)*
- *Environmental Handbook NS174c (Ausgrid, 2023)*
- *Engagement Framework 2024-2029 Regulatory Proposal (Ausgrid, 2022)*
- *International Association for Public Participation (IAP2) standards (IAP2, 2015)*
- Lessons learned from other large electrical infrastructure projects undertaken by Ausgrid across NSW.

These engagement principles were designed to focus the engagement approach with on the communities and stakeholder groups relevant to this Project (**Table 5-1**).

Table 5-1: Ausgrid engagement principles for the Steel River BESS

Ausgrid's engagement principles for the Steel River BESS	
Principle	Description
Accountable	Do what we say we will do, and encourage customers and stakeholders to hold us to account
Transparent	Be as open as possible on the role of customers and stakeholders in the decision-making process
Dynamic	Be progressive, open to new ideas, and prepared to change based on feedback from customers and stakeholders
Collaborative	Partner in the design of alternative options and the preferred outcome where possible
Inclusive	Collect stakeholder and customer feedback on the Project in a convenient, timely and accessible format

5.2.3 Community participation objectives

State significant projects, by their nature, are likely to affect a diverse range of stakeholders. To effectively engage, Ausgrid needs to adhere to the DPHI's community participation objectives, as per the *Community Participation Plan* (DPHI, 2024). The objectives and how the engagement undertaken for this Project addresses them are detailed in **Table 5-2**.

Table 5-2: Community participation objectives

Objectives	Actions	How it is addressed
Open and inclusive	Keep the community informed	Newsletters were distributed to the local community to inform them about the Project, potential impacts, promote participation in upcoming engagement opportunities and provided methods to provide their input. Letters were delivered to adjacent properties, to inform about the Project. Community input collected through engagement at information sessions, meetings, online survey and through the project inbox.
	Promote participation	
	Seek community input and accurately capture community views	
	Build strong partnerships with the community participation	A Community Reference Group (CRG) will be established in the next phase to provide feedback on future phases, as required. The CRG may also be consulted on program-wide initiatives such as a social value framework.

Objectives	Actions	How it is addressed
	Incorporate culturally appropriate practices when engaging Aboriginal Torres Strait Islander and culturally and linguistically diverse communities	Aboriginal and Torres Strait Islander consultation was undertaken in accordance with the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW, 2010), which establishes the requirements for consultation with Aboriginal stakeholders as part of the heritage assessment process to determine potential impacts of proposed activities on Aboriginal objects and places.
	Conduct community participation initiatives in a safe environment	Community engagement was conducted at local centres including Mayfield Hotel Carpark Markets, Mayfield East Shopping Village, Mayfield Library and Warabrook Shopping Centre. Online platforms (dedicated project webpage and online survey) facilitated inclusive participation and accessibility, by making information and feedback mechanisms available at a time and place that best suits community.
Easy access	Outline in advance how and when the community can participate	All communication materials have provided detail on how the community can express their views and to continue to be engaged throughout the process.
	Use best practice community participation techniques	The engagement process adheres to best practice guidelines outlined in Section 5.2.2 .
	Make relevant information available in plain English and translate information when engaging linguistically diverse communities or people living with disabilities	The information that was distributed and communicated with the community and other key stakeholders was in plain English and used images to communicate clearly.
	Incorporate visual representations to clearly illustrate possible impacts of a proposal	Maps showing project footprint, property boundary and local landmarks (roads) were used to help describe the Project to the community.
	Ensure information is accessible for groups who find it difficult to participate in usual community participation activities	The engagement process included a variety of methods for community members to provide feedback i.e. phone calls, email, online survey website with factsheets and newsletters, which are further detailed in Section 5.5 .

Objectives	Actions	How it is addressed
	Stage events at convenient times and locations	Community engagement was conducted at local centres including Mayfield Hotel Carpark Markets, Mayfield East Shopping Village, Mayfield Library and Warabrook Shopping Centre.
Relevant	Establish what things can be discussed	The purpose of all engagement activities is detailed in Table 5-7 .
	Ensure as many community members as possible can participate	Various opportunities for engagement were provided to cater for people of all abilities and individual circumstances. These activities are detailed in Table 5-6 .
	Recognise previous community input on the project and similar issues	The approach to engagement is guided by Ausgrid's <i>Community Engagement Handbook</i> , which is informed by Ausgrid's experiences engaging with community on infrastructure projects. Community feedback about similar projects informed the development of communications material.
	Tailor activities to the: context, which could include location, type of application, stage of the assessment process, previous engagement undertaken; and scale, nature and known impacts for the proposal	The extent and purpose of each engagement activity is provided in Table 5-7 .
	Adjust activities (if necessary) in response to community interest and participation preferences	The Project name was changed based on local council feedback. The engagement methods were changed from online to in-person at local community venues, in response to low interest in webinar and to increase participation.
Timely	Start community participation as early as possible, and continue for an appropriate period	Engagement began in July 2024 and has continued until March 2025.
	Provide regular project updates to the community	Newsletters are distributed to local community members at key milestones and interested parties can access the online website.
	Ensure the community has reasonable time to provide input	Community was able to provide input across 6 months.
	Facilitate ongoing discourse with local community networks	Section 5.6 and 5.7 outlines the opportunities for future community consultation and engagement.
	Consider holidays and other community events when setting dates for engagement initiatives	Engagement activities were not conducted during any local holiday periods and were outside any significant holiday periods.

Objectives	Actions	How it is addressed
Meaningful	Always explain at the end of projects how community views were considered when reaching decisions	Section 5.5.3 discusses how the community views were used to amend the detailed design and inform on mitigation measures. At key milestones, an update will be distributed to community members explaining what was heard and how feedback was considered in the Project.
	Be clear about what aspects of a plan, project or proposal the community can inform	Communications material and conversations clearly articulated the purpose, scope and location of the Project and sought feedback on potential impacts on the environment and local community.
	Have planners and decision makers engage directly with the community	Representatives from the Project team attended information sessions, and stakeholder meetings, and engaged directly with community, near neighbours and stakeholders.
	Ensure responses to community input are relevant and proportionate	The community input was used to amend aspects of the detailed design and to inform the appropriate mitigation measures (see Section 5.5.3).
	Give genuine and proper consideration to community input	The community input was used to amend aspects of the detailed design and to inform the appropriate mitigation measures (see Section 5.5.3).
	Keep accurate records of community input and participation activities	Records of community input have been retained, and results are summarised in Appendix C .
	Review the effectiveness of community participation initiatives regularly	Engagement was reviewed at end of each phase. Review following submission of the Scoping Report resulted in expansion of the letterbox drop area to reach a wider area of the local community.
	Integrate community input into the evaluation process	Community input was collated and used to evaluate the Project design. Key issues and suggestions made by community members are detailed in Section 5.5.3 .
	Comply with statutory obligations, protect privacy and respect confidentiality	The engagement undertaken complies with all statutory obligations which are detailed in Chapter 4.0 . Details of community members who were consulted and provided input were omitted from any and all documented feedback.

5.2.4 Overview of engagement process

The engagement delivery for the Project to date has included four distinct stages. The stages of the engagement process are:

- Scoping report consultation: Early communication to collect initial feedback on the Project.
- EIS Preparation: Collect community feedback on the Project which will help inform the EIS development.
- EIS Exhibition: Notify, outline and detail the Project to stakeholders and to collect feedback from the submissions process.
- Ongoing engagement: Keep stakeholders informed about the construction and Project progress.

5.2.5 Consistency with DPHI guidelines

Table 5-3 outlines the consistency of the Project's engagement process with the *Undertaking Engagement – Guidelines for State Significant Project* (Department of Planning, Housing and Infrastructure 2024) guidelines.

Table 5-3: Consistency of engagement process with DPHI guidelines

DPHI guidance for Ausgrid	EIS approach
Plan early	Ausgrid developed a CSEP at the Project outset to guide engagement throughout early planning and the EIS development.
Engage as early as possible	Engagement efforts commenced in July 2024, with letters of introduction distributed to key stakeholders. Other early engagement activities included briefing with the City of Newcastle Council, as well as phone calls and emails to arrange briefings with immediate neighbours.
Ensure engagement is effective	The engagement approach provided community and stakeholders with information about the Project and its potential impacts, by using a range of communication tools, including meetings, newsletters, website and factsheets. All material was in plain English and used visual communications where possible to explain technical concepts, making the project information inclusive and accessible for the community. The approach provided information up front for community and stakeholders to understand, ahead of participating in information sessions, meetings or online survey to provide their feedback. There has been ongoing engagement with neighbouring stakeholders to establish a productive working relationship and understand concerns and opportunities relating to impacts and mitigation measures.
Ensure engagement is proportionate to the scale and impact of the Project	The engagement process has included consultation with numerous stakeholders that have an interest or would be otherwise impacted by the Project. Stakeholders included the City of Newcastle Council, to immediate neighbours and local businesses in the vicinity of the Project, interested community members, and relevant First Nations parties. A variety of communication and engagement tools were used to inform these stakeholders on the opportunities that the Project presents for the region, as well as provide opportunity for feedback. The engagement process adopted is in line with other SSD BESS projects and is proportional to the Project's scale and likely impacts.

DPHI guidance for Ausgrid	EIS approach
Be innovative	The engagement strategies and communication tools identified were tailored to the stakeholders and community surrounding the Project. The combination of face-to-face and online tools were used. In-person information sessions were in local centres to increase engagement reach through intercepting local residents and providing convenient and accessible venues for interested community members. Face-to-face meetings with key stakeholders including City of Newcastle Council and near neighbours provided opportunities to build productive relationships and trust with the Project Team. Online tools (survey and dedicated project email and phone line) were used to collect community feedback in a way that is convenient and easy to participate in.
Be open and transparent about what can be influenced	Ausgrid was up front in all interactions with the stakeholders about what feedback they were seeking. Communications material clearly articulated what could be influenced and why Ausgrid was seeking community and stakeholder feedback. Feedback was collected and recommendations that could influence and change the Project are detailed in Table 5-4 .
Implement the community participation objectives	To engage effectively, Ausgrid needs to implement the community participation objectives (see Section 5.2.3). Table 5-4 shows how Ausgrid addressed the community participation objectives through the engagement process.

Engagement for SSD projects needs to consider the requirements for effective engagement techniques, as set out in the DPHI *Undertaking Engagement Guidelines for State Significant Projects* (2024). **Table 5-4** details how the Project addresses these matters.

Table 5-4: Requirements for effective engagement

Objective	How this has been addressed during engagement
Identify the people or groups who are interested in or are likely to be affected by the project	Prior to engagement, Ausgrid mapped stakeholders and considered who would be potentially impacted by, and interested in, the Project.
Use appropriate engagement techniques. This includes: - considering the accessibility of how information is delivered - the avoidance of technical language and jargon so information can be easily interpreted by the audience - the adoption of non-written forms of engagement, where needed	Appropriate engagement techniques were identified to effectively engage people and seek their feedback on the Project. Communications materials were designed to ensure they were accessible to a broad audience, written in plain English and used visual tools to explain technical concepts, simply (see Section 5.4).
Ensure the community are provided with safe, respectful and inclusive opportunities to express their views	A broad variety of different engagement methods have been offered and undertaken, providing people from different backgrounds methods of engagement that suit them.
Involve the community, councils and government agencies early in the development of the proposal, to enable their views to be considered in project planning and design	Engagement for the Project commenced prior to the scoping stage and has continued to date. This has covered a broad cross section of stakeholders, including near neighbours, local community, City of Newcastle Council and government agencies. Stakeholder feedback has been considered and integrated into the Project where relevant and possible.

Objective	How this has been addressed during engagement
Be innovative in their engagement approach and tailor engagement activities to suit the: • context (e.g. sensitivity of the site and surrounds) • scale and nature of the project and its impacts • level of interest in the project	The communication and engagement techniques used have been designed to be proportional to the scale and nature of the Project and its impacts. Communication has responded to the level of interest shown by the community and other stakeholders.
Provide clear and concise information about what is proposed and the likely impacts for the relevant people or group they are engaging with	Communication materials used plain English, maps and infographics, communications materials have included newsletters, factsheets and information boards. This material is also accessible on the project webpage.
Make it easy for the community to access information and provide feedback	Newsletters, outlining the project, impacts and how to provide feedback, were distributed to local residents and businesses. Near neighbours were door-knocked. All communications materials have included QR codes and links to webpages where all project information is housed. Feedback has been collected through direct conversation at in-person events, online survey and emails to a dedicated project inbox.
Clearly outline how and when the community can be involved in the process	All communication materials have provided detail on how the community can express their views and to continue to be engaged throughout the development proceed.
Seek to understand issues of concern for all affected people and groups and respond appropriately to those concerns	Ausgrid reached out to a variety of key stakeholders (see Section 5.2.4) to ensure all voices were heard. The details of how Ausgrid intends to respond to the concerns raised by the key stakeholders is outlined in Appendix C.
Provide feedback about how community and stakeholder views were used to shape the project or considered in making decisions	Ausgrid received stakeholder feedback on the Project and recommendations on how the Project is constructed. There were no strong views or opinions from the community on how the Project should operate, however there was some community feedback regarding the management of hazards and fire and the impacts of noise. While no changes to project infrastructure is needed, management and mitigation measures have been considered (see Appendix D).
Be able to demonstrate how the demography of the area affected has been considered in how and what engagement activities have been undertaken.	The community profile was developed by Ausgrid. Based on this, communications materials were developed using plain English and visual communications to support accessibility. All material was made available online and pop-ups held in local community venues such as shopping centres and libraries to intercept a wide cross-section of the local community.

5.3 Stakeholder identification

A stakeholder mapping exercise was undertaken as part of the development of the CSEP to identify people and organisations that would be likely to have an interest or be affected by the Project. These are outlined in **Table 5-5** below.

Table 5-5: Relevant stakeholders identified for the Project (Ausgrid, 2024)

Category	Stakeholder
Adjacent or nearby properties/landowners	• Benedict Recycling • CSIRO • Leading Edge Data Centres • Grace Information Management • Qualtest Laboratory • Mayfield West Fire Station • City of Newcastle Council • SES HQ • Novacastrian Demolition Services • Exploren Charging Station • Lifestyle Performance Gym • Aerologistics Helicopters • Various corporate offices.
Sensitive receivers – within 400 m of Project Area	• Imagine Early Learning and Childcare Centre, Murray Dwyer Circuit, Mayfield West • The Grainery Church, Murray Dwyer Circuit, Mayfield West.
Sensitive receivers – more than 400 m from the Project Area	• Making Waves Early Education Centre, Warabrook • Gowrie NSW Early Education Centre, Mayfield • Mayfield Early Learning Centre, The Hub Mayfield • Hunter Early Learning Centre, Mayfield North • Play Learn Grow, Mayfield Church • Mayfield Church of Christ, Mayfield West • Rhythm City Church, Mayfield • Mayfield Uniting Church • Mayfield Presbyterian Church • Mayfield Baptist Church • Saint Andrew's Anglican Church • Christ the King Mayfield • Mayfield West Public School • Hunter Christian School, Mayfield West • St Columban's Primary School, Mayfield • Baptist Care Warabrook Centre • Calvary Home Care Service, Warabrook • Catholic Healthcare Charles O'Neill, Mayfield • Mayfield Aged Care.
Local government and elected officials	• City of Newcastle Council • Office of Tim Crakanthorp MP, State Member for Newcastle • Office of Sharon Claydon MP, Federal Member for Newcastle.
Regulatory and planning agencies	• DPHI • AEMO.

Category	Stakeholder
State Government agencies	• SES NSW • Fire and Rescue NSW • Mayfield West Fire Station • NSW Environment Protection Authority • Transport for NSW • NSW Police Force • Office of the Register Aboriginal Land Rights Act (ORALRA) • Heritage NSW • Hunter Local Land Services.
Utilities	• Transgrid • Jemena.
Local Aboriginal Land Council (LALC)	• Awabakal LALC.
Traditional Owners and Aboriginal Groups	• Thomas Dahlstrom • AT Gomilaroi Cultural Consultancy • Didge Ngunawal Clan • A&K Cultural Heritage • Nukara Indigenous Cultural & Heritage • Widescope Indigenous Group • Long Gully Cultural Services • Awabakal Traditional Owners Aboriginal Corporation • Corroboree Aboriginal Corporation • Murrabidgee Mullangari • Lower Hunter Aboriginal Incorporated.

5.4 Engagement tools and activities

To implement the CSEP a variety of tools and engagement activities have been utilised. These are detailed in **Table 5-6**.

Table 5-6: Engagement tools and activities

Engagement tool/activity	Purpose	Relevant stage
Briefings and meetings (formal and informal)	These briefings provided opportunity to inform council and other key stakeholders on any updates to the Project, the EIS process. It also provided an initial platform for any feedback or concerns on the potential risks and impacts.	Scoping report consultation EIS preparation
Community pop-ups	These events provided opportunity for face-to-face community interaction and allowed them to discuss their concerns and pose any questions to Ausgrid.	EIS preparation
Door knocks and letterbox drops	Personalised outreach efforts like door knocking helps Ausgrid engage with businesses and other key stakeholders directly to collect their input, ensuring a thorough understanding of community sentiment. These target local businesses and nearby residents to inform them about the project and to gather feedback.	Scoping report consultation EIS preparation EIS exhibition period
Email	Emails allow members to digitally engage and are beneficial to those who were unable to attend in-person or online briefings.	Scoping report consultation EIS preparation EIS exhibition period

Engagement tool/activity	Purpose	Relevant stage
Phone calls, online surveys and dedicated project webpage	These were open communication platforms where all members of the public could access information and engage with Ausgrid directly to give their opinion on the Project.	Scoping report consultation EIS preparation EIS exhibition period

5.5 Engagement activities and outcomes

5.5.1 Scoping stage activities

The engagement activities highlighted in **Table 5-7** have been delivered to introduce stakeholders and community to the Project and provide opportunities to answer provide any feedback or concerns.

Table 5-7: Scoping stage engagement activities (AECOM, 2024)

Stakeholder	Date	Description
Adjacent or nearby properties/landowners		
CSIRO Energy Centre, 10 Murray Dwyer Court Mayfield West	27 August 2024	Sent a letter via email to outline the Project and offer a meeting (virtual or in-person) to discuss further.
	18 September 2024	Meeting with CSIRO staff at their Newcastle headquarters to provide a presentation about the Project, answer questions and discuss ongoing engagement and opportunities to collaborate.
Benedict Recycling, 1A McIntosh Drive Mayfield West	18 September 2024	Door knocked to introduce Project and hand delivered letter offering meeting (virtual or in-person).
	23 September 2024	Phone call discussion to arrange a meeting about the Project. Meeting date yet to be confirmed.
	3 February 2025	Meeting with Ernest Dupere to discuss changes to easement and relocation of right of carriageway. Agreed Ausgrid to provide formal letters requesting changes.
	13 February 2025	Meeting with Ernest Dupree to continue discussions about changes to easement and relocation of carriageway. Agreed on updates and additions to letters requesting changes.
Leading Edge Data Centres, 1A McIntosh Drive Mayfield West	18 September 2024	Door knocked and spoke to representative, outlining project and providing letter with offer of a meeting (virtual or in-person).
	11 March 2025	On site meeting with Chris Thorpe, with tour of data centre facility, discussing footprint of BESS HV connection. Agreed to share design footprint and introduce Ausgrid customer connections team.
Hymix, 1 Murray Dwyer Court Mayfield West	18 September 2024	Door knocked and spoke to representative, outlining project and providing letter with offer of a meeting (virtual or in-person).

Stakeholder	Date	Description
Qualtest Laboratory, 2 Murray Dwyer Court Mayfield West	18 September 2024	Door knocked and spoke to representative, outlining project and providing letter with offer of a meeting (virtual or in-person).
Port Hunter Environmental, 5/11 McIntosh Drive Mayfield West	18 September 2024	Door knocked and spoke to representative, outlining project and providing letter with offer of a meeting (virtual or in-person).
Weiley Electrical, 7/11 McIntosh Drive Mayfield West	18 September 2024	Door knocked to outline project and hand deliver letter offering meeting (virtual or in-person).
DAT Training, 3/11 McIntosh Drive Mayfield West	18 September 2024	Door knocked to outline project and hand deliver letter offering meeting (virtual or in-person).
Countrysell, 2/11 McIntosh Drive Mayfield West	18 September 2024	Door knocked to outline project and hand deliver letter offering meeting (virtual or in-person).
Metropolitan Players Inc, 11 McIntosh Drive Mayfield West	18 September 2024	Door knocked to outline project and hand deliver letter offering meeting (virtual or in-person).
A1 Flue and Canopy Services, 4/11 McIntosh Drive Mayfield West	18 September 2024	Door knocked to outline project and hand deliver letter offering meeting (virtual or in-person).
Local Government and elected officials		
City of Newcastle Council	2 September 2024	Phone call to introduce project and confirm interest in a meeting.
	3 September 2024	Sent a letter via email to outline the Project and offer a meeting (virtual or in-person) to discuss further.
	18 September 2024	Met with Council staff at their Newcastle office. Gave presentation about the Project and answered questions. Discussed interest in sustainability and energy transition and feedback to change name of project, to avoid confusion with similar project in area.
	27 September 2024	Sent copy of community newsletter via email.
	27 March 2025	Emailed to request a meeting to provide update on the Project and outcomes of technical studies, including, VPA arrangements and traffic and transport on local roads.
	2 April 2025	Council requested an email brief to include a summary of findings, opportunities and any permissions required from Council, including VPA arrangements and use of local roads.
		The Project team decided to submit the EIS, as Council would then have full access to technical

Stakeholder	Date	Description
		reports. Engagement will continue through SSDA assessment and submissions process.
Office of Tim Crakanthorp MP, Member for Newcastle	3 September 2024	Phone call and sent a letter via email to outline the Project and offer a meeting (virtual or in-person) to discuss further.
	9 – 25 September 2024	Follow up phone calls with messages left to arrange briefing.
	3 October 2024	Sent copy of community newsletter via email.
	13 March 2025	Met in-person to provide update on the Project's progression and supply hard copies of community newsletters.
Office of Sharon Claydon MP, Member for Newcastle and Deputy Speaker	3 September 2024	Phone call and sent a letter via email to outline the Project and offer a meeting (virtual or in-person) to discuss further. Confirmed meeting to be scheduled after a period of leave.
	5 – 25 September	Follow up phone calls to arrange briefing.
	3 October 2024	Sent copy of community newsletter via email.
Regulatory and planning agencies		
DPHI	3 September 2024	Met with DPHI representatives to outline the Project, work to date and proposed timeline. Discussed benefits of wider stakeholder engagement prior to submitting Scoping Report.
	30 September 2024	Met with DPHI representatives to discuss hazard considerations for the Project, with key feedback to consider adequate separation distances in site design and impact analysis during investigations.
	5 March 2025	Met with DPHI representatives to discuss the outcomes of the technical reports and provide an update on stakeholder engagement.
AEMO	26 July 2024	Meeting to discuss BESS strategy and connections process, with positive response.
Sensitive receivers – within 400 m of Project Area		
Imagine Early Learning and Childcare Centre, 9 Murray Dwyer Circuit Mayfield West	27 September 2024	Phoned to outline project, checked they received mailed copy of newsletter, and offered meeting (virtual or in-person).
The Grainery Church, 11 Murray Dwyer Circuit Mayfield West	1 October 2024	Phoned to outline project and confirm they received mailed copy of newsletter. Voicemail left with offer of meeting (virtual or in-person).
	4 October 2024	Follow up email with copy of community newsletter, offering meeting to answer questions and provide more information.
Local Aboriginal Land Council		

Stakeholder	Date	Description
Awabakal LALC	3 September 2024	Sent a letter outline the Project and offer a meeting (virtual or in-person) to discuss further.
	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation.
	27 September 2024	Responded to letter and registered interest in the Project.
Traditional Owners and Aboriginal Groups		
Hunter Local Land Service	4 September 2024	Contacted to request full list of relevant Aboriginal Traditional Custodians and directed to Awabakal LALC.
Office of the Register Aboriginal Land Rights Act (ORALRA)	4 September 2024	Contacted to request full list of relevant Aboriginal Traditional Custodians and referred to Awabakal LALC and Worimi Conservation Lands.
Heritage NSW	4 September 2024	Contacted to request full list of relevant Aboriginal Traditional Custodians and provided a list of potential Aboriginal stakeholders.
Worimi Conservation Lands	11 September 2024	Contacted to discuss project with no response.
AT Gomilaroi Cultural Consultancy	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation.
	26 September 2024	Responded to letter and registered interest in the Project.
Corroboree Aboriginal Corporation	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation.
	2 October 2024	Responded to letter and registered interest in the Project.
Didge Ngunawal Clan	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation and responded, registering interest in Project.
A&K Cultural Heritage	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation and responded, registering interest in Project.
Nukara Indigenous Cultural & Heritage	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation and responded, registering interest in Project.
Nur-Run-Gee Pty Ltd	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation and was advised that their organisation only works on Newcastle side of harbour if no Awabakal organisation can attend.
Thomas Dahlstrom	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation.

Stakeholder	Date	Description
	30 September 2024	Responded to letter and registered interest in the Project.
Widescope Indigenous Group	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation.
	30 September 2024	Responded to letter and registered interest in the Project.
Long Gully Cultural Services	25 September 2024	Sent letter via email requesting registration of interest in Aboriginal Heritage consultation and responded, registering interest in Project.
State Government agencies		
Fire and Rescue NSW	30 August 2024	Sent a letter via email to outline the Project and offer for a meeting (virtual or in-person) to discuss further.
Newcastle SES Headquarters, 13 Spit Island Close Mayfield West	18 September 2024	Door knocked and spoke to representative, outlining project and providing letter with offer of a meeting (virtual or in-person).
Mayfield West Fire Station, Industrial Drive Mayfield West	18 September 2024	Door knocked and spoke to representative, outlining project and providing letter with offer of a meeting (virtual or in-person).
Utilities		
Transgrid	8 February 2024	Ausgrid and Transgrid meet monthly. In February, Ausgrid flagged intention to pursue BESS connections.
	21 June 2024	Submitted Non-Prescribed DNSP work request for Transgrid's assessment and response.

5.5.2 EIS preparation stage

The EIS preparation stage prioritised community engagement activities.

In October 2024, Ausgrid distributed the second Steel River East BESS community newsletter to more than 8,000 residential and business properties across Mayfield, Mayfield West and Mayfield East. The newsletter outlined the project location, potential impacts and planning and assessment pathway. It also invited interested community members to learn more and provide feedback by:

- Visiting the Project webpage
- Attending a pop-information session
- Participating in a survey
- Contacting the project team on the dedicated email or phone line.

A dedicated webpage was established for the project, outlining the purpose and location of the Project. It included copies of two community newsletters, FAQs and factsheets, contact details (dedicated phone number and email) and details for all pop-up information sessions. Between 28 August and 8 December 2024, there had been 608 unique visitors, and 239 project documents downloaded. As of April 2025, there has been 1,144 unique visitors and 1,050 documents downloaded.

A webinar was proposed for 16 October 2024. This was cancelled due to low interest and the one registrant offered a meeting as an alternative.

In-person events were conducted in high-traffic areas (shopping centres) and community venues (Mayfield Library) to increase community awareness and interest in the Project. These events were attended by 40 community members and 13 people provided their feedback via online survey. The outcomes of pop-up sessions and doorknocking are summarised in **Table 5-8** and **Table 5-9**.

Table 5-8 outlines the consultation conducted during this stage.

Table 5-8: Early consultation - EIS preparation table

Stakeholder	Date	Description
Pop-up events		
Mayfield Hotel Carpark Markets	09/11/2024	Spoke with 6 community members.
Mayfield Library	16/11/2024	Spoke with 17 community members.
Mayfield East Shopping Village	19/11/2024	Spoke with 9 community members.
Warabrook Shopping Centre	20/11/2024	Spoke with 8 community members.
Sensitive receivers – closer than 400 m		
Making Waves Early Education Centre, Warabrook	October 2024	Community newsletter delivered (October issue).
Gowrie NSW Early Education Centre, Mayfield		
Mayfield Early Learning Centre		
The Hub Mayfield		
Hunter Early Learning Centre, Mayfield West		
Rhythm City Church, Mayfield		
Mayfield Uniting Church		
Mayfield Presbyterian Church		
Mayfield Baptist Church		
Saint Andrew’s Anglican Church		
Christ the King Mayfield		
Local residents		
Groongal Street	13/11/2024	Spoke with 5 residents.
Gregson Street	13/11/2024	Spoke with 4 residents.
Simpson Street	13/11/2024	Spoke with 4 residents.
Shelly Street	13/11/2024	Spoke with 2 residents.

5.5.3 Key issues raised by stakeholders

Table 5-9: Key stakeholder issues

Issue category	Issues raised	Who raised the issue	Where the issue is addressed in the EIS
Environmental impacts	Impacts on wildlife and biodiversity.	Survey responders City of Newcastle.	Section 6.1
	Scepticism on climate change.	Community pop-up attendees.	Chapter 3.0
	Soil contamination.	Community pop-up attendees.	Section 6.3
Noise	Concerns around the noise assessment and receptor locations.	Survey responders.	Section 6.5
Traffic disruption	Impacts around local traffic congestion.	Survey responders.	Section 6.6
Visual impact	Concerns around how the Project will impact the visual aesthetic.	Survey responders.	Section 6.4
Economic	Stakeholders questioning the economic viability of the Project.	Community pop-up attendees.	Section 6.9
Hazardous materials and risk	Some concerns raised about fire risk management and other health concerns.	Survey responders.	Section 6.8
Electricity cost	Impacts on the cost of electricity.	Community members (not specified).	Chapter 3.0
Communication	Stakeholders want transparent communication.	City of Newcastle.	This chapter
		Community members (not specified).	
Land zoning	General concerns around land zoning of the Project.	Community pop-up attendees.	Section 6.2

5.6 Future consultation and engagement

5.6.1 EIS exhibition period

During the EIS exhibition period stakeholders will be able to view electronic copies of the EIS on the DPHI Major Projects website. Submissions may be made directly through the website, or by email or letter directly to Ausgrid.

A third community newsletter will also be distributed to residential and business properties across Mayfield, Mayfield West and Mayfield East in mid-2025. This newsletter will outline the key feedback received from community and stakeholders during EIS preparation, key findings from technical studies and the next steps in the planning and approvals pathway.

In addition to this, **Table 5-10** provides detail on the engagement activities Ausgrid proposed to undertake during the EIS exhibition period.

Table 5-10: Stage three engagement method

Activity	Engagement method	Purpose	Target audience
Stakeholder letters	Stakeholder letters	- Announce EIS exhibition period and invite feedback via Planning Portal - Offer briefing or meeting to continue to discuss concerns, issues and opportunities.	All stakeholders.
Website update	Webpage – update content	- Announce EIS exhibition period and invite feedback via Planning Portal - Promote engagement activities and key dates.	- Immediate neighbours - Adjacent properties and landowners - Sensitive receivers.
Door knocking	Distribute community newsletter	- Provide update on EIS status - Encourage to provide formal feedback via Planning Portal.	- Immediate neighbours - Adjacent properties and landowners - Sensitive receivers.
Stakeholder meetings, as required	- Face-to-face meetings - Phone calls - Briefing packs	- Provide update on previous issues and questions raised, overview of relevant EIS content - Understand concerns, issues and risks - Encourage to provide formal feedback via Planning Portal.	All stakeholders.
Preparation of submissions report	- Publish media release on the Project website - Update the Project webpage - Send email to stakeholders and registered community members.	Outline and summarise the community input and make that information available to the public.	- Immediate neighbours - Adjacent properties and landowners - Sensitive receivers - Traditional Owners and Aboriginal Groups.

5.7 Future consultation during construction and operation

Ausgrid aims to continue community engagement throughout the construction of the Project. This would be undertaken through social and traditional media and would encourage community involvement and understanding of the Project. Ausgrid would take particular care with key stakeholders, including neighbouring landowners, ensuring they are updated and informed through private briefings, as required.

6.0 Assessment of environmental impacts

6.1 Biodiversity

6.1.1 Secretary Environmental Assessment Requirements

Table 6.1-1 sets out the SEARs relevant to biodiversity and where the requirements have been addressed in this EIS.

Table 6.1-1: Relevant SEARs - biodiversity

Relevant SEARs	Where addressed
Biodiversity	
The EIS must address the following specific matters: - an assessment of the biodiversity values and the likely biodiversity impacts of the Project in accordance with Section 7.9 of the <i>Biodiversity Conservation Act 2016</i> (NSW) (BC Act) having regard to the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must: - be prepared using the approved BDAR template; - document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; - assess the impacts associated with all ancillary infrastructure, - including the transport route road upgrades; - include an assessment for serious and irreversible impacts (SAII) in accordance with Section 9.1 of the BAM; - include a strategy to offset any residual impacts of the development in accordance with the BC Act; and - be finalised by an accredited assessor as BAM-compliant within 14 days of submission; unless BCS and DPHI determine the proposed development is not likely to have any significant impacts on biodiversity values	A BDAR has been prepared and is attached in Appendix E. The results of the BDAR are summarised in this chapter
an assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the <i>Fisheries Management Act 1994</i>, and a description of the measures to avoid, minimise and rehabilitate impacts;	Potential impacts to listed aquatic threatened species are discussed in Section 6.1.4 and Appendix E. The results of the BDAR are summarised in this chapter
a cumulative impact assessment of biodiversity values in the region from nearby developments; and	Cumulative impacts are discussed in Section 6.11
if an offset is required, details of the measures proposed to address the offset obligations.	Biodiversity offsets are discussed in Section 6.1.4.5 and Appendix E

6.1.2 Methodology

A BDAR was prepared by Wildthing Environmental Consultants (Wildthing) to assess potential biodiversity impacts associated with construction and operation of the Project. This report is attached as **Appendix E** and is summarised in this chapter. This assessment was undertaken in accordance with the following:

- *Environmental Planning and Assessment Act 1979*
- *Biodiversity Conservation Act 2016*
- *Biosecurity Act 2015*
- *State Environmental Planning Policy (Biodiversity and Conservation) 2021*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Biodiversity Assessment Method 2020 (BAM 2020).*

For the purposes of the BDAR, the Assessment Area was defined as the landscape and features within the site and within a 1500 m buffer of the site.

The preparation of the BDAR included the following key steps:

- Desktop searches were undertaken to inform field surveys and to consider the likelihood of threatened flora and fauna species to occur within the Assessment Area
- Designation of vegetation zones by undertaking vegetation integrity assessments in accordance with BAM
- Field surveys conducted to assess the presence of threatened species within proximity of the site. The dates of these surveys are listed in **Table 6.1-2**.
- Undertake a flora and fauna habitat constraints assessment on site
- Preparation of the BDAR using the BAM calculator in accordance with the BAM 2020
- Identification of measures to mitigate any potential impacts on biodiversity from the Project.

Table 6.1-2: Field survey dates

Survey undertaken (e.g. method / targeted species)	Date	Survey effort (Person Hours)
• General site inspection • Native vegetation mapping survey • Targeted flora survey • Significant tree survey • Diurnal avifauna survey • Incidental observations	27 May 2024	3.0 h (2 Persons)
• Additional survey western side of Project • Native vegetation survey • Targeted flora survey • Diurnal fauna survey • Incidental observations	18 July 2024	1.0 h (2 Persons)
• Additional survey western side of Project • Native vegetation mapping survey • Targeted flora survey • Diurnal fauna survey • Incidental observations	21 August 2024	1.0 h (1 Person)

Survey undertaken (e.g. method / targeted species)	Date	Survey effort (Person Hours)
- Native vegetation mapping survey - Targeted flora survey - Diurnal avifauna survey - Incidental observations	31 October 2024	1.5 h (1 Person)
- Set Anabat - Set Camera Trap	13 January 2025	1 h (1 Person)
Retrieve Anabat	15 January 2025	0.5 h (1 Person)
Retrieve Camera Trap	24 January 2025	0.5 h (1 Person)
- Floristic BAM plot - Targeted flora survey - Diurnal avifauna survey	4 February 2025	5.5 h (2 Persons)

6.1.2.1 Vegetation integrity

Vegetation Integrity (VI) is a metric developed by the NSW government as part of the BAM that represents the degree to which the composition, structure and function of the vegetation type at a site differs from the best-on offer condition (DCCEEW, 2025). The VI scored for a plot is based on:

- Composition condition
- Structure condition
- Function condition.

VI was used to quantify the extent of historic disturbance of vegetation that would be affected by the Project.

6.1.3 Existing environment

6.1.3.1 Landscape features

A summary of the landscape features of the site is provided in **Table 6.1-3**.

Table 6.1-3: Landscape features

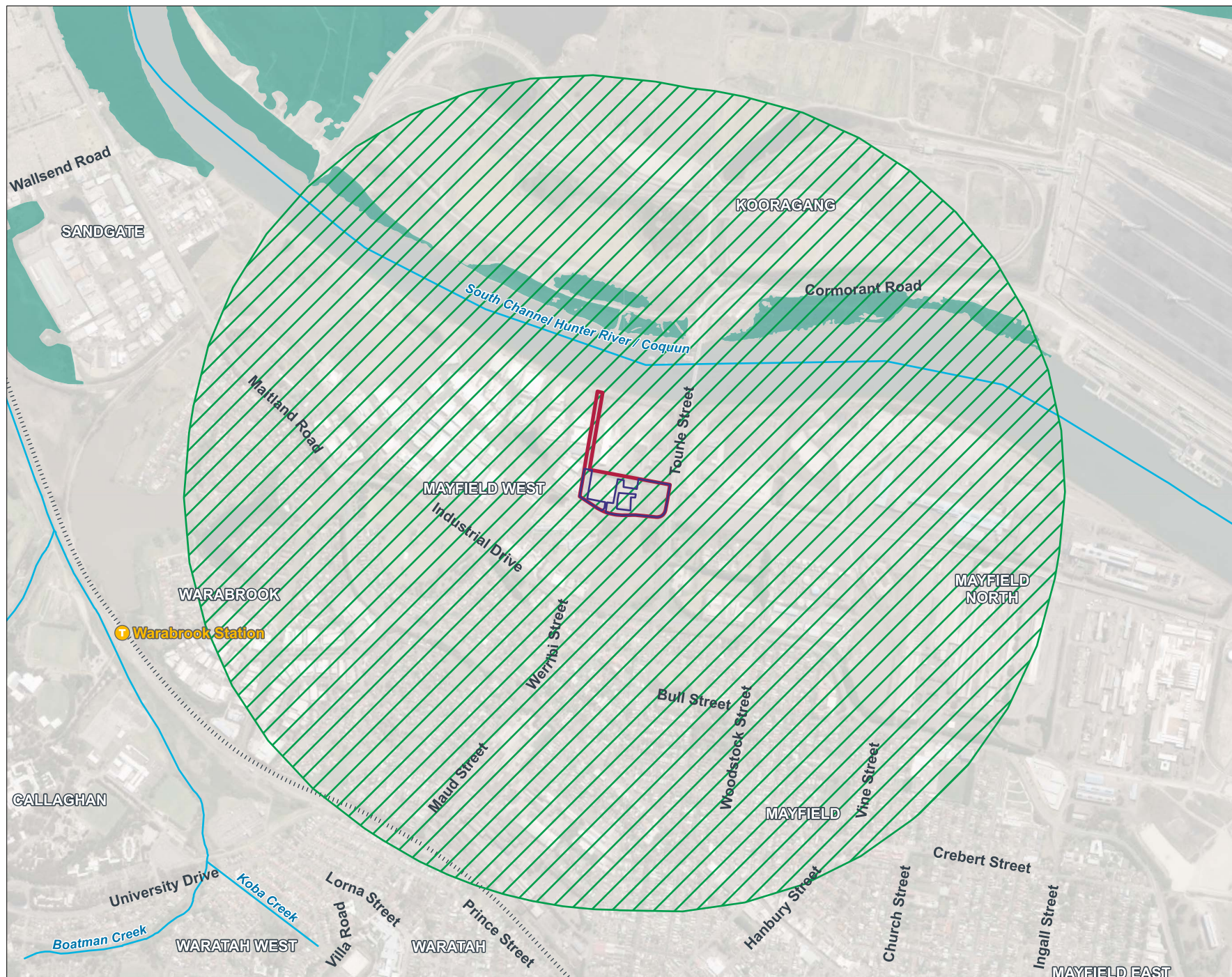
Landscape features	Description
Interim Biogeographic Regionalisation for Australia (IBRA) bioregions and subregions	The Assessment Area straddles two IBRA Bioregions and subregions: - the Sydney Basin IBRA bioregion - the Hunter IBRA Subregion.
Rivers, streams, estuaries, and wetlands	The closest waterbody to the site is the South Channel of the Hunter River, which is approximately 300 m north of the site (refer Figure 6.1-1)
Habitat connectivity	There is little to no connectivity between habitat within the site and surrounding habitat. Only trees planted between industrial buildings provide loose connection from vegetation within the site to disturbed habitat off site.
Geological features	There were no recorded karst, caves, crevices, cliffs or other areas of geological significance within the Assessment Area
Areas of outstanding biodiversity value	There are no areas of outstanding biodiversity or biodiversity values mapped within the site.

Landscape features	Description
NSW Mitchell Landscape	The Assessment Area falls within Gosford – Cooranbong Coastal Slopes.
Geology and soils	The northern portion of the site was located on Disturbed Terrain Soil Landscape (Matthei, 1995). Present was hummocky terrain, extensively disturbed by human activity which includes complete disturbance and removal of soil.
Important areas map	The Important Areas Map was consulted on 9 January 2025. Species returned from this search have been assessed in the BDAR.

6.1.3.2 Native vegetation

Within the 841.92 ha of the Assessment Area, 81.93 ha is comprised of native vegetation (approximately 9.7%). The extent of native vegetation within Assessment Area is detailed in **Figure 6.1-2**.

**FIGURE 6.1-1:
SUBJECT LAND/
ASSESSMENT AREA**



Legend

- The site
- Project Area / Subject Land
- Assessment area
- Railway
- t Railway station

SEPP - Resilience and Hazards (2021), Chapter 2

- Coastal Wetlands

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FIGURE 6.1-2:
NATIVE VEGETATION EXTENT
WITHIN THE ASSESSMENT AREA



Legend

-  The site
-  Project Area
-  Native vegetation

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EPBC Act Protected matters

A search using the Protected Matters Search Tool (DCCEEW, 2024) was undertaken on 9 January 2025 to identify any matters of national environmental significance (MNES) within a 10 km buffer of the site. The results are detailed in **Table 6.1-4**.

Table 6.1-4: MNES search results

MNES	Extent
World Heritage Properties	None
National Heritage Places	None
Wetlands of International Importance (RAMSAR)	1
Great Barrier Reef Marine Park	None
Commonwealth Marine Area	None
Listed Threatened Ecological Communities	8
Listed Threatened Species	103
Listed Migratory Species	74

Non-native vegetation

There is a total of 1.23 ha of non-native vegetation and 0.97 ha of maintained lawn mapped within the site. The types of non-native vegetation are listed below:

- Small trees and shrubs:
 - Western Australian Wattle *Acacia saligna* (Golden Wreath Wattle)
 - *Ricinus communis* (Caster Oil Plant)
 - *Cestrum parqui* (Green Cestrum)
 - *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush)
 - *Lantana camara* (Lantana).
- Perennial grasses:
 - *Chloris gayana* (Rhodes Grass)
 - *Cenchrus clandestinus* (Kikuyu)
 - *Melinis repens* (Red Natal Grass)
 - *Hyparrhenia hirta* (Coolatai Grass)
 - *Pennisetum setaceum* (African Fountain Grass).
- Other common ground covers
 - *Bidens pilosa* (Cobblers Pegs)
 - *Galium aparine* (Clevers)
 - *Foeniculum vulgare* (Fennel)
 - *Cirsium vulgare* (Black Thistle)
 - *Gomphocarpus fruticosus* (Narrow-leaved Cottonbush)
 - *Sida rhombifolia* (Paddys Lucerne).

Maintained lawns that were identified in the site include:

- *Medicago polymorpha* (Burr Medic)
- *Cenchrus clandestinus* (Kikuyu).

6.1.3.3 Plant Community Types (PCTs)

PCTs are specific assemblages of native vegetation used across NSW. The allocation of PCTs is based on (but not limited to) floristic composition and their location within the landscape such as elevation, landforms and soil types. The PCT identified within the site are detailed in **Table 6.1-5**. These are discussed in further detail below.

Table 6.1-5: PCTs identified within the site

PCT ID	PCT name / landscaping vegetation name	The site area (ha)
3437	Hunter Coast Lowland Spotted Gum Dry Forest	0.11

PCT 3437 – Hunter Coast Lowland Spotted Gum Dry Forest

Native vegetation that is most consistent with PCT 3437 was identified within a small area in the eastern boundary of the site. The canopy species within this small area were the following:

- *Corymbia maculata* (Spotted Gum)
- *Eucalyptus punctata* (Grey Gum)
- *Eucalyptus paniculata* (Grey Ironbark)
- *Eucalyptus tereticornis* (Forest Red Gum).

Key information about this PCT is summarised in **Table 6.1-6**.

Table 6.1-6: PCT 3437 Hunter Coast Lowland Spotted Gum Dry Forest

PCT ID	PCT name	Vegetation formation	Vegetation class	Per-cent cleared value (%)	Extent within the site (ha)
3437	Hunter Coast Lowland Spotted Gum Dry Forest	Dry Sclerophyll Forest (shrub/grass sub-formation)	Hunter-Macleay Dry Sclerophyll Forests	59.81	0.11

Landscaping – planted native and introduced species

Planted native and introduced species were present in the area surrounding the existing substation. The planted native and introduced species present were:

- Planted natives:
 - *Casuarina glauca* (Swamp Oak)
 - *Lomandra longifolia* (Spiny Mat Rush).
- Introduced small tree species:
 - Western Australian Wattle *Acacia saligna* (Golden Wreath Wattle).
- Introduced groundcovers:
 - *Medicago polymorpha* (Burr Medic).
 - *Cenchrus clandestinus* (Kikuyu)
 - *Megathyrsus maximus* (Guinea Grass)
 - *Chloris gayana* (Rhodes Grass).

An area of relatively dense planted swamp oaks is present around the substation with three species of *Eucalyptus tereticornis* (Forest Red Gum) and one *Corymbia citriodora* (Lemon-scented Gum) noted within the site. The groundcover primarily comprised of planted specimens of *Lomandra longifolia* (Spiny Mat Rush) and weed species *Megathyrsus maximus* (Guinea Grass) and *Chloris gayana* (Rhodes Grass). This vegetation was planted after the construction of the existing Mayfield West substation.

6.1.3.4 Threatened Ecological Communities (TEC)

No native vegetation within the site aligned with any TEC.

6.1.3.5 Vegetation zones

Data from random meanders, overview inspections, and detailed floristic plots were used to inform the stratification of the site into vegetation zones. These are detailed in **Figure 6.1-3**.

FIGURE 6.1-3:
VEGETATION ZONES



Legend

-  The site
-  Project Area
-  PCT 3437 - Hunter Coast Lowland Spotted Gum Dry Forest
-  Landscaping (Planted Native and Introduced Species)
-  Maintained Lawn
-  Unmaintained Introduced Vegetation
-  Area not requiring assessment

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6.1.3.6 Vegetation integrity

There is only one PCT of concern within and in the vicinity of the site. The VI for PCT 3437 was established as existing context and is provided in **Table 6.1-7**.

Table 6.1-7: Vegetation integrity scores (Wildthing, 2025)

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score	Vegetation integrity score	Hollow bearing trees present?
PCT 3437 Disturbed	11.8	23.3	45.3	23.2	No

6.1.3.7 Management zones

No vegetation zones were split into management zones as it assumed that all vegetation within the Project Area will be removed.

6.1.3.8 Movement corridors

The site is surrounded by industrial infrastructure, roads and the Hunter River, which limits connectivity between habitat on site and the surrounding area. There is a narrow vegetation connection that runs along the northern boundary of the site, connecting to habitat in the east and the west of the site.

6.1.3.9 Threatened species

Presence of candidate species credit species

A list of ecosystem credit species expected to occur within the site, based on the vegetation present, is presented in **Table 6.1-8**.

Table 6.1-8: Presence of candidate credit species

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required (BAM subsections 5.25 and 5.26)
		BC Act	EPBC Act			
Pokolbin Mallee	<i>Eucalyptus pumila</i>	V	C	Targeted threatened species survey	No	No
Scrub Turpentine	<i>Rhodamnia rubescens</i>	CE	CE	Targeted threatened species survey	No	No

No species credit species require further assessment as none were recorded during targeted surveys.

Recorded threatened fauna species

One threatened species was recorded during surveys: *Falsistrellus tasmaniensis* (Eastern False Pipistrelle). The Eastern False Pipistrelle is listed as vulnerable under the BC Act and is an ecosystem credit species. All native and non-native vegetation present on the site is considered to be hunting habitat for this species (2.51 ha), all of which is proposed to be removed for the Project.

6.1.4 Impact assessment

The Project has the potential to result in direct and indirect impacts on biodiversity values. The majority of on the biodiversity impacts would occur during construction from the clearing of native vegetation and

removal of habitat for flora and fauna. To understand these potential impacts and measures to avoid or mitigate them, this section provides:

- A description of how biodiversity impacts have been avoided, where possible
- An assessment of the potential direct, indirect and prescribed impacts during construction
- An assessment of the potential direct and indirect impacts during operation.

These points are discussed further below.

6.1.4.1 Actions to avoid/minimise Project impacts

In accordance with the BAM, the Project aims to avoid, mitigate and offset the direct, indirect and prescribed impacts on biodiversity (in that order). Measures to avoid and minimise impacts have been considered and are detailed in **Table 6.1-9**.

Table 6.1-9: Avoidance and minimisation of impact (Wildthing, 2025)

Impact	Input type	Avoidance and minimisation action	Outcome	Timing	Responsibility
Removal of 0.11 ha of native vegetation	Direct	The Project has been positioned within highly disturbed land that was previously part of Platts Channel. Native vegetation present was likely planted after the channel was filled. Native vegetation in this location is highly disturbed and is generally limited to native trees only. The Project design covers most of the space in the east of the site and cannot be repositioned to avoid native vegetation due to the space available within the substation boundary.	The Project will remove native vegetation that is highly disturbed and was likely planted or naturally seeded.	During the design phase.	Project designer
Removal of 0.55 ha of planted native vegetation	Direct	The Project's design takes into account the largest possible impact outside of the operational footprint for a potential laydown area. This area is likely to be reduced as part of the construction planning with most, planted trees around the existing substation being avoided where possible.	Some, if not all, planted native trees will be retained wherever possible.	During the design and construction planning phase	Project designer
Removal of 2.84 ha of hunting habitat for <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	Direct	The Project's design takes into account the largest possible impact outside of the operational footprint for a potential laydown area. This area is likely to be reduced as part of the construction planning and most, planted trees around the existing substation being ultimately avoided. Trees will be retained wherever possible when determining laydown areas. Hunting habitat was found to be present for the species. Flaking bark was present on trees within areas of PCT 3437, providing marginal habitat for the species.	Some, if not all planted native trees, will be retained wherever possible. This reduces the amount of hunting habitat being removed. No roosting habitat will be disturbed or removed.	During the design phase.	Project designer
Connectivity (habitat fragmentation)	Prescribed	The Project's design avoids impacting/trimming overhanging vegetation located in the north of the site, which connects habitat in the eastern portion of the site to the western portion of the site.	The Project's design avoids impacts to the habitat connectivity through the site.	During the design and construction phase.	Project designer Project manager

Impact	Input type	Avoidance and minimisation action	Outcome	Timing	Responsibility
Impact on breeding populations	Indirect	Timing of vegetation clearance will occur outside of the bird nesting season (late August - December).	Timing works to avoid critical life cycle events such as breeding for avifauna species.	During construction phase.	Project manager.
Reduced viability of adjacent habitat due to noise, dust, light spill, edge effects and weed incursion	Indirect	The majority of habitat adjacent to the Project is present along the northern boundary of the site. The Project is within an area that is subject to high noise pollution which can disturb local fauna behaviour. The extra noise generated by construction of the Project may exacerbate disturbance to local fauna. The Project will not undertake development on land adjacent to the habitat around the 'northern strip', therefore avoiding impacts to the viability of adjacent habitat. The amount of noise emitted by the BESS cannot be reduced or avoided. All lighting will be directed downwards and away from retained vegetation in the north of the site.	Increase in noise pollution. Avoidance in light pollution into retained habitat.	During the design phase.	Project designer.
Impact on waterbodies, water quality and hydrological processes	Prescribed	The Project avoids impacts to the South Channel of the Hunter River, which is located at the northern end of the narrow strip of the site. No other prescribed streams would be affected.	Avoidance of impact to prescribed stream to the north.	During the construction phase.	Construction site manager.

Impact	Input type	Avoidance and minimisation action	Outcome	Timing	Responsibility
Increased risk of starvation, exposure and loss of shade or shelter	Indirect	No mature or hollow-bearing trees were observed within the site. Larger specimens of Hills Weeping Fig were recorded partially overhanging into the narrow strip of land in the very north of the site. This overhanging vegetation would provide shelter for avifauna, reptile and some mammal species. Impacts to these trees will be avoided.	Avoidance of impact to mature trees that provide food and shelter resources within the immediate locality.	During the design phase and construction phase.	Project designer.
Clearing of native vegetation	Direct	Works will minimise impacts to retained trees as follows: - clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development footprint - where a tree must be disturbed the priority will be given to pruning rather than clearing - the clearing of any trees will be undertaken in a manner that avoids damaging adjacent vegetation i.e., all trees should be felled into disturbed areas when feasible - Individual trees that are to be retained will be protected during construction by a temporary fence around the dripline	Avoidance of inadvertent impacts to retained vegetation.	Prior to and during vegetation clearing in the construction phase.	Construction site manager.
Inadvertent impact to biodiversity values	Indirect	Measures will be taken during construction to avoid any inadvertent impact retained vegetation and habitat within the site. These include: - all material stockpiles, vehicle parking and machinery storage will be located within cleared areas (or areas proposed for clearing), and not in areas of vegetation that are to be retained - implementation of temporary stormwater controls during construction to ensure discharges outside the Project are consistent with existing conditions.	Avoidance of inadvertent impact to biodiversity values.	Prior to and during vegetation clearing.	Construction site manager.

Impact	Input type	Avoidance and minimisation action	Outcome	Timing	Responsibility
Clearing of fauna habitat, resulting in arboreal fauna injury and/or mortality	Indirect	Trees within the site are to undergo a preclearance survey (thorough inspection of the canopy) for nesting birds. This will be undertaken by a suitably qualified ecologist prior to tree clearance. Any animals injured during construction should be taken immediately to a vet for treatment. Any animals requiring rehabilitation would be placed into the care of an appropriate animal rehabilitator, with costs covered by the proponent.	Minimise clearing of fauna habitat that results in fauna injury and/or mortality.	During vegetation clearing.	Construction site manager.
Clearing of ground dwelling fauna habitat, resulting in fauna injury and/or mortality.	Indirect	Vegetation within the site is to undergo pre-clearance searches for ground dwelling species (particularly bandicoots). Any fauna present within areas to be cleared would be relocated into neighbouring vegetation.	Minimise clearing of fauna habitat that results in fauna injury and/or mortality.	During vegetation clearing.	Construction site manager.
Transport of weeds and pathogens from the site to adjacent vegetation	Indirect	The following measures will be implemented to prevent exotic plant material from entering/exiting the site: - removal and disposal of vegetation containing priority weeds should be done in accordance with Hunter Regional Strategic Weed Management Plan (LLS 2022) and local waste management regulations - prior to entering site, vehicles and machinery must be inspected for soils, vegetation and seeds. If present, this must be washed off in a suitable location prior to entering - a clean down register to be maintained at the entry of the site.	Minimise weed infestations within adjoining vegetation.	Prior to and during vegetation clearing.	Construction site manager.

Impact	Input type	Avoidance and minimisation action	Outcome	Timing	Responsibility
Vehicle strike	Prescribed	A restricted site speed limit will be implemented.	Reduce the likelihood and occurrence of vehicle strikes with fauna within the locality.	Construction and operational phase.	Construction site manager and Project manager.

6.1.4.2 Construction

Direct impacts

The direct impacts of construction relate to vegetation and landscaping within the site. A summary of the projected worst case scenario direct impacts is provided in **Table 6.1-10**.

The most significant direct impact to biodiversity during construction is the removal of hunting habitat for Eastern False Pipistrelle, with 2.51 ha of habitat likely to be affected. Although this species is considered vulnerable under the BC Act, the impact is not considered to be significant, as long as the mitigation measures in **Section 6.1.5** are applied. There are no EPBC Act threatened species expected to be affected by construction.

Table 6.1-10: Summary of direct construction impacts

Direct impact	BC Act status	EPBC Act status	Serious and irreversible impact entity	Extent (ha, number of individuals)
Removal of PCT 3437 - Hunter Coast Lowland Spotted Gum Dry Forest	N/A	N/A	No	0.11 ha
Landscaping - Planted Native and Introduced Species	N/A	N/A	No	0.46 ha
Removal of hunting habitat for <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	Vulnerable	N/A	No	2.51 ha

Vegetation removal as part of construction will remove all the PCT 3437 present within the site, reducing the VI score to zero.

Indirect impacts

The indirect impacts associated with sedimentation, runoff, transport of weeds and pathogens, and the impacts that the noise generated from the Project will have on habitat viability, were assessed. It was determined that although there is a risk to biodiversity values associated with each of these impacts, they can be managed through appropriate mitigation measures.

Indirect impacts as a result of construction are detailed in **Table 6.1-11**.

Table 6.1-11: Summary of proposed indirect impacts to biodiversity (Wildthing, 2025)

Indirect impact	Impacted entities	Location of impact	Frequency	Duration (long-term/ short-term/ medium-term)	Project phase/	Outcome
Sedimentation and contaminated and/or nutrient rich run-off.	South Channel of Hunter River located 300 m north of site, adjacent to the top of the narrow strip of land.	Surrounding vegetation outside the site boundary.	During heavy rainfall or storm events.	Long-term.	Construction and operation phase.	During the construction and operation phase, potential sediment and contaminated runoff into adjacent and retained vegetation may occur during high rainfall events.
Transport of weeds and pathogens outside the site.	Vegetation outside the site.	Vegetation outside the site boundary and anywhere vehicles and machinery travel off site.	Daily during the construction phase and ongoing during the operation phase.	Long-term.	Construction and operation phase.	During construction, the risk of the spread of weeds within and off the site will increase.
Reduced viability of adjacent habitat due to edge effects.	Retained vegetation within and outside the site.	Vegetation within and outside the site boundary.	During the life of the Project.	Long-term.	Construction and operation phase.	The Project will increase the risk of noise pollution and light pollution that reduce the viability of retained vegetation.

Prescribed impacts

The proposed prescribed impacts of the Project are detailed in **Table 6.1-12**.

There is expected to be 1.94 ha of non-native vegetation removed to facilitate construction of the Project. The extent of vegetation removal is considered to be minor and is not considered to be a prescribed impact. The potential increase in vehicle strikes can be addressed through mitigation measures and is therefore not a prescribed impact. Furthermore, no groundwater dependent ecosystems (GDEs) are present within the site and therefore there are no prescribed impacts on waterbodies.

Table 6.1-12: Summary of the prescribed impacts to biodiversity

	Nature	Extent	Timing/phase	Consequences	Impact
Non-native vegetation	Non-native vegetation is present in the form of maintained grasses and unmaintained introduced vegetation. This non-native vegetation provides hunting area for mobile species.	Removal of 1.94 ha.	Construction and operation.	Reduction in shelter habitat for Northern-Brown Bandicoots. Reduction in hunting habitat for vulnerable species <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle). Reduction in hunting habitat for other highly mobile species.	Additional native and non-native habitat is present in the site, therefore no prescribed impact .
Habitat connectivity	Overhanging vegetation canopy and planted trees provide connectivity to adjacent habitats.	Overhanging vegetation was present along the northern boundary of the site, connecting land and vegetation to both the east and west. Some vegetation overhangs the location of proposed laydown areas in the west, however, no overhanging trees are expected to be directly impacted.	Construction.	If overhanging vegetation will be trimmed, connectivity between adjacent habitats would be weakened.	No prescribed impacts are expected due to mitigation measures outlined in Table 6.1-16 .

	Nature	Extent	Timing/phase	Consequences	Impact
Waterbodies, water quality and hydrological processes	The South Channel of the Hunter River runs along the northern side of the narrow strip within the site that extends to the north. There is potential for sediment runoff into this channel from the Project.	The Project is located in the south of the site, approximately 300 m south of away from the South Channel of the Hunter River.	Construction and operation.	Potential long-term impacts to riparian corridors and the South Channel of the Hunter River.	No prescribed impact , due to mitigation measures outlined in Table 6.1-16 .
Vehicle strike	Increase in vehicle strikes due to increased vehicle presence within the site.	Vehicle movements during peak construction periods.	Construction and operation.	Potential increase in fauna strikes resulting in injuries or mortalities.	No prescribed impact , due to mitigation measures outlined in Table 6.1-16 .

6.1.4.3 Operation

Direct impacts

All direct impacts are expected to occur during construction. Additional direct impacts to biodiversity during operation are not expected.

Indirect impacts

The indirect impacts mentioned in **Table 6.1-11** mirror the indirect impacts that would occur during operation. After mitigation and control measures are applied, there are not expected to be any substantial indirect impacts during operation.

Prescribed impacts

As detailed in **Table 6.1-12**, there are no prescribed impacts expected to result from operation of the Project.

6.1.4.4 Serious and irreversible impacts

The concept of serious and irreversible impacts (SAII) seeks to protect threatened species and TECs that are most at risk of extinction from development (DEH, 2025). Species that were deemed SAII candidates were derived from threatened species that have the potential to occur based on the BAM calculator, and these species are detailed in **Table 6.1-13**.

Table 6.1-13: Species at risk of an SAII (Wildthing, 2025)

Common name	Scientific name	Further SAII assessment required	Reason for exclusion from further assessment
Regent Honeyeater	<i>Anthochaera phrygia</i>	No	The site was not within the Important Areas Map for this species and the species was not observed on site.
Swift Parrot	<i>Lathamus discolor</i>	No	The site was not within the Important Areas Map for this species and the species was not observed on site.
Scrub Turpentine	<i>Rhodamnia rubescens</i>	No	Despite targeted searches this species was not recorded within the site.
Little Bent-winged Bat (Breeding)	<i>Miniopterus australis</i>	No	Despite targeted searches this species was not recorded within the site.
Large Bent-winged Bat (Breeding)	<i>Miniopterus australis orianae oceanensis</i>	No	Despite targeted searches this species was not recorded within the site.

6.1.4.5 Biodiversity offsets

Table 6.1-14 outlines the ecosystem credit system requirements for the Project. Only one ecosystem credit was determined necessary for the Project.

Table 6.1-14: Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
1	3437 - Hunter Coast Lowland Spotted Gum Dry Forest	Hunter Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub/grass-formation)	N/A	Hunter-Macleay Dry Sclerophyll Forests - $\geq 50\%$ - $< 70\%$ cleared group (including Tier 3 or higher threat status).	No	Hunter

6.1.4.6 NSW Biosecurity Act 2015

Six priority weed species listed under the *Biosecurity Act 2015* were identified in the site and are listed in **Table 6.1-15** and the legal requirements associated with the respective weeds.

Table 6.1-15: Priority weed species recorded within the site (Wildthing, 2025)

Weed species	Legal requirements	Significance
<i>Lantana camara</i> Lantana	- General Biosecurity Duty - Prohibition on dealings - Regional Recommended Measure (Hunter).	- Weed of National Significance - Listed as a Key Threatening Process under NSW BC Act 2016.
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush	- General Biosecurity Duty - Prohibition on dealings - Regional Recommended Measure.	- Weed of National Significance - Listed as a Key Threatening Process under NSW BC Act 2016.
<i>Senecio madagascariensis</i> Fireweed	- General Biosecurity Duty - Regional Recommended Measure.	Weed of National Significance.
<i>Rubus fruticosus</i> species aggregate Blackberry	- General Biosecurity Duty - Prohibition on dealings - Regional Recommended Measure.	-
<i>Olea europaea</i> subsp. <i>cuspidata</i> African Olive	- General Biosecurity Duty - Regional Recommended Measure.	Listed as a Key Threatening Process under NSW BC Act 2016.
<i>Cestrum parqui</i> Green Cestrum	- General Biosecurity Duty - Prohibition on dealings - Regional Recommended Measure.	-

The presence of priority weeds on the site poses the potential risk of off-site spread. Transport of these weeds off site can be minimised through hygiene protocols (see **Table 6.1-16**) and therefore, priority weed spread is not expected to be an impact of concern.

6.1.5 Mitigation measures

Management and mitigation measures to avoid, minimise, or manage potential biodiversity impacts as a result of the Project are detailed in **Table 6.1-16**.

Table 6.1-16: Mitigation and management measures - biodiversity

ID	Mitigation and management measure	Timing
BD-1	The Project's design will take into account the largest possible impact outside of the operational footprint for a potential laydown area. This area is likely to be reduced as part of the construction planning with most, if not all, planted trees around the existing substation ultimately be avoided.	Design
BD-2	The Project will avoid impacting/trimming overhanging located in the north of the site. This will ensure that habitat connectivity within the site remains intact.	Design Construction
BD-3	Vegetation clearing will occur outside of breeding season (between late August-December) to ensure minimal impact on breeding populations.	Construction

ID	Mitigation and management measure	Timing
BD-4	Locating the Project in the southeast portion of the site ensures that impacts to the South Channel of the Hunter River are avoided.	Construction Operation
BD-5	Any animals injured during construction should be taken immediately to a vet for treatment. Any animals requiring rehabilitation would be placed into the care of an appropriate animal rehabilitator, with costs covered by the proponent.	Construction
BD-6	Vegetation within the site is to undergo pre-clearance searches including bandicoots that were observed in the site, to relocate captured specimens into neighbouring vegetation outside of the clearance zone.	Construction
BD-7	To prevent exotic plant material from entering/exiting the site, the following measures will be implemented: - removal and disposal of vegetation containing priority weeds should be done in accordance with Hunter Regional Strategic Weed Management Plan (LLS 2022) and local waste management regulations - prior to entering site vehicles and machinery must be inspected for soils, vegetation and seeds. If present this must be washed off in a suitable location prior to entering the site. - a clean down register to be maintained at the entry of the site	Construction Operation
BD-8	To reduce vehicle fauna strike, a restricted site speed limit will be implemented.	All phases

6.2 Aboriginal heritage

6.2.1 Secretary's Environmental Assessment Requirements

Table 6.2-1 sets out the SEARS relevant to Aboriginal heritage and where the requirements have been addressed in this EIS.

Table 6.2-1: Relevant SEARs – Aboriginal heritage

Relevant SEARs	
Aboriginal heritage	Where addressed
The EIS must address the following specific matters: an Aboriginal Cultural Heritage Assessment Report (ACHAR) prepared in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), identifying, describing, and assessing any impacts to any Aboriginal cultural heritage sites or values associated with the site (including impacts from any proposed earth works, construction works and road upgrades), including results of archaeological test excavations (where required), undertaken in accordance with the relevant standards and requirements	An Aboriginal Cultural Heritage Assessment Report (ACHAR) has been prepared and is attached as Appendix F.
evidence of adequate consultation with Aboriginal communities in determining and assessing impacts, identifying and selecting options for avoidance of Aboriginal cultural heritage and identifying appropriate mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010);	Outlined within the ACHAR and summarised in Section 6.2.2.

6.2.2 Methodology

An ACHAR has been prepared by Apex Archaeology to identify the Aboriginal cultural heritage values of the Project Area and assess the potential impact of the Project on those values.

The ACHAR is attached in **Appendix F** and was conducted in line with:

- Heritage NSW's Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011)
- Aboriginal Cultural Heritage Consultation Requirements for Proponents (Consultation Requirements) (DECCW, 2010a)
- Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010b).

This chapter summarised the Aboriginal heritage impacts associated with the Project and recommends management and mitigation measures to address identified impacts, as described in the ACHAR. The methodology described below is a summary of that undertaken by Apex Archaeology during the preparation of the ACHAR.

To determine the Aboriginal heritage values of the Project Area, the assessment involved:

- **A desktop-based assessment of the Project Area** – A desktop assessment reviewed the landscape context of the Project Area, with specific consideration of its potential for past Aboriginal land use and the likelihood of survival of associated archaeological materials. This included a search of publicly available databases, reports and map data, and the preparation of a predictive model for Aboriginal archaeological values within the Project Area. This was also informed by the results of previously completed archaeological test excavations.
- **A field work inspection of the Project Area** - An archaeological survey was carried out on foot within the Project Area on 22 November 2024. The entirety of the Project Area was assessed to provide an accurate assessment of the Project's likely impacts. During the assessment, two inspectors were responsible for a 2 m wide portion of the 4 m wide track, extending 1,075 m in total length. Due to visibility restrictions and the presence of long grasses, only 0.1% of the study transect was directly assessed, and only 0.009% of the total Project Area was covered; this is further detailed in **Appendix F**.

6.2.2.1 Predictive modelling

The landscape characteristics of an area help to predict archaeological potential. Based on previous investigations undertaken within the greater Hunter Region, predictions on the nature, extent and integrity of Aboriginal sites can be made.

Predictive modelling was conducted using a site location patterning method established by Kohen (1986). This approach uses environmental context to predict the location of potential Aboriginal sites. For example, proximity to water was an important consideration for site location, with 65% of recorded Aboriginal sites found to be located within 100 m of permanent water sources.

6.2.3 Aboriginal community consultation

A requirement and aim of the ACHAR is to identify any cultural values within the landscape that may not be detected via a land survey. Consultation with Aboriginal community stakeholders is required to consider Aboriginal cultural values, including intangible values. Apex Archaeology carried out this consultation in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (ACHCRs). Consultation with key Aboriginal stakeholders was undertaken as follows:

- Stage 1 consultation – Commencement
- Stage 2 & 3 consultation – Presentation and gathering of information
- Stage 4 consultation – Review of draft report.

6.2.3.1 Stage 1 - Commencement

Consultation began in September 2024, with letters sent to agencies requesting the details of Aboriginal people who may hold cultural knowledge of the Project Area. Based on this information advertisements and communications were sent to relevant parties requesting that they register any interest in the Project and its location. A total of 12 Aboriginal people responded and were consulted as Registered Aboriginal Parties (RAPs) for the Project:

- A & K Cultural Heritage Management
- Nukara Indigenous Cultural & Heritage
- Long Gully Cultural Services
- Didge Ngunawal Clan
- AT Gomilaroi Cultural Consultancy
- Widescope Indigenous Group
- Awabakal Traditional Owners Aboriginal Corporation
- Corroboree Aboriginal Corporation
- Awabakal Local Aboriginal Land Council

- Thomas Dahlstrom
- Murrabidgee Mullangari
- Lower Hunter Aboriginal Incorporated.

6.2.3.2 Stage 2 & 3 consultation – Presentation and gathering of information

Stage 2 consultation involved providing the RAPs with details about the Project and the methodology for undertaking the cultural heritage and archaeological assessments for the Project. This detail was provided to each RAP in writing on 15 October 2024.

During stage 3, RAPs were encouraged to share any information about the cultural significance of the Project Area to help guide the cultural heritage assessment. Comments or feedback from the RAPs regarding the methodology were received until 13 November 2024 from the following RAPs:

- Didge Ngunawal Clan
- Awabakal Traditional Owners Aboriginal Corporation
- Long Gully Cultural Services
- A&K Cultural Heritage Management.

All responses were in support of the proposed methodology with no amendments suggested. No further responses were received from any of the other RAPs on the Project, even after the closing period.

6.2.3.3 Stage 4: Review of draft report

Stage 4 involved preparing a draft of the ACHAR, with a copy provided to all RAPs for their review of the findings of the of cultural heritage assessment. Each RAP was given 28 days to provide comments, as per Stage 3 of the ACHCRs, with all comments included in the final report.

The draft report was provided to all RAPs on 29 January 2025 and the comments from RAPs were accepted until 26 February 2025. One response from Widescope was received, with no other comments on the draft report provided. Widescope were in support on the draft report and the assessment approach.

6.2.4 Existing environment

This section establishes the present environment of the Project Area in the context of Aboriginal heritage. The landscape and archaeological contexts are important to establish how the land has changed over time, as well as determining the likelihood of undiscovered Aboriginal items to remain within the Project Area.

6.2.4.1 Landscape context

Geology

The Project Area is underlain by geological formations typical of the Sydney Basin, which is a large sedimentary basin extending across the eastern part of NSW. The geology in this region consists primarily of Quaternary alluvial deposits, including clay, silt, sand, and gravel, associated with the Hunter River floodplain and estuarine systems. These sediments have been deposited through fluvial and tidal processes over time, forming low-lying, flood-prone landscapes. The underlying bedrock consists of Permian sedimentary rocks from the Maitland Group, which include siltstone, sandstone, and shale.

Soil landscapes

The Project Area is originally formed part of the Tomago Soil Landscape, which is associated with alluvial and estuarine deposits of the Hunter River floodplain, and are associated with poorly drained clays, silts, sands and other organic materials deposited through fluvial and tidal processes. These soils in their natural state are conducive to preserving archaeological deposits.

Due to the historical and contemporary uses, this Project Area has been significantly disturbed. Previous land reclamation, landfill operations and industrial development, including the construction of the adjacent electrical substation, have result in the extensive import of fill, and compaction and disturbance/removal of natural soil horizons.

Hydrology

The Project Area is located within the Hunter River catchment in the Newcastle LGA. The closest watercourse is the south channel of the Hunter River, approximately 320 m to the north. This watercourse is classified as a fourth-order stream, indicative of a large and permanent river system. The broader hydrology of the area is influenced by tidal processes, given the proximity to the Hunter River estuary and surrounding low-lying floodplains.

The site is located on land that has historically been inundated by the south channel of the Hunter River catchment, as recently as 1954. This limits the potential for future Aboriginal cultural significance discovery within the site, with artefacts being swept offshore or still below the surface water of the river.

Historically, hydrological conditions within the Project Area have been altered through land reclamation and industrial development, which have significantly altered natural drainage patterns. While the natural hydrology has been modified, understanding these systems remains relevant to assessing the potential impact of the Project.

Flora and fauna

The vegetation within the Project Area consists of disturbed remnant vegetation interspersed with non-native grasses, shrubs, and opportunistic weed species. Historical flora species are likely to have included Casuarinas, Eucalypts, and Melaleucas, which would have been used by Aboriginal people for either food (i.e. berries, tubers, seeds, leaves and nectar) or tools (i.e. implements for canoes and shields).

These plant species would have supported a range of fauna including kangaroos, wallabies, possums, small birds, reptiles, and amphibians, providing a diversity of food supply for Aboriginal people.

With the proximity of the Hunter River, there would have also been an abundance of aquatic and marine fauna species available as food sources for Aboriginal people. Fish, shellfish and aquatic birds would have been a staple part of the diet of Aboriginal people.

Aboriginal land use

Sea levels are generally considered to have been around 30-35 m lower than today's levels when Aboriginal occupation of Australia is thought to have commenced around 60,000 years ago (Apex, 2024). The rising of the seas since that time means that many Aboriginal historical artefacts and sites are likely to have been lost or buried offshore. Changing sea levels also resulted in changing ecological systems throughout time, which led to an increase in evidence of Aboriginal habitation from around 6,500 years before present (BP). During the Holocene period, sea levels again increased, which meant that coastal Aboriginal groups moved inland (McDonald, 2008).

In general, Aboriginal land use of an area is based on a number of factors:

- Proximity to permanent water sources
- Proximity to ephemeral water sources
- Ease of travel
- Topography of areas; flatter areas are likely to have more permanent inhabitants.

The site is located near the south channel of the Hunter River (known as Coquun in Awabakal language), which historically dictated how the Aboriginal people lived and manage their lifestyle. The wetlands that surrounded the Hunter River provided critical food and water resources and were important for further cultural practices. The Awabakal people were skilled marine hunters, and used the river to source fish, crustacea and other marine food sources. Evidence of middens throughout the Newcastle area suggest the use of these marine resources.

Aboriginal communities migrated between coastal and inland environments, depending on the height of sea levels and the Awabakal Aboriginal people would also hunt terrestrial game such as kangaroos, possums, wallabies and utilised other nutrient resources such as berries and seeds.

The landscape held significant cultural and spiritual for the Awabakal people, with sites used for storytelling and ceremonial practices. Awabakal shelters (referred to as gunyahs) were also prominent and constructed from bark, branches and leaves that provided protection for their semi-nomadic lifestyle. These shelters enabled them to maintain their connection to Country, while also being able to migrate to resource dense areas to provide for their tribes.

Non-Aboriginal land use

Early European settlement in Mayfield began in 1804. The area that is now Mayfield West was historically used for wheat cultivation, however due to poor soil quality, that venture was not successful. By the mid-19th century, settlers had established vineyards and were producing wine, which was attracting tourists. It was however pests, theft and industrial encroachment that eventually prompted the transition from agriculture to industry.

Coal mining dominated the region's industry in the early 19th century, however the large-scale industrialisation of the area only began in 1913 with the establishment of the BHP steelworks. BHP's establishment in Newcastle brought population growth and economic development and is largely why the Mayfield West region remains an industrial hub today.

By 1975, Mayfield West began its final transition towards its current primarily industrialised nature, with large steelworks and other industries defining the landscape along the Hunter River. The evolution of Mayfield West agriculture to a key industrial hub was largely driven by Newcastle's economic expansion and proximity to the Hunter River.

In general, historic and ongoing land uses such as industrial, commercial, farming and residential have caused substantial disturbance across the region and to the Project Area specifically. These land uses are likely to have displaced, altered and damaged historical Aboriginal sites and objects.

6.2.4.2 Ethnohistoric sources of regional Aboriginal culture

It should be noted that ethnohistorical evidence is based on the reports of colonisers and does not tend to include the Aboriginal perspective, leading to a Eurocentric view of Aboriginality (Apex, 2024). Despite this, such records still contain valuable information for establish past conditions for Aboriginal People.

The Project Area at Mayfield West is located within the traditional lands of the Awabakal people, whose Country spans the Hunter Region, including Newcastle and the Lower Hunter Valley. Awabakal Country encompasses coastal plains, estuarine wetlands, tidal creeks, and the Hunter River catchment, which provided abundant natural resources that sustained the group's way of life (Apex, 2024).

A range of stone and other materials have been known to be used by Aboriginal people for flaking to create implements. The types and quality of materials, as well as the methodology used to manufacture these implements are detailed in **Appendix F**.

6.2.4.3 Archaeological context

Previous assessments assist in understanding the archaeological context of the area.

AHIMS

A search of the Aboriginal Heritage Information System (AHIMS, 2022) was undertaken in April 2024. This search encompassed a 200 m buffer of the Project Area, though did not identify previously registered Aboriginal sites.

Regional archaeological assessment

Previous regional archaeological assessments have been undertaken in the broader Newcastle area, dating back to 1982. **Table 6.2-2** summarises the assessments completed in the broader region surrounding the Project Area.

Table 6.2-2: Regional archaeological assessments in broader Newcastle region since 1982

Consultant	Date	Sites Identified	Region
Haglund, H	1982	2 sites identified	Bagnals Beach
Comber, J	1990	2 sites identified	Anna Bay
Dean-Jones, P	1990	No sites identified (potential occupation areas avoided)	Anna Bay
Baker, N	1994	Salvage excavation dated to between 6000-17000 years ago	Moffat's Swamp
Dallas, M and Cowlshaw, G	1994	3 sites identified	Salamander Bay
Douglas et al	2001	4000+ artefacts recovered from salvage excavation	700 Hunter Street, Newcastle
ERM	2003	15 sites identified	Tomago to Tomaree
Kuskie, P	2004	1 site identified	Anna Bay
McCardle	2004	Fern Bay Archaeological Complex	Fern Bay
MDCA	2004	Archaeological complex identified (Midden sites and Camp Sites)	Boardwalk Site, Newcastle
GML	2009	551 artefacts recovered from surface salvage	Stockton Rifle Range
Umwelt	2010	Mitigation and research design for 6 registered sites	Tomago to Tomaree
RPS	2011	3 registered sites re-identified	Birubi point
AHMS	2011	5534 artefacts recovered from salvage excavation	Former Palais Royale Site (now KFC), 684 Hunter Street, Newcastle
McCardle	2012	4 new sites identified. 67 artefacts recovered from subsequent test excavation.	Nelson Bay Road upgrade
AMAC	2012	Post Contact Aboriginal flaked material recorded	Lee Wharf Development: Square-about and Lot 24 Honeysuckle Drive, Newcastle
RPS	2013a	No sites identified	Birubi Lane, Anna Bay
RPS	2013b	One site identified	4011 Nelson Bay Road, Bobs Farm
AMAC	2014	No Sites identified	18 Honeysuckle Drive, Newcastle

Consultant			
AMAC	2014-2017	500 artefacts recovered from test excavation and 6500+ artefacts recovered from subsequent salvage excavations	University of Newcastle, New Space, 409 Hunter Street, Newcastle
RPS	2014	1 previously registered site identified	Anna Bay
Artefact	2015	391 artefacts recovered from test excavation and 3912 artefacts recovered from subsequent targeted salvage excavations	Wickham Transport Interchange
RPS	2016	Four PAD sites identified	Newcastle Light Rail
Umwelt	2017	11 new sites identified	Stockton Rifle Range
Heritage Now	2020	No Sites Identified	21D and 21F School Drive, Tomago
Apex Archaeology	2023	No New Sites Identified – Multiple registered sites avoided by underboring and directional change.	Stockton to Anna Bay, NSW – Proposed Telecommunications Route

The review of the above assessments suggests previous potential for Aboriginal sites within the coastal area of the Newcastle region. Despite this, the assessment conducted by Apex Archaeology determined the absence of Aboriginal sites within the vicinity of the Project Area.

6.2.4.4 Predictive modelling

The predictive model was used to do site patterning and provide information on the following Aboriginal artefact types and whether they would be likely to be within the site:

Stone artefacts

Stone artefacts can be identified either on ground surface or subsurface deposits and are often associated with large concentrations of flaked stone debris, likely the result of knapping the stone to modify it for other uses. These stone artefacts are more easily identified in areas of high visibility i.e. areas that have undergone extensive clearing. Due to the extensive clearing and industrial development that has occurred in the site, detection of stone artefacts within the site is unlikely.

Quarry and procurement

Stones that can be exploited for production of lithics are quarries or procurement sites. Quarries can show visible evidence of extraction, whereas procurement sites are determined by the presence of artefactual materials that were sourced locally.

Within the Project Area, there is no evidence to suggest quarrying activities and the historical disturbance of the site makes it unlikely that procurement sites would be present.

Middens

Middens are concentrations of shell, with scattering of stone, bone and occasionally human burials. Middens are generally located coastally and formed through exploiting local species for resources and local shell accumulation.

Middens are representative of the species available in the area, and in the case of the site, would be concentrated with estuarine species given its proximity to the Hunter River. Historical disturbance and extensive clearing of the site limits the likelihood of midden discovery within the site.

Burials

Aboriginal burial practices include inhumation, cremation, desiccation and exposure and are largely located in sandy regions, where elders made use of the soft sand soils. The historical disturbance of the site and the lack of sandy landscapes means that the existence of burial sites within the Project Area, and any that were originally there, are likely to have been disturbed or destroyed due to historical land uses.

Rock shelters

Rock shelters not only provided a place of refuge for Aboriginal groups but often served as a place to engrave grinding grooves, pictographs, stencils and other art forms into the rocks. The presence of rock shelters relies on sandstone escarpments or prominent geological formations. The large-scale industrial development and the lack of the necessary geological features in the site means that there is unlikely to be existing rock shelters.

Grinding grooves

Grinding grooves are formed by using exposed sandstone to form and sharpen tools such as axes and spears. Fine, horizontal sandstone was the preferred surface for tool maintenance and often favouring those that have been nearby water sources. Grinding grooves are unlikely to occur within the site due to the lack of sandstone.

Scarred and carved trees

Scarred and carved trees can be identified by the presence of specific species of trees which are an appropriate age, which have had the bark removed for domestic and ceremonial reasons. Historical land clearing and industrial development would have removed any mature scarred trees that would have been present in the site.

Ceremonial sites

Specific sites were historically used as places to conduct significant ceremonial practices including initiation and burial practices. The NSW landscape is considered to hold significance to Aboriginal people, including natural features associated with spirits and beings of creation. There are no known recordings of sacred sites within the Project Area.

Contact sites

Contact sites are those with evidence of Aboriginal occupation that are concurrent with the arrival of European settlers. These sites would be evident through presence of flaked artefacts or burial sites containing non-Aboriginal grave goods. Aboriginal camps would often exist around newly formed colonised towns that were often used for exploitation of Aboriginal people by colonists and for cross-community trading. Contact sites also exist around Aboriginal mission sites where Aboriginal children were taken from their families to assimilate them into European culture. There is no known evidence of initial contact between Aboriginal people and colonists within the site, and there is low probability of future discovery of contact sites within the site.

6.2.5 Aboriginal cultural heritage significance assessment

The ACHAR determined that the Project Area has low archaeological significance, and no Aboriginal sites were located within the site. The significance assessment on the site commented on the following parameters:

6.2.5.1 Social value

No specific comments from the RAPs have been made on the social value of the area surrounding and within the site, although it is noted that all areas with evidence of Aboriginal significance are considered to be cultural landscapes.

6.2.5.2 Historic value

The site is not known to be associated with any specific Aboriginal individuals or any other historical events, therefore having low historical value.

6.2.5.3 Scientific value

The significant modification to the site means that there is low possibility of subsurface Aboriginal deposits and there has been no other evidence of Aboriginal cultural material. This means that the site holds limited scientific value.

6.2.5.4 Aesthetic value

The site is considered to be of low aesthetic value in relation to Aboriginal heritage, due to the highly disturbed nature of the site.

6.2.5.5 Research potential

There has been a lack of identified sites of Aboriginal significance located within the site, which limits the research potential of the region. The disturbed nature of the surrounding area reduces the ability to inform about previous Aboriginal occupation.

6.2.5.6 Representativeness

The site is generally representative of heavy industrialised areas rather than being representative of Aboriginal cultural sites. As such, the site has the ability to demonstrate significant Aboriginal cultural values or continual occupation of the land where the site lies.

6.2.5.7 Rarity

The presence of unobstructed and intact archaeological deposits is relatively rare in the Hunter Region. The site is deemed to have very low rarity value due to the significant disturbance and the absence of Aboriginal artefacts.

6.2.5.8 Integrity/Intactness

The site has been left with low archaeological integrity due to the significant historical disturbance and land remediation and leaves limited potential for intact deposits to be discovered in the future.

6.2.5.9 Aboriginal community input

The input provided by the RAP's was important in ensuring that the ACHAR is comprehensive, respectful and inclusive.

6.2.6 Potential impacts

6.2.6.1 Construction

The ACHAR found there were no Aboriginal sites or objects of cultural significance within or in the vicinity of the Project Area. The Project is confined to land that has experienced historical modification and disturbance, minimising the potential for impact upon any significant cultural heritage features.

6.2.6.2 Operation

The ACHAR considers that there would be no predicted impacts on cultural heritage or Aboriginal heritage as a result of the operation of the Project.

6.2.6.3 Cumulative impacts

The ACHAR considers that cumulative impacts are unlikely to arise from the development of the Project alongside other nearby development. This is due to the highly disturbed nature of the Project Area and the low likelihood of encountering unrecorded Aboriginal cultural heritage items on site during construction or operation.

6.2.7 Recommendations

Based on the results of the ACHAR, the following recommendations have been made for the Project, with respect to Aboriginal heritage:

- No further archaeological assessment required and no application for AHIP is necessary for the Project
- Establish distinct development boundaries
- Ensure a stop work provision for potential discovery of Aboriginal significant items.

The ACHAR concluded the Project Area has a low potential for archaeological significance, and no further investigations are necessary. However, measures should be implemented to address any potential discoveries of Aboriginal items.

Management and mitigation measures that would be implemented for the Project to address potential impacts to Aboriginal heritage are listed in **Table 6.2-3**.

Table 6.2-3: Mitigation and management measures – Aboriginal heritage (Apex, 2024)

ID		
AH-1	The Project must be contained within the boundaries of the site. If there is any alteration to the site boundaries, further investigation and cultural heritage assessment must be completed.	All phases
AH-2	Should unanticipated Aboriginal archaeological material be encountered during construction of the Project, all work must cease in the vicinity of the find and an archaeologist contacted to assess the find and to advise on the course of action to be taken. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to Heritage NSW. In the unlikely event that suspected human remains are identified during construction works, all activity in the vicinity of the find must cease immediately and the find protected from harm or damage. The NSW Police and the Coroner's Office must be notified immediately. If the finds are confirmed to be human and of Aboriginal origin, further assessment by an archaeologist experienced in the assessment of human remains and consultation with both Heritage NSW and the RAPs for the project would be required. This measure should be included in the Project CEMP.	All phases

6.3 Soils and land

6.3.1 Secretary's Environmental Assessment Requirements

Table 6.3-1 sets out the SEARs relevant to Land and where the requirements have been addressed in this EIS.

Table 6.3-1: Relevant SEARs - land

Relevant SEARs	
This EIS must address the following: a detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, land contamination, permissibility, strategic context and existing site constraints;	Justification of the site suitability is provided in Chapter 7.0.
- an assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: - agricultural land, flood prone land, nearby drinking water catchments, Crown lands, mining, quarries, mineral or petroleum rights (if relevant) - a soil survey to determine the soil characteristics and consider the potential for salinity, acid sulfate soils, and erosion to occur; and - a cumulative impact assessment of nearby developments	- Potential impacts on existing land uses and adjacent land are detailed in Section 6.3.4 - Flood prone land and other potential flood impacts are detailed in Section 6.7 - Soil characteristics are discussed in Section 6.3.3 and potential impacts to soil are detailed in Section 6.3.4 - Potential cumulative impacts are detailed in Section 6.11.
- an assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including: - consideration of the zoning provisions applying to the land, including subdivision (if required); and - completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industries <i>Land Use Conflict Risk Assessment Guide</i> (if required)	- Assessment of the compatibility of the Project with existing land uses during construction, operation and decommissioning is detailed in Section 6.3.4 - A Land Use Conflict Risk Assessment (LUCRA) was not required as indicated in Section 6.3.4.

6.3.2 Methodology

6.3.2.1 Land use

A desktop assessment was undertaken to gather information about the existing environment, including the surrounding land use and the environmental characteristics of the area. A review of historical images, district maps and aerial images was undertaken to provide historical context. A qualitative assessment was then undertaken to determine the compatibility of the site with existing land use during the construction and operation of the Project.

6.3.2.2 Soil

A Detailed Site (Contamination) Assessment (DSA) was prepared by RCA Australia (RCA) to assess the potential contamination status of the site and whether it is suitable for the Project. For the DSA, the assessment was contained to the Operational Footprint.

The objectives for this DSA assessment are summarised below:

- Identify the soil characteristics of the site
- Outline the contamination status of the soils within the Operational Footprint
- Outline mitigation measures that can be used to manage potential impacts of existing soil contamination or contamination that arises from the construction or operation of the Project.

The DSA was prepared in accordance with the following regulatory guidance documents and standards:

- *Contaminated Land Guidelines: Sampling Design* (NSW EPA, 2022)
- *Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2020)
- *Guidelines for the NSW Site Auditor Scheme* (NSW EPA, 2017)
- *State Environmental Planning Policy (Resilience and Hazards) 2021* (NSW, 2021)
- *National Environment Protection (Assessment of Site Contamination) Measure* (NEPC, 2013)
- *Technical Report 10, Health screening levels for petroleum in soil and groundwater* (CRC, 2011)
- *Guide to the investigation and sampling of sites with potentially contaminated soil, Part 1: Non-volatile and semi-volatile compounds* (Standards Australia, 2005).

RCA undertook a fieldwork survey to support the DSA on 12th of December 2024. The fieldwork investigated the following:

- Topography
- Site conditions
- Condition of buildings and roads
- Visual signs of contamination
- Signs of erosion
- Presence of drums or waste
- Identification of asbestos
- Odours
- Petroleum facilities
- Chemicals
- Evidence of waste burial.

A soil contamination assessment was completed within the Operational Footprint (see **Figure 1-2**) during further fieldwork on the 13th and 14th of January 2025. The methodology for this assessment included:

- Check of sampling locations for existing utilities prior to the commencement of fieldwork
- Collection of thirty-three soil samples from ten test pit locations (TP1 – TP10). Samples were collected from near the surface, and at approximately 1.0 and 2.0 mbgs using an 8-tonne excavator. An additional sample was collected at TP4 due to changes in lithology and or olfactory indications of contamination. Soil samples were collected directly from the bulk of the soil within the excavator bucket
- All soils samples were screened with a photoionisation detector (PID) to assess for the presence of volatile compounds
- Re-instatement of all test pits by replacing the extracted soil back into the pits
- Logging of test pits including description of samples for texture, colour, odour, moisture content. Logs are attached in **Appendix G**

- Laboratory analysis of all collected soil samples for total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene, naphthalene (BTEXN), PAH and metals (arsenic, cadmium, chromium, copper, nickel, lead, zinc and mercury).

6.3.3 Existing environment

6.3.3.1 Zoning and land use

The site is located on land within the *E4 General Industrial* one under the Newcastle LEP. The site and the surrounding area are primarily used for industrial and commercial purposes.

The online MinView database and mapping system (DPE, 2024) indicates that there are no current mining or exploration licences over the site. The most recent mining exploration licence was PEL458, which was a petroleum exploration licence, which ceased in June 2016. PEL458 was for a site located approximately 10 km northeast of the Project.

There are no Crown Land parcels, roads and waterways within the site, with the nearest Crown Land parcel approximately 350 m south of the site.

Chapter 4.0 provides further assessment of the zoning and land use of the site.

6.3.3.2 Historical land use

Historic maps and land records detailed early land use from the mid-late 19th and early 20th centuries within the area surrounding the site. District land maps indicated that the site was undeveloped in 1854 and 1892, while the maps from 1912 and 1919 showed the presence of the Shell Beach Park recreation facility. Aerial images showed the evolution of the land use from early undeveloped land to the present-day industrial estate, including the development of the early BHP structures. These images and maps are available in **Appendix G**. A summary of these photographs is provided in **Table 6.3-2**, describing how the site and the surrounding area has evolved over time.

Table 6.3-2: Aerial photographs summary (RCA, 2025)

Image	
1954 (Black and white)	The site seems to be largely in its original natural state and similar to the 1944 image although it appears that foreshore has changed slightly, either through natural causes or potentially filling. Other key aspects of this image include: • The majority of the surrounding area is cleared land • Murray Dwyer Orphanage remains unchanged from 1944 • Platt's Channel appears to be in the early stages of being filled to the east of the site • The residential area of Mayfield has been well developed • BHP Steelworks and associated industries are present.
1966 (Black and white)	The site has been formed by the filling of Platt's Channel, connecting Spit Island to Mayfield West. Access roads and contouring works can be seen in progress adjacent to the site
1976 (Colour)	Key aspects of the land use in this image are: • The site appears to be primarily a hardstand area with a road along the northern boundary connecting the land to the BHP property via a bridge across Tourle Street • The site appears to be used for equipment storage • Significant vegetation removal can be seen to the north of the site, with this area being repurposed for equipment storage and hardstand.
1985 (Black and white)	Key aspects of the land use in this image are: • The site remains a hardstand with visible storage being undertaken. There appears to be either stockpiles or vegetation in the western portion • Small material storage can be seen to the north of the site • A new structure has been developed to the northeast of the site on the opposite side of Tourle Street.

Image	
1990 (Colour)	Key aspects of the land use in this image are: • Land use on the site remains largely unchanged; used for storage. The Delta E.M.D. plant has been constructed directly to the north of the site • The orphanage site appears to have been repurposed with a large hardstand in its vicinity.
1998 (Colour)	Key aspects of the land use in this image are: • The northern portion of site is used for the storage, with large extents of vegetation regrown • The Orphanage building has been replaced with an NSW Fire facility • No changes to BHP or Delta EMD sites.
2001 (Colour)	Key aspects of the land use in this image are: • Majority of the vegetation has been cleared; the eastern boundary still contains vegetation • CWR used to cap the site is visible on the surface • The Steel River remediation works appear to be nearing completion in the area of the site • Steel River Boulevard, McIntosh Drive, Murray Dwyer Circuit and Laurio Place are constructed. • The Delta EMD and BHP sites remain unchanged.
June 2005 (Colour)	Key aspects of the land use in this image are: • The site land use is unchanged, and has experienced vegetation regrowth • The bridge connecting the eastern portion of the site to Tourle Street has been removed • Steel River remediation works appear completed • New buildings developed to the west of the CSIRO building • A childcare facility in the southwest is established • An aboveground pipeline has been demolished.
January 2007 (Colour)	Key aspects of the land use in this image are: • The site remains largely unchanged since 2005, besides concrete blocks in the northern corner and increased vegetation cover • Development to the west of the site, with buildings under construction • Hardstand construction immediately east of Tourle Street.
September 2009 (Colour)	Key aspects of the land use in this image are: • Parts of the site have been cleared, with the northwestern portion being used for stockpiling of soil. PVC pipes or geofabric rolls are present • The current Mayfield West substation has been constructed directly west of the Project • Further development within the Steel River Industrial Estate • No noticeable changes to the Delta EMD (noted that it was decommissioned in 2008) • A new eight span prestressed concrete girder bridge has been constructed to the immediate east of the steel lattice truss bridge (construction from August 2007 to May 2009). Tourle Street is realigned accordingly from north of the site.

Image	
September 2011 (Colour)	Key aspects of the land use in this image are: • The site remains largely unchanged with small trees and shrubs regrowing along the southern boundary. Additional construction materials appear to be stored on the asphalt path that runs parallel to the western boundary • The carpark directly to the west of the site appears to be used for construction materials storage • The Delta E.M.D. plant to the north has been partly demolished. The former Tourle Street steel lattice bridge has been demolished • Further development within the Steel River Industrial Estate.
October 2016 (Colour)	Key aspects of the land use in this image are: • The site remains largely unchanged, except for the absence of stockpiles and the increase in vegetation • Boom gate access is now present off McIntosh Drive • No apparent changes to the former Delta E.M.D, although it is understood that a recycling operation has begun on its property • Construction of a concrete girder bridge off Tourle Street has commenced.
June 2022 (Colour)	Key aspects of the land use in this image are: • The site remains mostly unchanged, with the exception of increased vegetation and the apparent storage of construction materials / soil stockpiles along the northern boundary and a cycle path connecting McIntosh Drive to Tourle Street has been constructed (between August and December 2017) • The existing data centre facility has been built (between November 2019 and March 2021) on the former carpark directly west of the Project • A concrete production facility has been established (after March 2021) directly to the south of the site • Benedict's Recycling facility (established in 2018) appears to be in full operation directly north of the site (former Delta E.M.D. site) • The second span of the Tourle Street bridge has been completed.

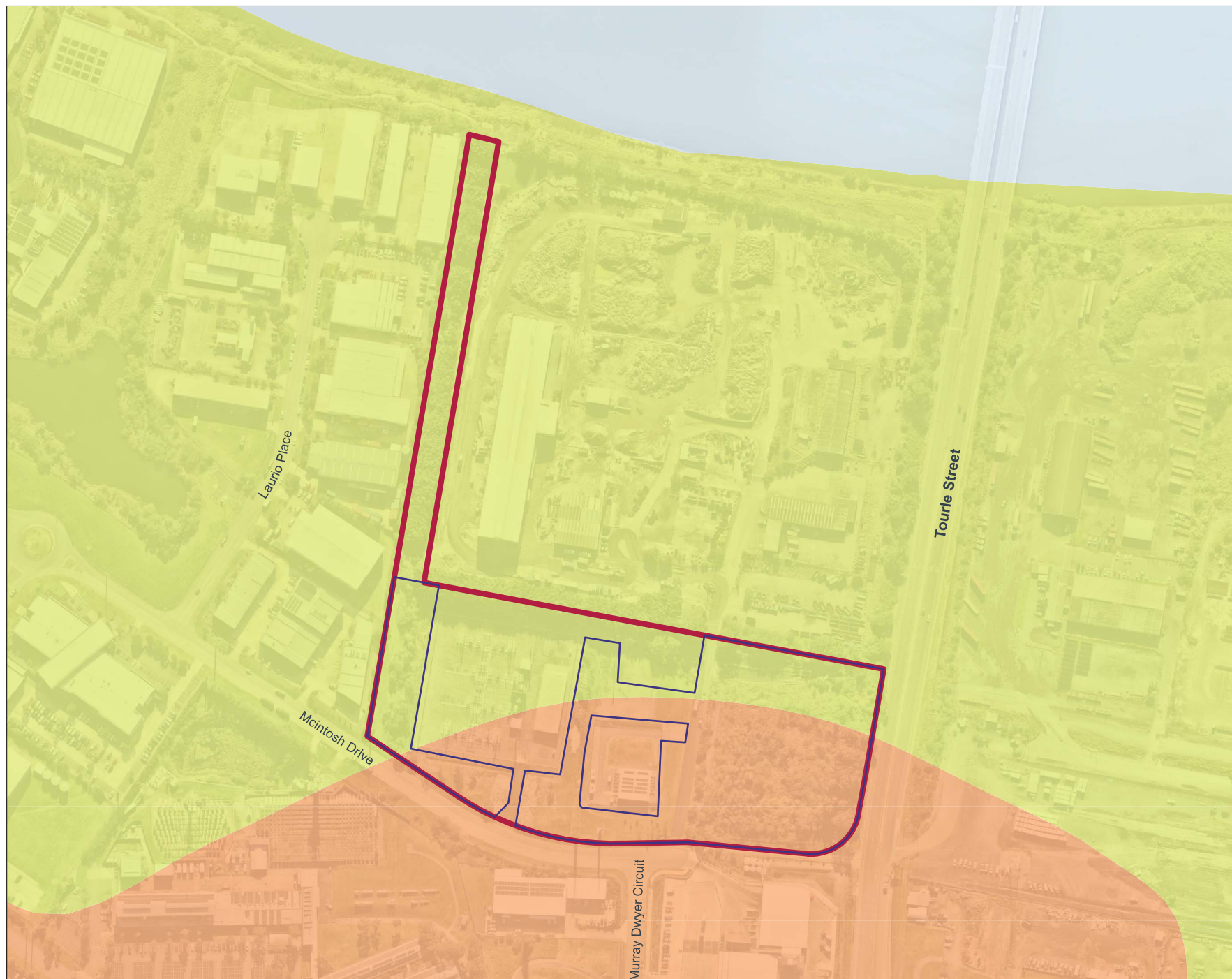
6.3.3.3 Soil landscapes

The Newcastle Soil Landscape map indicates that the Operational Footprint consists of two landscapes (mapped in **Figure 6.3-1**):

- **Disturbed terrain** heavily impacted by human activity; this soil landscape exists throughout the Operational Footprint. The development of the Mayfield West substation means that some of the Disturbed terrain is covered by concrete.
- **Beresfield soil landscape** exists in the south-east portion of the Operational Footprint and is characterised by brownish black loams, sandy loams and clay.

According to the Newcastle 1:250,000 geological sheet, the geological profile of the Operational Footprint was described as Quaternary period gravel, sand, silt, clay "Waterloo Rock", marine and freshwater deposits (DIRE, 2025). The Operational Footprint is mapped immediately north of Permian era Tomago Coal Measures, which consist of shale, mudstone, sandstone, tuff and coal.

FIGURE 6.3-1:
SOIL LANDSCAPES
WITHIN THE SITE



Legend

-  The site
-  Project Area

Soil Landscapes

-  REbe - Beresfield
-  DTxx - Disturbed Terrain
-  Water

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6.3.3.4 Acid sulfate soils,

According to the Newcastle LEP the disturbed terrain within the Operational Footprint contains Class 2 ASS.

6.3.3.5 EPL

None of the surrounding land uses that have EPLs pose a risk of contamination. A list of all land uses with EPLs that were considered is provided in **Appendix G**.

Fourteen locations within Mayfield West, Mayfield North and Mayfield are listed as potentially requiring regulation, according to the NSW EPA. Only four of these locations currently require contamination regulation, including:

- Koppers Coal Tar, east of Woodstock Street and Tourle Street (approximately 500 m southeast of the Project)
- BHP Steel River, 'The Buffer Zone' (approximately 300 m north of the Project)
- OneSteel (BHP), Industrial Drive, Mayfield (approximately 900 m east of the Project)
- BHP Closure site and bed sediments of Hunter River (approximately 2.3 km southeast of the Project).

No properties within the vicinity of the Project pose a contamination risk to the Operational Footprint.

6.3.3.6 Poly fluoroalkyl substances (PFAS)

There are no known PFAS investigations that have been undertaken on site or within the vicinity of the Operational Footprint. The closest known area of PFAS contamination is approximately 2.9 km south of the Operational Footprint.

6.3.3.7 Fieldwork

The fieldwork undertaken by RCA established an existing baseline for the Operational Footprint's land characteristics, these observations are detailed in **Table 6.3-3**.

Table 6.3-3: Fieldwork summary (RCA, 2025)

Site aspect	
Topography	The Operational Footprint is generally flat with a slight slope in the central area.
Site condition	The Operational Footprint is vegetated with weeds, small shrubs, and some trees (primarily along the eastern boundary), with the exception of an asphalt hardstand and path over parts of the northern and eastern boundaries. A black steel fence runs around the southern and western perimeter of the Operational Footprint and parallel to the eastern boundary within the Operational Footprint. The northern boundary contains vegetation. An old disused electrical box was found in the northeastern corner of the Operational Footprint amongst the vegetation and concrete blocks, pipes and barriers are stored along the northern boundary along with orange PVC pipes.
Condition of building and roads	The existing Mayfield West substation and the Leading Edge Data centre are adjacent to the Operational Footprint. The asphalt roads and pathways on site appear to be in relatively good condition.
Visual signs of contamination	There were no visual indications of contamination observed prior to the commencement of intrusive works.
Signs of erosion	No visual signs of erosion were identified.

Site aspect	Observation
Presence of drums or waste	No evidence of drums and / or waste beyond the abovementioned storage of construction materials were identified.
Identification of potential asbestos containing materials (ACM)	No visual indications of materials suspected to contain asbestos were identified during the Operational Footprint inspection and as such no asbestos samples were collected.
Visible signs of plant stress	No indications of plant stress were identified.
Odours noticeable on site	No odours were noticeable on site prior to the commencement of intrusive works.
Evidence of current or former petroleum facilities	No indications of former petroleum facilities were identified prior to the commencement of intrusive works.
Chemicals stored on site	No indications of chemical storage were identified on site.
Evidence of waste burial: (anecdotal or otherwise)	No evidence of buried waste materials was observed prior to intrusive works, noting that it has been well established that there is buried industrial and coal waste in the Operational Footprint and within the Steel River Industrial Estate.

6.3.4 Impact assessment

6.3.4.1 Construction

Land use

The site, and surrounding land use is primarily within the *E4 General Industrial* zone. The Project is consistent with, and would maintain, the existing context of the area, being primarily industrial land use.

Assessments of the air quality (refer to **Section 6.11**), traffic (refer to **Section 6.6**) visual amenity (refer to **Section 6.4**) and noise (refer to **Section 6.5**) impacts associated with the Project determined that such potential amenity impacts would be low to negligible. This demonstrates that the Project would be compatible with existing surrounding land uses.

A LUCRA was not prepared for the Project, as it would not alter the land use of the Project or the area surrounding the Project.

Soils and Contamination

The soil assessment (**Table 6.3-4**) identified the following test pit locations that contained contaminants above the relevant ecological criteria.

Table 6.3-4: Soil results above the relevant ecological criteria RCA, 2025)

Sample Identification (depth)			
T ² P1B (1.0 m)	Chromium	310	520
TP2B (1.0 m)	Total recoverable Hydrocarbons (TRH) >C ₁₀ -C ₁₆	170	270
	Chromium	310	760
TP4B (1.0 m)	Benzo(a)pyrene	1.4	5.6
	Chromium	310	420
TP5B (1.0 m)	Benzo(a)pyrene	1.4	2.4

¹ The criteria is available in [Appendix G: Preliminary Detailed and site Investigation](#)

² TP denotes testpit

Sample Identification (depth)	Analyte	Criteria (mg/kg) ¹	Concentration (mg/kg)
TP6C (2.0 m)	Benzo(a)pyrene	1.4	2
TP7A (0.1 m)	Nickel	55	62
TP10A (0.1 m)	TRH >C ₁₀ -C ₁₆	170	180

Whilst the test pits in **Table 6.3-4** contain elevated levels of select contaminants within the Operational Footprint these are not considered to pose a risk to ecological populations or human health. These locations with elevated contaminant levels have likely been caused by historic contamination associated with BHP operations. The 2 m capping layer, however, did not show signs of contamination concentration that exceeded the human health criteria.

Construction works, and specifically excavation, have been considered as the primary risk to the exposure of contaminants. Workers could potentially be exposed to such contaminants through:

- Inhalation of mobilised contaminants
- Dust inhalation
- Dust and soil ingestion
- Dermal contact with dust and soil.

Despite this, there is no further contamination risk provided that the proposed mitigation measures (see **Table 6.3-6**) are implemented appropriately. The Operational Footprint is deemed to be suitable for the proposed development.

6.3.4.2 Operation

Land use

As discussed in **Chapter 4.0**, the operation of the BESS for electricity generating works is permissible with development consent in an area zoned *E4 General Industrial*. The land use objectives of this zone, as described in the Newcastle LEP are outlined in **Table 6.3-6**. This includes a supporting discussion as to whether the Project complies with these objectives.

Table 6.3-5: E4 General Industrial' land use zone objectives

E4 zone objectives	
To provide a range of industrial, warehouse, logistics and related land uses.	• The Project would not conflict with this objective • The Project is located within a well-established industrial area • Construction and operation activities are consistent with industrial land use.
To ensure the efficient and viable use of land for industrial uses.	• The Project would not conflict with this objective • The Project is located within land that is used for industrial purposes • The Project would use the land within the site efficiently and in a viable manner.
To encourage employment opportunities.	• The Project would not conflict with this objective • The Project would directly employ people during the construction and operation phases.
To enable limited non-industrial land uses that provide facilities and services to meet the needs of businesses and workers.	• The Project would not conflict with this objective as it does not propose any non-industrial use of the site.

E4 zone objectives	Discussion
To support and protect industrial land for industrial uses.	- The Project would not conflict with this objective. - The Project will maintain the industrial land use the site and would not threaten any future use of the land for industrial purposes.
To ensure non-industrial land uses do not prejudice the viability of industrial land or other centres.	The Project would not conflict with this objective as it does not propose any non-industrial use of the site.

The operation of the Project would occur in a location surrounded by existing industrial operations and is not expected to adversely affect the land use of this area. The Project complies with all the objectives outlined in **Table 6.3-5**.

Soils and contamination

The operation of the Project would not involve soil disturbance or soil mobilisation and is not expected to involve handling of hazardous materials, therefore, it is not expected that this phase would pose any additional contamination risk.

6.3.5 Mitigation measures

The mitigation measures detailed in **Table 6.3-6** aim to reduce the potential for land use impacts to be incurred by the Project as far as is reasonable and practicable.

Table 6.3-6: Mitigation and management measures - land and soils (RCA, 2025)

ID		
L-1	All workers will be informed of the contamination status of the material below the capping layer and be informed of the procedures and protocols to minimise the potential exposure to themselves and the environment.	All phases
L-2	The Steel River certification process, regulated by City of Newcastle Council, includes a site management plan (SMP) which details the day-to-day requirements of construction work. The SMP will be part of the overall CEMP and will be implemented.	All phases
L-3	All material which is removed from site must be sampled, classified, transported and tracked in accordance with the NSW EPA waste framework.	All phases
L-4	During construction, differential stockpiling of capping materials to any underlying materials, prior to classification being undertaken.	Construction
L-5	No groundwater extraction is to be undertaken unless there is additional assessment into the suitability of the extracted groundwater for the proposed purpose. Any extracted groundwater is to be treated as contaminated unless confirmed otherwise i.e. implementation of occupational hygiene controls for workers and no release of groundwater to the environment	All Phases
L-6	Additions to be made to the SMP as follows: - Training to ensure that all workers undertaking excavation works are aware of the potential for unexpected contamination to be present in the capping layer and the likely presence of contamination at depths beyond 2 mbgs, including free tar and slag. - Minimisation of potential exposure by dust and implementation of occupational hygiene controls to prevent dermal contact and incidental ingestion of soil adhered to skin when conducting any works below a depth of 2 m.	All phases

ID		
	- Stockpiling controls to manage the potential for contaminated material to leave the Operational Footprint via dust or erosion. - The 2 m capping layer is to be maintained throughout construction of the Project. Requirements will be established for the return of soil, in the event that soil is excavated from below the capping layer. If this is not feasible or desirable, appropriate sampling and analysis will be undertaken to determine whether it is appropriate for this material to remain at the Operational Footprint and be subject to waste classification.	
L-7	A Certificate C will need to be obtained under the SMP. A Certificate C involves an environmental auditor reviewing the proposed design of the Project to confirm that it complies with the SMP. This will aim to avoid any penetration of the design below the existing 2 m capping layer.	Construction
L-8	Where soil is left exposed for more than three days, a soil binder will be used to help prevent erosion caused by wind or water. Binders would be used on stockpiles where these are in situ for more than 24 hours.	Pre-construction Construction
L-9	A spill response plan (SRP) will be developed prior to construction, to outline the procedures to follow in the event of a spill to minimise environmental impact and ensure the safety of workers.	Construction Operation
L-10	Impermeable barriers placed between sources of contamination (e.g. contaminated stockpiles or certain materials) and the natural ground.	Construction Operation
L-11	Hazardous materials such as chemicals, fuels and oils will be handled and stored in accordance with relevant Australia Standards and the NSW EPA's Storing and Handling of Liquids: Environmental Protection Participants Handbook (DECC, 2007).	Construction Operation

6.4 Visual amenity

6.4.1 Secretary's Environmental Assessment Requirements

Table 6.4-1 sets out the SEARs relevant to visual and where the requirements have been addressed in this EIS.

Table 6.4-1: Relevant SEARs - visual

Relevant SEARs	
The EIS must address the following specific matters: a detailed assessment of the likely visual impacts of all components of the project on surrounding residences (including approved developments, lodged development applications and dwelling entitlements), and key locations, scenic of significant vistas and road corridors in the public domain; and	A Visual Impact Assessment (VIA) has been prepared, which addresses the impacts to surrounding residences and other key locations and scenic vistas and is attached in Appendix M.
details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners)	Mitigation measures to manage potential visual impacts are detailed in Section 6.4.5.

6.4.2 Methodology

6.4.2.1 Assessment approach

The VIA has been prepared by Aurecon (2025) (**Appendix M**) based on the following approach:

- Identification of a visual Study Area, where the Project has the potential to be visible from the surrounding environment
- Determine the baseline environment against which the project is assessed against, including permitted land uses, proposed projects, biophysical characteristics and aesthetic value
- Identification of key viewpoints that encapsulate potential impacts on sensitive receivers
- Undertaking a field visit to capture photographs from viewpoints and ground truth desktop findings
- Production of artists' impressions of imagery indicating the magnitude of visual changes
- Considering the combination of visual sensitivity and magnitude of the change, based on the detailed design after one year of operation
- Determine the significance of visual impacts for each viewpoint using the matrix detailed in **Table 6.4-4**.
- Outline the mitigation measures to avoid and manage visual impacts that arise from the Project.

The VIA applied best practice industry guidelines, including the following:

- Technical Supplement – Landscape and Visual Impact Assessment, Large-Scale Solar Energy Guideline*, NSW Department of Planning, Housing and Infrastructure (DPHI), August 2022
- Guideline for Landscape Character and Visual Assessment - Environmental Impact Assessment Practice Note EIA-NO4*, Transport for New South Wales (TfNSW), 2020
- Guidance Note for Landscape and Visual Assessment, Australian Institute of Landscape Architects*, June 2018

- *Guidelines for Landscape and Visual Impact Assessment (third edition)*, Landscape Institute of Environment Management and Assessment (IEMA), 2013.

The *Landscape and Visual Impact Assessment – Large Scale Solar Energy Guideline* (DPHI, 2022) also outlines a specific process for undertaking VIA for BESS projects, as outlined in **Figure 6.4-1**. The assessment of the visual impacts for the Project concluded at Stage 4 in this process.

6.4.2.2 Study Area

The height of the key components of the Project and the distance in which they can be viewed, as well as the surrounding visual context from where the Project can be viewed were considered in determining the area that needed to be analysed. The Study Area considered in the VIA covers the site plus a 500 m buffer.

The VIA used topographic data to determine the viewshed in which the Project was potentially visible.

Within the Study Area, specific viewpoints were identified for detailed assessment within the VIA. The selection of viewpoints was based on locations that are publicly accessible, are representative of sensitive receivers, and are within the mapped zone of theoretical visibility (ZTV). **Figure 6.4-2** shows the ZTV, the Study Area and the four viewpoint locations that were assessed.

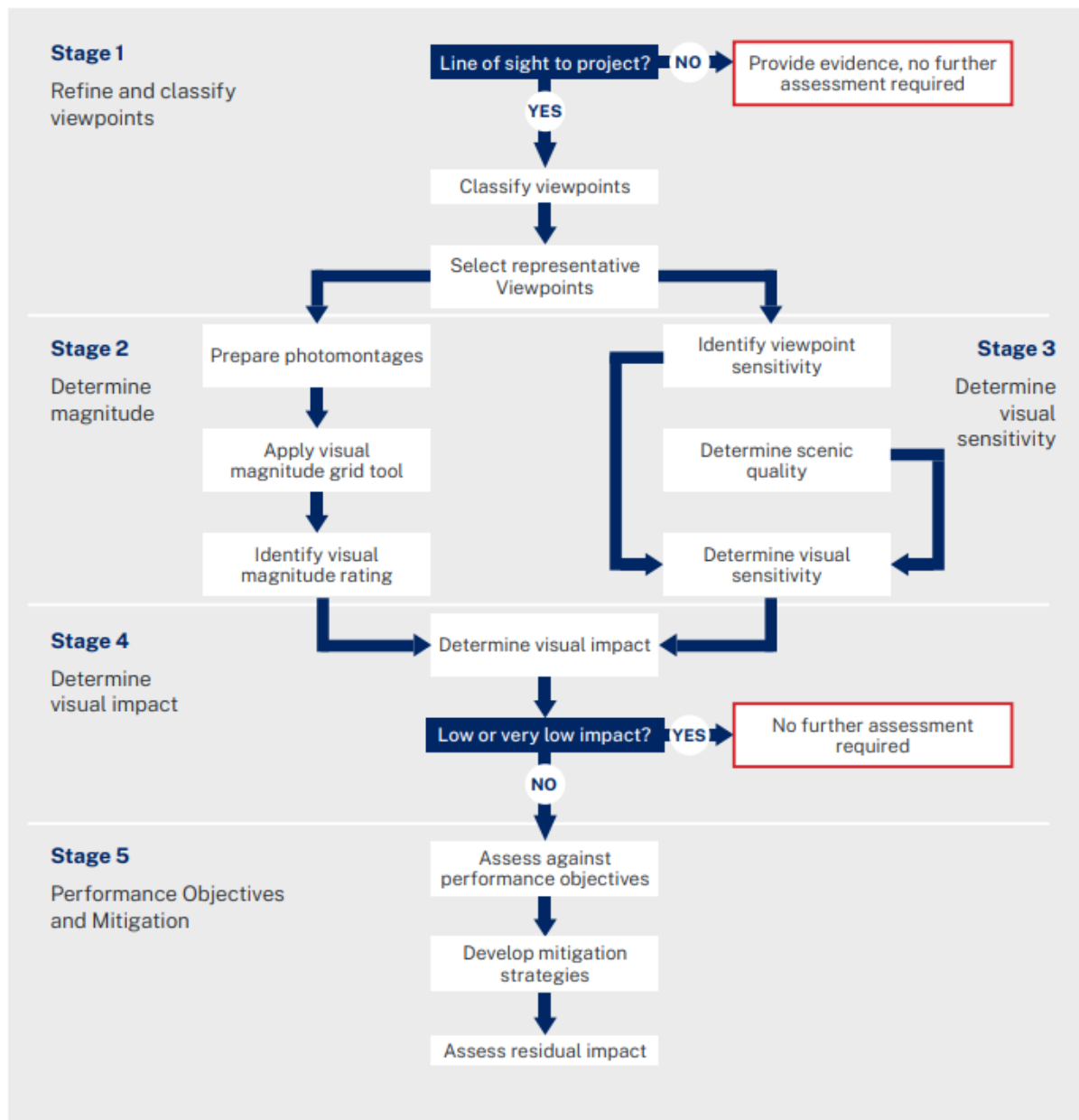
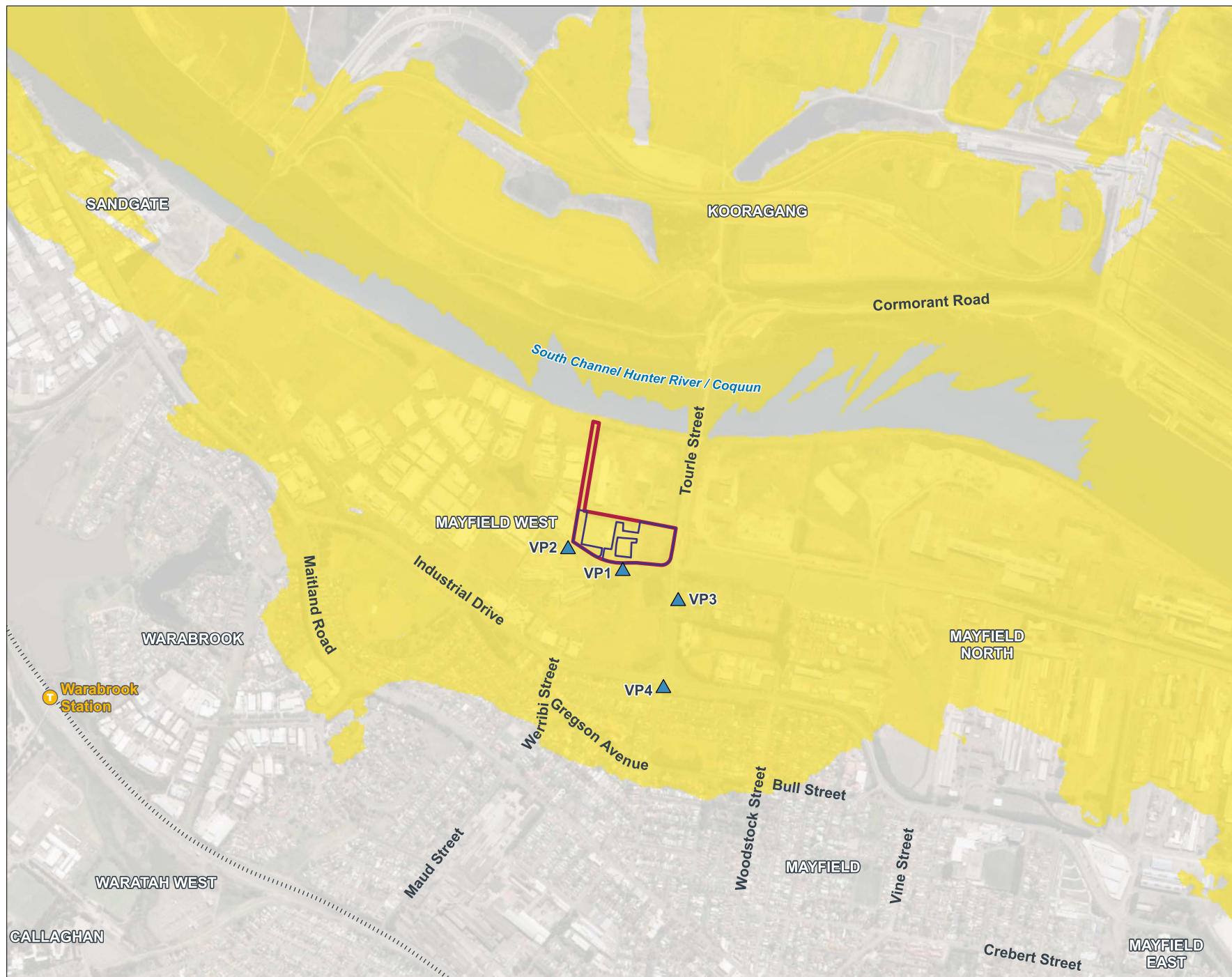


Figure 6.4-1: Detailed visual impact assessment process (DPHI, 2022)

FIGURE 6.4-2:
ZTV AND VIEWPOINT
LOCATIONS



Legend

-  The site
-  Project Area
-  Railway
-  Railway station
-  Viewpoint

Zone of Theoretical Visibility

-  Visible

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6.4.2.3 Visual impact assessment

Magnitude of change

The magnitude of change is how well the development / change contrasts or blends with the surrounding land use based on varying levels of visual prominence (Aurecon, 2025).

The description of the magnitude ratings used in this assessment are outlined in **Table 6.4-2** below.

Table 6.4-2: Viewpoint magnitude ratings (Aurecon, 2025)

Magnitude	Description
High	The Project, or part of it, would become the dominant feature or focal point of the view.
Moderate	The Project, or part of it, would form a noticeable feature or element of the view which is readily apparent to the receiver.
Low	The Project, or part of it, would be perceptible but not alter the overall balance of features and elements that comprise the existing view.
Very low	The Project, or part of it, would be perceptible, but the introduction of elements is commensurate with surrounding elements and/or is partially screened.
Negligible	Only a very small part of the Project would be discernible, or it is at such a distance that it would form a barely noticeable feature or element of the view.

Visual sensitivity

Visual sensitivity is the sensitivity of the viewer to the development / change and distance from the viewpoint (Aurecon, 2025). **Table 6.4-3** outlines the matrix used to determine the sensitivity of viewers for the Project.

Table 6.4-3: Viewer sensitivity determination matrix (Aurecon, 2025)

Land use (sensitivity of the viewing location)					
	0 – 200 m	201 – 500 m	501 – 1,000 m	1001 – 2,000 m	>2,000 m
Residential / Accommodation					
Parks and reserves					
Health care facilities					
Educational facilities					
Community facilities					
Shared use paths					
Commercial					
Arterial road					
Local road					
Industrial areas					

Assigning a level of impact

The visual impact is determined by combining the ratings for visual sensitivity and magnitude of change according to the matrix shown in **Table 6.4-4**.

Table 6.4-4: Impact determination matrix (Aurecon, 2025)

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-Low	Negligible
	Low	Moderate	Moderate-Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

6.4.2.4 Assumptions and limitations

There a series of assumptions and limitations were made for the purpose of this VIA, which are detailed in **Appendix M**.

6.4.2.5 Photomontages

Photomontages were prepared to show the Project overlaid on an existing photograph of the site. The method for producing photomontages followed the *Guideline for landscape character and visual impact assessment – Environmental impact practice note EIA-N04* (TfNSW, 2020).

Four viewpoints were assessed within the VIA (see **Section 6.4.3**). Photomontages were produced for two of the four viewpoints:

- Viewpoint 1: McIntosh Drive
- Viewpoint 3: Tourle Street.

The photomontages at day 1 of operation, depict the current design of key elements available when this EIS was prepared. These photomontages are detailed in **Appendix M**.

6.4.3 Existing environment

6.4.3.1 Site context

Land use

The Project is proposed on land zone as *E4 General Industrial*. The surrounding land shares this zoning and accommodates a range of activities, including a recycling facility and other industrial operations. Surrounding land uses are mapped in **Figure 2-1**. Further detail on the land use of the surrounding area is provided in **Section 6.3**.

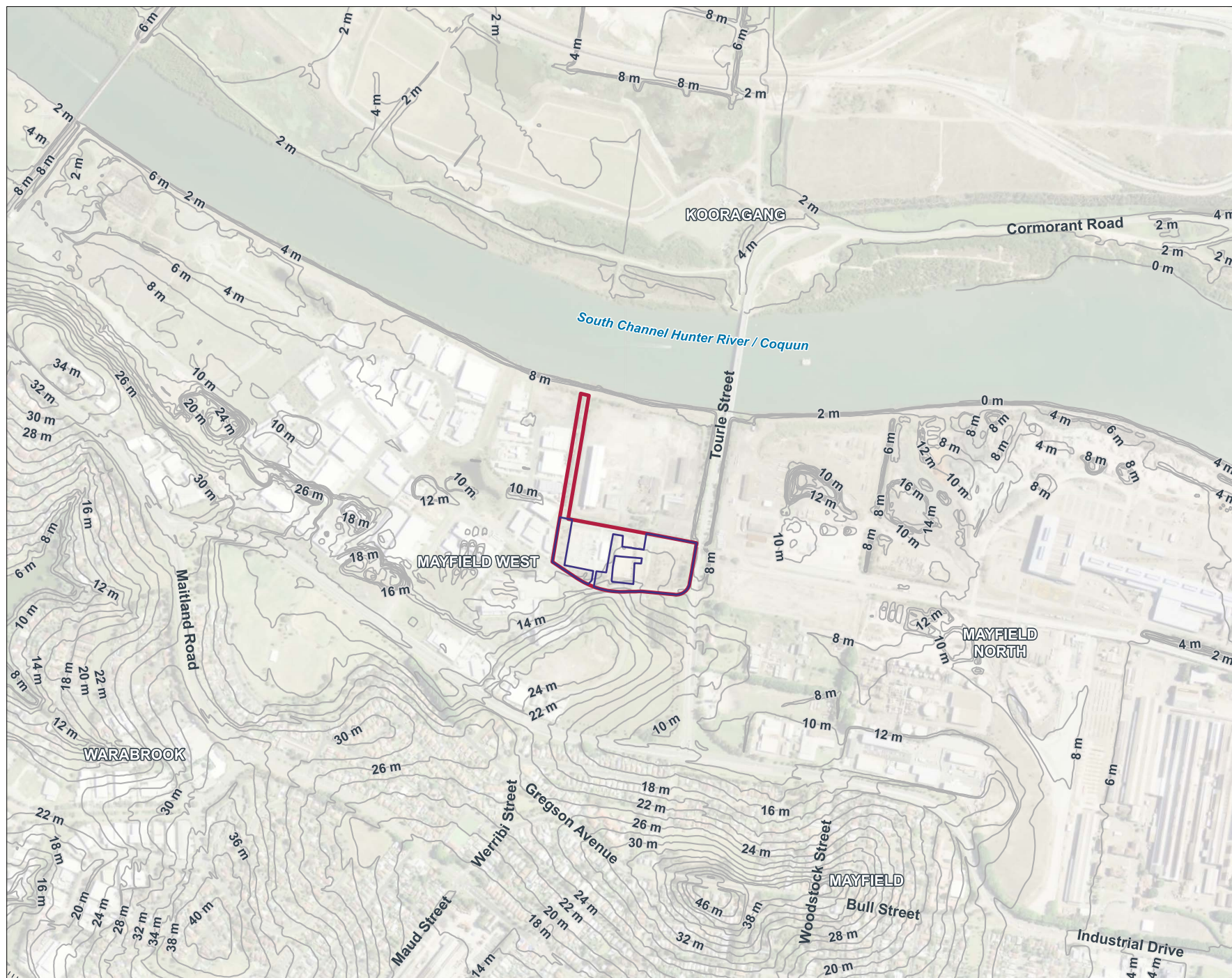
The closest residential property is approximately 400 m south of the Project. Residential receivers are mapped on **Figure 6.5-1**.

Topography, landform and waterways

The Project is at an elevation of approximately 6 m and is relatively flat, with a low rise to the southwest of the Study Area rising to 22 m elevation.

The Project is located approximately 300 m from the south channel of the Hunter River and is within the Ironbark Creek catchment. Refer to **Figure 6.4-3** for the topography mapping within and surrounding the Study Area.

**FIGURE 6.4-3:
TOPOGRAPHY
SURROUNDING
THE SITE**



Legend

- The site
- Project Area
- 2 m contour

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Visual context

The Project is located within a heavily industrialised area where transmission towers, powerlines, and other industrial facilities are prominent visual presences.

The Project is most visible from land immediately adjacent to the site, including nearby roads such as Tourle Street to the east and McIntosh Drive to the south. The taller transmission towers that connect to the substation are visible from a distance, however the local topography and the surrounding buildings obscure views of the majority of the Project Area.

Most of the closest residential dwellings have vegetation obstructing their north facing view, particularly those properties along Groongal Street and Simpsons Court.

The presence of intervening tall buildings and the northward elevation of the landscape towards the Project, from nearby residences means that the existing Mayfield West substation is not visible by residents south of the Project.

6.4.3.2 Viewpoints

The existing environment of the viewpoints considered in this VIA are outlined in **Table 6.4-5**.

Table 6.4-5: Representative viewpoint locations (Aurecon, 2025)

Viewpoint				
Viewpoint 1 (VP1)	McIntosh Drive – 70 m west of Project	Shared user path users / Industrial workers	This viewpoint is positioned on the corner McIntosh Drive and Murray Dwyer Circuit, looking northeast to east, towards the Project. The viewpoint is representative of the industrial workers that operate in this area and those who use the shared user path. In the foreground of VP1 is McIntosh Drive and grassed nature strips adjacent to pedestrian paths. Driveways are present allowing vehicles to access businesses and depots. The shared user path connects McIntosh Drive and Murray Dwyer Circuit with Tourle Street. The boundary of the site near Tourle Street is comprised of tall native trees, with understorey vegetation also visible from VP1.	Figure 6.4-4
Viewpoint 2 (VP2)	McIntosh Drive – 250 m west of Project	Industrial workers	This viewpoint is positioned looking northeast towards the Project from McIntosh Drive and is representative of how vehicle users and industrial workers would view the site. This viewpoint shows an industrial estate with low-to-medium vegetation surrounding the existing Mayfield West substation. The substation control room is located between the viewpoint and the Project Area, which obstructs views to the Project. Wide nature strips are visible in the foreground, with power lines spanning the top of the viewpoint. Theoretically, the Project should be visible from VP2 (based on topography alone), however the site visit confirmed that the Project would not be able to be seen from this location.	Figure 6.4-5

Viewpoint				
Viewpoint 3 (VP3)	Tourle Street – 150 m southeast of Project	People in vehicles	This viewpoint observes the Project in a north-westerly direction from Tourle Street and is representative of how vehicle users would view the Project. VP3 shows a highly modified industrialised setting, with Tourle Street in the foreground offering a busy two-lane, bi-directional road with cycle lanes. The far left of the viewpoint shows Hymix Steel River Plant with cement trucks on site. The far right of the viewpoint displays Benedict Recycling. The Project is central in this viewpoint but is sheltered by dense vegetation in the middle ground and trees on the eastern boundary of the site.	Figure 6.4-6
Viewpoint 4 (VP4)	Industrial Drive/Tourle Street – 430 m south of Project	Residents to the south of the Project	This viewpoint observes the Project from Industrial Drive, looking north towards the Project. The viewpoint is representative of how residents on Groongal Street and Simpson Court would view the Project. These residents would not be able to view the Project from within their houses due to high fences, tall trees along Industrial Drive and the hill crest on Tourle Street obstructing the view. The foreground of VP4 contains the Industrial Drive and Tourle Street intersection, with traffic signals and road and street signage. Streetlights and power poles are present in the middle ground and background. To the right, there is a vacant industrial lot that is screened by tall trees, and to the left are a range of commercial and industrial buildings. The background consists of Hymix Steel River Concrete Plant silos and trees which lie adjacent to the Project Area.	Figure 6.4-7



Figure 6.4-4: VP1 McIntosh Drive looking east towards the Project (Aurecon, 2025)



Figure 6.4-5: VP2 McIntosh Drive, looking northeast towards the Project (Aurecon, 2025)



Figure 6.4-6: VP3 Tourle Street, looking northwest towards the Project (Aurecon, 2025)



Figure 6.4-7: VP4 Industrial Drive, looking north towards the Project (Aurecon, 2025)

6.4.4 Impact assessment

6.4.4.1 Construction

Viewpoint 1

During construction, there will be a noticeable removal of existing vegetation which will alter the view of the foreground. There will also be an increase in vehicle numbers, though these factors combined are deemed to be a low magnitude of change within the context of the existing industrial area.

The visual sensitivity at VP1 is deemed to be low as the primary receptors at this viewpoint are expected to be industrial workers, and the Project aligns with the current aesthetic in the industrial estate.

Viewpoint 2

The Project is not visible from this viewpoint as it is screened by the existing substation, buildings and the rise of the hill, despite being located within the visible area within the ZTV. The sensitivity level is deemed low as the primary visual receptors are anticipated to be workers and commuters within the industrial area. Construction will not be visible from VP2; therefore, the magnitude of change is negligible.

Viewpoint 3

During construction, there will be a noticeable removal of existing vegetation which will alter the view of the foreground. There will also be an increase in vehicle numbers, though these factors combined are deemed to be a low magnitude of change within the context of the existing industrial area.

The visual sensitivity at VP1 is deemed to be low as the primary receptors at this viewpoint are expected to be industrial workers, and the Project aligns with the current aesthetic in the industrial estate.

Viewpoint 4

The Project is not visible from this viewpoint as it is screened by buildings, trees and the crest of the hill. Removal of trees to the east of the Project Area would cause minimal disruption to the visual aesthetic from this viewpoint. The visual sensitivity is deemed to be moderate, as there are residential dwellings located at VP4, however, there is no Project visibility, which therefore means that there is a negligible magnitude of change.

6.4.4.2 Operation

Viewpoint 1

During operation the Project will be visible from behind security fences. The components of the Project are lower than the existing built elements, and the background native vegetation will be visible. The magnitude of change is expected to be low at day one of operation.

Viewpoint 2

The Project would not be visible at VP2 at day one of operation as it will be screened by the existing Mayfield West substation. As such the magnitude of change is negligible.

Viewpoint 3

During operation, the Project will be visible from behind security fences. The components of the Project are lower than the existing built elements, and the background native vegetation will be visible. The magnitude of change is expected to be low at day one of operation.

Viewpoint 4

During operation, the Project would be screened by the crest of the hill and would not be visible from VP4. As such the magnitude of change is negligible.

6.4.4.3 Summary of impact

Table 6.4-6 summarises the impact from each of the viewpoints that the Project will have during construction and operation.

Table 6.4-6: Visual impact summary

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High				
	Moderate				VP4 – Construction VP4 - Operation
	Low			VP3 – Construction VP3 – Operation VP1 – Construction VP1 - Operation	VP2 – Construction VP2 - Operation
	Negligible				

Existing buildings, infrastructure and natural obstructions such as trees and topography all limit the impact that the Project will have during construction and operation. Given this, the VIA concludes that the Project overall will have low to-negligible visual impacts.

6.4.5 Mitigation measures

The proposed mitigation measures would aim to reduce the potential visual impacts of the Project to the greatest extent practicable. The measures that would be implemented during detailed design, construction and operation of the Project are detailed in **Table 6.4-7**.

Table 6.4-7: Mitigation and management measures - visual amenity (Aurecon, 2025)

ID		
V-1	Minimise the removal of existing vegetation along the site boundaries where possible.	Design
V-2	Provide a native planting buffer along the east and south boundaries (facing the SUP and Tourle Street) to provide screening effect.	Design
V-3	Limit the area of disturbance during construction where possible.	Construction
V-4	All areas disturbed by construction and not required for operation of the Project are to be rehabilitated, to soften appearance of the Project and provide permeable surface.	Construction
V-5	Storage areas and associated construction support equipment are to be located in cleared or otherwise disturbed areas away from public interfaces, where possible.	Construction
V-6	Lighting for the site is to be designed to minimise glare issues and light spillage into adjacent areas and should be generally consistent with the requirements of Australian Standard 4282-1997 <i>Control of the obtrusive effects of outdoor lighting</i> .	Operation
V-7	Where bespoke equipment or buildings are selected (e.g. control room) materials, colour and finishes should mitigate appearance of bulky structures and minimise glare through use of matt or low-sheen finishes. It is noted that all other equipment will be as per the manufacturer's default colour specifications.	Operation

6.5 Noise and vibration

6.5.1 Secretary's Environmental Assessment Requirements

Table 6.5-1 sets out the SEARs relevant to noise and vibration and where the requirements have been addressed in this EIS.

Table 6.5-1: Relevant SEARs - noise

Relevant SEARs	
The EIS must address the following: - an assessment of the construction noise impacts (including impacts from proposed road upgrades) of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), traffic noise in accordance with the NSW Road Noise Policy (DECCW, 2011) and cumulative noise impacts (considering other developments in the area), including (where appropriate): - identification of impacts associated with construction, site emission and traffic generation and noise sensitive receivers - details of the noise monitoring survey, background noise levels and amenity noise levels at the most impacted residential receivers - details of the likely daily charging/discharging load profile, manufacturer specifications for plant and equipment and a noise source inventory - an assessment of 'worst case' noise emission scenarios during periods of discharging and charging - consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area; and - details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration impacts following application of these mitigation measures and details of any proposed compliance monitoring programs	Section 6.5.4 Section 6.5.4 Section 6.5.2 Sections 6.5.2 and 6.5.4 Section 6.5.4 Section 6.5.3 Section 6.5.5

6.5.2 Methodology

A Noise and Vibration Impact Assessment (NVIA) by AECOM (2025) has been undertaken for the Project to assess the potential noise and vibration impacts through construction and operation. This technical report is attached in **Appendix H**, with relevant aspects summarised within this chapter.

The NVIA was prepared in accordance with the following guidelines:

6.5.2.1 Construction

- Interim Construction Noise Guideline* (ICNG), Department of Environment and Climate Change, NSW DECC (2009)
- Assessing Vibration: a technical guideline*, Department of Environment and Conservation (DECC 2006)
- Construction Noise and Vibration Guideline (Public Transport Infrastructure)*, Transport for NSW TfNSW (2023)
- NSW Road Noise Policy* (RNP), Department of Environment, Climate Change and Water NSW (DECCW 2011).
- NSW Protection of the Environment Operations Act 1997* (POEO Act 1997)
- NSW Noise Policy for Industry*, NSW Environment Protection Authority (EPA 2017)

- *NSW Road Noise Policy*, Department of Environment, Climate Change and Water NSW (DECCW, 2011).

6.5.2.2 Operation

The noise and vibration impact assessment involved the following:

- Establishing the existing background noise levels in accordance with the *NSW Policy for Industry*, (NPfI, 2017)
- Identifying the relevant sensitive noise receivers
- Undertaking a construction noise and vibration impact assessment
- Determining the construction noise and vibration management levels applicable to the identified sensitive receivers
- Quantitative assessment of the noise and vibration generated during construction, including that arising from additional traffic generated by the Project
- Undertaking an operational noise and vibration impact assessment
- Determining industrial project noise trigger levels applicable to relevant sensitive noise receivers
- Quantitative assessment of the noise and vibration generated during operation, including that arising from additional traffic generated by the Project
- Mitigation measures to avoid, reduce or manage construction and operational noise impacts associated with the Project.

Establishing existing noise background levels

Long term unattended and short term attended measurements were undertaken to establish the existing ambient and background noise levels.

Unattended noise measurements

Unattended noise measurements were conducted at the northern boundary of 19 Groongal Street Mayfield West, from 4 April 2024 until 24 April 2024 (the sample period). These were designed to measure the existing background noise levels over the sample period for the purposes of determining a baseline background noise level.

Noise data collected during the sample period that was affected by severe weather conditions or extraneous noise events were excluded from the monitoring, in accordance with NPfI (2017).

During the sample period the L_{A1} , L_{A10} , L_{A90} , and L_{Aeq} levels of the noise environment were determined. The L_{A1} , L_{A10} and L_{A90} noise levels are the levels exceeded for 1%, 10% and 90% respectively. The L_{Aeq} is the equivalent continuous sound level of the sample period. This level has the same sound energy as the actual noise environment.

The L_{A90} noise levels were used to determine the assessment background level (ABL) for the day, evening, and night periods respectively. The ABL is established by determining the bottom ten-percentile of L_{A90} data acquired during each time of day. A rating background level (RBL) for the day, evening and night periods was then determined based on the median of the individual ABLs over the entire sample period.

Table 6.5-12 presents the existing overall representative L_{Aeq} ambient noise level and the background L_{A90} noise levels for the day, evening and night-time periods, in accordance with the NPfI. For the results of each day of logging, refer to **Appendix H**.

Attended noise measurements

Attended noise measurements were conducted at both the unattended monitoring location and near the existing substation during clear weather conditions in the daytime period on 24 April 2024, with each measurement conducted over a 15-minute period. Refer to **Table 6.5-13** for the results of the attended noise measurements.

6.5.2.3 Construction noise assessment approach

Construction noise criteria

Construction of the Project would occur during standard working hours, as outlined in the ICNG being:

- Monday to Friday 7.00 am to 6.00 pm
- Saturday 8.00 am to 1.00 pm
- No works on Sundays and Public Holidays.

The ICNG establishes the assessment approach for considering construction noise impacts on sensitive receivers, including whether residential receivers would be considered to be 'highly noise affected'. The guideline also guides the preparation of methods to mitigate construction noise impacts.

The ICNG was used to determine the noise management levels (NMLs) for residential and non-residential noise receivers that may be affected by construction noise from the Project. These NMLs are outlined in **Table 6.5-4** and **Table 6.5-5** below.

The ICNG does not cover noise from construction traffic on public roads, however it does refer to the RNP (2011) (RNP) for the consideration of noise generated by construction traffic on residential receivers. Further assessment is required where predicted construction traffic noise levels increase would exceed 2dB(A) A-weighted decibel and exceeds the road category specific criteria (refer to **Table 6.5-2**). The RNP does not require assessment of construction road traffic noise impacts to commercial or industrial receivers.

Table 6.5-2: Road traffic noise assessment criteria

Road category	Type of land use	Assessment criteria, dB(A)	
		Day (7am – 10pm)	Night (10pm – 7am)
Freeway/arterial/sub-arterial road	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	L _{Aeq} (15 hour) 60 dB(A)	L _{Aeq} (9 hour) 55 dB(A)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	L _{Aeq} (1 hour) 55 dB(A)	L _{Aeq} (1 hour) 50 dB(A)

Noise catchment areas

Noise catchment areas (NCAs) are used to group residential receivers within a similar noise environment. Construction NMLs are then applied to these groups as a whole. Generally, NCAs are defined based on the unattended noise monitoring locations. Unattended noise monitoring for the Project was conducted at one location only. However, the background noise levels measured at this location are not considered representative for residential receivers located further away from major roads such as Industrial Drive and the Pacific Highway (Maitland Road), and two NCA's have been determined as a result. **Table 6.5-3** outlines the NCAs used for the purposes of the assessment.

Table 6.5-3: Noise catchment areas

NCA		
1	Residential receivers with line of sight to Industrial Drive and Pacific Highway (Maitland Road)	Measured L _{A90} noise levels for NL1
2	All other residential receivers (no line of sight to Industrial Drive and Pacific Highway (Maitland Road))	Measured L _{A90} noise levels for NL1 – 5 dB(A) ³

³ The L_{A90} background rating noise levels for NCA 2 have been determined by subtracting 5 dB(A) from the measured L_{A90} noise levels for NL1 in order to account for shielding provided by the first row of residential buildings in NCA 1

Project specific construction noise criteria

The construction NMLs for residential receivers within each NCA, as well as the NMLs for non-residential receivers, were established based on the INCG standards (**Table 6.5-4** and **Table 6.5-5**).

Table 6.5-4: Construction noise management levels - residential receivers

Noise catchment area	Construction NML $L_{Aeq, 15min}$ dB(A)			
	Standard hours (RBL + 10)	Outside standards hours (RBL + 5)		Highly noise level affected
	Day	Evening	Night	
NCA 1	67	58	51	75
NCA 2	62	53	46	

Table 6.5-5: Construction noise management levels – non-residential receivers

Land use	
Industrial premises	External noise level 75 dB(A)
Commercial premises (offices, retail outlets)	External noise level 70 dB(A)
Education (classrooms at schools and other educational institutions and childcare centres)	External noise level 55 dB(A)
Medical (hospital wards and operating theatres)	External noise level 55 dB(A)
Places of worship	External noise level 55 dB(A)
Active recreation areas (characterised by sporting activities and activities which generate their own noise or focus for participants, making them less sensitive to external noise intrusion)	External noise level 65 dB(A)
Passive recreation areas (characterised by contemplative activities that generate little noise and where benefits are compromised by external noise intrusion, for example, reading, meditation)	External noise level 60 dB(A)
Community centres	External noise level 55 dB(A)

Construction noise modelling scenarios

Table 6.5-6 provides a summary of the construction noise scenarios used for this assessment, including the proposed construction plant/equipment for each scenario and their associated sound power levels. The three scenarios with the potential greatest noise production were selected for assessment:

- Scenario 1 – Site establishment
- Scenario 2 – Civil works for BESS
- Scenario 5 – Landscaping.

All scenarios were assessed as standard hours construction work, as all major construction work is expected to be completed during standard hours only.

Table 6.5-6: Construction assessment staging and scheduling

Phase			
Scenario 1	Site establishment	Excavator (5 t)	93
		Front end loader	104
		Truck – dump	110
		Grader	114
		Truck – road	108
		Compactor	101
		Truck – water	113
		Light vehicle (4WD)	103
		Diesel generator	103
		Total	118
Scenario 2	Civil works for BESS	Hand tools	94
		Crane – franna	97
		Diesel generator	103
		Pump – concrete	109
		Front end loader	104
		Bobcat	104
		Truck – dump	110
		Excavator (5 t)	93
		Grader	114
		Compactor	101
		Truck – water	113
		Truck – concrete	109
		Elevated work platform	97
		Saw – concrete	118
		Backhoe	111
		Light vehicle (4WD)	103
		Total	122
Scenario 5	Landscaping	Excavator (5 t)	93
		Crane – franna	98
		Diesel generator	103
		Truck – road	108
		Light vehicle (4WD)	103
		Total	110

Noise levels due to the construction activities shown in **Table 6.5-6** have been predicted at nearby noise sensitive receivers using SoundPLAN 8.2 noise modelling software. The noise model was created to represent 'reasonable' worst-case periods of construction works. The following features were included in the noise model:

- Ground topography
- Ground absorption and reflection
- Receivers
- Construction noise sources.

Refer to **Section 6.5.4** for the results of the construction noise impact assessment.

Table 6.5-6 outlines the equipment used during each construction scenario and none of which produce significant vibration that warrants assessment. No vibration assessment was produced as a result.

6.5.2.4 Operational noise assessment approach

Operation noise criteria

The NPfI sets out a procedure to determine noise trigger levels relating to the operation of a development. The assessment procedure for industrial noise sources has two components that must be satisfied:

- Controlling intrusive noise impacts in the short term for residences
- Maintaining longer term noise level amenity for residences and other land uses.

Both components are assessed at the most affected point at or within the property boundary of the noise sensitive receiver. These criteria apply to environmental noise emissions from any plant installed as part of the Project, and for residential receivers, represent the lower of the intrusive or amenity criteria.

Intrusive noise

The NPfI states that the intrusiveness of an industrial noise source may generally be considered acceptable if the level of noise from the source (L_{Aeq} level), measured over a 15-minute period, does not exceed the background noise level measured by more than 5 dB. The RBL is the background noise level to be used for assessment purposes and is determined by the methods given in the NPfI.

The RBL and intrusive noise criteria for the Project are shown in **Table 6.5-7**.

Table 6.5-7: Recommended $L_{Aeq, 15 \text{ minute}}$ intrusive noise criteria levels from industrial noise sources

Time of day ⁴		
Day	57	62
Evening	53	58
Night	46	51

Protecting noise amenity

The maximum ambient noise level resulting from industrial noise resources should not exceed the recommended amenity noise levels for that locality and its land uses. The relevant amenity criteria for the Project are shown in **Table 6.5-8**.

⁴ Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays and Public Holidays. Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday and Public Holidays. Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays and Public Holidays.

Table 6.5-8: Recommended L_{Aeq} amenity noise levels from industrial noise sources

Type of receiver	Time of day	Recommended L_{Aeq} noise level dB(A)
Residence – urban	Day	60
	Evening	50
	Night	45
Commercial premises	When in use	65
Industrial premises	When in use	70
School classroom – internal	Noisiest 1-hour period when in use	40
Hospital ward – internal	Noisiest 1-hour	35
Hospital ward – external	Noisiest 1-hour	50
Place of worship – internal	When in use	40
Active recreation area	When in use	55

The Project is located in an area with high road traffic noise from surrounding major roads such as Industrial Drive and Tourle Street. The noise from high traffic volumes can make external industrial noise sources inaudible, even if the L_{Aeq} noise level from the industrial source exceeds the project amenity noise level. In such cases, the NPfI states that the project amenity noise level may be derived from the $L_{Aeq, period(traffic)}$ minus 15 dB(A).

The NPfI specifies that the high traffic project amenity noise level may be applied if all the following apply:

- Traffic noise is identified as the dominant noise source at the site
- The existing traffic noise level is 10 dB or more above the recommended noise amenity level for the area
- It is highly unlikely traffic noise levels will decrease in the future.

As all of the above conditions apply to the Project, the high traffic project amenity noise levels have been adopted. **Table 6.5-9** presents the high traffic project amenity noise levels for residential receivers. As per the NPfI, the project amenity level is converted to a 15-minute period by adding 3 dB(A).

Table 6.5-9: High traffic project amenity noise levels for residential receivers from industrial sources (AECOM, 2024b)

Time of day		
Day	75	63
Evening	73	61
Night	70	58

Project specific noise criteria

Based on the RBLs for each NCA, the environmental noise criteria in **Table 6.5-10** has been used to assess the potential noise impacts from the operation of the Project.

Table 6.5-10: Project specific noise levels (AECOM, 2024b)

Receiver	Period ⁵	RBL ($L_{A90, 15 \text{ min}}$)	Intrusive criterion ($L_{A90, 15 \text{ min}}$)	Amenity criterion ($L_{A90, 15 \text{ min}}$)	Project specific noise criteria ($L_{A90, 15 \text{ min}}$) ⁶
Residential	Day	57	62	63	62
	Evening	53	58	61	58
	Night	46	51	58	51

Tonality and NPfl modifying factors

Where a noise source contains certain characteristics, such as tonality, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same sound power level.

Fact Sheet C in the NPfl sets out corrections for annoying characteristics. The corrections are to be applied having regard to:

- The contribution noise level from the premises when assessed/measured at a receiver location
- The nature of the noise source and its characteristics.

The annoying characteristic corrections that are potentially applicable to the Project are detailed in **Appendix H**. It was determined that one correction would be applied based on the tonality of the Project's operational noise. The implementation of this correction is detailed in **Section 6.5.4**.

Sleep disturbance criteria

Based on the measured background noise levels during the night, the sleep disturbance criteria required for compliance for the nearest noise sensitive residential receivers are presented in **Table 6.5-11**.

Table 6.5-11: Night-time sleep disturbance screening levels (AECOM, 2024b)

Location	Measured night-time RBL, $L_{A90, 15 \text{ min}}$ dB(A)	Sleep disturbance screening levels for compliance, dB(A)	
		$L_{Aeq, 15 \text{ min}}$	$L_{AF, \text{ max}}$
Residential	46	51	61

6.5.3 Existing environment

6.5.3.1 Existing noise levels

Table 6.5-12 presents the existing overall representative ambient noise level and the rating background levels for the day, evening and night periods for the sample period.

Table 6.5-12: Existing background (L_{A90}) and ambient (L_{Aeq}) noise levels (AECOM, 2024b)

Noise logger (NL) ID	Location	L_{A90} RBL, dB(A)			Log average noise (ambient) L_{Aeq} levels dB(A)		
		Day	Evening	Night	Day	Evening	Night
NL1	Industrial Drive, northern boundary of 19 Groongal Street	57	53	46	75	73	70

⁵ Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays and Public Holidays. Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday and Public Holidays. Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays and Public Holidays

⁶ Project specific noise levels determined as the lowest of the intrusive and amenity criteria.

The results of the attended noise monitoring are presented in **Table 6.5-13**. The daytime measurements indicate that the residential receivers (along Industrial Drive) are generally affected by road traffic noise.

Table 6.5-13: Attended noise measurements (AECOM, 2024b)

Location	Date and time	L _{Aeq} dB(A)	L _{A90} dB(A)	Comments
Industrial Drive, northern boundary of 19 Groongal Street	24 April 2024 2:02 pm	76	66	Road traffic noise on Industrial Drive dominant, 65-78 dB(A). Police car pass-by with sirens on, 87 dB(A). Cars accelerating on Industrial Drive, 75 dB(A).
1 McIntosh Drive	24 April 2024 2:44 pm	66	53	Road traffic noise dominant. Car pass-bys on McIntosh Drive, 55-68 dB(A). Distant industrial noise from the north. Shovelling and scraping at the rear of Qualtest Laboratory. Concrete truck pass-by on McIntosh Drive, 75-77 dB(A). No audible noise heard from existing substation.

6.5.3.2 Sensitive receivers

The existing acoustic environment is largely defined by general industrial noise and road traffic noise along Industrial Drive. The nearby sensitive receivers that could be affected by construction and operational noise are shown on **Figure 6.5-1**. The closest residential receivers are approximately 400 m to the south of the site. The closest non-residential sensitive receivers are located to the southwest of the site and include a childcare centre (approximately 340 m), places of worship (approximately 350 m), and a school (approximately 520 m).

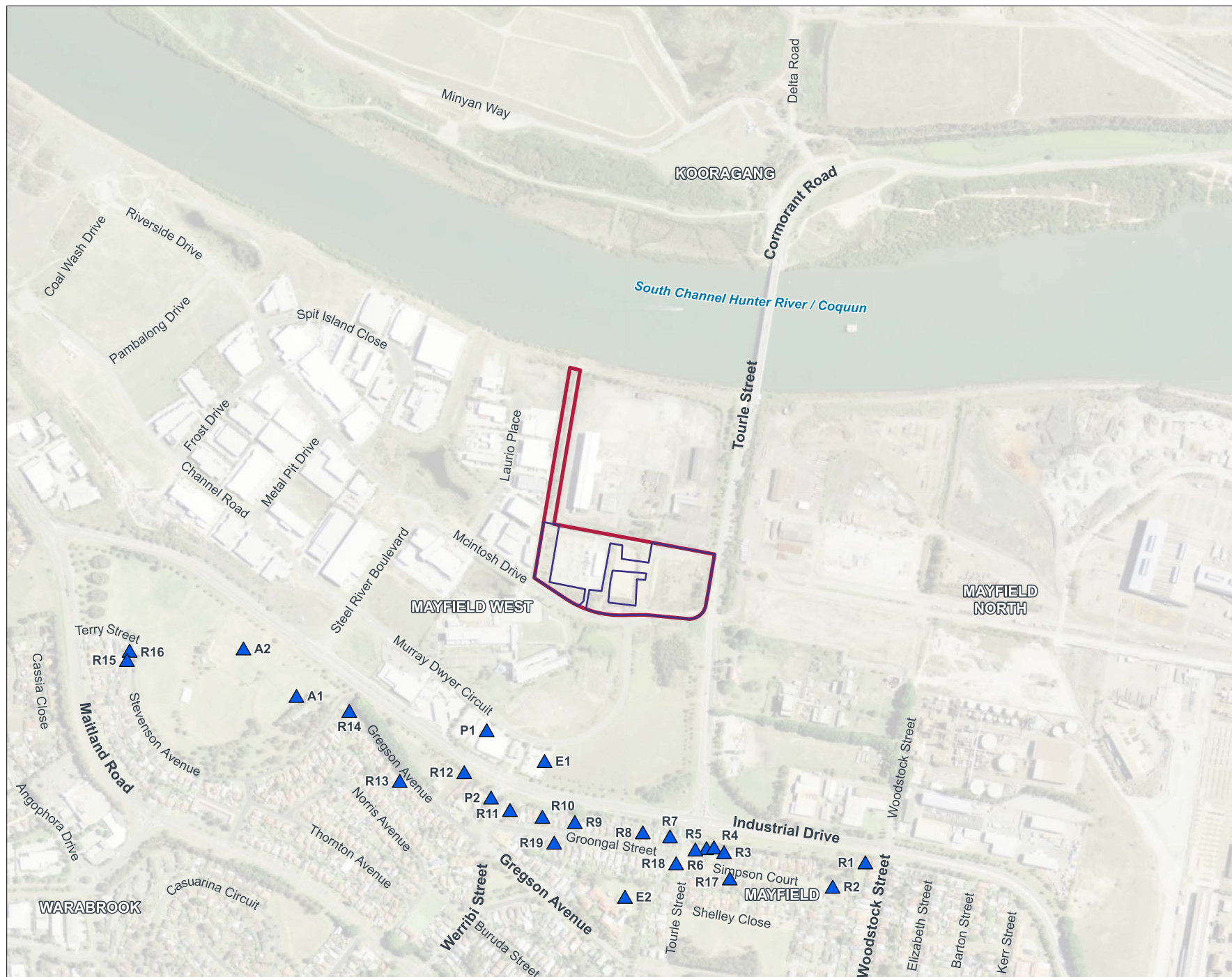
The majority of sensitive receivers within proximity of the site are residential dwellings. The locations of the receivers that were assessed, as well as their land use classification (as defined in the NPfI), are presented in **Table 6.5-14**.

Table 6.5-14: Assessment receiver locations (AECOM, 2024b)

Receiver		
R1	118 Woodstock Street, Mayfield	Residential
R2	33 Simpson Court, Mayfield	Residential
R3	7 Simpson Court, Mayfield	Residential
R4	5A Simpson Court, Mayfield	Residential
R5	3 Simpson Court, Mayfield	Residential
R6	1 Simpson Court, Mayfield	Residential
R7	3 Groongal Street, Mayfield West	Residential
R8	13 Groongal Street, Mayfield West	Residential
R9	33 Groongal Street, Mayfield West	Residential
R10	43 Groongal Street, Mayfield West	Residential
R11	53 Groongal Street, Mayfield West	Residential
R12	35 Gregson Avenue, Mayfield West	Residential
R13	62 Gregson Avenue, Mayfield West	Residential
R14	80 Gregson Avenue, Mayfield West	Residential
R15	77 Stevenson Avenue, Mayfield West	Residential

Receiver	Address	Land use classification
R16	79 Stevenson Court, Mayfield West	Residential
R17	8 Simpson Court, Mayfield	Residential
R18	2 Groongal Street, Mayfield West	Residential
R19	36 Groongal Street, Mayfield West	Residential
A1	Strikers Softball Club, 62/78 Stevenson Avenue, Mayfield West	Active Recreation
A2	Stevenson Park Baseball Field	Active Recreation
E1	Imagine Early Learning & Childcare, 9 Murray Dwyer Circuit, Mayfield West	Childcare Centre
E2	Mayfield West Public School, 7 Gregson Avenue, Mayfield West	Education
P1	The Grainery Church, 11 Murray Dwyer Circuit, Mayfield West	Place of Worship
P2	Mayfield Church of Christ, 31 Gregson Avenue, Mayfield West	Place of Worship

FIGURE 6.5-1:
NOISE SENSITIVE
RECEIVERS



Legend

- The site
- Project Area
- ▲ Sensitive receivers

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6.5.4 Impact assessment

6.5.4.1 Construction

Residential receivers

The predicted construction noise levels for residential receivers have been assessed against the standard hours NMLs (refer to **Table 6.5-15**). The results from this assessment show that the construction levels are not predicted to exceed the NMLs during standard working hours at residential receivers. Construction noise contours for scenario 1, scenario 2 and scenario 5 are provided in **Figure 6.5-2**, **Figure 6.5-3** and **Figure 6.5-4** respectively.

The ultimate level of impact may change depending on the final construction methodology and further assessment would be undertaken if required.

Table 6.5-15: Predicted construction noise levels - standard hours (residential receivers) (AECOM, 2024b)

Receiver	Distance from Project	Standard hours NML	Highly affected level	Construction phase			Exceedance (dB(A))
				Scenario 1 - Site establishment (dB(A))	Scenario 2 - Civil works (dB(A))	Scenario 5 - Landscaping (dB(A))	
R1	568 m	67	75	49	53	41	-
R2	475 m	67	75	48	52	40	-
R3	447 m	67	75	52	56	44	-
R4	435 m	67	75	51	55	43	-
R5	436 m	67	75	52	56	44	-
R6	437 m	67	75	52	56	44	-
R7	414 m	67	75	45	49	37	-
R8	411 m	67	75	43	47	35	-
R9	415 m	67	75	45	49	37	-
R10	429 m	67	75	52	56	44	-
R11	450 m	67	75	47	50	39	-
R12	453 m	67	75	44	48	36	-
R13	561 m	67	75	47	51	39	-
R14	588 m	67	75	49	53	41	-
R15	985 m	67	75	45	49	37	-
R16	978 m	67	75	45	49	37	-
R17	498 m	62	75	51	55	43	-
R18	464 m	62	75	50	54	42	-
R19	465 m	62	75	51	55	43	-

Non-residential receivers

The predicted construction noise levels for non-residential receivers have been assessed against the standard hours NMLs (refer to **Table 6.5-16**).

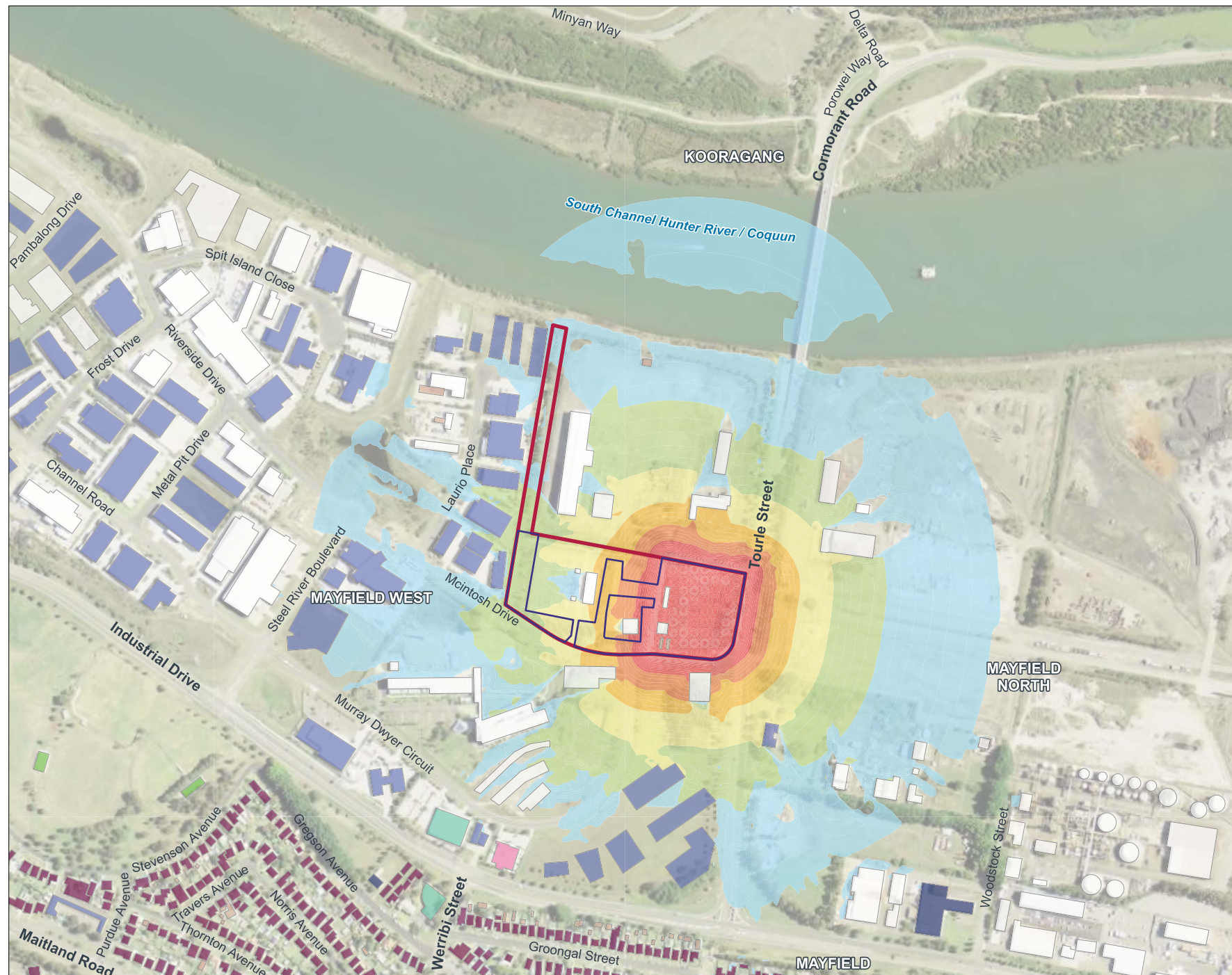
The results from this assessment show that the construction levels are not predicted to exceed the NMLs during standard working hours at non-residential receivers.

The ultimate level of impact may change depending on the final construction methodology and further assessment would be undertaken if required.

Table 6.5-16: Predicted construction noise levels - standard hours (non-residential receivers) (AECOM, 2024b)

Receiver	Distance from Project	Standard hours NML	Highly affected level	Construction phase			Exceedance (dB(A))
				Scenario 1 - Site establishment (dB(A))	Scenario 2 - Civil works (dB(A))	Scenario 3 - Landscaping (dB(A))	
A1	677 m	65	-	48	52	40	-
A2	763 m	65	-	46	50	38	-
E1	336 m	55	-	49	53	41	-
E2	536 m	55	-	49	54	41	-
P1	370 m	55	-	50	55	42	-
P2	452 m	55	-	49	53	41	-

FIGURE 6.5-2:
CONSTRUCTION NOISE
CONTOURS - SCENARIO 1
(SITE ESTABLISHMENT)



Legend

- The site
- Project Area

Building Usage

- Active Recreation
- Child Care Centre
- Commercial
- Community
- Industrial
- Place of Worship
- Residential
- Shed

Predicted Noise Level LAeq,15min dB(A)



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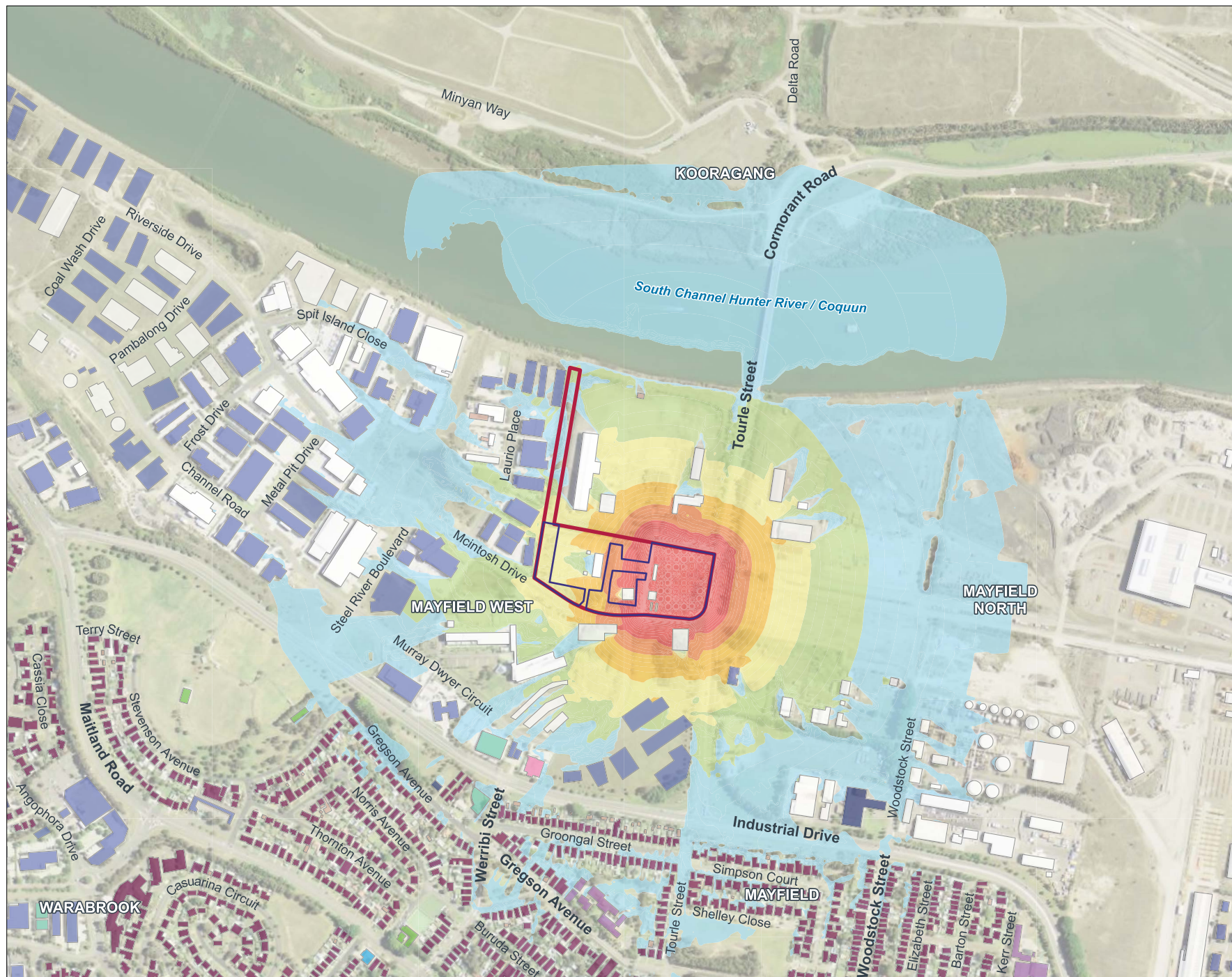
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FIGURE 6.5-3:
CONSTRUCTION NOISE
CONTOURS - SCENARIO 2
(CIVIL WORKS)



Legend

- The site
- Project Area

Building Usage

- Active Recreation
- Child Care Centre
- Commercial
- Community
- Education
- Industrial
- Medical
- Place of Worship
- Residential
- Shed

Predicted Noise Level LAeq,15min dB(A)



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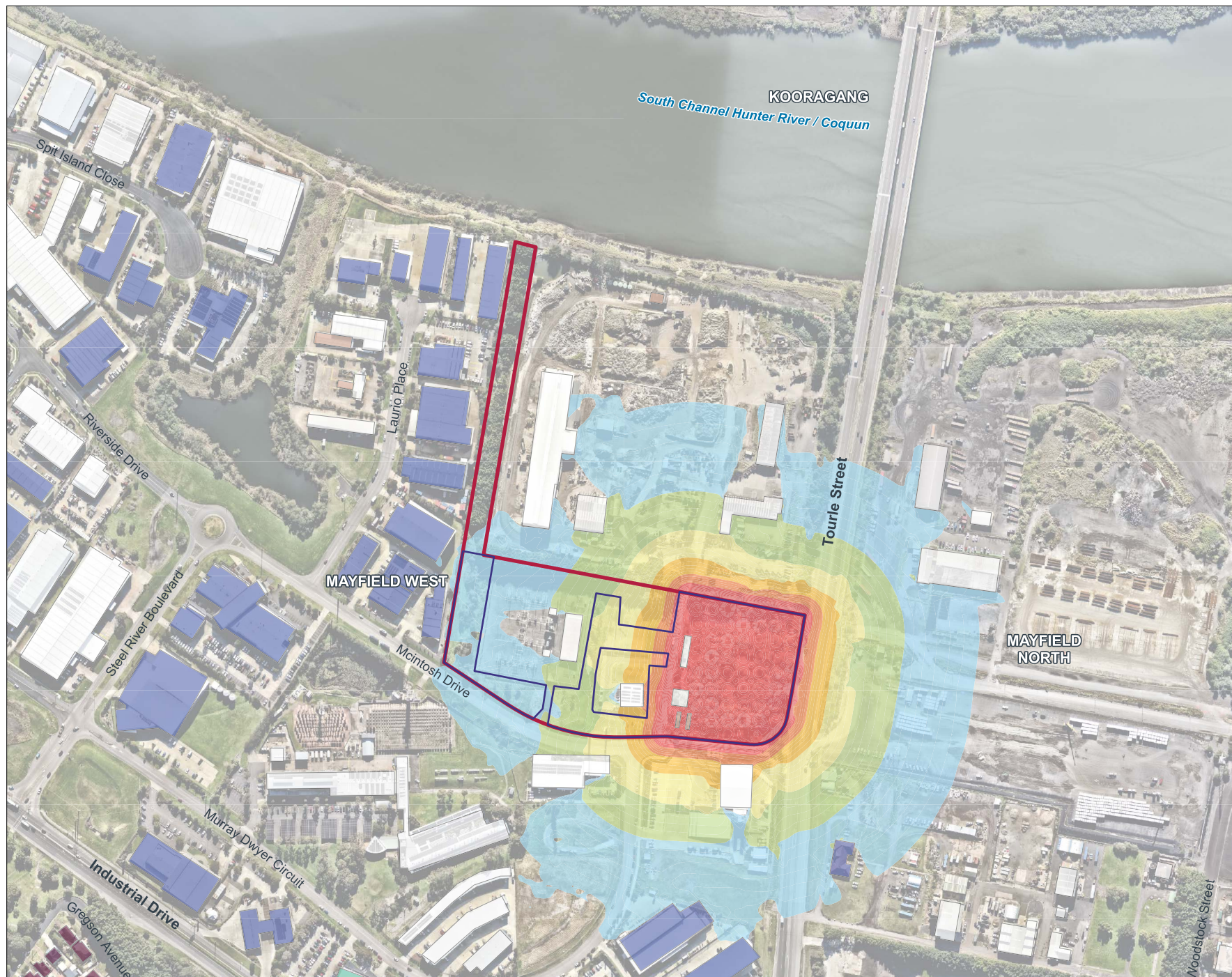
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FIGURE 6.5-4:
CONSTRUCTION NOISE
CONTOURS - SCENARIO 3
(LANDSCAPING)



Legend

- The site
- Project Area

Building Usage

- Commercial
- Industrial
- Place of Worship
- Residential
- Shed

Predicted Noise Level LAeq,15min dB(A)



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Construction traffic noise assessment

The predicted construction traffic volumes for the Project during the peak construction period comprise:

- Average of 68 light vehicles per day
- Average of 9 oversized vehicles per day.

It has been conservatively assumed that all construction vehicle movements would occur during a 1-hour period during off peak times for the road network; 1 hour in the AM and 1 hour in the PM. It was assumed that the construction traffic volumes were equal for morning and evening scenarios. The results of this traffic assessment are presented in **Table 6.5-17**.

Table 6.5-17: Existing traffic flows and additional construction traffic flows outside road network peak hours (AECOM, 2024b)

Period	Route	Existing traffic		Project related traffic		Relative noise increase, dB(A)
		Light	Heavy	Light	Heavy	
AM ¹ off peak hour	Industrial Drive	483	93	68	9	1
PM ² off peak hour		106	28	68	9	2

1: The quietest daytime hour for the road network. 2: The quietest nighttime hour for the road network

Given the high volume of existing traffic on Industrial Drive, the Project related construction traffic would not increase overall road traffic noise levels by more than 2 dB(A). An increase of up to 2 dB(A) represents a minor impact that is considered barely perceptible to the average person, and as such no consideration of noise mitigation measures is required.

Construction vibration assessment

As noted in the indicative construction equipment listed in **Table 6.5-6**, there is no vibration producing equipment proposed to be used in any construction scenario. Additionally, the nearest sensitive receiver is located approximately 350 m from the Project, and therefore it was deemed unnecessary to conduct a construction vibration assessment.

6.5.4.2 Operation

Predicted operational noise levels

Predicted operational noise levels at nearby noise sensitive receivers during the daytime and night-time periods are presented in **Table 6.5-18**.

For the evening and night-time periods, the predicted noise levels are assessed against the night-time criteria. Compliance with the night-time noise criteria implies compliance to the less stringent evening criteria for the operation of the BESS.

Operational noise contours calculated at 1.5 m above ground are provided in **Figure 6.5-5** and **Figure 6.5-6**. These contours are indicative only and should not be referred to for noise levels at specific receiver locations. Operational noise levels and contours presented in this report have been calculated under adverse weather conditions.

The one third octave noise levels at the worst affected residential receiver were assessed against the modifying factor criteria in **Appendix H** to check for tonal or low frequency components. These were found to contain tonal characteristics, and therefore a 5 dB(A) correction was added to the predicted L_{Aeq} noise levels for all assessed receivers.

Table 6.5-18: Predicted operational noise levels

Receiver	Project noise trigger levels, $L_{Aeq, 15}$ min, dB(A)	Predicted L_{Aeq} noise levels, dB(A)	Exceedance, dB(A)
R1	51 (nighttime)	46	-
R2		47	-
R3		50	-
R4		50	-
R5		50	-
R6		49	-
R7		46	-
R8		39	-
R9		39	-
R10		50	-
R11		46	-
R12		38	-
R13		40	-
R14		42	-
R15		37	-
R16		38	-
R17		49	-
R18		49	-
R19		49	-
A1	55 (daytime)	41	-
A2		38	-
E1	50 (daytime)	48	-
E2		49	-
P1	50 (daytime)	40	-
P2		40	-

**FIGURE 6.5-5:
OPERATIONAL NOISE
CONTOURS - DAY**

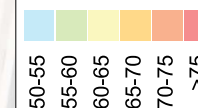
Legend

- The site
- Project Area

Building Usage

- Active Recreation
- Child Care Centre
- Commercial
- Community
- Education
- Industrial
- Medical
- Place of Worship
- Residential
- Shed

Predicted Noise Level LAeq,15min dB(A)



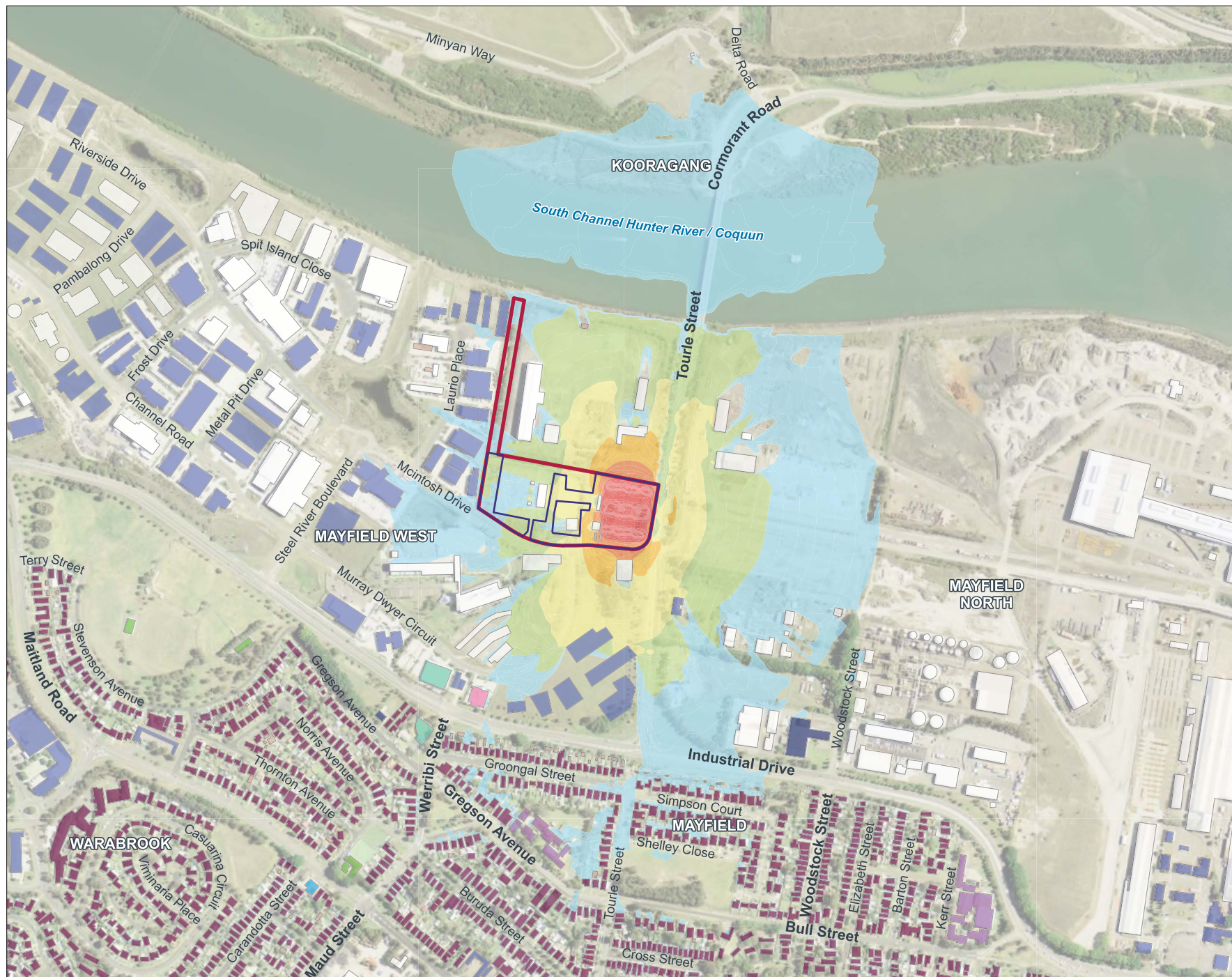
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**FIGURE 6.5-6:
OPERATIONAL NOISE
CONTOURS - NIGHT**

Legend

- The site
- Project Area

Building Usage

- Active Recreation
- Child Care Centre
- Commercial
- Community
- Education
- Industrial
- Medical
- Place of Worship
- Residential
- Shed

Predicted Noise Level LAeq,15min dB(A)



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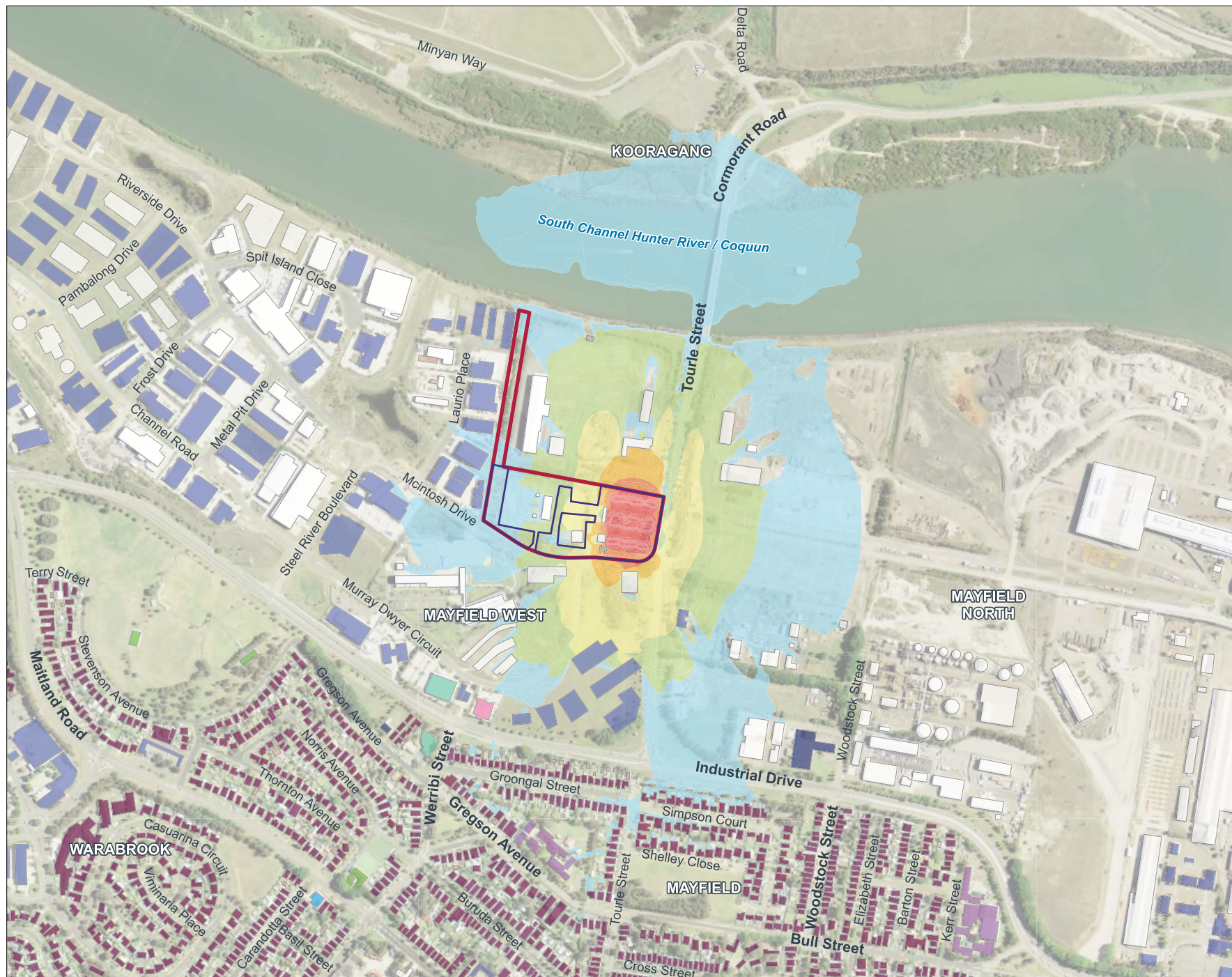


Table 6.5-18 shows that the predicted operational noise emissions from the Project do not exceed the noise trigger levels at any of the assessment receivers during any period of the day. This means that there would be no requirement for installation of any noise restricting infrastructure around the Project e.g. noise walls.

Future operational scenario

To assess a reasonable worst-case scenario, a model was produced that assumed that all equipment on site was operating at full capacity for 24 hours, seven days per week. If the model complies with the nighttime trigger levels, then it would comply with the trigger levels for all residential receivers during daytime periods.

To achieve the stated capacity for the Project, it is expected that the electrical equipment would be required in the following numbers:

- 112 x Megapack 2XL battery enclosures, including inverters
- 56 x medium voltage (MV) transformers.

The sound power level inputs presented in **Table 6.5-19**, were used in the noise modelling, and were assumed to be operating for a 15-minute period.

Table 6.5-19: Plant items sound power levels

Plant item/operation	Number of items	Sound power level, L_{Aeq} , dB(A)
Megapack 2XL (2-hour 9 fan configuration)	112	96 ¹
MV transformer	56	77

¹1. SNV8ound power levels have been taken from 'Tesla Megapack 2XL Sound Data – Quiet Version' provided in Q3 2024

The probable load profiles for the Project would include charging during the period of 3pm to 5pm and discharging during 5pm to 7pm. In the event of a network incident or high electricity demand from the grid, the charging and discharging profile would differ.

Operational road traffic noise

Asset management staff and contractors are expected to visit the site occasionally, though normally the site will not be occupied. As such traffic noise generation is expected to be negligible as a result of the operation of the Project. Given that operational traffic noise would not exceed 2 dB(A) this impact is not required to be considered further.

6.5.5 Mitigation measures

Mitigation measures are proposed to reduce the potential noise impacts of the Project to sensitive receivers. The relevant measures that would be implemented during detailed design, construction and operation of the Project are detailed in **Table 6.5-20**.

Table 6.5-20: Mitigation and management measures – noise (AECOM, 2025)

ID	Mitigation measure	Timing
NV-1	A construction noise management plan (CNMP) would be developed and implemented for the Project. The CNMP would include feasible and reasonable safeguards to manage noise emissions from the Project and to address complaints received in relation to construction noise. The CNMP should include, as a minimum, the following: • identification of nearby residences and other sensitive land uses • description of approved hours of work • description and identification of all construction activities, including work areas, equipment, and duration • description of what work practices (generic and specific) would be applied to minimise noise • a complaint handling process • noise monitoring procedures • overview of community consultation required for identified high impact work.	Construction
NV-2	Construction work should be planned and carried out during standard construction hours as far as reasonable and feasible.	Construction
NV-3	All works would be conducted in accordance with the Transport <i>Construction Noise and Vibration Guideline (Public Transport Infrastructure)</i> standard mitigation measures outlined in Appendix H .	Pre-construction and construction
NV-4	Attended measurements will be undertaken at the commencement of the full operation of the Project at the most affected receiver. In addition, attended measurements will be made in response to any complaints.	Operation
NV-5	A system of records which provides full documentation of all noise monitoring results, complaint handling and responses to non-compliances should be maintained.	Post-construction
NV-6	Residents and sensitive receivers likely to be affected by Project construction noise should be notified prior to commencement. The information provided to these receivers should include: • programmed times and locations of construction work • the hours of proposed work • construction noise impact predictions • construction noise mitigation measures being implemented on site.	Construction
NV-7	Community consultation regarding construction noise and vibration should be detailed in a Community Action Plan for the construction of the Project, including the provision of a 24-hour hotline and an associated complaints management process.	Construction

6.6 Traffic and transport

6.6.1 Secretary's Environmental Assessment Requirements

Table 6.6-1 sets out the SEARs relevant to traffic and transport and where the requirements have been addressed in this EIS.

Table 6.6-1: Relevant SEARs - transport

Relevant SEARs	
Transport	Where addressed
The EIS must address the following specific matters: an assessment of the peak and average traffic generation, including light vehicles, shuttle buses, heavy vehicles and high-risk heavy vehicles requiring escort and construction worker transportation;	An assessment of peak and average traffic generation and an assessment of all vehicle types required during the Project in Section 6.6.4.
an assessment of the likely transport impacts to the site access route(s), including the above listed vehicles, site access point(s), any Crown land, particularly in relation to the capacity and condition of the roads, road safety and intersection performance;	Impacts on public transport and the impacts that all listed vehicles will have on capacity, condition and safety of roads as well as intersection performance are detailed in Section 6.6.4
a cumulative impact assessment of traffic from nearby developments (including mining operations); and	Cumulative impacts to traffic are detailed in Section 6.6.4 and Section 6.11.
- provide details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road authorities) including: - a schedule of all required road upgrades (including resulting from heavy vehicle and heavy vehicle requiring escort traffic haulage routes) - clear figures of proposed road upgrades (including the site access point); and - road maintenance contributions, and other traffic control measures	Mitigation and management measures and the Traffic Management Plan were prepared in conjunction with relevant road authorities and are detailed in Section 6.6.4 and Section 6.6.5 discusses that road upgrades are not required for the Project

6.6.2 Methodology

A Traffic Impact Assessment (TIA) (**Appendix I**) has been prepared by Amber Organisation (Amber) to assess any potential traffic impacts that result from the Project during the construction, operation and decommissioning phases. Key aspects of the TIA include:

- Details of light and heavy vehicle traffic volumes and proposed transport routes
- An assessment of the potential traffic impacts of the Project on road network function and safety
- An assessment of the capacity of the existing road network to accommodate the type and volume of traffic generated by the Project
- Details of measures to mitigate and/or manage potential impacts
- Details of access roads and how these connect to the existing road network and ongoing operational maintenance.

6.6.2.1 Traffic surveys

To establish the existing traffic conditions of the road network surrounding the Project, traffic surveys needed to be undertaken on the major roads to the site, as well as the shared accessway within the site. Surveys were conducted at the Industrial Drive and Steel River Boulevard intersection on Thursday 21 November 2024 between 6.00 am to 10.00 am and 3.00 pm to 7.00 pm. At the junction of the shared

accessway and McIntosh Drive, surveys were conducted on Thursday 21 November 2024 between 5.00 am and 7.00 pm. For the purposes of surveying and modelling, the morning (AM) peak is considered to be 7.30 am to 8.30 am and the evening peak is considered to be 4.15 pm to 5.15 pm.

6.6.2.2 Traffic assessment

The traffic assessment considered the ability of the local road network to accommodate the excess traffic generated by the Project during peak construction periods. This assessment considered the Industrial Drive/Steel River Boulevard using SIDRA modelling software.

The level of service (LOS) of this intersection was assessed. LOS is a measurement of how free flowing the traffic through the intersection is and is graded A (best) to F (worst).

The traffic volumes were modelled based on the morning and evening peak hours during construction, with signal phasing being based off observations made during those peak periods. A growth rate was not applied to the model as construction is planned to commence 12 months after observation.

6.6.2.3 Route assessment

Appropriate routes for heavy vehicles and oversize overmass (OSOM) vehicles accessing the site during construction were determined. For heavy vehicles (up to a length of 26 m) an assessment of the NHVR Restricted Access Vehicle Map for approved B-double routes was reviewed (refer to **Figure 6.6-1** for the route access from Port of Newcastle and Port of Botany respectively). Further detail on the roads that are approved for B-Double travel is provided in **Appendix J**.

6.6.2.4 Site access

A swept path assessment (SPA) was undertaken at the intersection of the shared accessway and McIntosh Drive to assess whether this intersection would be able to accommodate simultaneous two-way traffic and safe entry and exit for all vehicles.

Though not required, a sight distance assessment was also undertaken via a desktop review of sightlines for exiting vehicles. As the site accessway is located at the end of a local road, a design speed of 40 kilometres per hour (km/hr) was assumed for this assessment.

6.6.3 Existing environment

6.6.3.1 Local road network

The local road network is comprised of a combination of State and local roads. This network is summarised in **Table 6.6-2**. The major intersections are outlined in **Table 6.6-3**.

Table 6.6-2: Road network (Amber, 2025)

Road	Typical width	Speed limit	Alignment
State roads			
Tourle Street	21.8 m providing two through lanes and a bike lane in each direction, a raised central median, and channelised right turn lanes (CHR)	80 km/hr (60 km/hr extending for approximately 600 m from Industrial Drive)	General north-south alignment between Industrial Drive in the south and its continuation as Cormorant Road in the north
Industrial Drive	23.0 m providing two through lanes and a bike lane in each direction, a raised central median, and CHRs	80 km/hr	General northwest-southeast alignment between Pacific Highway in the northwest and Elizabeth Street in the southeast

Road	Typical width	Speed limit	Alignment
Local roads			
Shared Accessway (Site Access) ⁸	9.0 m accommodating two-way vehicle movement	N/A – Private accessway	General north-south alignment extending north from McIntosh Drive for approximately 300 m
McIntosh Drive	13.0m providing one traffic lane in each direction and kerbside parking on both sides of the road	50 km/hr	General northwest-southeast alignment between Steel River Boulevard in the northwest and the Murray Dwyer Circuit in the southeast
Murray Dwyer Circuit	12.1 m providing one traffic lane and a bike lane in each direction, and kerbside parking on the south side of the road	50 km/hr	General east-west alignment between Steel River Boulevard in the west and McIntosh Drive in the east
Steel River Boulevard	17.5 m providing one traffic lane in each direction and a central raised median	50 km/hr	General northeast-southwest alignment between McIntosh Drive in the northeast and Industrial Drive in the southwest

Table 6.6-3: Intersection summary (Amber, 2025)

Road name	Intersecting road(s)	Configuration	Control / turn treatments
Industrial Drive	Steel River Boulevard	T-intersection (signalised)	Traffic signals are provided for each approach. A CHR is provided for vehicles turning right from Industrial Drive onto Steel River Boulevard. Pedestrian crossing legs are provided on the northeast and southeast approaches
Industrial Drive	Tourle Street	T-intersection (signalised)	Traffic signals are provided for each approach. Two CHR are provided for vehicles turning right from Industrial Drive onto Tourle Street
Steel River Boulevard	McIntosh Drive	Roundabout	Roundabout signage and associated line marking are provided at all approaches
Steel River Boulevard	Murray Dwyer Circuit	Cross Intersection	'Give-Way' signage and associated line marking are provided for vehicles exiting Murray Dwyer Circuit
McIntosh Drive	Murray Dwyer Circuit and the Shared Accessway	Staggered Cross Intersection	'Give-Way' signage is provided for vehicles exiting Murray Dwyer Circuit

6.6.3.2 Traffic volumes

Industrial Drive/Steel River Boulevard intersection

During the morning peak period (7.30 am to 8.30 am) 3,405 vehicles were recorded crossing this intersection. During the afternoon peak period (4.15 pm to 5.15 pm) 237 vehicles were recorded.

Industrial Drive generated the majority of vehicle traffic, with approximately 70% of both the morning and evening traffic moving through that road. Of the Steel River Boulevard traffic, 70% of the morning

⁸ The NSW Road Network Classification Map identifies the shared accessway as a local road, however, it is understood that this is a private accessway owned by Ausgrid with an easement for access to the recycling facility to the north.

traffic was moving northbound (toward the industrial estate) and 70% of the evening traffic was moving southbound (away from the industrial estate).

Shared accessway to the site

The traffic volumes observed for the shared accessway are summarised in **Table 6.6-4**.

Table 6.6-4: Shared accessway traffic volumes

	Typical Weekday Traffic Volumes (vehicles/day)	Weekday AM Peak - 11:00 (vehicles/hour)	Weekday PM Peak - 12:00 (vehicles/hour)	Heavy vehicle percentage (%)
Northbound (ingress)	315	44	37	72
Southbound (egress)	309	37	36	
Two-way	624	81	73	

6.6.3.3 Public transport

There are limited public transport services available within the vicinity of the Project, with three bus services available. Details of the nearest bus services are provided in **Table 6.6-5**.

Table 6.6-5: Bus services operating within the vicinity of the site (Amber, 2025)

Service	Route	Nearest stop	Approximate frequency		
			Monday-Friday	Saturday	Sunday
130	Fingal Bay to Newcastle via Gan Gan Road	Located 250 m south of the site on Tourle Street.	Every 20-60 minutes (4:30 am-10:45 pm)	Every 1-2 hours (6:15 am-12:00 am)	Every 1-2 hours (6:15 am-10:00 pm)
131	Fingal Bay to Newcastle (Express Service)	Located 250 m south of the site on Tourle Street.	Five services operate between 7:45 am to 6:30 pm	No Services	No Services
138	Newcastle Interchange to Lemon Tree Passage via Airport	Located 250 m south of the site on Tourle Street.	Eight services operate between 6:30 am to 6:45 pm	No Services	No Services

6.6.3.4 Active transport

A shared user path exists along the southern boundary of the site connecting McIntosh Drive to Tourle Street. Bicycle lanes are provided on either side of Industrial Drive and Tourle Street, which connect to the broader Newcastle cycling network.

6.6.3.5 Restricted vehicle access

B-Doubles

B-doubles are a combination of a prime move towing two semi-trailers all connected by B-couplings (TfNSW, 2025). There are certain rules and regulations that limit B-double access to particular roads. Roads that will be used within the Steel River Industrial Estate are approved.

The approved roads for B-Doubles to access the site are detailed in **Figure 6.6-1**.

Class 1 OSOM vehicles

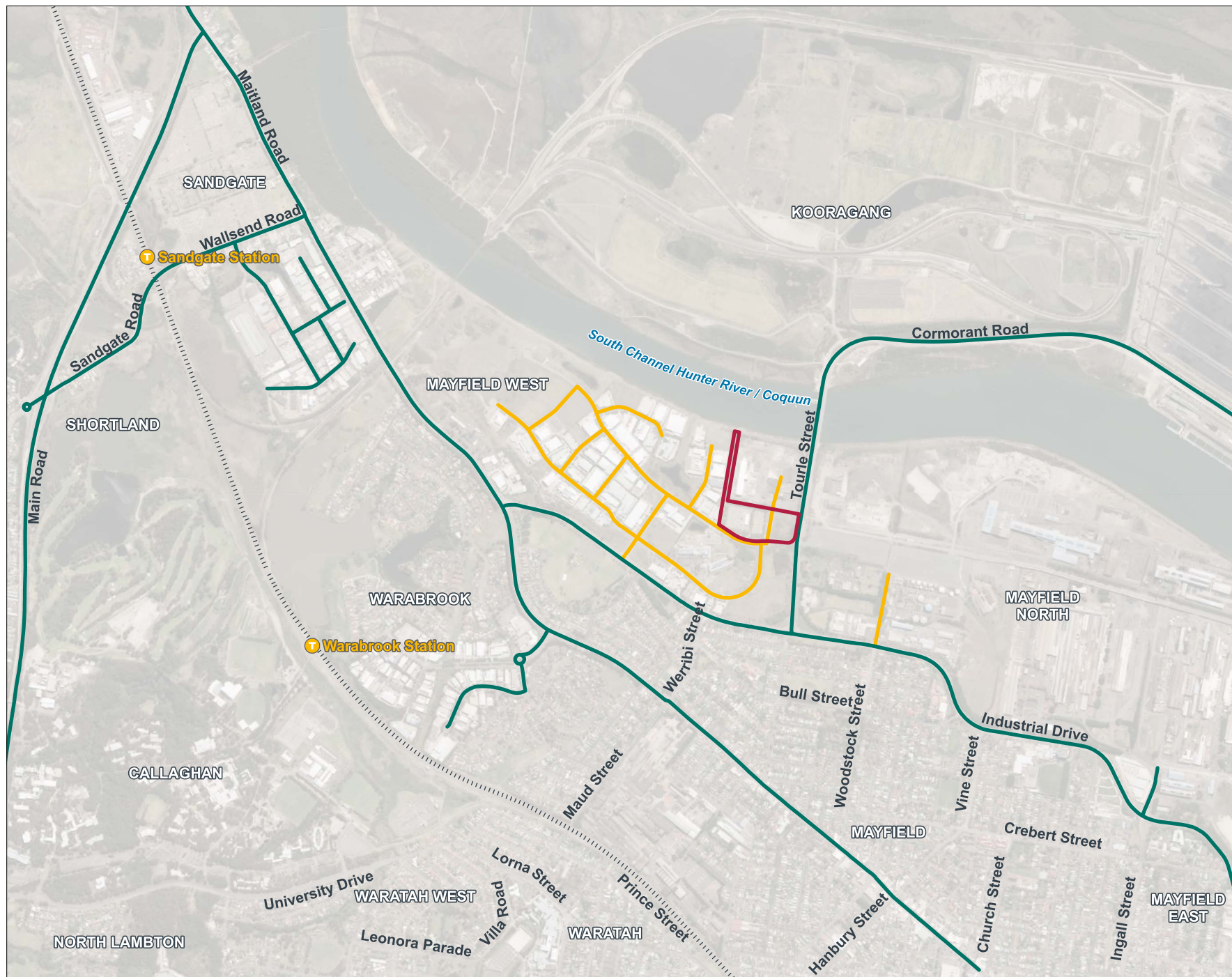
The TfNSW OSOM vehicle network map for the area surrounding the site is provided in **Figure 6.6-1**. The following restrictions must be observed by OSOM vehicles using these routes:

- Maximum dimensions: up to 5 m wide, 5 m high, 30 m long and 7.5 m rear overhang on approved state-owned route in NSW
- Maximum mass: 115 tonnes for rows of eight tyre low loaders and up to 77.5 tonnes of four tyres low loader combinations.

The green lines in **Figure 6.6-1** indicate the approved Class 1 OSOM vehicle routes. Local roads within the Steel River Industrial Estate, including McIntosh Drive and Steel River Boulevard, are not approved routes and will therefore require approval from City of Newcastle for OSOM movements (Amber, 2025). Any relevant permits required for the Project will be confirmed in a Construction Traffic Management Plan (CTMP).

The OSOM vehicles will also use the same routes identified for heavy vehicles, however would comply with *National Heavy Vehicle Regulator Multi-State Class 1 Load Carrying Vehicle Mass Exemption Notice 2020 Information Sheet* (NHVR, 2020). As such no further route assessment was required.

FIGURE 6.6-1:
SURROUNDING TRANSPORT
NETWORK



Legend

- The site
- Railway
- Railway station
- Transport Network**
- TfNSW 26m B-Double network approved road
- Approved Route with Travel Condition

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Special purpose vehicles (SPVs)

Vehicles that are built for purposes aside from transportation, including cranes and drill rigs, are defined as SPVs.

Figure 6.6-1 outlines the approved routes for SPV level 4 vehicles in the area surrounding the site, which will be subject to the same TfNSW conditions as mentioned for the B-Double vehicles. Any relevant permits required for the Project will be outlined in the CTMP. Route assessments are detailed in **Section 6.6.4**.

6.6.3.6 Crash history

The Centre for Road Safety Crash and Casualty Statistics (CRSCCS) database contains information of all recorded crashes in NSW. A search of the CRSCCS database over a five-year period from 2019 to 2023 was undertaken, which included the following roads:

- McIntosh Drive, Steel River Boulevard, Murray Dwyer Circuit and the shared accessway through the site; and
- All associated intersections.

The crash history for these roads is provided in **Table 6.6-6**.

Table 6.6-6: Crash history (Amber, 2025)

Road	Location	Severity	Crash type	Date and time	Light and weather conditions
Industrial Drive	Intersection with Steel River Boulevard	Minor/Other Injury	Rear end (vehicles in same lane)	July 2020 (14:00 - 15:59)	Daylight (Fine)
		Moderate Injury	Right lane change crash	September 2020 (16:00 - 17:59)	Daylight (Fine)
		Serious Injury	Out of control on road	October 2020 (06:00 - 07:59)	Dawn (Raining)
		Moderate Injury	Rear end (vehicles in same lane)	November 2020 (14:00 - 15:59)	Daylight (Fine)

Considering the road classifications and the associated traffic volumes, the current road network is considered to be operating relatively safely.

6.6.4 Impact assessment

6.6.4.1 Construction

Construction traffic volumes

The construction phase of the Project will require the use of both light and heavy vehicles. Heavy vehicles would transport large plant and equipment and light vehicles transport workers, smaller tools, supplies and equipment.

It was determined that construction peak hour and the road network peak hour would occur at different times. The morning and evening peak hours:

- Construction peak hour:
 - Morning: 6 am to 7 am
 - Evening: 5.30 pm to 6.30 pm
- Road network peak hour:
 - Morning: 7.30 am to 8.30 am
 - Evening: 4.15 pm to 5.15 pm.

Table 6.6-7: Traffic generation during construction period (Amber, 2025)

Vehicle type		Average construction period		Peak construction period	
		Vehicle trips per day (vpd)	Peak hour trips (vph)	Vehicle trips per day (vpd)	Peak hour trips (vph)
Light vehicles (LV)		68	34	136	68
Heavy vehicle (HV)	Rigid trucks	2	1	4	1
	Truck and dog	2	1	0	0
	Semi-trailers	0	0	0	0
	B-doubles	1	1	2	1
	SPV	2	1	2	1
	Non-high risk OSOM	4	1	10	1
	<i>HV subtotal</i>	<i>11</i>	<i>5</i>	<i>18</i>	<i>4</i>
Total		79	39	154	72

The Project is expected to generate an additional 154 vehicle trips per day during peak the construction period (136 light vehicle trips and 18 heavy vehicle trips). It is expected that the peak construction period will occur after the enabling works for a period of up to six months. This would reduce to a total of 79 vehicle trips per day during the average construction period (**Table 6.6-7**).

Road network

The assessment of the traffic and transport impacts during the peak construction period indicated the following:

- For the shared accessway:
 - The expected project traffic during peak construction is 72 vehicles entering the site from McIntosh Drive during the morning peak hour, and 72 vehicles exiting the site onto McIntosh Drive during the evening peak. The existing peak time of the shared accessway is 11 am and 12 pm and the majority of movement occurs between 8 am and 2 pm
 - The peak construction traffic is outside of the existing peak traffic period for the shared accessway, which means that the impact of approximately 72 vehicles in the morning and the evening is anticipated to be insignificant
 - No upgrades of the shared accessway are deemed necessary, (e.g. turn treatments) to facilitate future construction traffic numbers
- For Steel River Boulevard/Industrial Drive intersection:
 - The SIDRA analysis determined that the Steel River Boulevard (north) right turn had an LOS rating of E during both time morning and evening peak periods and the Industrial Drive (east) right turn has an LOS rating of E during the evening peak hour
 - The LOS E for the right turn from Industrial Drive (east) during the evening peak hour was due to the high average delay (59.8 seconds) and the 95th percentile queue for vehicles (38.9 m). This LOS E is justifiable given potential impacts to this intersection will only be temporary and only during the peak construction time
 - The LOS E for the right turn from Steel River Boulevard (north) is due to the average morning peak hour and evening peak hour delay of 58 seconds and 69 seconds respectively. This delay is caused by short green signal time causing much of the traffic to wait for more than one green phase. This operation is considered acceptable for this intersection. The results of this analysis are detailed in **Table 6.6-8**

- There would be an additional 72 vehicle movements through this intersection during construction peak hours. This would have minimal impact on the existing 2,464 vehicles that move through this intersection during the morning peak and the 2,076 vehicle movements during the evening peak
- The existing traffic volumes through this intersection during the construction peak hours are significantly lower than the traffic recorded during the road network's peak hours (refer to **Table 6.6-9**)
- The increase in traffic would be within daily traffic variations for this intersection. The mid-block sections of Industrial Drive and Steel River Boulevard can also accommodate this increase
- No upgrades are required for this intersection.

Table 6.6-8: Summary of SIDRA results – construction peak hours

Approach / Movement		Degree of saturation	Average delay (sec)	95% queue (m)	LOS
Morning peak hour					
Industrial Drive (east)	Through	0.257	2.6	36.8	A
	Right	0.785	54.7	136.3	D
Steel River Boulevard (north)	Left	0.081	5.8	0	A
	Right	0.452	57.8	34.1	E
Industrial Drive (west)	Left	0.228	16.3	33.3	B
	Through	0.587	21	160.4	B
All vehicles		0.785	19.7	160.4	B
Evening peak hour					
Industrial Drive (east)	Through	0.285	2.6	42.3	A
	Right	0.449	59.8	38.9	E
Steel River Boulevard (north)	Left	0.146	5.7	0	A
	Right	0.855	68.6	73.5	E
Industrial Drive (west)	Left	0.034	8.1	2.1	A
	Through	0.363	10.1	83.3	A
All vehicles		0.855	12.8	83.3	A

Table 6.6-9: Traffic volumes – construction peak hour vs road network peak hour (Amber, 2025)

Construction peak hour volumes		Road network peak hour volumes	
Morning peak (6 am to 7 am)	Evening peak (5.30 pm to 6.30 pm)	Morning peak (7.30 am to 8.30 am)	Evening peak (4.15 pm to 5.15 pm)
2,464	2,076	3,405	3,237

Public transport

There are no significant impacts to be expected for public transport within the immediate area surrounding the site. The bus lines that operate on Tourle Street are not expected to have their services impacted.

Active transport

The addition of 72 vehicles during the morning and evening construction peaks is not predicted to have a significant impact on the surrounding active transport. No active transport routes would be affected by construction.

Parking

On site parking allocation is expected to be sufficient for all construction vehicles. As a result, it is not anticipated that there will be any on-street parking impacts associated with the Project.

B-Doubles

Only a maximum of two B-Double vehicle trips are expected to occur per day during peak construction periods and only one vehicle trip needed on average throughout construction. All B-Doubles will be able to access the site without the need for exemptions, providing that the B-Doubles adhere to the routes indicated in **Figure 6.6-1**, and the TfNSW conditions outlined in **Section 6.6.2**. Those approved roads include the shared accessway, where the swept path assessment confirmed that simultaneous two-way vehicle passing can occur with B-Doubles exiting the site, however this is not possible when B-doubles enter the site. This can be controlled by sufficient traffic management if required.

OSOM vehicles

All non-high risk OSOM vehicles are anticipated to comply with the Class 1 exemption notices and would be able to operate on the SPV network. Once on site, these vehicles would not exit the site until they are no longer required for construction, and in this instance the OSOM vehicles would be transported off site outside of peak hours. All vehicles would comply with the *National Heavy Vehicle regulator Multi State Class 1 Load Carrying Vehicle Mass Exemption Notice 2020 Information Sheet*. These vehicles would require approval from City of Newcastle to access local roads in the Steel River Industrial Estate.

There are no high risk OSOM vehicles predicted to be used during construction of the Project. The largest vehicle that is anticipated to access the site is for the transport of the battery container, which would be within the 3.5 m width and 26 m length dimensions. This would be classified as OSOM and not high risk. Therefore, no heavy vehicles would require escort movements and an OSOM assessment is not required.

The SIDRA analysis determined that both Industrial Drive and Steel River Boulevard can readily accommodate the 95th percentile queue lengths, meaning that no intersection upgrades or turn treatments will be required to accommodate OSOM vehicles. Turn treatments for the shared accessway are also not considered necessary as McIntosh Drive is a local road that carries low volumes (Amber, 2025).

Site access

Based off a 40 km/hr design speed, a Safe Intersection Sight Distance (SISD) of 73 m is required under *Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections*. The SISD drawing provided in **Appendix I** indicates that the existing sight distance meets the requirements established by Austroads.

6.6.4.2 Operation

Road network

The Project is expected to generate negligible excess traffic whilst in operation. Operational traffic would include up to two maintenance vehicles and occasional deliveries per week i.e. up to four traffic movements per week. As such, operational impacts to the local road network would be negligible.

Public transport

There are no significant impacts to be expected for public transport within the area during operation, considering the Project will be confined to the site boundary and negligible additional traffic is expected during operation. The bus lines that operate on Tourle Street are not expected to have their services impacted.

Active transport

The addition of two vehicles per week during the morning and evening peaks is not predicted to have a significant impact on the surrounding active transport. No active transport routes would be affected by during operation of the Project.

Parking

There will on-site parking available for operational workers to park their vehicles with no on-street parking required. As such, there will be no offsite parking impacts.

6.6.4.3 Decommissioning

The Project has an anticipated operational life of 50 years, by which time the infrastructure will need to be dismantled and removed or components replaced. It is difficult to predict traffic levels at time of decommissioning; however, it is anticipated that the traffic levels will be consistent with the average construction conditions. A traffic management plan would be developed prior to decommissioning to ensure that road safety and road network operations are properly considered.

6.6.4.4 Cumulative traffic impacts

Project construction traffic will commence in late 2025. After a review of the DPHI website for other major projects within a 1 km radius of the Project, it was determined that there will be negligible cumulative impacts to other nearby developments (see **Section 6.11** for the cumulative impacts).

6.6.5 Mitigation measures

The management measures for traffic and transport that would be implemented during detailed design, construction, operation and decommissioning of the Project are detailed in **Table 6.6-10**.

Table 6.6-10: Mitigation and management measures – traffic and transport (Amber, 2025)

ID	Mitigation measure	Timing
T-1	Prior to construction, a pre-condition survey of McIntosh Drive will be undertaken by the appointed contractor in consultation with Council. During construction the sections of the road network utilised by Project traffic will be monitored and maintained to ensure continued safe use by all road users, and any faults attributed to construction of the BESS would be rectified. At the end of construction, a post-condition survey would be undertaken to ensure the road network is left in a condition equivalent to that at the start of construction.	All phases
T-2	Neighbouring properties will be consulted and notified regarding the timing of major deliveries which may require additional traffic control and disrupt access.	Pre-construction Construction
T-3	Warning signs advertising change of traffic conditions will be implemented if deemed necessary and will be located on the transport routes along Council roads.	Construction
T-4	A local bus company may be contacted to implement a shuttle bus program during a portion of the construction phase to transport workers to and from the site. Measures to ensure that a potential shuttle bus runs effectively will be detailed in the CTMP.	Construction
T-5	Heavy vehicles will avoid travel during peak bus operating times to limit the interaction of larger vehicles and vulnerable road users. Buses operate along Tourle Street.	Construction
T-6	All OSOM vehicle trips would be scheduled to avoid other OSOM vehicles within the surrounding area. This will be coordinated as part of the permit application.	Construction

ID	Mitigation measure	Timing
T-7	A CTMP will be created in accordance with the <i>Australian Standard 1742.3</i> and the <i>Work Health and Safety regulation 2017</i>. The CTMP would provide further information on the following: • Road transport volumes, distribution and vehicle types broken down into: - Hours and days of construction - Schedules for phasing/staging of the Project. • The origin, destination and routes for: - Employee and contractor light vehicles - Heavy vehicle traffic - OSOM vehicles. • A map of the primary haulage routes highlighting critical locations • An induction process for vehicle operators and regular toolbox meetings • A complaint resolution and disciplinary procedure • Local climatic conditions that may impact road safety of employees throughout all project phases (e.g. fog, wet and significant dry, dusty weather).	Decommissioning

6.7 Surface water, groundwater and flooding

6.7.1 Secretary's Environmental Assessment Requirements

Table 6.7-1 sets out the SEARs relevant to water and where the requirements have been addressed in this EIS.

Table 6.7-1: Relevant SEARs - water

Relevant SEARs	
Water	Where addressed
The EIS must address the following specific matters: an assessment of the likely impacts of the development (including flooding and flood modelling) on surrounding watercourses (including their Strahler Stream Order), groundwater resources and surface water movements, and measures proposed to monitor, reduce and mitigate these impacts including water management;	Potential impacts to surface water and groundwater are assessed in Section 6.7.4. Appropriate mitigation measures are detailed in Section 6.7.5.
a site water balance for the development	Water supplied and consumed for the purposes of the Project during construction and operation is discussed in Section 6.7.4.1.
details of water requirements and supply arrangements for construction and operation (including consultation with suppliers)	Water requirements and supply arrangements are discussed on Section 6.7.4.
a description of the erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with <i>Managing Urban Stormwater: Soils & Construction (Landcom, 2004)</i> and <i>Managing Urban Stormwater: Soils and construction – Volume 2A manual (Landcom, 2008)</i>;	Erosion and sediment control measures are detailed in Section 6.7.5.
assessing the impacts of the development, including any changes to flood risk and overland flows on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required	Flood risk impacts are detailed in Section 6.7.4 and detailed design solutions to mitigate these risks are provided in Section 6.7.5.
where the project involves works within 40 m of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the <i>DPI Guidelines for Controlled Activities on Waterfront Land (2018)</i> and (if necessary) <i>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI 2003)</i>, and <i>Policy & Guidelines for Fish Habitat Conservation & Management (DPE, 2013)</i>; and	The Project is not within 40 m of a waterbody and therefore impacts to waterfront land were not considered.

Relevant SEARs	
- Flood Risk: identification of any flood risk on site having regard to adopted flood studies, the potential effects of climate change and any relevant provisions of the NSW Flood Risk Management Manual: - where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the <i>Flood Impact and Risk Assessment – Flood Risk Management Guide LU01</i> - detailed design solutions and operational procedures to mitigate flood risk where required	Discussion of how the Project affects flooding during construction and operation is provided in Section 6.7.4. Section 6.7.5 outlines mitigation measures to manage any potential impacts to flooding.

6.7.2 Methodology

A Water Impact Assessment (WIA) has been prepared by GHD Pty Ltd (GHD). The WIA is provided as **Appendix J**, with relevant sections summarised within this chapter.

The WIA approach included:

- Reviewing relevant legislation, policy and guidelines to inform the assessment, including:
 - Environment Planning and Assessment Act (1979)*
 - Protection of the Environment Operations Act (1997)*
 - Water Management Act (2000)*
 - NSW Government Water Quality and River Flow Objectives* (DECCW, 2006)
 - Australian and New Zealand water quality guidelines* (ANZECC 2000 and ANZG 2018)
 - NSW Flood Risk Management Manual (2023)* and *NSW Flood Prone Land Policy* (DPHI, 2023)
 - Australian Rainfall and Runoff (2019)* (Babister et al., 2019)
 - Managing Urban Stormwater – Soils and Construction (2004)* (Landcom, 2004)
- A review of available information to establish existing environmental conditions, identify sensitive receptors, existing flood behaviour and drainage infrastructure. Sources used to establish existing environmental conditions included:
 - Scientific Information for Landowners (SILO)* operated by Queensland Government's Department of Environment and Science (DES, 2024)
 - Bureau of Meteorology (BoM 2025)
 - WaterNSW groundwater bore database (WaterNSW, 2020)
 - Water Quality Index* (Brown et al., 1970)
 - Hunter Valley Annual Surface Water Quality Report 2022-2023* (DCCEEWS, 2024)
 - Newcastle City-wide Floodplain Risk management Study and Plan (2012)* (Newcastle City Council, 2012)
 - TUFLOW⁹(WBM and University of Queensland, 1990)

⁹ TUFLOW is a computer software used to simulate water flow.

- An assessment of the potential construction and operational impacts that the Project could have on hydrology, flooding, surface water quality, groundwater and water supply
- Modelling of the following flooding scenarios using TUFLOW (WBM and University of Queensland, 1990):
 - 5% Annual Exceedance Probability (AEP) for 2030 using Shared Socio-economic Pathways scenario (SSP) SSP2-4.5. This event was used as an indication of the 'current' 1 in 20 AEP event
 - 1% AEP for 2030 using SSP2-4.5. This event was used as an indication of the 'current' 1 in 100 AEP event
 - 1% AEP for 2050 using SSP5-8.5. This event was used as an indication of future 1 in 100 AEP event for a conservative climate future in 2050
 - 1% AEP for 2080 using SSP5-8.5. This event was used as an indication of worst 1 in 100 AEP event anticipated during the site's operation
 - PMF for 2080 using SSP5-8.5. This event was used as an indication of probable maximum flood event anticipated during the site's operation
- Identification of appropriate measures to avoid or mitigate potential impacts on water related receptors.

6.7.3 Existing environment

6.7.3.1 Hunter River catchment

The site is situated in the Hunter River catchment (as shown in **Figure 6.7-1**). The Hunter River catchment is the largest coastal catchment in NSW, with an area of approximately 21,500 square km² (DCCEEW, 2024). The topography of the catchment varies, ranging from 0 m Annual Height Datum (AHD) in floodplains to 1,500 m AHD in mountain ranges.

The catchment includes major regulated rivers, controlled streams, and uncontrolled streams, bounded by the Manning and Karuah catchments to the north and Lake Macquarie and Hawkesbury-Nepean catchments to the south. The Hunter River (fourth order stream) starts in the Mount Royal Range and flows 460 km to the sea at Newcastle, with its largest tributary being the Goulburn River (high-order stream). Other significant tributaries include the Pages (second order stream), Isis (second order stream), Paterson (second order stream), and Williams (third order stream) Rivers, as well as several brooks. Wollombi Brook (third order stream) is the largest stream draining the southern portion of the catchment, joining the Hunter River near Singleton.

Glenbawn Dam and Glennies Creek Dam are the two largest water storage areas within the catchment, with capacities of 749,000 ML and 282,000 ML respectively.

The catchment features several significant wetland complexes important for waterbird habitats, including Kooragang Nature Reserve, Hexham Swamp, Hunter Wetlands Centre downstream, and upland swamps in Barrington Tops upstream.

6.7.3.2 Climate

The site is located within a temperate climate zone according to the Köppen climate classification mapping (2024). Temperate climate zones are associated with summers and do not typically experience a dry season. There is strong seasonality observed in the region of the site, with maximum temperatures exceeding 30 degrees Celsius (°C) during summer months and dropping to 15 °C in winter months.

The average annual rainfall, as recorded at the Newcastle Nobbys Signal Station (061055), is 1,108.55 mm. February to June generally experiences slightly higher median rainfall. The maximum annual rainfall recorded is 1,765.7 mm in 1990, with a minimum annual rainfall of 666.6 mm recorded in 2019.

The region experiences strong evapotranspiration throughout the year, with average annual levels of approximately 1,500 mm. December through to March experiences the highest monthly totals of evapotranspiration.

Moisture deficit (the difference between annual evapotranspiration and annual rainfall) is experienced in all months except June, with an overall annual moisture deficit of 391.43 mm. This indicates that evapotranspiration predominantly controls moisture levels in the region throughout the year.

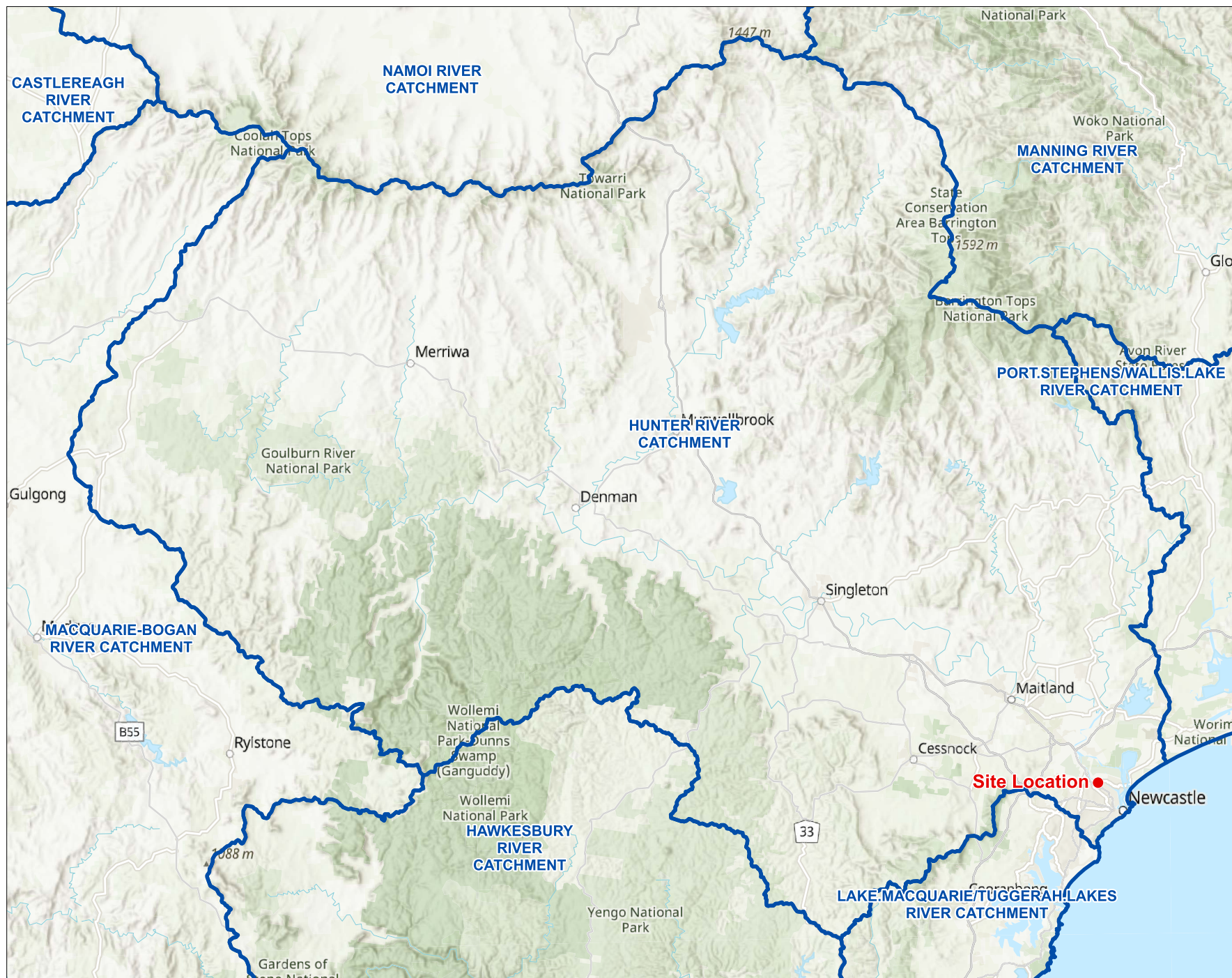
Climate data for the site is further detailed in **Figure 6.7-2**.

6.7.3.3 Soils

The site is located across both 'Disturbed Terrain' and 'Beresfield' soil landscapes. Disturbed Terrain is classified as soil that has been heavily affected by human activity and exists in the north-west portion of the site. The Beresfield soil landscape exists in the south-east portion and is characterised by brownish black loams, sandy loams and clay.

The Newcastle LEP indicates the potential for ASS to be present within the site. Class 2 and Class 5 ASS are indicated in the north-west and the south-east portions of the site. The risk of ASS within and surrounding the site is detailed in **Figure 3-7**. Further detail on the existing soils in the site is provided in **Section 6.3**.

**FIGURE 6.7-1:
HUNTER RIVER
CATCHMENT**



Legend

Catchment boundary

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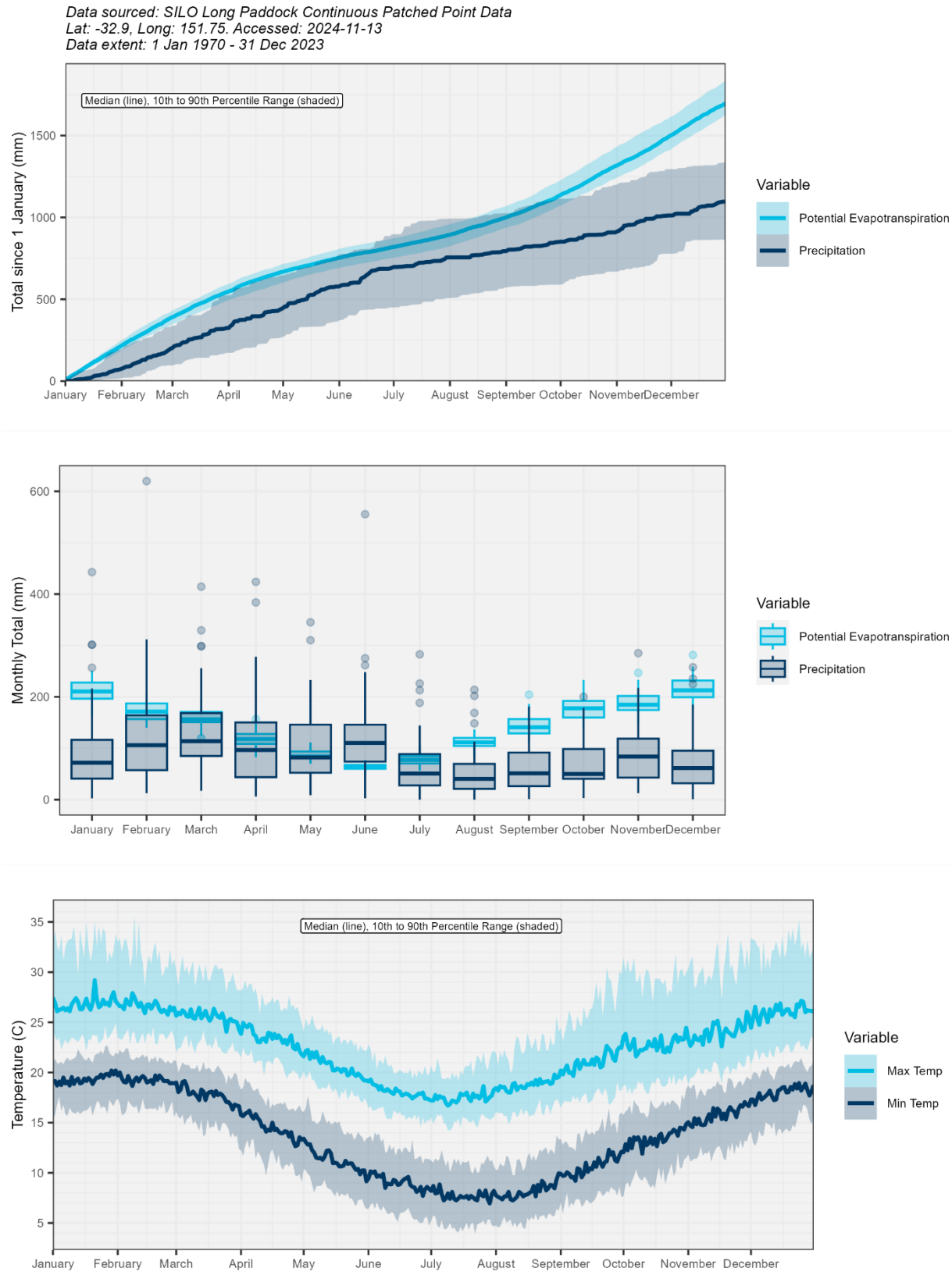


Figure 6.7-2: Climate statistic – SILO grid points 32.90 S, 151.75 E (GHD, 2025)

6.7.3.4 Topography

The topography of the site is generally flat, with a small mound in the eastern portion of the site adjacent to Tourle Street. The elevation of the site ranges from 13.3 m AHD at its highest point to 9.4 m AHD at its lowest point. Some of the site features include:

- A grassy hill adjacent to Tourle Street reaches 13.3 m AHD
 - The eastern slope reaching 9.4 m AHD, with an 8% slope
 - The western slope reaching 10.7 m AHD, with a 4% slope
- The eastern edge of the site near Tourle Street experiences a steep drop from 10 m AHD to 3.7 m AHD on Tourle Street
- To the north of the site, the land gently slopes from south to north, towards the Hunter River.

6.7.3.5 Hydrology and drainage

The closest body of water to the Project, the Hunter River, is located 300 m north of the site. The Hunter Estuary Wetlands, which is a Ramsar wetland, are located approximately 2.5 km north. A review of the NSW Riverstyles mapping (DPSI, 2024) was undertaken to determine the geomorphic condition of surrounding watercourses. According to DPSI (2024), the South Channel of the Hunter River has poor geomorphic condition, however it has a moderate potential to recover from this condition.

A site visit was undertaken by GHD in November 2024 to assess the site and its surrounding stormwater drainage.

The site's runoff currently discharges east (towards Tourle Street) or west (towards the existing substation). Vegetated swales, culvert structures and a primary collection pit exist to the west of the site, where water flows through the swales and minor culvert structures before entering the local stormwater system (GHD, 2025).

6.7.3.6 Groundwater

Groundwater in the vicinity of the site is likely to flow towards the South Channel of the Hunter River (GHD, 2025). A SMP completed by RCA in 2020 estimated that groundwater is more than 5 m below the surface.

A search of the NSW groundwater database was undertaken to determine groundwater bores within 1 km of the site, as detailed in **Table 6.7-2**.

Table 6.7-2: Groundwater monitoring bores (WaterNSW, 2024)

ID	Bore depth (m)	Lithology (m)	Groundwater standing water level (m)	Approximate groundwater elevation (m AHD)	Approx. distance to the Project (m)
BHW2/1	15.31	N/A	8.3	1.6 approximately	0 (onsite)
GW201305	21	Fill 0 to 13.4 Clayey Sand 13.4 to 21	-	-	900
GW201306	21	Fill 0 to 14 Clayey Sand 14 to 21	-	-	120
GW201307	15.8	Fill 0 to 2 Shale 2 to 3.2 Sandstone 3.2 to 12.05 Coal 12.05 to 13.05 Sand siltstone 13.05 to 20.15	-	-	250
GW201311	17	Fill 0 to 6 Clay 6 to 18 Shale 18.6 to 18.65	-	-	890

ID	Bore depth (m)	Lithology (m)	Groundwater standing water level (m)	Approximate groundwater elevation (m AHD)	Approx. distance to the Project (m)
GW202794	9.7	Fill 0 to 10	-	-	960
GW202797	2.1	Fill 0 to 1.95 Clay 1.95 to 6.7 Sand 6.7 to 7.45	-	-	700
GW203045	2.5	Topsoil 0 to 0.15 Fill with PAH odour, phase separated hydrocarbon 0.15 to 1.5 Fill, with phase separated hydrocarbon in groundwater and soil 1.5 to 2.5. Works abandoned	-	-	440
GW203046	16	Fill 0 to 6.8 Clay 6.8 to 11.0 Sand 11.0 to 11.2 Clay 11.20 to 16.00	7.95	-0.05	560

Table 6.7-2 indicates limited groundwater level data within the vicinity of the site and the lithology logs of all the wells indicate a range of fill levels in the area which is consistent with the soils information detailed above.

GW203046 is the closest bore with groundwater information, located approximately 560 m northwest of the site. This bore is approximately 20 m from the South Channel of the Hunter River, which is reflected in the groundwater elevation data in **Table 6.7-2**. The groundwater bores surrounding the site are mapped in **Appendix J**.

6.7.3.7 Water quality

Water quality data is available for the Hunter River, however the closest water quality sampling site is approximately 36 km from the site, located at Luskintyre (Station number 210009), according to the *Hunter Valley Annual Surface Water Quality Report 2022-2023* (DCCEE, 2024). Review of the Water Quality Index (WQI) tool indicated that the Hunter River is of poor water quality. Luskintyre and DCCEE (2024) indicate that flooding is the main cause of poor water quality.

6.7.3.8 Flooding conditions

Regional flooding and flood prone land

A review of the *Newcastle City-wide Floodplain Risk Management Study and Plan* (2012) indicated that the site is largely unaffected by flooding. This is due to the South Channel of the Hunter River being at a higher elevation than the northern bank, which generally pushes flooding north of the river rather than south.

The NSW Flood Risk Management Manual (DPHI, 2023) defines flood prone land as land that is susceptible to a Probable Maximum Flood (PMF). In the PMF event, Tourle Street was projected to be subject to 2 m of inundation, though this was not predicted to impact the site. The estimated PMF for the site is 5.4 m AHD, which was categorised as “riverine flooding where there is sufficient time to remove people from the risk to their lives by means of formal community evacuation plans”. The PMF of the area surrounding the site is detailed in **Appendix J**.

Local flood depth and level

There is a low risk of flooding across the northern boundary of the site due to overland flow. The flood risk of the site was modelled in years 2030, 2050, 2080 and under existing conditions. This is summarised in **Table 6.7-3**.

Table 6.7-3: Modelled existing flood conditions for the site

Year/Conditions	Summary
Current	Worst case flooding scenarios anticipate up to 15 cm flooding for the majority of the site. For moderate rain levels (5% AEP) there would also be up to 15 cm of flooding.
2030	Moderate climate change could cause flooding up to 30 cm during heavy rain (1% AEP). Under worst case scenario, flooding up to 50 cm is expected.
2050	Extreme climate change scenarios show similar flooding to 2030, with localised areas within the site experiences slight increases.
2080	Flooding depths remain around 30 cm for the 1% chance event and 50cm for the worst-case scenario. Northern boundary flood levels could reach 10-11 m AHD.

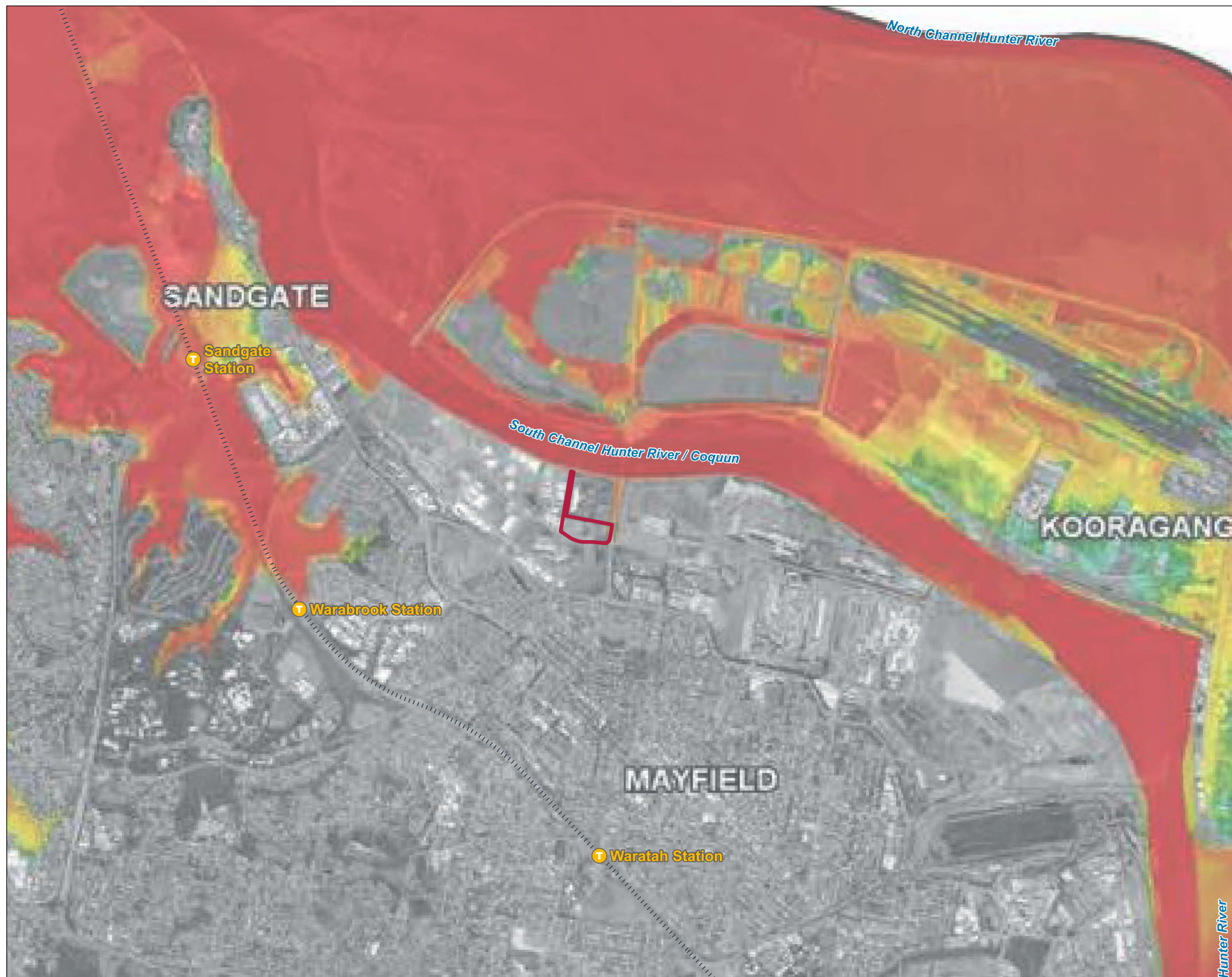
Local flood velocity

Throughout the site, existing flood velocities are relatively low in all predicted events (without the Project), with the maximum velocity reached being 1.25 m/s.

Local flood hazard

The NSW Flood Risk Management Manual FB03 has been used to categorise the hydraulic hazards. In all modelled flood events under the 1% AEP event, the flood hazard is around H1 (which is generally safe for vehicles, people and buildings) within the site. This is likely due to the low velocities for the predicted flooding. Along the drainage swale located along the northern boundary, there are localised H2 areas in the 2030 and 2050 PMF events, with areas of H3 (unsafe for vehicles, children and the elderly) along the western side of the swale.

FIGURE 6.7-3:
PROBABLE MAXIMUM
FLOOD DEPTHS



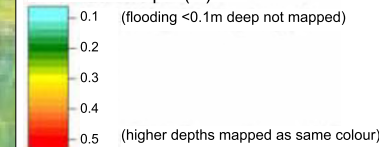
Legend

The site

.... Railway

T Railway station

Peak Flood Depth (m)



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6.7.4 Impact assessment

6.7.4.1 Construction

Hydrology and flooding

When assessing the construction impacts on flooding, the duration of the proposed construction period (approximately 21 months) was considered to be too short to conduct a quantitative assessment. As such a qualitative assessment was undertaken instead.

The water impact assessment anticipated that inundation of the site has the potential to:

- Cause damage to the works and delays in construction programming
- Pose a safety risk to construction workers
- Detrimentially impact the downstream waterways through the transport of sediments and construction materials by floodwaters
- Obstruct the passage of floodwater and overland flow through the placement of temporary elements such as construction compounds and stockpiles, which in turn could exacerbate existing flooding conditions
- Result in restricted accessibility to work areas due to ponded water or soft ground conditions.

These impacts would be temporary in nature and flooding levels would be low as a result. Therefore, impacts associated with flooding and hydrology are not expected to be significant, provided the mitigation measures outlined in **Section 6.7.5** are adhered to.

Surface water quality

Potential impacts to surface water quality during construction may arise from the following activities:

- Earthworks, excavation and disturbance of soils
- Handling and operation of equipment containing hazardous materials, the maintenance and refuelling of plant, handling of battery components and accidental spills of hazardous materials.

Disturbance of soils and stockpiles as a result of earthworks and excavation has the potential to affect surface water quality. Once disturbed, these soils have the potential to be mobilised during high rainfall events and contaminate downstream waterways. As a result, the primary contaminant of concern to surface water during construction is suspended solids.

Considering the scale of the Project, soil disturbance is projected to be minor, and therefore, overall impacts to surface water quality resulting from sedimentation can be managed through appropriate mitigation measures.

The activities and processes whereby hazardous materials pose risk to surface water are:

- Interactions with ASS
- Maintenance and refuelling of plant (e.g., hydrocarbons)
- Installation of concrete slabs (e.g., alkalinity)
- Handling of battery components (e.g., metals)
- Accidental spills of stored materials (e.g., fuels, oils)
- Accidental spills during the installation of transformers or similar infrastructure (e.g., mineral oils)
- Unexpected contamination that poses a risk to water quality.

The potential impacts associated with handling of contaminated materials includes mobilisation into downstream waterways, either directly or indirectly. Without mitigation measures, impacts to flora and fauna from contaminated downstream waterways would occur. However, this impact is generally considered to be minor.

Groundwater

During construction, the primary impacts to groundwater would likely be from cutting of the surface and exposing groundwater deposits. Review of the surrounding bores (refer to **Section 6.7.3**) determined that the groundwater standing water level was 7.95 m below ground level, at a bore located approximately 560 m from the Project. This indicates that the groundwater level is likely too deep to be affected by surface excavation during construction. Therefore, no groundwater impacts are anticipated during the construction phase of the Project.

Water supply

Water would be required during construction for dust suppression and landscaping purposes. A conservative estimate of the quantity required is 4.8 megalitres (ML) across the 21-month construction period. This excludes water used for concrete batching, which would occur off site.

All water required for the construction will be externally sourced and delivered to the site via a water tanker. Potable water will be supplied via bottled water or through the existing town water connection at the Mayfield West substation. As such impacts to the existing water supply during construction would be negligible.

6.7.4.2 Operation

Hydrology and flooding

Modelling of future flood scenarios was conducted as part of the assessment (detailed in **Appendix J**).

There are no significant changes anticipated to off-site flood runoff under current climate conditions during the 1% and the 5% AEP. In 2050, changes to current flooding conditions are not expected during 1% AEP, with similar conditions expected for the PMF in 2050. At Project decommissioning in 2080, changes to flood levels during the 1% AEP are not expected, even when considering future climate changes.

In all modelled flood events under the 1% AP event, the Project Area is considered to be safe for all vehicles, people and buildings. During PMF events in 2030 and 2050, the modelling indicates the area along the drainage swale in the north of the site will be unsafe for small vehicles, while the area to the north of the existing Mayfield West substation would be considered unsafe for all vehicles, children and the elderly.

Generally, the modelling concluded that any future flood waters would likely disperse from the site to the surrounding drainage network and that the risk of flooding during the life cycle of the Project would be low.

Surface water quality

Potential impacts to surface water during operation were identified to the following categories:

- General risks to stormwater associated with the development of large impervious areas
- Specific risks associated with the proposed works (e.g. transformer oil) that are not necessarily applicable to typical urban activities.

Development of impervious areas can result in changes to water quality, particularly concerning pollutant loads to downstream waterways. The Project proposes 1.1 ha increase in impervious area within the local catchment. A stormwater treatment train model was used to assess the existing pollutant load of stormwater from the Project and compared it to the pollutant levels after its proposed treatment. Results from a conceptual stormwater treatment model (see **Table 6.7-4**) confirmed that the Project is expected to meet the City of Newcastle Council stormwater pollutant reduction targets (City of Newcastle, 2023). Considering this, the operation of the Project is not expected to result in a significant adverse impact upon surface water quality.

Table 6.7-4: Water quality treatment train assessment (GHD, 2025)

Pollutant	Pre-treatment	Post-treatment	City of Newcastle Reduction target (%)	Modelled reduction (%)
Total Suspended Solids	2,018 kg/yr	144.8 kg/yr	85%	93%
Total Phosphorus	3.221 kg/yr	0.742 kg/yr	65%	77%
Total Nitrogen	23.8 kg/yr	10.21 kg/yr	45%	57%
Gross Pollutants	291.2 kg/yr	1.311 kg/yr	90%	99%

During operation, the handling of materials that could pose a risk of contamination to local surface water would be limited. Handling of materials such as transformer oil and other maintenance equipment are not expected to be a regular occurrence, and any impacts to surface water quality as a result of handling of hazardous materials will be able to be managed through mitigation measures outlined in **Section 6.7.5**.

Groundwater

No interaction with the subsurface is proposed during operation, and therefore it is not expected that there will be operational impacts on groundwater.

Water supply

A fire management strategy will be prepared prior to the commencement of construction. This study will inform how water will be used for emergency purposes during operation, including any storage volumes needed on site. Any other water for operation, which is expected to be limited to domestic uses within the operations building and some external use, will be sourced through the existing town water connection at the Mayfield West substation.

6.7.5 Mitigation measures

Implementing mitigation measures would aim to reduce the potential impacts on surface water, groundwater and flooding from the Project to the greatest extent practicable. The management measures that would be implemented during detailed design, construction and operation of the Project are detailed in **Table 6.7-5**.

Table 6.7-5: Mitigation and management measures – surface water, groundwater and flooding (GHD, 2025)

ID	Mitigation measure	Timing
SW-1	A construction Soil and Water Management Plan (SWMP), including an Erosion and Sediment Control Plan (ESCP) prepared in accordance with the Blue Book, will be prepared and implemented during construction. The ESCP will be prepared by a Certified Practitioner of Erosion and Sediment Control or an accredited soil scientist. The ESCP will include a protocol for erosion control inspections to detect and mitigate construction phase impacts.	Construction
SW-2	Include an ASS Management Plan (ASSMP) to minimise potential environmental impacts from development works that could disturb ASS.	Pre-construction Construction
SW-3	Prior to construction, a Flood Emergency Response Plan would be prepared. This would form part of the CEMP and would document how the risks to life and property within the Construction Footprint would be safely managed during construction.	Pre-construction

ID	Mitigation measure	Timing
SW-4	The detailed design of the stormwater management system would be undertaken following project approval and will include the following: • Confirmation through water quality modelling that the City of Newcastle Council requirements specified in this report can be met. • Confirmation that the proposed stormwater drainage layout would manage floodwaters appropriately and confirm that the outcomes of the flood assessment presented in this EIS would be met.	Design
SW-5	Operational controls relevant to water should be included in Ausgrid's existing environmental procedures for the site, or within a site-specific Operational Environment Management Plan (OEMP). The relevant document should include the following measures relevant to water: • Procedures to maintain drainage features at the site, including open channels, culverts, water quality controls (GPTs and pit inserts) and all pits and outlets. These should be maintained in accordance with the manufacturer's specifications and kept free-draining. • Identifying procedures to appropriately handle hazardous materials such that they can be contained within the site. Specified responses to a pollution incident should be documented for the unlikely event that hazardous materials.	Operation
SW-6	A water quality treatment train will be implemented to address the changes in pollutant loads that would be generated by the increased impervious area within the site.	Operation

6.8 Hazards and risk

6.8.1 Secretary's Environmental Assessment Requirements

Table 6.8-1 sets out the SEARs relevant to hazards and risks and where the requirements have been addressed in this EIS.

Table 6.8-1: Relevant SEARs – hazards and risks

Relevant SEARs	
Hazards and risk	Where addressed
This EIS must address the following: <i>Health</i> - an assessment of potential hazards and risks including but not limited to fires, spontaneous ignition, electromagnetic fields (EMF) for the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields.	Section 6.8.4.
<i>Bushfire</i> – identify potential hazards and risks associated with bushfires including the risks that a BESS would cause a bush fire and demonstrate compliance with <i>Planning for Bush Fire Protection 2019</i>;	Section 6.10.
Dangerous Goods - a preliminary risk screening completed in accordance with the State Environmental Planning Policy (Resilience and Hazards) 2021.	Section 6.8.2 and 6.8.4.
<i>Battery Energy Storage System</i> - a Preliminary Hazard Analysis (PHA) prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis (DoP, 2011) [HIPAP 6] and Multi-Level Risk Assessment [MLRA]. The PHA must consider all recent standards and codes and verify separation distances to on-site and off-site receptors to prevent fire propagation and compliance with <i>Hazardous Industry Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning [HIPAP 4]</i>.	Section 6.8.2 and 6.8.4.
<i>Aviation</i> – assess potential impacts on aviation safety.	Section 6.11

6.8.2 Methodology

A Preliminary Hazard Analysis (PHA) has been prepared by Sherpa Consulting Pty Ltd (Sherpa) to identify potential hazards related to the Project and assess their associated risk. The PHA is attached in **Appendix K** with relevant sections summarised within this chapter.

6.8.2.1 Preliminary risk screening

A preliminary risk screening was undertaken in accordance with the Applying SEPP 33 guideline.

6.8.2.2 Preliminary hazard analysis

The PHA followed a series of steps that are specified within *Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis* (HIPAP 6). These steps are:

1. Establish the study context
2. Conduct preliminary risk screening, to determine whether the Project is considered “potentially hazardous” according to the NSW DPHI Applying SEPP 33 This process considers:
 - The type and quantity of hazardous materials to be stored on site
 - Distance of the storage area to the nearest site boundary
 - Specific types of industry
 - Expected number of transport movements

3. Identification of hazards resulting from the proposed Project and events with the potential for off-site impact (*Hazard Identification*)
4. Analysis of the severity of the consequences for the identified events with potential off-site impact, e.g. fires and explosions (*Consequence Analysis*)
5. Determination of the level of risk analysis required, and the risk assessment criteria
6. Analysis of the risk of the identified events with off-site impact. These risks were assessed using the risk matrix (**Table 6.8-2**) detailed in (*Risk Analysis*)
7. Assessment of the estimated risks from identified events against risk criteria to determine acceptability (*Risk Assessment*).

A detailed description of the methodology of the PHA is provided in **Appendix K**.

Table 6.8-2: Risk matrix

Consequence	Likelihood				
	Rare	Unlikely	Possible	Likely	Almost certain
Catastrophic	Medium	High	High	Extreme	Extreme
Major	Medium	Medium	High	High	Extreme
Moderate	Low	Medium	Medium	High	High
Minor	Very low	Low	Medium	Medium	Medium
Insignificant	Very low	Very low	Low	Medium	Medium

6.8.2.3 Separation distances

The National Fire Protection Association (NFPA) 855 *Standard for the Installation of Stationary Energy Storage Systems* was used to outline the industry best practice required distances between BESS units. This aims to ensure an adequate separation to manage the potential for the spread of fire. Tesla provided their minimum clearances for the side, back and front of the Megapack 2XL (see **Table 6.8-3**). Propagation testing was also undertaken in accordance with the *Fire Protection Engineering and UL9540A Interpretation Report by Fire and Risk Alliance* (UL9540A) to assess the separation distance required to avoid fires between megapacks.

Table 6.8-3: Tesla BESS minimum clearances

Installation	Megapack 2XL Minimum Clearance (m)
Side	0.15
Back	0.46 0.23 with prior Tesla approval
Front	2.44

6.8.2.4 Electromagnetic fields

This assessment considers the EMF exposures from the Project components and compares it against the *International Commission on Non-Ionizing Radiation Protection* (ICNIRP, 1998) time varying electric and magnetic fields reference levels. These results are used as an input to the risk analysis.

6.8.3 Existing environment

6.8.3.1 Off-site receptors

Table 6.8-4 presents the distance of surrounding receptors to the Project.

Table 6.8-4: Off-site receptors

Receptor	Distance (m) from the Project
Data centre	20
Mayfield West substation	90
Recycling facility building (to the north)	60
Research laboratory	60
High pressure gas pipeline	7
Childcare centre	380
Closest residential area	420

6.8.3.2 Flooding

Flooding is considered as an existing environmental hazard and may occur due to regional riverine flooding of the Hunter River, or due to local (overland) flooding of the site. If flooding were to occur on site, it could cause contamination of groundwater and/or surface water.

Further details of existing flooding conditions associated with the Project are provided in **Section 6.7**.

6.8.3.3 Earthquake and landslide

Earthquakes and landslides present as a potential environmental risk as they could initiate a thermal runaway and a fire in the batteries.

A search of the Geoscience earthquake hazard map (Geoscience Australia, 2018) indicated a low risk of earthquakes occurring at the site.

6.8.3.4 Lightning strike

The National Seismic Hazard Assessment (NSHA) hazard map (NSHA23 hazard map) produced by Geoscience Australia, indicates that there is a low earthquake risk at the Project Area.

The Project Area is not within a known mine subsidence district.

Bureau of Meteorology lightning ground flash density (BoM, 2025) indicates that 2-3 km²/year and 30 to 40 days with thunder heard per km²/year.

6.8.3.5 High pressure gas pipeline

A high pressure gas pipeline runs along the southern boundary of the site. The distance from the pipeline to the closest BESS unit is approximately 30 m. A consequence assessment of the impact of a potential rupture of the pipeline is detailed in **Section 6.8.4**.

6.8.4 Impact assessment

6.8.4.1 Preliminary risk screening

In accordance with the Applying SEPP 33 guideline, the hazards within **Table 6.8-5** were identified.

Table 6.8-5: Preliminary risk screening summary

Material	DG Class	Category	Storage threshold	Transport threshold		Exceeds threshold?
				Movements	Quantities	
BESS battery (Lithium iron phosphate)	9	Miscellaneous DGs	N/A	< 1000 (annual) < 60 (weekly)	No limit	No
BESS coolant (50% ethylene glycol aqueous solution)	-	N/A	N/A	N/A	N/A	No
BESS refrigerant (R134A)	2.2	Non-flammable non-toxic gases	N/A	N/A	N/A	N/A
BESS MV Transformer oil	C	Combustible	N/A (unless stored with flammable liquids)	N/A	N/A	No
BESS battery (Lithium iron phosphate)	9	Miscellaneous DGs	N/A	< 1000 (annual) < 60 (weekly)	No limit	No
BESS coolant (50% ethylene glycol aqueous solution)	-	N/A	N/A	N/A	N/A	No

The results of the preliminary risk screening for the Project were:

- The expected storage of hazardous materials associated with the Project would not exceed the relevant risk threshold
- The expected transport of hazardous materials associated with the Project would not exceed the relevant risk threshold
- Based on the other risk factors considered, there were eight other events that may be associated with the Project that are listed in **Table 6.8-6**.

Table 6.8-6: Summary of hazards and events

Project components/substation						
Hazard type	Event	Battery modules	Battery management system	Thermal management system	BESS MV transformer	HV transformer and grid connection
Electrical	Exposure to voltage	✓	✓	-	✓	✓
Energy (arc flash)	Arc flash	✓	✓	-	✓	✓
Fire	Infrastructure fire, scrub fire	✓	✓	✓	✓	✓
Chemical	Release of hazardous materials	✓	-	✓	-	-
Explosive gas	Generation of explosive gas	✓	-	-	-	-
Reaction	Battery thermal runaway	✓	-	-	-	-
EMF	Exposure to EMF	✓	-	-	✓	✓
External factors	Water ingress (rain and flood), unauthorised access/trespasser, lightning storm, high ambient temperature, high pressure gas pipeline. Facility will be designed for the appropriate earthquake period.	✓	✓	✓	✓	✓

Based on storage and transport of hazardous materials, the Project would not be considered to be potentially hazardous. However, the other events and hazards identified in the Preliminary Risk Screening meant that an assessment needed to be conducted by means of a PHA. The PHA is provided as **Appendix K** and summarised in the following sections.

6.8.4.2 Hazard identification

Hazard identification (HAZID) only considered those with a potential offsite impact; occupational, health and safety (OH&S) hazards were not included. The identified hazards were largely associated with the operation of the Tesla Megapack 2XL. The key potential hazards include:

- Thermal runaway
- Toxic vapour generation
- Release of flammable gas
- Explosion overpressure
- High pressure gas pipeline rupture.

These hazards were determined through a review of incidents involving other BESS facilities. A table with the reviewed BESS incidents is available in **Appendix K**.

HAZID findings

The HAZID register identified 17 possible events to be considered, however there were only two hazards that required further assessment. Those hazards are:

- Fire due to ignition of the BESS units (onsite)
- Jemena gas pipeline rupture and resulting fire (offsite)
- Consequence modelling was conducted on these hazards to determine the extent of their potential risk.

6.8.4.3 Consequence assessment

The consequence assessment was used to determine if the potential to cause off-site injury was credible in each scenario.

BESS unit fire model

Sherpa modelled a scenario whereby a fire ignited in a fully developed BESS unit. While the unit model test did not initiate a fire for the Tesla Megapack 2XL, the method for initiating a fire can represent all possible BESS unit fires. A fire was modelled for areas representing:

- The side of the BESS megapack (9 m wide x 2.8 m high)
- The end of the BESS megapack (1.7m wide x 2.8 m high).

The HIPAP 4 criteria for heat radiation were used for the study as a reference point for the results of this assessment, which is detailed in **Appendix K**.

The modelling found that fatal and injury impacts do not reach offsite sensitive areas.

Jemena gas pipeline

A summary of the results of the assessment of the ignition of the high-pressure gas pipeline. This compares the maximum height that fatal heat radiation levels would reach in the event of ruptures with varying diameters. This table is provided in **Appendix K**.

The distance from the pipeline to the closest BESS unit is approximately 30 m. The results show that for a full-bore rupture of the gas pipeline there is the potential for heat radiation at 23 kW/m², however this is unlikely to increase the consequence of the initial rupture event. Based on this outcome, this event should still be considered in the site emergency plan, despite its very low risk profile (refer to **Table 6.8-9**).

6.8.4.4 Separation distances

Sherpa reviewed the BESS megapack separation distances for onsite and offsite and found that:

- The Project layout will meet the recommended Tesla specified clearances for BESS megapacks. The megapacks were also tested to UL9540A, and the results indicated the megapacks are resilient to thermal runaway in a single failure event
- The layout of the BESS units meets the separation distances outlined in the Tesla OEM installation manual. It was deemed acceptable for a water tank and the maintenance facility to lie within six metres of the nearest BESS megapack, as the water tank and maintenance facility do not contain any flammable liquids
- The BESS units are an estimated 10 m from the eastern boundary of the site, which is less than the estimated injury distance (15 m) from the larger face of a BESS unit fire. Recommendations to mitigate this are detailed in **Section 6.8.5**.

6.8.4.5 Preliminary Hazard Analysis

Based on the findings of the preliminary risk screening and HAZID, and in accordance with the SEARs, a PHA was undertaken. The potential hazardous events that were assessed were:

- Thermal runaway
- High pressure gas pipeline rupture.

Table 6.8-7 details the findings of the PHA.

Table 6.8-7: PHA findings

Hazardous event	Findings	Is it a valid hazard to consider?
Thermal runaway	Thermal runaway occurs with an excessive rise in temperature which causes the internal materials to breakdown and release heat. The heat release further increases the temperature which can result in a cycle of material breakdown and heat release which ultimately can lead to a fire if not controlled. Causes of thermal runaway include: • Electrical abuse (e.g. overcharging / discharging) • Thermal abuse (e.g. overtemperature) • Mechanical abuse (e.g. external impact) • Existing, latent defect (e.g. electrolyte leaks, faulty components). Design measures are in place to prevent this hazard occurring, although thermal runaway is still considered a valid hazard.	Yes
High pressure gas pipeline and other external hazards such as water ingress, lightning and earthquakes.	The high-pressure gas pipeline was identified as a potential hazard if it were to rupture. The pipeline is located 30 m to the nearest BESS unit and has the potential it impacts the Project, should a fire ensue. A consequence assessment was used to model the potential impact that a rupture of this pipeline would cause on the Project and the existing environment. As the pipe is buried, if ignited, it would release vertical jet fires in which could result in a heat radiation of 23 kW/m³ and would have the potential to reach the nearest BESS unit and cause a subsequent fire.	No

Hazardous event	Findings	Is it a valid hazard to consider?
	Escalation of a fire from the Jemena pipeline to a BESS unit is unlikely to have offsite impact, however there should be an offsite incident included in the emergency response plan for such a scenario. It was determined that no further assessment was required.	

6.8.4.6 Risk analysis

A risk analysis has been completed using a risk matrix to assess the risk for the population off-site. The risk matrix was sourced from AS/NZS 5139: *Electrical installations – Safety of battery systems for use with power conversion equipment* (AS/NZS 5139).

The hazardous events identified associated with the Project are presented in **Table 6.8-8**.

Table 6.8-8: Risk assessment (Sherpa, 2024)

Hazard type	Incident location	Risk analysis (off-site/public impact)			Recommendations
		Severity	Likelihood	Risk	
Fire	Battery modules	Moderate (medical treatment for burn)	Rare (area not occupied and escape possible)	Low	None
External factors	Jemena gas pipeline full bore rupture and fire	Minor (BESS fire will be smaller than the initiating event)	Rare (based on historical pipeline rupture data)	Very Low	Include a Jemena pipeline incident in the site emergency response plan

The above risk analysis concludes that all risks would be 'Low' or 'Very Low' risk.

An assessment was also conducted against the HIPAP No.4 qualitative land use planning risk criteria, which is presented in **Table 6.8-9**.

Table 6.8-9: Assessment against HIPAP No. 4 qualitative risk criteria (Sherpa, 2024)

HIPAP 4 qualitative criteria	Remarks	Complies?
<i>All 'avoidable' risks should be avoided. This necessitates the investigation of alternative locations and alternative technologies, wherever applicable, to ensure that risks are not introduced in an area where feasible alternatives are possible and justified.</i>	The PHA identified hazardous events and assessed risks for the proposed operations. The BESS is in a secure industrial area with large separation distances from sensitive receptors (e.g. residential, childcare) to minimise off-site risks. Batteries are essential for a BESS development, and a substation is necessary to connect to the electricity grid. The choice of battery technology balances cost and availability, with lithium-iron phosphate being most common.	Yes; fatality effects are contained on site and there are no residential or sensitive areas bordering the site boundary.

HIPAP 4 qualitative criteria	Remarks	Complies?
<i>The risk from a major hazard should be reduced wherever practicable, irrespective of the numerical value of the cumulative risk level from the whole installation. In all cases, if the consequences (effects) of an identified hazardous incident are significant to people and the environment, then all feasible measures (including alternative locations) should be adopted so that the likelihood of such an incident occurring is made very low. This necessitates the identification of all contributors to the resultant risk and the consequences of each potentially hazardous incident. The assessment process should address the adequacy and relevancy of safeguards (both technical and locational) as they relate to each risk contributor.</i>	Based on the separation distance to sensitive receptors, consequences from the identified hazardous events are not expected to have significant off-site impacts.	Yes
<i>The consequences (effects) of the more likely hazardous events (i.e. those of high probability of occurrence) should, wherever possible, be contained within the boundaries of the installation.</i>	Events with high probability of occurrence are expected to be contained within the boundaries of the installation. All BESS megapacks are located such a way that a fire will not escalate between units. The majority of units sit at least 15 m away from the site boundary, meaning that most BESS fires are not expected to have any impact off site.	Yes
<i>Where there is an existing high risk from a hazardous installation, additional hazardous developments should not be allowed if they add significantly to that existing risk.</i>	There are no publicly known high risks from hazardous developments (in the context of the Resilience and Hazards SEPP) in the vicinity of the Project. It is assumed other developments have been subject to planning controls that require risks to be managed to acceptable levels.	Yes

6.8.4.7 Outcomes

This assessment addressed the SEARs outlined in **Section 6.8.1**, which outlined the need to assess the potential hazards may arise from the Project. The assessment concluded the following:

- The proposal is not potentially hazardous in the context of SEPP
- The HAZID and consequence analysis found there are no potential events with significant off-site consequences and societal risk is negligible
- A PHA, including a review of separation distances and health effects has been completed and the level 1 assessment concludes that the project meets the HIPAP 4 risk criteria and should not be precluded on the basis of land use safety

- There is a residual risk of injury due to heat radiation from a fire extending up to 5 m into the road reserve of Tourle Street. The road is multi lane with a section of narrow pathway which is infrequently used and not connected to other pathways.

6.8.5 Mitigation measures

The following actions in **Table 6.8-10** are recommended to mitigate against potential hazards.

Table 6.8-10: Mitigation and management measures - hazards and risks

ID	Mitigation measure	Timing
HR-1	An offsite incident involving the high-pressure gas main be included in the site emergency response plan for the BESS facility.	Pre-construction, construction, operation

6.9 Social and economic

6.9.1 Secretary's Environmental Assessment Requirements

Table 6.9-1 sets out the SEARs relevant to Social and Economic impacts and where these requirements have been addressed in this EIS.

Table 6.9-1: Relevant SEARs – social and economic

Relevant SEARs	Where addressed
Social	
This EIS must address the following: Including an assessment of the social impacts or benefits of the project for the region and the State as a whole in accordance with the <i>Social Impact Assessment Guideline</i> (DPE, 2023), including consideration of any increase in demand for community infrastructure services, and consideration of construction workforce accommodation	An assessment of the social impacts of the Project is provided in Section 6.9.4 and Appendix L.
Economic	
This EIS must address the following: Including an assessment of the economic impacts or benefits of the project for the region and the State as a whole and provide details of any proposed voluntary benefit sharing, having regard to the <i>Benefit Sharing Guideline 2024 and Private Agreement Guideline 2024</i>.	An assessment of the economic impacts of the Project is provided in Section 6.9.4.

6.9.2 Methodology

A Social Economic Impact Assessment (SEIA) has been prepared by RPS Group (RPS) to assess the impacts of the Project in accordance with the *SIA Guideline and Technical Supplement: Social Impact Assessment Guideline for State Significant Projects (Appendix L)*. The SEIA assessed the social and economic impacts that the Project would have on the broader Newcastle region and NSW.

6.9.2.1 Social impact assessment methodology

The social impact assessment included the following five phases:

- **Phase 1 – Scoping:**
 - Identify key social and economic impacts to be included in the SEIA, and the level of assessment required
 - Definition of the social locality of the Project to focus on and understand the people and communities that may be affected, including vulnerable and marginalised populations
- **Phase 2 - Social baseline:**
 - Establishment of the existing socio-economic environment against which impacts and benefits may be measured
 - Collection of baseline information from primary and secondary sources, as detailed in **Table 6.9-2**
 - Identification of key vulnerable and disadvantaged social groups for consideration in the assessment
- **Phase 3 - Community and stakeholder consultation:**
 - Review of community consultation undertaken for the Project more broadly (see **Chapter 5.0**), and its alignment with the *International Association of Public Participation (IAP2) Spectrum*

- **Phase 4 - Impact assessment:**
 - Review of the relevant EIS technical studies to understand impacts and the potential groups that could experience socio-economic impacts
 - Identification and assessment of the potential socio-economic impacts that could arise from the Project
- **Phase 5 - Mitigation and monitoring:**
 - Development of mitigation measures to address adverse social impacts and enhance social benefits.
 - The social impact assessment drew upon the following primary and secondary data sources (**Table 6.9-2**).

Table 6.9-2: Social impact assessment data sources

Data type	
Primary data	Secondary data
• Pre SEIA data: early engagement activities, including community meetings, stakeholder correspondence and pre-scoping discussions with DPHI • SEIA specific data: - Social impacts: community engagement activities, meetings with stakeholders - Demographics: ABS Census 2021, SEIFA and REMPLAN community data on social house - Community infrastructure: Google Maps - Project insights: discussions with technical experts, EIS authors, engineers and designers	• Government strategies and plans: - NSW Net Zero Plan (2020) - NSW Electricity Strategy (2019) - Hunter Regional Plan 2041 - Newcastle Climate Action Plan (2021) • Local and regional policies: - Newcastle LEP 2012 - Newcastle 2030 CSP • Community stakeholder reports: - Local council engagement reports

The social impacts were assessed using a social impact significance matrix (see **Table 6.9-3**) evaluating the magnitude of impact against the likelihood of occurrence.

Table 6.9-3: Social impact significance matrix (RPS, 2025)

Likelihood	Magnitude level				
	Minimal	Minor	Moderate	Major	Transformational
Almost certain	Low	Medium	High	Very high	Very high
Likely	Low	Medium	High	High	Very high
Possible	Low	Medium	Medium	High	High
Unlikely	Low	Low	Medium	Medium	High
Very unlikely	Low	Low	Low	Medium	Medium

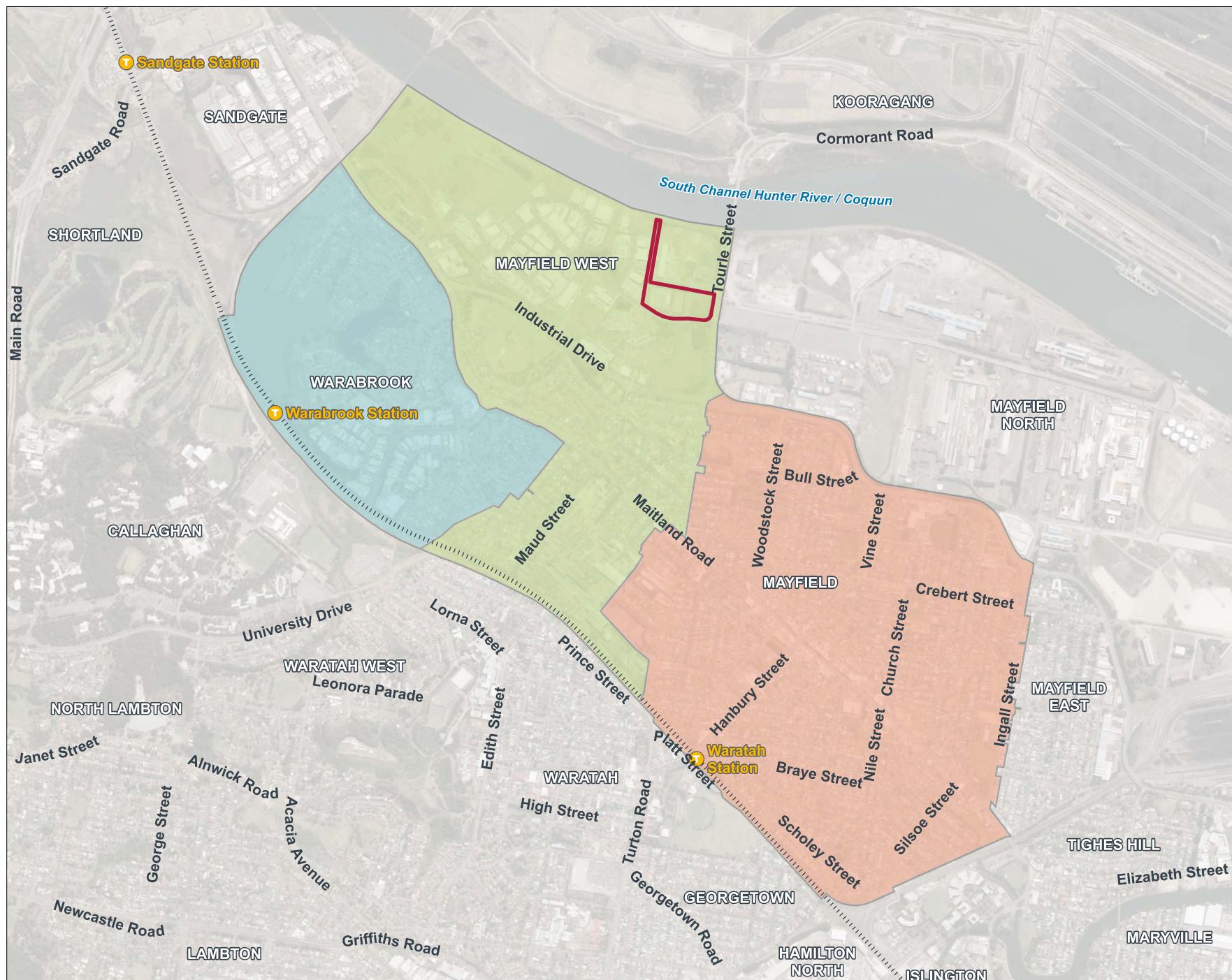
6.9.2.2 Economic impact assessment methodology

The economic assessment was based on an Input-Output (IO) analysis, which analysed the contribution of the Project to the broader NSW economy. IO tables were used to detail the supply and use of products across industries (i.e. the flow-on effects across sectors) and to quantify direct and indirect economic impacts. This assessment was undertaken using REMPLAN economic modelling software.

6.9.3 Existing environment

The social locality for the SEIA was defined as the suburbs of Mayfield West, Warabrook and Mayfield (see **Figure 6.9-1**). These were selected based on the scale and nature of the Project, the people and communities that may be affected (including vulnerable groups and marginalised populations), land use and natural features of the landscape. The ABS statistical areas used in this report are defined in **Table 6.9-4**.

FIGURE 6.9-1:
SOCIAL STUDY AREA



Legend

-  The site
-  Railway
-  Railway station

Social Study Area

-  Mayfield
-  Mayfield West
-  Warabrook

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6.9.3.1 Demographics

The demographics of the suburbs surrounding the site (Mayfield West, Warabrook and Mayfield) were considered against the same demographic indicators for the Newcastle LGA and NSW more broadly based on the 2021 Census results.

This detail is summarised in **Table 6.9-4**.

Table 6.9-4: Demographic, transport and housing in the social locality (RPS, 2025)

Indicator	Geographical location				
	Mayfield West	Warabrook	Mayfield	Newcastle	NSW
Population	1,993	1,982	9,760	169,433	8,097,062
Population growth since 2016 (%)	5.2%	0.5%	4.8%	10.8%	8.2%
First Nations Australians (%)	5.6%	3.4%	5.1%	4.4%	3.4%
Older persons (65+) (%)	14.3%	26.3%	15.6%	16.6%	17.7%
Very young children (0-4) (%)	5.8%	4.0%	6.3%	5.4%	5.8%
Households without a private vehicle (%)	10.2%	6.1%	11.5%	8.2%	9.0%
Separate houses (%)	79.6%	69.9%	74.3%	69.0%	65.6%
Most common housing tenure type	Renting (39%)	Owning outright (37.3%)	Renting (40.9%)	Renting (36.6%)	Mortgage (32.5%)
Residential vacancy rate as of 2025 (%)	0.9%	0.9%	0.9%	1.0%	N/A

The information provided in **Table 6.9-4** is discussed in the following sections.

Population

In Mayfield West, there has been greater population growth (5.2%) since 2016 than the other two suburbs within the social locality; Warabrook (0.5%) and Mayfield (4.8%). This localised population growth is not reflective of the greater regional population growth in that time with the Newcastle LGA growing 10.8% and NSW increasing its population by 8.2%.

Workforce

In Mayfield West, 68.1% of residents are of working age, similar to Mayfield (68.9%) but higher than Warabrook (59.9%). The unemployment rate in Mayfield West is 5.1%, lower than Mayfield's 5.6% but higher than Warabrook's 4.2%. These rates are lower than the regional (9%) and state (10%) averages.

The primary occupation category in all three areas is "professionals," making up around 25-28% of the workforce. The largest source of employment in Mayfield West, Warabrook, and Mayfield is healthcare, which is consistent with the top industry in both Newcastle and NSW, which is health care and social assistance.

Education

In Mayfield West, 7.7% of residents left school at Year 9 or below, which is similar to the NSW rate (7.4%) and slightly lower than Newcastle's (8.4%). Mayfield's rate is close to Newcastle's at 8.7%, while Warabrook has a higher proportion at 11.1%. Similarly, the percentage of residents with a bachelor's degree or higher is slightly lower in all three suburbs (ranging from 21.9% in Mayfield West to 26% in Mayfield) compared to the regional (28.3%) and state (26.3%) averages.

Transport

The greater Newcastle region is less dependent on public transport than the rest of NSW, with only 8.2% of households not having access to a private vehicle, as opposed to NSW 9%. Within the surrounding suburbs of the Project however, less households have access to private vehicles with 11.5% of Mayfield households and 10.2% Mayfield West households not having access to private vehicles.

Housing

Separate housing is the most common dwelling structure within the social locality. Separate dwellings comprised of, 79.6%, 69.9% and 74.3% of the housing in Mayfield West, Warabrook, and Mayfield respectively. These are all marginally higher than the regional and state averages Newcastle (69%) and NSW (65.6%).

The most common tenure type in Mayfield West is renting (39%), consistent with Mayfield (40.9%) and the Newcastle region (36.6%). In Warabrook, the most common tenure type is owning outright (37.3%), and in NSW, the most common type is owning with a mortgage (32.5%).

Vulnerable communities

A summary of key characteristics for vulnerable communities in the suburbs of Mayfield West, Warabrook, and Mayfield, compared with the broader Newcastle region and NSW, is provided in **Table 6.9-5**.

Table 6.9-5: Vulnerable communities within the social locality

Community	Summary
Culturally and linguistically diverse (CALD) community members	In Mayfield West, 16.7% of residents were born overseas, 24.3% in Warabrook, and 18.3% in Mayfield. These figures are higher than the Newcastle region (14.8%) but lower than NSW (34.6%). When it comes to households using a non-English language, Mayfield West has 9.7%, Mayfield 10.5%, and Newcastle 10.5%, all lower than the state average of 29.5%. Warabrook is the closest to the state rate at 20.4%.
Older persons and very young children	The proportion of older persons (65+) is 14.3% in Mayfield West, 15.6% in Mayfield, and 16.6% in Newcastle. Warabrook has a notably higher proportion at 26.3%, which is much higher than both the local and state averages (17.7%). Conversely, the proportion of very young children (0-4 years old) is consistent across the suburbs, with Mayfield West at 5.8%, Mayfield at 6.3%, and Newcastle at 5.4%. Warabrook has a slightly lower proportion at 4%.
Social and community housing	While specific data for Mayfield West, Warabrook, and Mayfield is not readily available, 5.3% of households in Newcastle were in social housing as of 2021, higher than the Regional NSW average of 3.8%.
Lone-person households	Lone-person households make up 33.3% of households in Mayfield West, 34% in Mayfield, and 29.5% in Newcastle, all of which are higher than the NSW average of 25%. Warabrook has a slightly lower proportion at 27%.
Low-income households	The proportion of households earning less than \$650 per week is 19.4% in Mayfield West, 16.9% in Warabrook, and 20.4% in Mayfield, all of which are in line with or slightly higher than the NSW rate of 16.3%.
First Nations Australians	The First Nations population in Mayfield West is 5.6%, in Mayfield it is 5.1%, and in Warabrook it is 3.4%. These rates are slightly higher than Newcastle (4.4%) and NSW (3.4%).

6.9.3.2 Socio-economic disadvantage

The Socio-Economic Indexes for Areas (SEIFA) measures community disadvantage based on factors like income, education, and unemployment. In 2021, Newcastle scored 1,012, ranking in the top 80% of disadvantaged areas. Warabrook had a higher score (993) than Mayfield West (987) and Mayfield (979), all three of which are in the 4th decile, indicating they are among 40% most disadvantaged areas in Australia.

6.9.3.3 Local features and community values

An overview of the local values and features of the social locality is provided in **Table 6.9-6**.

Table 6.9-6: Local features and values

Value/feature	Description
Local amenity and character	The locality of Mayfield West, Warabrook, and Mayfield is bordered by the South Channel Hunter River to the north and the Hunter Wetlands National Park to the north and west. To the south, the area is largely urban and residential. Land use in the social locality itself is predominantly industrial and urban.
Access and connectivity	The area houses three significant roads: Industrial Drive, Tourle Street, and Pacific Highway. These facilitate industrial and commuter movements and would also be used for any transport from the City of Newcastle to regional western NSW.
Environmental features	Key bodies of water that run through the locality are the South Channel Hunter River and Boatman Creek. The Eucalyptus Circuit Reserve also features wetlands. Small pockets of greenspace are used in the area for community parks and sports grounds.
Community cohesion	The locality is primarily an industrial and urban area, with some residential areas. There is some community greenspace, providing opportunities for physical activity and social interaction. There are several places of worship, community halls, and community sporting areas. The area is close to the University of Newcastle, which provides education and community facilities for students and local residents.

6.9.3.4 Community infrastructure

The key types of community infrastructure within the social locality of the Project include education facilities, childcare centres, aged care, healthcare, open spaces, recreation, and community services.

Table 6.9-7 outlines the number of different receptors in each category.

Table 6.9-7: Community infrastructure within the social locality

Category	Number of receptors
Education	7
Childcare	6
Aged care	4
Health and disability	8
Open space, parks	6
Recreation/sport	13
Community and cultural	9

6.9.4 Impact assessment

This section provides an overview of the potential socio-economic impacts associated with the construction and operation of the Project. It covers how the Project may affect various aspects of community life, including way of life, community cohesion, cultural heritage, health and wellbeing, surroundings, and livelihoods.

6.9.4.1 Construction

Social

An assessment of the potential social impacts associated with the construction of the Project is provided in **Table 6.9-8**.

Table 6.9-8: Assessment of social impacts associated with the construction of the Project

Social aspect	Potential impact during construction
Community	Community cohesion may be temporarily disrupted during construction of the Project, as community members may be concerned with the concentration of industrial activity within the area around the site. Negative community sentiment on transient workforces is also seen as an issue, with safety the biggest concern among vulnerable community members. However, the expected impact to overall community cohesion is expected to be of low significance, provided appropriate mitigation measures have been followed. Additionally, the construction phase of the Project has the potential to cause temporary disruptions to daily routines for residents, businesses, and industrial workers through additional traffic. Over lapping construction with projects such as the Clean Energy Precinct may amplify disruptions, straining local infrastructure and reducing community amenity. As mentioned in Section 6.7, residual traffic impacts are expected to be minimal, and as such, disruption to daily business routine is expected to be negligible.
Culture	During construction, there is potential for ground disturbance to impact Aboriginal cultural heritage, although the ACHAR has found no heritage sites within the Project Area. The risk remains that unidentified cultural or historical artefacts could be encountered during excavation activities. Such discoveries would require immediate stop-work protocols and consultation with Aboriginal representatives to ensure appropriate management and preservation. Non-Aboriginal heritage impacts are deemed unlikely due to the previously modified industrial nature of the site.

Social aspect	Potential impact during construction
Health and wellbeing	Noise, dust, and vibrations from heavy machinery associated with the construction phase have the potential to cause temporary health and well-being impacts. Sensitive receptors located within 400 m are considered to be particularly vulnerable. However, Section 6.5 outlines that the noise produced by the Project is not expected to exceed the standard NML for residential and non-residential receivers, therefore having negligible impact. Dust emissions are expected to be low (see Section 6.11) and manageable through appropriate mitigation measures. Previous contamination concerns have been addressed through site remediation and capping, and no further remediation is required. Standard dust suppression measures will be implemented to mitigate airborne particle exposure during construction. There is the potential for adverse impacts associated with a rupture of the high-pressure gas pipeline along McIntosh Drive, however, Section 6.8 outlines that this hazard represents a low risk, provided appropriate mitigation measures are followed.
Livelihoods	The Project will contribute an EDC of approximately \$208 million and create temporary jobs for contractors, engineers, and construction workers, benefiting the local workforce. Increased demand for materials, equipment, and services will stimulate short-term economic activity, supporting local businesses. Spending by the construction workforce may also boost service industries like hospitality and retail, aligning with regional economic diversification goals.
Surroundings	The construction phase of the Project is expected to include excavation, movement of heavy vehicles and vegetation clearing which has the potential to impact surrounding waterways, visual amenity and overall air quality of the area surrounding the site. While these impacts are seen as a possibility, technical assessments conducted on the impacts to visual amenity Appendix M and surface water and flooding (Appendix J) concluded that these potential impacts were low-to-negligible and could be managed through appropriate mitigation measures.
Way of life	The construction phase of the Project has the potential to impact on the way of life of community members and businesses alike. Particularly increased traffic numbers may influence congestion and access disruptions to nearby businesses. Construction congestion impacts on the wider traffic network and access disruptions have been assessed in Section 6.7. This assessment indicated that the addition of 154 vehicles during the peak construction periods will have negligible impact on the wider traffic network. The presence of a transient workforce may also influence the local rental market, as up to 10 workers are projected to seek temporary rental accommodation. As of January 2025, the rental vacancy in Newcastle is 1%, and although the workforce represents a small percentage of the total local rent demand, it does present an increase in competition for rental housing. By recommending motels and short-stay accommodation to non-local renters, as opposed to rental options, the impact to the local rental market is expected to be reduced.

Economic

An assessment of the potential economic impacts associated with the construction of the Project is provided in **Table 6.9-9**.

Table 6.9-9: Assessment of economic impacts associated with the construction of the Project

Economic aspect	Potential Impact during construction
Output	The Project is expected to provide a total output of \$79.29 million. This is divided into an initial direct spend of \$43.25 million within the NSW economy and an indirect demand for goods and services projected to be \$36.04 million.
Gross value added (GVA)	The Project construction is expected to have a direct GVA of \$17.68 million to the economy. It is estimated that there will be further indirect GVA of \$14.29 million generated by local purchases of goods and services.
Wages and salaries	Construction of the Project is expected to generate a direct increase of \$10.07 million in wages. An additional increase of \$8.03 million in wages is expected to be generated by local purchases of goods and services.
Employment	The Project is expected to generate 100 FTEs. An additional 69.92 FTEs are expected to be generated by local purchases of goods and services.

According to the SEIA, overall construction expenditure required for the Project has the potential to create further opportunities for workers and businesses to economically thrive. The overall benefit to the community and the economy is presented by the direct GVA of \$17.68 million and the indirect GVA of \$14.29 million that will be generated by the provision of goods and services. The GVA of the Project outlines the positive impact that the Project is expected to have on overall economic productivity.

The Project also completed an EDC as part of this EIS, which details an EDC of approximately \$208 million (refer to **Appendix N**).

6.9.4.2 Operation

Social

An assessment of the potential social impacts associated with the operation of the Project is provided in **Table 6.9-10**.

Table 6.9-10: Assessment of social impacts associated with the operation of the Project

Socio-economic aspect	Potential Impact during operation
Community	During operation, the Project is projected to have minimal community impact. The Project will operate quietly, and its integration into the industrial landscape means that long-term community cohesion will not be affected. The unmanned nature of the site also means there will be no increased strain on local resources or infrastructure.
Culture	The operational phase of the Project is not expected to pose any risks to cultural heritage. The site's unmanned and automated design minimises interaction with the physical environment. Furthermore, no Aboriginal cultural sites are directly affected. Further cultural engagement is not anticipated to be necessary but would be conducted if concerns are raised by local stakeholders or community groups.

Socio-economic aspect	Potential Impact during operation
Health and wellbeing	The Project is designed to minimise health risks, operating quietly with no significant noise or pollutant emissions. However, LiFePO ₄ batteries pose potential risks, including fire, overheating, and chemical leaks, requiring strict safety measures. Offsite hazards are only expected to pose a low-to-negligible risk, as detailed in Section 6.8 , provided appropriate mitigation measures are followed.
Livelihoods	The Project will generate ongoing economic benefits through periodic maintenance, supported by an annual \$2 million operating cost, benefiting local contractors and service providers. While workforce needs are negligible, steady demand for technical expertise will support regional businesses. The Project's key economic role lies in storing surplus electricity for release during peak demand, enhancing grid stability, integrating renewables, and lowering wholesale electricity prices. This strengthens energy resilience and competitiveness in NSW. Aligned with the NSW ISP and the Electricity Strategy, the Project will improve energy reliability, reduce fossil fuel reliance, and attract renewable energy investments, positioning NSW as a leader in clean energy innovation.
Surroundings	Once operational, the visual and environmental impacts of the Project will be minimal. The facility will blend into the surrounding industrial landscape, with landscaping and aesthetic design measures mitigating long-term visual changes. The Project is expected to operate without significant noise or air emissions, resulting in a negligible impact on local amenity.
Way of life	The operation of the Project does not have the potential to alter the way of life of local residents and businesses. The noise levels and the visual aesthetic of the Project blends in with the industrial nature of the Steel River Industrial Estate. Additionally, as mentioned in Section 6.6 , only two vehicle trips per week will be needed during operation and therefore no impacts to local traffic are expected.

Economic

An assessment of the potential economic impacts associated with the construction of the Project is provided in **Table 6.9-11**.

Table 6.9-11: Assessment of economic impacts associated with the operation of the Project

Economic aspect	Potential Impact during construction
Output	An annual spend of \$1.06 million into the NSW economy is expected as a result of operation of the Project. Supply chain flow on effects from operation are expected to indirectly generate \$920,000 approximately.
GVA	The operation of the Project is expected to generate in \$410,000 from GVA annually and as a result, supply-chain effects in terms of local purchases of goods and services are anticipated to further value-add \$380,000.
Wages and salaries	The operation of the Project is expected to create a \$280,000 increase in salaries. Flow-on supply chain effect from purchases of goods and services are anticipated to generate an extra \$200,000 in wages and salaries.

Economic aspect	Potential Impact during construction
Employment	Operation of the Project is expected to directly create 1 FTE. Expected flow on supply chain affects are expected to indirectly create an additional 1.62 FTE jobs.

The annual expenditure required for the operation of the Project is expected to be \$1.06 million, that will directly and indirectly contribute to the NSW economy. Operation of the Project is expected to generate an increase in GVA (\$790,000), wages (\$480,000) and employment (2.62 FTE).

The operation of the Project is also expected to achieve significant flow on benefits to the NSW economy. The Project is expected to support the transition to renewable energy within the NEM, as well as increasing the overall firming capacity of the NSW electricity grid. This could see a reduction in wholesale electricity prices, benefiting household consumers and businesses alike.

6.9.5 Mitigation and management measures

Construction and operational mitigation measures to manage potential social and economic impacts of the Project are outlined in **Table 6.9-12**.

Table 6.9-12: Mitigation and management measures - social and economic

ID	Mitigation measure	Timing
SI-1	Implement noise, traffic, and dust mitigation measures while communicating construction schedules in advance. Monitor community complaints and ensure compliance with management plans to reduce disruptions and demonstrate adherence.	Construction
SI-2	Provide regular updates via newsletters, emails, and meetings, maintaining a contact point for enquiries. Foster transparency on potential impacts to build trust, increase engagement, and reduce unresolved complaints.	All Project stages
SI-3	Modify work schedules or traffic routes based on real-time monitoring of noise, traffic, and air quality. Maintain a grievance register to track concerns, with the goal of reducing grievances over time.	Construction and operation
SI-4	Share project-related opportunities with communities to increase awareness and engagement.	Construction and operation
SI-5	Prioritise local hiring, engage employment agencies, and track the number of local hires.	Construction and operation
SI-6	Provide cultural awareness training for staff to support First Nations engagement, ensuring completion and feedback are recorded.	Construction and operation
SI-7	Use toolbox talks to promote local businesses, encouraging contractors and workers to support nearby suppliers, services and hospitality providers.	Construction

Further to the mitigation measures outlined above, a construction environment management plan (CEMP) would be prepared for the Project. The CEMP would detail the proposed approach to environmental management, monitoring and reporting during construction.

In addition to the CEMP, mitigation measures identified in other chapters of this EIS are relevant to the management of potential social impacts.

Cumulative social and economic impacts would be managed through the application of the mitigation measures outlined in **Section 6.11**.

6.10 Other issues

This section provides an overview of other environmental matters that, based on existing information and conditions on site, require limited assessment. These matters include:

- Non-Aboriginal heritage
- Waste
- Air quality
- Aviation
- Embodied carbon emissions
- Bushfire.

6.10.1 Non-Aboriginal heritage

6.10.1.1 Secretary's Environmental Assessment Requirements

Table 6.10-1 below sets out the SEARs relevant to non-Aboriginal heritage and where the requirements have been addressed in this EIS.

Table 6.10-1: Relevant SEARS – non-Aboriginal heritage

Relevant SEARS	
Non-Aboriginal heritage	Where addressed
The EIS must address the following specific matter: • assess the impact to historic heritage having regard to the <i>Guidelines for Preparing a Statement of Heritage Impact</i>.	• This section discusses the impact that the Project will have on non-Aboriginal heritage.

6.10.1.2 Methodology

A search of the NSW State Heritage Register (SHR) and the Newcastle LEP was undertaken to determine the location of known non-Aboriginal heritage items within or near the site. Based on these results, a desktop assessment was completed to:

- Identify non-Aboriginal items that have the potential to be affected by the Project
- Assess potential impacts on historic heritage items
- Identify mitigation measures to address potential impacts on known or unknown historic heritage items.

6.10.1.3 Existing environment

Historical context

Early European settlement in Mayfield began in 1804, and the land was initially used for agriculture and cultivation. However, due to poor soil quality and the presence of pests, land was repurposed for industrial usage. The presence of coal mining in the region set the foundation for the present-day industrial nature of the site, noting its history as part of the BHP steelworks in the mid-20th century. Further detail on early European settlement and historical land use within the broader Mayfield West region is detailed in **Section 6.2**.

Heritage items

There is one historic heritage item located within the vicinity of the site, which is *Remnant Garden* (1692). This is located approximately 80 m southwest of the site, adjacent to where the Murray Dwyer orphanage was previously situated (refer to **Figure 6.5-1**).

6.10.1.4 Impact assessment

Construction

Based on the desktop assessment of the SHR and the Newcastle LEP there are no registered or known historic heritage items located within the site, with only item I692 being near to the site. It is not expected that construction works will affect this heritage item as works are not anticipated to extend beyond the site boundary. Considering the significant historical disturbance, as detailed in **Section 6.3** and **Section 6.4**, that has occurred within the site, it is highly unlikely that historic heritage items remain within the site. As such the site has very low archaeological potential.

Operation

Impacts on historic heritage items during the operational phase of the Project are not expected. This is based on the fact that no ground disturbing works are necessary during operation of the Project.

6.10.1.5 Mitigation measures

The measures detailed in **Table 6.10-2**, would be implemented in case historic heritage items are discovered during construction.

Table 6.10-2: Mitigation and management measures - non-Aboriginal heritage

ID	Management and mitigation measures	Timing
NAH-1	If any heritage objects and/or relics are uncovered during the construction of the Project, the following steps would be followed: • All activity in the immediate area would cease immediately. • The site construction manager would be notified. • Flagging or fencing would be erected to demarcate and protect the area. • Project Area personnel and visitors would be advised to avoid the area until further notice. • An appropriately qualified heritage professional would be consulted to confirm if the object/s is a heritage item or relic. • NSW Heritage Council would be contacted. If confirmed as a historic heritage item, an appropriately qualified heritage professional would record the location and attributes of the site and determine the significance of the find.	Construction
NAH-2	In the event of the discovery of human skeletal material (or suspected human skeletal material) during project activities in the Project Area, the following steps would be followed: • All activities and/or works in the immediate area would cease as soon as practicable • The NSW Police would be immediately contacted along with the project manager and the NSW Heritage Council • Flagging or fencing would be erected to demarcate and protect the area • Project Area personnel and visitors would be advised to avoid the area until further notice Any sand or soils removed from the near vicinity of the find would be identified and set aside for assessment by the investigating authorities.	Construction

6.10.2 Waste

6.10.2.1 Secretary's Environmental Assessment Requirements

Table 6.10-3 below sets out the SEARs relevant to waste and where the requirements have been addressed in this EIS.

Table 6.10-3: Relevant SEARs - waste

SEARs	
Waste	Where addressed
The EIS must address the following specific matters: Identify, quantify and classify the likely waste stream to be generated during construction, operation, and decommissioning, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste (in consultation with waste facilities, including Council); and	This section discusses likely waste streams.
Provide a waste management plan (as appropriate).	A waste management plan is recommended to be included in the CEMP.

6.10.2.2 Methodology

A qualitative assessment was carried out to estimate waste types and approximate quantities, identify potential impacts, and identify appropriate management measures. The desktop assessment involved:

- Identifying potential waste generating activities during construction, operation, decommissioning and rehabilitation
- Estimating the likely waste streams/types and associated quantities
- Identifying the likely classification of waste streams in accordance with NSW EPA waste classification guidelines
- Describing proposed management and handling techniques for key waste streams, including waste storage and collection, minimisation, and reuse.

The waste types and quantities estimated in this chapter are indicative and have been identified for the purpose of determining potential waste management options. While quantities are likely to differ slightly from the estimates made, the identified waste management options would be appropriate for the final waste quantities.

Definitions for waste classifications used during the desktop assessment have been provided within **Table 6.10-4**.

Table 6.10-4: NSW EPA waste classification guidelines

NSW EPA waste classification	Waste description
Special waste	Waste that has unique regulatory requirements, including clinical and related waste, asbestos waste, tyres, and anything classified as special waste under an EPA gazettal notice.
Liquid waste	Liquid waste means any waste (other than special waste) that has an angle of repose of less than 5 degrees above horizontal, becomes free-flowing at or below 60 degrees Celsius or when it is transported, is generally not capable of being picked up by a spade or shovel, is classified as liquid waste under an EPA gazettal notice.

NSW EPA waste classification	Waste description
Hazardous	Hazardous waste (other than special waste or liquid waste) includes waste that is a dangerous good that is classified under the Transport of Dangerous Goods Code as a 'Class 1' to 'Class 8' type of waste. It can also include coal tar or coal tar pitch waste, lead, acid or nickel-cadmium batteries, lead paint waste, or any mixture containing one of these types of wastes.
Restricted Solid Waste	No wastes have been pre-classified by the EPA as 'restricted solid waste'. Restricted solid waste, therefore, currently only includes wastes assessed and classified as restricted solid waste in accordance with the procedures in Step 5 of the waste classification guidelines. Restricted solid waste is generally determined based on the exceedance of a given mg/kg limit for each type of contaminant. See Table 1 and Table 2 of the waste classification guidelines (NSW EPA, 2014a).
General solid waste – putrescible (GSWp)	GSWp waste (other than special waste, liquid waste, hazardous waste, or restricted solid waste) includes standard household and litter bins waste that is collected by, or on behalf of, local councils, food waste, animal waste, manure and night soil and any grit of screening from sewage treatment systems.
General solid waste – non-putrescible (GSWnp)	GSWnp waste (other than special waste, liquid waste, hazardous waste, restricted solid waste or GSWp) includes glass, plastic, rubber, ceramics, bricks, concrete or metal, paper or cardboard, household recyclable waste (excluding food waste), garden waste, wood waste, waste that was previously in dangerous containers that have been thoroughly cleaned out, virgin excavated material and building and demolition waste.

6.10.2.3 Existing environment

There is one site for waste disposal facility and approximately 13 recycling centres within the City of Newcastle LGA. The sole waste disposal facility is Summerhill Waste Management Centre, which is approximately 8.1 km west of the site. The nearest recycling facility is Benedict Recycling Centre which is adjacent to the site. The waste types that are relevant to the Project are:

- Green waste
- Wastewater
- Construction waste
- Demolition waste
- Construction and office personnel waste
- Excess spoil
- Contaminated fill or soils.

6.10.2.4 Impact assessment

Construction

A summary of key waste streams, waste classification, estimated waste volumes, and a description of the methodology likely to be adopted for the management of each waste type is provided in **Table 6.10-5**.

Table 6.10-5: Key waste streams

Waste type / stream	Waste Classification	Proposed handling, treatment, and/or disposal method	Estimated volume
Green waste (vegetation)	GSWnp	Separated from other excavation waste and chipped, to be stored and used later for landscaping where possible. Excess woodchips would be sent to landscape suppliers or off-site recycling.	Moderate clearing of vegetation on site required (approximately 2.74 ha)
Wastewater	Liquid waste	Collection, transport and pump-out for off-site disposal into existing sewer system.	Up to 500 litres per week at peak construction (10 litres per person per day)
Construction waste	GSWnp	Reuse of materials would be prioritised where possible. Otherwise, waste will be transported to an off-site recycling or disposal facility.	Minimal
Demolition waste	GSWnp	Reuse of materials would be prioritised where possible. Otherwise, waste would be transported to an off-site recycling or disposal facility.	Minimal
Construction and office personnel waste	GSWnp	Waste would be recycled or separated where possible. Other general waste would be distributed to landfill.	Minimal
Excess spoil	GSWp	Spoil would be distributed to another project as fill or sent to a repurposing facility or a landfill. Confirmation of excess spoil will be determined following the preparation of a bulk earthworks plan as part of the detailed design.	Moderate
Contaminated fill or soils	To be classified, subject to results of testing	Procedure for handling and disposal of contaminated fill or soils would be in line with the management measures presented in Section 6.4 . An unexpected finds protocol would be implemented.	Negligible/Minimal – pending detailed design

Operation

During operation, the most common waste streams generated by the Project would be:

- BESS facility operational equipment waste (i.e. replaced battery modules, used transformer oil)
- On-site office waste
- Domestic waste generated by workers.

The Project is estimated to require low-staffing requirements on an intermittent basis. During operation, it is expected that only small quantities of general waste and recycling will be generated on-site by these intermittent workers.

Operational equipment waste such as replaced battery modules would be included in chemical waste collection. Any material that can be repurposed, will be returned to the supplier, otherwise those materials will be undergo recycling.

Decommissioning and rehabilitation

Before decommissioning the Project, all waste and operating chemicals would be disposed of at a licenced facility in accordance with the POEO Regulation and the *NSW EPA Waste Classification Guidelines* (NSW EPA, 2014a).

Prior to demolition, existing infrastructure, plant and equipment would be assessed and categorised based on whether the materials can be reused, repurposed, or recycled. Materials able to be reused, repurposed, or recycled will be distributed off-site to other projects, suppliers, or recycling facilities willing to accept the materials. Batteries will be recycled at an approved recycling facility or returned to the manufacturer for refurbishment. Other materials that cannot be recycled, will be disposed of at a licenced waste facility.

6.10.2.5 Mitigation measures

Mitigation and management measures to avoid or minimise potential waste-related impacts during construction, operation and decommissioning and rehabilitation of the Project have been provided in **Table 6.10-6**.

Table 6.10-6: Mitigation and management measures - waste

ID	Mitigation measures	Timing
W-1	A Waste Management Sub-Plan would be prepared as part of the CEMP and would: - Identify requirements consistent with the waste hierarchy and circular economy initiatives - Include relevant measures from the National Waste Policy: Less Waste, More Resources (Department of Agriculture, Water and the Environment, 2018) - Provide a framework to target resource efficiency through the design and construction phases - Provide consistent clear direction on waste and resource handling, storage, stockpiling, use and reuse management measures - Set out processes for disposal, including on-site transfer, management, and the necessary associated approvals/permits - Describe the process for regularly removing waste from the Project Area to avoid issues associated with odour, visual amenity, and the attraction of animal/pest species - Outline procedures for waste generated to be segregated at source and suitably stored in designated waste management areas within the Project Area - Include material tracking measures to track waste and recyclables generated from the Project and removed from the Project Area.	Construction
W-2	All waste would be assessed, classified, managed, and disposed of in accordance with the Waste Classification Guidelines and other relevant legislation (NSW EPA, 2014).	Construction Operation Decommissioning and Rehabilitation

6.10.3 Air quality

6.10.3.1 Secretary's Environmental Assessment Requirements

No specific requirements were provided for air quality in the SEARs, however an assessment for this environmental aspect has been provided below.

6.10.3.2 Methodology

A qualitative desktop assessment has been carried out to estimate the potential air quality impacts associated with the construction and operation of the Project. This involved:

- Reviewing the legislation for air pollution and air quality in NSW
- Identifying potential air pollution generating activities during construction and operation
- Describing the proposed mitigation and management techniques for key air pollutants during construction and operation.

6.10.3.3 Existing environment

Air Quality Index

The baseline recording for air pollution for the site was recorded at Mayfield monitoring station (MMS), approximately 180 m south of the site. The data used in this section from the MMS was collected from NSW Government's air quality website (NSW Government, 2025).

The MMS measures the following:

- Fine particles less than 2.5 micrometres in diameter (PM_{2.5})
- Fine particles less than 10 micrometres in diameter (PM₁₀).
- Nitrogen dioxide
- Sulfur dioxide.

Data from the MMS is summarised in **Table 6.10-7**. The results of the fine particles from the MMS are all of 'good' air quality, according to the NSW Government ratings.

Table 6.10-7: MMS air quality data (NSW EPA, 2025)

Date	Averaging period	Pollutant concentration			
		PM _{2.5} (ug/m ³)	PM ₁₀ (ug/m ³)	Nitrogen dioxide (pphm)	Sulfur dioxide (pphm)
09/02/2025	1-hour average	7.6	19.76	0.42	0.43
09/01/2025	1-hour average	4.88	11.35	0.62	0.18
09/12/2024	1-hour average	7.93	32.9	0.58	0.07
09/11/2024	1-hour average	7.55	26.38	0.35	0.04 ¹⁰

National Pollutant Inventory

Based on the results from the MMS presented in **Table 6.10-7**, air quality within the region surrounding the site is considered to be good. The majority of air pollution surrounding the Project is likely to be generated by industrial processes, considering the surrounding land uses.

The National Pollutant Inventory has a list of registered facilities, which are those that meet the following Commonwealth criteria:

- Emission thresholds
- Those that participate in manufacturing, mining, waste treatment and energy production
- Exceeding 20,000 hours of work per year (i.e. 10 full time employees).

¹⁰ Air quality criteria to achieve "Good" rating: PM_{2.5} (<25 ug/m³), PM₁₀(<50 ug/m³), nitrogen dioxide (<8 pphm) sulfur dioxide (<13.3 pphm)

According to the above criteria, there are 11 registered facilities within a 3 km radius of the site, including:

- Delta EMD Australia Pty Ltd (1 McIntosh Drive, Steel River Industrial Estate, Mayfield West, NSW, 2304)
- Commonwealth Steel Company Ltd (2 Maud Street, Waratah, NSW, 2304)
- One Steel – Market Mill (Ingall Street, Mayfield East, NSW, 2304)
- Koppers Carbon Materials and Chemicals Pty Ltd (Woodstock Street, Mayfield, NSW, 2304)
- Onesteel Trading Pty Ltd (Industrial Drive, Mayfield, NSW, 2304)
- Onesteel Australian Tube Mills Pty Ltd (51 Industrial Drive, Mayfield, NSW, 2304)
- Bekaert Wires Ropes Pty Ltd (2 George Street, Mayfield East, NSW, 2304)
- Stolhaven Australia Pty Ltd (Lot 2 Steelworks Road, Mayfield NSW, 2304)
- Infrabuild (Newcastle) Pty Ltd (Ingall Street, Mayfield, NSW, 2304)
- Thiess Services Pty Ltd (Cnr Selwyn St & David Baker Rd, Mayfield, NSW, 2304)
- Infrabuild Wire (Newcastle) (Ingall Street, Mayfield, NSW, 2304).

Sensitive receivers

The Project is within an urban and industrial area with some sensitive receivers located within the vicinity of the site. The list of sensitive receivers with their proximity to the site is available in **Section 6.5.4**.

6.10.3.4 Impact assessment

Construction

During construction, earthworks would be required, which would involve site levelling for a suitable pad for the battery units and trenching for the underground cable connection.

Air emissions (e.g. exhaust emissions) would be generated by vehicles that transport to and from the site as well as plant and machinery (e.g. excavators and diesel generators) used during construction. During peak construction periods, vehicle generated emissions will be at their highest, but these would only be temporary and not expected to have a significant impact on local air quality.

Considering the proposed sources of air emissions, the Project is not expected to result in significant impacts on air quality during construction.

Operation

During operation, there would be up to two additional vehicle movements per week for periodic maintenance activities and inspection. These vehicle movements would generate emissions, however, these would be negligible in the context of existing traffic emissions in the area.

The Project will help support NSW to transition towards greater network capacity for renewable energy to be stored in the grid. This transition is expected to improve air quality in the long term due to reductions in the operation of fossil fuel powered electricity generators.

6.10.3.5 Mitigation measures

Management and mitigation measures that would be implemented for the Project to address potential air quality impacts are listed in **Table 6.10-8**.

Table 6.10-8: Mitigation and management measures – air quality

ID	Mitigation and management measure	Timing
AQ-1	The CEMP would include air quality management measures including measures to minimise visible dust moving offsite. Air quality measures would include: - Daily construction activities would consider the expected weather conditions for each workday and design the work program accordingly to reduce dust or emission impacts - Approaches to minimise exposed surfaces, such as stockpiles and cleared areas, including partial covering of stockpiles where practicable - Dust suppression measures on exposed surfaces would be implemented, such as watering of exposed soil surfaces, dust mesh, water trucks and sprinklers to reasonably minimise dust generation - Defined site entry and exit points would be defined to minimise tracking of soil on surrounding roads. Use wheel washes or shaker grids where the risk of offsite track out of dirt is identified - Heavy vehicles entering and leaving the site would be covered to prevent material escaping during transport - Vehicles and construction equipment operating onsite are to be kept well maintained and turned off when not operating (minimise idling on the site) - The handling of spoil would be minimised when excavating and loading of vehicles.	Construction

6.10.4 Aviation

6.10.4.1 Secretary's Environmental Assessment Requirements

Table 6.10-9 sets out the SEARs relevant to aviation and where the requirements have been addressed in this EIS.

Table 6.10-9: Relevant SEARs - aviation

Relevant SEARs	
Aviation	Where addressed
The EIS must address the following specific matters: <i>Aviation</i> – assess potential impacts on aviation safety.	An assessment of potential impacts on aviation safety is included below

6.10.4.2 Methodology

A review of the *Airports Act 1996* and the Airports Regulation was used to determine whether the Project complies with the safety and protection of airspace guidelines during construction and operation.

The Advisory Circular (Federal Aviation Administration, 2023) provides advice on how to seek approval from the Air Base Command Post (ABCP) to erect a tall structure within 15 km of Newcastle Airport or RAAF Williamtown.

6.10.4.3 Existing environment

Newcastle Airport and the Williamtown Royal Australian Airforce (RAAF) base are both within the vicinity of the Project. Both the airports are approximately 14 km northeast of the Project. As the Project is within 15 km of the nearest airport, it will need to adhere to the Civil Aviation Safety Authority (CASA) Advisory Circular – Reporting of Tall Structures which outlines a 30 m height limit on structures within 15 km of airports. There is also a heliport located at 10 Laurio Place, Mayfield West, approximately 400 m northeast of the site. This heliport is defined as an 'aerodrome' under the CASA regulations.

6.10.4.4 Impact assessment

Construction

The Airports Act and the Airport regulation were considered to apply to the Project; however, the Newcastle Airport and RAAF Williamtown base do not meet the definition of “core regulated airport”, meaning that Part 12 of the Airports Act does not apply.

The Project would involve the temporary use of tall equipment, such as cranes, during construction. However, it is not expected that those tall structures would exceed 30 m. As such, it is not expected that an approval is required from ABCP, and no construction impacts are expected.

Operation

During operation, the height of the BESS megapacks will be 2.75 m and the switch room will have a maximum height of 5 m. It is not expected that there will be impacts to aviation during operation.

6.10.4.5 Mitigation measures

The management measures for aviation that would be implemented are detailed in **Table 6.10-10**.

Table 6.10-10: Mitigation and management measures - aviation

ID	Mitigation and management measures	Timing
AV-1	If construction requires the use of a tall structure deemed to be a temporary obstruction greater than 30 m tall, approval will be sort from the ABCP via email. All applications need to be submitted to the ABCP at least two business days prior to the intended use of the tall structure.	Construction
AV-2	Newcastle Airport the RAAF Williamtown Base and Mayfield West heliport will be included as key stakeholders for the Project and will be notified of works throughout the construction phase.	Construction

6.10.5 Embodied carbon emissions

6.10.5.1 Secretary's Environmental Assessment Requirements

No specific requirements were provided for embodied carbon emissions in the SEARs, however Section 3.2 of the Sustainable Buildings SEPP requires calculation of the quantified embodied carbon emissions for non-residential development (**Appendix O**).

6.10.5.2 Methodology

AECOM has undertaken an embodied carbon emissions assessment to determine any potential carbon impact that may result during the Project. Calculation of the embodied carbon related to the Project was undertaken using the following method:

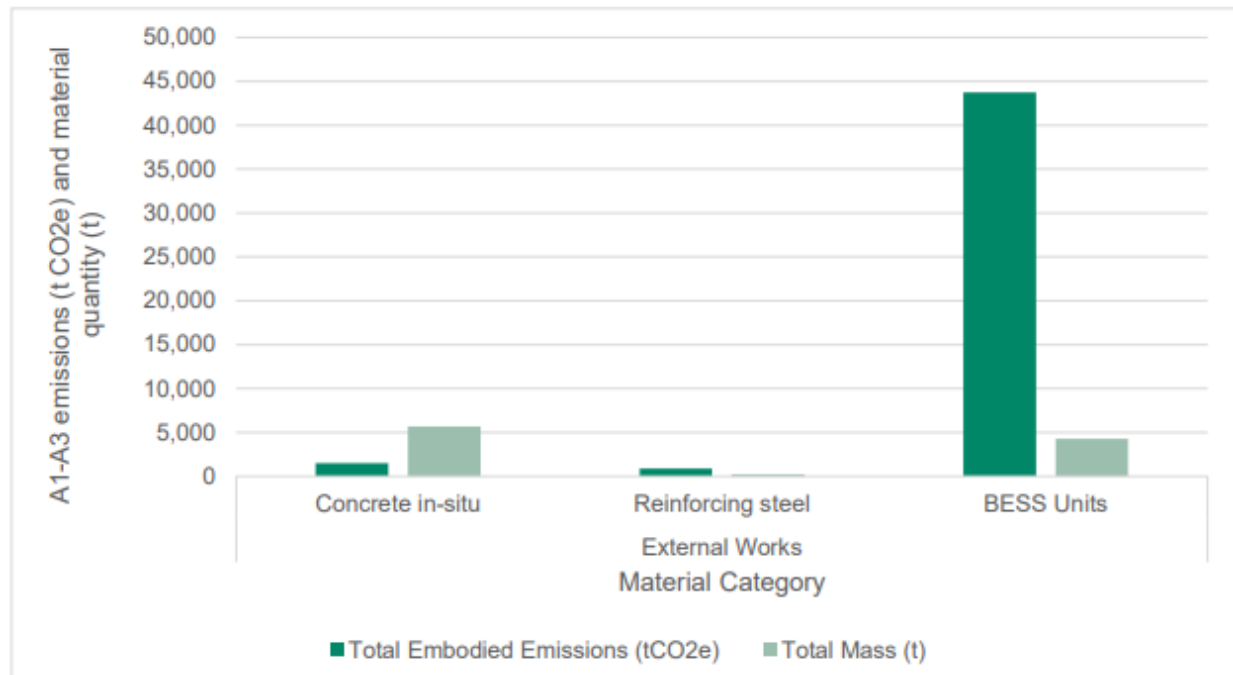
- Using material quantity estimates (MQE) to provide input into the National Australian Built Environment Rating System (NABERS) Emissions Materials Form
 - Filters were used to exclude items from the assessment
 - Filter 1: excludes non-physical material items that contribute to emissions
 - Filter 2: excludes items where there is a lack of available data e.g. CCTV systems, electrical outlets
 - Filter 3: materials that are expected to have a less than 5% impact were excluded from assessment
 - Items separated into individual materials
 - Each material was categorised to correspond to the NABERS Embodied Emissions Materials Form

- Units converted from original estimates to the functional units provided by NABERS Embodied Emissions Materials Form
- Material quantities were put into NABERS Embodied Emissions Materials Form
- Emissions factors for each material quantity in the NABERS Embodied Materials Form were sourced from the NABERS National Emission Factors Database (v1.02). When exact matches for material types were not available, the closest representative material's emission factor was used. Emissions factors for BESS megapacks were sourced from the peer review life cycle assessment completed by Hao *et al* (2017)
- The total carbon footprint in tonnes CO₂e was calculated using NABERS Embodied Emissions Materials Form.

6.10.5.3 Results

The estimated embodied carbon emissions that relate to the materials used in the construction of the Project is 46,111 tonnes CO₂e. The largest contributor to embodied carbon is the BESS megapacks, which represent 43,720 tonnes CO₂e (95% of total emissions). The other two contributors to the carbon footprint are steel and concrete and **Figure 6.10-1** breaks down the contribution of these materials to the overall embodied carbon in the Project.

The lifecycle assessment conducted by Hao, et al. (2017) provided an emissions factor of 109 kg CO₂e/kWh, the literature review conducted by AECOM reported minimum and maximum emissions factors of 39 kg CO₂e /kWh and a 246 kg CO₂e /kWh respectively. This represents either a 67% decrease or a 125% increase in BESS megapack-related carbon emissions.



Refer to **Appendix O** for the Embodied Emissions Technical Note.

Figure 6.10-1: Breakdown of material quantities and embodied emissions (AECOM, 2025)

6.10.5.4 Mitigation measures

The mitigation and management measures for embodied carbon emissions that would be implemented are detailed in **Table 6.10-11**.

Table 6.10-11: Mitigation and management measures – embodied carbon emissions (AECOM, 2025)

ID	Mitigation and management measures	Timing
EC-1	Measures that could be taken during detailed design and construction to reduce the embodied emissions of the Project include selecting lower-carbon materials such as concrete mixes with reduced Portland cement content, optimisation of steel design, selection of higher strength per mass steel components.	Design
EC-2	Reduction of direct emissions of sulphur hexafluoride (a GHG with potential for global warming) derived from equipment such as switchgear, will be considered throughout the Project.	Design Construction

6.10.6 Bushfire

6.10.6.1 Secretary's Environmental Assessment Requirements

Table 6.10-12 below sets out the SEARs relevant to Bushfire and where the requirements have been addressed in this EIS.

Table 6.10-12: Relevant SEARs - bushfire

Relevant SEARs	
Bushfire	Where addressed
The EIS must address the following specific matter: Bushfire – identify potential hazards and risks associated with bushfires including the risks that a BESS would cause a bush fire and demonstrate compliance with <i>Planning for Bush Fire Protection 2019</i>.	No assessment has been conducted as the Project is not within a bushfire prone area.

6.10.6.2 Methodology

6.10.6.3 Existing environment

The site is not located on bushfire prone land and the risk of bush fire threatening the site is low. A bushfire assessment in accordance with *Planning for Bush Fire Protection 2019* is not warranted for the Project. Therefore, the risk of bushfire is not considered further in the PHA or this section.

6.10.6.4 Impact assessment

A fire occurring in proximity of the site has potential to affect existing and proposed site infrastructure. There is also potential that a fire at the BESS, particularly involving the batteries, may cause a bushfire.

The site is not located on bushfire prone land and the risk of bush fire threatening the site is low. Similarly, the risk of the Project causing a fire is mitigated through the measures considered in the PHA (see **Section 6.8.5**).

6.10.6.5 Mitigation measures

No additional mitigation measures are required relating to bushfires.

6.11 Cumulative impacts

6.11.1 Secretary's Environmental Assessment Requirements

Table 6.11-1 sets out the SEARs relevant to cumulative impacts and where the requirements have been addressed in this EIS.

Table 6.11-1: Relevant SEARs - cumulative impacts

Relevant SEARs	Where addressed
Cumulative impact	
The EIS must address the following specific matters: - An assessment of the likely impacts of the development on the environment, and any other significant issues identified in the above risk assessment, focusing on the specific issues identified below, including: - an assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including any cumulative impacts of the site and existing, approved or proposed developments in the region and impacts on the site and any road upgrades, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice including the Cumulative Impact Assessment Guideline (DPE, 2022);	A cumulative impact assessment has been completed within Section 6.11.6.
Biodiversity	
The EIS must address the following specific matters: A cumulative impact assessment of biodiversity values in the region from nearby developments	A cumulative impact assessment was not conducted for biodiversity, as the BDAR, attached in Appendix E found that the Project would not result in any residual biodiversity impacts. As such a cumulative biodiversity impact is not possible.
Land	
The EIS must address the following specific matters: - An assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: - a cumulative impact assessment of nearby developments	A cumulative impact assessment was not conducted for land, as Section 6.3 has indicated that there were no residual impacts related to land use for the Project.
Transport	
The EIS must address the following specific matters: A cumulative impact assessment of traffic from nearby developments (including mining operations)	A cumulative impact assessment for traffic and transport is detailed in Section 6.11.6.

6.11.2 Methodology

This chapter has been prepared to assess the potential cumulative impacts of the Project during construction and operation.

When multiple projects are undertaken at the same time, their residual impacts can overlap, which may worsen any social or environmental impacts of the projects alone, resulting in a cumulative impact. The extent of these the cumulative impact can be dictated by the relative location of the projects, and the respective phases of the projects (i.e. design, construction, operation, decommissioning etc.)

The identification and assessment of cumulative impacts for the Project involved the following steps:

- Identification of other projects in the nearby area that may generate cumulative impacts alongside from the Project
- Identification of the residual impacts of the Project (identified within each of the previous sections of **Chapter 6.0**)
- A screening process for nearby projects so that only those that have a timeframe, scale or status that overlap with the Project are considered (see section **6.11.5**)
- Assessment of potential cumulative impacts (if any).

This process has been developed with view to providing a proportionate cumulative impact assessment (CIA) in accordance with *Cumulative Impact Assessment Guidelines for State Significant Projects* (CIA Guideline) (DPE, 2022).

6.11.3 Residual impacts

The key residual impacts arising from the Project after mitigation is considered are:

- Minor visual amenity impacts during construction (refer to **Section 6.4**)
- Minor construction traffic impacts along roads that are part of the heavy and OSOM vehicle routes (refer to **Section 6.6**)
- Low risk of injury due to heat radiation from a potential fire extending up to 5 m into the infrequently used road reserve off Tourle Street (refer to **Section 6.8**).

In addition to these, the SEARs requested that cumulative impacts be specifically considered for biodiversity, land use and traffic. However, since it was concluded that there are no residual impacts associated with biodiversity or land use, these have not been assessed cumulatively.

6.11.4 Identification of potentially cumulative projects

A search of publicly available information was undertaken to identify existing and potential future projects in the vicinity of the Project. A search of the DPHI Major Projects database was undertaken on 27 February 2025 to identify SSD and SSI projects within 10 km of the Project that may be relevant for the EIS cumulative impact assessment. A search was also completed on the City of Newcastle Development Tracker database for DAs with 1 km of the Project. The projects returned by these searches are included in **Table 6.11-2**.

6.11.5 Screening process

Screening of identified projects was undertaken to assess their potential to impact the same receptors as the Project. If a project was not deemed to impact the same receptors as the Project, they were screened out of the CIA and no further assessment on that project was conducted.

The screening process considered the following:

- **Location:** projects where there is the potential for spatial overlap (e.g. use the same roads for construction access). A radius of 10 km was implemented when a search of the DPHI Major Projects database was undertaken, and a 1 km radius was applied to a search of the City of Newcastle Development Tracker database for Development Applications
- **Timeframe:** with construction proposed to begin in late 2025 and last for approximately 21 months, only projects that are being developed simultaneously or immediately after the Project have been considered

- **Scale:** large scale projects that have been identified on the Major Project's website or the City of Newcastle Council Development Tracker have been considered for this assessment. Smaller scale local developments have not been considered as they are not expected to incur any substantial cumulative impacts alongside the Project
- **Status:** Projects that have been considered for this assessment are those that are in construction, in the determination phase or currently preparing an EIS.

Projects that met the above criteria are outlined in **Table 6.11-2** below.

Table 6.11-2: Relevant future projects for cumulative impact assessment

Project	Approximate distance to the site	Assessment stage	Timeline	Description	Possibility for cumulative impact
Clean Energy Precinct Concept DA SSD-62423490	1 km north west	EIS being prepared	Unknown	The Clean Energy Precinct Concept would help facilitate the production, storage, transmission and distribution of clean energy.	The potential for cumulative impact will be confirmed once the hazards, traffic and visual impact assessments for the Clean Energy Facility are available.
Tomago BESS SSD-57107216 Newcastle Power Station SSI-9837	8 km north west	Granted development consent. Construction not yet commenced.	Construction commenced is expected to commence in 2026	AGL is proposing to build a BESS or Gas Fired Power Station at 1940 Pacific Highway.	The traffic impact assessment for the Tomago BESS indicates that proposed haulage routes would be along Pacific Highway, New England Highway and Maitland Road and would have negligible impact on the traffic network. During construction, B-Doubles travelling to the site from Port Botany will also be using Maitland Road and the Pacific Highway, so there is potential for cumulative traffic impacts. However, the vehicles being used during construction of the BESS will be travelling west along Maitland Road and then north along Pacific Highway, whereas the vehicles for the Project travelling from Port Botany will be travelling north along Pacific Highway, and east along Maitland Road. The PHA completed for the Tomago BESS outlines that the risk of offsite impacts is low-to-negligible with the proper application of mitigation measures. As such, the possibility for cumulative impacts associated with hazards is negligible. The visual impact assessment completed for the Tomago BESS determined that there is no overlap of visual receivers between the Project. There is negligible possibility for cumulative visual impact.

Project	Approximate distance to the site	Assessment stage	Timeline	Description	Possibility for cumulative impact
Hunter Valley Hydrogen Hub SSD-48655719	5 km west	Determination	Construction to commence in 2025	The Hunter Valley Hydrogen Hub is proposed by Origin Energy to facilitate hydrogen production and a recycled water pipeline.	There is potential for cumulative impacts to arise on traffic for roads both used for the Project. The PHA completed for the Hunter Valley Hydrogen Hub indicated that there is potential for offsite risk to properties adjacent to its project. However, considering the proximity of the Project and the Hunter Valley Hydrogen Hub, the potential for cumulative impacts associated with hazards are not expected. No residual visual impacts are expected for the Hunter Valley Hydrogen Hub, therefore no cumulative visual impact is expected.
Light Industrial Units – 60 Riverside Drive, Mayfield West DA2023/00661	1.4 km west	Decision pending with Council	Unknown	Precinct Capital has submitted an application for development of light industrial units.	If construction occurs simultaneously with the Project, there is potential for cumulative traffic impacts, considering access to the industrial estate is off the same road. Further hazardous and visual residual impacts are still to be determined for the Light Industrial Units project.
Modification 3 Relocation of Acid Sulfate Soil Activity – 80 Tourle Street, Mayfield West SSD-7698-Mod-3	Adjacent	Determination	Unknown	Benedict Recycling, in 2018 completed an EIS to expand on their waste storage facility. In the modification of this request, Benedict Recycling want to increase their existing SSD boundary by 1,040 m ² to cater for the relocation of ASS.	Benedict Recycling updated the traffic, odour and noise assessments for this modification. The noise generated by this modification is not expected to generate significant noise increases. When comparing the noise levels of this modification to the noise levels of the Project, cumulative noise impacts are not expected. This modification is expected to have negligible impacts on traffic, as there are only marginal changes in truck operation expected during this modification. When compared to traffic impacts of this modification to the Project, cumulative impacts to the existing road network are not expected.

Project	Approximate distance to the site	Assessment stage	Timeline	Description	Possibility for cumulative impact
					Since the odour is not an expected residual impact from the Project, this is not a considered cumulative impact. Overall, it is unlikely there will be a cumulative impact in relation to this modification.

6.11.6 Cumulative impact assessment

6.11.6.1 Construction

An assessment of the potential cumulative impacts associated with the Project's construction and the 'screened in' projects is provided below.

6.11.6.2 Transport

Potential cumulative traffic impacts resulting from the Project and other major projects are detailed in **Table 6.11-3**.

Table 6.11-3: Summary of potential construction cumulative impacts - transport

Project	Potential conflict
Tomago BESS	Construction is estimated to begin in 2026 and last for approximately 18 months. Based off the traffic assessment for the Tomago BESS, the proposed haulage routes are Pacific Highway, New England Highway and Maitland Road and light vehicles would be sourced from the surrounding area. The vehicles are expected to use the Pacific Highway and Maitland Road, as those associated with the Project. However, the timing and use of these roads are expected to be different for the Project and the Tomago BESS project. On this basis, no cumulative traffic impacts are expected.
Hunter Valley Hydrogen Hub	Construction is predicted to commence in 2025 with a duration of 25 months. Based on the traffic assessment provided for this development, the proposed haulage routes for this project would include Cormorant Road, Teal Street, Nelson Bay Road and Greenleaf Road and light vehicles would be sourced from the surrounding area. These roads are not included in the proposed routes that will be used for the Project. On this basis, no cumulative traffic impacts are expected.

Based on **Table 6.11-3**, there does not appear to be direct overlap of haulage routes of nearby projects that would generate significant cumulative impacts. As such, it is expected that the cumulative traffic impacts on traffic and the surrounding road network will be negligible.

6.11.6.3 Hazards

Potential cumulative impacts associated with hazards resulting from the Project and other major projects are detailed in **Table 6.11-4**.

Table 6.11-4: Summary of potential construction cumulative impacts - hazards

Project	Potential conflict
Tomago BESS	Only low-negligible impacts associated with hazards are expected to result from the Tomago BESS project. Therefore, cumulative impacts are not expected between the Project and Tomago BESS.
Hunter Valley Hydrogen Hub	There is potential offsite risk to adjacent properties as a result of the Hunter Valley Hydrogen Hub. The potential risk is low-to-negligible. The potential risk of the Project (see Section 6.9) is low-to-negligible and also limited generally to the site. On this basis, considering the distance between the Project and the proposed Hunter Valley Hydrogen Hub, it is not expected that there will be cumulative hazards impacts.

6.11.6.4 Visual

Potential cumulative visual impacts resulting from the Project and other major projects are detailed in **Table 6.11-5**.

Table 6.11-5: Summary of potential construction cumulative impacts - visual

Project	Potential conflict
Tomago BESS	The visual impact assessment completed for the Tomago BESS determined that there is no overlap of visual receivers between the Project. On this basis, there is negligible possibility for cumulative visual impact.
Hunter Valley Hydrogen Hub	There was no visual impact assessment undertaken for the Hunter Valley Hydrogen Hub and as such cumulative visual impacts are not able to be fully assessed. However, considering the distance between the Project and the proposed Hunter Valley Hydrogen Hub it is not expected that cumulative visual impacts will be possible.

6.11.7 Operation

An assessment of the potential operational cumulative impacts associated with the Project is provided below.

6.11.7.1 Transport

The Project would require up to two-vehicle trips per week. On this basis, no notable residual traffic impacts are expected from the Project, and as such there are no cumulative traffic impacts are expected.

6.11.7.2 Hazards

The PHA for the Project identified that there are no potential events with significant off-site consequences and that societal risk is negligible. Any potential offsite hazard associated with the Project (i.e. BESS fire or pipeline rupture) is expected to be adjacent to the site. The distance between the Hunter Valley Hydrogen Hub and the Tomago BESS project to the Project screens out cumulative impacts associated with hazards this basis during operation.

6.11.7.3 Visual

Existing buildings, infrastructure and natural obstructions limit the visual impact of the Project to low-to-negligible during operation. As no visual impact assessment was available for the Hunter Valley Hydrogen Hub, and the visual impact of the Tomago BESS project is limited, there is no visual receiver overlap expected. On this basis, no cumulative visual impacts are expected during operation.

6.11.8 Conclusion

Cumulative impacts associated with the Project are expected to be negligible. Assessment of the residual impacts associated with transport, hazards and visual concluded that there are no cumulative impacts expected to result from the Project.

7.0 Justification and conclusion

7.1.1 Recognised need

The NEM is in the process of transitioning from fossil fuel-based electricity baseload to a grid based primarily on renewable energy. This is spurred on by planned decommissioning of the coal-fired power plants in coming years, as well as by the need to decarbonise our economy more generally.

The planned closeout of coal fired power stations is driving the NEM and the broader economy towards renewable energy. Expanding and augmenting the electricity network to one that is reliable, low carbon and low cost for consumers, is therefore seen as a key priority. Transitioning to a network dominated by renewable energy faces initial challenges with power intermittency, which can be addressed through energy storage. Batteries can be used to store excess energy from renewable sources when demand is low and then can release it when energy demand is high.

Transition to renewables also satisfies the commitments under Commonwealth legislation and the Paris Agreement. The extent to which the Project satisfies Commonwealth legislation and the Paris Agreement, is detailed within **Chapter 4.0**.

7.1.2 Project benefits

The Project provides the following key benefits (as described further in **Chapter 2.0**):

- Supporting the energy transition
- Improving grid stability for NSW
- Job creation and investment.

The Project's key benefit is in the provision of short-term storage of electricity for release into the grid at times of lower generation by renewable energy generators. This is particularly important in the evenings when solar assets stop generating yet power demand is still strong. The Project, being a two-hour battery, would be able to support the consumption of several thousand residential properties during this period until demand drops later in the night. In addition, the BESS would be charged during the middle of the day when solar and wind assets are at peak generation, and when there is typically an oversupply of electricity in the system.

In addition to its energy storage function, the Project would also provide frequency stabilisation services. This function helps to maintain the frequency of the NEM at the nominated 50 Hz and is necessary to support the growing contribution of renewable energy to the generation mix.

By addressing the variable nature of renewable energy generation, the Project provides a significant contribution to the reshaping of the NEM into a largely decarbonised and sustainable grid, which in turn bolsters its resilience and does so at a reasonable overall cost to the consumer.

The Project will provide a \$208 million capital investment to the NSW economy and contribute locally to the Newcastle region. The direct local economic benefit centres around job creation, with the direct creation of 100 FTE roles during construction and one FTE during operation and indirectly contributes to increased demand of local goods and services. The construction and operation of the Project will help diversify the local job market and promote local economic resilience.

7.1.3 Suitability of the site

The site was selected based on several key attributes, discussed in detail in **Section 2.3**, that make it an optimal location for a BESS facility. These include:

- Proximity to the electricity transmission network ensures efficient energy distribution and minimises transmission losses
- The capacity of the existing transmission network supports the Project without needing significant upgrades to infrastructure
- The existing road network is suitable to accommodate the transport of construction loads
- High availability of skilled construction workforce in the local region.

Alternative site locations for the Project were considered during the development phase. A review of these sites considered the relevant environmental, social and technical parameters of each, with some performing better than others across this assessment. Ultimately the alternative sites were discounted based on:

- Environmental impacts and/or
- The potential increased costs associated with acquiring property and/or
- The increased extent of connection infrastructure required between the proposed BESS and the existing substation.

In summary, the selected site is considered optimal for the Project due to:

- The generally low environmental and social impact associated with the development of the Project at this location, being within the existing substation, on historically disturbed land and, most critically, within an existing industrial area, which significantly limits the potential for ongoing amenity impacts
- The availability of suitable land at the Mayfield West substation, being of a suitable size and within Ausgrid's existing landholdings
- Its proximity to the existing electricity network and existing Ausgrid infrastructure
- The capacity of the existing distribution network to support the BESS's integration
- The proximity of the large industrial load centres of the Hunter Region, reducing the potential for transmission losses for electricity released by the BESS
- The presence of the existing suitable road network to accommodate delivery of heavy construction loads and the ongoing operation of the BESS
- Availability of skilled construction and operation workers in the local region.

7.1.4 Consideration of community views

Consultation and community engagement that was undertaken for the Project is detailed in **Chapter 5.0**. Where stakeholders have raised concerns over key matters such as noise, traffic disruption, visual amenity, hazards and risk and general environmental impacts, the Project's design has been adjusted, or mitigation and management measures have been developed to address such concerns. The proposed mitigation and management measures are summarised in **Appendix D**.

Though the Project is not expected to generate high levels of social interest (due to its low expected impact), stakeholder and community engagement will continue during the EIS exhibition stage. The results of both the formal EIS exhibition and the ongoing community consultation activities will be summarised in the submissions report for the Project, which will be submitted prior to DPHI's assessment of the development.

7.1.5 Consistency of the Project with relevant statutory requirements and government policies

The Project is supported by Commonwealth, State, regional and local plans and policies (as described in **Chapter 4.0**) and will support the Commonwealth and State government's aspirations to achieve their respective renewable energy and GHG emission reduction targets. The Project will also contribute to the continued growth of renewable energy generation and storage capacity for the broader NEM.

7.1.6 Future monitoring and communication

A CEMP will be adopted as part of an overall management and monitoring document, which will be supported by the following documents:

- Construction Traffic Management Plan (CTMP)
- Construction Noise Management Plan (CNMP)
- Site Management Plan (SMP)
- Soil and Water Management Plan (SWMP)

- Emergency Response Plan (EMP)
- Waste Management Plan (WMP)
- Erosion Sediment Control Plan (ESCP).

These documents will be designed to comply with relevant legislation and include a range of mitigation measures to monitor how the construction of the Project will comply with relevant legislation and guidance.

An operational environmental management plan (OEMP) will be used to monitor the Project during the operational phase. The OEMP will ensure environmental compliance during operation, particularly with respect to noise monitoring, risk management and maintenance.

During construction of the Project, activities will be communicated to the public through regular website and social media updates. There is no planned communication during operation of the Project, however, if there are any matters of significance that arise during operation, then community members will be notified. During decommissioning (approximately 50 years after operation commences), residents, community members and businesses will be consulted if there are any changes to amenity or further environmental impacts.

7.1.7 Key uncertainties

Due to the extent of the technical studies undertaken for each of the key matters and the proposed mitigation measures that will be in place to address any potential impacts, there are no notable uncertainties related to the Project.

7.2 Consistency with the objectives of the EP&A Act

Table 7.2-1 outlines how the Project aligns with the objectives of the EP&A Act.

Table 7.2-1: Consistency with the objectives of the EP&A Act

Object	Response
a. to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,	The Project increases stability of the grid and will support transition towards renewable energy. During construction, economic benefits are expected through the creation of up to 100 construction jobs, and direct output to the NSW economy of \$79.29 million during construction and an annual contribution of \$1.06 million during operation. During operation, the Project would benefit communities, businesses, and industry by increasing the reliability in the NEM. The Project may provide lower-priced electricity as it enables electricity to be stored and distributed as market demand dictates. Technical specialists have been engaged to assess and report on the potential for the Project to impact upon the natural and other resources of the State and local areas. Impacts have been found to be generally of low significance and manageable with suitable mitigation measures (see Chapter 6.0 and Appendix D).

Object	Response
b. to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,	This EIS describes the potential environmental, economic and social impacts of the Project and has used these results to inform the preparation of the SSD, specifically the Projects' design and the proposed mitigation measures. The Project's consistency with the principles of an Ecologically Sustainable Development (ESD) is outlined in Section 7.4.
c. to promote the orderly and economic use and development of land,	The Project comprises a permissible development, which is consistent with the statutory context and planning controls at the site. The Project represents a suitable, economic and orderly use of the site, being within an existing industrial area and otherwise unoccupied by existing distribution assets within the Ausgrid property boundary. This EIS details that the Project would result in positive economic impacts, as detailed in Section 6.9.
d. to promote the delivery and maintenance of affordable housing,	This objective is not applicable to the Project.
e. to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,	A BDAR was undertaken to assess the Project's potential impacts on biodiversity within the site or in the vicinity of the site. The BDAR considered the potential biodiversity impacts of the Project in accordance with the BAM, including the degree to which biodiversity impacts have been avoided in the first instance, and then mitigated. Where residual impacts remained, the BDAR prescribes the number of biodiversity offset credits that must be obtained on behalf of the Project. These credits will be obtained and retired prior to the commencement of construction (refer to Section 6.1).
f. to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),	The Project is not expected to result in any significant impacts upon Aboriginal or non-Aboriginal cultural heritage. The ACHAR found no sites or objects of cultural significance within or in the vicinity of the site. The ACHAR found one site of non-Aboriginal heritage outside of the site boundary, (<i>Remnant Garden, I692</i>). Although located within the vicinity of the site, I692 is not expected to be impacted by the Project. For any potential future discovery of Aboriginal or non-Aboriginal heritage sites or items, appropriate mitigation measures would be applied (see Section 6.2.7).
g. to promote good design and amenity of the built environment,	Potential visual, noise and air quality impacts on sensitive receivers and the broader community have been assessed and described in Sections 6.4, 6.5 and 6.10 , respectively. These impacts were all found to be manageable with the mitigation measures proposed, noting the context of the Project within an existing industrial precinct.

Object	Response
h. to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,	All components of the Project have been designed to incorporate and comply with all relevant electrical and building safety standards. All construction associated with the Project would be compliant with the <i>Building Code of Australia</i> (Australian Building Codes Board, 2022) and other relevant statutory requirements detailed in Chapter 4.0. Over the life of the Project, infrastructure would be appropriately maintained, to ensure safe and efficient operation.
i. to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,	The statutory requirements of the different levels of government have been explored in Chapter 4.0. Chapter 5.0 details the range of government agencies that have been consulted on the Project. The Project would comply with all relevant local, state and federal environmental planning requirements.
j. to provide increased opportunity for community participation in environmental planning and assessment.	Chapter 5.0 details the key community stakeholders that were consulted on the Project. Appendix C outlines the community engagement that has been undertaken to date. Section 5.7 outlines planned future engagement with key stakeholders and community members. This EIS will be placed on public exhibition, whereby community members can provide additional comments through formal submissions.

7.3 Summary of project impacts

This EIS has considered all relevant potential environmental, social and economic impacts associated with the Project. This section summarises the potential impacts on these factors and provides an overall justification for the Project.

7.3.1 Environmental impacts

This EIS has assessed the potential biophysical impacts that may result from the Project. These potential impacts are summarised in **Table 7.3-1**.

Table 7.3-1: Summary of environmental impacts

Matter	Section	Summary
Biodiversity	Section 6.1	The Project would involve the removal of: 0.55 ha of planted vegetation 0.11 ha of native vegetation. (PCT 3437 – Hunter Coast Lowland Spotted Gum Dry Forest). 2.84 ha of hunting habitat for <i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle) 2.18 ha of non-native vegetation. Mitigation measures would help minimise the potential impacts to biodiversity values, and as such, no residual impacts to biodiversity are expected to result from the Project.
Aboriginal heritage	Section 6.2	There were no sites or items of Aboriginal cultural heritage identified within or in the vicinity of the site. Appropriate mitigation measures are in place in the instance of future discovery of Aboriginal sites or items.

Matter	Section	Summary
Soils and land use	Section 6.3	The land on which the site is located has historically contaminated soil with a capping layer to a depth of 2 m throughout the site. No contamination was found within the capping layer. Construction has the potential to destabilise and mobilise these contaminants if soil below the capping layer is breached. Mobilisation of contaminants has the potential to impact surrounding air quality. In this event, these impacts would be mitigated in line with the CEMP, SMP and Certificate C. The Project would not have an impact on the surrounding land use, as it is generally in line with the industrial nature of surrounding industrial estate. The Project complies with the objectives of the <i>E4 General Industrial</i> land use zone, as outlined in the Newcastle LEP.
Visual amenity	Section 6.4	Overall, the visual impact of the Project during construction and operation is expected to be low-to-negligible, which is driven by low-to-negligible magnitude of change and the low visual sensitivity of the industrial precinct. There was one viewpoint deemed to have moderate sensitivity, however since the magnitude of change was deemed negligible, the overall impact is negligible.
Noise and vibration	Section 6.5	Construction noise levels are expected to be below the NMLs during standard hours for both residential and non-residential receivers. Modelling determined that the operational noise levels of the Project would not exceed the noise trigger levels at any residential or non-residential receivers. Therefore, no residual noise impacts are expected.
Traffic	Section 6.6	During peak construction (a 6-month period), up to 154 vehicle trips per day (136 light vehicle trips and 18 heavy vehicle trips) are expected. This would reduce to 79 vehicle trips per day during the average construction period. The additional vehicles associated with construction are not expected to significantly impact the broader road network, nor require any road upgrades. Only an additional four traffic movements are expected during operation, which is negligible. The impact assessment found no residual impact from the Project on the transport network, furthermore no cumulative impacts are expected.

Matter	Section	Summary
Surface water, groundwater and flooding	Section 6.7	The assessment found that there are no residual impacts related to flooding during construction or operation, provided the appropriate mitigation measures are applied. Surface water quality impacts from soil disturbance or spills of hazardous materials are possible, particularly if these mobilised materials enter downstream waterways. These potential impacts are expected to be appropriately managed through the application of the proposed mitigation measures. No groundwater impacts are expected as the standing water level was measured at 7.95 m below ground level, which is too deep to be disturbed by the proposed construction works. Water supply during construction is expected to be externally sourced, or through the existing connection at the Mayfield West substation. Water demand during operation is expected to be minimal as the Project would largely be operated remotely, with only periodic on-site staff. As such, no impact to the existing water supply is expected.
Hazards and risk	Section 6.8	The PHA (see Appendix K) concluded that the Project is not potentially hazardous. Hazards associated with the Project are a fire of the BESS or a fire initiated by a rupture of the high-pressure gas pipeline. The risk of these events was considered to be low to negligible.
Non-Aboriginal heritage	Section 6.10.1	The <i>Remnant Garden</i> (I692), which holds historic heritage significance, was identified 80 m southwest of the site. As works are not anticipated to extend beyond the site, I692 is not expected to be impacted. No other non-Aboriginal heritage items would be affected by the Project. Mitigation measures are in place should future historic heritage sites be discovered during construction, operation or decommissioning of the Project.
Waste	Section 6.10.2	Waste expected to be generated during construction includes vegetative waste, wastewater, construction waste, contaminated fill, personnel waste and demolition materials. During operation, waste is expected to be limited to office generated waste, operational equipment waste and worker generated waste. Waste streams during both construction and operation are expected to be able to be suitably managed using the existing waste management infrastructure in the region.

Matter	Section	Summary
Air quality	Section 6.10.3	Construction is likely to generate dust emissions from ground disturbance works such as excavation and the movement of vehicles. Other emissions are expected to be generated by site vehicles and construction machinery. Minor dust and vehicle emissions are expected during operation of the Project, mainly from travel to and from the site and any maintenance activities. Air quality during both construction and operation is expected to be appropriately managed through the application of the proposed mitigation measures.
Aviation	Section 6.10.4	Construction of the Project would temporarily involve the use of tall structures, however, these are not expected to exceed the 30 m threshold (as outlined by the Advisory Circular for developments within 15 km of airports).

7.3.2 Economic impacts

The Project is expected to provide direct and indirect economic benefits to the NSW and local economy. These benefits have been detailed in in **Section 6.9** and **Appendix L**. The overall economic benefits of the Project include:

- Direct input of \$79.29 million output to the NSW economy during construction and a \$1.06 million output during operation
- Direct employment through onsite construction activities, including up to 100 construction workers, and one full-time operational worker
- Indirect expenditure at local businesses, particularly hospitality and retail businesses
- Direct expenditure associated with construction and operation of the Project
- Indirect employment opportunities at local businesses through increased demand for goods and services needed for the Project
- Reduction in wholesale electricity prices.

7.3.3 Social impacts

The social impacts of the Project have been assessed in **Section 6.9** and **Appendix L**. The Project would provide direct social benefits to NSW, through increased grid stability of the NEM and ensuring greater network reliability. Any potential adverse impacts associated with the Project are expected to be adequately managed through the proposed mitigation measures (refer to **Section 6.9.5**).

7.3.4 Cumulative impacts

Major projects in the vicinity of the Project were screened based on scale of the project, data confidence, overlapping receptors, and overlapping timelines. The Tomago BESS project and the Hunter Valley Hydrogen Hub project were screened into the assessment, based on potential traffic impacts. It was determined that there were no overlapping haulage routes and therefore, no expected adverse cumulative impacts are expected when considering the Project alongside other surrounding projects.

7.4 Ecologically sustainable development

7.4.1 The principles

This section provides a review of the Project, its impacts, and associated safeguards with respect to the principles of ecologically sustainable development (ESD). These are provided in accordance with the requirements of the EP&A Regulation and the *Protection of the Environmental Administration Act 1991* (NSW). The principles, as listed in clause 193 of the EP&A Regulation, are as follows:

- **the precautionary principle**, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, public and private decisions should be guided by—
 - careful evaluation to avoid, wherever practicable, serious or irreversible damage to the
 - environment, and an assessment of the risk-weighted consequences of various options.
- **inter-generational equity**, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations
- **conservation of biological diversity and ecological integrity**, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration
- **improved valuation, pricing and incentive mechanisms**, namely, that environmental factors should be included in the valuation of assets and services such as—
 - polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,
 - the users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,
 - environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The following sections provide an overview of the principles and how they have been applied to the Project.

7.4.2 Precautionary principle

The precautionary principle is a risk management strategy that is applied in situations where scientific knowledge is lacking or uncertain. It promotes the use of caution and preventive action when there is a threat of serious environmental damage, and a lack of scientific evidence should not be a reason to not act.

An EIS is a public process that is used to assess the potential impacts of a project and is therefore precautionary by nature.

This EIS has been prepared by experienced and qualified professionals in their respective fields and has identified and thoroughly assessed the potential impacts that could result from the Project. This EIS presents assessments that are consistent with relevant statutory and guideline requirements. Where there was uncertainty on potential impacts, a worst-case and conservative scenario approach was applied to adhere to the precautionary principle. For example, the noise assessment assumed that all construction equipment would be operating all at once, even though this is highly unlikely to be the case in reality.

The Project has been adapted to avoid impacts where possible, and appropriate mitigation and management measures have been proposed to minimise potential environmental impacts. Considering this, the Project is not considered to be a threat to the natural environment and the precautionary principle has been properly applied.

7.4.3 Inter-generational equity

Intergenerational equity involves future generations having access to at least the same natural environment and resources as generations before them.

Future modelling outlines that there is an expected breach in capacity of the NEM network within the next five years, without any action. The Project allows for increased storage of electricity, which is a key method to increase stability of the NEM and to support the ongoing transition of the grid to primarily renewable generation. This increased electricity storage also allows for the increased stability and resilience of the NEM as the grid will be able to respond quickly to any potential intermittent blackouts.

The Project would support greater investment, delivery and integration of renewable energy into the electricity grid and constitute to reducing the reliance on fossil fuel sourced energy. This will ultimately help decarbonise the electricity grid and reduce GHG emissions.

This EIS has assessed all relevant impacts of the Project and incorporates a range of mitigation measures to minimise these.

7.4.4 Conservation of biological diversity and ecological integrity

Biological diversity relates to the breadth and variety of life. Ecological integrity relates to the structure, composition and functions of an ecosystem that is operating normally. This principle requires that the conservation of biological diversity and ecological integrity is integrated into design and execution of any project.

A BDAR was prepared to assess the potential impacts to biodiversity to the Project. The direct impacts to 0.11 ha of PCT 3087 would be required to facilitate the Project. This impact represents the net result after relevant avoidance measures have been taken. This impact will be compensated through biodiversity offsets and managed through appropriate mitigation measures (see **Section 6.1**).

Given this and noting the siting and design of the Project, its impact upon biological diversity and ecological integrity generally is expected to be acceptable.

7.4.5 Improved valuation and pricing of environmental resources

This principle is premised on an assumption that all resources should be appropriately valued and that the value of environmental resources should be considered alongside any economic or cost benefit analysis for the life of the Project.

The benefits of the Project are considered to outweigh its costs. The Project would generate up to 100 jobs for construction and a further two for operation and maintenance and are expected to continue to provide local economic benefits.

The Project will facilitate the integration of renewable energy into the grid and support the transition away from fossil fuel-based energy generation. This will contribute to net GHG reductions and is expected to place downward pressure on electricity prices.

The Project incorporates a range of mitigation measures to limit environmental impacts, and the costs associated with these measures have been considered in the overall capital investment and operating costs of the Project.

7.5 Conclusion

The Project involves the development of a 200 MW/400 MWh BESS adjacent to the current Mayfield West Zone Substation. The Project aims to increase stability of the NEM electricity grid, support the transition of the NEM to primary renewable energy generation and provide the services to stabilise the wider transmission network.

Potential impacts associated with the Project have been assessed and it has been determined that any residual impacts would have a low-to-negligible effect on environmental, social and economic factors. Appropriate mitigation measures have been detailed to manage potential impacts during construction, operation and decommissioning.

The Project will provide environmental, social and economic benefits to the greater Newcastle region and to NSW more broadly. Overall, the Project delivers:

- Alignment with Commonwealth, state and local policies, strategies and statutory requirements
- Additional energy storage capacity to support the broader increase in renewable energy generation across the NEM, directly addressing projected shortfalls
- Improved network stability, by providing system services to help stabilise the wider transmission network
- Job creation and investment for the City of Newcastle and NSW more broadly.

The environmental, social and economic benefits of the Project outweigh the impacts that would result from its construction, operation and decommissioning. It is therefore considered that the Project should be granted development consent.

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Appendix A

SEARs Compliance Table

Appendix A SEARs Compliance Table

Secretary's Environmental Assessment Requirements	Location addressed in EIS
General requirements	
The Environmental Impact Statement (EIS) for the development must comply with the requirements in Part 8, of the <i>Environmental Planning and Assessment Regulation 2021</i> (the Regulation) and must have regard to the <i>State Significant Development Guidelines</i> , the <i>Renewable Energy Planning Framework</i> and any relevant <i>planning circulars</i> .	The EIS is compliant with the EP&A Regulation, with regard to the <i>State Significant Development Guidelines</i> , the <i>Renewable Energy Planning Framework</i> and any relevant <i>planning circulars</i> . The responses below provide justification of this.
A stand-alone executive summary	A stand-alone summary, as per the <i>State Significant Development Guidelines</i> is provided at the start of the EIS.
A full description of the development, including:	
Details of construction, operation, and decommissioning, including any staging of the development	Chapter 3.0 provides a detailed description of the Project, including details of construction, operation and decommissioning.
A high-quality site plan showing all infrastructure and facilities (including any infrastructure that would be required for the development but the subject of a separate approvals process)	Figure 3-1 depicts the Project Area and indicative site layout.
The Project Area (as per Table 1 of the <i>SSD guidelines – preparing an environmental impact statement</i>) and Development Footprint (disturbance area including but not limited to areas for infrastructure, road works, access tracks, defensible space, fencing and temporary laydown)	Chapter 3.0 provides a project overview, detailing the Project Area and development footprint as per Table 1 of the SSD guidelines.
A high-quality, detailed constraints map identifying the key environmental and other land use constraints that have informed the final design of the development	Detailed maps of environmental constraints can be found in Chapter 3.0 and Figure 3-7 .
Confirmation if the project is designated development in accordance with the Environmental Planning and Assessment Act 1979 (EP&A Act) and the Regulation;	Chapter 4.0 details how the Project is a designated development in accordance with the EP&A Act and the Regulation.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Consistency in information presented in the EIS and all technical reports, including distances, development footprint, project design and infrastructure proposed, construction timeframes and receiver numbers	Chapter 3.0 details the Project's design, development footprint, proposes infrastructure, construction timeframes and relevant distances. The number of receivers impacted by the Project is outlined in Figure 2-2 and within Consistency of information between the technical reports and the EIS is detailed in Chapter 6.0 .
A strategic justification of the development focusing on site selection and the suitability of the proposed site with respect to potential land use conflicts with existing and future surrounding land uses (including existing land use, other proposed or approved energy facilities, major projects, rural/residential development, Crown lands within and adjacent to the project site and subdivision potential);	Chapter 2.0 provides a strategic justification of the Project in Section 2.1 and discusses surrounding land uses in Section 2.5.2 .
A risk assessment of the potential impacts of the development, identifying the key issues for further assessment	Chapter 6.0 addresses potential impacts of the Project.
An assessment of the likely impacts of the development on the environment, and any other significant issues identified in the above risk Assessment, focusing on the specific issues identified below, including:	
A description of the existing environment likely to be affected by the development using sufficient baseline data	Chapter 6.0 includes an existing environment section for each issue described.
An assessment of the likely impacts of all stages of the development (which is commensurate with the level of impact), including any cumulative impacts of the site and existing, approved or proposed developments in the region and impacts on the site and any road upgrades, taking into consideration any relevant legislation, environmental planning instruments, guidelines, policies, plans and industry codes of practice including the <i>Cumulative Impact Assessment Guideline</i> (DPE, 2022);	Chapter 6.0 assess likely impacts of the Projects at all stages of the development. Section 6.11 includes an assessment of potential cumulative impacts.
A description and assessment if staging of the project is proposed including any site mobilisation or pre-construction works	Section 3.3. outlines project construction, including construction stages.
A description of the measures that would be implemented to avoid, mitigate and/or offset the impacts of the development (including draft management plans for specific issues as identified below)	Measures that would be implemented to avoid, mitigate and/or offset the impacts of the development are explored within their appropriate sections within Chapter 3.3 . Appendix D includes all measures to mitigate potential impacts for each issue described, as well as monitoring actions within the associated mitigation measures tables.
A description of the measures that would be implemented to monitor and report on the environmental performance of the development	
A consolidated summary of all the proposed environmental management and monitoring measures, identifying all the commitments in the EIS	

Secretary's Environmental Assessment Requirements	Location addressed in EIS
A detailed evaluation of the merits of the project as a whole having regard to:	
The requirements in Section 4.15 of the <i>Environmental Planning and Assessment Act 1979</i> , including the objects of the Act and how the principles of ecologically sustainable development have been incorporated in the design, construction, and ongoing operations of the development	Section 4.15 of the EP&A Act is explored with Chapter 4.0 , under Section 3.3 . Section 7.4 within Chapter 7.0 describes how the principles of ecologically sustainable development have been incorporated into the Project.
The suitability of the site with respect to potential land use conflicts with existing and future surrounding land uses	Chapter 2.0 and Chapter 4.0 details the suitability of the site with respect to potential land use conflicts.
Feasible alternatives to the development and its key components, siting and project design alternatives to avoid areas of biodiversity value, opportunities for shared infrastructure with proposed developments in the region, and the consequences of not carrying out the development;	Section 2.2 , within Chapter 2.0 provides a description of the feasible alternatives considered.
A detailed consideration of the capability of the project to contribute to the security and reliability of the electricity system in the National Electricity Market, having regard to local system conditions and the Department's guidance on the matter	Section 2.1 , within Chapter 2.0 details the capability of the Project to contribute to the security and reliability of the electricity market.
Estimated Development Cost and Employment	
Provide the estimated development cost (EDC) of the development prepared in accordance with the relevant planning circular using the Standard Form of EDC Report	An EDC report has been prepared by a suitably qualified Quantity Survey in accordance with the SEARs. EDC is discussed in Section 3.6 and the EDC report is included as Appendix N .
Provide an estimate of the retained and new jobs that would be created during the construction and operational phases of the development, including details of the methodology to determine the figures provided	Chapter 2.0 provides an estimate of jobs retained and created. This is specified in Section 2.1.3 .
The development must be accompanied by:	
The consent of the owner/s of the land (as required in Section 23(1) of the EP&A Regulation)	Landowner consent is not necessary as Ausgrid is the landowner.
A declaration from a Registered Environmental Assessment Practitioner that the EIS includes the information specified in the Department's <i>Registered Environmental Assessment Practitioner Guidelines</i>	Provided in the Declaration at the start of the EIS.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Key Issues	
Biodiversity – including:	
An assessment of the biodiversity values and the likely biodiversity impacts of the Project in accordance with Section 7.9 of the <i>Biodiversity Conservation Act 2016</i> (NSW) (BC Act) having regard to the Biodiversity Assessment Method (BAM) 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must: • be prepared using the approved BDAR template; • document the application of the avoid, minimise and offset framework including assessing all direct, indirect and prescribed impacts in accordance with the BAM; • assess the impacts associated with all ancillary infrastructure; • including the transport route road upgrades; • include an assessment for serious and irreversible impacts (SAIL) in accordance with Section 9.1 of the BAM; • include a strategy to offset any residual impacts of the development in accordance with the BC Act; and • be finalised by an accredited assessor as BAM-compliant within 14days of submission; • unless BCS and DPHI determine the proposed development is not likely to have any significant impacts on biodiversity values	Section 6.1 outlines and discusses biodiversity values. Appendix E provides detailed information on biodiversity in the form of a specialist report.
An assessment of the likely impacts on listed aquatic threatened species, populations or ecological communities, scheduled under the <i>Fisheries Management Act 1994</i> , and a description of the measures to avoid, minimise and rehabilitate impacts;	Potential impacts to listed aquatic threatened species are discussed in Section 6.1.4 and Appendix E .
A cumulative impact assessment of biodiversity values in the region from nearby developments	A cumulative impact assessment was not conducted for biodiversity as the BDAR (attached in Appendix E) found no residual impacts related to biodiversity for the Project.
If an offset is required, details of the measures proposed to address the offset obligation	Biodiversity offsets are discussed in Section 6.2.4 and Appendix E .

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Aboriginal heritage – including:	
An assessment of the impact of Aboriginal cultural heritage items (cultural and archaeological) in accordance with the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011) and the Code of Practice for the Archaeological Investigation of Aboriginal Objects in NSW (DECCW, 2010), including results of archaeological test excavations (if required)	Section 6.2 includes an Aboriginal cultural heritage impact assessment.
Evidence of consultation with Aboriginal communities in determining and assessing impacts, developing options and selecting options and mitigation measures (including the final proposed measures), having regard to the Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)	Section 6.2.3 includes a description of consultation with Aboriginal communities. Appendix F provides further details in the specialist report.
Assess the impact to historic heritage having regard to the <i>Guidelines for Preparing a Statement of Heritage Impact</i>	Section 6.10.1 discusses the impact that the Project will have on non-Aboriginal heritage.
Land – including:	
A detailed justification of the suitability of the site and that the site can accommodate the proposed development having regard to its potential environmental impacts, land contamination, permissibility, strategic context and existing site constraints	Justification of the site suitability is provided in Chapter 7.0 .
An assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including: • Agricultural land, flood-prone land, nearby drinking water catchments, Crown lands, mining, quarries, mineral or petroleum rights • A soil survey to determine the soil characteristics and consider the potential for salinity, acid sulfate soils and erosion to occur • An assessment of the potential impacts of the development on existing land uses on the site and adjacent land, including a cumulative impact assessment of nearby developments	Potential impacts on existing land uses and adjacent land are detailed in Section 6.3.4. Flood prone land and other potential flood impacts are detailed in Section 6.7. There are no crown lands, mining, quarries, mineral or petroleum rights. Soil characteristics are discussed in Section 6.3.3 and potential impacts to soil are detailed in Section 6.3.4. A cumulative impact assessment was not conducted for land as Section 6.3 has indicated that there were no residential impacts expected related to land use for the Project.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
An assessment of the compatibility of the development with existing land uses, during construction, operation and after decommissioning, including: • consideration of the zoning provisions applying to the land, including subdivision (if required); and • completion of a Land Use Conflict Risk Assessment in accordance with the Department of Industries <i>Land Use Conflict Risk Assessment Guide (if required)</i>	Assessment of the compatibility of the Project with existing land uses during construction, operation and decommissioning is detailed in Section 6.3.4. A Land Use Conflict Risk Assessment (LUCRA) was not required as indicated in Section 6.3.4.
Visual – including:	
A detailed assessment of the likely visual impacts of all components of the project (including transmission lines, substations and any other ancillary infrastructure) on surrounding residences and key locations, scenic or significant vistas, road corridors in the public domain, and provide details of measures to mitigate and/or manage potential impacts	Section 6.4 assesses the visual impacts. The Visual Impact Assessment (VIA) has been prepared, which addresses the impacts to surrounding residences and other key locations and scenic vistas and is attached in Appendix M.
Details of measures to mitigate and/or manage potential impacts (including a draft landscaping plan for on-site perimeter planting, with evidence it has been developed in consultation with affected landowners)	Mitigation measures to manage potential visual impacts are detailed in Section 6.4.5. A landscape plan will be developed prior to construction including vegetation removal, planting areas and planting list.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Noise – including: An assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG), operational noise impacts in accordance with the NSW Noise Policy for Industry (2017), cumulative noise impacts (considering other developments in the area), and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria, including (where appropriate): • Identification of impacts associated with construction, site emission and traffic generation and noise sensitive receivers • Details of the noise monitoring survey, background noise levels and amenity noise levels at the most impacted residential receivers • Details of the likely daily charging/discharging load profile, manufacturer specifications for plant and equipment and a noise source inventory • An assessment of 'worst case' noise emission scenarios during periods of discharging and charging • Consideration of annoying characteristics of noise and prevailing meteorological conditions in the study area • Details and analysis of the effectiveness of proposed management and mitigation measures to adequately manage identified impacts, including a clear identification of residual noise and vibration impacts following application of these mitigation measures and details of any proposed compliance monitoring programs	Section 6.5.4 provides an assessment of noise and vibration impacts. A Noise and Vibration Impact Assessment is attached at Appendix H. Section 6.5.4 provides an impact assessment. Section 6.5.2 provides methodology details. Section 6.5.4 and Section 6.5.2 provides an impact assessment and methodology details. Section 6.5.4 provides an impact assessment, including a 'worst case' noise scenario. Section 6.5.3 considers the existing environment around the study area. Section 6.5.5 illustrates mitigation measures regarding noise.
Transport – including: An assessment of the peak and average traffic generation (including light, heavy and over-mass and over-dimensional vehicles/heavy vehicles requiring escort) and construction worker transportation An assessment of the likely transport impacts to the site access route/s, including for over-dimensional vehicles/heavy vehicles requiring escort, site access point/s, any Crown land, particularly in relation to the capacity and condition of the roads, road safety and intersection performance A cumulative impact assessment of traffic from nearby developments	An assessment of peak and average traffic generation and an assessment of all vehicle types required during the Project Section 6.6.4. Impacts on public transport and the impacts that all listed vehicles will have on capacity, condition and safety of roads as well as intersection performance are detailed in Section 6.6.4. Section 6.6.4 describes the potential traffic impacts. Cumulative impacts are further discussed in Section 6.11, specifically Section 6.11.6 provides a cumulative impact assessment for traffic and transport.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Provide details of measures to mitigate and / or manage potential impacts (developed in consultation with the relevant road authorities) including: • a schedule of all required road upgrades (including resulting from heavy vehicle and heavy vehicle requiring escort traffic haulage routes) • clear figures of proposed road upgrades (including the site access point); and • road maintenance contributions, and other traffic control measures	Mitigation and management measures and the Traffic Management Plan were formed in conjunction with relevant road authorities and are detailed in Section 6.6.5. Section 6.6.4 discusses that road upgrades are not required for the Project.
Water – including:	
An assessment of the likely impacts of the development (including flooding and flood modelling) on surrounding watercourses (including their Strahler Stream Order), groundwater resources and surface water movements, and measures proposed to monitor, reduce and mitigate these impacts including water management;	Section 6.7.4 provides an assessment of Surface Water, Groundwater and Hydrology. Measures to mitigate and monitor potential impacts are described in Section 6.7.5. A water balance is provided in Appendix J.
A site water balance for the development	Water supplied and consumed for the purposes of the Project during construction and operation is discussed in Section 6.7.4.1.
Details of water requirements and supply arrangements for construction and operation	Water requirements and supply arrangements are discussed on Section 6.7.4.
A description of the erosion and sediment control measures that would be implemented to mitigate any impacts in accordance with <i>Managing Urban Stormwater: Soils & Construction (Landcom, 2004)</i> and <i>Managing Urban Stormwater: Soils and construction – Volume 2A manual (Landcom, 2008)</i>;	Erosion and sediment control measures are detailed in Section 6.7.5.
Assessing the impacts of the development, including any changes to flood risk and overland flows onsite or offsite, and detail design solutions and operational procedures to mitigate flood risk where required	Flood risk impacts are detailed in Section 6.8.4 and detailed design solutions to mitigate these risks are provided in Section 6.7.5.
Where the project involves works within 40 m of any river, lake or wetlands (collectively waterfront land), identify likely impacts to the waterfront land, and how the activities are to be designed and implemented in accordance with the <i>DPI Guidelines for Controlled Activities on Waterfront Land (2018)</i> and (if necessary) <i>Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (DPI 2003)</i>, and <i>Policy & Guidelines for Fish Habitat Conservation & Management (DPE, 2013)</i>;	The Project is not within 40 m of a waterbody, and therefore impacts to waterfront land was not considered.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Flood Risk: identification of any flood risk on site having regard to adopted flood studies, the potential effects of climate change and any relevant provisions of the NSW Flood Risk Management Manual: - where the development could alter flood behaviour, affect flood risk to the existing community or expose its users to flood risk, provide a flood impact and risk assessment (FIRA) prepared in accordance with the <i>Flood Impact and Risk Assessment – Flood Risk Management Guide LU01</i> - detailed design solutions and operational procedures to mitigate flood risk where required	Discussion of how the Project affects flooding during construction and operation is provided in Section 6.7.4 and Section 6.7.5 outlines mitigation measures to manage any potential impacts to flooding.
Hazards – including:	
<i>Health</i> - an assessment of potential hazards and risks including but not limited to fires, spontaneous ignition, electromagnetic fields (EMF) for the proposed grid connection infrastructure against the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for limiting exposure to Time-varying Electric, Magnetic and Electromagnetic Fields	Section 6.8.4.
<i>Bushfire</i> – identify potential hazards and risks associated with bushfires including the risks that a BESS would cause a bush fire and demonstrate compliance with <i>Planning for Bush Fire Protection 2019</i>	Section 6.10.
<i>Dangerous Goods</i> - a preliminary risk screening completed in accordance with the <i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>	Section 6.8.2 and 6.8.4.
<i>Battery Energy Storage System</i> - a Preliminary Hazard Analysis (PHA) prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis (DoP, 2011) [HIPAP 6] and Multi-Level Risk Assessment [MLRA]. The PHA must consider all recent standards and codes and verify separation distances to on-site and off-site receptors to prevent fire propagation and compliance with <i>Hazardous Industry Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning [HIPAP 4]</i>	Section 6.8.2 and 6.8.4.
<i>Aviation</i> – assess potential impacts on aviation safety	Section 6.10 assesses potential impacts on aviation safety.
Social impact – including:	
An assessment of the social impacts or benefits of the project for the region and the State as a whole in accordance with the <i>Social Impact Assessment Guideline</i> (DPE, 2023), including consideration of any increase in demand for community infrastructure services, and consideration of construction workforce accommodation	Section 6.9.4 provides a social impact assessment and Appendix L.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Economic – including:	
An assessment of the economic impacts or benefits of the project for the region and the State as a whole and provide details of any proposed voluntary benefit sharing, having regard to the <i>Benefit Sharing Guideline 2024 and Private Agreement Guideline 2024</i>	Section 6.9.4 provides an economic impact assessment.
Waste – including:	
Identify, quantify and classify the likely waste stream to be generated during construction and operation, and describe the measures to be implemented to manage, reuse, recycle and safely dispose of this waste, including a waste management plan	Section 6.10.2 includes an assessment of the likely waste stream to be generated and their management, including a preliminary waste management plan.
Plans and documents	
The EIS must include all relevant plans, diagrams and relevant documentation required under Part 3 of the EP&A Regulation. Provide these as part of the EIS rather than as separate documents. In addition, the EIS must include high-quality files of maps and figures of the subject site and proposal In addition, the EIS must include high quality files of maps and figures of the subject site and proposal.	This EIS follows the directions of the <i>State Significant Development Guidelines</i> in providing all relevant plans, diagrams and relevant documentation required under Part 3 of the EP&A Regulation. Maps and figures of the site are provided throughout Chapter 1.0 and Chapter 3.0 .
Legislation, policies and guidelines	
The assessment of the key issues listed above must take into account relevant guidelines, policies, and plans as identified. A list of some of the legislation, policies and guidelines that may be relevant to the assessment of the project can be found at: • https://www.planning.nsw.gov.au/policy-and-legislation/planning-reforms/rapid-assessment-framework/improving-assessment-guidance • https://www.planningportal.nsw.gov.au/major-projects/assessment/policies-and-guidelines; and • http://www.environment.gov.au/epbc/publications#assessments	Chapter 4.0 describes all relevant guidelines, policies, plans and legislation.

Secretary's Environmental Assessment Requirements	Location addressed in EIS
Consultation During the preparation of the EIS, you should consult with the relevant local, State or Commonwealth Government authorities, infrastructure and service providers, community groups, affected landowners and any exploration licence and/or mineral title holders. In particular, you must undertake detailed consultation with affected landowners surrounding the development, the owners of all exploration licences across the proposed development site, the operator of any pipelines on or adjacent to the site, and all relevant government agencies, including the relevant local Council. The EIS must: detail how engagement undertaken was consistent with the Undertaking Engagement Guidelines for State Significant Projects (DPHI, 2024); and describe the consultation process and the issues raised, and identify where the design of the development has been amended in response to these issues. Where amendments have not been made to address an issue, an explanation should be provided.	Chapter 5.0 details engagement and consultation undertaken for the Project. Section 5.5 details engagement activities and outcomes. Chapter 5.0 provides information on how engagement undertaken was consistent with the Undertaking Engagement Guidelines for State Significant Projects. Section 5.2.5 outlines the Project's consistency with DPHI guidelines. Chapter 5.0 describes the consultation process and Section 5.5 details engagement activities and outcomes.
Expiry date	
If you do not lodge a Development Application and EIS for the development within 2 years of the issue date of these SEARs, your SEARs will expire. If an extension to these SEARs will be required, please consult with the Planning Secretary 3 months prior to the expiry date.	N/A

Appendix B

Statutory Compliance Table

Appendix B Statutory compliance table

Legislation	Purpose/description	Where is this addressed/ considered in EIS
NSW legislation		
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act) (NSW)	An approval is required. Approval – development consent	Section 4.2
<i>Aboriginal Land Rights Act 1983</i> (NSW)	Not required – no active Aboriginal Land Claim over the Project Area.	Section 6.2 Appendix F
<i>National Parks and Wildlife Act 1974</i> (NPW Act) (NSW)	An Aboriginal Heritage Impact Permit (AHIP) is not required for a project that is an SSD.	Section 6.2 Appendix F
<i>Water Management Act 2000</i> (WM Act) (NSW)	The Project is not considered to be a 'controlled activity' under section 90 and 91 of the WM Act, and therefore no approvals are required.	Section 6.7 Appendix J
<i>Protection of the Environment Operations Act 1997</i> (POEO Act)	An EPL is not required as the Project does not fall under the list of activities outlined in Schedule 1 of the POEO Act.	Chapter 4.0
<i>Contaminated Land Management Act 1997</i> (CLM Act) (NSW)	Not required – the Detailed Site (Contamination) Assessment outlined that there is no contamination risk across the site.	Section 6.3 Appendix G
<i>Biodiversity Conservation Act 2016</i> (BC Act) (NSW)	An approval is required: Approval – development consent	Section 6.1 Appendix E
<i>Biosecurity Act 2015</i>	No approvals or consent under the <i>Biosecurity Act 2015</i> .	Section 6.1 Appendix E

Legislation	Purpose/description	Where is this addressed/ considered in EIS
<i>Roads Act 1993</i>	Approval for works in a road reserve is required under section 138 of the Roads Act. No works within road reserve areas are proposed and approval is therefore not required.	Section 6.6 Appendix I
<i>Heritage Act 1977 (Heritage Act) (NSW)</i>	No approval under the Heritage Act is required for a project that is considered SSD.	Section 6.10
Commonwealth legislation		
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (ATSI)</i>	No approval under the ATSI for a Project that is SSD.	Section 6.2 Appendix F
<i>Airports Act 1996 and Airports (Protection of Airspace) Regulations 1996</i>	No approval would be required as long as no structure is greater than 30 m above ground level. Consultation with and approval from ABCP. Completion of application two business days prior to intended use.	Section 6.10
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Cth)</i>	An approval from the Australian Government Minister under the EPBC Act is not required as the Project is not likely to have significant impact on MNES or the environment in general (i.e. the Project is not a controlled action).	Section 6.1 Appendix E
<i>Native Title Act 1993 (Native Title Act) (Cth)</i>	A search of the National Native Title Tribunal Register confirmed that the land is not subject to a Native Title claim.	Chapter 4.0

Appendix C

Community Engagement Table

Appendix C Community Engagement Table

Audience	Method	Date	Feedback	Comments
Adjacent properties/landowners				
CSIRO Energy Centre	Letter via email	27 August 2024	Neutral	Ausgrid outlined the Project and offered a meeting (virtual or in-person) to discuss the Project further. CSIRO requested the opportunity for continued engagement and particularly expressed interest in understanding the Project's impacts and timelines.
	Meeting	18 September 2024	Neutral	Ausgrid provided a presentation about the Project scope, potential impacts and next steps, as well as answered questions and discussed ongoing engagement and collaboration opportunities. CSIRO Energy Centre provided feedback on potential collaboration opportunities which Ausgrid address during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Benedict Recycling	Door knocking	18 September 2024	Positive	Ausgrid outlined the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the project further. Benedict Recycling was interested in learning more about the Project.
	Phone call	23 September 2024	Neutral	Ausgrid discussed a follow-up meeting about the Project with the site manager, who initially agreed to a meeting but later requested that Ausgrid liaise with the business manager instead. Ausgrid followed up with the business manager via phone and email to arrange a meeting, but a meeting date is yet to be confirmed.
	Meeting	3 February 2025	Neutral	Discussion about an existing easement and access used by Benedict Recycling.
	Meeting	13 February 2025	Neutral	Further discussion about an existing easement and access used by Benedict Recycling. Agreed that Ausgrid will provide written correspondence regarding easement and access.

Audience	Method	Date	Feedback	Comments
Hymix	Door knocking	18 September 2024	Positive	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. Hymix inquired about opportunities to provide services for the Project which Ausgrid have noted and will take into account during the assessment process.
Qualtest Laboratory	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Leading Edge Data Centres	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Meeting	11/03/2025	Neutral	On site meeting with a representative and a tour of the data centre facility. Footprint of HV connection infrastructure was discussed. Ausgrid agreed to share project design and provide introduction to Ausgrid customer connections team.
Port Hunter Environmental	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Weiley Electrical	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
DAT Training	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Countrytell	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Metropolitan Players	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
A1 Flue and Canopy Services	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Mayfield community stakeholders				
Mayfield Hotel Carpark Markets	Pop-up event	9 November 2024	Positive	Ausgrid spoke with 6 community members who expressed interest in the economic and job benefits of the Project, as well as possibilities for site tours to learn more about the technology. There was a desire to understand how the Project could positively impact their households, the physical aspects of the project and its operational mechanics. Ausgrid responded to these interests at the pop-up event which has been noted and will be further addressed during the assessment process. Additionally, there was general support for renewable energy initiatives that the Project supports. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Mayfield Library	Pop-up event	16 November 2024	Neutral	Ausgrid spoke with 17 community members who expressed queries about noise assessment, battery footprint, geographical footprint, receptor locations, loss of river access and fire management. There were concerns about the Project reducing property valuations. Ausgrid responded to these interests at the pop-up event which has been noted and will be further addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Mayfield East Shopping Village	Pop-up event	19 November 2024	Positive and Negative	Ausgrid spoke with 9 community members who expressed interest in the planning process, technical aspects and fire risk management. The community members were not worried about noise from cooling fans. However, one community member expressed scepticism about climate change and government initiatives. Ausgrid responded to these interests at the pop-up event which has been noted and identifies a need to address broader concerns and misinformation. These community members desire transparency and involvement throughout the Project's development which Ausgrid will facilitate by continuing to engage with the stakeholder.
Warabrook Shopping Centre	Pop-up event	20 November 2024	Positive	Ausgrid spoke with 8 community members who expressed interest in the planning process, technical aspects, fire risk management and support the future-generation benefits. Ausgrid discussed these interests at the pop-up event which has been noted and will be further addressed. There was support for the Project benefiting future generations and community members agreed with the proposed location in the industrial area. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Local Government and Elected Officials				
City of Newcastle Council	Email	27 August 2024	Initial notice of project and request for meeting.	No response
	Phone call	2 September 2024	Positive	Ausgrid introduced the Project and offered a meeting to discuss the Project further. This was accepted by the Council which will be followed up by Ausgrid.
	Letter via email	3 September 2024	Neutral	Ausgrid followed up with the Council regarding a meeting invite, outlining the Project and offering a meeting (virtual or in-person) to discuss further.

Audience	Method	Date	Feedback	Comments
	Phone	6 & 10 September 2025	NA	Follow up phone calls to arrange meeting.
	Meeting	18 September 2024	Neutral	Ausgrid met with Council staff at their Newcastle office and presented information about the project and answered questions. Council provided feedback on the Project name and highlighted interest in sustainability. Ausgrid responded to these interests during the meeting which has been noted and will be further addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Email	27 September 2024	Positive	Ausgrid sent a copy of the community newsletter which Council appreciated and look forward to receiving regular updates and information about the project. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Email	31 March 2025	Positive	Ausgrid offered in person/online meeting to outline findings of EIS, open negotiations on VPA and confirm acceptance of local road use.
	Email	2 April 2025	Positive	Council requested an email brief only, to include a summary of findings, opportunities and any permissions required from Council, including VPA arrangements and use of local roads. The Project team decided to submit the EIS, as Council would then have full access to technical reports. Engagement will continue through SSDA assessment and submissions process.
Office of Tim Crakanthorp MP	Phone call and letter via email	3 September 2024	Neutral	Ausgrid outlined the Project and offered a meeting (virtual or in-person) to discuss the Project further. No feedback was given at this stage.
	Phone calls	9 September 2024 – 25 September 2025	Neutral	Ausgrid left messages following up initial phone call to arrange a briefing. However, no feedback was given at this stage. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
	Email	3 October 2024	Neutral	Ausgrid sent a copy of the community newsletter. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Meeting	13 March 2025	Neutral	Met to provide update on project progress and supply hard copies of community newsletters.
Office of Sharon Calydon MP	Phone call and letter via email	3 September 2024	Positive	Ausgrid outlined the Project and offered a meeting (virtual or in-person) to discuss the project further. The stakeholder requested a meeting after a period of leave.
	Phone calls	5 September 2024 – 25 September 2025	Neutral	Ausgrid left messages following an initial phone call to arrange a briefing. The stakeholder requested a meeting after a period of leave. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Email	3 October 2024	Neutral	Ausgrid sent a copy of the community newsletter which was not responded to by the stakeholder. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Regulatory and Planning Agencies				
DPHI	Meeting	3 September 2024	Positive	Ausgrid met with DPHI representatives to outline the Project, work to date and proposed timeline. Representatives emphasised the importance of stakeholder engagement for comprehensive planning which has been noted and will be addressed during the assessment process.
	Meeting	30 September 2024	Positive	Ausgrid met with DPHI representatives to discuss hazard considerations for the Project. Representatives provided key feedback on hazard considerations and separation distances which has been noted and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Meeting	5 March 2025	Neutral	Met with DPHI representatives to discuss the outcomes of the technical reports and provide an update on stakeholder engagement.

Audience	Method	Date	Feedback	Comments
AEMO	Meeting	26 July 2024	Positive	Ausgrid discussed the BESS strategy and connections process for the project. AEMO expressed support for the BESS strategy and connections process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Sensitive Receivers within 400 metres				
Imagine Early Learning and Childcare Centre	Phone call	27 September 2024	Neutral	Ausgrid outlined the Project, ensured the centre received a copy of the newsletter and offered a meeting (virtual or in-person). No feedback at this stage was given but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
The Grainery Church	Phone call	1 October 2024	Neutral	Ausgrid phoned to outline the Project and ensure the centre received a copy of the newsletter. A voicemail was left with an offer of a meeting (virtual or in-person). No feedback at this stage was given but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
	Email	4 October 2024	Neutral	Ausgrid followed up the initial phone call with a copy of the community newsletter and offering a meeting to answer questions and provide more information. No feedback at this stage was given but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Sensitive receivers more than 400 metres				
Making Waves Early Education Centre, Warabrook	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Growrie NSW Early Education Centre, Mayfield	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Mayfield Early Learning Centre	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
The Hub Mayfield	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Hunter Early Learning Centre, Mayfield North	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Play Learn Grow, Mayfield	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Church	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Mayfield Church of Christ, Mayfield West	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Rhythm City Church, Mayfield	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Mayfield Uniting Church	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Mayfield Presbyterian Church	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Mayfield Baptist Church	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Saint Andrew's Anglican Church	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.
Christ the King Mayfield	Community newsletter	November 2024	Neutral	Ausgrid delivered the October issue of the Project's community newsletter to the stakeholder. No feedback has been given at this stage, but Ausgrid will continue to engage with the stakeholders to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
First Nations Stakeholders				
Awabakal LALC	Letter	3 September 2024	Positive	Ausgrid outlined the Project and offered a meeting (virtual or in-person) to discuss the Project further. The stakeholder responded with particular interest in understanding the project's impact on cultural heritage.
	Letter via email	25 September 2024	Neutral	Ausgrid requested registration of interest in Aboriginal Heritage consultation.
	Email	27 September 2024	Positive	Awabakal LALC responded to previous email and letter, and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
Hunter Local Land Services	Email	4 September 2024	Positive	Ausgrid contacted the stakeholder to request a full list of relevant Aboriginal Traditional Custodians and directed to Awabakal LALC. The stakeholder provided information on relevant custodians which has been noted by Ausgrid and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Office of the Register Aboriginal Land Rights Act (ORALRA)	Email	4 September 2024	Positive	Ausgrid contacted the stakeholder to request a full list of relevant Aboriginal Traditional Custodians and referred to Awabakal LALC and Worimi Conservation Lands. ORALRA provided information and referrals to appropriate stakeholders which has been noted by Ausgrid and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Heritage NSW	Email	4 September 2024	Positive	Ausgrid contacted the stakeholder to request a full list of relevant Aboriginal Traditional Custodians and provided a list of potential Aboriginal stakeholders. Heritage NSW provided a comprehensive list of stakeholders for consultation which has been noted by Ausgrid and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Worimi Conservation Lands	Email	11 September 2024	Neutral	Ausgrid contacted the stakeholder to discuss the Project. No response was received but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
AT Gomilaroi Cultural Consultancy	Letter via email	25 September 2024	Neutral	Ausgrid requested registration of interest in Aboriginal Heritage consultation and awaited response.
	Email	26 September 2024	Positive	The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
Corroboree Aboriginal Corporation	Letter via email	25 September 2024	Neutral	Ausgrid requested registration of interest in Aboriginal Heritage consultation and awaited response.
	Email	2 October 2024	Positive	The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
Didge Ngunawal Clan	Letter via email	25 September 2024	Positive	Ausgrid requested registration of interest in Aboriginal Heritage consultation. The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
A&K Cultural Heritage	Letter via email	25 September 2024	Positive	Ausgrid requested registration of interest in Aboriginal Heritage consultation. The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.

Audience	Method	Date	Feedback	Comments
Nukara Indigenous Cultural & Heritage	Letter via email	25 September 2024	Positive	Ausgrid requested registration of interest in Aboriginal Heritage consultation. The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
Nur-Run-Gee Pty Ltd	Letter via email	25 September 2024	Neutral	Ausgrid requested registration of interest in Aboriginal Heritage consultation. The stakeholder responded to the letter advising Ausgrid that their organisation only works on the Newcastle side of the harbour if no other organisation can attend. Ausgrid noted this information and will continue to engage with the stakeholder.
Widescope Indigenous Group	Letter via email	25 September 2024	Neutral	Ausgrid requested registration of interest in Aboriginal Heritage consultation and awaited response.
	Email	30 September 2024	Positive	The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
Long Gully Cultural Services	Letter via email	25 September 2024	Positive	Ausgrid requested registration of interest in Aboriginal Heritage consultation. The stakeholder responded to the letter and registered interest in the Project. They look forward to further engagement which Ausgrid will facilitate.
State Government Agencies				
Fire and Rescue NSW	Letter via email	30 August 2024	Neutral	Ausgrid outlined the Project, ensured the centre received a copy of the newsletter and offered a meeting (virtual or in-person). No feedback at this stage was given but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Newcastle SES Headquarters	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the Project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Mayfield West Fire Station	Door knocking	18 September 2024	Neutral	Ausgrid spoke to a representative, outlining the Project and hand-delivered a letter offering a meeting (virtual or in-person) to discuss the project further. There has been no feedback at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Utilities				
Transgrid	Meetings	8 February 2024	Positive	Ausgrid organised monthly meetings with Transgrid. They provided positive responses regarding the BESS connection proposal which has been noted by Ausgrid and will be addressed during the assessment process.
	Email	21 June 2024	Neutral	Ausgrid submitted Non-Prescribed DNSP work request for Transgrid's assessment and response. No feedback has been received at this stage, but Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Local residents				
Groongal St	Community briefing	13 November 2024	Negative	Ausgrid spoke with 5 residents who opposed to the battery Project and are sceptical about renewable energy. Some community members were unaware of the Project and directed to the website for more information. Others raised an unrelated voltage issue. Some community members were concerned about the impact on local bird species around the construction site, rising electricity costs and potential price increases due to the Project. Concerns and feedback have been noted and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Audience	Method	Date	Feedback	Comments
Gregson St	Community briefing	13 November 2024	Negative	Ausgrid spoke with 4 residents who had concerns about the impact on local bird species around the construction site and opposed certain suppliers. They were also worried about rising electricity costs and potential price increases due to the Project. Some community members raised an unrelated voltage issue. Concerns and feedback have been noted and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Simpson St	Community briefing	13 November 2024	Positive and Neutral	Ausgrid spoke to 4 residents who were positive about the renewable aspect of the project but raised concerns about increasing energy prices, particularly frustrated about electricity prices due to non-working solar panels. Some community members were unaware of the Project and directed to the website for more information. Concerns and feedback have been noted and will be addressed during the assessment process. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.
Shelly St	Community briefing	13 November 2024	Positive	Ausgrid spoke to 2 residents who provided a positive sentiment about the Project and renewable energy. Ausgrid will continue to engage with the stakeholder to ensure ongoing communication and collaboration.

Appendix D

Proposed Mitigation Measures

Appendix D Proposed Mitigation Measures

ID	Mitigation and Management Measures	Timing
Biodiversity		
BD-1	The Project's design will take into account the largest possible impact outside of the operational footprint for a potential laydown area. This area is likely to be reduced as part of the construction planning with most, if not all, planted trees around the existing substation ultimately be avoided.	Design
BD-2	The Project will avoid impacting/trimming overhanging located in the north of the site. This will ensure that habitat connectivity within the site remains intact.	Design Construction
BD-3	Vegetation clearing will occur outside of breeding season (between late August-December) to ensure minimal impact on breeding populations.	Construction
BD-4	Locating the Project in the southeast portion of the site ensures that impacts to the South Channel of the Hunter River are avoided.	Construction Operation
BD-5	Any animals injured during construction should be taken immediately to a vet for treatment. Any animals requiring rehabilitation would be placed into the care of an appropriate animal rehabilitator, with costs covered by the proponent.	Construction
BD-6	Vegetation within the site is to undergo pre-clearance searches including bandicoots that were observed in the site, to relocate captured specimens into neighbouring vegetation outside of the clearance zone.	Construction
BD-7	To prevent exotic plant material from entering/exiting the site, the following measures will be implemented: - removal and disposal of vegetation containing priority weeds should be done in accordance with Hunter Regional Strategic Weed Management Plan (LLS 2022) and local waste management regulations - prior to entering site vehicles and machinery must be inspected for soils, vegetation and seeds. If present this must be washed off in a suitable location prior to entering the site. - a clean down register to be maintained at the entry of the site	Construction Operation
BD-8	To reduce vehicle fauna strike, a restricted site speed limit will be implemented.	All phases
Aboriginal Heritage		
AH-1	The Project must be contained within the boundaries of the site. If there is any alteration to the site boundaries, further investigation and cultural heritage assessment must be completed.	All phases
AH-2	Should unanticipated Aboriginal archaeological material be encountered during construction of the Project, all work must cease in the vicinity of the find and an archaeologist contacted to assess the find and to advise on the course of action to be taken. Further archaeological assessment and Aboriginal community consultation may be required prior to the recommencement of works. Any objects confirmed to be Aboriginal in origin must be reported to Heritage NSW. In the unlikely event that suspected human remains are identified during construction works, all activity in the vicinity of the find must cease immediately and the find protected from harm or damage. The NSW Police and the Coroner's Office must be notified immediately. If the finds are confirmed to be human and of Aboriginal origin, further	All phases

ID	Mitigation and Management Measures	Timing
	assessment by an archaeologist experienced in the assessment of human remains and consultation with both Heritage NSW and the RAPs for the project would be required. This measure should be included in the Project CEMP.	
Land and Soils		
L-1	All workers will be informed of the contamination status of the material below the capping layer and be informed of the procedures and protocols to minimise the potential exposure to themselves and the environment.	All phases
L-2	The Steel River certification process, regulated by City of Newcastle Council, includes a site management plan (SMP) which details the day-to-day requirements of construction work. The SMP will be part of the overall CEMP and will be implemented.	All phases
L-3	All material which is removed from site must be sampled, classified, transported and tracked in accordance with the NSW EPA waste framework.	All phases
L-4	During construction, differential stockpiling of capping materials to any underlying materials, prior to classification being undertaken.	Construction
L-5	No groundwater extraction is to be undertaken unless there is additional assessment into the suitability of the extracted groundwater for the proposed purpose. Any extracted groundwater is to be treated as contaminated unless confirmed otherwise i.e. implementation of occupational hygiene controls for workers and no release of groundwater to the environment	All Phases
L-6	Additions to be made to the SMP as follows: • Training to ensure that all workers undertaking excavation works are aware of the potential for unexpected contamination to be present in the capping layer and the likely presence of contamination at depths beyond 2 mbgs, including free tar and slag. • Minimisation of potential exposure by dust and implementation of occupational hygiene controls to prevent dermal contact and incidental ingestion of soil adhered to skin when conducting any works below a depth of 2 m. • Stockpiling controls to manage the potential for contaminated material to leave the Operational Footprint via dust or erosion. • The 2 m capping layer is to be maintained throughout construction of the Project. Requirements will be established for the return of soil, in the event that soil is excavated from below the capping layer. If this is not feasible or desirable, appropriate sampling and analysis will be undertaken to determine whether it is appropriate for this material to remain at the Operational Footprint and be subject to waste classification.	All phases
L-7	A Certificate C will need to be obtained under the SMP. A Certificate C involves an environmental auditor reviewing the proposed design of the Project to confirm that it complies with the SMP. This will aim to avoid any penetration of the design below the existing 2 m capping layer.	Construction
L-8	Where soil is left exposed for more than three days, a soil binder will be used to help prevent erosion caused by wind or water. Binders would be used on stockpiles where these are in situ for more than 24 hours.	Pre-construction Construction

ID	Mitigation and Management Measures	Timing
L-9	A spill response plan (SRP) will be developed prior to construction, to outline the procedures to follow in the event of a spill to minimise environmental impact and ensure the safety of workers.	Construction Operation
L-10	Impermeable barriers placed between sources of contamination (e.g. contaminated stockpiles or certain materials) and the natural ground.	Construction Operation
L-11	Hazardous materials such as chemicals, fuels and oils will be handled and stored in accordance with relevant Australia Standards and the NSW EPA's Storing and Handling of Liquids: Environmental Protection Participants Handbook (DECC, 2007).	Construction Operation
Visual Amenity		
V-1	Minimise the removal of existing vegetation along the site boundaries where possible.	Design
V-2	Provide a native planting buffer along the east and south boundaries (facing the SUP and Tourle Street) to provide screening effect.	Design
V-3	Limit the area of disturbance during construction where possible.	Construction
V-4	All areas disturbed by construction and not required for operation of the Project are to be rehabilitated, to soften appearance of the Project and provide permeable surface.	Construction
V-5	Storage areas and associated construction support equipment are to be located in cleared or otherwise disturbed areas away from public interfaces, where possible.	Construction
V-6	Lighting for the site is to be designed to minimise glare issues and light spillage into adjacent areas and should be generally consistent with the requirements of Australian Standard 4282-1997 <i>Control of the obtrusive effects of outdoor lighting</i> .	Operation
V-7	Where bespoke equipment or buildings are selected (e.g. control room) materials, colour and finishes should mitigate appearance of bulky structures and minimise glare through use of matt or low-sheen finishes. It is noted that all other equipment will be as per the manufacturer's default colour specifications.	Operation
Noise and Vibration		
NV-1	A construction noise management plan (CNMP) would be developed and implemented for the Project. The CNMP would include feasible and reasonable safeguards to manage noise emissions from the Project and to address complaints received in relation to construction noise. The CNMP should include, as a minimum, the following: • identification of nearby residences and other sensitive land uses • description of approved hours of work • description and identification of all construction activities, including work areas, equipment, and duration • description of what work practices (generic and specific) would be applied to minimise noise • a complaint handling process • noise monitoring procedures • overview of community consultation required for identified high impact work.	Construction
NV-2	Construction work should be planned and carried out during standard construction hours as far as reasonable and feasible.	Construction
NV-3	All works would be conducted in accordance with the Transport <i>Construction Noise and Vibration Guideline (Public Transport Infrastructure)</i> standard mitigation measures outlined in Appendix H .	Pre-construction and construction

ID	Mitigation and Management Measures	Timing
NV-4	Attended measurements will be undertaken at the commencement of the full operation of the Project at the most affected receiver. In addition, attended measurements will be made in response to any complaints.	Operation
NV-5	A system of records which provides full documentation of all noise monitoring results, complaint handling and responses to non-compliances should be maintained.	Post-construction
NV-6	Residents and sensitive receivers likely to be affected by Project construction noise should be notified prior to commencement. The information provided to these receivers should include: - programmed times and locations of construction work - the hours of proposed work - construction noise impact predictions - construction noise mitigation measures being implemented on site.	Construction
NV-7	Community consultation regarding construction noise and vibration should be detailed in a Community Action Plan for the construction of the Project, including the provision of a 24-hour hotline and an associated complaints management process.	Construction
Traffic and Transport		
T-1	Prior to construction, a pre-condition survey of McIntosh Drive will be undertaken by the appointed contractor in consultation with Council. During construction the sections of the road network utilised by Project traffic will be monitored and maintained to ensure continued safe use by all road users, and any faults attributed to construction of the BESS would be rectified. At the end of construction, a post-condition survey would be undertaken to ensure the road network is left in a condition equivalent to that at the start of construction.	All phases
T-2	Neighbouring properties will be consulted and notified regarding the timing of major deliveries which may require additional traffic control and disrupt access.	Pre-construction Construction
T-3	Warning signs advertising change of traffic conditions will be implemented if deemed necessary and will be located on the transport routes along Council roads.	Construction
T-4	A local bus company may be contacted to implement a shuttle bus program during a portion of the construction phase to transport workers to and from the site. Measures to ensure that a potential shuttle bus runs effectively will be detailed in the CTMP.	Construction
T-5	Heavy vehicles will avoid travel during peak bus operating times to limit the interaction of larger vehicles and vulnerable road users. Buses operate along Tourle Street.	Construction
T-6	All OSOM vehicle trips would be scheduled to avoid other OSOM vehicles within the surrounding area. This will be coordinated as part of the permit application.	Construction

ID	Mitigation and Management Measures	Timing
T-7	A CTMP will be created in accordance with the <i>Australian Standard 1742.3</i> and the <i>Work Health and Safety regulation 2017</i>. The CTMP would provide further information on the following: - Road transport volumes, distribution and vehicle types broken down into: - Hours and days of construction - Schedules for phasing/staging of the Project. - The origin, destination and routes for: - Employee and contractor light vehicles - Heavy vehicle traffic - OSOM vehicles. - A map of the primary haulage routes highlighting critical locations - An induction process for vehicle operators and regular toolbox meetings - A complaint resolution and disciplinary procedure - Local climatic conditions that may impact road safety of employees throughout all project phases (e.g. fog, wet and significant dry, dusty weather).	Decommissioning
Surface water, groundwater and flooding		
SW-1	A construction Soil and Water Management Plan (SWMP), including an Erosion and Sediment Control Plan (ESCP) prepared in accordance with the Blue Book, will be prepared and implemented during construction. The ESCP will be prepared by a Certified Practitioner of Erosion and Sediment Control or an accredited soil scientist. The ESCP will include a protocol for erosion control inspections to detect and mitigate construction phase impacts.	Construction
SW-2	Include an ASS Management Plan (ASSMP) to minimise potential environmental impacts from development works that could disturb ASS.	Pre-construction Construction
SW-3	Prior to construction, a Flood Emergency Response Plan would be prepared. This would form part of the CEMP and would document how the risks to life and property within the Construction Footprint would be safely managed during construction.	Pre-construction
SW-4	The detailed design of the stormwater management system would be undertaken following project approval and will include the following: - Confirmation through water quality modelling that the City of Newcastle Council requirements specified in this report can be met. - Confirmation that the proposed stormwater drainage layout would manage floodwaters appropriately and confirm that the outcomes of the flood assessment presented in this EIS would be met.	Design

ID	Mitigation and Management Measures	Timing
SW-5	Operational controls relevant to water should be included in Ausgrid's existing environmental procedures for the site, or within a site-specific Operational Environment Management Plan (OEMP). The relevant document should include the following measures relevant to water: - Procedures to maintain drainage features at the site, including open channels, culverts, water quality controls (GPTs and pit inserts) and all pits and outlets. These should be maintained in accordance with the manufacturer's specifications and kept free-draining. - Identifying procedures to appropriately handle hazardous materials such that they can be contained within the site. Specified responses to a pollution incident should be documented for the unlikely event that hazardous materials.	Operation
SW-6	A water quality treatment train will be implemented to address the changes in pollutant loads that would be generated by the increased impervious area within the site.	Operation
Hazards and Risks		
HR-1	An offsite incident involving the high-pressure gas main be included in the site emergency response plan for the BESS facility.	Pre-construction, construction, operation
Social and economic		
SI-1	Implement noise, traffic, and dust mitigation measures while communicating construction schedules in advance. Monitor community complaints and ensure compliance with management plans to reduce disruptions and demonstrate adherence.	Construction
SI-2	Provide regular updates via newsletters, emails, and meetings, maintaining a contact point for enquiries. Foster transparency on potential impacts to build trust, increase engagement, and reduce unresolved complaints.	All Project stages
SI-3	Modify work schedules or traffic routes based on real-time monitoring of noise, traffic, and air quality. Maintain a grievance register to track concerns, with the goal of reducing grievances over time.	Construction and operation
SI-4	Share project-related opportunities with communities to increase awareness and engagement.	Construction and operation
SI-5	Prioritise local hiring, engage employment agencies, and track the number of local hires.	Construction and operation
SI-6	Provide cultural awareness training for staff to support First Nations engagement, ensuring completion and feedback are recorded.	Construction and operation
SI-7	Use toolbox talks to promote local businesses, encouraging contractors and workers to support nearby suppliers, services and hospitality providers.	Construction

ID	Mitigation and Management Measures	Timing
Non-Aboriginal heritage		
NAH-1	If any heritage objects and/or relics are uncovered during the construction of the Project, the following steps would be followed: • All activity in the immediate area would cease immediately. • The site construction manager would be notified. • Flagging or fencing would be erected to demarcate and protect the area. • Project Area personnel and visitors would be advised to avoid the area until further notice. • An appropriately qualified heritage professional would be consulted to confirm if the object/s is a heritage item or relic. • NSW Heritage Council would be contacted. If confirmed as a historic heritage item, an appropriately qualified heritage professional would record the location and attributes of the site and determine the significance of the find.	Construction
NAH-2	In the event of the discovery of human skeletal material (or suspected human skeletal material) during project activities in the Project Area, the following steps would be followed: • All activities and/or works in the immediate area would cease as soon as practicable • The NSW Police would be immediately contacted along with the project manager and the NSW Heritage Council • Flagging or fencing would be erected to demarcate and protect the area • Project Area personnel and visitors would be advised to avoid the area until further notice Any sand or soils removed from the near vicinity of the find would be identified and set aside for assessment by the investigating authorities.	Construction
Waste		
W-1	A Waste Management Sub-Plan would be prepared as part of the CEMP and would: • Identify requirements consistent with the waste hierarchy and circular economy initiatives • Include relevant measures from the National Waste Policy: Less Waste, More Resources (Department of Agriculture, Water and the Environment, 2018) • Provide a framework to target resource efficiency through the design and construction phases • Provide consistent clear direction on waste and resource handling, storage, stockpiling, use and reuse management measures • Set out processes for disposal, including on-site transfer, management, and the necessary associated approvals/permits • Describe the process for regularly removing waste from the Project Area to avoid issues associated with odour, visual amenity, and the attraction of animal/pest species • Outline procedures for waste generated to be segregated at source and suitably stored in designated waste management areas within the Project Area • Include material tracking measures to track waste and recyclables generated from the Project and removed from the Project Area.	Construction

ID	Mitigation and Management Measures	Timing
W-2	All waste would be assessed, classified, managed, and disposed of in accordance with the Waste Classification Guidelines and other relevant legislation (NSW EPA, 2014).	Construction Operation Decommissioning and Rehabilitation
Air quality		
AQ-1	The CEMP would include air quality management measures including measures to minimise visible dust moving offsite. Air quality measures would include: - Daily construction activities would consider the expected weather conditions for each workday and design the work program accordingly to reduce dust or emission impacts - Approaches to minimise exposed surfaces, such as stockpiles and cleared areas, including partial covering of stockpiles where practicable - Dust suppression measures on exposed surfaces would be implemented, such as watering of exposed soil surfaces, dust mesh, water trucks and sprinklers to reasonably minimise dust generation - Defined site entry and exit points would be defined to minimise tracking of soil on surrounding roads. Use wheel washes or shaker grids where the risk of offsite track out of dirt is identified - Heavy vehicles entering and leaving the site would be covered to prevent material escaping during transport - Vehicles and construction equipment operating onsite are to be kept well maintained and turned off when not operating (minimise idling on the site) - The handling of spoil would be minimised when excavating and loading of vehicles.	Construction
Aviation		
AV-1	If construction requires the use of a tall structure deemed to be a temporary obstruction greater than 30 m tall, approval will be sort from the ABCP via email. All applications need to be submitted to the ABCP at least two business days prior to the intended use of the tall structure.	Construction
AV-2	Newcastle Airport the RAAF Williamtown Base and Mayfield West heliport will be included as key stakeholders for the Project and will be notified of works throughout the construction phase.	Construction
Embodied carbon emissions		
EC-1	Measures that could be taken during detailed design and construction to reduce the embodied emissions of the Project include selecting lower-carbon materials such as concrete mixes with reduced Portland cement content, optimisation of steel design, selection of higher strength per mass steel components.	Design
EC-2	Reduction of direct emissions of sulphur hexafluoride (a GHG with potential for global warming) derived from equipment such as switchgear, will be considered throughout the Project.	Design Construction

Appendix E

Biodiversity Development Assessment Report

Appendix E Biodiversity Development Assessment Report

Appendix F

Aboriginal Cultural Heritage Assessment Report

Appendix F Aboriginal Cultural Heritage Assessment Report

Appendix G

Detailed Site
(Contamination)
Assessment

Appendix G Detailed Site (Contamination) Assessment

Appendix H

Noise and Vibration Impact Assessment

Appendix H Noise and Vibration Impact Assessment

Appendix I

Traffic Impact Assessment

Appendix I Traffic Impact Assessment

Appendix J

Water Impact Assessment

Appendix J Water Impact Assessment

Appendix K

Preliminary Hazard Analysis

Appendix K Preliminary Hazard Analysis

Appendix L

Social and Economic Impact Assessment

Appendix L Social and Economic Impact Assessment

Appendix M

Visual Impact Assessment

Appendix M Visual Impact Assessment

Appendix N

Estimated Development
Cost

Appendix N Estimated Development Cost

Appendix O

Embodied Carbon Calculations and Technical Note

Appendix O Embodied Carbon Calculations and Technical Note