



Supagas Carbon Dioxide Plant

Environmental Impact Statement

Supagas Pty Ltd

June 2026



Document version history

Version	Date	Revision description	Author	Reviewed	Approved
0	25 May 2026	Draft for review	Patric Illingworth – Environmental Project Manager	Phil Burns – Principal – Assessment and Approvals	-
1	11 June 2026	Final	Patric Illingworth – Environmental Project Manager	Mark Vile – Managing Director	Mark Vile – Managing Director

Disclaimer

This Environmental Impact Statement has been prepared in accordance with the brief provided by Supagas Pty Ltd and has relied upon the information available at the time. All findings, recommendations and actions contained in the Environmental Impact Statement are based on that information. This Environmental Impact Statement is for the use of Supagas Pty Ltd and no responsibility will be taken for its use by other parties. Any Party seeking to rely on this Environmental Impact Statement does so solely at their own risk. Supagas Pty Ltd may, at its discretion, use the Environmental Impact Statement to inform regulators and the public.

Declaration table

Statement of validity	
Project details	
Project name	Supagas CO ₂ Plant
Secretary's Environmental Assessment Requirements reference	SEARs 1946
Land to be developed	Lot 12 of DP 1171292 930 Kiandool Lane, Bohena Creek NSW 2390
Applicant details	
Applicant name	Supagas Pty Ltd
ABN	50 074 008 496
Applicant address	5 Benson Road, Ingleburn NSW 2565
Environmental Impact Statement prepared by	
Lead author	Patric Illingworth
Position	Environmental Project Manager
Qualifications	Bachelor of Engineering (Honours)
Address	Suite 2, 86-88 Tudor Street, Hamilton, NSW 2303
Declaration	
The undersigned declares that this EIS: • has been prepared in accordance with the Environmental Planning and Assessment Regulation 2021 • contains 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 SEARs for the Project • identifies and addresses the relevant statutory requirements for the project, including any relevant matters for consideration in environmental planning instruments • 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 principles of ecologically sustainable development • contains a consolidated description of the project in a single section 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.	
Approval	
Name	Mark Vile
Position	Managing Director
Signature	
Date	11 June 2026

Executive Summary

Supagas Pty Ltd (Supagas) is seeking to construct and operate a carbon dioxide (CO₂) plant, which will connect to the adjacent existing Wilga Park Power Station (WPPS) (the Project). The Project will be located wholly within the Narrabri Local Government Area, approximately 12 km south-west of Narrabri, NSW.

The Project is designated development and requires approval under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). This Environmental Impact Statement (EIS) considers the potential environmental impacts associated with the construction and operation of the Project in accordance with sections 190-192 of the Environmental Planning and Assessment Regulation 2021 and the Planning Secretary's Environmental Assessment Requirements 1946.

Project overview

The Project includes the construction and operation of a CO₂ plant, which will capture and process exhaust gas from gas generators within the WPPS. The Project will produce approximately 72 tonnes per day of high purity, liquid CO₂, with allowance for storage of approximately 800 tonnes prior to transport off-site.

The key activities for the Project include:

- clearing and earthworks for site preparation
- construction of the Project
- operation of the Project, including distribution of the CO₂ product via road transport
- decommissioning, rehabilitation, and closure.

Project rationale

Australia currently has a shortage of locally produced high purity CO₂ and currently imports CO₂ from sources in Asia to meet its increasing demands. Gas produced from the combustion of natural gas largely contains CO₂, which is typically discharged to the atmosphere as a waste stream. In its current arrangement, exhaust gas from the WPPS is discharged to the atmosphere via exhaust stacks.

The Project proposes the construction and operation of a CO₂ plant to recover exhaust gas from natural gas combustion and produce a high purity (i.e. up to 99.9% pure) CO₂ product for transport to Australian markets. Key applications of high purity CO₂ in Australian markets includes the following:

- Food and beverage carbonation – liquid CO₂ is injected into beverages like soda, beer, and sparkling wine to create the fizz.
- Freezing and chilling – CO₂ is used for quick-freezing food products and for maintaining low temperatures during storage and transport.
- Welding and metal fabrication – CO₂ acts as a shielding gas, protecting the weld area from atmospheric contamination and oxidation.
- Chemical production – liquid CO₂ is a feedstock for various chemical processes, including the production of methanol and urea.
- Fire extinguishers – CO₂ is used to displace oxygen and extinguish electrical and liquid fires.
- Agriculture – CO₂ can be used to enrich greenhouse air, promoting plant growth.
- Medical – liquid CO₂ can be used in cryosurgery to freeze and destroy abnormal tissue.

The recovery of the CO₂ from the WPPS waste stream, which would otherwise have been discharged directly into the atmosphere, is an economically viable source of CO₂. The Project shows a commitment by Supagas to provide Australian CO₂ customers with a secure and reliable local supply of high purity CO₂, thereby reducing Australia's reliance on imported products.

Engagement

Engagement was conducted during the preparation of the EIS and included the following stakeholders:

- Government agencies, including:
 - Narrabri Shire Council
 - NSW Department of Planning, Housing and Infrastructure
 - NSW Environment Protection Authority
 - Transport for NSW
 - NSW Rural Fire Service
 - Fire and Rescue NSW,
 - WaterNSW
 - Narrabri Local Aboriginal Land Council
- Santos NSW (Eastern) Pty Ltd (i.e. the owner of the WPPS and the land on which the Project is located)
- community engagement, including:
 - surrounding landowners
 - the Narrabri Gas Project Community Consultative Committee

Impact assessment

This EIS provides an environmental assessment in accordance with the requirements of the EP&A Act and its associated policy and guidelines. A summary of the key outcomes of the environmental assessment identified is provided in Table ES1.

Table ES1 Summary of key impacts

Aspect	Key outcomes
Biodiversity	• The disturbance footprint of the Project is approximately 0.76 ha, of which 0.16 ha is non-native vegetation and cleared ground. The remaining 0.60 ha consists of native vegetation (PCT 411: Buloke - White Cypress Pine woodland on outwash plains in the Pilliga Scrub and Narrabri regions, Brigalow Belt South Bioregion) that would be removed and disturbed for the Project. Due to the relatively low magnitude of clearing required for the Project, the impact is not considered to be significant. • The Project will not result in any impacts to threatened ecological communities. • The Project would not result in a significant impact to any threatened flora or fauna species. • There is uncertainty regarding the potential for indirect impacts associated with the irrigation of treated wastewater to adversely affect populations of <i>Myriophyllum implicatum</i> that may be present. Specific mitigation and management measures for this species have been included for the Project. • No habitat trees were detected during the field survey. However, the Project area contains fallen timber which provides shelter, nesting, and foraging microhabitats for a range of fauna species. • The overall impact of the Project on wildlife connectivity at the landscape scale is expected to be negligible. • Potential indirect impacts to habitats or native vegetation adjacent to the Project area may include: ◦ edge effects on adjacent native vegetation and habitat

Aspect	Key outcomes
	invasion and spread of weeds and pathogens by earthworks, movement of soil, and attachment of seed (and other propagules) to vehicles and machinery
Traffic and transport	- The road network is able to readily accommodate the traffic generated by the Project during the construction and operational periods. - The existing WPPS site access and access routes to site are considered suitable to safely accommodate access to the Project. - The car parking arrangements are sufficient to accommodate the entirety of the construction and operational parking demands without off-site impacts. - A preliminary swept path assessment was undertaken for the truck turning area. The loading arrangements are considered suitable subject to further detailed design development.
Hazard and risk	- Twenty-eight (28) hazards and associated risk events were identified for the Project. - A risk assessment found: - no high risks were identified - twenty-six (26) hazards fall within a medium risk category - two (2) hazards associated with very low likelihood events were rated as low risk - All risks have been reduced through the application of established control measures and are considered tolerable.
Bushfire	- The Project asset protection zones (APZs) are suitable and acceptable to minimise bushfire risk. - The Project is not expected to materially increase bushfire risk to surrounding land uses, and bushfire risk associated with the Project is acceptable.
Noise	- The predicted noise levels during construction and operation will comply with the relevant noise management criterion at the nearest privately-owned receiver. - Predicted noise levels for receivers adjoining affected roadways are expected to comply with the relevant criterion for daytime road traffic noise.
Air quality and greenhouse gas	- With the implementation of standard best-practice mitigation measures, construction-related air quality impacts will not result in adverse impacts at sensitive receivers or exceed relevant air quality criteria. - The operational phase of the Project is not expected to result in adverse air quality impacts or exceedances of relevant regulatory criteria. - Project average annual Scope 2 emissions are approximately 0.007 Mt CO₂-e. This represents a very small contribution to national greenhouse gas emissions, being approximately 0.002% of Australia's Paris Agreement target. These emissions are not considered to be significant in a global or regional context.
Soils and surface water	- With the implementation of mitigation measures, potential surface water quality impacts from the Project will be negligible. - With the implementation of mitigation measures, potential impacts from the discharge from the Project will be low. - The Project area is outside of the flood extents for all events; 10% AEP, 1% AEP and Probable Maximum Flood. - Loss of catchment yield due to the Project is considered negligible. - Soil surveys found the Project area contains one dominant soil mapping unit Brown Sodosol, and one subdominant mapping unit Brown Dermosol.
Groundwater	- The Project will not intercept groundwater with respect to the Project design and surrounding groundwater level information. - No Project activities will cause groundwater drawdown at nearby high priority groundwater dependent ecosystems, or a water level decline at any water supply work. Additionally, there will be no permanent groundwater take from the Project construction and operation, excluding the use of the groundwater bore which is separately being assessed via a bore dealing assessment. - There will not be any change in the groundwater quality and the beneficial use category of the groundwater source.

Aspect	Key outcomes
	The Project does not exceed the Level 1 impact considerations under the Aquifer Interference Policy.
Aboriginal cultural heritage	No Aboriginal cultural heritage sites are known to exist within the Project area and all landforms within the Project area were assessed to have low archaeological potential. Therefore, the impacts to Aboriginal cultural heritage will be negligible.
Contamination	- There are no complete or credible exposure pathways identified for the Project. Potential impacts, if any, will be limited to the unlikely disturbance of previously unidentified contamination during construction. - The Project is extremely unlikely to result in any measurable cumulative soil or groundwater contamination. - The likelihood of significant contamination is extremely low and no further investigation is required.
Visual amenity	- One privately-owned receiver (R32) has potential theoretical visibility of the Project, however the visual impact to R32, Yarrie Lake Road, and Kiandool Lane were assessed as very low. - There are limited public vantage points within the landscape and visual study area, with Yarrie Lake Road to the north and Kiandool Lane to the west.

Acronyms and abbreviations

Term	Definition
ADG Code	Australian Code for the Transport of Dangerous Goods by Roads and Rail
AHIMS	Aboriginal Heritage Information Management System
Amber	Amber Organisation Pty Ltd
Applying SEPP 33	Hazardous and Offensive Development Application Guidelines - Applying SEPP 33
APZ	asset protection zones
AQA	air quality assessment
AQGHGA	air quality and greenhouse gas assessment
AWS	Automatic Weather Station
BAL	bushfire attack level
BC Act	<i>Biodiversity Conservation Act 2016</i>
BFAR	bushfire assessment report
CCC	Community Consultative Committee
CO	carbon monoxide
CO ₂	carbon dioxide
CSM	conceptual site model
DA	Development Application
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plans
DCS	Distributed Control System
DG	Dangerous Goods
DPHI	Department of Planning, Housing and Infrastructure
DSF	Dry Sclerophyll Forest
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPA	Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPL	Environmental Protection Licence
GDE	groundwater dependent ecosystems
GHG	greenhouse gas
GHGA	greenhouse gas assessment
GLVIA3	Guidelines for Landscape and Visual Impact Assessment, 3rd Edition
HIPAP 6	Hazardous Industry Planning Advisory Paper No. 6 - Guideline for Hazard Analysis
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan

Term	Definition
LGA	Local Government Area
LVSA	landscape and visual study area
m BGL	metres below ground level
MCC	Motor Control Centre
MEA	Monoethanolamine
MNES	matters of national environmental significance
N ₂	nitrogen gas
NGP	Narrabri Gas Project
nitric oxide	Nox
NO	nitric oxide
NSC	Narrabri Shire Council
O ₂	oxygen gas
Onward	Onward Consulting Pty Ltd
OSOM	Oversize-overmass
OzArk	OzArk Environment and Heritage Management Pty Ltd
Pando	Pando Consulting Pty Ltd
PBP	Planning for Bushfire Protection
PCT	plant community type
PHA	Preliminary Hazard Analysis
PoEO Act	<i>Protection of the Environment Operations Act 1997</i>
PPE	personal protective equipment
PRS	Preliminary Risk Screening
PSI	Preliminary Site Investigation
R&H	resilience and hazards
NSW RFS	NSW Rural Fire Service
RO	reverse osmosis
Santos	Santos NSW (Eastern) Pty Ltd
SEARs	Secretary's Environmental Assessment Requirements
SEPP	Statement Environmental Planning Policies
SO ₂	sulfur dioxide
Supagas	Supagas Pty Ltd
t	tonnes
tpd	tonnes per day
TfNSW	Transport for NSW
TIA	traffic impact assessment
WAL	Water Access Licence
WM Act	<i>Water Management Act 2000</i>
WPPS	Wilga Park Power Station
Zephyr	Zephyr Environmental Pty Ltd
ZTV	zone of theoretical visibility

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1. Introduction

Supagas Pty Ltd (Supagas) is seeking to construct and operate a carbon dioxide (CO₂) plant, which will connect to the adjacent existing Wilga Park Power Station (WPPS). The CO₂ plant will capture and process exhaust gas from the WPPS gas generators and output a high purity CO₂ product for transport and use in a range of industries in the Australian market (the Project).

The Project will be located wholly within the Narrabri Local Government Area (LGA), approximately 12 km south-west of Narrabri, NSW (Figure 1.1).

The Project is designated development and requires approval under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Project also meets the requirements for integrated development because it requires approvals, licenses and permits under other planning and environmental legislation.

This document is an Environmental Impact Statement (EIS) for the Project which has been prepared in accordance with the Planning Secretary's Environmental Assessment Requirements (SEARs) 1946 issued on 18 November 2024.

1.1. Project overview

1.1.1. Project summary

The Project includes the construction and operation of a CO₂ plant, which will capture and process exhaust gas from gas generators within the WPPS.

This exhaust gas will be treated to produce a CO₂ product of high purity for transport and use in a range of industries in the Australian market (e.g. food and beverage, freezing and chilling, welding and metal fabrication, chemical production, fire extinguishers, agriculture, medical). The Project will produce approximately 72 tonnes per day (tpd) of liquid CO₂, with allowance for storage of approximately 800 tonnes (t) prior to transport off-site.

The key activities for the Project include:

- clearing and earthworks for site preparation
- construction of the Project
- operation of the Project, including distribution of the CO₂ product via road transport
- decommissioning, rehabilitation, and closure

1.1.2. Project location and land ownership

The Project will be located wholly within Lot 12 of DP 1171292 in Narrabri LGA, approximately 12 km south-west of Narrabri.

Lot 12 of DP 1171292 is owned by Santos NSW (Eastern) Pty Ltd (Santos). An Essential Energy substation is located to the east of the Project on Lot 11 of DP 117292 (Figure 1.2).

Supagas proposes to subdivide the Project area from Lot 12 of DP 1171292. A Subdivision Certificate Application with plans and supporting information would be lodged for assessment and endorsement. Consideration of the 'Narrabri Local Environmental Plan 2012' (Narrabri LEP) in relation to the proposed subdivision is provided in Section 4.4.2.1.

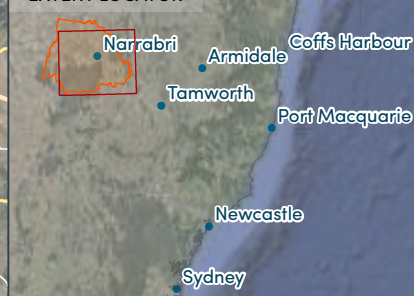
SUPAGAS CO₂ PLANT

Figure 1.1
Regional locality

LEGEND

-  Proposed Project Site
-  Narrabri LGA
- Infrastructure and watercourse**
 -  Railway
 -  Primary road
 -  Arterial road
 -  Sub-arterial road
 -  Local road
 -  Major watercourse
- Conservation area**
 -  State Forest
 -  Aboriginal Area
 -  National Park
 -  Nature Reserve
 -  State Conservation Area

EXTENT LOCATOR



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Figure print date: 12/05/2026

Author: Jett McLachlan



Scale: A4 1:600,000
Datum: GDA2020 MGA Zone 55



SUPAGAS CO₂ PLANT

Figure 1.2
Land ownership

LEGEND

Land ownership

- Essential Energy
- Santos
- Privately owned

Document code: SPL 002	Figure version: 3.1
Figure print date: 12/05/2026	Author: JettMcLachlan



Scale: A4 1:3,500
Datum: GDA2020 MGA Zone 55



1.1.3. Project objectives

The key Project objectives are as follows:

1. Produce a high purity CO₂ product which meets the quality standards specified by the International Society of Beverage Technologists and European Industrial Gases Association.
2. Utilise a waste stream to facilitate local supply of CO₂ product to a range of industries.
3. Create a new opportunity for ongoing investment in the region.
4. Design the Project to avoid sensitive environmental features and minimise impacts as far as practical.

1.1.4. Purpose of the document

This EIS has been prepared to accompany a Development Application (DA) made for the Project in accordance with Part 4 of the EP&A Act.

This EIS considers the potential environmental impacts associated with the construction and operation of the Project in accordance with sections 190-192 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) and the SEARs 1946 as issued by the NSW Department of Planning, Housing and Infrastructure (DPHI) and the Narrabri Shire Council (NSC). The SEARs, and a reconciliation of where the SEARs and requirements under section 190-192 of the EP&A Act are addressed in the EIS, is provided in Appendix A.

1.2. Related Santos operations

The WPPS is owned by Santos and operates as a gas fired power station up to an approved capacity of 40 megawatts using gas extracted from the Narrabri Gas Project (NGP). The WPPS includes a series of generator units, a control room, a fenced switchyard, a site office, and storage and car parking areas within a fenced site.

The WPPS was originally approved by the NSC in November 2002. Upgrades to the WPPS were proposed as part of the Narrabri Gas Utilisation Project, which was approved in December 2008 (Development Consent MP07_0023). Development Consent MP07_0023 has been modified on seven occasions, most recently on 21 October 2019.

Currently, exhaust gas from the operation of the WPPS is discharged into the atmosphere via exhaust stacks. This exhaust gas generally contains a mixture of CO₂, nitrogen gas (N₂), oxygen gas (O₂), nitric oxide (NO), sulfur dioxide (SO₂), and other trace compounds.

Santos also owns and operates a range of existing and approved coal seam gas infrastructure in the Narrabri region surrounding the Project, including several coal seam gas pilot wells, gas and water gathering lines as well as gas and water management facilities at the Bibblewindi and Leewood properties.

Supagas and Santos executed an agreement to facilitate the development of the Project. Santos is separately modifying the WPPS approval to allow for the connection of the Project, and any other modifications required following approval of the Project.

The WPPS currently operates in accordance with the following management plans:

- WPPS Traffic Management Plan
- WPPS Construction Environmental Management Plan
- WPPS Operational Management Plan

These management plans have been considered where relevant in the preparation on this EIS.

2. Strategic Context

2.1. Project rationale

Australia currently has a shortage of locally produced high purity CO₂. Consequently, Australia currently imports CO₂ from sources in Asia to meet our increasing demands.

Gas produced from the combustion of natural gas contains a large proportion CO₂, which is typically discharged to the atmosphere as a waste stream. In its current arrangement, exhaust gas from the WPPS is discharged to the atmosphere via exhaust stacks.

The Project proposes the construction and operation of a CO₂ plant to recover exhaust gas from natural gas combustion and produce a high purity (i.e. up to 99.9% pure) CO₂ product for transport to Australian markets. Key applications of high purity CO₂ in Australian markets include the following:

- Food and beverage carbonation – liquid CO₂ is injected into beverages like soda, beer, and sparkling wine to create the fizz.
- Freezing and chilling – CO₂ is used for quick-freezing food products and for maintaining low temperatures during storage and transport.
- Welding and metal fabrication – CO₂ acts as a shielding gas, protecting the weld area from atmospheric contamination and oxidation.
- Chemical production – liquid CO₂ is a feedstock for various chemical processes, including the production of methanol and urea.
- Fire extinguishers – CO₂ is used to displace oxygen and extinguish electrical and liquid fires.
- Agriculture – CO₂ can be used to enrich greenhouse air, promoting plant growth.
- Medical – liquid CO₂ can be used in cryosurgery to freeze and destroy abnormal tissue.

The recovery of the CO₂ from the WPPS waste stream, which would otherwise have been discharged directly into the atmosphere, is an economically viable source of CO₂. The Project shows a commitment by Supagas to provide Australian CO₂ customers with a secure, reliable, and local supply of high purity CO₂, thereby reducing Australia's reliance on imported products.

2.2. Site features and suitability

The existing land uses in the vicinity of the Project are characterised by a combination of agriculture, gas extraction and power generation. Built features surrounding the Project include the WPPS, an underground gas pipeline and an aboveground water pipeline, access tracks, and the Tintsville Ponds.

Other features in the surrounding area include Bohena Creek approximately 1 km east and Kiandool Lane approximately 2.5 km west. The site and surrounding land are rural in nature and zoned for primary production (RU1) under the Narrabri LEP.

The location of the Project is considered suitable as:

- it is co-located adjacent to the existing WPPS site and Essential Energy substation, allowing for the efficient recovery of its waste stream and use of existing facilities (e.g. site access, and electricity supply)
- it is unlikely to result in a conflict with other land uses
- the two closest receivers (R12 and R13) are owned by Santos (Figure 2.1)
- the nearest privately-owned receiver (R22) is situated approximately 1.5 km to the north-west of the Project (Figure 2.1)

SUPAGAS CO₂ PLANT

Figure 2.1
Sensitive receivers

LEGEND

 Project Area

Sensitive receiver

 Non-associated

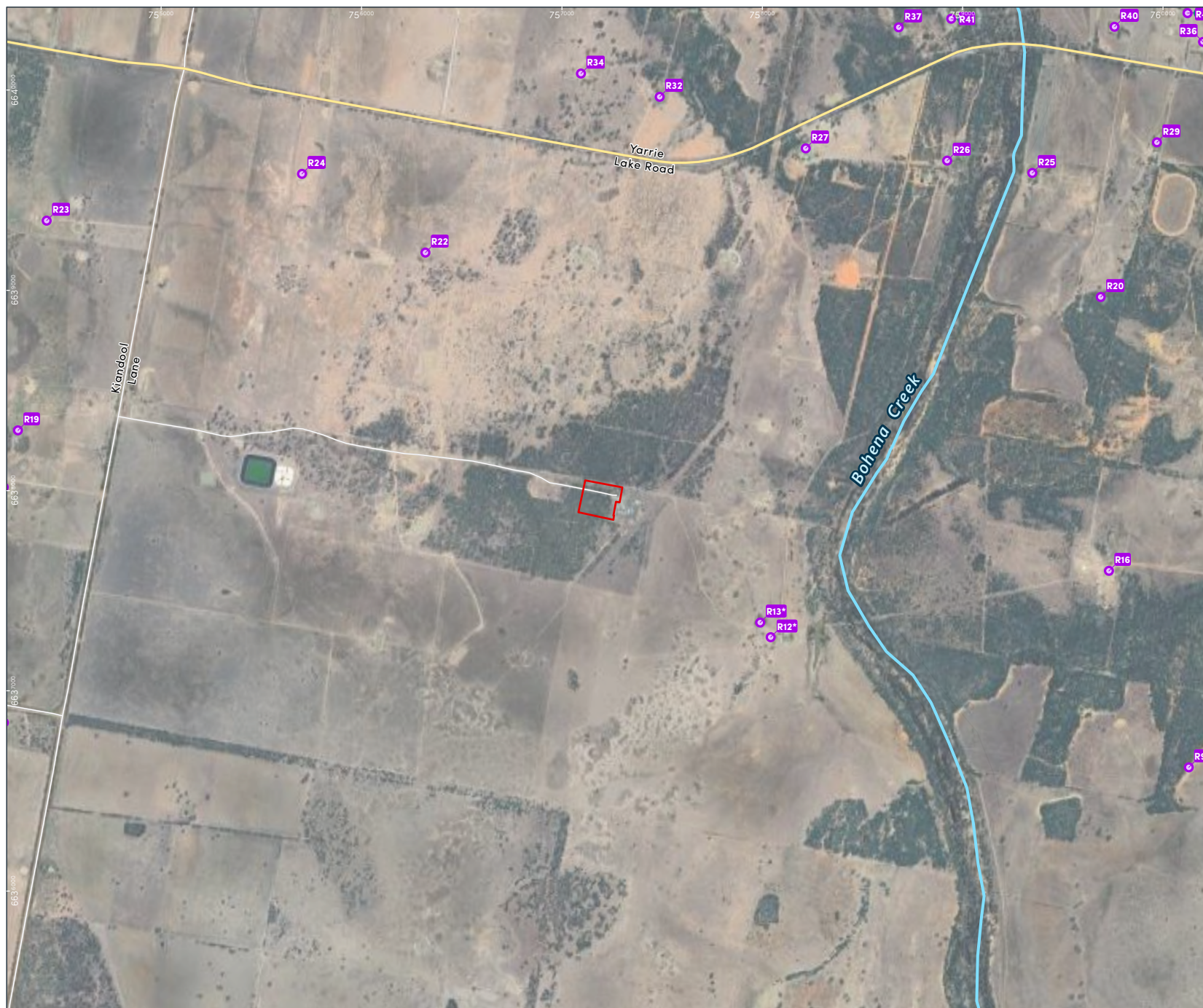
Infrastructure and watercourse

 Sub-arterial road

 Local road

 Major watercourse

* R12 and R13 are owned by Santos



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2.3. Alignment with strategies, policies and plans

2.3.1. New England North West Regional Plan 2041

The 'New England North West Regional Plan 2041' (DPE, 2022) applies to Tamworth Regional, Armidale Regional, Inverell, Narrabri, Gunnedah, Glen Innes, Gwydir, Liverpool Plains, Tenterfield, Uralla, Walcha and Moree Plains LGAs.

The plan guides land use planning priorities and decision making in the region for the next two decades. Table 2.1 summarises the strategies of the plan that are relevant to the Project.

Table 2.1 New England North West Regional Plan 2041 strategies relevant to the Project

Strategy	Relevance to the Project
Strategy 1.2: Maximise the cost-effective and efficient use of infrastructure by focusing development around existing infrastructure and promote co-location of new infrastructure	As the Project requires connection to the WPPS to take CO ₂ for reuse in a range of industries, the Project will be co-located in proximity to the WPPS and utilise existing infrastructure where possible (e.g. WPPS access road from Kiandool Lane).
Strategy 6.1: Respond to future changes in industry to allow a transition to new opportunities	With CO ₂ generally a waste product resulting from combustion of fossil fuels, as well as a pollutant regulated by the NSW Environment Protection Authority (EPA), the Project will:
Strategy 10.2: Use strategic planning and waste management strategies to support a circular economy, including opportunities for new industry specialisations	• create a new opportunity for ongoing investment in the region and enable supply of products to a range of industries in the Australian market that would otherwise have been wasted (i.e. beneficial reuse) • result in local/regional environmental benefits by removing approximately 72 tpd of CO₂ emissions from the operation of the WPPS, which would otherwise have been discharged directly into the local environment/atmosphere as a waste

2.3.2. 2025-2035 Narrabri Shire Community Strategic Plan

The '2025-2035 Narrabri Shire Community Strategic Plan' (NSC, 2025) is the NSC's strategic plan for the Narrabri LGA to 2035. The plan seeks four key relevant outcomes:

- Outcome 1: Society – An empowered, inclusive and connected community.
- Outcome 2: Environment – A sustainable and compatible natural and built environment.
- Outcome 3: Economy – A strong, diverse, and sustainable economy.

The Project is generally consistent with the outcomes included in the plan as the Project:

- incorporates a range of strategies to manage and minimise potential impacts on the surrounding environment
- will result in local/regional environmental benefits by removing approximately 72 tpd of CO₂ emissions from the operation of the WPPS, which would otherwise have been discharged directly into the local environment/atmosphere as a waste
- incorporates relevant Ecologically Sustainable Development considerations
- economic benefits from workforce employment associated with the Project

2.3.3. Narrabri Shire 2040 Local Strategic Planning Statement

The 'Narrabri Shire 2040 Local Strategic Planning Statement' (NSC, 2016) is the NSC's 20-year vision for the Narrabri LGA and outlines the economic, social and environmental land use needs and the planning priorities which meet the community's needs.

The statement gives effect to the 'New England North West Regional Plan 2041' (DPE, 2022) implementing the direction and actions at a local level.

As discussed in Section 2.3.1, the Project is consistent with the statement as it:

- will be co-located in proximity to the WPPS and utilise existing infrastructure where possible (e.g. WPPS access road from Kiandool Lane)
- will create a new opportunity for ongoing investment in the region and enable supply of products to a range of industries that would otherwise have been wasted (i.e. beneficial reuse)

2.4. Analysis of alternatives

Several alternatives to the Project have been considered by Supagas to date, including:

- alternatives to the Project arrangement and footprint
- alternatives to Project design
- not proceeding with the Project (i.e. the "do nothing" scenario)

The above alternatives have not been adopted as they had potential outcomes that were not aligned with Supagas' objectives for the Project. Discussion of these alternatives, and why they were not adopted for the Project are further detailed in the following sections.

2.4.1. Alternatives to the Project location

The Project includes the construction and operation of a CO₂ plant, which is intended to capture and process exhaust gas from gas generators within the WPPS. The location of the Project is therefore driven by the location of the WPPS, in particular the location of the exhaust stacks. The Project location also allows for the use of WPPS facilities, such as the existing site access and electricity supply.

2.4.2. Alternatives to Project design

The design of the Project is largely influenced by the equipment manufacturer specifications and CO₂ purification process. Supagas have made changes to the design of the Project to:

- improve the safety of operations (e.g. increase the height of the vent stacks to avoid exposure of personnel to process gas)
- avoid environmental impacts where possible (e.g. avoidance of biodiversity impacts within the Project area [Section 6.1])

2.4.3. "Do nothing" scenario

If the Project did not proceed, the CO₂ from the operation of the WPPS will continue to be discharged to the atmosphere and the economic potential of this waste stream would not be realised.

In addition, the consequences of not proceeding with the Project include:

- the social and economic benefits of further investment in the region would not be realised
- the potential impacts of the Project along with the Project management measures and offsets, would not occur

3. Project description

3.1. Project overview

The Project includes the construction and operation of a CO₂ plant, which will capture and process exhaust gas from gas generators within the WPPS.

This exhaust gas will be treated to produce a CO₂ product of high purity for transport to Australian markets.

The key activities for the Project include:

- clearing and earthworks for site preparation
- construction of the Project
- operation of the Project, including distribution of the CO₂ product via road transport
- decommissioning, rehabilitation, and closure

Table 3.1 provides a summary of the key characteristics of the Project.

Table 3.1 Summary of key Project aspects

Aspect	Description
Limits of production	Processing of approximately 72 tpd of CO ₂ , with storage capacity of approximately 800 t of liquid CO ₂ .
Project area	The area assessed in technical assessments as defined in Figure 3.1. The Project area includes the disturbance footprint and the irrigation area.
Disturbance footprint	The disturbance footprint is located within the Project area and includes the plant area and the truck turning area (Figure 3.1). The disturbance footprint totals approximately 0.76 ha, of which 0.16 ha is non-native vegetation and cleared ground. The remaining 0.60 ha consists of native vegetation that would be removed and disturbed for the Project
Employment	Peak construction workforce of 30. Average construction workforce of 20. Two full-time employees during operation. During scheduled maintenance activities, up to two additional staff would be required.
Construction timeline	Up to 15 months.
Construction hours	Monday to Friday 7am to 6pm. Saturday 8am to 1pm. No work on Sundays or public holidays.
Operational hours	The CO ₂ plant will be operational 24 hours a day, 7 days a week. Operational personnel will attend site Monday to Friday: 8am to 4pm.
Site access	Access and egress from the site via Kiandool Lane and the WPPS site access road within Lot 12 of DP 1171292.
Product transport	The liquid CO ₂ product will be transported from the Project by heavy vehicle movements.

3.2. Project general arrangement

Key components of the Project include the gas processing equipment, the liquid CO₂ storage vessels, a loading and distribution weighbridge, the truck turning area, the connection to the existing WPPS infrastructure, and other ancillary infrastructure.

Figure 3.1 provides an overview of the general arrangement of the Project.



SUPAGAS CO₂ PLANT

Figure 3.1
Indicative general arrangement
of the project

- LEGEND**
- Project area
 - Site layout
 - Security fence
 - Processing plant infrastructure
 - Supporting infrastructure
 - Parking area
 - Conceptual irrigation area
 - Internal access roads
 - Cleared hardstand area
 - Truck turn-around pad (concrete)

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3.2.1. Gas processing equipment

An indicative overview of the operation of the CO₂ plant is summarised below:

- Above-ground pipeline: Exhaust gas from the WPPS operations will be collected via an above-ground pipe from the WPPS exhaust to the Project's flue gas scrubber.
- Flue gas scrubber: The flue gas is cooled and water condensed, with any SO₂ present in the flue gas removed by means of a chemical reaction with sodium carbonate (i.e. soda ash). The soda ash is automatically added to the scrubbing water through pH control.
- Absorber and heat exchanger: Once cooling and scrubbing is completed, the gas is fed via an exhauster through an absorber, in which the gas flows counter-current to an amine solvent (i.e. Monoethanolamine [MEA]) solution flow. By chemical reaction, the MEA solution absorbs the CO₂ from the flue gas (referred to as 'rich MEA solution'). The rich MEA solution is first pressurized and heated in the heat exchanger and then led to a nitric oxide (NO_x) Flash Polisher where most of the contaminants like O₂, N₂, and NO are removed from the rich MEA solution by flashing to the absorber pressure. A stream of CO₂ and steam is added to the bottom of the NO_xFlash Polisher column for further reduction of the contaminants in the rich MEA solution. This optimises the process yield to the highest quality CO₂ product without any use of additional chemicals.
- Stripper: The rich MEA solution is pumped to a stripper, where the CO₂ is released from the rich MEA solution utilising the combustion heat generated in the MEA heater. The CO₂-depleted MEA solution (referred to as 'lean MEA solution') is recycled to the absorber.
- Gas cooler and after scrubber: After exiting the top of the stripper, the CO₂-rich gas is cooled in a gas cooler and washed in an after-scrubber for removal of potential MEA solution carry-over.
- CO₂ compressor: The CO₂ gas is then compressed in two stages by the CO₂ compressor.
- Dehydrator and CO₂ condenser: Before liquefaction, the CO₂ gas is dried to a dew point in the dehydrator. Regeneration occurs automatically by electrical heating and the use of dry purge gas from the CO₂ condenser.
- Reboiler: To remove the last non-condensable gases, the CO₂ gas first passes a reboiler in the purification system. It is then condensed in the CO₂ condenser, where the non-condensed gases are purged off.
- Distillation: Following completion of condensing in the CO₂ condenser, the liquified CO₂ is fed through a distillation column to an insulated storage tank. A refrigeration unit, controlled by the CO₂ pressure in the CO₂ condenser.

The final liquid CO₂ produced during the process has a purity higher than 99.9% volume per volume (v/v), enabling its use as a food/beverage ingredient which meets the quality standards specified by International Society of Beverage Technologists and European Industrial Gases Association.

3.2.2. Storage of liquid CO₂

Liquid CO₂ will be stored under pressure and low temperatures in designated storage vessels within the plant area. Up to four 200 t capacity storage vessels will be utilised for the Project (i.e. a total storage capacity of 800 t).

3.2.3. Car park, weighbridge and truck turning area

A designated parking area will be provided for all vehicles used by the operational workforce. This will include up to eight parking spaces. The existing WPPS car parking facilities will be used during the construction phase.

A weighbridge is proposed to facilitate collection of the CO₂ product when the Project is operational. Once loaded to capacity, the trucks will complete a U-turn in the new truck turning area and then proceed to the designated destination.

3.2.4. Ancillary infrastructure

Ancillary infrastructure for the Project includes:

- control room and electrical room
- workshop
- chemical storage

3.3. Other infrastructure and services

3.3.1. Water supply

Water required for construction activities will be limited to amenities and hosing down of trucks. Construction water will be sourced using a specialised truck to transport and distribute water to the Project.

Operations water will be sourced from an existing groundwater bore located within the Project area. The existing groundwater bore requires upgrades to the surface infrastructure prior to it being operational. The required water licences will be obtained for the upgrade and operation of the groundwater bore. Prior to use, water from the groundwater bore will be treated at the primary reverse osmosis (RO) plant and temporarily stored in a storage vessel within the Project area.

Maximum daily demand rates during construction and operation are anticipated to be:

- Non-potable construction demand: 42 kL/day.
- Potable construction demand: 1.0 kL/day
- Non-potable operational demand (i.e. water from the groundwater bore): 33.1 kL/day
- Potable operational demand: 0.1 kL/day

3.3.2. Lighting and site security

External lighting is not expected to be required during Project construction, due to the proposed daytime working hours. Stationary work lights and fixed/permanent lights will be installed around the Project area for safety purposes during the Project operations.

Security fencing will be constructed around the entire perimeter of the Project, excluding the vehicle access road and the associated truck turning area. The height of the fence is estimated to be between 1.8 m and 2.5 m and would likely be a barbed chain link fence. An entrance gate would also be installed.

3.3.3. Water management

3.3.3.1. Construction water management

During the construction of the Project, erosion and sediment controls will be used to minimise erosion and reduce the risk of sediment-laden runoff reporting off site.

Erosion and sediment controls will be designed and implemented generally in accordance with requirements outlined in the Managing Urban Stormwater – Soils and Construction Volume 1 (Landcom, 2004) and Volume 2 (Department of Environment and Climate Change, 2008) (collectively referred to as the 'Blue Book'). All erosion and sediment controls will be installed, managed and maintained in accordance with the 'Blue Book' to:

- divert clean water (i.e. runoff from undisturbed areas) around disturbed areas
- minimise the movement of sediment off site by tracking and sediment laden runoff draining off site and entering watercourses, drainage lines or drain inlets
- reduce surface flow velocity and capture sediment retain sediment laden water within the Project area
- minimise the amount of material transported from site to surrounding pavement surfaces

3.3.3.2. Operation water management

A Project stormwater management system will be developed by a suitably qualified engineer during detailed design in accordance with '0074 Stormwater Drainage (Design)' (NSC, 2023). A conceptual operational water management system is provided in Appendix J. The key objectives of the system will be to:

- divert and release, where practical, catchment runoff from undisturbed catchments and clean hardstand areas to minimise the quantity of dirty water runoff to be managed
- contain and manage all untreated sediment-laden runoff from disturbed areas in accordance with the 'Blue Book'
- capture and contain stormwater that has an elevated risk of being contaminated by chemicals (e.g. hydrocarbons, solvents and MEA) or water used in CO₂ processing in bunds

Key components of the water management system that will be implemented for the Project include swale drains, containment bunds, sumps, the primary RO plant, the water treatment plant, containment/wastewater tanks, and irrigation.

3.3.4. Wastewater management

The Project will generate up to 400 L/h of process wastewater during operations, made up of drainage from some gas processing equipment and the concentrate stream from the primary RO plant. Sewage will also be generated from site amenities located at the Project.

The approach to manage this wastewater will require a combination of the following options:

1. Irrigation of treated wastewater:

- Treatment of process wastewater at an onsite water treatment plant and application to land within the Project area (i.e. irrigation). Treated wastewater will be temporarily stored on site and irrigated intermittently.
- The infrastructure to support the irrigation component will include piping and a sprinkler network which will be placed on the surface without additional disturbance.
- If, for any reason, irrigation is not available, all wastewater would be disposed of offsite. In this scenario, offsite transport would occur more regularly or at a greater volume (details provided below).

- The conceptual irrigation area for the Project covers approximately 0.7 ha within the Project area and is shown in Figure 3.1.
- The irrigation design and operation will be confirmed by the preparation of a detailed irrigation plan.
- 2. Transfer of treated wastewater to Santos' existing water management infrastructure:
 - Treatment of process wastewater at an onsite water treatment plant and transfer via a truck to water storages owned and operated by Santos which are located approximately 1.7 km west of the Project (referred to as the Tintsville Ponds).
 - Supagas, in consultation with Santos, is investigating the feasibility of the transfer and receipt of wastewater to produced water storage ponds with the NGP or Tintsville, which would be subject to separate approvals.
- 3. Offsite disposal of wastewater as trade waste:
 - Wastewater will be disposed to the NSC's sewerage system as trade waste. This water will be temporarily stored and trucked offsite. The volume and/or frequency of offsite disposal as trade waste will increase if irrigation is not available.
- 4. If disposal as trade waste is not available, offsite disposal of wastewater to a licensed facility:
 - Wastewater will be disposed offsite to a licensed facility. This water will be temporarily stored and trucked offsite. The volume and/or frequency of offsite disposal to a licensed facility will increase if irrigation is not available.
 - Sewage generated from the site amenities will be transported off-site for disposal at a licensed facility.

Supagas is seeking approval for all options for the Project which have been assessed in this EIS. The volume allocated to each option and frequency of disposal will be confirmed following detailed design and will be provided in a Waste Management Plan and/or Irrigation Management Plan.

3.4. Project construction

3.4.1. Construction activities

The construction activities required for the Project would include:

- Planning and mobilisation:
 - survey, investigations and setting out of the Project area in accordance with the subdivision and design plans
 - establishment of a construction compound, including:
 - site sheds
 - equipment laydown areas
 - waste receptacles
 - stockpiling areas
 - storage areas for construction materials
 - installation of environmental controls including temporary erosion, sediment, and water quality controls
 - clearing and grubbing vegetation, where required
 - removal and stockpiling of topsoil
- Construction and installation of a CO₂ plant and supporting infrastructure, including:
 - equipment and structures required for the operation of the CO₂ plant including connection to the WPPS hardstand areas, including concrete pads, parking, and heavy vehicle turning area

- site amenities (i.e. connection to the WPPS power supply, and water supply)
- surface water management infrastructure
- CO₂ plant commissioning.
- Site restoration and landscaping, as relevant.

Temporary construction facilities would be contained within the Project disturbance footprint and surrounded by a temporary boundary fence prior to the construction of the permanent security fence.

The appropriate construction signage will be displayed on the temporary boundary fence.

3.4.2. Construction equipment

Construction equipment will generally include, but is not limited to, the following:

- piling rig
- mobile crane
- excavator (30 tonne) or similar earthmoving equipment
- civil equipment (e.g. dump trucks, bulldozers and grader)
- concrete truck / pump
- grinder
- power saw
- welding equipment

3.4.3. Construction schedule

An indicative construction schedule for the Project is provided in Table 3.2.

Table 3.2 Construction schedule

Construction activity	Construction month period														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Planning and Mobilisation															
Construction and installation															
Commissioning of the CO ₂ plant															
Site restoration and landscaping															

3.4.4. Construction hours and personnel

Construction will occur during standard construction hours:

- Monday to Friday 7am to 6pm
- Saturday 8am to 1pm
- no work on Sundays or public holidays

The Project would generate employment of 20 personnel on average during its construction, with peak construction requiring 30 personnel. Construction personnel would be sourced from the local Narrabri community where possible. Should non-local or specialist personnel be required, the existing Civeo facility in Narrabri will be utilised for accommodation.

3.5. Project operations and maintenance

3.5.1. Operational activities

The Project will have a processing capacity of 72 tpd of CO₂ and a storage capacity of 800 t of liquid CO₂.

Other key elements during the operational stage of the Project include:

- periodic scheduled inspections, maintenance and servicing of equipment
- replacement of equipment (as required)
- transport of materials, equipment and product

3.5.2. Operation hours and personnel

The Project would operate 24 hours per day, seven days a week over its operational life. Maintenance activities would be intermittent and would generally occur during daytime hours.

The operation of the Project would require approximately two full time employees who would attend site during standard work hours (i.e. Monday to Friday: 8am to 4pm). During scheduled maintenance activities, up to two additional staff would be required.

Operational personnel would be sourced from the local Narrabri community where possible.

3.5.3. Operational safety

The Project will be operated via a fully automated Distributed Control System (DCS) designed to provide reliable process control, continuous monitoring, and comprehensive safety management. The system integrates both hardware and software safeguards to ensure safe, efficient, and uninterrupted operation. Key features related to operational safety include.

- Safety devices on equipment and piping: All process equipment and associated piping are fitted with appropriate safety relief valves, pressure and temperature sensors, and isolation devices to protect against overpressure, overtemperature, and process upsets.
- Alarm and interlock system: The DCS incorporates a comprehensive hierarchy of alarms and automatic interlocks to ensure safe startup, normal operation, and emergency shutdown of the plant. Interlocks are configured to prevent unsafe operating conditions and to initiate corrective actions automatically.
- Emergency shutdown: A dedicated emergency shutdown system is provided to enable immediate and safe isolation of critical process areas during abnormal or hazardous conditions. The system can be activated both automatically and manually through strategically located emergency stop push buttons.
- Personal protective equipment (PPE): Adequate PPE, including gas detectors, safety helmets, gloves, and protective clothing, will be available on-site to ensure personnel safety during plant operation and maintenance activities.
- Continuous process monitoring: The DCS continuously monitors key process parameters and equipment status, generating real-time data for trend analysis, performance tracking, and predictive maintenance to minimise downtime and ensure process integrity.
- Qualified operating personnel: The plant will be operated and supervised by trained and certified operators who are competent in process control, safety procedures, and emergency response protocols.
- Remote process interrogation and alarms: The Plant Operator is capable of monitoring and controlling the plant remotely. Additionally, in the event of alarms or system trips occurring after hours, notifications are automatically sent to the on-call Plant Operator's mobile device, allowing them to make necessary parameter adjustments or to start and stop the plant as required.

- **CCTV Surveillance:** CCTV system will be installed throughout the facility to provide continuous monitoring and recording of site activities. This enhances site security, deters unauthorised access, and supports incident investigation.
- **Boundary wire fencing:** The site will be secured with a boundary wire fence, serving as a physical barrier to restrict unauthorised entry and enhance perimeter protection.
- **Fire detection system:** A fire detection system will be installed within the facility to promptly identify signs of fire, such as smoke or heat. Early detection enables timely alerts and response, minimising potential damage and ensuring personnel safety.
- **Building burglar alarm:** The buildings will be equipped with an intruder alarm system that activates in the event of unauthorised access. This system helps prevent theft, vandalism, and other security breaches, particularly during unoccupied hours.

3.6. Traffic volumes and routes

Light and heavy vehicle access and egress will be via Kiandool Lane and the WPPS site access road. The WPPS site access road will continue to be used by Santos employees throughout the construction and operation of the Project.

Table 3.3 summarises the forecast traffic volumes for the Project.

Table 3.3 Vehicle traffic volumes

Phase		Vehicles trips per day (vpd)	Peak hour trips (vph) ¹
Light vehicles			
Construction	Average construction	40	15
	Peak construction	60	25
Operational		4	2
Heavy vehicles			
Construction	Average construction	10	2
	Peak construction	20	2

1) Morning peak hour is between 6:00am and 7:00am. Afternoon peak hour is between 5:00pm and 6:00pm.

Up to eight trucks would be used to transport the product anytime during daytime hours. Out of hours transport may be required during high demand period. The liquid CO₂ product would be transported via a B-double (total capacity of 30 t) or single tanker truck (total capacity of 20 t) on one the following transport routes:

- Product delivered south of the Project (i.e. toward Coonabarabran): Cains Crossing Road and the Newell Highway.
- Product delivered north of the Project (i.e. toward Narrabri): Yarrie Lake Road, Mooloobar Street, and Newell Highway.

Occasional truck movements will also be required to transport and distribute water to the Project and transport wastewater collected on-site during operations (Section 3.3.3).

3.6.1. Oversize-overmass vehicles

Oversize-overmass (OSOM) vehicles will be required for the delivery of construction equipment, and specialist plant and equipment for the Project (i.e. liquid CO₂ storage vessels and specialist CO₂ capture equipment). The largest vehicle combination required for the Project is the liquid CO₂ storage vessels. The vehicle specifications for this component are provided in Table 3.4.

Table 3.4 Liquid CO₂ storage vessel transport vehicle specifications

Item	Approximate vehicle combination size (L x W x H)	Approximate vehicle combination weight (t)	OSOM vehicle combination
Liquid CO ₂ storage vessel	24 m x 4.9 m x 4.6 m	101	Units will be transported with a prime mover and a trailer

Three storage vessels will be delivered during the construction phase, and one storage vessel will be delivered during the operational phase. An example of a liquid CO₂ storage vessel proposed to be used for the Project is provided in Plate 3.1.



Plate 3.1 Example of liquid CO₂ storage vessel being transported

3.7. Integration with existing site operations

The Project and the WPPS will be operated and managed separately by Supagas and Santos, respectively. Notwithstanding, the Project will integrate with the WPPS through the collection of exhaust gas, connection to the electricity supply, and use of the access road as described in the following sections.

3.7.1. Exhaust gas collection

Exhaust gas from four existing gas generators (G03B, G04B, G05B, G06B) at the WPPS will be collected via an above-ground pipe to the Project's flue gas scrubber. The above-ground pipeline will connect to the pipe rack located within the boundary of the WPPS.

Supagas may, if required in the future, connect to two more existing gas generators at the WPPS. The throughput capacity and disturbance footprint of the Project will not change if this is required.

3.7.2. Electricity supply from WPPS

Electricity will be supplied to the Project via an above-ground connection to the existing WPPS electricity network. The electricity supply will connect to the pipe rack located within the boundary of the WPPS. A transformer will be located in the Plant area to support the electricity supply.

3.7.3. Access road

Access and egress will be via the existing WPPS site access road. The WPPS site access road will continue to be used by Santos employees throughout the construction and operation of the Project.

Supagas will maintain the WPPS site access road to provide an effective surface for all vehicles and personnel.

3.8. Decommissioning, rehabilitation and closure

The design operation life of the Project is 20 years, at which point the Project would be decommissioned or reconditioned with updated technology. The operational life of the Project may also be subject to any future activities proposed at the WPPS.

Decommissioning activities would include the removal of infrastructure and site restoration works to return the land to its pre-development land capability and use. The equipment would be dismantled and recommissioned at another facility or disposed of for recycling and/or scrapping. Materials that cannot be recycled would be disposed of at a licensed waste management facility.

The Project would be rehabilitated to a safe, stable and non-polluting landform of similar character to the surrounding area. Rehabilitation would be undertaken progressively as soon as reasonably practicable.

The decommissioning, rehabilitation and closure of the Project will be undertaken in consultation with Santos and the rehabilitation activities completed at the WPPS.

4. Statutory context

4.1. Power to grant approval

The EP&A Act and EP&A Regulation set the framework for planning and environmental assessment in NSW.

Division 4.1 of the EP&A Act creates a threefold classification of development, including:

- development that may be carried out without development consent
- development that may be carried out with development consent
- development that is prohibited

The Project falls into the classification of development that may be carried out with development consent.

4.1.1. Designated development

The WPPS exhaust gas processed by the Project, which largely contains CO₂, is classified as ‘waste’, as it:

- meets the criteria for a Class 2.2 Dangerous Good (i.e. non-flammable and non-toxic gas) under the ‘Australian Code for the Transport of Dangerous Goods by Roads and Rail’ (ADG Code) (NTC, 2022)
- meets the definition of hazardous waste under clause 49, Schedule 1 of the NSW *Protection of the Environment Operations Act 1997* (PoEO Act)

The Project is therefore development for the purpose of ‘waste management facilities or works’ as defined under clause 45(6), Schedule 3 of the EP&A Regulation:

- (1) *waste management facility or works means a facility or works that—*
- (a) *stores, treats, purifies or disposes of waste, or*
 - (b) *sorts, processes, recycles, recovers, uses or reuses material from waste.*

As a consequence, the Project meets the requirements for ‘designated development’ as it falls within the specified category of development for the purposes of ‘waste management facilities or works’, under clause 45(2)(a) and (b)(i) of Schedule 3, Part 2 of the EP&A Regulation:

- (2) *Development for the purposes of a waste management facility or works is designated development if—*
- (a) *the facility or works sorts, consolidates or temporarily stores waste at a transfer station or material recycling facility for transfer to another site for final disposal, permanent storage, reprocessing, recycling, use or reuse, and*
 - (b) *the facility or works—*
 - (i) *handle substances classified in the ADG Code or medical, cytotoxic or quarantine waste, or*

4.1.2. Integrated development

Integrated development is development (not being State significant development or complying development) that, in order for it to be carried out, requires a licence or approval listed in Section 4.46 of the EP&A Act.

The Project is integrated development as it would require approvals, licenses and permits under other planning and environmental legislation. Refer to Section 4.2 for more detail.

4.1.3. Permissibility

In accordance with the EP&A Regulation, the Project is development for the purpose of ‘waste management facilities or works’. Under the Narrabri LEP, the Project purpose is marginally different and is considered a ‘waste or resource management facility’ in accordance with the following definition:

waste or resource management facility means any of the following—

- (c) *a resource recovery facility,*
- (d) *a waste disposal facility,*
- (e) *a waste or resource transfer station,*
- (f) *a building or place that is a combination of any of the things referred to in paragraphs (a)–(c).*

waste disposal facility means a building or place used for the disposal of waste by landfill, incineration or other means, including such works or activities as recycling, resource recovery and other resource management activities, energy generation from gases, leachate management, odour control and the winning of extractive material to generate a void for disposal of waste or to cover waste after its disposal.

Note. Waste disposal facilities are a type of waste or resource management facility

In accordance with the Narrabri LEP, the Project is located on land zoned as RU1 for Primary Production. Under the Narrabri LEP, ‘waste or resource management facility’ are not permitted with or without consent on land zoned as RU1.

In consideration of section 3.28 of the EP&A Act, section 2.153 of the Transport and Infrastructure SEPP permits ‘waste or resource management facility’ to be carried out with consent on land in a prescribed zone. Under section 2.152 of the Transport and Infrastructure SEPP, land in a prescribed zone includes land zoned as RU1 Primary Production.

The Project is therefore permitted with consent under the provisions of the Transport and Infrastructure SEPP.

4.2. Other NSW legislation and approvals required

Other key NSW legislation applicable to the Project is discussed in Table 4.1.

Table 4.1 Other NSW legislation

NSW Legislation	Requirement
<i>Water Management Act 2000</i> (WM Act)	The WM Act's overarching objective is to sustainably manage the state's water resources for all aspects of the environment and communities. The required water licences under the WM Act will be obtained for the Project for the upgrade and operation of the groundwater bore.
PoEO Act	The PoEO Act sets out the general obligations for environmental protection in NSW, which is administered by the EPA. Section 48 of the PoEO Act requires an Environmental Protection Licence (EPL) for a premises at which any activities listed in Schedule of the Act is carried on. The Project triggers the requirement for an EPL from the EPA under Schedule 1 of the PoEO Act, including: Clause 8 (Chemical production): Dangerous goods production (i.e. meaning the commercial production, blending, recovering, or using of, or research into, dangerous goods (other than toxic substances, explosives, or radioactive substances) is a relevant fee-based activities associated with Chemical production. Dangerous goods production that has capacity to produce, blend, recover or use more than 1,000 tonnes of dangerous goods per year is considered to be a scheduled activity under the PoEO Act. As the flue gas received from the WPPS is considered a hazardous waste under Clause 49 of Schedule 1 of the PoEO Act, and processing the flue gas to produce a high

NSW Legislation	Requirement
	purity CO₂ product (a Class 2.2 [Non-flammable and Non-toxic Gas] dangerous good), Clause 8 of Schedule 1 of the PoEO Act is triggered. - Clause 9 (Chemical storage): General chemical storage that has capacity to store more than 20 tonnes (pressurised gases), 200 tonnes (liquefied gases) or 2,000 tonnes (chemicals in any other form) is considered to be a scheduled activity under the PoEO Act. As the Project would include storage of more than 20 tonnes of pressurised gases, Clause 9 of Schedule 1 of the PoEO Act is triggered. - Clause 41 (Waste processing [non-thermal treatment]): Non-thermal treatment of hazardous and other waste (i.e. meaning the receiving of hazardous waste, restricted solid waste or special waste [other than asbestos waste or waste tyres] from off site and its processing otherwise than by thermal treatment). As the flue gas received from the WPPS is considered a hazardous waste under Clause 49 of Schedule 1 of the PoEO Act, Clause 41 of Schedule 1 of the PoEO Act is triggered. Relevantly, the Project triggers the requirement for an EPL under clauses 8, 9, and 41, Schedule 1 of the PoEO Act. Therefore, the Project would require an EPL to be issued under the PoEO Act.
<i>Biodiversity Conservation Act 2016 (BC Act)</i>	The BC Act provides an approach to be followed for conducting an assessment of a development's impacts on threatened species and ecological communities. An assessment of potential impacts to biodiversity is provided in Appendix D.
<i>National Parks and Wildlife Act 1974</i>	The <i>National Parks and Wildlife Act 1974</i> is the legislation which provides for the protection of national parks and conservation areas, as well as native fauna and flora and Aboriginal places and objects in NSW. An assessment of potential impacts to Aboriginal cultural heritage is provided in Appendix L. An Aboriginal heritage impact permit is not required for the Project.
<i>Contaminated Land Management Act 1997</i>	The <i>Contaminated Land Management Act 1997</i> establishes a process for investigation and remediating land that the EPA considers to be contaminated significantly enough to require regulation. An assessment of potential contamination impacts is provided in Appendix M.
<i>Local Government Act 1993</i>	In accordance with section 68 of the <i>Local Government Act 1993</i>, approval must be obtained from the relevant council prior to discharging liquid trade waste to the sewerage system. Chapter 7 of the <i>Local Government Act 1993</i> governs the procedure for approving the discharge of liquid trade waste into the sewerage system. Relevantly, Supagas will obtain the relevant approvals from the Narrabri Shire Council prior to discharging liquid trade waste for the Project.

4.3. Commonwealth legislation

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the overarching commonwealth legislation for which environmental assessment must address potential impacts on matters of national environmental significance (MNES).

Approval from the Minister for the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) is required for any action that would or is likely to have a significant impact on one or more MNES.

The Biodiversity Assessment completed for the Project concluded that the Project will not impact any MNES, and therefore, the Project was not referred to DCCEEW.

4.4. Environmental planning instruments

4.4.1. NSW State Environmental Planning Policies

Key NSW Statement Environmental Planning Policies (SEPP) that are applicable to the Project are detailed in Table 4.2.

Table 4.2 Relevant SEPPs for the Project

SEPP	Relevance to the Project
<i>State Environmental Planning Policy (Biodiversity and Conservation) 2021</i>	The SEPP provides the framework for planning and protecting biodiversity and conservation in NSW. A Biodiversity Assessment was completed for the Project and is provided in Appendix D.
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>	In relation to subsection 3.12 of the SEPP, a Preliminary Hazard Analysis (PHA) was completed for the Project and is provided in Appendix F. In relation to subsection 4.6 of the SEPP, a Preliminary Site Investigation (PSI) was completed for the Project to determine if the land contains contamination. The PSI is provided in Appendix M.
<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (Transport and Infrastructure SEPP)	Schedule 3 of the SEPP details traffic generating development that is to be referred to Transport for NSW (TfNSW), including waste or resource management facilities of any size or capacity. Clause 2.122(4) of the SEPP requires TfNSW to be notified of an application for traffic generating development.

4.4.2. Narrabri Local Environmental Plan 2012

The Project area is wholly located within the Narrabri LGA, in an area regulated under the Narrabri LEP. The purpose of the Narrabri LEP is to provide the standards which public and private land must adhere to by means of land zoning and to define and address matters for consideration for different types of development.

In accordance with the Narrabri LEP, the Project is located on land zoned as RU1 for Primary Production. The Project is consistent with the following key objectives of the RU1 Primary Production zone under the Narrabri LEP:

- to minimise conflict between land uses within this zone and land uses within adjoining zones
- to allow for non-agricultural land uses that will not restrict the use of other land in the locality for agricultural purposes

4.4.2.1. Subdivision of the property

The Project is located wholly within Lot 12 of DP 1171292 which is currently owned by Santos. In consultation with Santos, Supagas is proposing to include the subdivision of Lot 12 of DP 1171292 as part of the DA.

The proposed subdivision will result in a lot size which will be less than the minimum lot size. Supagas understands that there are exceptions to the minimum lot size if it can be demonstrated that the Project is consistent with section 4.2A of the Narrabri LEP.

As detailed in Table 4.3, the proposed subdivision is considered to be consistent with section 4.2A of the Narrabri LEP. Subject to development consent for the Project, a Subdivision Certificate Application with plans and supporting information will be lodged for assessment and endorsement.

Table 4.3 Consideration of exceptions to minimum lot sizes in the Narrabri LEP

Minimum lot size considerations	Relevance to the Project
4.2A Exceptions to minimum lot sizes for certain rural subdivisions (1) <i>The objective of this clause is to enable the subdivision of land in rural areas to create lots of an appropriate size to meet the needs of current permissible uses other than for the purpose of dwelling houses or dual occupancies.</i>	The subdivision of the property will create a lot of an appropriate size for the Project which is permissible with consent as detailed in Section 4.1.3.
(2) <i>This clause applies to land in the following rural zones—</i> (a) <i>Zone RU1 Primary Production,</i> (b) <i>...</i>	The Project is located wholly within land zoned RU1 Primary Production.
(3) <i>Land to which this clause applies may, with development consent, be subdivided to create a lot of a size that is less than the minimum size shown on the Lot Size Map in relation to that land, if the consent authority is satisfied that the use of the land after the subdivision will be the same use (other than a dwelling house or a dual occupancy) permitted under the existing development consent for the land.</i>	The existing land uses in the vicinity of the Project are characterised by a combination of agriculture, gas extraction and power generation. The lot includes the WPPS, an underground gas pipeline and an aboveground water pipeline, access tracks, Tintsville Ponds 1 and 2, the Tintsville Flare and coal seam gas wells Wilga Park 3, 4 and 5. The land use of the subdivided property will be consistent with the existing land use.
(4) <i>Development consent must not be granted for the subdivision of land to which this clause applies unless the consent authority is satisfied that—</i> (a) <i>the subdivision will not adversely affect the use of the surrounding land for agriculture, and</i> (b) <i>the subdivision is necessary for the ongoing operation of the permissible use, and</i> (c) <i>the subdivision will not cause a conflict between the use of the land subdivided and the use of the surrounding land in the locality, and</i> (d) <i>the subdivision is appropriate having regard to the natural and physical constraints affecting the land.</i>	The Project will result in negligible impacts to agricultural land. The subdivision of the property will allow for the effective construction and operation of the Project which is permissible with consent as detailed in Section 4.1.3. The land use of the subdivided property will be consistent with the existing land use. The Project's location and subdivision boundary have considered the natural and physical constraints of the of the surrounding land. The suitability of the site is detailed in Section 2.2.

4.4.3. Narrabri Shire Council Development Control Plans

The NSC has a number of Development Control Plans (DCP) to provide guidelines regarding the types of development that may occur on specific sites. A summary of the relevant NSC DCPs and their applicability to the Project is provided in Table 4.4.

Table 4.4 Narrabri DCPs and their applicability to the Project

NSC DCP	Relevance to the Project
Drainage to Buildings DCP	The objective of the DCP is to ensure that there is adequate provision for the control and disposal of roof waters; to specify the method of disposal of wastes from sanitary fittings; to ensure that Trade Wastes are adequately treated and to specify the method of disposal. The Project will be constructed in accordance with the DCP.
Parking Code DCP	The objectives of the DCP are to: - provide a consistent guide for Council and developers - provide adequate parking for people using, and employed by, developments within the NSC - provide an acceptable quality of parking areas within the NSC The Project parking will be constructed in accordance with the DCP.

5. Engagement

5.1. Engagement approach

Engagement conducted during the preparation of the EIS is in accordance with the SEARs. The key objectives for engagement completed for the Project included:

- engage with and seek input from key stakeholders
- give key stakeholders the opportunity to voice their concerns so that this information can be considered early in planning, design and assessment
- consider the issues raised by the key stakeholders when making project refinements
- continue ongoing dialogue between Supagas and key stakeholders.

5.2. Engagement carried out

5.2.1. Government agencies

A summary of the engagement undertaken with state and local government agencies for the Project is provided in Table 5.1.

Table 5.1 Summary of agency engagement

Government agency	Summary of engagement undertaken
DPHI	A Scoping Report was submitted to DPHI in August 2024 which provided a preliminary description of the Project and identified key matters to be assessed in the EIS. DPHI issued project specific SEARs in November 2024 (local SEARs 1946). A compilation of where the SEARs are addressed in the EIS is provided in Appendix A. Correspondence was provided to DPHI in April 2025 to notify of a minor change to the project layout to include the upgrades to the access road and truck turning area. DPHI responded in May 2025 confirming that the existing SEARs will continue to allow for the preparation of an EIS to appropriately address any potential impacts of the Project.
NSC	Correspondence was provided to the NSC in August 2024 which provided a brief description of the Project and offered an opportunity for a meeting. A meeting was held via teleconference on 3 September 2024 and attended by Supagas, Onward Consulting Pty Ltd (Onward), Santos and the NSC. During this meeting, a brief description of the Project was provided and the approval pathway discussed. The Scoping Report was provided to the NSC for comment in February 2025. The NSC responded in March 2025 providing input into the SEARs. A compilation of where the assessment requirements are addressed in the EIS is provided in Appendix B. Correspondence was provided to the NSC in March 2026 to provide an update on the EIS and seek confirmation of the proposed approach to the following: • the approval pathway of the Project under the recent reforms to the EP&A Act • the proposed wastewater management strategy for the Project • the inclusion of a subdivision to the property as part of the DA
TfNSW	Correspondence, including a copy of the Scoping Report, was provided to TfNSW in July 2025 to provide a description of the Project and offer a meeting. TfNSW responded in August 2025 providing input into the assessment requirements for the Project. TfNSW comments were considered in the preparation of this EIS and relevant technical assessments. A compilation of where the comments are addressed is provided in Appendix B.

Government agency	Summary of engagement undertaken
EPA	The Scoping Report was provided to the EPA in August 2024 by DPHI. The EPA provided comments in November 2024. The comments were considered in the preparation of this EIS and relevant technical assessments. A compilation of where the comments are addressed is provided in Appendix B.
NSW Rural Fire Service (RFS)	Correspondence was provided to the NSW RFS in July 2025 to provide a description of the Project and offer a meeting. NSW RFS responded in August 2025 requesting that the EIS shall identify bushfire risk to the proposed development and recommend mitigation measures to reduce said risks. This has been addressed in Section 6.12 and Appendix G.
Fire Rescue NSW	Correspondence was provided to Fire Rescue NSW in July 2025 to provide a description of the Project and offer a meeting. Supagas received no response to the correspondence.
WaterNSW	Correspondence was provided to WaterNSW in July 2025 to provide a description of the Project and offer a meeting. WaterNSW provided comments in August 2025. The comments were considered in the preparation of this EIS and relevant technical assessments. A compilation of where the comments are addressed is provided in Appendix B.
Narrabri Local Aboriginal Land Council (LALC)	A representative from the Narrabri LALC attended the Aboriginal cultural heritage surveys completed in June 2024 and June 2025 as part of the Aboriginal Heritage Due Diligence Assessment (Appendix L). Correspondence was provided to the Narrabri LALC in July 2025 to provide a description of the Project and offer a meeting. Supagas received no response to the correspondence.

5.2.2. Other stakeholders

A summary of the engagement undertaken with the other stakeholders, including the surrounding community, is summarised in Table 5.2.

Table 5.2 Summary of community engagement

Other stakeholders	Summary of engagement undertaken
Santos	Supagas has completed extensive consultation with Santos throughout the preparation of the EIS. This included fortnightly meetings via Microsoft Teams and attendance at site visits. Engagement with Santos resulted in Project change and adjustments to better integrate the Project with the existing WPPS (Section 3.7).
Landowners surrounding the Project	Supagas distributed letters to 10 landowners surrounding the Project in July 2025, including: - seven landowners within 2.5 km of the Project - three landowners, outside of the 2.5 km buffer, located on the western side of Kiandool Lane between the site access road and Yarrie Lake Road (i.e. landowners who have an access road that connects to Kiandool Lane). The letters included a brief description of the Project and invited the landowner to provide input and/or feedback on the Project. An opportunity for a meeting was also offered. Supagas received no response to the letters.
Attendance and presentation at the NGP Community Consultative Committee (CCC)	The NGP CCC was established as part of the project approval for the NGP and provides a for a forum for discussion with Santos, representatives from the Narrabri community, stakeholder groups, and the NSC on issues relating to the NGP. Given the overlap with the Santos operations at the NGP, Supagas attended the NGP CCC held in June 2025 to provide an overview of the Project and invited attendees to provide input and/or feedback on the Project. Supagas received no specific feedback related to the Project following the presentation to the CCC.

5.3. Engagement to be carried out

Following lodgement of the EIS and during the life of the Project, Supagas will continue to consult with a range of stakeholders.

Potential opportunities for further community consultation may include:

- Project briefings with the NSC
- provision of information on the Supagas website, including:
 - description of the Project
 - Project status
 - key documents
- responding to any consultation with / feedback provided by landowners and the local community

6. Impact Assessment

6.1. Biodiversity

OzArk Environment and Heritage Management Pty Ltd (OzArk) prepared a biodiversity assessment report (BAR) for the Project. The BAR is summarised below and included in Appendix D.

6.1.1. Methodology

The assessment methodology included:

- completing desktop studies including relevant database searches to identify the Project area's mapped biodiversity values, predicted threatened species, populations and ecological communities listed under the BC Act, *Fisheries Management Act 1994* or the EPBC Act
- completing a field survey for the purposes of:
 - collating lists of those plants present, these being used to assist with the identification of the site's vegetation communities
 - determining the habitat structures present
 - determining habitat availability for fauna species recorded or expected to occur
- consideration as to whether the NSW Biodiversity Offset Scheme (BOS) is triggered
- reporting that describes the impacts of the proposed activity on native vegetation and threatened species, populations and ecological communities, and provides recommendations to avoid, minimise and mitigate these impacts

6.1.1.1. Biodiversity offset scheme trigger

Entry into the BOS is not triggered by the Project. A summary of the triggers and the relevance to the Project are provided in Appendix D and summarised in Table 6.1.

Table 6.1 Triggers for entry into the NSW Biodiversity Offset Scheme

BOS trigger	Relevance to the Project
The proposal exceeds the clearing threshold for the relevant property.	Not triggered. According to the minimum lot size mapping in the Narrabri LEP, the minimum lot size associated with the Project is 100 ha. Therefore, the clearing threshold will be 1 ha. The proposal would require the clearing of 0.60 ha of native vegetation, below the 1 ha clearing threshold.
The proposal will impact a mapped area of biodiversity value on the state-wide Biodiversity Values Map.	Not triggered. The subject site does not contain any land mapped on the Biodiversity Values Map.
The proposal will result in a significant impact to one or more listed threatened entities.	Not triggered. Based on the tests of significance completed under the BC Act, the Project would not significantly impact a BC Act-listed threatened entity.

6.1.2. Existing environment

6.1.2.1. Bioregion and NSW landscapes

The Project is located within the Pilliga outwash subregion of the Brigalow Belt South Bioregion, as per the Interim Biogeographic Regionalisation of Australia. The wider 10 km search area overlaps the Liverpool plains and Pilliga subregion of the Brigalow Belt South Bioregion.

The Project area is represented by the Coghill Alluvial plains and the Baradine – Coghill Channels and Floodplains landscapes.

6.1.2.2. Watercourses

No watercourses occur within the Project area and therefore there are no areas recognised as Key Fish Habitat or Protected Riparian Land within the Project area. The Project area is also not part of any endangered aquatic ecological community.

Pig Creek and Bohena Creek (approximately 400 m and 1,000 m from the Project, respectively) both contain Protected Riparian Land and some Key Fish Habitat.

6.1.2.3. Field surveys

Surveys of the Project area were completed by OzArk ecologists in June 2024 and June 2025. A summary of the results of the surveys is provided in Section 6.1.3.

6.1.3. Impact assessment

6.1.3.1. Direct impacts

Native vegetation

The survey identified two plant community types (PCT) within the Project area, namely:

- PCT 411: Buloke - White Cypress Pine woodland on outwash plains in the Pilliga Scrub and Narrabri regions, Brigalow Belt South Bioregion
- PCT 416: Pilliga tank gilgai wetland sedgeland rushland, Brigalow Belt South Bioregion

The disturbance footprint of the Project is approximately 0.76 ha, of which 0.16 ha is non-native vegetation and cleared ground. The remaining 0.60 ha consists of native vegetation (PCT 411) that would be removed and disturbed for the Project.

PCT 416 is located outside of the proposed disturbance footprint and will not be impacted by the Project.

Clearing of native vegetation is a key threatening process under the BC Act, however, due to the relatively low magnitude of clearing required for the Project, the impact is not considered to be significant.

An area of PCT 411 will also be subject to impacts resulting from the irrigation of treated wastewater as PCT 411 is represented by dry woodland habitat and the introduction of regular irrigation may lead to changed species composition and abundance. Irrigation water also has the potential to inadvertently move beyond the boundaries of the designated irrigation area through surface flow or soil infiltration. Irrigation of treated wastewater will be managed to avoid any onsite and offsite impacts in accordance with the management and mitigation measures described in Sections 6.1.4 and 6.12.3.1.

Threatened ecological communities

PCT 411 is not associated with a BC Act or EPBC Act listed threatened ecological community, therefore, the Project will not result in any impacts to threatened ecological communities.

Threatened flora

Fifty-seven (57) flora species were detected during the field surveys. No flora species or populations listed as threatened under the BC Act or EPBC Act were observed. Given the short duration of the field survey, and the lack of targeted flora surveys, the non-detection of threatened flora species cannot be considered as confirmation of their absence.

Based on the proximity of past records, habitat requirements, and the results of the field surveys, 13 threatened flora species were assessed as having a moderate-to-high likelihood of occurring at the Project. Tests of significance were conducted for these species under the BC Act and EPBC Act; which concluded that the Project would not result in a significant impact to any threatened flora species.

Of the species assessed, *Myriophyllum implicatum* represents the species of greatest concern in relation to the Project. A population of *Myriophyllum implicatum* could not be confirmed or excluded during the field survey conducted in June, as this falls outside the appropriate survey window for the species (October – February). Potential habitat for the species was recorded approximately 28 m from the proposed irrigation area. Given this proximity, there is uncertainty regarding the potential for indirect impacts associated with the irrigation of treated wastewater to adversely affect any population of the species that may be present.

Specific mitigation and management for *Myriophyllum implicatum* is described in Section 6.1.4.

Threatened fauna and associated habitat

Five fauna species were detected during the initial field survey. No fauna species or populations listed as threatened under the BC or EPBC Act were observed. Due to the short duration of the survey, and the lack of detailed targeted surveys for threatened species (e.g. trapping, nocturnal spotlighting, microbat ultrasonic call capture, etc), the non-detection of threatened fauna species cannot be considered as confirmation of their absence.

Based on the proximity of past records, habitat requirements, and the results of the field survey, 39 threatened and/or migratory fauna species were assessed as having a moderate-to-high likelihood of occurring at the Project. Tests of significance were conducted for these species under the BC Act, and/or EPBC Act; which concluded that provided mitigations are adhered to (Section 6.1.4), the Project would not result in a significant impact to any threatened fauna species.

No habitat trees were detected during the field survey. However, the Project area does contain fallen timber which provides shelter, nesting, and foraging microhabitats for a range of fauna species. Given this habitat value, management and mitigation measures are described in Section 6.1.4.

Wildlife connectivity

The Project would result in some further fragmentation of habitat within the local landscape context; however, given the highly modified nature of the surrounding land and the existing degree of isolation of the remnant patch, the Project is not anticipated to isolate any habitat that is not already functionally isolated.

Considering the small size of the disturbance footprint (0.76 ha) and its position immediately adjacent to the existing WPPS infrastructure, the overall impact of the Project on wildlife connectivity at the landscape scale is expected to be negligible.

Fauna injury and mortality

During the construction phase of the Project, the removal of vegetation and habitat features (e.g. fallen timber) is likely to disturb fauna. In addition, fauna may become trapped in or may choose to shelter in machinery that is stored in the study area overnight. If these animals were to remain inside the machinery, or under the wheels or tracks, they may be impacted once the machinery is in use.

Mitigation measures designed to reduce injury and mortality of fauna are provided in Section 6.1.4.

Matters of national environmental significance

No entities listed under the EPBC Act are likely to be significantly impacted by the Project.

6.1.3.2. Indirect impacts

Indirect impacts on native vegetation, threatened entities and their habitat are assessed in Appendix D. Potential indirect impacts to habitat or vegetation adjacent to the Project area may include:

- edge effects on adjacent native vegetation and habitat
- invasion and spread of weeds and pathogens by earthworks, movement of soil, and attachment of seed (and other propagules) to vehicles and machinery

Measures to mitigate and manage potential indirect impacts are described in Section 6.1.4.

6.1.4. Mitigation and management measures

The following mitigation measures will be implemented for the Project:

- Any change in design outside the assessed disturbance footprint will require further ecological survey and assessment.
- Clearing of native vegetation:
 - Before starting work, a physical vegetation clearing boundary at the approved clearing limit is to be demarcated and implemented.
 - All construction personnel should be inducted to be aware of the potential presence of those threatened flora species relevant to the Project. If any threatened flora species are encountered, construction must stop in the immediate area and an ecologist should be consulted for advice and guidance before proceeding with works.
 - Vegetation would be removed in such a way as to avoid damage to surrounding vegetation.
 - Groundcover disturbance would be kept to a minimum.
 - Any stockpile and compound sites should be located using the following criteria:
 - In areas of low ecological conservation significance (i.e. previously disturbed land)
 - On relatively level ground
 - Stockpiling materials and equipment and parking vehicles would be avoided within the dripline (extent of foliage cover) of any tree.
 - Where possible, vegetation to be removed would be mulched on-site and re-used to stabilise disturbed areas.
- Accidental death of fauna:
 - If threatened fauna species are discovered, stop works immediately and contact a suitably qualified ecologist for advice.
 - If trapped or stressed fauna are encountered, a fauna spotter catcher or wildlife handler should be engaged to remove the animal(s) and relocate them nearby, or if necessary, deliver them to a veterinarian or wildlife carer for rehabilitation.
- Lighting:
 - Any artificial lighting to be used during construction or operation should follow the Best Practice Lighting Design within the National Light Pollution Guidelines (DoEE 2020). In particular, all lighting should be kept close to the ground, directed, and shielded to avoid light spill.
- Threatened species:
 - Provide identification resources for personnel to enable identification of threatened species that might occur on the work site.
 - Construction work to occur only during daylight hours to avoid indirect impacts on threatened fauna such as vehicle strikes.

- If threatened fauna or flora species are discovered, stop works immediately and contact a suitably qualified ecologist for advice.
- Prior to the commencement of treated wastewater irrigation, a targeted survey for *Myriophyllum implicatum* will be undertaken within the PCT 461 – Pilliga tank gilgai wetland sedgeland rushland habitat located approximately 28 m from the proposed irrigation area. The survey would be conducted during the appropriate survey window for the species (October – February) by a suitably qualified botanist.
 - If the species is not detected, no further mitigation measures relating to *Myriophyllum implicatum* are required.
 - If the species is detected, treated wastewater irrigation will not commence until a monitoring program has been developed and approved. The monitoring program would seek to determine whether the species is being adversely impacted by the treated wastewater irrigation and should include, at a minimum:
 - baseline documentation of the population size, extent, and condition prior to irrigation commencing
 - periodic monitoring of the population at appropriate intervals throughout the irrigation period
 - defined trigger thresholds for population decline or habitat condition that would prompt a review of irrigation activities
 - adaptive management responses to be implemented in the event that adverse impacts are detected
- Introduction and spread of priority weeds and pathogens:
 - Construction crew should be briefed on the identification of priority weeds that occur on site during inductions.
 - If declared priority weeds are identified during construction, they will be managed according to the requirements of the *Biosecurity Act 2015*.
 - Construction machinery (bulldozers, excavators, trucks, loaders and graders) will be cleaned using a high-pressure washer or other suitable device before entering and exiting work sites.
 - Machinery will be inspected by designated personnel following washdown to ensure no soil, mud, or vegetative material remains. Records of inspections to be maintained.
 - All pesticides will be used in accordance with the requirements on the label. Any person carrying out pesticide (including herbicide) application will be trained to do so and have the proper certificate of completion/competency or statement of attainment issued by a registered training organisation.
 - Keep records of any weed control activities that take place.
- Disturbance to fallen timber, dead wood, and bush rock:
 - Any fallen timber, dead wood, and bush rock encountered on site would be left in situ (where possible) or relocated to a suitable place nearby.
 - Large logs must be carefully relocated to avoid crushing, so as to protect any fauna sheltering beneath or within them from injury.
- Exacerbating invasive fauna:
 - All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent providing forage habitats for foxes, rats, pigs, dogs, and cats.

6.2. Traffic and transport

Amber Organisation Pty Ltd (Amber) prepared a traffic impact assessment (TIA) for the Project. The TIA is summarised below and is provided in Appendix E.

6.2.1. Methodology

The TIA was prepared in accordance with the SEARs, the 'Guide to Traffic Impact Assessments' (TfNSW, 2024) and relevant Austroads Guidelines.

The assessment methodology included:

- review of details of both 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
- development 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

6.2.2. Existing environment

6.2.2.1. Road network

A summary of the surrounding road network is provided in Table 6.2.

Table 6.2 Road network surrounding the Project

Road	Surface	Typical width	Speed limit	Alignment
State roads				
Newell Highway	Sealed	Between 8 m and 12 m providing one lane of traffic in each direction and sealed shoulders.	110 km/hr	Northeast-southwest alignment from the Victorian border near Tocumwal and the Queensland border near Goondiwindi.
Local roads				
Kiandool Lane	Unsealed	8 m providing two-way vehicle movements for low levels of traffic.	100 km/hr	General north-south alignment between Culgoora Road in the north to Cains Crossing Road in the south.
Yarrie Lake Road	Sealed	7 m providing two-way vehicle movements for low levels of traffic.	100 km/hr	General east-west alignment between Culgoora Road in the west and its continuation as Goobar Street to the east, in Narrabri.
Cains Crossing Road	Unsealed	8 m providing two-way vehicle movement for low levels of traffic.	100 km/hr	An approximately 7 km loop on the western side of Newell Highway
Goobar Street / Baranbar Street/ Mooloobar Street	Sealed	6 – 16 m accommodating two lanes of traffic in each direction with sections of parallel parking.	50-80 km/hr	Residential collector roads within Narrabri between Newell Highway and Yarrie Lake Road.
Private roads				
WPPS Access Road	Unsealed	6 m providing two-way vehicle movements for low levels of traffic.	50 km/hr	General east-west alignment between Kiandool Lane and the Project area

6.2.2.2. Intersections

An overview of the key intersections within the surrounding area is provided in Table 6.3.

Table 6.3 Intersections surrounding the Project

Road name	Intersecting road	Configuration	Control / turn treatments
Newell Highway	Mooloolbar Street / Old Turrawan Road	Roundabout	Four single lane approaches with signage and line markings provided.
	Cains Crossing Road	T-intersection	'Give Way' signage is provided for vehicles exiting Cains Crossing Road. Auxiliary left and basic right turn treatments are provided. The straight and flat alignment of the Newell Highway provides good visibility for motorists departing Cains Crossing Road.
Yarrie Lake Road	Kiandool Lane	Cross intersection	Priority controlled with vehicles exiting Kiandool Lane required to give way. The generally flat and straight alignment of the roads facilitates good visibility.
Cains Crossing Road		T-intersection	Priority controlled with major flow expected between Kiandool Lane and the south approach of Cains Crossing Road.
Kiandool Lane	WPPS Access Road	Cross intersection	Priority controlled with vehicles exiting WPPS Access Road and opposing Private Road required to give way.

6.2.2.3. Traffic surveys

Traffic surveys of the local and State road network surrounding the Project area were undertaken in May 2025 to establish the existing traffic conditions. The surveys included:

- Turning movement counts at four key intersections (i.e. Newell Highway / Mooloolbar Street / Old Turrawan Road, Newell Highway / Cains Crossing Road, Yarrie Lake Road / Kiandool Lane, and Kiandool Lane / WPPS Access Road).
- 7-day tube count surveys of roads anticipated to be used by the Project (i.e. Yarrie Lake Road, and Kiandool Lane).

The traffic surveys found that the road network and intersections that provide access to the Project area have capacity to accommodate an increase in traffic. Specifically, the traffic surveys noted:

- The highest volume of traffic was recorded at the intersection of Newell Highway / Mooloolbar Street / Old Turrawan Road which is to be expected given the location within town and the level of traffic carried by the Newell Highway.
- Traffic volumes recorded at other intersections and roads were much lower, particularly along Kiandool Lane and Cains Crossing Road, which carry in the order of 60 and 35 vehicles per day, respectively.
- Based on the level of traffic, all intersections and roads will be expected to operate without significant queuing or delays, except potentially the intersection on of Newell Highway / Mooloolbar Street / Old Turrawan Road.

6.2.2.4. Road safety

A review of the TfNSW road crash data in the vicinity of the Project for the five-year period from 1 January 2019 to 31 December 2023 was undertaken and identified one crash approximately 100 m south of the Cains Crossing Road / Kiandool Lane intersection. The road safety review found that the road network is currently operating in a relatively safe manner near the proposed site access.

6.2.2.5. Restricted vehicle access routes

The surrounding local and State road networks are B-Double approved routes. The Project has access to the B-Double approved road network via Newell Highway from the north and south direction to the Project.

The Project has access to the Class 1 OSOM approved road network via Newell Highway. All roads on the north-west side of Newell Highway are unrated and will require approval from NSC for Class 1 OSOM vehicles to operate along these roads.

The Project has access to Special Purpose Vehicles Level 1 and 3 approved routes. The Newell Highway is approved with the following traffic conditions:

- Vehicles exceeding 2.5 metres wide or 22 metres long are not permitted to travel between sunrise and sunset during public holiday periods (including 23 December in one year to 3 January of the following year inclusive).

6.2.2.6. Public transport and school buses

There are no formal public transport facilities in the vicinity of the Project. Two school bus services are provided within the vicinity of the Project area, as follows:

- A service (S188) travels along Yarrie Lake Road and pass Kiandool Lane at approximately 8:20am in the eastbound direction and approximately 3:50pm in the westbound direction.
- A services (S626) travels along Cains Crossing Road and utilise the intersection with Newell Highway at approximately 8:25am and 3:54pm.

6.2.3. Potential impacts

6.2.3.1. Potential impacts to the road network

The traffic volumes for the Project are described in Section 3.5.

The Project is expected to generate the highest level of traffic during the peak construction period. The road network is able to accommodate the Project traffic during the peak construction period within minimal impact based on intersection modelling and mid-block assessments.

During construction the vehicle trips throughout the middle of the day are expected to be predominantly associated with heavy vehicles. This increase in traffic will be within the daily variation of traffic volumes on the road network and can be readily accommodated.

The road network is able to readily accommodate the traffic generated by the Project during the construction and operational periods.

6.2.3.2. Site access

The primary proposed access route for B-Double vehicles from the State Road network (Newell Highway) is via Mooloolbar Street, Baranbar Street, Goobar Street, Yarrie Lake Road and Kiandool Lane.

The route measures a total of 16.5 km, with all roads between Newell Highway and the site access currently approved for use by B-Doubles. A swept path assessment of intersections where the B-Double vehicles would undertake turning movements has been undertaken and provided in Appendix E.

Alternatively, B-Double vehicles may approach the site from the south via Cains Crossing Road and Kiandool Lane, as shown in Figure 17. This route measures 15.6 km from Newell Highway to the site access with all roads currently approved for use by B-Doubles. The swept path assessment for the intersection of Newell Highway / Cains Crossing Road is also provided in Appendix E.

The existing WPPS site access and access routes to site are considered suitable to safely accommodate access to the Project.

6.2.3.3. Car park, weighbridge and truck turning area

The car parking arrangements are sufficient to accommodate the entirety of the construction and operational parking demands without off-site impacts.

A preliminary swept path assessment was undertaken for the truck turning area and is provided in Appendix E. The loading arrangements are considered suitable subject to further detailed design development.

6.2.4. Mitigation and management measures

The following mitigation measures will be implemented for the Project:

- A Traffic Management Plan will be prepared for the Project and will include:
 - 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)
- The Traffic Management Plan will be prepared in consideration of the existing measures implemented by Santos at the WPPS:
 - Deliveries will be performed during approved working hours.
 - Routes should be maintained to provide an effective surface for both vehicles and personnel. Any unsuitable conditions such as overly slick or rough shall be reported.
 - All frequently used unsealed roads shall be inspected for deterioration and damage following storms, cyclones, prolonged rainy conditions, prolonged dry conditions
- A Driver Code of Conduct is to be implemented as a measure to maintain safety within and around the site.
- Measures to minimise the impact during construction include:
 - prior to construction, a pre-condition survey of the relevant sections of the existing road network will be undertaken in consultation with the NSC
 - the unsealed access road will be managed in consultation with Santos, as the landowner
 - at the end of construction, a post-condition survey will be undertaken to ensure the road network is left in a condition equivalent to that at the start of construction
 - heavy vehicles are to avoid travel during peak school bus operating times to limit the interaction of larger vehicles and vulnerable road users

6.3. Hazard and risk

Pando Consulting Pty Ltd (Pando) prepared a PHA for the Project. The PHA is summarised below and included in Appendix F.

The PHA assesses credible hazard scenarios associated with the process of CO₂ absorption, stripping and liquefaction, and assesses the potential consequences and likelihood of each. It also determines whether risks to people, property and the environment are acceptable in the context of land use planning, as well as defines required management and mitigation measures.

6.3.1. Methodology

The PHA has been undertaken in accordance with the SEARs, with hazards and risks associated with the Project assessed under the resilience and hazards (R&H) SEPP. Under these requirements, a preliminary risk screening (PRS) was completed to determine whether the Project was classified as a hazardous and offensive development.

Projects that are classified as 'potentially hazardous' industry require a PHA in accordance with 'Hazardous Industry Planning Advisory Paper No. 6 – Guideline for Hazard Analysis' (DoP, 2011) (HIPAP 6) to determine the risk to people, property and the environment. The PRS applies the process from the 'Hazardous and Offensive Development Application Guidelines – Applying SEPP 33' (DoP, 2011) (Applying SEPP 33).

The assessment methodology included:

- completion of a PRS to determine if the Project is a 'potentially hazardous industry', including:
 - the type and quantity of expected hazardous materials to be stored and handled on-site
 - the expected number of transport movements and
 - any other risk factors
- completion of a multi-level risk assessment as the basis to determine the level of risk assessment required relative to the nature, scale and location of the Project, being either:
 - level 1: qualitative – no major off-site consequences and societal risk is negligible
 - level 2: semi-quantitative – off-site consequences but with low frequency of occurrence
 - level 3: quantitative – where qualitative and partially qualitative analyses are exceeded
- completion of a PHA including:
 - identification of all possible Project hazards both on-site and off-site
 - the selection of representative incident scenarios
 - analysis of the consequences of these incidents on people, property, and the biophysical environment.
 - evaluation of the likelihood of such events occurring and the adequacy of safeguards.
 - calculation of the resulting risk levels of the facility
 - comparison of these risk levels and identification of opportunities for risk reduction / control measures
- reporting on the outcomes of the PHA including final risk profile

'Hazardous materials' are substances which have a Dangerous Goods (DG) classification.

The PHA prepared a hazard identification table which provides a summary of potential hazards, consequences and safeguards at the site and was prepared in accordance with the recommended approach in HIPAP No. 6.

6.3.2. Existing environment

Within 1 km of the Project, land uses are primarily agriculture, gas extraction and power generation. Beyond that buffer, rural-residential land uses are also scattered across the landscape. Apart from the WPPS (R17), two receivers are identified within 1 km (R12 and R13) which are owned by Santos. There are no privately-owned receivers (or other sensitive developments as defined by HIPAP no. 6) located within 1 km.

The Project is located within bushfire prone land, which presents potential forest/woodland and grassland hazards. Bushfire is assessed separately in Section 6.4, with relevant bushfire protection methods adopted as part of the PHA.

6.3.3. Impact assessment

6.3.3.1. Preliminary risk screening

The PRS confirms the storage of some hazardous materials on-site exceed the Applying SEPP 33 screening thresholds. All hazardous materials which exceed the threshold are Class 8 DGs (corrosive substances). Therefore, and in the absence of safeguards, codes, and standards, the Project may be considered to constitute a 'potentially hazardous industry' under the R&H SEPP.

Comparatively, the PRS confirms transport quantities of hazardous materials were below the Applying SEPP 33 thresholds. Therefore, Project does not trigger additional transport assessment requirements.

Additionally, the PRS considered the potential for other risk factors including incompatible materials, potential for toxic gas generation, environmental hazards, and site-specific processing conditions.

Therefore, the preparation of a PHA to support the Project is justified by the presence of the above-mentioned additional risk factors, in combination with the exceedance of hazardous materials storage thresholds.

6.3.3.2. Preliminary hazard analysis

The PHA identifies the nature and scale of all Project hazards and the selection of representative incident scenarios (or risk events), including operational activities, equipment, hazardous materials, natural events, and interactions with neighbours. A comprehensive hazard register documents each of the identified risk events including their initiating causes, the resulting consequences, any relevant controls in place, and the likelihood of such events occurring.

Twenty-eight (28) hazards and associated risk events were identified. Key hazards include pressurised and cryogenic CO₂, chemical handling (e.g. MEA, ammonia, and soda ash), process equipment failures, electrical risks, and external events (e.g. fires or explosions at adjacent facilities). Any existing controls which prevent and/or mitigate against the event and resulting consequences are also identified. Controls include pressure relief devices, detection/suppression/alarm systems, monitoring systems, bunding, segregated storage, preventative maintenance, PPE, emergency response plans, and operator training.

The likelihood assessment found there were no "likely" events, with the highest likelihood of occurrence assigned to any event being "unlikely". Hazard ID10 (WPPS – Explosion) was rated as "very unlikely" and Hazard ID13 (Substation – EMF) was rated as "extremely unlikely". All other events were rated as "unlikely", meaning they are credible but not expected to occur frequently (i.e. could occur within a 10-year period), reflecting both industry experience and the effectiveness of controls. Overall, Project risks are generally low frequency in nature.

6.3.3.3. Risk assessment

In combining consequence and likelihood for the twenty-eight (28) hazards, the risk assessment found twenty-six (26) hazards to fall within a medium risk category. Two (2) hazards associated with very low likelihood events were rated as low risk. No high risks were identified.

All risks have been reduced through the application of established control measures and are considered tolerable in accordance with the principle of 'as low as reasonably practicable'.

The assessment indicates potential impacts are largely confined to the Project workforce and the Project does not pose a significant off-site risk. Overall, the Project presents a tolerable risk profile, with appropriate safeguards in place to minimise the likelihood and consequences of hazardous events. Risk levels are manageable to an acceptable level, and do not impede the approval of the Project.

6.3.4. Mitigation and management measures

The following measures are recommended to manage potential impacts to hazards and risks:

- undertake a Final Hazard Analysis at the detailed design stage, generally in accordance with the PHA
- implement mitigation and management measures from the Final Hazard Analysis

6.4. Bushfire

Peterson Bushfire prepared a bushfire assessment report (BFAR) for the Project. The BFAR is summarised below and included in Appendix F.

The BFAR assesses the potential hazards and risks associated with bushfires and the use of bushfire prone land, including Project-specific bushfire risks and compliance with development standards. The BFAR also defines required management and mitigation measures.

6.4.1. Methodology

The assessment methodology included:

- desktop and field-based assessment of the bushfire landscape, including the potential for bushfire to impact the Project and the potential for the Project to contribute to bushfire risk
- identification of potential hazards and risks associated with bushfires and ignition and fire impacts relevant to operation
- evaluation of bushfire protection and mitigation measures to address bushfire risk, minimise bushfire impact and protect assets

The BFAR has been undertaken in accordance with the objectives and relevant provisions of 'Planning for Bush fire Protection' (PBP), with reference to Section 8.3.9 (Hazardous Industry) (NSW RFS, 2019). The BFAR is intended to complement the PHA prepared by Pando (Appendix F).

The findings indicate that Project bushfire risk is manageable and acceptable.

6.4.2. Existing environment

The Project area is mapped as Vegetation Category 1 (highest risk) and Vegetation Category 3 (medium risk) bushfire prone land, which represents the potential for forest/woodland and grassland hazards, respectively.

The predominant bushfire landscape within 10 km of the Project is characterised by cleared rural-agricultural lands with prevailing grassland hazards, fragmented by expansive remnant bushland with woodland fuel types. The landscape is dissected by roads, rural laneways and boundary trails.

6.4.3. Impact assessment

This section examines the potential bushfire risks associated with the Project in the context of its surrounding landscape and operational characteristics. The assessment considers risk pathways, effectiveness of protection and mitigation measures and the Project's consistency with relevant standards. A risk-based approach is used to determine whether residual bushfire risk is acceptable having regard to the Project's nature and provisions of the PBP.

6.4.3.1. Bushfire landscape assessment

Bushfire behaviour in the landscape is influenced by expansive areas of Pilliga Outwash Dry Sclerophyll Forest (DSF) (within 1 km to the north and west). Notably, fuel loads within this vegetation pattern contribute to a lower fire intensity and are more closely associated with semi-arid woodland fuel loads. Cleared agricultural lands within 10 km also present potential grassland hazards, being highly dependent on the type of crop, level of growth, curing and grazing practices. Grassland hazards are associated with low fuel loads, with crops and grazing land even lower. There are also expansive patches of woodland and DSF communities between 5 km and 10 km from the Project, particularly along the Bohena Creek corridor (east), though these are separated from the Project by agricultural lands.

The Project area and surrounding landform are characterised by the predominance of virtually flat land. Slopes exceeding 5 degrees are limited to short embankments along Bohena Creek (east) and around farm dams. Slope is therefore not a contributing factor to the rate of fire spread for the Project.

The region has warm to hot summers, generally moderate and variable rainfall, and winter consists of cool clear days and cold nights. The bushfire season generally runs from October to March, and the prevailing weather has the potential to extend outside of this timeframe.

The Project is not located within a known or recurrent bushfire corridor and has not been subject to frequent or recent large-scale bushfire events. Dry lightning is the greatest ignition risk in the Project area, followed by accidental ignitions caused by using machinery in grass and other activities such as welding and grinding.

Bushfire behaviour and bushfire threat is predicted to be a combination of seasonal climatic conditions and elevated temperatures, resulting in undesirable fire weather (i.e. hot and dry north-westerly winds) combined with ignition (natural or accidental) creating the potential for a bushfire to spread generally in a west to east direction. Specifically, a fire may impact the Project area from surrounding vegetation to the north and west or spread from the Project area into the adjoining agricultural lands to the east, including the Bohena Creek corridor.

6.4.3.2. Asset protection zones

Asset protection zones (APZ) are applied to limit bushfire impact on development, provide defensible space and enable safe access for firefighting. APZs are also informed by region wide fire indexes and the relevant bushfire attack level (BAL) (which represents bushfire exposure).

BAL-29 has been adopted as a conservative reference benchmark for the Project, having regard to the identified vegetation types and fire weather applicable to the Project.

The Project includes reduced APZs of 7 m based on very low fuel forest vegetation (Pilliga Outwash DSF) on flat land at the threshold of BAL-29. The minimum 7 m APZ is to be provided for the Project (the facility within the security fence) to the north, west and south. Existing maintained land associated with WPPS is to the east.

The Project has designed APZs in excess of 7 m to the north (13 m) and west (19 m). The WPPS to the east provides in excess of 100 m of maintained land.

The Project APZs will need to be maintained to the standards of an inner protection area. Specifications include 5 m gaps between tree canopies, avoidance of shrubs, regular grass maintenance and limited use of mulch (not within 2 m of infrastructure).

The Project APZs are suitable and acceptable to minimise bushfire risk.

6.4.3.3. Construction standards

The existing bushfire setting reflects a managed rural environment where bushfire risk is present but moderated by land use, fuel management practices and the absence of slope and extensive continuous vegetation. Bushfire impacts to enclosed buildings such as the maintenance room, control room and Motor Control Centre (MCC) room should be managed by constructing to a standard that protects from radiant heat exposure and ember attack.

The maintenance room is impacted by BAL-29 and the control room and MCC room are impacted by BAL-12.5. The design and construction of these rooms should comply with their respective BAL specifications.

In considering credible bushfire scenarios and the Project infrastructure and office buildings, bushfire risk to the Project is acceptable. Bushfire risk during operation of the Project, including risk to personnel, will be managed through standard construction controls.

6.4.3.4. Access and egress

The Project has designed access and egress to support bushfire response and safe evacuation.

Internal access roads (site entry including 15 m radius turning circle and 5 m wide perimeter ring road) provide managed circulation around the Project infrastructure and are integrated within the APZs (within the security fence). The roads comply with the PBP standards for property access roads.

6.4.3.5. Bushfire risk from the Project

The potential for Project operations to contribute to bushfire risk has been considered, including ignition potential and the Project's nature as a hazardous industry.

During construction, bushfire ignition risks are typical of civil and electrical works in rural environments and can be managed through standard controls. During operation, ignition potential can be reduced through design and operational actions in accordance with relevant standards, managing vegetation and APZs, and through bushfire-aware employee and contractor action.

The Project is not expected to materially increase bushfire risk to surrounding land uses, and bushfire risk associated with the Project is acceptable.

6.4.4. Mitigation and management measures

Mitigation and management measures to reduce bushfire risk are as follows:

- the Project APZ (the site within the security fence) is to be managed to the standards of an inner protection area as follows:
 - trees at maturity should not touch or overhang assets
 - tree canopies should not be connected when at maturity
 - gaps between crowns or groups of crowns are to be maintained at distances of at least 5 m
 - shrubs should not be planted
 - grass should be regularly mown or slashed
 - organic mulch is not to be used within 2 m of infrastructure
- in accordance with *AS 3959-2018 Construction of buildings in bushfire prone areas*, the maintenance room is to be designed and constructed to comply with BAL-29; and the control room and MCC room are to comply with BAL-12.5.
- all internal access roads are to comply with the relevant provisions of 'property access' listed in the PBP, and summarised below:
 - a minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches
 - curves have a minimum inner radius of 6 m and are minimal in number to allow for rapid access and egress
 - the minimum distance between inner and outer curves is 6 m
- water storages are accessible for use by fire-fighters, if required:
 - fitted with 65 mm Storz outlet with a ball valve
 - truck access and standing area provided within 4 m of the outlet
 - made with non-combustible materials (e.g. steel or concrete)
- actions listed in the BFAR are to be included in the Construction Environmental Management Plan (CEMP) and followed by employees and contractors to help prevent fire ignition
- the Bushfire Emergency Management Plan detailed in the BFAR is to be followed by employees and contractors

6.5. Noise

Todoroski Air Sciences prepared a noise assessment for the Project. The noise assessment is summarised below and included in Appendix H.

The noise assessment identifies all potential Project noise and vibration sources arising during construction and operation (including road traffic noise, assesses potential impacts associated with these activities, and defined required management and mitigation measures.

6.5.1. Methodology

The noise assessment has been undertaken in accordance with the SEARs, the 'Noise Policy for Industry' (EPA, 2017), 'Interim Construction Noise Guideline' (ICNG) (DECC, 2009), and the 'NSW Road Noise Policy' (NSW DECCW, 2011).

The assessment methodology included:

- review the baseline environment, existing land uses and sensitive receivers within the acoustic catchment
- identify potential noise sources and traffic generation during the construction and operational phases of the Project
- apply a semi-qualitative assessment to predict construction and operational noise levels at identified sensitive receivers
- calculate road traffic noise to predict noise levels associated with Project-related traffic
- identify required mitigation measures
- reporting on the outcomes of the noise assessment

6.5.2. Existing environment

The background noise environment is typical of a rural bushland setting, generally characterized by low ambient levels that are periodically influenced by natural elements, road traffic, rural-residential properties and agricultural activities. The operational WPPS and Essential Energy substation to the Project's east also contribute to background noise.

The nearest privately-owned receiver to the Project is located approximately 1.5 km to the north-west. Further information on the sensitive receivers relevant to the Project is provided in Section 2.2.

6.5.3. Impact assessment

6.5.3.1. Construction noise

Construction work will be undertaken during standard construction hours as defined in the ICNG. The use of heavy machinery and light power tools will be typical of the scale and nature of works, including excavators and other earthmoving machinery, trucks, concrete plant and equipment, and handheld power tools. Heavy vehicles are also associated with material deliveries, whilst light vehicles (including contractor transport) will also be used.

The worst-case combined construction sound power level is estimated at 120 dB(A). At the nearest privately-owned receiver, the predicted noise levels are 41 dB(A), which complies with the relevant noise management criterion of 45 dB(A).

6.5.3.2. Operational noise

Operational noise will be generated by Project component and plant equipment. The maximum sound power level of individual plant items is 100 dB(A), with a combined level of 106 dB(A). The predicted operational noise at the nearest privately-owned receiver is approximately 28 dB(A), which complies with the relevant criterion of 35 dB(A).

6.5.3.3. Road traffic noise

The greatest source of road traffic noise will be generated during the construction phase, being temporary and of short duration.

Predicted noise levels for receivers adjoining affected roadways are expected to comply with the relevant criterion of 55 dB(A) for daytime road traffic noise.

6.5.4. Mitigation and management measures

The Noise Assessment concludes the construction, operational and road traffic noise impacts can be effectively managed and demonstrate compliance with the relevant criteria. Notwithstanding, the following measures are recommended to minimise potential noise impacts:

- preparation of a Construction Noise Management Plan to confirm predicted levels, detail staging, and outline site-specific mitigation and stakeholder engagement measures
- preparation of a Noise Verification Report to confirm compliance during operations, including monitoring, assessment of noise limits, and implementation of corrective actions, if required
- any noise management will be completed in consultation with Santos

6.6. Air quality

Zephyr Environmental Pty Ltd (Zephyr) prepared an Air Quality and Greenhouse Gas Assessment (AQGHGA) for the Project.

Construction and operational Project activities have the potential for emission of air pollutants and airborne dust particles. Consideration of this impact is essential to prevent reductions in air quality that have a potential to cause amenity and health issues.

The air quality assessment (AQA) component of the AQGHGA assesses the potential impacts of the Project on air quality during construction and operation, and describes the mitigation and management measures to be implemented to ensure potential air quality impacts are avoided and minimised.

The AQA is summarised below and included in Appendix I.

6.6.1. Methodology

Air quality in NSW is primarily regulated by the EPA under the PoEO Act and the *Protection of the Environment Operations (Clean Air) Regulation 2022*. This regulatory framework is supported by the 'Approved Methods for the Modelling and Assessment of Air Pollutants in NSW' (EPA, 2022) (Approved Methods).

The assessment methodology included:

- review the baseline air quality environment, existing land uses and sensitive receivers within the air catchment, detailing any statutory air quality goals (if available) and assumed background concentrations
- review local meteorology including climatic conditions, wind speed and direction and atmospheric stability
- identify potential emissions to air during construction and operations
- apply a semi-qualitative risk-based approach to assess the potential construction air quality risks and impacts
- apply a quantitative assessment of the operational phase associated with the Project, including dispersion modelling to predict pollutant concentrations at sensitive receivers
- consideration of odorous compounds and relevance to the Project
- provide a cumulative impact assessment
- identify required mitigation measures

A semi-qualitative construction and quantitative operational assessment was undertaken and informed by the above matters, with the findings concluding the Project is not anticipated to result in adverse air quality impacts.

6.6.2. Existing environment

6.6.2.1. Local meteorology

Meteorological conditions recorded at the BOM weather station at Narrabri Airport Automatic Weather Station (AWS) (Site No. 54038), located 20 km north-east of the Project, are considered representative of the Project area. This data indicates that January is the hottest month and July is the coldest. The data is suggestive of seasonal rainfall, indicating that November and December are the wettest months. The data further shows that wind speed and direction are reasonably consistent year-to-year, with a strong dominance by winds from the south/southeast, particularly during autumn. Frequency of winds from the north/north-east increase throughout spring and summer, where winds are typically stronger. There are fewer east and west directional winds.

6.6.2.2. Baseline air quality

Baseline air quality conditions for the Project area have been characterised using data from nearby NSW DCCEE monitoring stations. Due to the absence of comprehensive local monitoring in Narrabri, data from Gunnedah (for NO₁ NO_x and NO₂) and Merriwa (for CO) have been adopted. No publicly available background data exists for ammonia, benzene, toluene or hydrogen sulfide.

Measured concentrations of nitrogen oxides (NO_x) at Gunnedah between 2019 and 2024 indicate consistent annual average levels, with some variability in short-term (1-hour) peak concentrations. All recorded NO₂ concentrations comply with applicable air quality criteria for both annual and 1-hour averaging periods.

Carbon monoxide (CO) data from Merriwa between 2019 and 2024 shows low ambient concentrations, with all measured 1-hour and 8-hour averages well below relevant air quality criteria.

Overall, the available monitoring data indicates that existing air quality in the region is categorised as good and complies with relevant regulatory standards.

6.6.3. Impact assessment

6.6.3.1. Construction phase

No privately-owned receivers are located within 250 m of the Project. Accordingly, a detailed construction dust assessment is not required. Further, due to the highly variable and short-term nature of construction dust emissions, dispersion modelling is not considered appropriate for this phase. Instead, a semi-quantitative, risk-based assessment has been undertaken.

With minimal demolition required, the potential impacts during construction include temporary increases in particulate matter (PM) and dust nuisance from construction activities such as:

- site establishment, minor earthworks, minor site clearing and associated topsoil removal
- construction of new or upgraded access tracks
- excavation, drainage works and trenching for cables and laying equipment
- material handling, stockpiling, loading and unloading
- vehicle-track out (transporting of dirt and dust by heavy duty vehicle movements on unsealed surfaces)
- vehicle, plant and equipment movements including cranes, rollers, excavators, compactors and trucks
- minor exhaust emissions from diesel-powered plant and equipment.

Dust generation will be intermittent and influenced by weather conditions, soil moisture and the extent of exposed surfaces. Exhaust emissions will be typical of rural infrastructure construction and comparable to existing agricultural activities in the locality, are not expected to significantly affect local air quality (and were therefore not quantitatively assessed). Construction-related traffic is expected to include staggering of light and heavy vehicle movements across the day, further minimising vehicle dust generation during this phase. Construction-related air quality impacts are expected to be minor and temporary.

Standard best-practice mitigation measures are recommended to minimise dust generation and emissions. With the implementation of these measures (Section 6.6.4), construction-related air quality impacts will not result in adverse impacts at sensitive receivers or exceed relevant air quality criteria.

6.6.3.2. Operational phase

Operational air quality impacts were assessed using a dispersion model suitable for the source characteristics, nearby sensitive receivers and local terrain. The modelling incorporated terrain data and site-specific meteorological data generated using the Weather Research and Forecasting model. Due to the absence of representative on-site meteorological data (where the closest data station [Narrabri Airport AWS] is 20 km northeast of the Project), prognostic meteorological modelling was undertaken for the 2024 period. Model outputs were compared with observations from the Narrabri Airport AWS and demonstrated good agreement, supporting their use in the assessment.

The model was used to predict ground-level concentrations of pollutants across a 6 km by 6 km grid and at discrete sensitive receivers. Pollutants assessed included NO₂, CO, ammonia, toluene, benzene and hydrogen sulfide. Hydrogen sulfide is an odorous compound and therefore was assessed using criteria that are relevant to odour impact.

Predicted concentrations for all pollutants, including cumulative impacts (background plus existing and proposed sources), comply with the relevant assessment criteria for all averaging periods. Modelled concentrations at both the grid scale modelled terrain and at discrete sensitive receivers were well below the applicable standards. Only minor (low) incremental contributions from the Project sources are predicted.

Cumulative concentrations (including background levels) remain compliant with relevant air quality standards.

Accordingly, the operational phase of the Project is not expected to result in adverse air quality impacts or exceedances of relevant regulatory criteria.

6.6.4. Mitigation and management measures

The AQA concludes the Project is not anticipated to result in adverse air quality impacts. Notwithstanding, the following good practice measures will minimise air quality impacts and be outlined in the CEMP and Operational Environmental Management Plan (OEMP):

- wheel-generated dust emissions to be minimised via the application of water and / or coarse gravel (or equivalent) on internal access routes
- vehicles should cover their loads while transport materials capable of creating wind-blown dust vehicle
- vehicle speeds to be limited when travelling on unsealed roads
- areas of exposed surface should be minimised to reduce the area of potential wind erosion sources
- stockpiles to be managed through stabilisation, light watering and the use of covers
- works which disturb vegetation, soils and stockpiles to be avoided during strong winds
- all Project vehicles and machinery will be in good condition, fitted with appropriate emission controls and comply with the relevant standards and manufacturer's operating recommendations
- plant and equipment to be operated efficiently and turned off when not in use
- revegetation to be undertaken of disturbed areas no longer required for construction
- a complaints process and response protocol will be developed

6.7. Greenhouse gas

Zephyr prepared an AQGHGA for the Project.

The greenhouse gas assessment (GHGA) component of the AQGHGA provides a calculation of scope 1 and 2 greenhouse gas (GHG) emissions during the construction phase, and also for each year of operation for the life of the Project. The GHGA describes mitigation and management measures to be implemented as required.

The GHGA is summarised below and included in Appendix I.

6.7.1. Methodology

Quantification of GHG emissions has been completed in accordance with the 'Greenhouse Gas Protocol' (World Business Council for Sustainable Development and World Resource Institute, 2004), and GHG classification systems.

The assessment methodology included:

- identify potential GHG emissions to air during operations, including energy production, energy consumption and potential GHG emissions embodied in combusted fuels
- categorise emissions as either Scope 1, Scope 2 or Scope 3 under the GHG Protocol
- assess GHG emissions associated with the construction and operational phases of the Project (for each year of operation)
- assess the Project in relation to relevant climate change targets
- provide a cumulative impact assessment of the Project's contribution to national GHG emissions
- identify required mitigation measures

6.7.2. Existing environment

Refer to the existing environmental conditions including local meteorology and baseline air quality provided in Section 6.6.2.

6.7.3. Impact assessment

6.7.3.1. Scopes of emissions

Scope 3 emissions (other indirect emissions) are not relevant for the Project. Therefore, Scope 1 emissions (direct emissions) and Scope 2 emissions (indirect emissions from purchased electricity) are addressed.

Scope 1 emissions are direct GHG emissions. They are principally the result of the generation of electricity, heat or steam, physical or chemical processing, transportation of materials, or fugitive emissions. No Scope 1 emissions are associated with the Project, as no on-site fuel combustion is proposed.

Operational emissions are limited to Scope 2 emissions, being indirect emissions from the generation of purchased energy (electricity).

6.7.3.2. Assessment of emissions

Scope 2 emissions were estimated using an energy consumption of 9,986,400 kWh per annum (provided by the Applicant) and NSWs adopted emission factor of 0.66 kg CO₂-e/kWh. This results in estimated annual emissions from electricity usage of approximately 6,591 t CO₂-e.

Based on planned operations, the Project's total GHG emissions in any financial year are below the NSW EPA threshold for CO₂-e (25,000 t of Scope 1 and 2).

Therefore, the Project is not classified as an EPA large emission project as defined by the EPAs 'NSW Guide for Large Emitters' (EPA, 2025). Consequently, a GHG Mitigation Plan or Climate Change Adaptation Plan is not required under the guidelines.

6.7.3.3. Cumulative greenhouse gas contributions

Project average annual Scope 2 emissions are approximately 0.007 Mt CO_{2-e}. This represents a very small contribution to national GHG emissions, being approximately 0.002% of Australia's Paris Agreement target.

These emissions are not considered to be significant in a global or regional context.

6.7.4. Mitigation and management measures

The AQGHGA concludes the Project is not anticipated to result in adverse emissions-related impacts. There are no Project-specific mitigation and management measures required for GHG emissions. Notwithstanding, good practice measures to minimise air quality impacts are included for completeness in Section 6.6.4.

6.8. Surface water and soils

Engeny Australia Pty Ltd (Engeny) prepared a surface water assessment (SWA) for the Project. The SWA is summarised below and includes an assessment of surface water and soils and is included in Appendix J. The SWA describes mitigation and management measures to be implemented as required.

The SWA was prepared in accordance with the SEARs and the agency advice provided by the EPA, BCS, and WaterNSW.

A further assessment of soils in relation to the Project is provided in the land capability assessment (LCA) prepared by Minesoils Pty Ltd (Minesoils). The LCA is provided in Appendix N.

6.8.1. Methodology

The SWA assessment methodology included:

- review of background information and establishing the characteristics of the local water environment
- develop a conceptual Project water management system in consideration of '0074 Stormwater Drainage (Design)' (NSC, 2013)
- prepare Project water balance
- complete a flood impact assessment
- assess the erosion and sedimentation risks and management measures for the Project in accordance with 'Managing Urban Stormwater – Soils and Construction Volume 1' (Landcom, 2004) and Volume 2 (DECC, 2008)
- assess the potential construction and operational water supply requirements
- undertake a water pollution discharge assessment generally in accordance with the EPAs guidance

6.8.2. Existing environment

6.8.2.1. Catchment and watercourses

The Project is located within the Namoi River Catchment that covers an area of approximately 42,000 km².

Bohena Creek is located approximately 1 km east of the Project. Bohena Creek flows north and joins the Namoi River approximately 12 km downstream from the Project. Pig Creek, located approximately 400 m west of the Project, also flows into the Namoi River, joining 3 km further downstream than Bohena Creek. Additionally, an unnamed watercourse originates from an agricultural dam located 800 m north of the Project.

No minor or non-minor Strahler classification drainage lines are mapped within the Project Area.

6.8.2.2. Water quality objectives

The water quality objectives relevant to the Project are summarised in Table 6.4 in consideration of the receiving environment's environmental values and potential pollutants in offsite discharges.

Table 6.4 Relevant NSW water quality objectives – Namoi River Catchment

Water quality objective	Applicability to the Project
Aquatic Ecosystems: Maintaining or improving the ecological condition of waterbodies and their riparian zones over the long term.	Low Relevance – There are no ephemeral and perennial drainage lines in close proximity to the Project that the potential to have aquatic ecosystems.
Visual amenity: Aesthetic qualities of waters	Low Relevance – The Project proposes to use hazardous materials during processing, which will be contained and appropriately disposed of to minimise risk of offsite spills. The Project area does not contain any ephemeral or perennial drainage lines.
Livestock water supply - Protecting water quality to maximise the production of healthy livestock	Moderate Relevance - The Project and surrounding area is close to water storages associated with agriculture and domestic purposes.
Irrigation water supply - Protecting the quality of waters applied to crops and pasture	High Relevance - The Project proposes to treat wastewater for irrigation where possible.
Drinking water: Refers to the quality of drinking water drawn from the raw surface and groundwater sources before any treatment	Moderate Relevance - The Project is not in close proximity to groundwater bores registered for water supply. The Project and surrounding area are close to water storages associated with agriculture and domestic purposes.

6.8.2.3. River flow objectives

The river flow objectives relevant to the Project are summarised in Table 6.5.

Table 6.5 Relevant NSW River flow objectives – Namoi River Catchment

River flow objective	Applicability to the Project
Protect pools in dry times: Protect natural water levels in pools of creeks and rivers and wetlands during periods of no flows	Low Relevance – Naomi Catchment experiences fluctuations in rainfall with risk of dry periods, however the Project area contains no ephemeral Creeks in its surrounds.
Protect natural low flows: Protect natural low flows	Low Relevance – the Project has potential to have minor impacts on surface water flows within the Project area. Downstream receiving waters are perennial and any changes to flow as a result of the Project will be negligible
Maintain wetland and floodplain inundation - Maintain or restore the natural inundation patterns and distribution of floodwaters supporting natural wetland and floodplain ecosystems	Low Relevance – The Project has potential to impact surface water flows in downstream watercourses, however due to its size relative to the downstream catchment, impacts to flows would be negligible.
Minimise effects of weirs and other structures: Minimise the impact of instream structures	Low Relevance - The Project area does not contain any watercourses.
Manage groundwater for ecosystems: Maintain groundwater within natural levels and variability, critical to surface flows and ecosystems	Low Relevance - the Project is located upon gently sloped topography. The Project has potential to have minor impacts on surface water flows within the Project. Downstream receiving waters are perennial and highly regulated and any changes to flow as a result of the Project will be negligible

6.8.2.4. Surface water users

Licensed surface water users potentially impacted by the Project are located within the Bohena Creek Water Source. A search of the NSW Water Register found that there are 17 water access licences (WAL) with a total of 173-unit shares within the Bohena Creek Water Source. WALs are predominantly under the unregulated river licence category with the purpose for irrigation.

6.8.2.5. Soils

Minesoils undertook a soil and land resources survey within the Project Area in accordance with the 'Australian Soil and Land Survey Field Handbook soil classification procedures' (NCST, 2009). Soil samples were collected at each of the assessment site's soil horizons to a depth of up to 1 m, with a total of 20 samples collected. 12 of these were considered representative and subject to laboratory testing.

The soil survey found the Project area contains one dominant soil mapping unit Brown Sodosol, and one subdominant mapping unit Brown Dermosol.

6.8.3. Impact assessment

6.8.3.1. Site water balance and water demand

Overall inflows, outflows, and internal transfers for the Project are summarised in Table 6.6.

Table 6.6 Project water balance inflows and outflows

Type	Phase	Description
Inflows		
Rainfall and Runoff	Construction and Operation	Rainfall and runoff captured by containment bunds.
Potable Water Supply	Construction and Operation	Potable water trucked in for use in onsite amenities and dust suppression.
Raw Water Supply	Operation	Raw water supply for the primary RO plant, sourced from an existing groundwater bore.
Outflows		
Dust Suppression	Construction	Water applied to roads and disturbed areas within the Project disturbance area during construction.
Evaporation	Construction and Operation	Evaporative losses from sumps and bunded areas.
Wastewater	Construction and Operation	Wastewater from site amenities and RO concentrate.
Controlled Discharges	Construction and Operation	Controlled discharges of stormwater captured by erosion and sediment control structures (construction) and swale drains, containment bunds and sumps (operation), which is deemed suitable for release off site.
Uncontrolled Discharges	Construction and Operation	Overflows from erosion and sediment control structures (construction) and containment bunds and sumps (operation).
Process Water Demands	Operation	Water used for processing of CO ₂ . This water will be supplied from the primary RO plant permeate. Once used in the plant, process water will be collected and sent to a water treatment plant for irrigation (permeate only) or disposal off site.
Irrigation Water	Operation	Treated wastewater will be distributed through a piping system connected to a sprinkler network to cover the required irrigation area.

6.8.3.2. Water quality

The Project has potential to impact the quality of surrounding surface water through the following:

- soil erosion and sedimentation of downstream watercourses
- spill of hydrocarbons or other pollutants used to support transportation and construction activities
- discharge or spill of wastewater (treated or untreated) into downstream watercourses
- discharge of sediment-laden or potentially contaminated water (treated or untreated) into downstream watercourses

There are no mapped watercourses within the Project area. The downstream receiving watercourse, Pig Creek, is a first order ephemeral creek. With the mitigation measures described in Section 6.8.4, it is considered that potential surface water quality impacts from the Project will be negligible.

6.8.3.3. Water pollution impact assessment

The EPA's guidance for industry and practitioners on the relevant statutory, policy, and technical framework to consider when conducting a water pollution discharge impact assessment is provided in Appendix J. The assessment indicates that with the mitigation measures described in Section 6.8.4, the potential impact of discharge from the Project would be low.

6.8.3.4. Flooding and flow regimes

A review of flood modelling undertaken for the NGP indicates that the Project area is not subject to flood inundation under both the 10% and 1% Annual Exceedance Probability (AEP) storm events and the Probable Maximum Flood. The maximum flood depth maps utilised from the NGP in relation to the Project area show that the Project area is outside of the flood extents for all events; 10% AEP, 1% AEP and Probable Maximum Flood.

The proposed infrastructure and hardstand areas within the Project area would also be limited, based on the proposed disturbance footprint of approximately 0.76 ha, and are not expected to materially impact the flow of surface water within the Pig Creek catchment. Similarly, runoff from bunded areas and sumps which will be temporarily retained, would equate to a minor portion (<0.1%) of the overall Pig Creek Catchment. No runoff from the Project area is directed toward Bohena Creek, and there is no planned extraction from Bohena Creek water source, aside from rainfall temporarily retained within bunded areas.

Flooding and loss of catchment yield due to the Project is therefore considered negligible.

6.8.4. Mitigation and management measures

The following mitigation and management measures will be detailed in the CEMP and OEMP to minimise potential surface water and soils impacts and will include:

- development of an erosion and sediment control plan in accordance with Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004), Volume 2 (DECC, 2008)
- controls and procedures to minimise the potential for hydrocarbons and other contaminants being discharged to the surrounding environment including:
 - storage of solvents, MEA, hydrocarbons and other liquid chemicals within an above ground, bunded areas away from watercourses or area subject to high levels of overland sheet flow
 - re-fuelling of construction vehicles and equipment to be limited to designated areas, with adequate spill management controls
 - emergency spill response procedures
 - maintain an emergency spill kit

- transport and dispose of any captured chemical spills and contaminated soils/materials to a suitable offsite licenced facility
- develop and implement a suitable monitoring regime at discharge location (Section 6.8.4.1), including visual inspections and routine monitoring of relevant physicochemical parameters
- develop and implement a suitable monitoring regime of all stormwater and erosion and sediment control structures, particularly following large flow events
- development of operational stormwater management plan to manage increased stormwater runoff during operations (due to clearing of vegetation and filling for infrastructure) and will consider:
 - diversion of upstream flows around site infrastructure as required, to minimise scouring and erosion
 - inspection and monitoring regimes to maintain stormwater and erosion and sediment control structures
- minimise filling of Project infrastructure to minimise impacts to overland flooding

6.8.4.1. Monitoring

Surface water quality monitoring will be undertaken at the downstream culvert to assess discharged stormwater against the impact assessment criteria. The monitoring regime will include pH, salinity (EC), turbidity, total suspended solids and Oil and Grease during discharge events.

Supagas will also implement an inspection and water quality testing program for potable water stored in tanks on site (delivered by water tanker) to ensure amenities water quality meets the Australian Drinking Water Guidelines – Version 3.5 (National Health and Medical Research Council, 2011).

6.9. Groundwater

Engeny prepared a groundwater assessment for the Project. The groundwater assessment is summarised below and included in Appendix K.

The groundwater assessment was prepared in accordance with the agency advice provided by the EPA and BCS. There were no SEARs requirements to prepare a groundwater assessment. The groundwater assessment considered the following:

- WM Act
- relevant water sharing plans
- 'NSW Aquifer Interference Policy'

6.9.1. Methodology

The groundwater assessment assessed the potential groundwater impacts at nearby sensitive receivers due to the Project based on the groundwater level and quality measurements from the existing bores within the vicinity of the Project.

Assessment of the groundwater bore was not included in the groundwater assessment as it is being separately assessed via a bore dealing assessment.

6.9.2. Existing environment

6.9.2.1. Geology

The Project is located southwest of the Namoi River on generally flat and low-lying riverine plain of the Great Australian Basin. The Project area geology consists of the Quaternary aged alluvium, residuum and colluvium sedimentary deposits formed from prolonged erosion.

6.9.2.2. Hydrogeology

6.9.2.2.1. Groundwater source

Groundwater and surface water resources in the vicinity of the Project are regulated by the 'Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2020' under the WM Act. The Project falls within the Southern Recharge Groundwater Source of the water sharing plan.

The Southern Recharge Groundwater Source comprises the southern region of the Great Artesian Basin and is categorised as a porous rock, highly productive groundwater source. Groundwater flow from the Southern Recharge Groundwater Sources drives groundwater flow in a west and north-west direction. Artesian conditions (i.e. where the groundwater piezometric head is above the ground surface) exist over most of this groundwater source.

6.9.2.2.2. Existing groundwater levels and quality

Publicly available groundwater data (i.e. driller logs and the Santos Water Portal) provides an indication of the groundwater levels and quality near the Project.

The groundwater data indicated that the surrounding depth to groundwater ranges from 14.5 to 22.5 metres below ground level (m BGL). The water quality measured generally has low salinity and recorded as 'fresh' and 'good'.

6.9.2.3. Registered groundwater users

Desktop searches found only one registered groundwater bore within 1 km of the Project. The groundwater bore is approximately 250 m from the Project and is listed as being used for 'stock'.

Santos is also a significant groundwater user in the area for works associated with the NGP.

The existing groundwater bore proposed to be used by the Project is currently non-operational.

6.9.2.4. Groundwater dependent ecosystems

Ecosystems that are dependent or partially dependent on groundwater, or that may be affected or impacted by change in groundwater quality and levels are referred to as groundwater dependent ecosystems (GDE).

High Potential Terrestrial GDEs were identified within 1 km of the Project, with the closest located approximately 590 m to the north-west. The High Potential Terrestrial GDEs are described as shallow freshwater wetland sedgeland in depressions on floodplains on inland alluvial plains and floodplains.

There are no High Value Aquatic Ecosystems GDEs located within 1 km of the Project.

There are no GDEs listed in the Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2020 near the Project.

6.9.3. Impact assessment

6.9.3.1. Groundwater take and drawdown

With respect to the Project design and surrounding groundwater level information, the Project will not intercept groundwater. Therefore, no Project activities will cause groundwater drawdown at nearby high priority GDEs, or a water level decline at any water supply work. Additionally, there will be no permanent groundwater take from the Project during construction and operation, excluding the use of the groundwater bore which is separately being assessed via a bore dealing assessment.

6.9.3.2. Groundwater quality

As the Project will not intercept groundwater, there will not be any change in the groundwater quality and the beneficial use category of the groundwater source.

Potential groundwater impacts due to contamination could occur from leaks and spills of hazardous substance, or leaks and spills associated with road traffic. The risk of contamination is discussed further in Section 6.11 which found the Project is extremely unlikely to result in any measurable groundwater contamination.

6.9.3.3. Aquifer interference policy

The 'NSW Aquifer Interference Policy' outlines the requirements for obtaining water licences and the assessment processes for aquifer interference activities under the WM Act and other relevant legislative frameworks.

Table 6.7 presents the 'NSW Aquifer Interference Policy' minimal impact considerations for highly productive porous rock water sources and indicates how the Project meets these requirements.

Table 6.7 Minimal impact considerations under the NSW Aquifer Interference Policy

Minimal impact considerations	Relevance to the Project
Water table	All groundwater levels are greater than 14 m BGL. Considering there will be no excavation, there will be no interception of groundwater. Therefore, there will be no changes to groundwater levels at nearby groundwater bores. There are no High Value Aquatic Ecosystems GDEs located within 1 km of the Project. There are also no culturally significant sites present listed in the schedule of the relevant water sharing plan near the Project. The Project does not exceed the Level 1 impact considerations.
Water pressure	There are no confined aquifers that will be intercepted. The Project does not exceed the Level 1 impact considerations.
Water quality	There will be no change to the existing groundwater quality or beneficial use category. Changes to groundwater quality due to contamination could occur from leaks and spills of hazardous substances. Chemicals of primary concern include hydrocarbons, or leaks and spill associated with road traffic. Site specific controls, such as proper storage and bunding of chemicals, site drainage and sedimentation basins at key locations will be used around the project to control site runoff. The Project does not exceed Level 1 impact considerations

6.9.4. Mitigation and management measures

The Groundwater Assessment concludes there will be negligible groundwater impacts. Though the Project is extremely unlikely to result in any measurable groundwater contamination, the following controls are proposed to be implemented to minimise contamination risks:

- regular maintenance and inspection of bunded fuel, and oil storage areas to ensure integrity
- proper storage and bunding of chemicals, along with well-designed site drainage and sedimentation basins at key locations to manage site runoff effectively
- provision of spill kits for cleaning up spillages
- training for personnel and regular maintenance and inspection of bunded storage areas to ensure integrity

6.10. Aboriginal cultural heritage

OzArk prepared an aboriginal heritage due diligence assessment for the Project. The aboriginal heritage due diligence assessment is summarised below and included in Appendix L.

The assessment was prepared in accordance with 'Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales' (DECCW, 2010).

6.10.1. Methodology

The assessment included a desktop and visual inspection component. The desktop review included:

- a review of the landscape and environmental context of the Project
- a review of relevant archaeological and ethno-historic information for the local landscape and environments, including a search of the Aboriginal Heritage Information Management System (AHIMS) database

A field investigation undertaken by OzArk and a representative of the Narrabri LALC investigation to confirm the presence of known Aboriginal sites within the Project area and identify the presence of any unknown Aboriginal sites and potential for subsurface objects to occur.

6.10.2. Existing environment

6.10.2.1. Historical disturbance

Aerial imagery from 1964 shows the Project area has previously been almost entirely cleared of all trees with only one remnant tree present along the northern boundary of the Project area. The aerial imagery from 1964 indicates the Project area has likely been subject to ploughing however this is not clear at a desktop level.

6.10.2.2. Database search

A search of the AHIMS was undertaken on 11 June 2025 covering a 100 km² area centred on the Project area. The search returned 37 previously registered Aboriginal sites. None of the AHIMS sites are within the Project area with the closest recorded site is approximately 3.4 km away.

A second AHIMS search was completed over the same area on 20 May 2026 to ensure the continued validity of the AHIMS data. The renewed search indicated that no new sites had been recorded in the search area.

The AHIMS data suggests that Aboriginal people of the past concentrated their use of the land on landforms associated with reliable waterways and it is in such areas that archaeological material is most likely to be present.

6.10.2.3. Previous archaeological studies

A review of previous archaeological studies in the region was completed in Appendix L and indicates that isolated finds are the most likely site type to be recorded within the Project area due to previous levels of disturbance and distance to reliable water. The results of these studies demonstrated that open camp sites consisting of higher density and complexity artefact scatter are most likely along creek banks with lower levels of land disturbance.

6.10.2.4. Landscape features

The landform within the Project area consists of an undifferentiated flat plain. There are no rises, crests or obvious slopes in the Project area.

The surrounding watercourses for the Project are described in Section 6.8.2.1 however the closest watercourse is approximately 400 m away and no part of the Project area is within a water source. Relevantly, the Project is not considered to have any archaeological sensitivity.

6.10.2.5. Field investigation

A visual inspection of the Project area was undertaken by an OzArk archaeologist and Narrabri LALC representative on 27 June 2024. Subsequently, minor changes were made to the Project design layout and the Project area was subject to further fieldwork. The second visual inspection was undertaken by an OzArk archaeologist and a Narrabri LALC representative on 12 June 2025.

Standard archaeological field survey and recording methods were employed during each inspection. The Project area was inspected on foot to ground-truth levels of disturbance and assess the archaeological potential of the landforms.

The field investigation found the Project area was assessed as having low archaeological potential throughout and no Aboriginal sites were identified.

The lack of Aboriginal objects is likely the result of the Project area's combination of limiting factors, namely the small size of area assessed, its distance to a reliable water source, lack of desirable landform features, and the disturbances from previous long-term pastoral land use.

6.10.3. Impact assessment

No Aboriginal cultural heritage sites are known to exist within the Project area and no landforms within the Project area were assessed to have low archaeological potential. An Aboriginal Heritage Impact Permit is not required for the Project.

Therefore, the impacts to Aboriginal cultural heritage will be negligible.

6.10.4. Mitigation and management measures

Mitigation and management measures will be detailed in the CEMP and will include:

- all land ground disturbance activities will remain within the Project area, eliminating the risk of harm to potential Aboriginal objects that may be in adjacent landforms
- inductions for work crews will include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts and are aware of the legislative protection of Aboriginal objects
- in the unlikely event that previously unidentified Aboriginal objects or sites are identified while carrying out works within the proposed area, all activities in the immediate vicinity of the identified Aboriginal object will cease and the procedures in the 'Unanticipated Finds Protocol' (Appendix 2 of the Aboriginal Due Diligence Assessment Report) should be followed

6.11. Contamination

Pando prepared a PSI for potential contamination for the Project. The PSI is summarised below and included in Appendix M.

The PSI assesses the impacts of ground surface disturbance within the disturbance footprint, and investigates potential contamination and potential human and environmental risks based on previous and current land uses. The PSI also defines required management and mitigation measures.

6.11.1. Methodology

The assessment methodology included:

- field-based (April 2025) and desktop site investigation including historical aerial photo and title reviews, environmental database searches, and hydrogeological and geological assessment
- development of a preliminary conceptual site model (CSM), including potential areas of contaminants, transport mechanisms, exposure pathways and sensitive receivers
- determination of whether contamination has the potential to exist, any data gaps and the need for further investigation

The PSI has been prepared in accordance with the R&H SEPP; the 'National Environment Protection (Assessment of Site Contamination) Measure' (NEPC, 1999) (as amended 2013), the 'Guidelines for consultants on contaminated land' (EPA, 2020), and the NSW *Contaminated Land Management Act 1997*.

6.11.2. Existing environment

6.11.2.1. Historical aeriels

The Project area has been historically used for agricultural purposes, with land use remaining largely unchanged until the early 2000s. Historical title records indicate the broader Lot 12 DP1171292 was used for farming from at least 1909 until approximately 2004, after which parts of the broader landholding were used for power generation and petroleum-related activities. Relevant easements for access and transmission infrastructure are present.

Physical development near the Project includes the adjacent WPPS (a licensed petroleum activity) and Tintfield Ponds 1.5 km west, constructed between 2003 and 2013. No contaminated land listings were identified via the NSW EPA, though a historical contamination incident at Tintfield Ponds resulted in localised groundwater impacts. Subsequent remediation and monitoring indicates there are no ongoing contamination concerns. Potential for this localised incident to impact the Project is low noting the spatial separation (approximately 1.7 km from the Project).

Historical aerial imagery indicates the disturbance footprint was predominantly cleared grassland prior to 1956, with scattered trees and limited vegetation occurring from the 1980s. No infrastructure, structures or intensive land uses were identified as occurring within the disturbance footprint, with only minor ground disturbance noted during the site inspection. No signs of contamination, including staining, odours, waste or vegetation stress, were observed. Surrounding infrastructure associated with WPPS appeared well maintained, with no evidence of spills.

There is an extremely low probability of acid sulfate soils, no identified salinity risk, and no records of naturally occurring asbestos.

Overall, existing conditions reflect a history of agricultural land use with more recent energy infrastructure in the surrounding area. No indicators of significant contamination were identified within the Project area.

6.11.2.2. Database search

A Lotsearch was undertaken on 11 April 2025 and included lot 12 and DP1171292 and a 1,000 m buffer. The results of the Lotsearch are found in Appendix M and identified:

- An EPA penalty notice, and section 91 clean up notice for X Line Road, Narrabri, NSW 2390. The notice of clean up action is dated 29 July 2014.
- There is a licenced activity under the PoEO Act on Lot 12 DP1171292 and in the buffer. The licenced activity is 'petroleum, exploration, assessment and production'. This activity relates to the WPPS and gas network.
- A surrendered licence related to other activities on waterways including the application of herbicides for a tributary that traverses Lot 12 DP1171292. This dataset relates to waterways throughout NSW. This tributary would not be impacted by the Project.
- Points of interest included the WPPS (on-site) and homesteads (in the buffer).
- There are major easements related to the gas network.

6.11.3. Impact assessment

6.11.3.1. Potential sources of contamination

No known or potential sources of contamination were identified within the Project area. No evidence of uncontrolled fill, waste disposal, or other contaminating activities were identified.

Historical contamination associated with the 2013 Tintstfield Ponds incident represent a source of potential contamination outside of the Project area. The incident occurred 1.5 km west and involved leakage from pond liners, resulting in localised elevated concentrations of total dissolved solids and metals in groundwater. The affected area was subsequently remediated and the infrastructure upgraded; ongoing monitoring has not identified any further incidents or exceedances.

WPPS has not been identified as a contaminating activity; it appears well constructed, is well maintained and there were no spills or contamination observed. Therefore, potential contamination originating from WPPS is negligible.

6.11.3.2. Potential receivers

Potential receivers include construction workers, maintenance personnel, and underlying groundwater resources. Ecological receivers include surface water systems and associated ecosystems within the broader landscape.

6.11.3.3. Transport mechanisms and exposure pathways

Potential transport mechanisms for identified contaminants of potential concern are limited and primarily relate to groundwater migration from the Tintstfield Ponds incident. However, environmental exposure pathways are considered highly unlikely given the distance and absence of ongoing contamination.

Other generic mechanisms include soil disturbance during construction and overland flow during rainfall events. The most relevant exposure pathways will occur during construction and include dermal contact with groundwater, incidental ingestion, and inhalation of dust. However, potential for encountering groundwater during construction is extremely unlikely given the depth to groundwater.

6.11.3.4. Risk assessment

The preliminary CSM indicates there are no complete or credible exposure pathways identified for the Project. Potential impacts, if any, will be limited to the unlikely disturbance of previously unidentified contamination during construction.

The Project is extremely unlikely to result in any measurable cumulative soil or groundwater contamination.

The likelihood of significant contamination is extremely low and no further investigation is required.

6.11.4. Mitigation and management measures

The following standard measures will be adopted to manage potential impacts from contamination:

- if excavation or construction activities expose unexpected odours, staining, fill material, or other potential indicators of contamination, a suitably qualified environmental consultant should be engaged to reassess the site conditions
- any fill material imported to the site must comply with the requirements for Virgin Excavated Natural Material, with supporting documentation confirming the classification obtained and retained
- any spoil or excavated material to be removed from the site must be classified in accordance with the 'NSW EPA Waste Classification Guidelines' (EPA, 2014) prior to disposal and transported to a licensed waste facility that is approved to receive that waste class
- mitigation and management measures for potential contamination impacts from the Project are described in Sections 6.8.4 and 6.9.4

6.12. Waste management

The waste management assessment has been prepared in response to the SEARs, providing details of waste handling including transport, identification, receipt, stockpiling and quality control including off-site reuse and disposal

6.12.1. Methodology

A wastewater assessment was conducted to identify and classify potential waste sources generated by the Project, and review appropriate management and mitigation strategies to either reduce or correctly dispose waste.

Waste generated by the Project has been assessed in consideration of the following:

- PoEO Act
- *Waste Avoidance and Resource Recovery Act 2001*
- 'NSW Waste Avoidance and Sustainable Materials Strategy 2041' (EPA, 2021).
- 'NSW Waste Classification Guidelines' (EPA, 2014)

The Project would use the general hierarchy of resource management outlined in the *Waste Avoidance and Resource Recovery Act 2001* in the following order to manage waste generated by the Project:

- waste avoidance, prevention, or reduction of waste generation. Achievable through better design and purchasing choices
- waste reuse, reuse without substantially changing the form of the waste
- waste recycling, treatment of waste that is no longer usable in its current form to produce new products
- energy recovery, processing of residual waste materials to recover energy
- waste treatment, reduce potential environmental, health and safety risks
- waste disposal, in a manner that causes the least harm to the natural environment

6.12.2. Impact assessment

6.12.2.1. Construction waste

A summary of the waste generated during Project construction, in consideration of the 'NSW Waste Classification Guidelines' (EPA, 2014), is provided in Table 6.8.

Table 6.8 Summary of construction waste type and classification

Classification	Description	Indicative construction	Indicative operational
General solid waste (non-putrescible)	• vegetative waste from vegetation clearance • cardboard and plastic packing waste • excess building materials • wood (e.g. from pallets) • general waste (e.g. cans, glass bottles)	50 t	500 kg/month
	• excavated material from excavation and soils works	4,000 t	N/A
General solid waste (putrescible)	• General waste (e.g. food scraps)	150 kg/month	50 kg/month
Liquid waste	• Oils, fuels, contaminated water from washing equipment	40 kg/month	20 kg/month

6.12.2.2. Wastewater management

A summary of the proposed wastewater management for the Project is provided in Section 3.3.3. Potential impacts associated with each of the management options is detailed in Table 6.9.

Table 6.9 Summary of potential impacts from wastewater management options

Wastewater management option	Wastewater stream	Feasibility and potential impacts
Irrigation	Treated wastewater	The proposed irrigation of treated wastewater has been assessed in the BAR (Appendix D), the SWA (Appendix J) and Groundwater Assessment (Appendix K) prepared for the Project. Minesoils has also prepared a LCA (Appendix N) in accordance with 'Environmental Guidelines, Use of Effluent by Irrigation' (DEC, 2004) to assess the potential impacts associated with the irrigation of treated wastewater. The LCA found that there are limitations to the volume of treated wastewater to be irrigated due to the soil profile and drainage characteristics of the soils within the Project Area. Whilst the soils appear to have adequate depth, the drainage and physio-chemical parameters will require regular monitoring to minimise any potential impacts. The proposed monitoring, mitigation and management measures proposed for the irrigation of treated waste water is described in Section 6.12.3.1.
Transfer to Santos' existing water management infrastructure	Treated wastewater	Supagas, in consultation with Santos, is investigating the feasibility of the transfer and receipt of treated wastewater to waste storage ponds with the NGP or Tintsville, which would be subject to separate approvals.
Offsite disposal as trade waste	Untreated wastewater	Potential impacts are limited to an increase in truck movements associated with the transport of wastewater to the disposal site. The disposal of wastewater as trade waste will be completed in accordance with NSC's 'Liquid Trade Waste Policy' (NSC, n.d.). Subject to further discussion with NSC, an application for liquid trade waste approval may be submitted, including details on the water quality parameters as per the Liquid Trade Waste Policy.
Offsite disposal to a licensed facility	Untreated wastewater and sewage generated on site	Potential impacts associated with this option are limited to a minor increase in truck movements associated with the transport of wastewater to the disposal site.

6.12.3. Mitigation and management measures

Mitigation and management measures to reduce potential impacts from Project waste are as follows:

- Project-generated waste would be managed in accordance with the PoEO Act and the *Waste Avoidance and Resource Recovery Act 2001*
- waste would be classified, stored and handled in accordance with the 'NSW Waste Classification Guidelines' (EPA, 2014)
- a Waste Management Plan will be prepared for the Project and would include the following:
 - a summary of anticipated waste streams generated during construction and operation of the Project
 - a detailed description of the wastewater management and optionality for the Project
 - measures to manage waste in accordance with the general hierarchy for resource management
 - consultation with the NSC and licensed waste management facilities to confirm the capacity of nearby facilities and their availability to manage the Project's waste
 - on-site waste management measures in line with the relevant guidelines
 - commitments around disposal of Project assets at the completion of operations

6.12.3.1. Irrigation management

Prior to any irrigation occurring, a threatened species survey will be completed in accordance with the methods described in Section 6.1.4.

Water quality monitoring will be conducted on the water treatment plant outlet stream to determine if irrigation is an appropriate water management option:

- If the treated wastewater can be treated to required limits, it may be used for irrigation.
- If the treated wastewater cannot be treated to required limits, it will be collected in containment tanks for disposal off site.

The irrigation design and operation will be confirmed by the preparation of a detailed irrigation plan however will generally be undertaken in accordance with the recommendations of the LCA:

- Prior to completing any irrigation, the weather forecast and the moisture content of the soil are checked. Treated wastewater is only irrigated when the soil is sufficiently dry to absorb the applied liquid and should not occur within 48 hours of heavy rain. Irrigation will not occur if significant rainfall is expected.
- The soil is monitored during irrigation to ensure there is no surface pooling or runoff.
- The irrigation system is set up to apply treated wastewater at the target rate.
- Details of the following are recorded by operational personnel: – date of irrigation – weather forecast summary, including rainfall – assessment of likelihood of amenity impacts – utilisation area – target and actual rate of application (mm)
- An annual environmental report is prepared that includes
 - soil analysis results for samples taken from any irrigated area
 - analysis results of the treated wastewater for irrigation

6.13. Visual amenity

The visual amenity assessment has been prepared in response to the SEARs, requiring an evaluation of Project-related visual impacts at both privately-owned receivers and public vantage points.

This section assesses these potential Project impacts and describes mitigation measures to be implemented to ensure potential visual impacts are avoided and minimised.

6.13.1. Methodology

This assessment has been undertaken generally in accordance with the principles of 'Guidelines for Landscape and Visual Impact Assessment, 3rd Edition' (GLVIA3) (Landscape Institute and IEMA, 2013), adapted as appropriate to the NSW planning and assessment context and DPHI expectations.

This assessment methodology included:

- desktop review to identify the landscape and visual study area (LVSA), establish scenic quality, condition and visual amenity, including review of aerial imagery, topography, vegetation, land use, environmental and planning spatial datasets and photographs
- preliminary viewshed, receiver selection and theoretical visibility analysis using a digital elevation model and LiDAR survey data, assuming maximum structure heights of 24 m and 38 m
- assessment of visual effects, including
 - visual receiver identification: groups of people or viewpoints who may be affected
 - evaluation of receiver sensitivity: how sensitive the receiver is to change depending on the nature of their activity and the value attached to the view
 - evaluation of magnitude of change: predicting changes to the view considering visibility, distance from the receiver or viewpoint, geographic extent of change, view composition and exposure
- evaluation of significance, by combining judgements of sensitivity and magnitude to determine the significance of the effect on visual amenity and views
- identification of measures to avoid, minimise or offset impacts, as required

6.13.2. Existing environment

The Project is surrounded by established land uses, including infrastructure associated with the WPPS. Features include energy-related infrastructure (gas extraction and power generation), existing above-ground and underground pipelines, access tracks and utility infrastructure.

Sensitive receivers surrounding the Project are shown in Figure 2.1.

More broadly, the Project is within a rural landscape which experiences low vertical relief within the immediate surrounds. The LVSA is characterised by broad, relatively flat agricultural land with scattered agricultural and rural development. The Project is also situated within the NGP which includes existing and approved coal seam gas infrastructure.

Vegetation within 800 m of the Project is relatively dense, notably to the northeast, northwest, west and southwest and provides intermittent natural screening. Beyond this, vegetation becomes sparse, consisting largely of cleared paddocks with occasional trees and shrubbery. Brigalow Nature Reserve and Pilliga State Forest are 8 km and 15 km south/south-west of the Project, respectively.

Dense riparian vegetation also surrounds Bohena Creek 1 km east of the Project.

The Project is located within a designated Dark Sky region, associated with the Siding Spring Observatory 117 km south, which increases sensitivity to artificial lighting.

6.13.3. Impact assessment

Visual impacts relate to changes in the appearance of the landscape experienced by people at specific viewpoints or locations.

6.13.3.1. Landscape and visual study area

The Project involves the construction and operation of a CO₂ processing facility with vertical infrastructure components including gas processing towers (up to 24 m and 38 m in height), storage vessels and ancillary infrastructure.

A LVSA extending 2 km from the Project has been adopted to capture the zone of potential visibility and likely visual influence of the Project components. In accordance with GLVIA3, the extent of the LVSA has been informed by the scale and nature of the Project, the degree to which visual effects are likely to occur and the character of the receiving landscape.

The LVSA is appropriate having regard to the:

- relatively flat landforms of the locality and limited-long distance visibility
- presence of existing dense vegetated zones surrounding the Project and along road corridors
- predominantly rural and working pattern of land use and settlement
- Project's location and proximity to existing and operational electricity-related development
- limited number of potential receivers and limited population density

The LVSA is considered to have a low to moderate scenic quality due to these features. Therefore, potential visual effects are anticipated to be localised, and a wider visual catchment will not materially alter the findings of this assessment.

6.13.3.2. Viewshed analysis

GIS was used to model the geographic area from which the Project could potentially be seen helping to select visual receivers and representative viewpoints for further assessment. This was completed using a viewshed analysis, determining the zone of theoretical visibility (ZTV) based on topography. A ZTV analysis was completed for the 24 m high stripper and one for the 38 m high tower (shown as purple and grey extents, respectively) (Figure 6.1).

Comparing these ZTV analyses allows for a direct assessment of how each component from 24 m to 38 m in height expands the visual "footprint" in the LVSA. Notably, resulting effects to receivers is comparable.

6.13.3.3. Visual receptors

A total of five potential visual receptors were identified within the 2 km LVSA (Figure 6.1). Of these, receptors "R12", "R13", and "R32" have potential theoretical visibility. R12, and R13 are owned by Santos (i.e. are excluded from the assessment). R32 is a privately-owned, rural residential dwelling located at the 2 km LVSA extent. All other receivers had no theoretical visibility (at the location of the primary dwelling) and were all discontinued.

There are limited public vantage points within the LVSA, with Yarrie Lake Road to the north and Kiandool Lane to the west the primary local roads.

SUPAGAS CO₂ PLANT

Figure 6.1
Zone of theoretical visibility

LEGEND

 Project Area

 Buffer line

Visual receptor

 No theoretical visibility

 Theoretical visibility

Infrastructure and watercourse

 Sub-arterial road

 Local road

 Major watercourse

Zone of theoretical visibility at 38 m

 High visibility

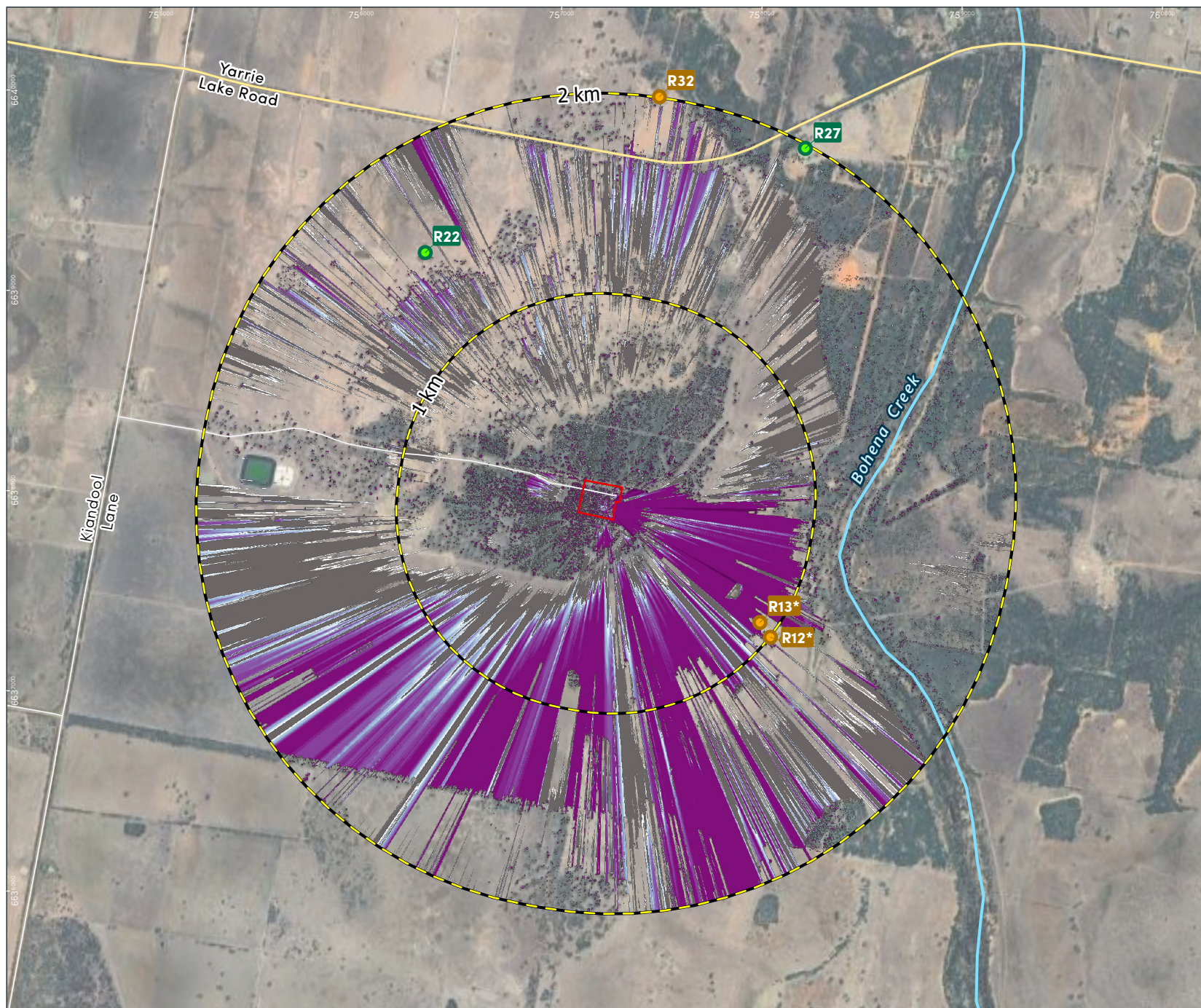
 Low visibility

Zone of theoretical visibility at 24 m

 High visibility

 Low visibility

* R12 and R13 are owned by Santos



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Author: Jett McLachlan



Scale: A4 1:27,500
Datum: GDA2020 MGA Zone 55

6.13.3.4. Visual impact assessment

Potential visual receptor R32 is identified as having theoretical visibility of both modelled vertical components. R32 is a privately-owned, rural-residential dwelling located on the north side of Yarrie Lake Road. It has a private open space orientated northward, away from the Project.

The sensitivity of rural-residential receptors is typically identified as low to moderate, where the viewpoint relates to a dwelling's secondary view within the RU1. Whilst visibility at R32 has not been confirmed via on-site verification, visibility of the Project is expected to be limited and localised, where any views would be partial and filtered due to the relatively flat topography and intervening vegetation. Further, the introduction of additional vertical industrial elements within an existing working rural landscape, co-located with the existing WPPS, will not be visually contrasting. The sensitivity rating of R32 has therefore been assessed as low.

The magnitude of change for R32 is expected to be very low, due to:

- extent of visible structures are clustered within an existing industrial site (i.e. the height of the six existing WPPS exhaust stacks are 15 m), and when seen in context of existing infrastructure they are not visually dominant nor out of character
- consistency with established energy and industrial character already present within the LVSA
- distances greater than 1 km significantly reduce visual prominence
- vegetation providing screening
- likelihood of intermittent and oblique views, not experienced from the primary dwelling outlook

Overall, visual impact is assessed as very low. No receptor-specific mitigation is required for R32.

Similarly, the impact on public vantage points is comparable. Kiandool Lane is located beyond the 2 km LVSA, whilst Yarrie Lake Road is located within the northern LVSA extents, 1.7 km from the Project. Despite partial theoretical visibility, actual views of the Project are expected to be brief, transitory and heavily obstructed due to distance related visibility reduction and existing roadside vegetation. Any public views would also be viewed in motion and seen alongside existing infrastructure, effectively obstructing direct visibility. No further consideration or mitigation of public vantage points is required.

Given the Project's location within a Dark Sky Region, lighting has the potential to increase visual presence at night. However, impacts are expected to be minimal and localised, due to the limited nature of light polluting operational Project activities.

6.13.4. Mitigation and management measures

The following measures will be implemented to minimise visual impacts:

- maintain a compact Project layout and limit the spatial footprint, as far as practicable
- select non-reflective finishes and neutral / natural colours for infrastructure and buildings to reduce visual contrast with the surrounding landscape, as far as practicable
- minimise vegetation removal associated with the Project, as far as practicable
- minimise the off-site lighting impacts and ensure any Project lighting:
 - required for the Project will be installed with consideration of the 'Dark Sky Planning Guideline' (DPE, 2022)
 - is installed as low intensity lighting (except where required for standards, safety, maintenance or emergency purposes)
 - does not shine above the horizon
 - complies with Australian Standard/New Zealand Standard *AS/NZS 4282:2023 – Control of Obtrusive Effects of Outdoor Lighting* (or the latest version)

6.14. Cumulative impacts

Given the Project's location in a rural landscape, the main cumulative impacts would be in relation to the WPPS which is located adjacent to the Project. The WPPS is owned by Santos and operates as a gas fired power station up to an approved capacity of 40 megawatts using gas extracted from the NGP.

The cumulative impacts of the Project in relation to the WPPS have been discussed, where relevant, in the respective sections and specialist report.

7. Justification and conclusions

7.1. Project objectives

The objectives of the Project are as follows:

- Produce a high purity CO₂ product which meets the quality standards specified by the International Society of Beverage Technologists and European Industrial Gases Association.
- Utilise a waste stream to facilitate local supply of CO₂ product to a range of industries.
- Create a new opportunity for ongoing investment in the region.
- Design the Project to avoid sensitive environmental features and minimise impacts as far as practical.

To fulfil these objectives, Supagas are seeking approval for the construction and operation of the Project as outlined in this EIS.

7.1.1. Objects of the EP&A Act

This EIS supports a development application under Part 4 of the EP&A Act. The relevant objectives under section 1.3 of the EP&A Act are:

- 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
- to promote productivity through the development and management of the State and its resources
- to protect the environment, including the conservation of threatened species of native animals and plants and ecological communities and their habitats
- to promote resilience to climate change and natural disasters through adaptation, mitigation, preparedness and prevention
- to promote the sustainable management of built and cultural heritage, including Aboriginal cultural heritage
- to promote good design, amenity and the proper construction and maintenance of built environments, including the protection of the health and safety of the occupants of buildings
- to provide opportunities for participation in environmental planning and assessment
- to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment
- to promote a proportionate and risk-based approach to environmental planning and assessment
- to promote the orderly and economic use and development of land.

The Project is consistent with the objectives under section 1.3 of the EP&A Act as it:

- creates a new opportunity for ongoing investment in the region and enable supply of products to a range of industries in the Australian market that would otherwise have been wasted (i.e. beneficial reuse)
- results in local/regional environmental benefits by removing approximately 72 tpd of CO₂ emissions from the operation of the WPPS, which would otherwise have been discharged directly into the local environment/atmosphere as a waste
- is permissible in accordance with the relevant environmental planning instruments
- incorporates the outcomes of stakeholder engagement
- the EIS has been prepared in accordance with a proportionate and risk-based approach

7.2. Ecologically sustainable development

The Project has considered the principles of ecologically sustainable development as defined in section 6(2) of *Protection of the Environment Administration Act 1991*. A summary of how the principles have been considered is provided in the following sections

7.2.1. Precautionary principle

Environmental assessment involves predicting the likely environmental outcomes of a development. The precautionary principle reinforces the need to take risk and uncertainty into account, especially in relation to threats of irreversible environmental damage.

The technical assessment completed has evaluated the potential harm to the environment from the Project and has taken into account the risks and uncertainty through detailed analysis.

The findings of the technical assessment are presented in Section 6 and the relevant appendices. A range of management and mitigation measures have been adopted by Supagas as components of the Project design to minimise potential for impacts to the environment. The management and mitigation measure to are described in Section 6 and summarised in Appendix B.

7.2.2. Inter-generational equity

Inter-generational equity is the concept 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, while intra-generational equity is applied within the same generation.

The principles of social equity are addressed through the implementation of management and mitigation measures (Appendix B) and any environmental monitoring programs.

Not proceeding with the Project will also result in a significant lost economic benefit associated with the Project, including reduced employment opportunities and flow-on employment.

7.2.3. Conservation of biological diversity and ecological integrity

This principle holds that the conservation of biological diversity and the maintenance of ecological integrity should be a fundamental consideration for development proposals.

The biodiversity assessment completed for the Project describes the potential impacts on the biological and ecological environment and associated mitigation measures.

7.2.4. Improved valuation, pricing and incentive mechanisms

This principal of improved valuation and pricing of environmental resources is based on environmental factors being included in the valuation of assets and services. The cost associated with impacting upon the environment or an environmental resource is seen as a cost incurred to use that resource.

Wherever possible, direct environmental effects of the Project would be internalised through the adoption and funding of mitigation measures by Supagas to mitigate potential environmental impacts.

The benefits of the Project are considered to outweigh the impacts, with economic advantages expected during the construction and operation of the Project.

7.3. Justification and conclusion

The Project includes the construction and operation of a CO₂ plant, which will capture and process exhaust gas from gas generators within the WPPS. The Project will produce approximately 72 tpd of high purity, liquid CO₂, with allowance for storage of approximately 800 t prior to transport off-site.

The location of the Project is considered suitable as:

- it is co-located adjacent to the existing WPPS site and Essential Energy substation, allowing for the efficient recovery of its waste stream and use of existing facilities (e.g. site access, and electricity supply)
- it is unlikely to result in a conflict with other land uses
- the nearest privately-owned receiver is situated approximately 1.5 km to the north-west of the Project

Australia currently has a shortage of locally produced high purity CO₂ and currently imports CO₂ from sources in Asia to meet its increasing demands. Gas produced from the combustion of natural gas largely contains CO₂, which is typically discharged to the atmosphere as a waste stream. In its current arrangement, exhaust gas from the WPPS is discharged to the atmosphere via exhaust stacks.

The Project proposes the construction and operation of a CO₂ plant to recover exhaust gas from natural gas combustion and produce a high purity (i.e. up to 99.9% pure) CO₂ product for transport to Australian markets. Key applications of high purity CO₂ in Australian markets includes the following:

- Food and beverage carbonation – liquid CO₂ is injected into beverages like soda, beer, and sparkling wine to create the fizz.
- Freezing and chilling – CO₂ is used for quick-freezing food products and for maintaining low temperatures during storage and transport.
- Welding and metal fabrication – CO₂ acts as a shielding gas, protecting the weld area from atmospheric contamination and oxidation.
- Chemical production – liquid CO₂ is a feedstock for various chemical processes, including the production of methanol and urea.
- Fire extinguishers – CO₂ is used to displace oxygen and extinguish electrical and liquid fires.
- Agriculture – CO₂ can be used to enrich greenhouse air, promoting plant growth.
- Medical – liquid CO₂ can be used in cryosurgery to freeze and destroy abnormal tissue.

The recovery of the CO₂ from the WPPS waste stream, which would otherwise have been discharged directly into the atmosphere, is an economically viable source of CO₂. The Project shows a commitment by Supagas to provide Australian CO₂ customers with a secure and reliable supply of high purity CO₂, thereby reducing Australia's reliance on imported products.

The Project has a positive benefit as it will:

- create a new opportunity for ongoing investment in the region and enable supply of products to a range of industries in the Australian market that would otherwise have been wasted (i.e. beneficial reuse)
- result in local/regional environmental benefits by removing approximately 72 tpd of CO₂ emissions from the operation of the WPPS, which would otherwise have been discharged directly into the local environment/atmosphere as a waste

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Appendix A

EP&A Regulation and SEARs compliance table

Table A.1 Sections 190 and 192 of the EP&A Regulation

Aspect	Details	Where addressed
190 Form of environmental impact statement	An environmental impact statement must contain the following information—	Declaration table
	• the name, address and professional qualifications of the person who prepared the statement,	
	• the name and address of the responsible person,	Declaration table
	• the address of the land—	Declaration table
	◦ to which the development application relates, or	
	◦ on which the activity or infrastructure to which the statement relates will be carried out,	
	• a description of the development, activity or infrastructure,	Section 3
192 Content of environmental impact statement	• 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.	Section 6
	• The person preparing the statement must have regard to—	N/A to the Project
	◦ for State significant development—the State Significant Development Guidelines, or	
	◦ for State significant infrastructure—the State Significant Infrastructure Guidelines.	
	• An environmental impact statement must also contain a declaration by a relevant person that—	Declaration table
	◦ the statement has been prepared in accordance with this Regulation, and	
	◦ the statement contains all available information that is relevant to the environmental assessment of the development, activity or infrastructure, and	
192 Content of environmental impact statement	An environmental impact statement must contain the following—	Executive summary
	• a summary of the environmental impact statement,	
	• a statement of the objectives of the development, activity or infrastructure,	Section 1.1.3
	• (Repealed)	N/A
	• an analysis of the development, activity or infrastructure, including—	Section 3
	◦ a full description of the development, activity or infrastructure, and	
	◦ 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 2.2
	◦ the significant likely impacts on the environment of the development, activity or infrastructure, and	Section 6
	◦ a full description of the proposed measures to mitigate adverse effects of the development, activity or infrastructure on the environment, and	Section 6

Aspect	Details	Where addressed
	◦ 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,	Section 4.2
	◦ a compilation, in a single section of the environmental impact statement, of the proposed measures referred to in paragraph (d)(iv),	Appendix C
	◦ 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.	Section 7

Table A.2 NSW Planning Secretary's Environmental Assessment Requirements 1946

Issues	Details	Where addressed
General requirements	- strategic and statutory context – including: - detailed justification that the proposed land use is permissible	Section 4.1.3
	a detailed justification for the proposal and suitability of the site for the development	Sections 2.1 and 2.2
	a demonstration that the proposal is consistent with all relevant planning strategies, environmental planning instruments, development control plans (DCPs), or justification for any inconsistencies	Section 4
	a list of any approvals that must be obtained under any other Act or law before the development may lawfully be carried out	Section 4
	a description of how the proposed development integrates or relates with existing on-site and adjacent site operations.	Section 3.7
	- suitability of the site – including: - a detailed justification that the site can accommodate the proposed processing capacity, having regard to the scope of the operations and its environmental impacts and relevant mitigation measures	Section 2.2
	site plan depicting the proposed layout, including the location of machinery and equipment.	Figure 3.1
Biodiversity	accurate predictions of any vegetation clearing on site or for any road upgrades	Section 6.1 and Appendix D Wetlands are N/A to the Project
	an assessment of the proposal in accordance with the Biodiversity Assessment Method (BAM) including the potential impacts on any threatened species, populations, endangered ecological communities or their habitats and groundwater dependent ecosystems.	
	details of the hydrology of the wetland in relation to the ecological and hydrological function of the wetland, including drainage through the wetland, and an assessment of potential changes to the depth of standing water and any effects on survival of the wetland plants	
	details of weed management during construction and operation in accordance with existing State, regional or local weed management plans or strategies	
	a detailed description of the measures to avoid, minimise, mitigate and/or offset biodiversity impacts	
Traffic and transport	details of road transport routes and access to the site	Section 6.2 and Appendix E
	road traffic predictions for the development during construction and operation	
	swept path diagrams depicting vehicles entering, exiting and manoeuvring throughout the site	
	an assessment of impacts to the safety and function of the road network and the details of any road upgrades required for the development.	

Issues	Details	Where addressed
Hazards and risk	a preliminary risk screening completed in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021, Chapter 3 and Applying SEPP 33 (DoP, 2011), with a clear indication of class, quantity and location of all dangerous goods and hazardous materials associated with the development. Should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011)	Section 6.3 and Appendix F
	The PHA must also include all potential hazards and risks associated with the process CO₂ absorption, stripping and liquefaction	
	an assessment of flood risk on the site. The assessment should determine: the flood hazard in the area; address the impact of flooding on the proposed development, and the development's impact (including filling) on flood behaviour of the site and adjacent lands; and address adequate egress and safety in a flood event	Section 6.8 and Appendix J
	an assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines	Section 6.4 and Appendix G
Noise and vibration	a description of all potential noise and vibration sources during construction and operation, including road traffic noise	Section 6.5 and Appendix H
	a noise and vibration assessment in accordance with the relevant Environment Protection Authority guidelines	
	a description and appraisal of noise and vibration mitigation and monitoring measures	
Air quality and odour	a quantitative assessment of the potential air quality, dust and odour impacts of the development, during both construction and operation, in accordance with relevant Environment Protection Authority guidelines	Section 6.6 and Appendix I
	a description and appraisal of air quality and odour impact mitigation and monitoring measures, in line with International Best Practice	
Soil and water	a description of local soils, topography, drainage and landscapes	Sections 6.8 and Appendix J
	details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000	
	an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment	
	details of sediment and erosion controls	
	a detailed site water balance	
	an assessment in accordance with ASSMAC Guidelines for the presence and extent of acid sulfate soils (ASS) and potential acid sulfate soils (PASS) on the site and, where relevant, appropriate mitigation measures	
	an assessment of potential impacts on the quality and quantity of surface and groundwater resources	
	details of the proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts	

Issues	Details	Where addressed
	a description and appraisal of impact mitigation and monitoring measures	
Contamination	a site contamination assessment in accordance with the Managing Land Contamination Planning Guidelines: SEPP 55 – Remediation of Land (DUAP, 1998)	Section 6.11 and Appendix M
	Characterisation of the nature and extent of any contamination on the site and surrounding area	
Waste management	details of waste handling including transport, identification, receipt, stockpiling and quality control including off-site reuse and disposal	Section 6.12
	the measures that would be implemented to ensure that the proposed development is consistent with the aims, objectives and guidelines in the NSW Waste Avoidance and Sustainable Materials Strategy 2041	
Community and stakeholder engagement	a community and stakeholder participation strategy which identifies who in the community has been consulted and a justification for their selection, other stakeholders consulted and the form(s) of the consultation, including a justification for this approach	Section 5
	details of how issues raised during stakeholder consultation have been addressed and whether they have resulted in changes to the proposal	
Visual	an impact assessment at private receptors and public vantage points.	Section 6.13
Consultation	During the preparation of the EIS, you must consult the relevant local, State and Commonwealth government authorities, service providers and community groups, and address any issues they may raise in the EIS. In particular, you should consult with the:	Section 5
	Environment Protection Authority (EPA)	
	Transport for NSW (TfNSW)	
	NSW Rural Fire Service	
	Fire Rescue NSW	
	WaterNSW	
	Narrabri Shire Council	
	Narrabri Local Aboriginal Land Council	
	the surrounding landowners and occupiers that are likely to be impacted by the proposal	
	Details of the consultation carried out and issues raised must be included in the EIS	

Appendix B

Narrabri Shire Council and other agency requirements

Table B.1 Narrabri Shire Council assessment requirements

Issues	Details	Where addressed
Biodiversity	Clearing of vegetation should be minimised where practical. Impacts of construction, including clearing of potentially threatened flora, fauna and ecological communities, should be investigated and a biodiversity development assessment report prepared. (Note: Any clearing in the land identified on the Biodiversity Values Map for the access road will trigger the requirement for a BDAR for the whole development)	Section 6.1 and Appendix D
	Detailed investigation into vegetation clearing for any access or road upgrades required for the project should be undertaken. This should include upgrades required to satisfy bushfire guidelines given the site is identified as Bushfire prone land.	
	Further assessment should be undertaken to determine the presence of any threatened ecological communities (TECs) and threatened or migratory species within the investigation area.	
Traffic and Transport	Construction of the project will generate additional light and heavy vehicle movements on the local road network and should be further investigated as part of a Traffic Impact Assessment report, this should include:	Section 6.2 and Appendix E
	Specific details of proposed transport routes and access to site	
	Assessment of impact to the road network including detail of all proposed heavy traffic movements and consideration to the suitability of the existing road network along with dilapidation reports as appropriate.	
	Traffic predictions for both construction and operation	
	Details of road upgrades required for the development with consideration to safety and function of the road network.	
Hazards and Risks	Should preliminary screening indicate that the project is "potentially hazardous" a Preliminary Hazard Analysis (PHA) must be prepared in accordance with Hazardous Industry Planning Advisory Paper No. 6 - Guidelines for Hazard Analysis (DoP, 2011) and Multi-Level Risk Assessment (DoP, 2011). The PHA should also include all potential hazards and risks associated with the process CO₂ absorption, stripping and liquefaction	Section 6.3 and Appendix F
	A Flood risk assessment report should be undertaken to assess flood risk on the site. The report should include flood hazard in the area, the impact of flooding on the proposed development as well as the development's impact on flood behaviour of the site and adjacent lands (including any filling). It should also address adequate egress and safety during a flood event.	Section 6.8 and Appendix J
	The site is identified as Bushfire prone land, as such an assessment of bushfire risks and asset protection zones (APZ) in accordance with NSW Rural Fire Service guidelines should be included as part of the EIS.	Section 6.4 and Appendix G

Issues	Details	Where addressed
Nosie and Vibration	Operation of machinery during construction, including clearing, excavation and building works, would generate noise with the potential to affect sensitive receptors such as rural residences. Operation of the project would also generate noise related to the development. A detailed Noise and Vibration assessment should be undertaken to further understand these impacts and to identify and implement mitigation and monitoring measures.	Section 6.5 and Appendix H
Aboriginal Cultural Heritage	The area may hold cultural significance to First Nations people including cultural heritage sites, and more broadly, the cultural heritage value of the environment generally. A detailed Aboriginal Heritage Assessment should be undertaken as part of the EIS documentation including consultation with Registered Aboriginal Parties (RAPs).	Section 6.10 and Appendix L
Air Quality and Odour	Investigation into the potential air quality, dust and/or odour impacts of the development, during both construction and operation, in accordance with relevant Environment Protection Authority guidelines should be undertaken to further understand the potential impacts and to identify and implement mitigation and monitoring measures	Section 6.6 and Appendix I
Soil and Water	Impacts of the development (including flooding and flood modelling) on surrounding watercourses, groundwater resources and surface water movements should be assessed, and measures proposed to monitor, reduce and mitigate these impacts. This should also include an assessment of potential impacts on floodplain and stormwater management and any impact to flooding in the catchment.	Sections 6.8 and Appendix J
	details of proposed stormwater and wastewater management systems (including sewage), water monitoring program and other measures to mitigate surface and groundwater impacts.	
	details of water usage for the proposal including existing and proposed water licencing requirements in accordance with the Water Act 1912 and/or the Water Management Act 2000.	
	Analysis of local soils, topography of the site, drainage and landscape	
Landscape and Visual	An assessment report, including an impact assessment at private receptors and public vantage points, to investigate likely visual impacts of the project should be prepared along with mitigation measures to manage any potential impacts identified.	Section 6.13
Contamination	A contamination assessment report should be undertaken including the nature and extent of any contamination found both on the site and within the surrounding area.	Section 6.11 and Appendix M
Waste Management	A waste management plan should be developed including details of waste handling including transport, identification, receipt, stockpiling and quality control including off-site reuse and disposal.	Section 6.12
Social Impact	Council recognises that the construction workforce numbers as stated in the scoping report is going to be approximately 20 for a 6-month period. Council would like to advise that Narrabri already has a tight rental market and, in an effort, to not exacerbate the current market shortages, the existing Civeo accommodation facility should be utilised for the term of construction to house any non-local workforce.	Section 3.4.2
	Further, Council recognises that construction of the Wilga Park Power Station Carbon Dioxide Plant will be limited in both workforce and timeframe. Council highlights the opportunity to employ local Narrabri Shire residents to construct the facility and then for operating the facility in an ongoing basis. This could be seen as a training opportunity for residents in a new industry.	Section 3.5.2

Table B.2 Biodiversity, Conservation and Science Group assessment requirements

Issues	Details	Where addressed
Biodiversity	The EIS must assess the impact of the proposed development on biodiversity values to determine if the proposed development is “likely to significantly affect threatened species” for the purposes of Section 7.2 of the Biodiversity Conservation Act 2016 (BC Act), as follows: - The EIS must demonstrate and document how the proposed development exceeds, or does not exceed, the biodiversity offsets scheme threshold as set out in Section 7.4 of the BC Act 2016 and Clause 7.1 of the Biodiversity Conservation Regulation 2017 (BC Regulation) by determining whether the proposed development involves: - The clearing of native vegetation exceeding the thresholds listed under Clause 7.23 of the BC Regulation, or ii. The clearing of native vegetation, or other action, on land included on the Biodiversity Values Map published under Clause 7.23 of the BC Regulation (this map includes areas of outstanding biodiversity value, as declared under Section 3.1 of the BC Act). - If the proposal does not trigger any of the criteria in (a) above, then the EIS must determine whether the proposed development is likely to have a significant impact based on ‘the test for determining whether proposed development likely to significant affect threatened species or ecological communities’ in Section 7.3 of the BC Act. - Where there is reasonable doubt regarding potential impacts, or where information is not available, then a significant impact upon biodiversity should be considered likely when applying the test in Section 7.3 of the BC Act. Where it is concluded that there is no significant impact, the EIS must justify how the conclusion has been reached.	Section 6.1 and Appendix D
	- If the development exceeds the thresholds in (a) or (b), then the EIS must be accompanied by a biodiversity development assessment report (BDAR) prepared in accordance with Part 6 of the BC Act. That is, the Biodiversity Assessment Methodology applies. - Where development is considered “likely to significantly impact on threatened species” and a Biodiversity Development Assessment Report is required, the following requirements apply: - Biodiversity impacts related to the proposal are to be assessed in accordance with the Biodiversity Assessment Method 2020 and documented in a Biodiversity Development Assessment Report (BDAR). The BDAR must include information in the form detailed in the Biodiversity Conservation Act 2016 (s6.12), Biodiversity Conservation Regulation 2017 (s6.8) and Biodiversity Assessment Method. - The BDAR must document the application of the avoid, minimise and offset hierarchy including assessing all direct, indirect, uncertain and prescribed impacts in accordance with the Biodiversity Assessment Method. - The BDAR must include details of the measures proposed to address the offset obligation as follows: - The total number and classes of biodiversity credits required to be retired for the proposal. - The number and classes of like-for-like biodiversity credits proposed to be retired. - The number and classes of biodiversity credits proposed to be retired in accordance with the variation rules. - Any proposal to fund a biodiversity conservation action. - Any proposal to make a payment to the Biodiversity Conservation Fund.	N/A to the Project – the BOS is not triggered

Issues	Details	Where addressed
	◦ If seeking approval to use the variation rules, the BDAR must contain details of the reasonable steps that have been taken to obtain requisite like-for-like biodiversity credits. ◦ The BDAR must be prepared by a person accredited to apply the Biodiversity Assessment Method under s6.10 of the Biodiversity Conservation Act 2016.	
Water	• The EIS must map features relevant to water, including: ◦ Rivers, streams, estuaries (as described in s4.2 of the Biodiversity Assessment Method) ◦ Wetlands (as described in s4.2 of the Biodiversity Assessment Method) ◦ Groundwater ◦ Groundwater dependent ecosystems.	Sections 6.8 and 6.9 Section 2 of Appendix J Section 3 of Appendix K
	• The EIS must describe background conditions for any water resource likely to be affected by the proposal, including: ◦ Existing surface and groundwater ◦ Hydrology ◦ Water Quality Objectives (as endorsed by the NSW Government) including groundwater as appropriate that represent the community's uses and values for the receiving waters. Indicators and trigger values/criteria for the identified environmental values in accordance with the ANZECC (2000) Guidelines for Fresh and Marine Water Quality and / or local objectives, criteria or targets endorsed by the NSW Government o Risk-based Framework for Considering Waterway Health Outcomes in Strategic Land-use Planning Decisions (OEH/EPA, 2017)	Sections 6.8 and 6.9 Section 2 of Appendix J Section 3 of Appendix K
	• The EIS must assess the impacts of the proposal on water quality, including: ◦ The nature and degree of impact on receiving waters for both surface and groundwater, demonstrating how the proposal protects the Water Quality Objectives where they are currently being achieved, and contributes towards achievement of the Water Quality Objectives over time where they are currently not being achieved. This should include an assessment of the mitigating effects of proposed stormwater and wastewater management during and after construction. ◦ Identification of proposed monitoring of water quality. ◦ Consistency with any relevant certified Coastal Management Program (or Coastal Zone Management Plan).	Section 6.8 Sections 4.2 and 5.1 of Appendix J Section 4 of Appendix K
	• The EIS must assess the impact of the proposal on hydrology, including: ◦ Water balance including quantity, quality and source. ◦ Effects upon rivers, wetlands, estuaries, marine waters and floodplain areas. ◦ Effects upon water-dependent fauna and flora including groundwater dependent ecosystems. ◦ Impacts to natural processes and functions within rivers, wetlands, estuaries and floodplains that affect river system and landscape health such as nutrient flow, aquatic connectivity and access to habitat for spawning and refuge (e.g. river benches). ◦ Changes to environmental water availability, both regulated / licensed and unregulated / rules-based sources of such water.	Sections 6.8 and 6.9 Section 4 of Appendix J Section 4 of Appendix K

Issues	Details	Where addressed
Flooding	• The EIS must map the following features relevant to flooding as described in the Flood Risk Management Manual (NSW Government 2023) including: ◦ Flood prone land (ie land susceptible to the probable maximum flood event). ◦ Flood planning area, the area below the flood planning level. ◦ Hydraulic categorisation (floodway and flood storage areas). ◦ Flood hazard. • The EIS must describe flood assessment and modelling undertaken in determining the design flood levels for events, including a minimum of the 10% Annual Exceedance Probability (AEP), 1% AEP flood levels and the probable maximum flood, or an equivalent extreme event. • The EIS must model the effect of the proposal (including fill) on the current flood behaviour for a range of design events as identified above, and the 0.5% AEP and 0.2% AEP year flood events as proxies for assessing sensitivity to an increase in rainfall intensity of flood producing rainfall events due to climate change. • All site drainage, stormwater quality devices and erosion / sedimentation control measures should be identified in the EIS and the onsite treatment of stormwater and effluent runoff and predicted stormwater discharge quality from the proposal should be detailed. • Modelling in the EIS must consider and document: ◦ Existing council flood studies in the area and examine consistency to the flood behaviour documented in these studies. ◦ The impact on existing flood behaviour for a full range of flood events including up to the probable maximum flood (PMF), or an equivalent extreme flood. ◦ Impacts of the proposal on flood behaviour resulting in detrimental changes in potential flood affection of other developments or land. This may include redirection of flow, flow velocities, flood levels, hazard categories and hydraulic categories. ◦ Impacts of earthworks and stockpiles within the flood prone land up to the PMF level. The assessment should be based on understanding of cumulative flood impacts of construction and operational phases. ◦ Relevant provisions of the Flood Risk Management Manual 2023. • The EIS must assess the impacts on the proposal on flood behaviour, including: ◦ Whether there will be detrimental increases in the potential flood affection of other properties, assets and infrastructure. ◦ Consistency with Council floodplain risk management plans. ◦ Consistency with any Rural Floodplain Management Plans. ◦ Compatibility with the flood hazard of the land. ◦ Compatibility with the hydraulic functions of flow conveyance in floodways and storage in flood storage areas of the land. ◦ Whether there will be adverse effect to beneficial inundation of the floodplain environment, on, adjacent to or downstream of the site. ◦ Whether there will be a direct or indirect increase in erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses.	Section 6.8 Section 4.3 of Appendix J

Issues	Details	Where addressed
	◦ Appropriate mitigation measures to offset potential flood risk arising from the proposal. Any proposed mitigation work should be modelled and assessed on the overall catchment basis in order to ensure it fits its purpose and meets the criteria of the Council where it is located, and to ensure it has no adverse impact to surrounding areas. ◦ Any impacts the proposal may have upon existing community emergency management arrangements for flooding. These matters are to be discussed with the NSW SES and Council. ◦ Whether the proposal incorporates specific measures to manage risk to life from flood. These matters are to be discussed with the NSW SES and Council. ◦ Emergency management, evacuation and access, and contingency measures for the proposal during both construction and operational phases considering the full range of flood risk (based upon the probable maximum flood or an equivalent extreme flood event). These matters are to be discussed with and have the support of Council and the NSW SES. ◦ Any impacts the proposal may have on the social and economic costs to the community as a consequence of flooding.	

Table B.3 Environment Protection Authority assessment requirements

Issues	Details	Where addressed
Environmental impacts of the Project	- The description should include the following for both the construction and operation of the project: - Details of the premises covered by the project including any relationship with any existing Environment Protection Licences	Section 2.2 N/A to the Project – the WPPS does not have an EPL
	the layout of all the physical elements of the project within the project area, including all buildings, structures, works, haulage activities, pollution controls, stockpile, and material handling areas, sealed and unsealed areas, landscaping and open space.	Figure 3.2 and Appendix O
	all mitigation measures that will be built into the physical layout and design of the project (such as noise walls)	Appendix C
	any ancillary infrastructure for which approval is being sought (such as upgrades to utilities or surrounding roads)	Section 3
	identify those components of the physical layout and design that may change during the detailed design of the project, and set clear limits within which this change may occur without requiring amendments to the DA or modifications to the development consent if the project is approved	Section 3.3.3
	plans showing the layout and design in plan-view and cross section.	Figure 3.2 and Appendix O
	Identify any likely interactions between the development and any existing/approved developments and land uses in the area.	Section 3.7
	Identify all sensitive receivers likely to be affected by the development using clear maps/plans, including key landform areas, such as conservation areas and waterways.	Section 2.2
	Identify all potential environmental emissions, assess the likely environmental impacts, and describe the proposed mitigation measures to minimise environmental pollution to achieve compliance with relevant environmental legislation, policies, and guidelines.	Section 6
	The EIS must accurately summarise the key findings of the detailed technical studies in the appendices of the EIS and use suitable cross-referencing to reduce repetition between the two parts of the EIS.	Section 6
EPA Licensing and Approval Requirements	Identify all approvals and licences required under environment protection legislation including details of all scheduled activities under schedule 1 of the Protection of the Environment Operations Act 1997.	Section 4.2
	Outline how the proposal and its environmental protection measures would be implemented and managed so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licences or approvals (e.g. outline of an environmental management plan).	Appendix C and any environmental management plans prepared for the Project
Construction works	- The EIS must include detail of the construction works including: - any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site).	Section 3.4

Issues	Details	Where addressed
	- Identify, characterise, and classify the following in accordance with the EPA's Waste Classification Guidelines (2014): - all waste that will be generated onsite through excavation, demolition, or construction activities, including proposed quantities of the waste; - all waste that is to be removed to an offsite location, including proposed quantities. Include the commitment to ensure this waste is taken to a facility that can lawfully receive it.	Section 6.12
	construction timetable and staging; hours of construction; proposed construction methods.	Section 3.4
	environment protection measures, including noise mitigation measures - in accordance with the Interim Construction Noise Guideline (DECC, 2009), dust control measures and erosion, and sediment control measures- in accordance with Managing urban stormwater: Soils and construction, vol. 1 (Landcom 2004).	Section 6 and Appendix C
	Include a site diagram showing the site layout and location of environmental controls.	Figure 3.2 and Appendix O
	Construction noise associated with the proposed development should be assessed using the Interim Construction Noise Guideline (DECC, 2009)	Section 6.5 and Appendix H
Air quality	The EIS must demonstrate the proposal's ability to comply with the relevant regulatory framework, specifically the PoEO Act and the Protection of the Environment Operations (Clean Air) Regulation 2022. This consideration should include section 129 of the PoEO Act concerning control of "offensive odour".	Section 6.6 and Appendix I
	The EIS must include an air quality impact assessment (AQIA). The AQIA must be carried out in accordance with the document, Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2022). These are available at: https://www.epa.nsw.gov.au/your-environment/air/industrial-emissions/approved-methods-for-the-modelling-and-assessment-of-air-pollutants	Appendix I
	The EIS must detail emission control techniques/practices that will be employed at the site and identify how the proposed control techniques/practices will meet the requirements of the PoEO Act, PoEO (Clean Air) Regulation (2022) and criteria within Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2022).	Appendix I
Noise and vibration	Operational and construction activities on the premises that maybe considered vibration intensive should be assessed using the guidelines contained in the Assessing Vibration: a technical guideline (DEC, 2006).	N/A to the Project
	If blasting is required for any reasons during the construction or operational stage of the proposed development, blast impacts should be demonstrated to be capable of complying with the guidelines contained in Australian and New Zealand Environment Council – Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC, 1990). These are available at: https://www.epa.nsw.gov.au/your-environment/noise/industrial-noise/construction-noise	N/A to the Project
	Operational noise from noise intensive activities to be undertaken on the premises should be assessed using the guidelines contained in the NSW Noise Policy for Industry (EPA, 2017).	Section 6.5 and Appendix H

Issues	Details	Where addressed
	If applicable, noise on public roads from increased road traffic generated by land use developments other than road projects should be assessed using the guidelines contained in the NSW Road Noise Policy (EPA, 2011) and associated application notes. Available at: https://www.epa.nsw.gov.au/your-environment/noise/transport-noise.	Section 6.5 and Appendix H
	If applicable, noise on rail lines from increased rail traffic generated by land-use developments other than rail projects should be assessed using the guidelines contained in the Rail Infrastructure Noise Guideline (EPA, 2013) and associated application notes. Available at: https://www.epa.nsw.gov.au/your-environment/noise/transport-noise.	N/A to the Project
Waste, chemicals and hazardous materials and radiation	The EIS must assess the following waste, chemical and hazardous materials related aspects of the proposed development:	Section 6.12
	Assess and describe all aspects of waste generation, management and disposal associated with the proposed development.	Section 6.12
	Demonstrate compliance with all regulatory requirements outlined in the PoEO Act and associated waste regulations.	To be included in the Waste Management Plan
	Outline contingency plans for any event that may result in environmental harm, such as excessive stockpiling of material, or dirty water volumes exceeding the storage capacity available on-site.	Appendix C
	Demonstrate that appropriate spill containment will be provided for storage, filling and loading of all fuels and other chemicals to be used on site, in accordance with all relevant Australian Standards, and/or NSW EPA's Storing and Handling of Liquids: Environment Protection- Participants Manual (DECC, 2007).	N/A to the Project
	Demonstrate compliance with Part 9.3E of the PoEO Act for the use of any industrial chemicals, including details of activities involving Schedule 6 or Schedule 7 chemicals listed on the IChEMS register. Additionally, demonstrate a system for periodic review to ensure that any new IChEMS Register requirements are incorporated.	Section 6.12
	Identify the measures that would be implemented to ensure that the development is consistent with the aims, objectives and guidance in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21. Available at: https://www.epa.nsw.gov.au/your-environment/recycling-and-reuse/warr-strategy.	N/A to the Project
	- This waste facility will be required to report on the amount of waste being handled: - If it is located within or receives waste from the Metropolitan Levy Area (MLA) or Regional Levy Area (RLA), a weighbridge will need to be installed and it will need to report monthly. If it is located within the Non-Levied Area (NLA), and only receives waste from the NLA, then it will need to report annually. - Document how you will comply with Clause 36 of the Protection of the Environment (Waste) Regulation 2018. This Clause includes requirements regarding the installation and calibration of a weighbridge, vehicle flow plans, weighbridge software and associated recording and reporting requirements. - Document how you will comply with the EPA's waste levy benchmark requirements including the software to be used. - Nominate the upper limit of the amount of waste that may be stockpiled at your facility at any one time. This nominated amount will be considered when determining the maximum authorised amount of waste that may be at your facility at any time. - Ensure that the facility complies with the waste levy requirements for the levy area in which it is located. Information about levy areas is available at	N/A to the Project

Issues	Details	Where addressed
Water	Demonstrate that all practical measures to prevent, control, abate or mitigate water pollution have been implemented, including a description of options that were explored (such as reuse to avoid a discharge or treatment).	Section 5 of Appendix J
	- Provide details of the proposal that are essential for predicting and assessing potential impacts to receiving waters. This could include (but is not limited to): - Site layout, including details of the existing and proposed water management system. - Drainage map for the entire site identifying sub-catchments, flow paths, drainage infrastructure, design sizing of structures, water storages, discharge points, and any potential flow paths to receiving waters. - How stormwater will be managed in all phases of the project. Information should include, where appropriate, measures to avoid or minimise erosion, leachate generation, and sediment mobilisation at the site. - Any in-water activities (such as piling or dredging).	Section 3 of Appendix J
	Include water balance(s) for ground and surface water, including any intake and discharge locations, volumes, frequency, and duration.	Section 3.4 of Appendix J
	Identify and estimate the quality and quantity of all pollutants that may be introduced into the water cycle by source and discharge point, including residual discharges after mitigation measures are implemented. This should be undertaken for construction and operational phases.	Section 4.2 and 3.4.1 of Appendix J
	Include a water pollution impact assessment undertaken consistent with the guidance available at https://www.epa.nsw.gov.au/your-environment/water/managing-water-pollution-in-nsw/environment-protection-licensing/water-pollution-discharge-assessments. The level of assessment should be commensurate with the risk to the environment and human health.	Section 4.2.1 of Appendix J
	Describe any surface water quality monitoring programs, including proposed monitoring locations, frequency, and indicators of surface water quality. Analytical limits of reporting should have regard to any identified guideline values. Water quality monitoring should be undertaken in accordance with the Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (2004)	Section 5.1 of Appendix J
Groundwater	- Provide details of the project that are essential for predicting and assessing impacts to groundwater with a description of the existing environment, including: - Geological, topographical, and hydrogeological resource descriptions, maps, and cross- sections. - Assessment of groundwater quality, users of groundwater, existing bores including depths and construction, assessment of local land use. - A hydrogeological interpretation of water-bearing geological units, depth to water table, groundwater gradient, Conceptual hydrogeological model, assessment of groundwater dependent ecosystems. - Site map and cross-sections showing and characterising any proposed excavations and spoil emplacement (relative to water table) with topography. - Proposed groundwater monitoring program.	Sections 3 and 6 of Appendix K

Issues	Details	Where addressed
	This EIS should take considerations in accordance with Information guidelines for proponents preparing coal seam gas and large coal mining development proposals (IESC 2018) - https://www.iesc.gov.au/sites/default/files/2022-07/iesc-information-guidelines-may-2018.pdf	N/A to the Project
Soils	- The EIS should include an assessment of the potential impacts on soil and land resources should be undertaken, being guided by the Soil and Landscape Issues in Environmental Impact Assessment (DLWC 2000). The nature and extent of any significant impacts should be identified. Particular attention should be given to: - Soil erosion and sediment transport- in accordance with Managing urban stormwater: Soils and construction, vol. 1 (Landcom 2004) and vol. 2 (A. Installation of services; B Waste landfills; C Unsealed Roads; D Main Roles) (DECC2008).	Section 3 of Appendix K
	Mass movement (landslides) – in accordance with Landslide risk management guidelines presented in the Australian Geomechanics Society (2007).	N/A to the Project
	Urban and regional salinity – guidance given in the Local Government Salinity Initiative booklets which includes Site Investigation for Urban Salinity (DLWC, 2002).	N/A to the Project
	A description of the mitigation and management options that will be used to prevent, control, abate or minimise identified soil and land resource impacts associated with the project. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented. Where required, add any specific assessment requirements relevant to the project.	Section 5 of Appendix K
Contamination	Identify the likelihood of contamination at the site and surrounding land (on different media such as soils, groundwater, ground gas, surface water and sediments, where applicable) by considering the context of past, current, and proposed land uses. The EIS must document how the assessment of contaminated land has been undertaken with regard to the relevant guidelines for contaminated land made or approved by the NSW EPA.	Appendix M
	All reports on contamination must be prepared by a suitably qualified contaminated land consultant who is also certified	Certification in Appendix M
	Where contamination is considered likely based on past or current land uses or other factors (such as offsite contamination migrating onto the site), undertake detailed site investigation/s to determine the nature and extent of the contamination.	N/A to the Project – contamination not found
	Where contamination exists, assess if remediation of the land is required, having regard to current and future land uses; and the ecological and human health risks posed by the contamination to both onsite and offsite receptors.	N/A to the Project – contamination not found
	Where a detailed site investigation is prepared and/or remediation is considered necessary, a NSW EPA accredited Site Auditor must be engaged to undertake an audit. The EIS must include copies of any Interim Audit Advice provided by the auditor and a Site Audit Statement and Site Audit Reports issued by the auditor which certifies the site can be made suitable for the proposed use	N/A to the Project – contamination not found
	The following references should be included as relevant guidelines that must be followed when assessing contaminated land:	Section 1.2 of Appendix M

Issues	Details	Where addressed
	- Managing Land Contamination: Planning Guidelines SEPP 55 – Remediation of Land (DUAP and EPA, 1998) - https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/clm/managing-contaminated-land-guidelines-remediation.pdf?la=en&hash=6AAE054645C2A0264515ABF7121AEF7F47E5FC85 - Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (EPA, 2015) - Contaminated land sampling design guidelines - Part 1 and 2 (EPA, 2022) - Consultants reporting on contaminated land: contaminated land guidelines (EPA, 2020) - Guidelines for the NSW Site Auditor scheme 3rd edition (EPA, 2017) - Any other relevant guidelines made or approved by the EPA under s105 of the Contaminated Land Management Act 1997 - https://www.epa.nsw.gov.au/your-environment/contaminated-land/statutory-guidelines	
Climate change	The proponent must prepare a Greenhouse Gas Assessment in accordance with the EPA's Greenhouse Gas Assessment Guide for Large Emitters (or its most recent version that is available on the EPA website). Input data and assumptions must also be robustly justified by providing supporting evidence to assist the EPA's assessment.	Section 6.7 and Appendix I
	For projects estimated to emit 25,000 tonnes or more of scope 1 and 2 emissions (CO₂-e) in any financial year during the operational life of the project (based on planned operational throughput and as designed), a GHG Mitigation Plan must be provided in accordance with the EPA's Greenhouse Gas Assessment Guide for Large Emitters (or its most recent version that is available on the EPA website).	N/A to the Project – the emissions trigger is not met
	- For projects estimated to emit 25,000 tonnes or more of scope 1 and 2 emissions (CO₂-e) in any financial year during the operational life of the project (based on planned operational throughput and as designed), the proponent must prepare a Climate Change Adaptation Plan that incorporates the following components: - A climate change risk assessment that addresses predicted climatic changes and the potential impacts of climate hazards on the environmental performance of the project. - An assessment of measures to reduce climate risk, including: - a description of measures that would be implemented to reduce likely climate change risks and potential impacts on the environmental performance of the project. - an assessment of: - the likely effectiveness of these measures - whether these measures will remain effective over time as climate change risks increase - whether contingency plans will be necessary to manage any residual risks. - if contingency measures are deemed necessary under (ii) above, a description of how the project is designed so that these contingency measures can be readily implemented if and when necessary. - A description of how the effectiveness of measures to reduce climate risk will be monitored over time, including: - a description of metrics that will be used to periodically evaluate the effectiveness of the adaptation management measures. - a description of the measures that would be implemented to monitor and periodically report on against these metrics.	N/A to the Project – the emissions trigger is not met

Issues	Details	Where addressed
	◦ A timetable for review of the project's Climate Change Adaptation Plan that reflects the project's lifespan and incorporates at each review the latest knowledge about predicted climate risks in the short and long term.	

Table B.4 WaterNSW assessment requirements

Issues	Details	Where addressed
Access to surface water and groundwater resources	Annual volumes of surface water and groundwater proposed to be taken by the activity (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.	Section 3.4 of Appendix J
	Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project).	
	Assessment of the impact and approvals (Works and Use Approvals under the WMA 2000) required for the taking or storage of water.	
	The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.	
	A detailed and consolidated site water balance.	
Impact on surface and groundwater resources	Assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.	Sections 6.8 and 6.9 and Appendices J and K
	Full technical details and data of all surface and groundwater modelling.	Appendices J and K
	Proposed surface and groundwater monitoring activities and methodologies.	Appendices B, J and K
	Proposed management and disposal of produced or incidental water	Section 3.3.3
Flooding	WaterNSW is responsible for the management and licensing of flood work approvals. If the proposal is for an earthwork, embankment or levee, wherever situated or proposed to be constructed that is reasonably likely to affect the flow of water to or from a river or lake then the assessment is required to address potential impacts detailed further in attachment A.	Section 4.3 of Appendix J
Impact on waterfront land and water resource dependents	Clear identification of "waterfront land" (as defined in the WMA 2000) and an assessment of impacts of works and activities on waterfront land. (Works on waterfront land may be subject to Controlled Activity Approval (CAA) under the Water Management Act 2000.)	N/A to the Project
	Details of the final landform of the site, including final void management (where relevant) and rehabilitation measures.	
	Assessment of any potential cumulative impacts on water resources, and any proposed options to manage the cumulative impacts.	
	Consideration of relevant policies and guidelines.	
	A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).	

Table B.5 Transport for NSW assessment requirements

Issues	Details	Where addressed
Traffic Impact Assessment	A Traffic Impact Assessment (TIA) is to be prepared for this project and accompany the EIS. The TIA is to be prepared in accordance with the methodology set out in Guide to Traffic Impact Assessment (GTIA) 2024 and part 12 Austroads Guide to Traffic Management, including:	Section 1.2 of Appendix E
	Hours, days and periods of construction.	Sections 3.2 and 3.3 of Appendix E
	Schedule for phasing/staging of the project (including pre-construction, accommodation and ancillary infrastructure works) and identifying the traffic volumes for each stage.	Section 4 of Appendix E
	- Traffic volumes are to include a description of: - Surveyed existing background traffic at key intersections per Part 3 Austroads Guide to Traffic Management, with survey raw data included. - Project-related traffic volumes (measured as single vehicle trips per hour, AM/PM peak hour and per day) for each stage, including pre-construction, construction, operation, and decommissioning and identifying peak period(s) for traffic volumes. - Ratio of light vehicles to heavy vehicles. - Differentiation of Over Size/Over Mass (OSOM) that do or do not require an NHVR permit and proposed times of operation on the State road network. - Peak times for existing traffic and project-related traffic. - Transportation hours. - Distribution split, i.e number turning left and right at each access or intersection. - Number of high-risk OSOM anticipated for the project.	Sections 2.3, 4 and 4.2 of Appendix E
	- The origin, destination and routes (including maps for all stages of the project) for: - Employee and contractor light traffic. - Heavy vehicle traffic. - OSOM vehicle traffic. - OSOM high-risk loads. - A description of all non-high-risk OSOM vehicles and materials to be transported. The shortest and least trafficked route is to be given priority for the movement of materials and machinery to minimise risk and impact to other motorists, so far as is reasonably practicable. - Identify the location of each new or existing intersection and access point (including GPS coordinates for new locations) that will be used for project traffic and what types of vehicles. - The assessment is to identify high-level enforceable mitigation measures to manage traffic volumes, driver behaviour and site access paths for all project stages.	Section 4 and Figure 13 of Appendix E

Issues	Details	Where addressed
	A turn warrant assessment for different scenarios (i.e project peak hour is different to network peak hour, for worst case scenario (i.e overlap of construction, pre-construction works and occupation of stages of workforce accommodation camp). The turn warrant assessments are to be prepared in accordance with section 3.25 of Part 6 of the Austroads Guide to Traffic Management. A turn warrant assessment will be required for each scenario identified above and for each access, access track and any other access along the project's identified routes with an interface or connection to the state road network. The methodology to be used for the turn warrants assessment is: • AM/PM peak project traffic volumes (including turn direction and traffic type ratios), • Applied to existing AM/PM network peak background traffic, • Include linear growth to the year of peak construction. • Including the cumulative traffic volumes for projects at EIS and approved stages that will be present in the background and turning traffic volumes at the site access or intersection. Note: In rural agricultural areas, harvest periods must be factored into the traffic analysis and turn warrant assessments. Note: SIDRA Analysis may be required in locations with higher populations, accesses or intersections used by other existing high traffic-generating land uses or accesses that are located close to railways lines or traffic signals.	Section 4.3 of Appendix E
	TIA is to detail the required intersection treatments and scope of upgrades at each intersection and proposed access point that is required to facilitate workforce accommodation facilities, transmission lines, compounds, ancillary infrastructure access, emergency access must be designed to facilitate the traffic volumes and safe turning of project traffic for each identified access or intersection with the State Road network. All strategic concept designs must be developed to demonstrate compliance with Austroads, TfNSW supplements, and TfNSW technical directions. The list below (but not limited to) is provided to assist with common questions and issues that may arise with the preparation and review of strategic concept design for renewable projects, and is provided as helpful tips to assist in the preparation of the strategic concept design. • The 2D section of the TfNSW strategic concept design fact sheet will inform the level of detail required to be captured within the strategic concept designs for each access or intersection that is required to be upgraded. • An assessment of the Safe Intersection Sight Distance (SISD) at each access point or intersection to be used by the project traffic is to be included within the TIA. TfNSW adopts within the TfNSW supplement to Austroads a 2.5 second reaction time for design speeds 110km/hr. The outcome of the SISD assessments must be incorporated into the scope of the strategic concept designs (where required). • Strategic concept designs are to include swept path analysis for the largest heavy vehicle and high-risk OSOM configuration (design and check) required to use each intersection or access point. Must be prepared in accordance with Austroads Design Vehicles and Turning Path Templates. • The posted speed zone +10km/hr is the design speed that is to be used to inform the strategic concept designs. • Typical sections are to be included for the drainage and must be designed to provide a 6:1 batter and table drain. • Sealed shoulder width requirements are informed by the Average Annual Daily Traffic volumes (AADTs), which will be obtained from the traffic count data collected within the traffic count survey.	N/A to the Project – SIDRA analysis undertaken confirms the Project traffic can be readily undertaken at all intersections on the routes to the site

Issues	Details	Where addressed
	- The strategic concept designs are to factor in any existing accesses, intersections or TfNSW planned works and will need to consider within the designs how the accesses or interaction with TfNSW will be accommodated or impacted by the design. - Culvert extensions and clear zone requirements will need to be addressed within the strategic concept designs for each access and intersection. - Any other geometric or infrastructure constraints (i.e railways, proximity to accesses, intersections, rest areas, stockpiles. Embankments) will need to be addressed within the strategic concept designs. - Road train gazetted routes will need to incorporate additional widening within the design of the intersection treatments refer to the relevant intersection treatment type within Austroads Guide to Road Design Part 4A. - Left in left out proposed arrangements will need to prepare in accordance with Austroads Guide to Traffic Management Part 6 for the design requirements for these arrangements any proposed U-turn location will need to be designed or provide suitable existing intersection treatments to accommodate the design heavy vehicle and proposed project traffic volumes during the peak of construction (or other relevant stage) that will use the U-turn facility. - Acceleration lanes will be required based on the identified reasons for needing an acceleration lane within the Austroads Guide to Traffic Management Part 6. - Any street lighting that requires relocation is to be designed following TfNSW Technical Direction. Required changes to street lighting must be designed in accordance with R0600 Street Lighting, AS 1158.1, and TfNSW supplements. - Any access via TfNSW assets (i.e stockpiles and rest areas) is to be discussed with TfNSW prior to consideration of use of these locations. - Relocation or modification to bus stops, safety barriers and rest areas etc is to be identified on the strategic concept designs and discussed with TfNSW. - Consideration of radii and adjustment for crests and curved road geometry. - Pavement widening for high-risk OSOM is to be consistent with the existing pavement of the state road network. - Emergency access points are to include gates to prevent access for project traffic, designed to accommodate the storage of the largest emergency vehicle, assess SISD and provide a compliant (sealed) rural property access in accordance with the requirements of Part 4 of Austroads Guide to Road Design Note: It is the proponent's responsibility to acquire and dedicate land required to accommodate road infrastructure including, but not limited to, footways, structures, stormwater drainage, batters, maintenance access and utilities. Note: Works Authorisation Deeds are required for intersection upgrades on the state road network. Note: TfNSW is not the landowner of the state road network. The relevant council is the landowner of the state road network (with the exclusion of freeways).	
	Traffic safety assessment: - Local climate conditions that may affect road safety for vehicles used during construction, operation and decommissioning of the project (eg fog, wet weather, snow etc). - A review of crash data along the identified transport route/s for the most recent 5-year reporting period and an assessment of road safety along the proposed transport route(s).	Section 2.6 of Appendix E

Issues	Details	Where addressed
	Measures to be employed to ensure a high level of road safety for daily staff commutes between accommodation and construction site(s), specifically addressing impacts of unsafe driver behaviour and driver fatigue for all project stages and how measures employed will be enforced.	
	Pre-construction minor works assessment (prior to construction of intersection upgrade)	N/A to the Project – no intersections upgrades are required
	Gas pipelines and transmission lines (where applicable)	N/A to the Project
	Concept level route analysis require for High Risk OSOM	N/A to the Project – no high risk OSOM vehicles are required

Appendix C

Mitigation and management measures

Table B.1 Summary of mitigation and management measures

Aspect	Mitigation and management measure
Biodiversity	- Any change in design outside the assessed disturbance footprint will require further ecological survey and assessment. - Clearing of native vegetation: - Before starting work, a physical vegetation clearing boundary at the approved clearing limit is to be demarcated and implemented. - All construction personnel should be inducted to be aware of the potential presence of those threatened flora species relevant to the Project. If any threatened flora species are encountered, construction must stop in the immediate area and an ecologist should be consulted for advice and guidance before proceeding with works. - Vegetation would be removed in such a way as to avoid damage to surrounding vegetation. - Groundcover disturbance would be kept to a minimum. - Any stockpile and compound sites should be located using the following criteria: - In areas of low ecological conservation significance (i.e. previously disturbed land) - On relatively level ground - Stockpiling materials and equipment and parking vehicles would be avoided within the dripline (extent of foliage cover) of any tree. - Where possible, vegetation to be removed would be mulched on-site and re-used to stabilise disturbed areas. - Accidental death of fauna: - If threatened fauna species are discovered, stop works immediately and contact a suitably qualified ecologist for advice. - If trapped or stressed fauna are encountered, a fauna spotter catcher or wildlife handler should be engaged to remove the animal(s) and relocate them nearby, or if necessary, deliver them to a veterinarian or wildlife carer for rehabilitation. - Lighting: - Any artificial lighting to be used during construction or operation should follow the Best Practice Lighting Design within the National Light Pollution Guidelines (DoEE 2020). In particular, all lighting should be kept close to the ground, directed, and shielded to avoid light spill. - Threatened species: - Provide identification resources for personnel to enable identification of threatened species that might occur on the work site. - Construction work to occur only during daylight hours to avoid indirect impacts on threatened fauna such as vehicle strikes. - If threatened fauna or flora species are discovered, stop works immediately and contact a suitably qualified ecologist for advice. - Prior to the commencement of treated wastewater irrigation, a targeted survey for <i>Myriophyllum implicatum</i> will be undertaken within the PCT 461 – Pilliga tank gilgai wetland sedgeland rushland habitat located approximately 28 m from the proposed irrigation area. The survey would be conducted during the appropriate survey window for the species (October – February) by a suitably qualified botanist. - If the species is not detected, no further mitigation measures relating to <i>Myriophyllum implicatum</i> are required. - If the species is detected, wastewater irrigation won't commence until a monitoring program has been developed and approved. The monitoring program would seek to determine whether the species is being adversely impacted by the wastewater irrigation and should include, at a minimum: - baseline documentation of the population size, extent, and condition prior to irrigation commencing - periodic monitoring of the population at appropriate intervals throughout the irrigation period - defined trigger thresholds for population decline or habitat condition that would prompt a review of irrigation activities

Aspect	Mitigation and management measure
	– adaptive management responses to be implemented in the event that adverse impacts are detected • Introduction and spread of priority weeds and pathogens: ◦ Construction crew should be briefed on the identification of priority weeds that occur on site during inductions. ◦ If declared priority weeds are identified during construction, they will be managed according to the requirements of the <i>Biosecurity Act 2015</i>. ◦ Construction machinery (bulldozers, excavators, trucks, loaders and graders) will be cleaned using a high-pressure washer or other suitable device before entering and exiting work sites. ◦ Machinery will be inspected by designated personnel following washdown to ensure no soil, mud, or vegetative material remains. Records of inspections to be maintained. ◦ All pesticides will be used in accordance with the requirements on the label. Any person carrying out pesticide (including herbicide) application will be trained to do so and have the proper certificate of completion/competency or statement of attainment issued by a registered training organisation. ◦ Keep records of any weed control activities that take place. • Disturbance to fallen timber, dead wood, and bush rock: ◦ Any fallen timber, dead wood, and bush rock encountered on site would be left in situ (where possible) or relocated to a suitable place nearby. ◦ Large logs must be carefully relocated to avoid crushing, so as to protect any fauna sheltering beneath or within them from injury. • Exacerbating invasive fauna: ◦ All food scraps and rubbish are to be appropriately disposed of in sealed receptacles to prevent providing forage habitats for foxes, rats, pigs, dogs, and cats.
Traffic and transport	• a Traffic Management Plan will be developed for the Project • prior to construction, a pre-condition survey of the relevant sections of the existing road network will be undertaken in consultation with the Narrabri Shire Council • the unsealed access road will be managed in consultation with Santos, as the landowner • at the end of construction, a post-condition survey will be undertaken to ensure the road network is left in a condition equivalent to that at the start of construction • heavy vehicles are to avoid travel during peak school bus operating times to limit the interaction of larger vehicles and vulnerable road user
Hazard and risk	• undertake a Final Hazard Analysis at the detailed design stage, generally in accordance with the Preliminary Hazard Analysis • implement mitigation and management measures from the Final Hazard Analysis
Bushfire	• the Project asset protection zones (the site within the security fence) is to be managed to the standards of an inner protection area as follows: • trees at maturity should not touch or overhang assets • tree canopies should not be connected when at maturity • gaps between crowns or groups of crowns are to be maintained at distances of at least 5 m • shrubs should not be planted • grass should be regularly mown or slashed • organic mulch is not to be used within 2 m of infrastructure • in accordance with <i>AS 3959-2018 Construction of buildings in bushfire prone areas</i>, the maintenance room is to be designed and constructed to comply with BAL-29; and the control room and Motor Control Centre room are to comply with BAL-12.5. • all internal access roads are to comply with the relevant provisions of 'property access' listed in the Planning for Bushfire Protection, and summarised below: ◦ a minimum vertical clearance of 4 m to any overhanging obstructions, including tree branches ◦ curves have a minimum inner radius of 6 m and are minimal in number to allow for rapid access and egress ◦ the minimum distance between inner and outer curves is 6m

Aspect	Mitigation and management measure
	- water storages are accessible for use by fire-fighters, if required: - fitted with 65 mm Storz outlet with a ball valve - truck access and standing area provided within 4 m of the outlet - made with non-combustible materials (e.g. steel or concrete) - actions listed in the bushfire assessment report are to be followed by employees and contractors to help prevent fire ignition - the Bushfire Emergency Management Plan detailed in the bushfire assessment report is to be followed by employees and contractors
Noise	- preparation of a Construction Noise Management Plan to confirm predicted levels, detail staging, and outline site-specific mitigation and stakeholder engagement measures - preparation of a Noise Verification Report to confirm compliance during operations, including monitoring, assessment of noise limits, and implementation of corrective actions, if required - any noise management will be completed in accordance with Santos
Air quality	- wheel-generated dust emissions to be minimised via the application of water and / or coarse gravel (or equivalent) on internal access routes - vehicles should cover their loads while transport materials capable of creating wind-blown dust vehicle - vehicle speeds to be limited when travelling on unsealed roads - areas of exposed surface should be minimised to reduce the area of potential wind erosion sources - stockpiles to be managed through stabilisation, light watering and the use of covers - works which disturb vegetation, soils and stockpiles to be avoided during strong winds - all Project vehicles and machinery will be in good condition, fitted with appropriate emission controls and comply with the relevant standards and manufacturer's operating recommendations - plant and equipment to be operated efficiently and turned off when not in use - revegetation to be undertaken of disturbed areas no longer required for construction - a complaints process and response protocol will be developed
Soils and surface water	- development of an erosion and sediment control plan in accordance with Managing Urban Stormwater: Soils and Construction – Volume 1 (Landcom, 2004), Volume 2 (DECC, 2008) - controls and procedures to minimise the potential for hydrocarbons and other contaminants being discharged to the surrounding environment including: - storage of solvents, MEA, hydrocarbons and other liquid chemicals within an above ground, bunded areas away from watercourses or area subject to high levels of overland sheet flow - re-fuelling of construction vehicles and equipment to be limited to designated areas, with adequate spill management controls - emergency spill response procedures - maintain an emergency spill kit - transport and dispose of any captured chemical spills and contaminated soils/materials to a suitable offsite licenced facility - develop and implement a suitable monitoring regime at discharge location, including visual inspections and routine monitoring of relevant physicochemical parameters - develop and implement a suitable monitoring regime of all stormwater and erosion and sediment control structures, particularly following large flow events - development of operational stormwater management plan to manage increased stormwater runoff during operations (due to clearing of vegetation and filling for infrastructure) and will consider: - diversion of upstream flows around site infrastructure as required, to minimise scouring and erosion - inspection and monitoring regimes to maintain stormwater and erosion and sediment control structures - minimise filling of Project infrastructure to minimise impacts to overland flooding

Aspect	Mitigation and management measure
Groundwater	- regular maintenance and inspection of bunded fuel, and oil storage areas to ensure integrity - proper storage and bunding of chemicals, along with well-designed site drainage and sedimentation basins at key locations to manage site runoff effectively - provision of spill kits for cleaning up spillages - training for personnel and regular maintenance and inspection of bunded storage areas to ensure integrity
Aboriginal cultural heritage	- all land ground disturbance activities will remain within the Project area, eliminating the risk of harm to potential Aboriginal objects that may be in adjacent landforms - inductions for work crews will include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts and are aware of the legislative protection of Aboriginal objects - in the unlikely event that previously unidentified Aboriginal objects or sites are identified while carrying out works within the proposed area, all activities in the immediate vicinity of the identified Aboriginal object will cease and the procedures in the 'Unanticipated Finds Protocol' (Appendix 2 of the Aboriginal Due Diligence Assessment Report) should be followed
Contamination	- if excavation or construction activities expose unexpected odours, staining, fill material, or other potential indicators of contamination, a suitably qualified environmental consultant should be engaged to reassess the site conditions - any fill material imported to the site must comply with the requirements for Virgin Excavated Natural Material, with supporting documentation confirming the classification obtained and retained - any spoil or excavated material to be removed from the site must be classified in accordance with the NSW Environment Protection Authority Waste Classification Guidelines (2021) prior to disposal and transported to a licensed waste facility that is approved to receive that waste class
Waste management	- Project-generated waste would be managed in accordance with the PoEO Act and the Waste Avoidance and Resource Recovery Act 2001 - waste would be classified, stored and handled in accordance with the 'NSW Waste Classification Guidelines' (EPA, 2014) - a Waste Management Plan will be prepared for the Project and would include the following: - a summary of anticipated waste streams generated during construction and operation of the Project - a detailed description of the wastewater management and optionality for the Project - measures to manage waste in accordance with the general hierarchy for resource management - consultation with the NSC and licensed waste management facilities to confirm the capacity of nearby facilities and their availability to manage the Project's waste - on-site waste management measures in line with the relevant guidelines - commitments around disposal of Project assets at the completion of operations
Irrigation	Water quality monitoring will be conducted on the water treatment plant outlet stream to determine if irrigation is an appropriate water management option: - If the treated wastewater is treated to required limits, it may be used for irrigation. - If the treated wastewater cannot be treated to required limits, it will be collected in containment tanks for disposal off site. The irrigation design and operation will be confirmed by the preparation of a detailed irrigation plan however will generally be undertaken in accordance with the recommendations of the LCA: - Prior to completing any irrigation, the weather forecast and the moisture content of the soil are checked. Wastewater is only irrigated when the soil is sufficiently dry to absorb the applied liquid and should not occur within 48 hours of heavy rain. Do not irrigate if significant rainfall is expected. - The soil is monitored during irrigation to ensure there is no surface pooling or runoff. - The irrigation system is set up to apply treated wastewater at the target rate.

Aspect	Mitigation and management measure
	• Details of the following are recorded by operational personnel: – date of irrigation – weather forecast summary, including rainfall – assessment of likelihood of amenity impacts – utilisation area – target and actual rate of application (mm) • An annual environmental report is prepared that includes ◦ soil analysis results for samples taken from any irrigated area ◦ analysis results for wastewater for irrigation
Visual amenity	• maintain a compact Project layout and limit the spatial footprint, as far as practicable • select non-reflective finishes and neutral / natural colours for infrastructure and buildings to reduce visual contrast with the surrounding landscape, as far as practicable • minimise vegetation removal associated with the Project, as far as practicable • minimise the off-site lighting impacts and ensure any Project lighting: ◦ required for the Project will be installed in consideration of the 'Dark Sky Planning Guideline' (DPE, 2023) ◦ is installed as low intensity lighting (except where required for standards, safety, maintenance or emergency purposes) ◦ does not shine above the horizon ◦ complies with Australian Standard/New Zealand Standard AS/NZS 4282:2023 – <i>Control of Obtrusive Effects of Outdoor Lighting</i> (or the latest version)

Contact us for further information

PO Box 1606,
Armidale NSW 2350
admin@onward.au

ARMIDALE

Head Office
0437 645 419
Suite 3, 131 Faulkner Street
Armidale NSW 2350

BRISBANE

0437 008 431
Suite 2, Level 12
157 Ann Street
Brisbane QLD 4000

NEWCASTLE

0401 499 270
Suite 2
86 - 88 Tudor Street
Hamilton NSW 2303

