Epic Energy South Australia

Whyalla Hydrogen Pipeline

Environmental Impact Report

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ABBREVIATIONS AND GLOSSARY

ABBREVIATIONS

Term	Definition
AAR	Aboriginal Affairs and Reconciliation
ABS	Australian Bureau of Statistics
AH Act	*Aboriginal Heritage Act 1988* (SA)
Air EPP	*Environment Protection (Air Quality) Policy 2016*
APIA	Australian Pipeline Industry Association
AQA	Air Quality Assessment
AQMS	Air Quality Monitoring Stations
ARTC	Australian Rail Track Corporation
AS	Australian Standards
ASS / PASS	Acid Sulfate Soils / Potential Acid Sulfate Soils
BAM	Bushland Assessment Methodology
BDAC	Barngarla Determination Aboriginal Corporation
BDBSA	Biological Data Base South Australia
BOM	Bureau of Meteorology
CCSZ	Cuttlefish Coast Sanctuary Zone
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CP system	cathodic protection system
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DCVG	Direct current voltage gradient
DEM	Department for Energy and Mining (SA)
DEW	Department for Environment and Water (SA)
DIT	Department for Infrastructure and Transport
DMP	Dust Management Plan
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMS	Environmental Management System
EPA	Environment Protection Authority
EP Act	*Environment Protection Act 1993* (SA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
Epic Energy	Epic Energy South Australia Pty Ltd
EPP	Environmental Protection Policies
ER Act	*Energy Resources Act 2000* (SA)

Term	Definition
ER Regulations	*Energy Resources Regulations 2013* (SA)
HDD	Horizontal directional drilling
HJP	Hydrogen Jobs Plan
HSEC	Health Safety and Environment
IBRA	Interim Biogeographic Regionalisation for Australia
ILI	In line inspection
ILUA	Indigenous Land Use Agreement
JHA	Job Hazard Analysis
JLL	Jones Lang Lasalle Infrastructure Advisory
km	kilometres
Land Report	Landowner, Occupier and Interests Desktop Assessment developed by JLL in April 2024
Landscape SA Act	*Landscape South Australia Act 2019* (SA)
LGA	Local Government Area
LMS	Land management system
LNLC Act	*Local Nuisance and Litter Control Act 2016* (SA)
MNES	Matters of National Environmental Significance
NDT	Non-destructive testing
Noise EPP	*Environment Protection (Commercial and Industrial Noise) Policy 2023*
NT Act	*Native Title Act 1993* (Cth)
NV Act	*Native Vegetation Act 1991* (SA)
NVC	Native Vegetation Council
OEMP	Operational Environmental Management Plan
OHPSA	Office of Hydrogen Power South Australia
OSM	Oversize / overmass
PACM	Potential asbestos containing material
PCA	Potentially contaminating activity
PGE Act	*Petroleum and Geothermal Energy Act 2000* (SA)
PLA	Pipeline licence application
PMST	Protected Matters Search Tool
PSL	Preliminary Survey Licence
SCADA	Supervisory control and data acquisition
SEB	Significant Environmental Benefit
SEO	Statement of Environmental Objectives
SMS	Safety Management Study
TEC	Threatened ecological community

Term	Definition
TIA	Traffic Impact Assessment
TMP	Traffic management plan
UXO	Unexploded ordinance
vpd	Vehicles per day
WHP, the Project	Whyalla Hydrogen Pipeline
WoNS	Weeds of national significance

GLOSSARY

Term	Definition
Hydrogen storage looped pipeline	Refers to the main looped pipeline which contains the approximate 100 tonne working storage capacity. This pipeline is a ~22.5 km looped line (~45 km in total), commencing and ending at the Whyalla Hydrogen Compressor Station.
Valve station	Refers to the proposed valve station attached to the hydrogen storage looped pipeline, located 1-2 km from eastern end of the pipeline alignment.
Whyalla Hydrogen Compressor Station	Refers to the compressor station at Site 1, used to compress the hydrogen into storage and to deliver the hydrogen into the power generation facility.
Whyalla Hydrogen Facility; Site 1	Refers to the proposed development of the South Australian Government under its Hydrogen Jobs Plan (HJP), and which is the development site for Epic Energy's Whyalla Hydrogen Compressor Station as well as the starting point and ending point of the hydrogen storage looped pipeline.
Whyalla Hydrogen Pipeline (WHP)	Refers to the proposed hydrogen compression station, looped pipeline and associated facilities in Whyalla, South Australia, and is the subject of this report.

EXECUTIVE SUMMARY

Project Background

Epic Energy South Australia Pty Ltd (Epic Energy) was selected by the South Australian Government to develop the Whyalla Hydrogen Pipeline (WHP; the Project) for the storage and transportation of hydrogen produced at the Whyalla Hydrogen Facility and to be supplied to the hydrogen power station. The WHP will be constructed, owned and operated by Epic Energy in accordance with a Pipeline Licence issued under the *Energy Resources Act 2000* (ER Act).

The WHP involves the following key components:

- a compressor station on the Whyalla Hydrogen Facility site to compress hydrogen for injection and withdrawal from the pipeline
- an approximately 45 km long, buried and looped pipeline to store and transport hydrogen
- a valve station located near Fitzgerald Bay Road, Port Bonython at the end of the pipeline prior to it looping back to the Whyalla Hydrogen Facility.

The proposed pipeline route aligns with existing infrastructure corridors (including roads, tracks, rail and pipeline alignments) for the majority of its length. The proposed route is indicative at this stage of development and the final alignment will be subject to detailed engineering design and further refinement in some sections as consultation with affected landholders progresses.

Scope of the EIR and SEO

The Environment Impact Report (EIR) and accompanying Statement of Environmental Objectives (SEO) cover the WHP construction and operation activities. The EIR (this document) provides an assessment of the potential impacts of these activities on the environment and measures that are proposed to mitigate them. The SEO outlines the environmental objectives that the WHP is required to achieve and the criteria upon which these objectives are to be assessed, based on the information provided in this EIR.

As this EIR and the accompanying SEO were prepared by Epic Energy prior to recent amendments to the ER Act and *Energy Resources Regulations 2013*, they have been prepared in accordance with the requirements of the former *Petroleum and Geothermal Energy Act 2000* and underlying Regulations that were in force before the amendments came into effect on 11 April 2024.

Construction and operation of the Whyalla Hydrogen Facility is subject to a separate approval process and not within the scope of the WHP EIR and SEO.

Land Use and Environment

The WHP is located largely within the City of Whyalla local government area, commencing at the Whyalla Hydrogen Facility and extending approximately 22.5 km east towards Port Bonython before looping back to the facility.

Whyalla is an industrial city and the major centre for manufacturing, steel production and mineral resources processing and export in the Upper Spencer Gulf. Major facilities in the vicinity of the Project area include the Whyalla Steelworks, the Spencer Gulf Saltworks, Port Bonython gas fractionation plant and hydrocarbon import / export facility, and water and gas pipelines. Two proposed solar farms and existing and proposed electricity transmission lines and a substation associated with the SA

Government's Hydrogen Jobs Plan are also in the vicinity. More recently there has been a strong focus by the people of Whyalla to diversify industry and increase tourism opportunities (e.g. during the Giant Cuttlefish breeding season).

Land within the Project area includes sealed roads and a rail line but is predominantly undeveloped with many unsealed tracks used by motorbikes and recreational vehicles. Nearby land uses include water and petroleum transmission pipelines. There is no significant agricultural activity in the Project area.

The existing transport network carries traffic associated with industrial, agricultural, tourism and residential / commuter traffic. Several projects are proposed in the locality in addition to the WHP, which may present impacts to the transport network during their respective construction stages.

Physical environment

The Project area is generally flat to gently sloping terrain with soils along the proposed alignment dominated by sand and clay alluvium. There are no areas of potential acid sulfate soils mapped and very little evidence of erosion on or near the proposed alignment, despite the presence of significant disturbance from adjacent underground gas and liquids lines, Point Lowly Road and numerous tracks.

Although there is no defined drainage in the majority of the Project area, the alignment section along Point Lowly Road crosses one defined ephemeral drainage line towards its eastern end. Ephemeral drainage lines in this area are usually dry, only flowing intermittently for short periods during significant rainfall events. Surface runoff may make its way to the coast and discharge into the sea under some conditions.

Available groundwater data suggests that depth to shallow groundwater is between 2-5 m at the eastern end and 9 and 13 m at the western section. Groundwater recharge in the Project area is likely to be very low due to the low rainfall, high evaporation and relatively low permeability of soils and there is no record or evidence of springs or seeps in the area. Based on mapping and available data, groundwater is expected to be brackish to saline and there are no known groundwater users in the Project area.

Existing air quality is considered generally good and similar to that experienced in South Australia's rural and remote semi-arid areas, although air quality in Whyalla has the potential to be affected from time to time by dust from industrial activities and the movement of bulk materials. The existing noise environment is predominantly influenced by traffic and existing industrial activities in the area, as well as natural sources such the wind and ocean. The nearest residential dwellings are in False Bay approximately 350 m from the pipeline and in Whyalla over 5 km from the compressor station and pipeline.

Biological environment

The Project area comprises predominantly native vegetation, which is reasonably intact, with some disturbance (e.g. from roads, rail line, hydrocarbon pipelines and use by motorbikes and recreational vehicles). The proposed alignment avoids the Whyalla Conservation Park and the nationally important False Bay wetlands.

Desktop assessments followed up by multiple surveys were undertaken within a 5 km buffer of the Preliminary Survey Licence Area (which incorporates the Project area). These included vegetation assessments to describe the composition and condition of native vegetation species and communities, surveys to detect the presence of State and Commonwealth-listed flora and fauna species, and targeted searches for *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed

fauna species identified in the Protected Matters Search Tool. This data was used to inform the impacts from the removal of native vegetation, potential impacts to State-listed flora and fauna and the significant impact assessment for Commonwealth listed species.

A referral under the EPBC Act was submitted in May 2024. The Project was declared a 'controlled action' in July 2024 and will be assessed by preliminary documentation under the EPBC Act, which will run as a separate process to approval under the ER Act.

Cultural heritage

The Barngarla people have been recognised as the Traditional Owners of this region. Epic Energy is committed to working with the Barngarla People to reduce the potential for impacts to any sites, objects and remains that may be within the Project area, through cultural heritage surveys and consultation on the development of a Cultural Heritage Management Plan.

The Project will have no direct impact on the Cuttlefish Coast Sanctuary Zone (CCSZ), inscribed on the National Heritage List on 24 February 2023. The CCSZ is located approximately 2.2 km from the proposed alignment at its closest point and is buffered by Point Lowly Road and unformed roads and tracks.

There are no State-listed heritage places or Commonwealth Heritage Places in the vicinity of the Project area which could be impacted by construction and operation of the Project.

Assessment of Key Environmental Impacts

This EIR assesses the potential impacts posed by hazards that may result from construction and operation of the WHP. The risk assessment undertaken indicates that potential impacts are generally short term and localised, the level of risk is generally low, and the activities can be adequately managed to prevent unacceptable environmental impacts.

A range of management measures that will be implemented are listed in the EIR and have been incorporated into the accompanying SEO.

Soils, surface water and groundwater

With implementation of appropriate construction and engineering practice, impacts due to soil inversion and compaction are expected to be localised, short term and readily manageable. The potential occurrence of acid sulfate soils in the pipeline corridor is very low and the Construction Environmental Management Plan (CEMP) will set out standard management measures to address unexpected disturbance of ASS.

As construction of pipeline projects involve relatively small quantities of chemicals, likely volumes of spills are low and risks to soils, surface water and groundwater are generally small. Management measures include restrictions on re-fuelling, spill prevention and cleanup measures. Groundwater is relatively deep, with high salinity and there are no known groundwater users. If a spill occurred, impacts to soil and water would be localised, short term and readily manageable.

Trenching and pipeline installation at the small number of watercourses would be undertaken in dry conditions. If sedimentation and increased turbidity occurred, this would generally be short term and localised (in an environment where turbidity is naturally high) and can be successfully managed by implementation of measures for erosion and sediment control and watercourse crossings set out in the CEMP.

Flora and fauna

A 'significant environmental benefit' (SEB) under the *Native Vegetation Act 1991* will be achieved to offset vegetation clearance. It is anticipated that Epic Energy will make a payment into the Native Vegetation Fund to achieve the SEB requirements, however options for an on-ground offset in the Whyalla region will be investigated where available.

A significant impact assessment was undertaken for the Project in support of the EPBC Act referral which concluded that the Project is not likely to have a significant impact on any EPBC-listed species or communities or migratory species. Residual impacts to Western Grasswren, Southern Whiteface and migratory shorebirds have been further evaluated in preliminary documentation prepared in response to the EPBC Act controlled action decision. This has also concluded that the Project is not likely to have a significant impact on these species. If, following assessment of the EPBC Act preliminary documentation, the Commonwealth Minister decides that residual impacts to Western Grasswren and Southern Whiteface are significant, Epic Energy will implement offsets that provide an appropriate benefit to compensate for any significant residual impacts on these species.

Air and Noise

Given the mobile nature of the construction work front, the distance from sensitive receptor areas surrounding the proposed alignments, and with the implementation of appropriate construction practices incorporated in the CEMP, impacts to amenity from air and noise emissions are expected to be negligible.

Operational noise emissions are predicted to be below EPA Environment Protection Policy noise limits at sensitive receptor locations during the day and night.

Cultural Heritage

The findings of a formal cultural heritage survey undertaken on behalf of the Barngarla Determination Aboriginal Corporation (BDAC) have been taken into account in the proposed pipeline alignment, and in consultation with BDAC following the outcome of the survey. This will ensure that the proposed pipeline avoids or minimises impact to areas of cultural heritage significance.

The Project will have no direct impact on the CCSZ given its distance from the alignment (being 2.2 km at its closest point), the buffering provided by Point Lowly Road and unformed roads and tracks, the naturally high sediment loads carried by the ephemeral watercourses in the area, the relatively small width of disturbance on the construction right-of-way in relation to the length of unvegetated channels downstream of the Project area and the standard sediment and erosion controls that will be in place during construction.

Public Safety and Risk

As a flammable fuel, hydrogen must be treated carefully and handled safely, and safety of the Project will be a key focus in Epic's design process and during operations. Safety expertise, standards and regulations developed globally over decades for large scale hydrogen use will provide invaluable inputs to the Project. Key design considerations include:

- adoption of the established AS 2885 framework, incorporating hydrogen specific considerations
- utilising international standards and advanced fatigue analysis methods to ensure robust design and appropriate material selection
- adopting specialised construction techniques where appropriate

- involvement of expert collaboration; and
- incorporation of long term monitoring of pipeline integrity.

All necessary approvals for construction and operation will be obtained, having established to the relevant Commonwealth and State regulatory agencies that Epic Energy is equipped to operate the Project in a safe and reliable manner.

Stakeholder Consultation

As an experienced operator Epic Energy understands the importance of establishing credibility, trust and good relationships with the communities within which it operates and its responsibility to provide the Whyalla community with timely, accurate, accessible information.

Epic Energy has undertaken extensive engagement since the inception of the WHP and has incorporated feedback from stakeholders and the community into the design of the Project and the pipeline alignment. Engagement has been undertaken with the Whyalla and surrounding community, Traditional Owners, local landowners and businesses, local government and elected representatives, and government department and regulatory agencies. Several revisions have been made to the pipeline alignment since the Project planning commenced in response to consultation and discussion with landowners and other stakeholders.

Following formal submission to the Department for Energy and Mining, drafts of the EIR and accompanying SEO will be made available on Epic Energy's website for a period of public comment, giving the opportunity for the community and any interested parties to make submissions, raise issues or ask questions.

Epic Energy will continue to engage with community and key stakeholders to keep them informed of construction timing, associated activities and how they will be managed, prior to works commencing. This will include ongoing communications via Project updates and newsletters, website information and email updates, responding to phone enquiries, and provision of community information at the Office of Hydrogen Power South Australia office in Whyalla.

1. INTRODUCTION

1.1. Background

Epic Energy proposes to construct and operate the Whyalla Hydrogen Pipeline (WHP; the Project), a buried pipeline and associated above ground infrastructure (including compression facilities) for storage and transportation of hydrogen and supply to the Whyalla Hydrogen Facility. The Whyalla Hydrogen Facility will be constructed and operated by, or on behalf of, the South Australian Government as part of the Hydrogen Jobs Plan (HJP).

The WHP involves the following key components:

- A compressor station on the same site as the Whyalla Hydrogen Facility to compress the hydrogen for injection and withdrawal of hydrogen from the pipeline
- A buried and looped pipeline designed to store and transport hydrogen (nominally 900 mm diameter) approximately 45 km in length (22.5 km right-of-way length)
- A valve station located near Fitzgerald Bay Road, Port Bonython (near to where the pipeline will loop and return to the Whyalla Hydrogen Facility).

1.2. Purpose of Report

This Environmental Impact Report (EIR) has been prepared to satisfy the requirements of the *Energy Resources Act 2000* (ER Act) and *Energy Resources Regulations 2013* (ER Regulations) for the construction and operation of the WHP. For the avoidance of doubt, it has not been prepared to support the construction and operation of the Whyalla Hydrogen Facility which is subject to a separate approval process being undertaken by the Office of Hydrogen Power SA (OHPSA).

Table 1-1 provides a brief outline of the content and structure of this EIR.

Table 1-1: Content and structure of EIR

Section	Title	Content
1	Introduction	Introduces the purpose and format of the EIR and provides background information
2	Legislative Framework	Outlines the legislative approvals required for the WHP
3	Project Description	Provides a description of the WHP project including proposed pipeline route, pipeline design and construction, compressor station construction, operation and decommissioning
4	Project Rationale and Alternatives	Discusses the rationale for the WHP and the alternatives considered
5	Environmental Impact Assessment	• Describes the specific features of the environment that are reasonably expected to be affected by pipeline construction and operation • Identifies potential environmental impacts and consequences • Proposes measures to mitigate potential environmental impacts
6	Environmental Management Framework	Describes Epic Energy's proposed environmental management framework for the WHP
7	Stakeholder Consultation	Summarises Epic Energy's approach to consultation and summarises the consultation activities undertaken for development of the EIR and SEO
8	References	List of references used in the development of the EIR

A Statement of Environmental Objectives (SEO) has also been developed in conjunction with this EIR. The SEO outlines the environmental objectives that the WHP is required to achieve and the criteria upon which these objectives are to be assessed. The SEO has been developed based on the information provided in this EIR.

1.3. Project Proponent

Epic Energy is one of Australia's leading energy infrastructure companies operating across the gas, electricity, and renewable energy markets. Epic Energy owns and operates more than 1,200 km of gas transmission pipelines – South Australia's Moomba to Adelaide Pipeline System (including the Whyalla Lateral Gas Pipeline) and the South East Pipeline System – which transport gas to customers in the residential, industrial, and power generation sectors in South Australia. Epic Energy also owns a renewable energy portfolio of wind, solar and microgrid assets in South Australia and Victoria.

Epic Energy will construct, own and operate the WHP. Pipeline construction activities will be carried out by specialist contractors engaged under an engineering, procurement and construction arrangement. Epic Energy has also engaged specialist advisors in the engineering/design, environmental and regulatory approvals, and cultural heritage areas.

1.4. Environmental Commitment

Epic Energy is committed to responsible environmental management for the construction and operation of the proposed pipeline and believes that any potential adverse environmental impacts can be managed in an effective manner that complies with the requirements of this document together with:

- all relevant State and Commonwealth laws and regulations
- Epic Energy's Environmental Management System
- relevant industry standards (e.g. Australian Standard AS 2885: Pipelines – Gas and Liquid Petroleum)
- the Australian Pipelines and Gas Association (APGA) Code of Environmental Practice – Onshore Pipelines (APGA, 2022).

Epic Energy aims to minimise its impact on the environment through activities such as:

- complying with all relevant environmental legislation and standards
- ensuring its employees are aware of Epic Energy's environmental responsibilities
- adopting new technologies and best practices to reduce environmental impact
- minimising land and habitat disturbance
- open communication with landowners and other stakeholders
- identifying, monitoring and mitigating environmental issues
- focussing on continual improvement in its environmental performance through regular review
- endeavouring to prevent pollution and developing opportunities for recycling and more efficient use of energy, water and other resources.

2. LEGISLATIVE FRAMEWORK

This chapter summarises the current legislative framework that applies to activities that are regulated under the ER Act and ER Regulations in South Australia.

2.1. Energy Resources Act 2000

2.1.1. Environmental Impact Report

Note: As outlined in Section 2.1.3, the transitional provisions in Schedule 3, clause 3 of the ER Regulations apply, and this section summarises the requirements of the Act as in force before 11 April 2024.

The EIR (this document) provides an assessment of the potential impacts of regulated activities on the environment and provides the basis of information for development of the SEO unless activities are classified as 'high impact' (refer Section 2.1.4).

'Environment' is defined in the ER Act as including:

- land, air, water (including both surface and underground water and sea water), organisms, ecosystems, flora and fauna
- buildings, structures and other forms of infrastructure and cultural artefacts
- existing and potential land use
- public health, safety or amenity
- the heritage, aesthetic or cultural values of an area; and
- the economic or social impact on an area.

Content of the EIR

The EIR is a document prepared by the proponent that contains an assessment of the potential impacts of the proposed regulated activity on the environment. Information must be presented in a balanced, objective, and concise manner.

In accordance with Section 97 of the ER Act, an EIR must:

- consider cultural, amenity and other values of Aboriginal and other Australians insofar as those values are relevant to the assessment
- consider risks to the health and safety of the public inherent in the regulated activities
- contain sufficient information to make possible an informed assessment of the likely impact of the activities on the environment.

In accordance with Regulation 10 of the ER Regulations, the EIR must provide:

- a description of the regulated activities to be carried out under the licence (including their location)
- a description of the specific elements of the environment that can reasonably be expected to be affected by the activities, with particular reference to the physical and biological aspects of the environment and existing land uses
- an assessment of the cultural and heritage values of Aboriginal and other Australians which could reasonably be foreseen to be affected by the activities in the area of the licence, and the

public health and safety risks inherent in those activities (insofar as these matters are relevant in the particular circumstances)

- if required by the Minister, a prudential assessment of the security of natural gas supply
- a description of the reasonably foreseeable events associated with the activity that could pose a threat to the relevant environment including information on:
  - events during the construction stage (if any), the operational stage and the abandonment stage,
  - events due to atypical circumstances (including human error, equipment failure or emissions, or discharges above normal operating levels)
  - information on the estimated frequency of events
  - an explanation of the basis on which these events and frequencies have been predicted)
- an assessment of the potential consequences of these events on the environment, including information on
  - the extent to which these consequences can be managed or addressed
  - the action proposed to be taken to manage or address these consequences
  - the anticipated duration of these consequences
  - the size and scope of these consequences
  - the cumulative effects (if any) of these consequences when considered in conjunction with the consequences of other events that may occur on the relevant land (insofar as this is reasonably practicable)
  - an explanation of the basis on which these consequences have been predicted.
  - a list of all owners of the relevant land
- information on any consultation that has occurred with the owner of the relevant land, any Aboriginal groups or representatives, agency or instrumentality of the Crown, or other relevant stakeholders, or any other interested person or parties, including specific details about relevant issues that have been raised and any response to those issues, but not including confidential information.

2.1.2. Overview of the ER Act

In South Australia, the principal legislation relevant to onshore gas (including hydrogen) and petroleum pipelines is the ER Act and the ER Regulations, administered by the Department for Energy and Mining (DEM). The ER Act is a revision of the *Petroleum and Geothermal Energy Act 2000* (PGE Act) which was amended effective April 2024 to reflect the broader scope of energy resources regulated by the ER Act. The transitional legislative provisions in place for the operation of the revised Act (as they affect the EIR and SEO) are described in Section 2.1.3.

Key objects of the ER Act include:

- establishing an effective, efficient and flexible regulatory scheme to enable the exploration for, and the recovery, production, transmission, storage and management of, energy resources that encourages and maintains an appropriate level of competition
- ensuring that energy rights and resources are managed for the benefit of the State
- ensuring that the exploration for, and the recovery, production, transmission, storage and management of, energy resources is carried out safely and is ecologically sustainable

- ensuring that regulated activities that may have adverse effects on the environment:
  - are properly managed to reduce environmental damage
  - are carried out in a way that eliminates or limits the risk of significant long term environmental damage
- ensuring that land adversely affected by regulated activities is properly rehabilitated
- establishing appropriate consultative processes with people directly affected by regulated activities including Aboriginal people and the public generally
- protecting the public from risks inherent in regulated activities.

The ER Act and ER Regulations are objective-based rather than prescriptive. An objective-based regulatory approach principally seeks to ensure that industry effectively manages its activities by complying with performance standards that are cooperatively developed by the licensee, the regulatory authority and the community. This contrasts with prescriptive regulation where detailed management strategies for particular risks are stipulated in legislation.

The regulated substances and activities to which the Act applies are defined within the ER Act. Hydrogen and hydrogen compounds or by-products of the creation of hydrogen are defined as regulated substances. Section 10(g) defines the relevant regulated activity for the purposes of this EIR as 'constructing, operating, maintaining, modifying or decommissioning a transmission pipeline'. The definition of transmission pipeline includes a pipeline for conveying a regulated substance from place to place.

Epic Energy will be required to prepare a pipeline licence application (PLA) for the WHP, which under ER Regulation 9 must be accompanied by an EIR and a draft SEO. As discussed in Section 2.1.4, this EIR and the SEO will provide detailed environmental information for the area of the proposed pipeline route, identifying potential environmental impacts relating to the activity and describing the appropriate mitigation strategies that will be employed to avoid or minimise these impacts.

2.1.3. Transitional provisions

This EIR and the accompanying SEO were prepared by Epic Energy prior to the amendments to the ER Act which came into effect on 11 April 2024. Consequently, the transitional provisions outlined in Schedule 3, clause 3 of the ER Regulations apply. Under these provisions:

- the EIR that forms the basis for the SEO need only comply with the requirements of the Act as in force before 11 April 2024
- the SEO and any application to the Minister for approval of the statement need only comply with the requirements of the Act as in force before 11 April 2024
- the Minister must determine any application received for the approval of the SEO in accordance with the provisions of the Act as in force before 11 April 2024.

As a result, this EIR and the SEO have been prepared in accordance with the requirements of the Act that were in force before 11 April 2024 (when the ER Act and ER Regulations were known as the PGE Act and the *Petroleum and Geothermal Energy Regulations 2013*).

The following sections outline these requirements.

2.1.4. Statement of Environmental Objectives

Note: As outlined in Section 2.1.3, the transitional provisions in Schedule 3, clause 3 of the ER Regulations apply, and this section summarises the requirements of the Act as in force before 11 April 2024.

As a requirement of section 96 of the ER Act, a regulated activity can only be conducted if an approved SEO is in force for the relevant activity. The SEO outlines the environmental objectives that the regulated activity is required to achieve and the criteria upon which achievement of the objectives is to be determined.

The SEO is developed based on information provided in an EIR unless activities are classified as 'high impact'.

2.1.5. Environmental Significance Assessment and SEO consultation requirements

Note: As outlined in Section 2.1.3, the transitional provisions in Schedule 3, clause 3 of the ER Regulations apply, and this section summarises the requirements of the Act as in force before 11 April 2024.

The EIR is submitted to DEM and an Environmental Significance Assessment is undertaken in accordance with criteria established under Section 98 of the ER Act, to determine whether the activities described in the EIR should be classified as 'low', 'medium' or 'high' impact. Following this classification, a corresponding SEO is prepared, reflecting the impacts and measures identified in the EIR or other assessments that may be required as determined by the classification. The SEO will outline the environmental objectives that must be achieved and the criteria on which achievement of the objectives is to be assessed.

The classification also determines the level of consultation DEM will be required to undertake prior to approval decisions being made on the SEO as follows:

- Low impact activities do not require public consultation and are subjected to a process of internal government consultation and comment on the EIR and SEO prior to approval.
- Medium impact activities require a public consultation process for the EIR and proposed SEO, with comment sought for a period of at least 30 business days.
- High impact activities require assessment and consultation under an environmental impact statement (EIS) under the impact assessed development provisions of the *Planning, Development and Infrastructure Act 2016*. An SEO for high impact activities must be prepared on the basis of this EIS.

The level of impact of a particular activity is assessed on the basis of the predictability and manageability of the impacts on the environment. Where the environmental impacts are predictable and readily managed, the impact of the activity is considered low. Where the environmental impacts are less predictable and are difficult to manage, the impact of the activity is potentially high.

Once the approval process is complete, all documentation, including this EIR and its associated SEO, must be entered on an environmental register maintained by DEM. This public Environmental Register is accessible to the community from the DEM website.

2.1.6. Activity notification / approval process

Prior to commencing a regulated activity, Section 74(3) of the ER Act requires that the Minister's prior written approval is obtained for activities requiring high level official surveillance. For activities

requiring low level official surveillance (as per Regulation 18) an Activity Notification must be prepared and submitted to DEM setting out the activities to be undertaken at least 21 days prior to any activity commencing. High level surveillance activities require at least 35 days' notice (Regulation 19).

All licensees are initially high-level official surveillance operators for all activities, unless specifically classified as a low-level official surveillance operator for specific activities by the Minister. To assess whether a licensee can be granted low level surveillance classification, the effectiveness of the licensee's management system is considered. Past demonstrated performance and history of compliance are also necessary for classification as low surveillance.

Based in on its past demonstrated performance and history of compliance, Epic Energy is classified as a Low Level Surveillance Operator.

This activity notification and approval process is often referred to as Stage 3 of the approval process under the ER Act, as it follows licensing (Stage 1) and the EIR and SEO approval process (Stage 2). The Stage 3 activity notification and approval process provides an additional opportunity for DEM to ensure that the proposed activities and their impacts can be effectively managed and are consistent with the approvals obtained during the EIR and SEO approval process.

The activity notification must provide specific technical and environmental information on the proposed activity and include an assessment to demonstrate that it is covered by an existing SEO. For a pipeline this information must include an assessment of the fitness-for-purpose of facilities, equipment and management systems including a Safety Management System and HAZOP risk assessment and demonstration of compliance with AS 2885, and would typically include a Construction Environmental Management Plan (CEMP). An updated assessment (based on the detailed design) of the 'significant environmental benefit' (SEB) required to offset vegetation clearance under the *Native Vegetation Act 1991* would also be submitted at this stage.

2.2. Other Legislation

Key South Australian and Commonwealth legislation which may be relevant to WHP activities is discussed in Sections 2.2.1 and 2.2.2. Additional legislation which may be relevant is outlined in Table 2-1.

2.2.1. Key State legislation

Aboriginal Heritage Act 1988

The *Aboriginal Heritage Act 1988* (AH Act) provides protection for all Aboriginal sites, objects and remains across the state, whether registered, recorded or unknown. The AH Act applies to all land and bodies of water and vests the powers to protect and preserve Aboriginal heritage to the Minister for Aboriginal Affairs, who is required to take such measures as are practicable for protecting and preserving Aboriginal sites, objects and remains.

Ministerial consent would be required if construction of the WHP will damage, disturb or interfere with Aboriginal sites, objects or remains. Penalties apply for failure to comply.

Amendments to the AH Act may be enacted in the near future which primarily increase penalties for breaches under the Act and clarify the reporting requirements where areas of heritage values are discovered.

Environment Protection Act 1993

The *Environment Protection Act 1993* (EP Act) imposes a general duty of care not to undertake an activity that pollutes, or might pollute, the environment unless all reasonable and practicable

measures have been taken to prevent or minimise any resulting environmental harm. The EP Act includes protection for air and water quality, disposal of water to marine or inland waters. Environmental authorisations are required to undertake activities prescribed under the EP Act.

Environment Protection Policies (EPPs) are regulatory mechanisms which must be adhered to in addition to the EP Act and Regulations. The EPPs that may apply to the Project include:

- *Environment Protection (Air Quality) Policy 2016*
- *Environmental Protection (Water Quality) Policy 2015*
- *Environment Protection (Commercial and Industrial Noise) Policy 2023.*

The EP Act does not apply to exploration activity undertaken under the ER Act or to wastes produced in the course of an activity (not being a prescribed activity of environmental significance) authorised by a lease or licence under the ER Act when produced and disposed of to land and contained within the area of the lease or licence.

Landscape South Australia Act 2019

The *Landscape South Australia Act 2019* (Landscape SA Act) provides for approval for water-affecting activities, water sourcing (e.g. from new bores) and management of declared pest plants and animals.

Drilling of a new water well (e.g. for water sourcing or groundwater monitoring) would require a permit under this Act. Decommissioning of a water well would also require a permit, or a formal transfer of ownership if it is left in the care and ownership of a third party.

The Landscape SA Act and the Water Affecting Activity Control Policy (Landscape South Australia Eyre Peninsula, 2022) also set out a number of water-affecting activities that must not be undertaken without a permit. The Project is expected to require Water Affecting Activity permits for watercourse crossings.

Native Vegetation Act 1991

The *Native Vegetation Act 1991* (NV Act) and the *Native Vegetation Regulations 2017* apply to vegetation clearance for operational activities under the ER Act. Under Regulation 14 of the Native Vegetation Regulations:

- Clearance of native vegetation incidental to operations authorised under the ER Act is permitted if it is undertaken in accordance with—
  - a management plan, approved by the Native Vegetation Council (NVC) for implementation, that results in a significant environmental benefit; and
  - in the case of operations authorised under a Mining Act—a management plan under that Act; and
  - in the case of operations authorised under the ER Act—a statement of environmental objectives under that Act.
- Sub regulation (1)(a) does not apply if the person undertaking the activities or operations (or a person acting on the person's behalf) has made a payment into the Native Vegetation Fund of an amount considered by the NVC to be sufficient to achieve a significant environmental benefit in the manner contemplated by Section 21(6) or (6a) of the Act.

Guidelines[1] have been developed to provide a framework for determining the SEB requirement or the amount for payment into the Native Vegetation Fund. These guidelines are administered by DEM, who have delegated authority to approve SEBs.

A requirement to achieve a SEB will be included in the accompanying SEO.

2.2.2. Key Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999

Approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is required for activities that are likely to significantly impact Matters of National Environmental Significance (MNES), including World Heritage properties, National Heritage places, Ramsar wetlands of international importance, listed threatened species and ecological communities, migratory species, Commonwealth marine areas, the Great Barrier Reef Marine Park, nuclear actions and a water resource in relation to coal seam gas development and large coal mining development. The EPBC Act also covers actions on, or impacting on, Commonwealth land or actions by Commonwealth agencies.

A referral was submitted to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) in May 2024. The Commonwealth Minister decided in July 2024 that the Project is a 'controlled action' and requires assessment and approval under the EPBC Act. The controlling provisions listed in the decision notice were *National Heritage places*, *Listed threatened species and communities*, and *Listed migratory species*. The Project will be assessed by preliminary documentation under the EPBC Act, which will run as a separate process to approval under the ER Act.

Native Title Act 1993

The *Native Title Act 1993* (Cth) (NT Act) provides for the recognition and protection of native title and establishes ways for future dealings on native title land to proceed.

The WHP is located within the area of the Barngarla Native Title Determination (SCD 2016/001). The Federal Court determined in 2016 that native title rights and interests exist over some parts of the Eyre Peninsula within the Barngarla Native Title Claim (SCD2016/001).

The proposed alignment as set out in this EIR does not traverse any land where native rights and interests exist or will exist. However, if the proposed alignment is revised to traverse any portion of land where native rights and interests exist or will exist, Epic Energy will seek to negotiate and enter into an Indigenous Land Use Agreement (ILUA) with Barngarla Determination Aboriginal Corporation (BDAC) to enable the construction and operation of the WHP over the relevant portion of land. It is anticipated that any matters with respect to cultural heritage may also be documented in an ILUA in accordance with section 19N of the *Aboriginal Heritage Act 1988 (SA)*. This is discussed further under Section 5.5.

[1] MG16 Guide for a significant environmental benefit for the clearance of native vegetation associated with the Minerals and Petroleum Industry (NVC 2017).

2.2.3. Additional legislation

Key State and Commonwealth legislation relevant to the Project is summarised in Table 2-1[2].

Table 2-1: State and Commonwealth legislation

Legislation	Relevance	Agency
South Australia		
Aboriginal Heritage Act 1988	Refer Section 2.2.1 for further information	Aboriginal Affairs and Reconciliation within the Attorney-General's Department
Crown Land Management Act 2009	The WHP may traverse Crown Lands or land held under licence from the Crown.	Department for Environment and Water (DEW)
Dangerous Substances Act 1979	Licences may be required for storage or transport of dangerous substances if certain limits are exceeded.	SafeWork SA
Environment Protection Act 1993	Refer Section 2.2.1 for further information	Environment Protection Authority (EPA)
Fire and Emergency Services Act 2005	This Act provides for the prevention, control and suppression of fires and for the handling of certain emergency situations. Permits may be required in relation to fire bans and hot work activities for construction of the WHP.	Police and Emergency Services
Heritage Places Act 1993	Consent required from the South Australian Heritage Council if listed heritage places or related objects would be destroyed or disturbed as a result of WHP activities.	Heritage South Australia, DEW
Highways Act 1926	Construction of the WHP will temporarily impact on roads and highways during construction. Approval for temporary closures and/or rerouting of traffic may be required.	Department for Infrastructure and Transport
Landscape South Australia Act 2019	Refer Section 2.2.1 for further information	DEW
Local Government Act 1999	The WHP may temporarily impact on roads under the care and control of the Whyalla City Council during construction. Approval for temporary closures and/or rerouting of traffic may be required.	Whyalla City Council
National Parks and Wildlife Act 1972	This Act establishes parks and reserves and provides for their management and provides for the conservation of wildlife.	DEW
Native Vegetation Act 1991	Refer Section 2.2.1 for further information	NVC, DEW
Planning, Development and Infrastructure Act 2016	This Act contains special provisions relating to activities carried out under the ER Act in some cases (e.g. activities classed as 'high impact' or considered by the Planning Minister to be of major social, economic or environmental would need to be assessed as an EIS under this Act).	Planning and Land Use Services within the Department for Housing and Urban Development

[2] This table presents key legislation and is not considered an exhaustive list of all legislation.

Legislation	Relevance	Agency
Radiation Protection and Control Act 2021	This Act controls activities involving radiation sources and provides for the protection of people and the environment from the effects of radiation. Operation of non-destructive testing (NDT) equipment may require licensing.	EPA
Work Health and Safety Act 2012	Includes health and safety duties of care, including the primary duty to protect all persons from exposure to risks and hazards that arise from work.	SafeWork SA
Commonwealth		
Aboriginal and Torrens Strait Islander Heritage Protection Act 1984	While Aboriginal heritage is primarily dealt with under State legislation (e.g. the *Aboriginal Heritage Act 1988*), the Commonwealth legislation enables the Australian Government to protect cultural heritage that may be under threat if State or Territory laws have failed to protect it.	Attorney General's Department and DCCEEW
Environment Protection and Biodiversity Conservation Act 1999	Refer Section 2.2.2 for further information	DCCEEW
Native Title Act 1993	Refer Section 2.2.2 for further information	Attorney-General's Department Department of the Prime Minister and Cabinet

3. PROJECT DESCRIPTION

3.1. Overview

Epic Energy proposes to construct and operate the WHP to support the Whyalla Hydrogen Facility, a South Australian Government initiative to be constructed by OHPSA as part of the HJP.

As noted in Section 1.1, the WHP comprises the following key components:

- A compressor station at the Whyalla Hydrogen Facility to compress the hydrogen for injection and withdrawal of hydrogen from the pipeline
- A buried and looped pipeline designed to store and transport hydrogen (nominally 900 mm diameter) approximately 45 km in length (22.5 km right-of-way length)
- A valve station located near Fitzgerald Bay Road, Port Bonython (near to where the pipeline will loop and return to the Whyalla Hydrogen Facility).

Hydrogen produced by the Whyalla Hydrogen Facility's electrolysers would be compressed, injected into, stored under pressure and transported through the WHP. This stored hydrogen would be used to feed the hydrogen power station at the Whyalla Hydrogen Facility at times when the power station is delivering dispatchable power into the energy grid. Excess hydrogen produced at the HJP site would be stored in the WHP to be used to generate dispatchable power into the grid when required.

3.2. Project Area and Pipeline Route

For the purposes of discussion in the EIR and SEO, a Project area was defined which encompasses the proposed alignment and all potential variations that could occur during final route selection and detailed design (Figure 3-1).

The proposed WHP route commences at the Whyalla Hydrogen Facility and extends approximately 22.5 km to the east towards Port Bonython (Figure 3-1). The proposed WHP is situated predominantly within the City of Whyalla local government area, with a short section in the unincorporated areas of Whyalla (i.e. land not within a council area) and is within the region overseen by the Eyre Peninsula Landscape Board. The Barngarla people have been recognised as the Traditional Owners of this region.

The WHP route aligns with existing infrastructure corridors (including roads, tracks, rail and pipeline alignments) for the majority of its length. From its commencement at the Whyalla Hydrogen Facility, it crosses Lincoln Highway and the adjacent rail line, then parallels the rail line and highway northwards for approximately 2 km. It then heads generally eastwards for approximately 3 km, parallel to, and adjacent to the northern boundary of the proposed Cultana Solar Farm (remaining south of the proposed Yoorndoo Ilga Solar project), then bears north-east for approximately 3.5 km through the Cultana Industrial Estate to Point Lowly Road, where it crosses to the north side of the road. The alignment then heads in a generally south-easterly direction along the north side of Point Lowly Road and parallel to the existing Santos Moomba to Port Bonython liquids pipeline for about 11 km before heading in an easterly direction along the north side of Fitzgerald Bay Road. It loops back around at a location which is approximately 4.5 km north-west of Port Bonython.

The proposed WHP route is indicative at this stage of development, with the final alignment subject to detailed engineering design and further refinement in some sections as consultation with affected landowners progress.

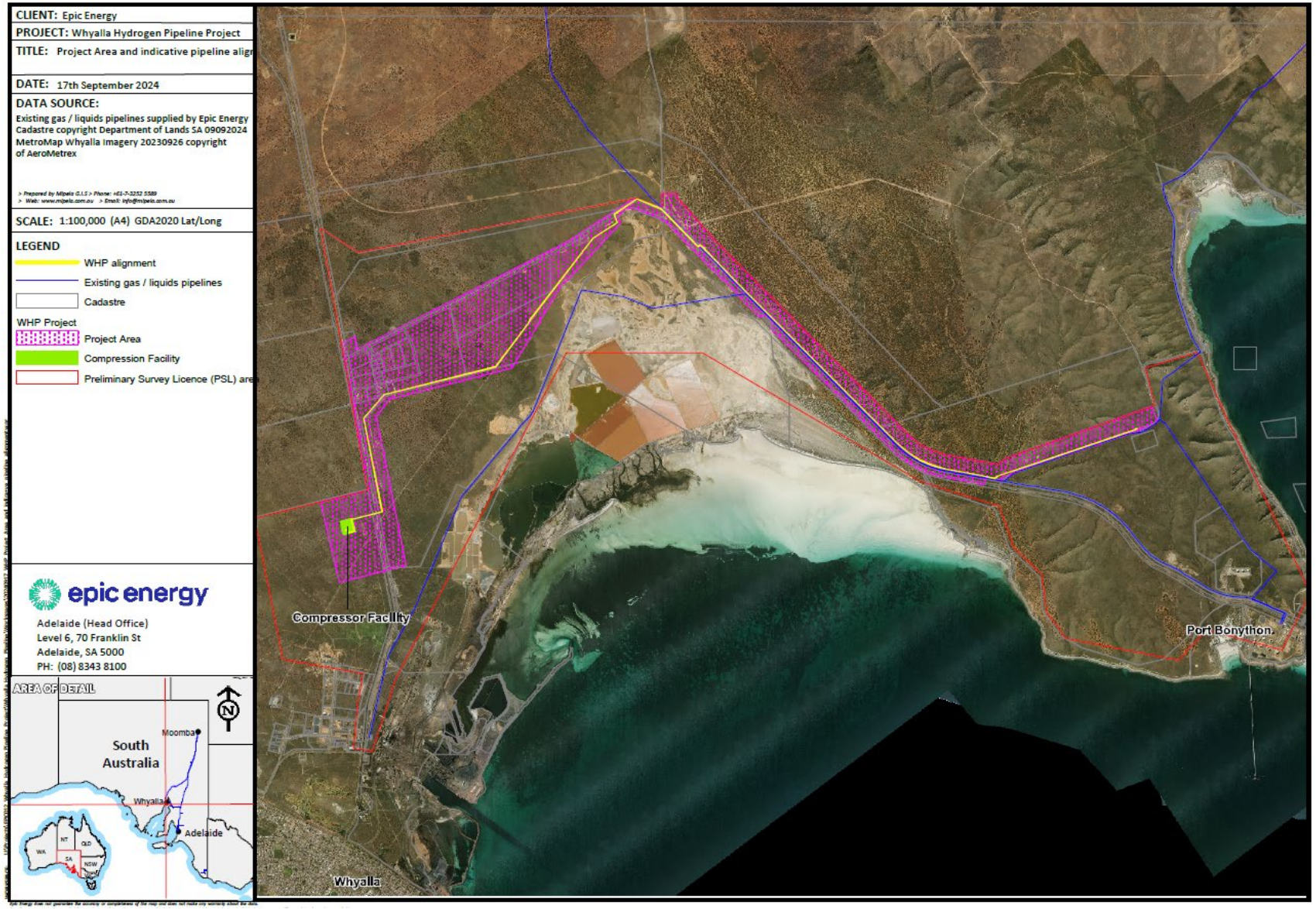

Figure 3-1: Project area and indicative pipeline alignment

3.3. Project Timing

The South Australian Government has set an operational date in 2026 for the Whyalla Hydrogen Facility. The WHP will be required to be commissioned and in operation in line with the operations date for that facility.

It is anticipated that the WHP will take approximately 12 months to construct and commission. The schedule is dependent upon the timing of all required regulatory approvals.

The design life of the pipeline has not been finalised but is expected to be in the order of 40 years.

3.4. Design and Engineering

The pipeline will be designed in accordance with the requirements of AS 2885, however, as the pipeline will be carrying hydrogen, the relevant requirements of the *Hydrogen Pipeline Systems Design, Construction and Operation A Code of Practice for the Australian Pipeline Industry (June 2024)* (FF CRC2024) will also be incorporated into the design of the pipeline.

The WHP has been designed to provide storage of 100 tonnes of hydrogen for the Whyalla Hydrogen Facility and to allow potential future hydrogen transmission to third-party users.

Key engineering and design features are provided in Table 3-1.

Table 3-1: Key engineering and design features

Design element	Details
Length	Approximately 45 km total (i.e. 22.5 km for each of the looped pipeline segments)
Diameter (nominal)	DN900 (i.e. 900 mm)
Separation between dual pipes	5 to 10 m
Wall Thickness	27 mm
Pipe Specification	API 5L X52 PSL2
Factory Coating / Field Joint Coating	DLFBE/HBE (dual layer fusion bond epoxy / high build epoxy)
Pipeline Content	Hydrogen gas
Operational Pressure (min / max)	1.5 / 6.5 MPa
Maximum Allowable Operating Pressure	6.5 MPag
Design Flow Rate	Filling: 5000 kgH2/hr Discharging: ~15,840 kgH2/hr
Nominal Storage Capacity	100 tonnes
Minimum Depth of Cover	In accordance with AS 2885:1, typically: • Location class R1 / R2 – 750 mm • Location class T1, HI – 900 mm • Road and Track Crossings (Sealed and Unsealed) – 1200 mm • Major Road Crossings (bored) – 1500 mm • Rail Crossings – 2000 mm • Watercourses– 1200 mm
Pipeline Easement	25-30 metres post construction (fully reinstated)

Design element	Details
Corrosion Protection	Impressed current cathodic protection system
Non Destructive Testing	100% radiography or ultrasonic testing of welded joints.
Hydrostatic Pressure Testing	Mainline test – 20.4 MPa (96% SMYS) Pipeline assemblies – 20.4 Mpa (1.5 x mechanical design pressure of 10.2 MPa) A leak test will be completed following the strength test.
Buried Marker Tapes	Installed above pipeline.
Pipeline Monitoring System	A Supervisory Control and Data Acquisition (SCADA) system for remote monitoring and control of all facilities along the pipeline.

A brief description of the pipeline facilities and associated infrastructure is provided in Table 3-2. The facilities will be designed in accordance with all relevant legislation and standards.

Table 3-2: Indicative pipeline facilities and infrastructure

Design element	Details
Compression Facilities	Major components of the compressor station include 3x 33% electric drive reciprocating packages (with an allowance for potential future expansion to four packages) , gas filters to remove particulates, gas pressure regulation skids, air cooled heat exchanges, instrument air package, nitrogen generation package, a flare or cold vent, a HV transformer compound, lube oil storage, safety showers, a control room housing the automated control system and motors office, amenities, carpark and a workshop. The station is designed to be operated from the Pipeline Control Room at Epic Energy located at 70 Franklin Street Adelaide SA and would be visited regularly for maintenance and instrument calibration.
Metering and Valve Facilities	A mainline valve compound will be constructed at the far eastern end of the pipeline easement near Port Bonython.
Cathodic Protection System	A cathodic protection (CP) system will be incorporated into the pipeline design to protect the pipeline from external corrosion in conjunction with the external corrosion coating. This involves the use of impressed current CP system located at the Whyalla Hydrogen Facility connected to the buried pipeline via cabling and electrically isolated from the above ground piping using monolithic isolation joints. In addition, CP test posts will be located approximately every 2 km. Test posts are required to allow for monitoring of the effectiveness of the cathodic protection system.
SCADA System	A SCADA system for remote monitoring and control of all facilities along the pipeline will be installed comprising of Remote Telemetry Units connected to Epic Energy's Transportation Services Control Centre via Satellite Communication.
Pipeline Markers	Pipeline marker signs will be located at intervals along the pipeline easement in accordance with AS 2885:1 so that a person can clearly see a marker sign in either direction. These marker signs will be placed closer at bends, on either side of road and watercourse crossings and at fence lines.

An indicative layout of the compression facilities is shown in Figure 3-2 (noting that this layout is subject to revision in detailed design).

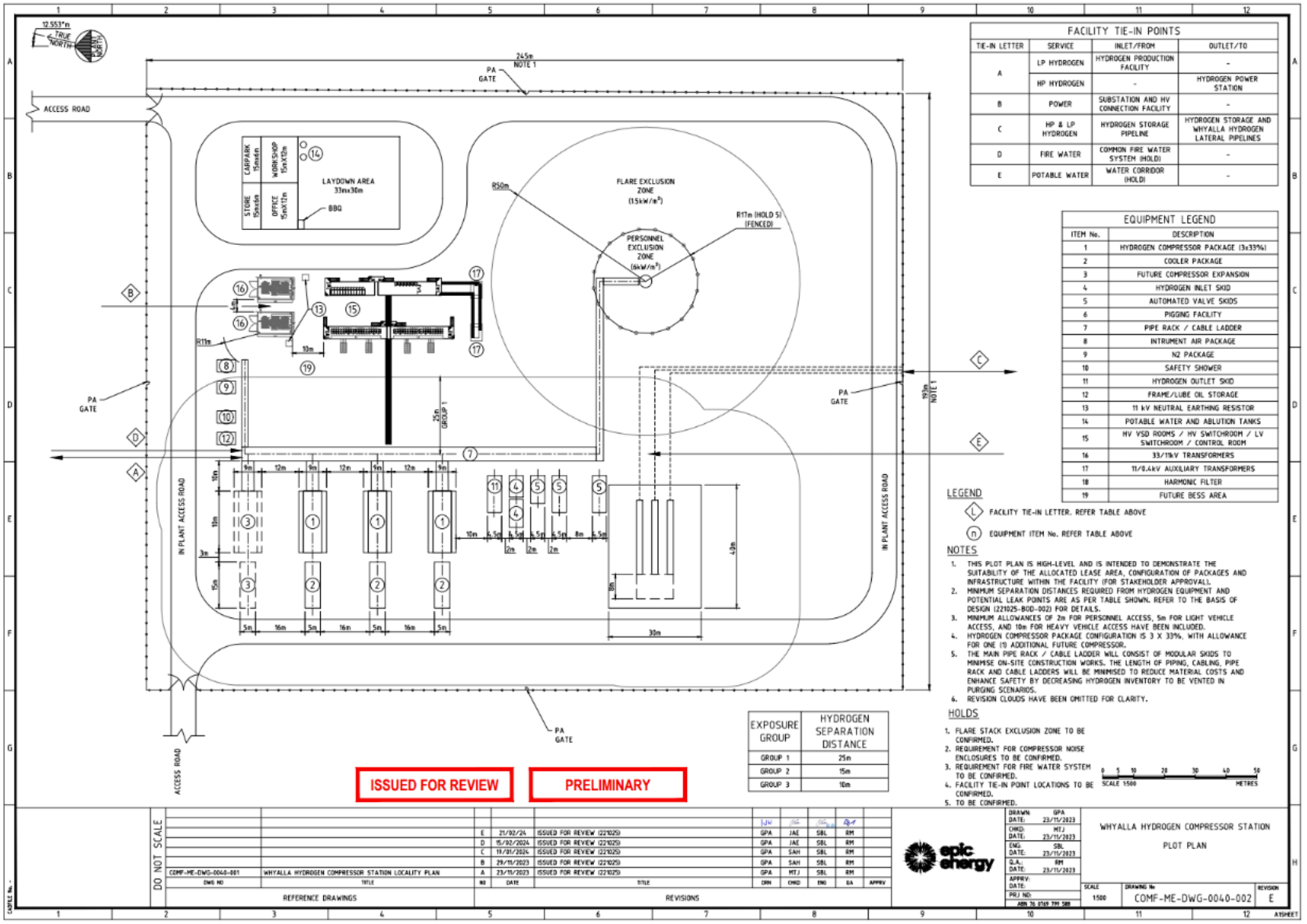

Figure 3-2: Indicative layout of compression facilities

3.5. Pipeline Construction

The pipeline will be sequentially constructed in accordance with the requirements of AS 2885 and in accordance with any conditions incorporated into the pipeline licence.

The pipeline will be buried effectively for its entire length and will generally involve trenched construction.

It is anticipated that construction of the looped pipeline will be undertaken by constructing each run of pipeline separately following the methods set out below. The first run of pipeline will be completed in a sequential manner (unless otherwise required by landowners) before the second run of pipeline (return loop) is constructed approximately 5-10 metres from the first. This will minimise the construction footprint by enabling crews to use the disturbance area created during the first run for stockpiling topsoil when constructing the second run.

3.5.1. Construction activities

Pipeline construction activities and sequencing will follow standard industry practices and are described in this section. The key construction elements are listed in Table 3-3 and a typical pipeline construction layout is presented in Figure 3-3. These elements may change depending on detailed engineering design and any conditions set out in the pipeline licence to be issued under the ER Act.

Construction is expected to be undertaken by a series of specialised crews (e.g. clear and grade, stringing, bending, welding and NDT, coating, lowering-in, backfill, reinstatement) that sequentially move along the alignment.

Table 3-3: Key construction elements

Element	Description
Construction right-of-way width	45 – 50 metres with potential to pinch to 30 metres in short sections of greater sensitivity
Construction workforce	Peak workforce of approximately 520 people (inclusive of workforce for both pipeline and compressor facility construction activities)
Standard construction hours	6am – 6pm, 7 days / week
Construction duration	Approximately 12 months
Length of open trench	No limit – target 6 km subject to ground conditions
Expected time between clear and grade and restoration	Approx. 6 months

Survey

Detailed engineering, environmental and cultural heritage surveys have been used to inform route selection and to determine where special construction techniques or mitigation measures will be required.

The centreline of the pipeline route will be surveyed and engineering aspects finalised. Markers (pegs) will be placed along the entire route to identify the pipeline route and right-of-way.

A survey crew will carefully survey and stake the construction right-of-way to ensure only the pre-approved construction workspace is cleared. All potentially impacted utilities will be identified and marked to prevent damage during construction. Areas of environmental or cultural heritage sensitivity that are not to be disturbed will be clearly demarcated from the work area by the use of signage and / or fencing.

Setting up work areas

The construction process may provide for the following activities to establish work areas:

- new access tracks as well as access upgrades
- establishment of groundwater monitoring bores, turkey nests and related infrastructure along the pipeline route, including a hydrotesting dam for construction and commissioning water
- establishment of equipment laydown yard, plant yard and offices / carpark areas to support construction activities
- pre-construction survey including survey control stations
- pipe stockpiles
- temporary fencing.

These activities will be pre-agreed with landowners and will enable the timely mobilisation of pipeline construction personnel, equipment, and materials, while minimising impacts to landowner operations. These areas are integral to pipeline construction and will help ensure it is installed in the shortest period possible and in a safe and environmentally sound manner.

Equipment laydown yard, plant yard and offices / carpark

During construction of the pipeline, a temporary area of approximately 15 ha or less will be required to house the equipment laydown yard, plant yard and offices / carpark areas.

The equipment laydown yard will be centrally located, with good access to transport links and away from flood prone areas. It will be used to store pipes (approximately 2,500 pipes, 18m long), induction bends, valves, facilities fittings, piping, spools, electrical and instrumentation materials and will contain site offices, sheds, kitchen and ablution blocks with generators.

The plant yard will be used for inspection, certification, storage, maintenance and repair of mechanical equipment such as excavators, sidebooms, graders, welding equipment, trucks and other plant and equipment required for construction, containers for storage of materials, parts, goods and a store for distribution of these to the crews, a diesel tank for vehicles and fuel trucks, sheds and ablution blocks (likely shared with pipe yard if it is adjacent).

The offices and carpark area will house temporary units of 12x12 m, 12x6 m and 6x3 m (for offices, meeting rooms, kitchen and ablution blocks), generators and parking spaces for light vehicles to access offices.

Clear and grade

To make the construction right-of-way a suitable work area, a clearing and grading crew will prepare the route so that construction equipment can operate safely. The clearing crew will remove trees, shrubs, boulders and other impediments that may prohibit construction. Cleared vegetation will be stockpiled on the edge of the construction right-of-way for re-spread during reinstatement.

The grading crew will prepare a working surface for the construction workers and equipment that will follow.

Topsoil will be stripped to a pre-determined depth (typically 100 mm) and stockpiled along the sides of the construction right-of-way to be returned to its original state. The stripping and stockpiling of the topsoil (and embedded seed stock) provide a ‘sterile’ work surface which is important in preventing the spread of weeds.

A surveyor will mark out the pipe centreline using pegs as well as any changes in design requirements such as depth of cover and wall thickness.

The construction right-of-way is expected to be consistent with the widths outlined in Table 3-3, however additional workspace may be required in certain areas such as road, rail and other crossings.

Pipe stringing, welding and field joint coating

Stringing

Once the construction right-of-way has been sufficiently cleared to allow access of construction equipment, sections of pipe will be laid out along the right-of-way. This process is called 'stringing' the pipe (refer to Plate 3-1).

The pipes will be transported on trucks from the pipe mill to the pipe storage yard or directly to the right-of-way. Once at the right-of-way, the pipe will be lifted off the truck and placed on skid and sawdust bags to protect the pipe coating. The stringing crew will carefully distribute the various pipe sections along the right-of-way according to the design plan.

Plate 3-1: Example of pipe stringing

Bending

Pipe bends can be performed in the field or fabricated offsite. Using a series of clamps and hydraulic pressure, a bending machine makes field-formed controlled bends in individual sections of the pipe. This allows the pipe to follow the pipeline route and to conform to the topography. All bending must be performed in strict accordance with a qualified procedure to ensure integrity of the pipe.

Welding and non-destructive testing

To carry out the welding process, each pipe will be temporarily supported and ‘stabbed’ on to the preceding pipe section. The joint must be clamped, aligned and welded together to form one continuous string length, which may be up to 1 km in length. This is accomplished using manual or mechanised welding procedures. All welding procedures must be qualified, and the welding of the pipe controlled to strict specifications. Each weld procedure must be approved by a Welding Engineer for use on the Project.

Sidebooms will be used to pick up, support, and align each section of pipe with the next section to make the first pass of each weld.

Each welder must pass qualification tests prior to welding on a pipeline project. Typically, each welder must successfully complete test welds using the same process of pipe welding to be used in the Project. The welds are then evaluated by visual inspection, destructive testing, and NDT.

Weld quality will be monitored throughout the Project. To do this, qualified technicians will use NDT methods (radiographs (X-rays) or ultrasound) to inspect the pipe welds to ensure completed welds meet mandated quality standards. After evaluating the radiograph or ultrasonic images, the technicians will interpret the NDT results to identify any defects which will then be either repaired and re-inspected or removed entirely.

A number of production welds (typically 3 for the Project) will be randomly selected for cut out and undergo full destructive testing to ensure required metallurgical and mechanical properties are being maintained.

Field joint coating

While a factory coating is applied to the pipe during manufacturing, the ends of the pipe will remain uncoated to allow for welding. After the ends are welded together the uncoated portion of pipe will be thoroughly cleaned to remove any dirt and debris and a coating applied to the weld joint to prevent corrosion. Several different types of coatings may be used to coat field welds, such as high build epoxy. After application, the coating will be cured as per manufacturer's specifications and inspected to ensure it is free from defects before being lowered into the ground.

Trenching

A trench will be dug along the right-of-way to the surveyor's specifications using specialised trenching machines and excavators (Plate 3-2). Two trenches will be dug running parallel to each other to accommodate the two looped pipeline sections; however it is anticipated that only one trench will be dug at a time.

Trenching is usually performed after pipe string fabrication (welding, NDT and joint coating) is completed, although may be performed ahead of these activities if drilling and blasting are required to clear rock obstructions in a controlled manner.

Trench spoil will be stockpiled (windrowed) adjacent to the trench on the opposite side to the welded pipe string, keeping trench spoil segregated from stripped topsoil.

The trenches will be dug deep enough to allow adequate cover of the buried pipe (in accordance with the requirements of AS 2885) and wide enough to avoid coating damage during lowering-in operations. The trench is expected to be approximately 1100 mm wide and range in depth from 1650-2100 mm to facilitate installation of the pipeline and achieve the minimum design depth of cover (measured from the top of the pipe). Pipeline depth is expected to vary depending on surrounding features (refer Table 3-1). In other locations, such as where consolidated rock is present, the pipeline may be installed in a shallower trench.

Plate 3-2: Example of pipeline trenching

The time between the trench being opened and lowering-in will be minimised to prevent trench collapse and reduce the likelihood of fauna entering the trench. However, sufficient trench is needed to be opened ahead of the lowering-in crew to avoid impeding progress of the subsequent crews in the pipeline construction operation. This may be as much as 6 km (or up to 10 days) depending on trenching progress.

Bellholes (enlarged areas of trench) would need to be excavated at the start and end of each string to enable tie-ins of adjacent pipe strings after being installed in the trench.

Figure 3-3 sets out how each pipeline run will be constructed for the Project. The second pipeline run will be constructed in a similar fashion, parallel to the first with a separation distance of approximately 5-10 m.

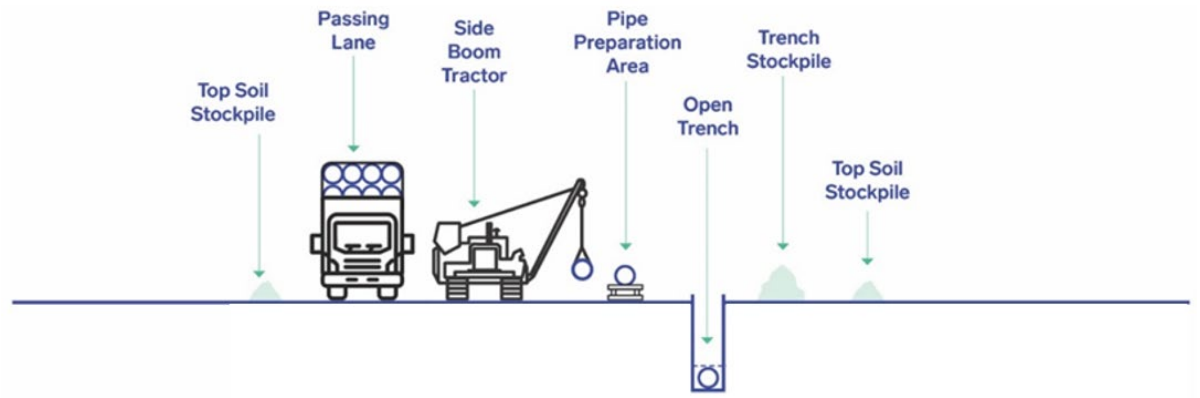

Figure 3-3: Typical layout for construction of a pipeline

Padding and Lowering-in

Prior to lowering-in of the pipeline string, the trench bed will be prepared by 'bedding' with a layer of material conforming to maximum particle size and distribution specification. This is usually achieved

by screening the excavated trench spoil through a nominated screen size by use of a padding machine. Alternatively, imported sand or similar material conforming to specification can be used.

Once the trench is prepared, the pipeline string will be lowered into the trench in a smooth and uniform manner to prevent overstressing and damaging the pipeline, using sidebooms and excavators / cranes (Plate 3-3).

The pipeline and coating will be protected from damage by 'padding' the pipeline with material similar to the bedding material referred to above, to a thickness of 300 mm above the top of the pipe. The remaining backfill material will be placed into the trench and compacted in layers. If large rocks (more than 300 mm diameter) are present in the backfill material, these will be separated and either re-placed on the surface of the trench, used for erosion control (e.g. rock beaching) or disposed of.

Plate 3-3: Example of pipeline lowering-in

Backfilling

Stockpiled trench spoil excavated during trenching will be returned to the trench and compacted following the lowering-in of the pipe. Special care will be taken to ensure that excavated spoil and soil profiles are re-established to avoid soil inversion.

After the trench is fully backfilled and compacted, the subsoil contours will be reinstated, compacted areas de-compacted by ripping, and topsoil pulled back over the stripped area. This will ensure the topsoil is returned to its original position.

The time between lowering-in and backfilling will be minimised to reduce the likelihood of fauna entering the trench.

Pipe cleaning

Prior to hydrostatic testing, the pipeline will be cleaned with foam and / or brush pigs to remove weld debris, dust and surface scale.

Hydrostatic testing

Pipeline integrity will be verified using hydrostatic testing (hydrotesting) in accordance with AS 2885.5.

All newly constructed hazardous liquid and gas transmission pipelines must be pressure tested (strength test and leak test) before they can be placed into service. The purpose of a strength pressure test is to find any defect that might threaten the pipeline's ability to sustain its designed maximum operating pressure. The purpose of the leak pressure test is to confirm integrity of the pipeline and identify and repair any defects detected before the pipe is placed into service.

To complete hydrostatic pressure testing, the pipeline will be filled with water and the internal pressure raised to a specified level above the intended maximum operating pressure. If there are any critical defects in the pipe, they will most likely fail during pressure testing. If the pipe does fail, these defects will be repaired, or cut out, and the pressure test repeated to establish the maximum operating pressure of the pipeline.

Potable water is preferred for hydrotesting, but non-potable hydrotest water may be treated prior to testing with chemicals such as biocide, oxygen scavengers and corrosion inhibitors (depending on factors such as the water quality of test water and the length of pipe tested). If the hydrotest water meets water quality guidelines and has landholder approval, it may be discharged to the surrounding land (away from watercourses or areas where it could impact surface water). Alternatively, it may be contained and treated on site or removed off site. A lined and fenced 'turkey nest' dam approximately 150 m x 150 m may be constructed on the Whyalla Hydrogen Facility site to hold water for hydrotesting.

Following successful strength and leak pressure tests, the pipeline will be dewatered, cleaned and dried.

Reinstatement, clean-up, and rehabilitation

Commencement of rehabilitation of the construction right-of-way will follow closely behind the mainline backfill of the second pipeline run, with strict adherence to all relevant regulatory requirements. The primary objective of rehabilitation works will be to restore disturbed areas to resemble their pre-clearance condition to the extent feasible.

Rehabilitation of the construction right-of-way will include the following steps:

- Stockpiled topsoil will be respread over the stripped area (as described in ‘Backfilling’ above)
- Surface drainage lines and other land features will be re-established
- Soils will be ripped in areas to relieve compaction (if applicable) and cleared vegetative material (e.g. shrubs and tree branches) reinstated along the construction right-of-way
- Natural regeneration will be allowed to occur within the disturbed areas to facilitate indigenous species regeneration and soil stabilisation
- Additional seeding will be undertaken using selected local species that match the vegetation communities traversed. Seed species selection will favour, where feasible, vulnerable fauna such as Western Grasswren, Southern Whiteface and Malleefowl.

In addition to the ecological rehabilitation works described, pipeline marker signs will be installed to identify the pipeline location (Plate 3-4), crossovers, access tracks, temporary gates and fences will be removed and reinstated to original condition or in accordance with requirements of the relevant landowner.

Plate 3-4: Example of rehabilitated right-of-way and marker post 12-18 months post construction (Epic Energy QSN3 pipeline)

Post-rehabilitation, a direct current voltage gradient (DCVG) survey will be conducted to verify the coating integrity of the pipeline. Subsequent inspections of the pipeline will be conducted to monitor the effectiveness of the rehabilitation activities detailed in the Project CEMP.

Regular inspections will be scheduled both during and after construction to detect any signs of trench subsidence, with erosion and sediment control measures maintained as necessary.

Upon completion of all rehabilitation activities, access to the pipeline will be restricted to essential maintenance tasks only to ensure successful re-establishment of ground cover.

3.5.2. Watercourse and infrastructure crossings

Crossings of watercourses or drainage lines are expected to be constructed using standard open cut (trenching) construction. This technique is most suited to the dry, low flow conditions characteristic of the arid lands. Should high flowing water be encountered, flow diversion techniques will be employed where necessary.

The standard open cut method involves establishing a stable working platform either side of the watercourse and creating a trench using excavators. The trench will not be completed through the banks until immediately prior to pipe installation. Tie-in points (where the section of pipe used for the water course crossing is connected to the adjacent pipeline section) will be located on high ground well away from the banks.

Watercourse bed and bank material and trench spoil will be stockpiled separately. Pipe string welding and field joint coating will occur prior to placement in the trench. Where there is water in the trench at watercourse crossings and in areas of significant inundation (as identified by risk assessment in compliance with AS 2885.1) trench dewatering or buoyancy control measures may be implemented to prevent the pipe 'floating' once in place.

Flow diversion techniques can be used to prevent siltation during trenching, lowering in and backfilling if higher water volumes and flows are encountered (typically up to 1,000 litres per second). These techniques involve temporarily redirecting watercourse flows away from the active work area and

require construction of barrier dykes or head walls upstream and downstream of the active work area. Once barriers are in place, the waterflow will be either piped around the work area (not suitable for watercourses with broad channels, low gradients or permeable substrates) or the work area will be pumped dry (suitable for low gradient streams with discharges less than 1,000 litres per second). Flow diversion techniques are unlikely to be required given the ephemeral nature of the watercourses present in the Project area.

To minimise the period of construction and subsequent environmental disturbance, Epic Energy aims to complete watercourse crossings within the shortest period practicable (small watercourse crossings would typically be completed within 1-2 days). State agencies responsible for water resources will be consulted prior to construction and during restoration and appropriate approvals in place prior to construction.

Boring

The technique of boring will be used to install pipelines beneath infrastructure such as roads, the Australian Rail Track Corporation (ARTC) railway line and any buried utilities. It is a low impact technique involving drilling short distances from below ground within an enlarged trench area, or bellhole, located inside the construction right of way.

Horizontal directional drilling

Horizontal directional drilling (HDD) is a technique used to cross features such as major watercourses where standard open cut methods are not feasible. It may also be used for road or railway crossings. It is not expected to be used for the WHP, however remains a possibility while site investigations and engineering design are underway. The feasibility of using HDD is strongly limited by site conditions such as soil stability, slope, access, available workspace and the nature of subsurface rock.

The installation of the pipeline by HDD involves drilling a hole at a shallow angle beneath the surface, then pulling the welded pipe string pipe back through the drill hole. Drilling is conducted by a specially designed drill rig, operated by a specialist contractor. A variety of associated equipment and infrastructure is required. Excavations are typically required for a cuttings settlement pit and drilling mud containment pits at the drill entry and exit points. Depending upon the length of the crossing, an HDD can take anywhere between a few days to several weeks to complete. The size of the HDD rig and its associated footprint depends on the size of the pipe, subsurface geology and the length of the drill.

Although HDD may reduce above ground impacts, the technique introduces additional environmental considerations such as drill site sediment control, waste management, noise and increased duration of construction and workforce numbers. To address these issues, site-specific management procedures are prepared prior to drilling.

3.6. Compressor Station Construction

Initial compressor station construction activities will include site establishment works including establishment of access to the Lincoln Highway, clearing of the site and establishment of general laydown hardstand areas (for office, amenities, car parking and equipment storage). These works will be undertaken by contractors on behalf of OHPSA as part of the Whyalla Hydrogen Facility works.

The construction footprint for the compression facility is nominally 250 m x 200 m. It will include an equipment laydown area, offices, and a truck quarantine area and carparking on the northern boundary to support construction works.

After the site has been established by OHPSA, piles and concrete foundations will be installed for the buildings, pipework and equipment to be set up on. Equipment and pipework will be both skid-

mounted and constructed on site to maximise construction efficiency and minimise supply chain risk. Buried services such as earthing grids, service water and cable pits will be installed, and cables and pipework will be constructed to connect the installed equipment.

Most of the major equipment and structural, mechanical, piping, electrical and instrumentation components will be manufactured outside of Australia, although fabrication of skids and installation of equipment will be undertaken within Australia where equipment is shipped as separate components. It is anticipated that the major equipment and structural, mechanical, piping, electrical and instrumentation components will be transported to the Port of Adelaide by ship, then transported by semi-trailer to the compressor station in Whyalla for installation.

Testing and commissioning of the associated compressor station and pipeline equipment may involve hydrostatic testing of pipework, as well as non-destructive testing of mechanical and electrical equipment to ensure it has been installed correctly and is ready for commissioning. Commissioning involves the introduction of gas and fine tuning of equipment and instrumentation by running the equipment through various operating modes to test performance. Once performance is verified and the equipment is deemed safe to operate, the compressor station will be ready for commercial operation.

Construction of the associated surface facilities is estimated to take approximately 10 months to complete, with around 3 months for commissioning. Commissioning will occur sequentially and overlap with the construction phase, such that construction and commissioning of the compressor station is estimated to require 12 months in total.

3.7. Pipeline Operation

After reinstatement of the construction right-of-way, there will be very little above-ground infrastructure visible. Above-ground infrastructure will be limited to marker posts to identify the location of the pipeline, compression and associated facilities on the main Whyalla Hydrogen Facility site and a small, fenced facility at the end of the line valve station.

The pipeline will be operated in accordance with the pipeline licence, an Operation Environmental Management Plan (OEMP) and all relevant legislation and standards. A summary of pipeline operational activities is provided below and in Table 3-4.

A routine operation and maintenance program will be implemented, which will include leak detection surveys, ground and aerial patrols, in-line inspection, repair or replacement of faulty pipe or other equipment, pigging and cleaning of the pipeline, corrosion monitoring and remediation and easement and lease area maintenance. Aerial and / or ground inspections will include checking vegetation for discolouration which can be an indicator of a leak, detection of erosion, monitoring of rehabilitation success and detection of weed species.

Access to the easement will be necessary to follow-up issues identified from inspections. Low level maintenance for erosion, subsidence and weeds is likely to be necessary, particularly during the first 12 months following construction. Light vehicle access may be required at various points along the pipeline easement to allow inspection and maintenance, however a formal access track along the easement is not expected to be required. Existing access tracks would be utilised to access the easement where required.

More significant maintenance activities to address coating defects, such as dig-ups, are likely to be infrequent. However, any maintenance activities required will be conducted in accordance with the SEO and the OEMP. Dig-ups involve the excavation of material from around the pipeline (typically referred to as a bellhole), to allow sufficient room for operations technicians to safely undertake any

remedial works that may be required. The excavation of material will be undertaken in accordance with the construction management conditions outlined in Section 3.5.1 (i.e. topsoil will be stockpiled separately from trench spoil, and the site will be restored as soon as practical following completion of maintenance works).

Prior to commencing extensive work, or where numerous sites are involved, operations personnel will consult with regulatory authorities as appropriate.

Operational pipelines generally have very little environmental or landowner impact. Regular consultation will be maintained with landowners whose properties are traversed by the pipeline and the 'Before You Dig Australia' service will be promoted for use by third parties wishing to locate the pipeline prior to undertaking excavations.

Table 3-4: Summary of pipeline operational activities

Activity	Description
Easement maintenance	
Weed control	Localised spraying of weeds is undertaken along the easement as required.
Line of sight clearance	Clearance of the right-of-way to maintain line of sight is generally not required in arid regions with predominantly low open grassland or shrubland. Trees retained on the easement during construction will not be removed, however it may be necessary to remove trees that regenerate within 2 m of the pipeline as they pose a threat to pipeline integrity.
Patrolling/inspections – easement access	Vehicle travel along the right-of-way, on private / public roads or over paddocks and will involve access to private property and use of private tracks. Frequency depends on whether particular issue(s) require monitoring; frequency can range from weekly to monthly or longer. Vantage point patrols are performed every 3 months and full patrols conducted every 12 months.
Aerial inspection of easement	Use of low-flying aircraft, typically carried out every 12 months.
Pipeline operations	
Cathodic protection surveys	Surveys involve taking readings at CP test points (above-ground post) along the easement. Typically conducted twice per year.
Testing and inspection of relief valves	Controlled venting of minimal quantities of hydrogen gas to atmosphere is involved. Typically occurs once per year with a duration of approximately 30 seconds.
Erosion events	Following major rainfall events, creek lines or run-off areas on right-of-way can experience soil erosion. Repairs are effected immediately following the erosion event and include the replacement of similar materials and re-profiling. Given the area is so flat, this is not expected to be a regular occurrence.
Emissions	Hydrogen gas is released to the atmosphere as a result of pipeline and facility maintenance operations (i.e. unit blow downs / venting, valve opening / testing). Small volumes are released. Occurs for duration of operational life.
Pipeline Incident	The main threats to public safety from pipeline operation and maintenance are fire, explosion or radiation exposure as a result of pipeline rupture. Pipeline risk assessments have identified that these threats are associated with factors such as third party or external interference to the pipeline and pipeline corrosion.
Pipeline maintenance	

Activity	Description
Pigging / in-line inspection	Intelligent pigging will be conducted for in line inspections purposes. These inspections will be carried out every 5 years and will require the pipeline to be vented. As a part of planning, the pipeline pressure will be drawn down to the minimum operating pressure of 1.5 Mpa using the compressors and the remaining hydrogen vented or flared to atmosphere. This could be up to 30 tonnes of hydrogen every 5 years.
Excavations	Excavations of the pipeline follow the same processes as those identified in Section 3.5.1, namely clear and grade, trenching, backfill and restoration and rehabilitation but are generally on a much smaller scale. Once vegetation and topsoil have been cleared and stockpiled, the required area is excavated and spoil stockpiled. Pipeline maintenance activities are then undertaken which may include welding, painting, sand blasting. Once complete the trench is backfilled, the ground surface is re-contoured and the topsoil and vegetation respread. Some reseeding will be undertaken if necessary. These activities may occur during the first year of operation to rectify defects, although are expected to be very rare during the life of the pipeline.
Replacement of pipeline section	A section of the pipeline is isolated and a controlled release of hydrogen gas is undertaken from the affected section. The affected area is then excavated, the old pipeline removed and replaced (includes welding, blasting, coating) and the site reinstated. This is expected to be very infrequent.
Welding	Welding is usually required when pipeline repairs or modifications are made to existing infrastructure.
Coating	Sleeves or tape or epoxy painting (spray) are expected to be used to coat welds or repair areas of pipeline or above ground pipeline.
Pressure testing	Pressure testing is required when a section of pipe is replaced. Pressure testing, even for small sections of pipe, follows the same processes as those identified in Section 3.5.1 – Hydrostatic testing.
Facility operation and maintenance	
Compressor facilities	This station would operate daily with an expected duty of up to 55% (4796 hours per year) to compress the hydrogen for storage in the pipeline of for supply of hydrogen to the power station. The flare at the compressor facility is expected to operate on an intermittent and infrequent basis (e.g. daily / weekly for a duration of under 15 minutes).
Weed control	Localised spraying of weeds is undertaken in and around compounds.
Production of hazardous waste	Liquids and heavy metals (e.g. mercury) are not expected in the product, but if present they would be trapped in coalescing filters. Contaminated filters are generated from maintenance change-overs at the compressor facilities. Contaminated waste and oils will be removed from site for disposal by a licensed contractor.
Waste disposal	General waste generated during operations is collected on site and removed to licensed facilities for disposal.
Station blow downs	Uncontrolled venting which is a result of equipment failure e.g. regulator failure. Duration would depend on type and duration of failure

3.8. Decommissioning

When no longer required, the pipeline will be decommissioned in accordance with the regulatory requirements and accepted environmental best practices of the day. Current decommissioning procedures require the removal of all above ground infrastructure and the restoration of associated disturbed areas.

At the time of decommissioning a decision will be made regarding the opportunities for future use of the pipeline. If no longer required, the pipeline, once purged of hydrogen, and below ground facilities

will be left in-situ. However, if it is considered that the pipeline may offer some future benefits, it will be filled with an inert material and the cathodic protection system maintained to prevent corrosion. All above ground facilities will be removed.

4. PROJECT RATIONALE AND ALTERNATIVES

4.1. Need for the Project

The WHP would be an integral part of the HJP which seeks to:

- generate employment opportunities and contribute to economic growth in the region
- ensure a secure and resilient energy supply for South Australia
- unlock investment opportunities across a variety of sectors
- activate the growth of renewable hydrogen initiatives
- support the clean energy transition.

The WHP would not only provide storage for up to 100 tonnes of hydrogen, but it would also be capable of providing infrastructure connections for hydrogen production expansion and industrial offtake to support an emerging industry and a transitioning economy. The WHP would support existing industry in proximity to it which includes beta carotene and salt works, steelworks and petroleum refining and exporting facilities. The WHP would also allow for hydrogen produced at the Whyalla Hydrogen Facility to be transported to other users in the future.

The stored hydrogen would be used to feed the hydrogen power station at the Whyalla Hydrogen Facility at times when the power station is delivering dispatchable power into the energy grid. Excess hydrogen produced at the HJP site would be stored in the WHP to be used to generate dispatchable power into the grid when required.

4.2. Project Alternatives

The alternatives to the proposed Project are following different pipeline routes and not developing the Project at all.

4.2.1. Route Alternatives

Seven alternate route alignments have been considered since inception of the WHP.

The preferred pipeline route has been selected having regard to the following key criteria set out in AS 2885:

- public safety
- pipeline integrity
- environmental impact
- consequences of escape of gas
- constructability and cost.

In addition to these criteria, consideration was given to the following factors:

- pipeline length and location to minimise costs to the Project and to optimise operation of the pipeline
- topography, geology, soil types, ground stability, possible inundation and constructability
- existence of known national parks, conservation areas and other route constraints
- existence of areas of cultural heritage significance
- utilisation of existing infrastructure corridors.

The preferred alignment has been selected based on stakeholder feedback, having regard to other proposed projects in the area such as the Yoorndoo Ilga Solar Farm and the Cultana Solar Farm and to ensure that where possible, the alignment follows existing roads, unsealed tracks and rail and pipeline infrastructure for the majority of its length. The proposed alignment is located adjacent to this existing infrastructure on generally undeveloped land.

The pipeline would be constructed within a cleared right-of-way, which is expected to be approximately 50 metres in width, to allow safe installation and maintain necessary separation distances between the pipelines. There may be variations to decrease this 50 metre construction right-of-way in areas of sensitivity such as watercourses and cultural heritage sites.

The alignment will continue to be refined as the outcomes of environmental, cultural heritage, engineering and geotechnical studies are incorporated, and as the detailed design, risk assessment and discussions with landowners progress. No adverse changes to landowner or environmental impacts are expected during this refinement process.

4.2.2. "No Project" Alternative

If the Project was not to proceed, the expected benefits would not be achieved.

Without the WHP:

- the opportunity to deliver hydrogen to future users and provide future offtake opportunities would be lost
- the direct knowledge gain from building a hydrogen pipeline of this size in Australia would not be realised
- the direct economic benefit from construction and operation of the pipeline would be lost

5. ENVIRONMENTAL IMPACT ASSESSMENT

5.1. Overview

Sections 5.2 to 5.13 provide an assessment of the potential impacts of construction, operation and decommissioning of the WHP against physical, biological and social environmental elements (e.g. soils and terrain, water resources, flora and fauna, cultural heritage). These sections:

- describe the existing environment of the Project area
- identify and assess potential environmental impacts
- summarise proposed mitigation measures.

The proposed mitigation measures are considered in the discussion of potential impacts and cross-referenced where relevant.

The discussion is supported by an environmental risk assessment. The risk assessment is presented in Section 5.14 (Table 5-24) and reference is made to the results of the risk assessment throughout the discussion in Sections 5.2 to 5.13.

5.1.1. Environmental risk assessment process

Environmental risk is a measure of the likelihood and consequences of environmental harm occurring from an activity. Environmental risk assessment is used in this EIR to evaluate potential environmental impacts where there is uncertainty in the prediction of their size or occurrence.

The risk assessment process involves:

- identifying the potential hazards or threats posed by the activity
- categorising the potential consequences and their likelihood of occurring; and
- using a risk matrix to characterise the level of risk.

The objective of the risk assessment process is to separate the minor, acceptable risks from the major risks and to provide data to assist in the evaluation and management of risks. The risk assessment process presented within is based on procedures outlined in Australian and New Zealand Standard AS/NZS ISO 31000:2018 (Risk Management) and HB 203:2012 (Managing Environment Related Risk).

The risk assessment considers proposed risk controls and assigns a consequence and likelihood rating to the residual risk. Consequence and likelihood categories and the risk matrix adopted for use within are consistent with those used previously for assessment of energy resources projects in South Australia and are provided in Appendix A.

The tables in Appendix A define:

- Five categories of consequence (Negligible to Catastrophic) to describe the severity, scale and duration of potential impacts. These are provided in two tables which address aspects of the physical environment and environmental amenity.
- Five categories of likelihood of potential environmental consequences occurring (Remote to Almost Certain). The likelihood refers to the probability of the particular consequences eventuating, rather than the probability of the hazard or event itself occurring.
- A risk matrix to characterise the risk associated with each hazard as Low, Medium, High or Extreme.

The risk assessment process is also iterative. 'Low' risks were generally accepted, and 'Medium' and 'High' risks were reviewed to determine if each risk was as low as reasonably practicable. Where necessary, management practices were reviewed to identify additional management options to lower risk and / or improve environmental outcomes (e.g. elimination, substitution, reduction, engineering controls and management controls). The risk was then re-assessed based on these additional management options. This EIR details the final or residual risk after management options have been applied.

5.2. Soils and Terrain

5.2.1. Existing environment

Climate

Whyalla has a semi-arid climate where it typically experiences warm to hot summers and mild dry winters with cool to cold nights.

The closest Bureau of Meteorology (BOM) station to the WHP site for temperature data is Whyalla Norrie (Station number: 018103) and records indicate that the mean daily maximum temperatures range from 16.9°C in the winter months to 29.2°C in summer. Mean daily minimum temperatures range between 7.2°C (July) to 18.7°C (February).

Annual rainfall is typically around 280 mm (BOM 2024) and there is little variation in seasonal rainfall, the mean rainfall is typically between 17 mm and 30 mm. The highest daily rainfall event on record is 169.9 mm (18 February 1946).

A summary of climate records for Whyalla Norrie (Station number 018103; BOM 2024) is provided in Table 5-1.

Table 5-1: Temperature and rainfall records for Whyalla Norrie (Station # 018103)

	Jan	Feb	Marc	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Daily Max (°C)	29.2	29.1	26.8	23.9	20.3	17.6	16.9	18.4	20.8	23.5	25.8	27.3	23.3
Mean Daily Min (°C)	18.5	18.7	16.9	13.7	10.5	8.2	7.2	7.9	9.9	12.4	14.9	16.8	13.0
Mean Rainfall (mm)	19.3	23.0	17.5	19.0	27.0	27.1	22.4	24.3	26.5	27.0	23.2	21.2	277.5
Median Rainfall (mm)	7.6	11.4	11.3	14.6	21.6	19.1	18.8	22.6	19.7	20.1	19.3	15.7	255.7
Highest Rainfall (mm)	115.1	219.7	112.4	104.4	94.3	92.2	95.0	78.8	112.8	104.0	109.7	109.7	557.8

Wind rose diagrams for Whyalla Norrie indicate that:

- at 9 am it is typically calm 13 % of the time and there is no dominant wind direction
- at 3pm it is typically calm 3% of the time and wind is predominantly from the south and southeast. Wind speed and gusts can be greater than 20 km/h, particularly when southerly.

Bioregions and land systems

The Project is located within the Gawler biogeographic region[3] defined under the Interim Biogeographic Regionalisation for Australia (IBRA). The proposed alignment traverses two IBRA Subregions: Myall Plains and Arcoona Plateau, with the boundary between the Subregions is near the eastern end of the alignment, towards Port Bonython.

Within these IBRA Subregions the proposed alignment traverses several land systems, which are areas throughout where there is a recurring pattern of geology, topography, soils and vegetation. The land systems were derived as part of broader land system mapping in the pastoral areas of South Australia and now form the bottom layer in the IBRA regionalisation in northern South Australia (DEW 2024).

The landforms, soils and vegetation within these land systems are summarised in Table 5-2 and shown in Figure 5-1 and Plate 5-1, Plate 5-2, Plate 5-3 and Plate 5-4.

Table 5-2: IBRA Subregions and land systems in the Project area

IBRA Subregion	Land system	Description
Myall Plains	Hesso	Extensive sand sheets with calcareous soils. Plains of myall, sugarwood woodland over pearl bluebush +/- bladder saltbush; plains and rises of mulga and myall woodland with pinbush wattle, pearl bluebush and spiny fanflower.
	Yorkey	Saline sand plain. Dunes of mulga, myall or northern native pine overnarrow-leaf hopbush and blackbush; swales of blackbush, slender glasswortand bladder saltbush; sandy flats of myall open woodland over blackbush,bladder and bitter saltbushes; salt pans and fringing samphire flats.
	Bittali	Extensive undulating calcareous plains. Mallee woodland plains with myall over bluebush daisy, scotia bush and bluebushes; myall, mallee and blackoak woodland plains with cassia, wattles, sheepbush and daisybush; pediments of myall open woodland with mallee, pearl bluebush and spiny goosefoot.
Arcoona Plateau	Tent Hill	Strongly dissected stony tablelands complex. Plains of bladder saltbush and glasswort shrubland with bluebushes; footslopes and plains of low bluebush and bladder saltbush with some blackoak; tablelands of bladder saltbush and slender glasswort; watercourses of blackoak and bladder saltbush.

[3] Biogeographic regions (bioregions) are broad landscape units based on major geomorphic features.

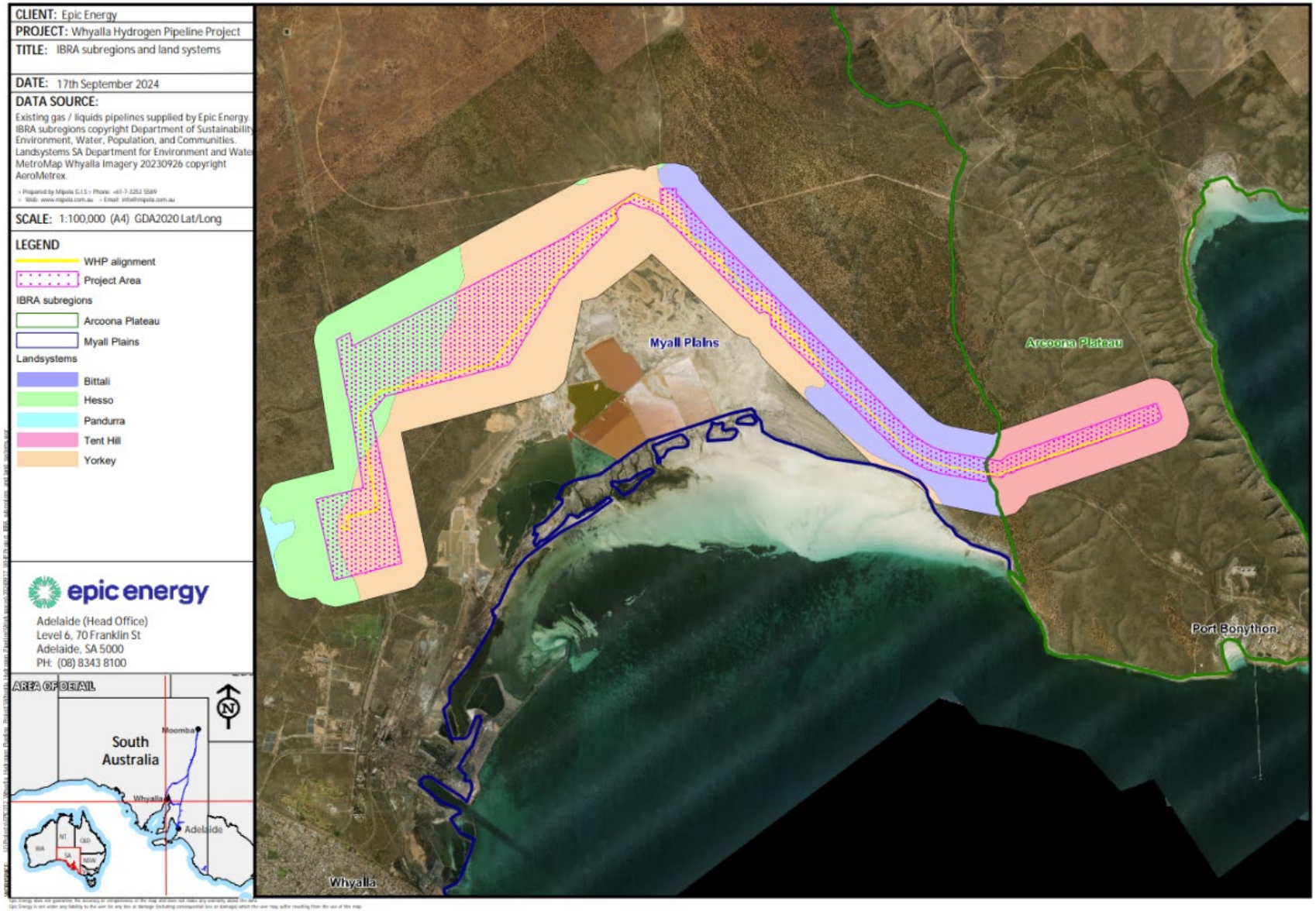

Figure 5-1: IBRA Subregions and land systems in the Project area

Plate 5-1: Representative photo of Hesso land system

Plate 5-2: Representative photo of Yorkey land system

Plate 5-3: Representative photo of Bittali land system

Plate 5-4: Representative photo of Tent Hill land system

Landform and soils

The Project area is generally flat to gently sloping terrain. The western half of the Project area is relatively flat, with a very gentle slope downwards to the southeast. The eastern half of the alignment is relatively flat to gently undulating and generally slopes downwards to the southwest, towards the coast.

Elevation along the proposed alignment varies between 3 m and 70 m AHD, with the majority of the alignment at elevations between 5 m and 20 m AHD. Gradients along the alignment are generally below 2%. Within approximately 3.5 km from the eastern terminus of the pipeline the elevation increases from 13 m AHD (west) to a maximum elevation of 70 m (east) and the maximum gradient within this area is approximately 7%.

The pipeline alignment is approximately parallel to Lincoln Highway and Point Lowly Road. Lincoln Highway and Point Lowly Road are typically at least 1 m above the elevation of the adjacent terrain.

In general, the soils along the proposed alignment are dominated by alluvium comprising sand and clay. The eastern 1.8 km of the proposed alignment (east of the intersection between Point Lowly Road and Fitzgerald Bay Road) is characterised by sand and clay alluvium with a sparse scatter of siliceous gravel. Surface geology is shown in Figure 5-2 (based on Geoscience Australia 2012) and the main surface geology units present on or near the Project area are described in Table 5-3.

Analysis of material from a preliminary geotechnical survey (from 32 test pits of up to 3.2 m below ground level) confirmed soils in the Project area were generally clayey, consistent with mapped surface geology. Five of the 32 test pits encountered rock described as calcrete or Simmens Quartzite. Soil dispersion testing indicated soils in the eastern half of the alignment were generally of low to moderate clay dispersion hazard, while soils from the western half were often of moderate and high dispersion hazard (Douglas Partners 2024).

There is very little evidence of erosion on or near the proposed alignment, despite the presence of significant disturbance including adjacent underground gas and liquids line, Point Lowly Road, numerous tracks and other surface disturbances.

Table 5-3: Surface geology in the Project area

Name	Map unit	Description
Quaternary alluvium	Qa	Channel and flood plain alluvium; gravel, sand, silt, clay; may be locally calcreted
Cenozoic sand plain	Czs	Sand or gravel plains; may include some residual alluvium; quartz sand sheets commonly with ferruginous pisoliths or pebbles; local clay, calcrete, laterite, silcrete, silt, colluvium
Quaternary dunes	Qd	Dunes, sandplain with dunes and swales; may include numerous interdune claypans; may be locally gypsiferous
Saint Kilda Formation	Qesa	Undifferentiated Holocene coastal marine sediment. Calcareous, fossiliferous sand and mud of intertidal sand flats, beaches and tidal marshes; organic, gypseous clay of supratidal flats
Simmens Quartzite Member	Nsws	Neoproterozoic sedimentary siliciclastic lithology. Quartzite, blocky; sandstone, cream coloured

Acid Sulfate Soils

There are no areas of potential acid sulfate soils (PASS) mapped on the alignment (NatureMaps 2024, CSIRO 2024) and the alignment is mapped as ‘extremely low probability of occurrence’ for acid sulfate soils (ASS) (CSIRO 2024).

The closest area of PASS is located at the northern extremity of the stranded tidal flats in False Bay, which is mapped as 'moderate risk of disturbed potential acid sulfate soils’ by NatureMaps (2024) and ‘high probability of occurrence’ of ASS by CSIRO (2024). This area is located approximately 190 m south of the alignment at the closest point. There is also an area of stranded tidal flats and samphire vegetation near the alignment on the eastern side of False Bay, however this area is mapped as ‘low risk of potential acid sulfate soils below the watertable’ by NatureMaps (2024) and ‘low probability of occurrence’ by CSIRO (2024). Both of these areas are on the far side of Point Lowly Road from the alignment.

Existing Contamination - Desktop

The following was undertaken for the purpose of assessing the potential for site contamination to exist within the Project area:

- review of the SA EPA Site Contamination Index
- review of the Department of Defence Online Unexploded Ordnance (UXO) maps database
- review of historical aerial imagery.

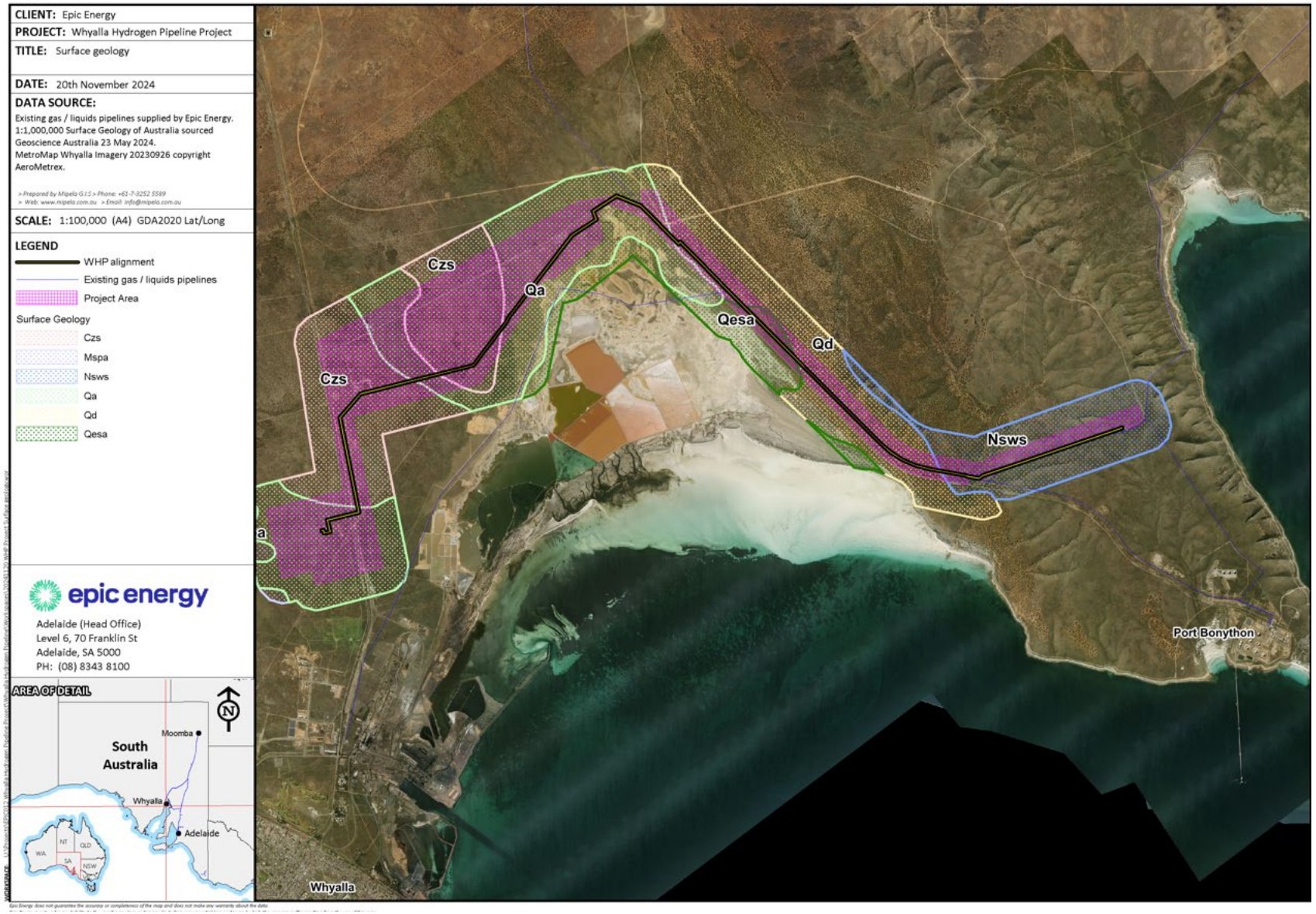

Figure 5-2: Surface geology of the Project area

A review of SA EPA records identified no Section 83A (notification of site contamination of groundwater) or EPA licensed activities within the Project area, however, several EPA licensed activities are noted to occur in the vicinity, as outlined below in Table 5-4 and identified in Figure 5-3.

Table 5-4: EPA Licenced Activities within the vicinity of the Project area

Site	Licence Number(s)	Distance from project area	Licenced activity
Sections 6 & 53 Hundred of Cultana (BASF Pty Ltd)	36542	Adjacent south site boundary (south side Point Lowly Road)	Activity producing listed waste
Pacific Salt Pty Ltd	1283	Between Lincoln Highway and False Bay	Hydrocarbon and chemical storage Materials handling and transport

At both sites the activities are believed to be associated with salt production and beta-carotene farming and are not considered to contribute to site contamination within the Project area.

Several Section 83A notifications were identified in the region surrounding the Project area. Notably, notification number 60278-02 lies on CT6105/304, which is at the northernmost point of the SIMEC / GFG Steelworks and is directly south of the proposed Project area. This notification has no recorded potentially contaminating activity (PCA), however the original notification (60278-01) shows “storage of listed substances” as the PCA of interest. It is not known whether the groundwater impacts extend offsite.

No other Section 83A notifications were identified within 3 km of the Project area.

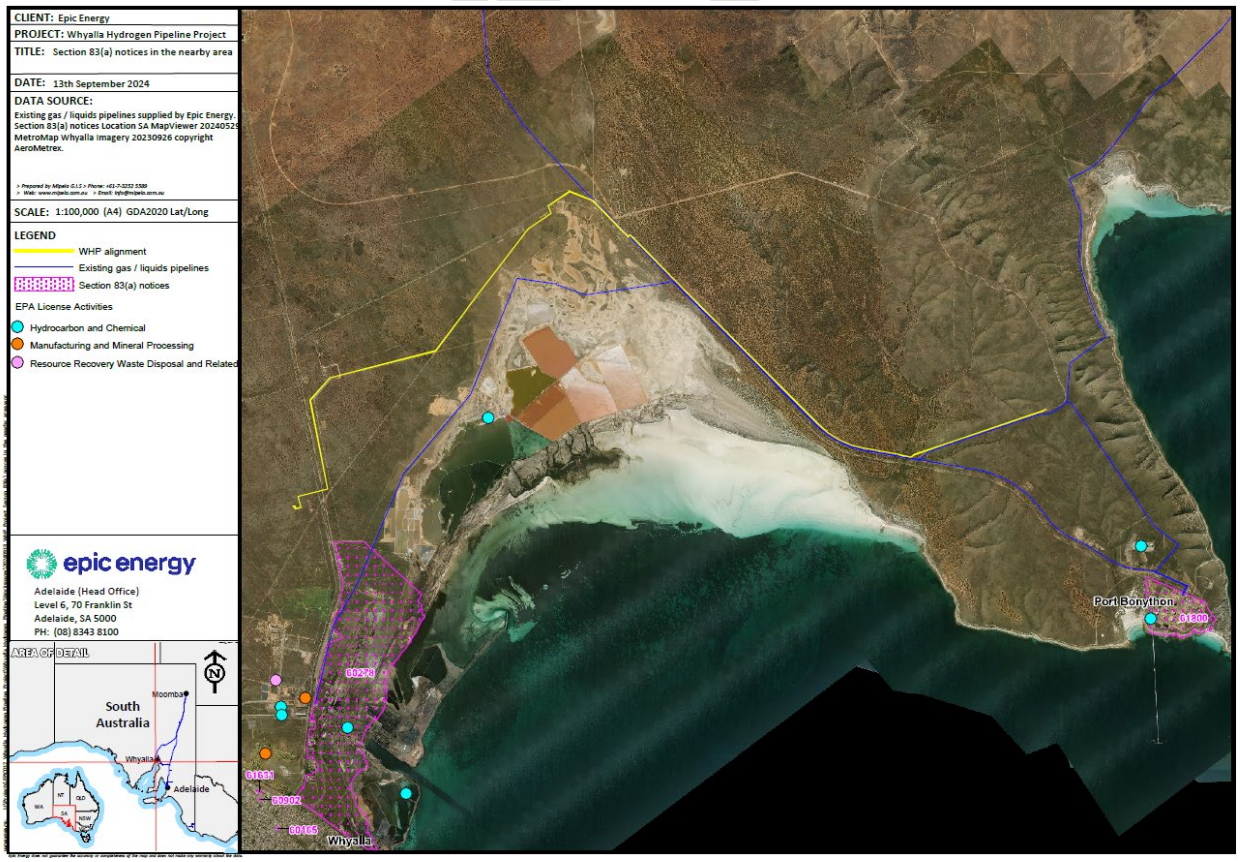

Figure 5-3: EPA Licenced Activities and Section 83(a) notification

The search of the Defence Unexploded Ordinance (UXO) database did not identify any recorded potential UXO within the Project area. It is noted that north of the site lies the Cultana Training Area and this site may contain the presence of UXO or munitions.

A review of historical aerial imagery (1985 - 2024) for the Project area identified one small structure and a rail corridor. The structure appears to have been unchanged since 1985 and is surrounded by a network of offroad vehicle and motorcycle tracks. The major rail corridor passes through the Project area in the eastern portion and may have historic contamination associated with railway operations. The remainder of the Project area appears to comprise largely undisturbed native vegetation, with some gravel roads and shallow excavations (borrow pits).

While it is acknowledged that this is a high-level summary and does not fully encompass potential historic activities, it is considered that there is low potential for widespread site contamination across the Project area. EPA licenced activities and Section 83A notifications within the vicinity of the Project area occur down hydraulic gradient (closer to the ocean) and are therefore considered unlikely to impact groundwater quality within the site. There is potential for soil impacts associated with the rail corridor, however, these impacts are likely to be restricted to near surface soils.

Existing Contamination – Site Observations

Potential asbestos containing material (PACM) was identified at two sites during the geotechnical investigation (Douglas Partners 2024). The PACM identified is described as:

- Dumped asbestos sheets and pieces.
- Demolition materials and numerous PACM pieces. Photographs presented in the geotechnical report show an intact pipe that is partly exposed and may be PACM. There is likely more PACM pipe in this area. A potential septic tank and old well has also been identified in this area.

Potential illegal dumping was observed at one location and was described as building materials (including ceramic tiles and minor amounts of fabric and scrap metal) and there were no obvious signs of soil staining or odours.

5.2.2. Impact assessment

The following activities have been identified as sources of potential impacts to soils and terrain:

- earthworks and vegetation clearance (including clear-and-grade operations, trenching, backfilling and reinstatement, or excavations (‘dig-ups’) during operations)
- dewatering of excavations (if required)
- storage and disposal of water used for hydrostatic testing
- storage and handling of fuel, oil and chemicals.

The potential impacts resulting from these aspects of the Project are discussed below.

Erosion and sedimentation

Earthworks and vegetation clearance have the potential to lead to soil erosion if stockpiles or disturbed areas are exposed to surface water flows. This could result in localised reduction in soil quality and quantity (and subsequent transport of sediment to watercourses as discussed in Section 5.3.2). Inadequate soil compaction over the trench line may also lead to trench subsidence and subsequent erosion.

Soil erosion impacts are not expected to be significant. The proposed alignment is located on relatively flat to gently undulating terrain, where there is low potential for soil erosion, and evidenced by the absence of significant erosion on land that has previously been disturbed (e.g. for other buried pipelines). As discussed in Section 5.3.2 the proposed alignment is also distant from receiving environments (i.e. more than 350 m from the coast at the closest point) with very limited connectivity due to the presence of Point Lowly Road and the very small number of drainage paths present.

Measures will be implemented during construction to minimise the risk of soil erosion (refer Section 5.2.3). Any soil erosion impacts that occur would be localised, short term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Soil inversion and compaction

Topsoil may be 'lost' during the construction process by burial beneath (or mixing with) trench spoil during stockpiling, covering with sediment washed in from adjacent areas or returning trench spoil and topsoil to the trench in a sequence different to original profiles. The loss of topsoil can reduce the effectiveness of easement restoration and revegetation by limiting the amount of available nutrients, biomass and productivity and changing the soil's permeability and water holding capacity.

The construction methodology requires that separate topsoil and trench stockpiles are created when the trench is excavated. The purpose of separating the topsoil is to mitigate against loss of topsoil as the trench can be systematically backfilled with spoil from the trench and the separated topsoil placed as the final layer of backfill. When this methodology is followed topsoil is not expected to be 'lost'.

Vehicle traffic on the construction easement can lead to soil compaction, in particular at equipment and machinery laydown areas or areas of heavy vehicle traffic. Soil compaction may change local drainage patterns and prevent effective plant growth. Activities that may cause soil compaction will be restricted to approved areas (e.g. the right-of-way and access tracks) and will be temporary. Prior to completion, areas potentially affected by compaction will be rehabilitated by ripping or scarifying (if / where appropriate).

Pipeline construction requires compaction of the backfilled trench to prevent the disturbed soil from subsiding.

With implementation of appropriate construction and engineering practice, any impacts due to soil inversion and compaction are expected to be localised, short term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Disturbance of acid sulfate soil

Acid sulfate soils (ASS) can generate acidic conditions when exposed to oxygen and if incorrectly handled, may potentially impact on human health and the environment, and may also result in damage to infrastructure constructed on ASS material.

The potential occurrence of ASS in the pipeline corridor is very low, and the proposed alignment is approximately 190 m north of an area where the soils are mapped as potentially acid sulfate forming.

If geotechnical investigations identify ASS, detailed engineering design can ensure that the pipeline is appropriately designed for soil conditions. An appropriate construction methodology would also be developed to manage excavated ASS material and prevent any impacts (e.g. storage in a lined area, lime dosing and minimisation of exposure to oxygen prior to replacement in the trench). The CEMP will also contain standard management measures to address unexpected disturbance of ASS.

Impacts from ASS are not likely to occur, and if ASS is encountered then appropriate engineering design and construction methodology can mitigate hazards. The level of risk has been assessed as low (see Table 5-24).

Soil Contamination

Activities that could result in soil contamination are assessed in the following sections.

Spills of fuel or chemicals

Construction of pipeline projects involve relatively small quantities of chemicals and likely volumes of spills are low. Pipeline construction equipment (such as graders, bulldozers and side-boom tractors) will be refuelled on the right-of-way from a standard fuel truck. Environmental controls and quality systems will be implemented as discussed in Section 5.2.3, including erosion and sediment controls and spill prevention and cleanup measures. If a spill occurred, impacts would be localised, short term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Disturbance of existing contaminated soil

Disturbance of existing contaminated soil can result in the spread of contamination to adjacent areas. Limited existing contamination has been observed in the Project area, with asbestos and potential asbestos containing materials (PACM) observed at two locations during geotechnical investigations. While there is always potential for other existing small-scale localised contamination in the Project area (e.g. if fuel or chemicals have been spilled or inappropriately disposed in the past), there is considered to be low potential for widespread site contamination across the Project area.

Where asbestos and PACM is located within or immediately adjacent the construction zone, a licensed asbestos removalist would be engaged to remove the asbestos and PACM. Following removal, the area would be validated by a surface walkover by a suitably accredited and experienced professional.

If further potential site contamination issues are identified during geotechnical investigations or site surveys, then a site-specific soil contamination assessment will be completed. It is anticipated that outcomes and recommendations from the soil contamination assessment can be accommodated by detailed engineering design and site-specific soil management measures during construction.

The CEMP will contain measures relating to existing contamination as well as procedures that will be implemented in the case of a discovery of potentially contaminated soil or groundwater, including measures to contain material and treat it on site or remove off-site for treatment or disposal at an appropriately licensed facility.

Impacts from disturbance of existing contaminated soil are not expected to occur. The level of risk has been assessed as low (see Table 5-24).

Dewatering of excavations

Dewatering of excavations that encounter shallow groundwater or that collect rainwater or runoff can, if inappropriately managed, result in soil erosion and soil and surface water quality impacts.

The depth to groundwater is anticipated to generally be greater than the depth of the base of the pipeline trench. As noted in Section 5.3.1, several locations closest to the salt marsh / tidal flats have saline groundwater less than 3 m below ground level. Excavation in these areas may require dewatering during construction and the procedure for this will be outlined in the CEMP.

If dewatering is required, it would be undertaken in accordance with the requirements of the *Environment Protection (Water Quality) Policy 2015* and relevant guidelines e.g. EPA 1093/18 *Environmental management of dewatering during construction activities* and mitigation measures outlined in Section 5.2.3. Water quality would be assessed to determine its suitability for disposal to land with reference to relevant guidelines (e.g. EPA SA guidelines, ANZECC / ARMCANZ 2000 and ANZG 2018). Discharge to surface waters (or to a place where it could enter surface water) would be avoided. Impacts of dewatering excavations on groundwater (e.g. drawdown) would be very localised and short term.

If dewatering is required, the impacts are anticipated to be very minor, short term and localised. The level of risk has been assessed as low (see Table 5-24).

Hydrotest water discharge

Hydrotest water will preferably be potable but may contain low levels of corrosion inhibiting chemicals or biocides, depending on the water source and total time required for the test. Inappropriate disposal of water of poor quality may result in localised soil contamination and measures to prevent this occurring are detailed below.

Investigations of hydrotest water undertaken by the CSIRO (Tjandraatmadja et al. 2005) indicated that for hydrotests where source water is not contaminated and biocides are not added, the quality of the discharge water causes no increase in environmentally hazardous compounds from either the pipe or any treatment added to the water (e.g. oxygen scavengers). The study found that hydrotest water did not have elevated nutrient levels, but did have elevated levels of turbidity, sodium or ammonium sulfate and low levels of dissolved oxygen. The study concluded that current industry treatment methods (to remove solids by sedimentation and / or filtration and to neutralise residual oxygen scavenger and restore dissolved oxygen levels by aeration) are effective in raising the quality of disposal water sufficiently for it to be disposed by irrigation or evaporation or even into watercourses, depending on their characteristics.

The study noted that special planning is required when specifying treatment programs for hydrostatic test water containing biocides to deactivate residues prior to discharge to the environment, and when using water that may cause disposal problems (e.g. containing high salinity, presence of sulfate–reducing bacteria, sewage effluent).

Appropriate measures would be implemented to manage hydrostatic test water disposal. The level of risk has been assessed as low (see Table 5-24).

5.2.3. Mitigation measures

Mitigation measures that will be implemented to reduce potential impacts are summarised below. These measures will be implemented via the CEMP or the Operational Environmental Management Plan (OEMP).

General

- Undertake planning and assessment to identify constraints and areas where special management measures are required (e.g. ASS, erodible soils, contamination, steep banks) and as far as practicable, avoid such areas for any new construction.
- Routinely inspect the easement during operations to ensure the integrity of erosion and sediment control structures (particularly after heavy or prolonged rainfall) and to identify and resolve any recurring erosion or subsidence problems.

Erosion and sedimentation

- Limit ground disturbance and vegetation clearing to the minimum extent necessary for safe pipeline construction.
- During periods of heavy rainfall, suspend all activities likely to result in erosion and sedimentation if their effects cannot be adequately controlled and they may result in pollution of the environment.
- Install and maintain erosion and sediment control structures in accordance with the CEMP (e.g. diversion berms and cross ditches on slopes to divert water off the right-of-way to adjacent stable ground).
- Limit the period between clear-and-grade and restoration to the minimum practicable.

- Compact the trench to a level consistent with surrounding soils.
- Promote rapid restoration by conserving and re-spreading topsoil and ripping / scarifying compacted areas where necessary to facilitate vegetation growth.
- Implement appropriate physical and biological stabilisation and site rehabilitation measures in accordance with the CEMP.
- Ensure that windrows or changes in the level between the right-of-way and adjacent land are removed during reinstatement to prevent water channelling along the right-of-way.
- Leave periodic breaks in any crown left over the trench, to prevent channelling of run-off along the right-of-way.

Soil inversion

- Stockpile topsoil and trench spoil separately.
- Backfill the trench in the appropriate soil horizon order.
- At the completion of works, respread topsoil across the easement.

Soil compaction

- Identify access tracks and turn-around points for vehicles prior to construction.
- Minimise the number of planned tracks and use existing tracks as far as practicable.
- Restrict all vehicles and equipment movements to the construction easement or designated access tracks and roads.
- Rip or scarify compacted areas where necessary to facilitate vegetation growth.

Acid sulfate soils

- Undertake a desktop assessment for PASS on the final alignment.
- Undertake field screening to determine presence of ASS if excavating in a risk area in accordance with the Environment Protection Authority Guidelines - Site Contamination – acid sulfate soil materials (November 2007)[4] guideline.
- Implement procedures to manage ASS encountered during construction, which may include:
  - placing any intercepted soils identified as PASS in an isolated bunded stockpile area
  - treating any identified ASS with agricultural lime in accordance with the EPA guideline prior to backfill.

Soil contamination

- Implement measures outlined in Section 5.13.4 for spill prevention and response.
- Implement site-specific measures for soil management in areas of contaminated soils or ASS where required, including removal of asbestos and PACM by a licensed asbestos removalist.
- Conduct a walkover of the alignment prior to construction by a suitably qualified and experienced professional to identify (if present) asbestos and PACM materials within and immediately adjacent to the right-of-way.

[4] https://www.epa.sa.gov.au/files/8371_guide_sc_acid.pdf

- Incorporate procedures for trench dewatering and hydrotest water disposal into the CEMP. These may include measures to:
  - dispose of water to land on site (away from any areas where it could enter surface waters) after assessment / analysis, provided that:
    - water quality meets relevant criteria for the disposal site (e.g. *Environment Protection (Water Quality) Policy 2015*, ANZECC / ARMCANZ 2000 and ANZG 2018 criteria)
    - dewatering is in accordance with relevant guidelines (e.g. APGA Code of Environmental Practice, EPA dewatering guideline)
    - landowner approval has been obtained
    - measures are in place to prevent erosion.
  - contain and treat water on site (e.g. return hydrotest water to the lined dam that may be constructed on the Whyalla Hydrogen Facility site. The dam would be constructed in accordance with relevant guidelines e.g. EPA 509/19 *Wastewater lagoon construction*)
  - remove water off site (where onsite disposal is not appropriate).

5.3. Water Resources

5.3.1. Existing environment

Surface water

The majority of the Project area is characterised by relatively flat topography with no defined drainage (Figure 5-4). Point Lowly Road has a small number of culverts and separates the eastern half of the WHP alignment from the coastal areas to the south. The proposed alignment crosses only one well-defined ephemeral watercourse located approximately 3 km from its eastern end.

This ephemeral watercourse (Plate 5-5) consists of a narrow, very shallowly incised channel (approximately 0.5 m deep) that flows southwards, within a broader drainage depression that also receives flows from a small channel from the northeast. Flows from this channel and the adjacent area are directed through several culverts under Point Lowly Road, ultimately reaching the coast approximately 1.5 km to the south of the alignment.

There are culverts in other locations that allow water to flow under Point Lowly Road, however there are no defined drainage lines associated with them on either side of Point Lowly Road or along the alignment.

Ephemeral watercourses in this area are usually dry and only flow intermittently for short periods during seasonal rainfall and storm events. Under some conditions (depending on factors such as soil moisture and rainfall intensity and duration) surface runoff may make its way to the coast and discharge into the sea. Elsewhere in the Project area, overland flows from storm events generally pool in low lying areas before dissipating by infiltration or evaporation.

Water quality in ephemeral watercourses in the area would be characterised by low salinity and high turbidity following a significant rainfall event.

Plate 5-5: Ephemeral watercourse ~3 km from eastern end of WHP looking north (left) and south (right) from Point Lowly Road

The WHP is aligned to the north and east of the nationally important wetlands of False Bay (SA020-Upper Spencer Gulf) (Figure 5-4). This wetland is characterised by tidal sand and mud flats, with some areas of shingle and sandy beaches. At its closest point, the WHP is located approximately 180 m from the mapped boundary of this wetland, on the opposite side of Point Lowly Road.

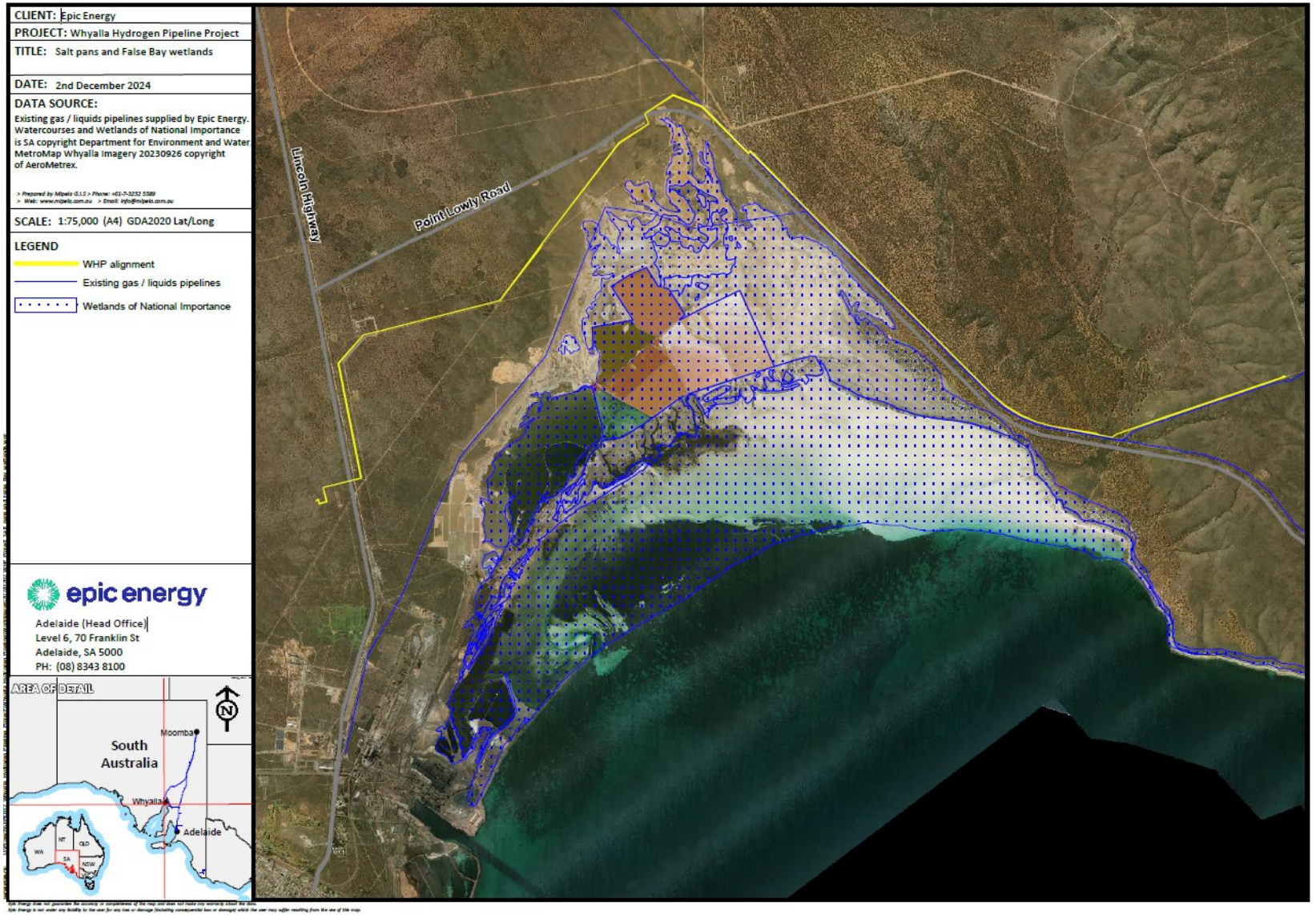

Figure 5-4: Salt pans and False Bay Wetlands

Groundwater

There is limited groundwater data available for the Project area. Depth to shallow groundwater is mapped as between 5 m and 20 m for the majority of the proposed alignment, and between 2 m and 5 m for the eastern 3 km of the alignment (DEW 2016a). One well (6432-1118) located within approximately 150 m of the alignment in the western part of the Project area was constructed with a production zone between 9.7 m and 12.7 m below ground level which suggests that groundwater in this area is between these depths.

Groundwater was encountered at less than 3 m below ground level in two test pits on the alignment during initial geotechnical investigations. These were located where the proposed alignment is close to the salt marsh / tidal flats. The remainder of the 27 test pits on the alignment (which were generally 3.2 m deep, except where hard rock was encountered) did not encounter groundwater.

Based on mapping (DEW 2016a and DEW 2016b) and data from two test pits and one groundwater well with water quality data in the vicinity, groundwater is expected to be brackish to saline. Shallow groundwater salinity is mapped as between 14,000 mg/L and 35,000 mg/L along the majority of the proposed alignment, and between 7,000 mg/L and 14,000 mg/L for the eastern 4.5 km of the alignment (DEW 2016b). Two samples were collected from test pits during geotechnical investigations and total dissolved solids (i.e. salts) were 57,200 mg/L and 88,500 mg/L, with elevated concentrations of boron and fluoride which is not uncommon for groundwater in this region. The WaterConnect database lists seven groundwater wells in the Project area that were drilled between 1975 and 1980 (WaterConnect, 2024), one of which has water quality data. This well (6432-22), near Point Lowly Road, was drilled to a depth of 68 metres and flowed at 11 litres per second with a salinity of 23,000 mg/L.

Groundwater recharge in the Project area is likely to be very low due to the low rainfall, high evaporation and relatively low permeability of soils in the eastern end of the Project area.

There is no record or evidence of any groundwater discharges such as springs or seeps in the area (Spencer Gulf Port Link 2013).

There are no known groundwater users in the Project area.

5.3.2. Impact assessment

Surface water

The following activities have the potential to affect surface water:

- earthworks associated with construction (e.g. clear-and-grade operations, trenching, backfilling and reinstatement)
- earthworks associated with operations (e.g. excavation for pipe or coating repair or replacement)
- movement of vehicles along pipeline corridor and access tracks
- storage and handling of small quantities of fuel and chemicals
- hydrostatic testing and disposal of trench water.

Potential impacts to surface water are discussed below. During pipeline operation, the potential impacts would be generally minor in severity and duration.

Increased sediment load and turbidity

Pipeline construction activities (and to a lesser extent, earthworks associated with operational activities) have the potential to result in a temporary reduction in water quality caused by increased sediment load in surface run-off, or inappropriate disposal of turbid trench water.

Due to the nature of the environment and the management measures that will be in place, significant sedimentation impacts are not expected to occur. As discussed in Section 5.2.2, the terrain is relatively flat to gently sloping, and there is limited evidence of erosion on the existing pipelines and other areas of disturbance. The pipeline alignment is distant from receiving environments (i.e. coastal areas) with very limited drainage connectivity to these areas.

The watercourse crossed by the pipeline is usually dry and would only flow intermittently and for short periods in response to seasonal rainfall and storm events. These intermittent flows are characterised by high turbidity and high sediment loads. Trenching and pipeline installation at watercourses would be undertaken in dry conditions, and sediment and erosion controls (such as berms on slopes, hay bales and geotextile fencing) would be in place during construction and following rehabilitation to control erosion on the right-of-way and sediment transport off the right-of-way.

Any trench dewatering required would be undertaken in accordance with measures discussed in Section 5.2.2.

If sedimentation and increased turbidity occurred, they would generally be short term and localised (in an environment where turbidity is naturally high) and can be successfully managed by implementation of the measures for erosion and sediment control and watercourse crossings outlined in Section 5.3.3.

The level of risk has been assessed as low (see Table 5-24).

Interruption or modification to surface drainage patterns

Construction activities (or, to a lesser extent, earthworks associated with operational activities) may result in physical disturbance to flow in defined watercourses and to overland flow. Potential impacts would be associated with the presence of temporary linear stockpiles of topsoil and trench spoil, and modifications to surface contours during earthworks, which may impede or change natural overland flows. If they occur, impacts would generally be short term and localised.

As noted previously, there is only one well-defined watercourse and surface gradients are generally low. Impacts to surface drainage patterns during construction would be relatively short-term and would be minimised by implementing measures outlined in Section 5.3.3, including crossing watercourses in dry conditions and avoiding the stockpiling of materials in watercourses. Surface drainage patterns would be restored following successful reinstatement of the construction right-of-way.

The pipeline would be constructed below the base of the channel of watercourses and long-term impacts on surface water flowing in watercourses are anticipated to be negligible.

Potential impacts are generally localised, short term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Contamination of surface water

The potential exists for construction or operational activities to result in localised surface water contamination. The main potential sources of contamination are minor spills of fuel or chemicals, leachate from acid sulfate soils exposed during excavation (which is not anticipated) and discharged hydrotest water.

Pipeline projects involve relatively small quantities of chemicals and the risks to surface water associated with minor spills is generally low, particularly in the Project area where there are limited surface water features. Management measures implemented would include restrictions on refuelling near watercourses and spill prevention and immediate clean-up measures.

Hydrotest water may contain low levels of corrosion inhibiting chemicals. Trench water could also have elevated salinity (if shallow groundwater is intercepted, which is likely to be a very limited occurrence). Uncontrolled disposal of this water may result in localised contamination of surface water. This potential impact would be avoided through the implementation of measures described in Section 5.3.3.

Surface water management at the compressor station would be consistent with site stormwater management for the overall Whyalla Hydrogen Facility, which includes separation of 'clean' surface water streams from water in contact with plant areas, detention and reuse on site of 'clean' water streams and piping of water in contact with plant areas to GFG's Whyalla Steelworks for reuse and management.

Contamination impacts to surface water are not expected to occur and standard management measures can be implemented to mitigate potential impacts. The level of risk has been assessed as low (see Table 5-24).

Groundwater

The following construction and operation activities have the potential to affect shallow groundwater resources:

- construction of the pipeline trench
- de-watering of the trench or excavations (e.g. bellholes for pipeline inspection)
- the storage and handling of small quantities of fuel and chemicals.

Potential impacts to shallow groundwater resources (where present) include:

- changes to hydrological conditions
- localised contamination of shallow groundwater.

Groundwater is not proposed to be used as a water source during construction and impacts to deep aquifers are not likely to occur due to the nature of pipeline construction activities.

Potential impacts are mostly related to construction activities. During pipeline operation, potential impacts are limited and generally restricted to those activities involving excavation, or the use of hydrocarbons or chemicals where there is the potential for a spill.

The level of risk has been assessed as low (see Table 5-24).

Changes to Hydrological Conditions

The intersection of shallow groundwater by the open trench has the potential to create localised disturbance to groundwater flow patterns, particularly in recharge or discharge zones. There is also the potential for infiltration from surrounding waters or stormwater entry.

Due to the minor depth of the intrusion (typically 1.5 m up to 3 m below watercourses and major roads), the short period for which the trench is open (several days to several weeks, depending on the location) and the depth to groundwater in the Project area, the resultant impact on groundwater resources is considered to be inconsequential.

Backfilling the trench after the pipeline has been installed is intended to compact returned trench spoil consistent with pre-existing conditions. This minimises any potential for altering local hydrology or impeding lateral flows of groundwater, which are not expected to occur due to the shallow depth of the trench relative to the depth to groundwater.

The level of risk has been assessed as low (see Table 5-24).

Contamination of Groundwater

The potential exists for construction or operational activities to result in localised shallow groundwater contamination. The main potential sources of contamination are minor spills of fuel or chemicals, leachate from ASS exposed during excavation (which is not anticipated) and discharged hydrotest water.

Pipeline projects involve relatively small quantities of chemicals and the risks to groundwater associated with minor spills are extremely low, particularly in the Project area where groundwater is relatively deep. Pipeline construction equipment such as graders, bulldozers and side-boom tractors may be refuelled on the right-of-way from a standard fuel truck. Management measures would be implemented as discussed in Section 5.3.3, including spill prevention and immediate clean-up measures.

Hydrotest water may contain low levels of corrosion inhibiting chemicals. Inappropriate disposal of this water may result in localised contamination of shallow groundwater (which is not expected to be present across the vast majority of the Project area). This potential impact would be avoided through the implementation of measures described Section 5.3.3.

Contamination impacts to groundwater are not expected to occur. Groundwater is also relatively deep, with high salinity and there are no known groundwater users. The level of risk has been assessed as low (see Table 5-24).

5.3.3. Mitigation measures

Mitigation measures that will be implemented to minimise potential impacts on water resources are summarised below. These measures will be implemented via the CEMP, which will also include a Soil and Erosion Management Plan, and / or the OEMP.

Surface Water

- Restrict the level of activity during wet weather, particularly watercourse crossings.
- Remain vigilant for expected storm or flood warnings (particularly during construction or major operational activities) and developing a contingency plan for such events.
- Reinstate surface contours as soon as reasonably practicable.
- Restore surface drainage profiles to pre-construction conditions.
- Install adequate erosion and sediment controls (e.g. berms or drains on slopes leading to watercourses or surface water features; contour banks, silt fences and / or hay bales for interim on-site erosion control).
- Monitor and maintain erosion and sedimentation controls to ensure they remain effective.
- Leave periodic gaps in stockpiles to allow overland flow.
- Avoid vehicle refuelling in close proximity to watercourses.
- Implement the measures outlined in Section 5.2.3 for fuel, oil and chemical management, spill prevention, response and clean-up, trench dewatering, hydrotest water disposal and management of contaminated water (e.g. leachate from ASS).
- Obtain hydrotest water from an appropriate source in consultation with relevant landowners and regulatory bodies and in accordance with statutory requirements.
- Work with regulatory agencies and affected landowners regarding the management of surface water issues.

Specific measures that will be implemented for watercourse crossings include:

- ensure that all necessary approvals are in place, including Landscape South Australia Act permits for water affecting activities (if required)
- complete watercourse crossings in the shortest time practicable
- rehabilitate crossing points and banks as soon as possible after works have been completed
- avoid watercourse crossing works during periods of flood or heavy rainfall
- avoid the stockpiling of materials in watercourses / drainage lines
- carry out grading and trenching across watercourses immediately prior to pipe laying, i.e. after the pipe is welded and watercourse crossing site has been prepared
- contain pumps within lined, bunded areas
- if HDD is used:
  - locate HDD drill entry and exit points away from watercourse banks, sensitive vegetation and any heritage sites
  - monitor HDD mud flow rates to assess whether seepage or other losses may be occurring
  - dispose of drilling mud and cuttings as per regulatory requirements.

Groundwater

- Compact the trench to a level consistent with surrounding soils.
- Install trench plugs to prevent longitudinal water flow within the trench.
- Implement measures outlined in Section 5.2.3 for fuel, oil and chemical management, spill prevention, response and clean-up, trench dewatering, hydrotest water disposal and management of contaminated water (e.g. leachate from ASS)
- Undertake dewatering (if required) in accordance with measures outlined in Section 5.2.3.
- Where required, liaise with the Eyre Peninsula Landscape Board, DEW, EPA, DEM and affected landowners regarding the management of groundwater issues.

5.4. Flora and Fauna

5.4.1. Existing environment

Extensive ecological survey work has been carried out across the Project area and adjacent areas for the WHP and other projects in the region. This section summarises the information contained in the Baseline Ecological Assessment (Appendix B) and EPBC Act Significant Impact Assessment (Appendix C) undertaken for the WHP by Lathwida Environmental. These assessments involved multiple field surveys of the Project area, including:

- vegetation assessments using Bushland Assessment Methodology (BAM) (NVC 2020) conducted in December 2023, March 2024 and August 2024
- targeted Western Grasswren surveys conducted in December 2023, which included area surveys using call playback and song meter deployment (75.25 hours deployment), and August 2024 which also included area surveys using call playback and song meter deployment (37 hours deployment)
- targeted searches for Malleefowl nesting mounds conducted in March 2024, which included multiple transects covering the proposed disturbance corridor in mallee areas (total of 12 dedicated person hours searching for Malleefowl), and August 2024, which included a transect,

high-level visual search for Malleefowl mounds in proximity to the former Department of Defence boundary.

Additional survey effort included desktop analysis of LiDAR (Light Detection and Ranging) data to classify potential mounds and follow-up ground-truthing in the field in September 2024.

The baseline and significant impact assessments adopted Epic Energy's Preliminary Survey Licence (PSL) area (which encompasses the Project area) plus a buffer of 5 km as the basis for database searches. The PSL area is shown in Figure 5-5.

The baseline and significant impact assessments also consolidate information from other surveys and assessments undertaken in the area to support other proposed developments.

Regional context

The Project is located within the Gawler biogeographic region[5] defined under the Interim Biogeographic Regionalisation for Australia (IBRA) as discussed in Section 5.2.1. The proposed alignment traverses two IBRA Subregions: Myall Plains and Arcoona Plateau. The boundary between these subregions is near the eastern end of the alignment, towards Port Bonython, as shown in Figure 5-1.

The Myall Plains subregion is characterised by vast plains of chenopod shrubland with emergent trees tending to lower chenopod shrublands in coastal areas and a narrow coastal strip with samphire low open shrubland encroaching on tidal areas and mangrove forests in tidal areas. The Arcoona Plateau subregion comprises dissected stony tablelands and plains and is characterised by saltbush low shrublands on gilgai soils with mixed tall shrublands on younger sandy soils.

The Project area contains predominantly native vegetation, which is reasonably intact with some disturbance, primarily from infrastructure such as roads, rail line, hydrocarbon pipelines and use by motorbikes and recreational vehicles.

The Whyalla Conservation Park is located on the western side of the Lincoln Highway, on the opposite side to the western end of the pipeline alignment. The Whyalla Conservation Park covers about 1971 ha and is located approximately 10 km north of the centre of Whyalla. The park has a high conservation value with undisturbed native vegetation dominated by Western Myall, Saltbush and Bluebush, and is home to over 80 species of birds, 20 species of reptiles, and several threatened species including the EPBC Vulnerable Western Grasswren and the Southern Whiteface.

The False Bay wetlands area is located south and west of the WHP (Figure 5-4). This area is characterised by tidal sand and mud flats, with some areas of shingle and sandy beaches, and also contains the Whyalla Saltfields where a number of threatened shorebirds are known to occur or potentially occur. In the vicinity of Point Lowly Road and the pipeline alignment, the False Bay wetlands have been isolated from tidal influence by bunds and salt evaporation ponds located to the south and are described as 'stranded saltmarsh' (Appendix B).

[5] Biogeographic regions (bioregions) are broad landscape units based on major geomorphic features.

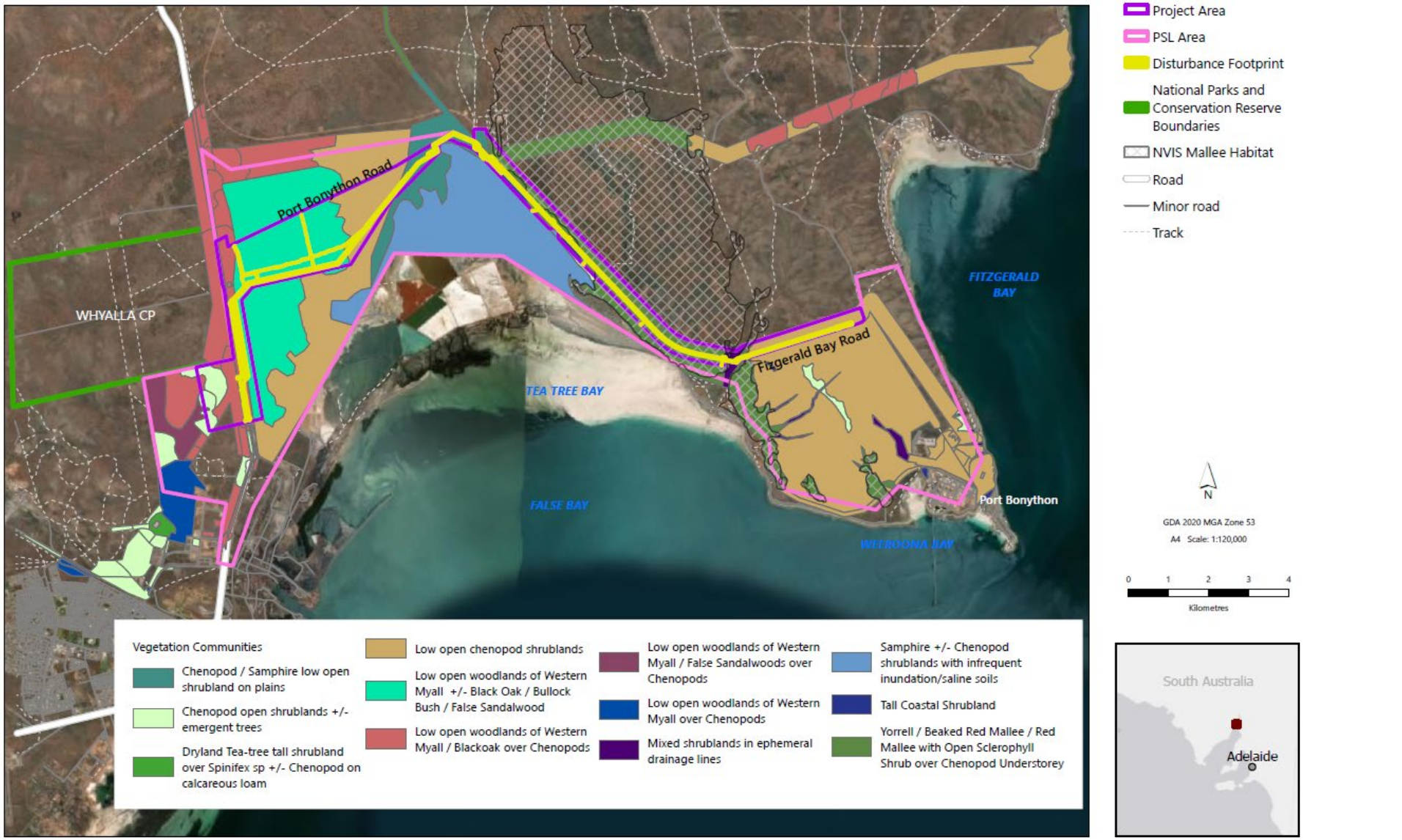

Figure 5-5: Project area and broad vegetation communities (Source: Lathwida2024a, Appendix B)

Vegetation types

The Baseline Ecology Assessment (Appendix B) identified sixteen vegetation associations within the Project area and surrounding PSL area, which represent five major vegetation groups. These associations, summarised in Table 5-5 and mapped in Figure 5-5, are relatively common and widespread in the bioregion and none are listed as threatened.

Table 5-5: Summary of Vegetation Groups, Communities and Associations

Major Vegetation Group	Broad Vegetation Community	Vegetation Association	BAM Site
Mallee	Mallee and low woodlands with an open sclerophyll shrub over Chenopods on sand plains / low dunes over calcareous loams	Yorrell / Beaked Red Mallee with sclerophyll and Chenopod understory	LEEP5
		Mallee +/- False Sandalwood open woodland over Chenopod shrubland	LEEP7
		Mallee +/- False Sandalwood open woodland over Chenopod shrubland	LEEP8
		False Sandalwood +/- Red Mallee over chenopod shrubland	LEEP10
		Open Red Mallee +/- False Sandalwood / Bullock Bush over Bluebush Daisy and Chenopod	LEEP12
	Mixed shrublands in ephemeral drainage lines[1]	Mixed shrublands in ephemeral drainage lines transition between mallee and chenopod	LEEP7
Acacia Woodlands (+/- Black Oak/False Sandalwood/ Bullock Bush)	Low open woodlands of Western Myall over Chenopods	Western Myall over Black Bluebush, Pearl Bluebush and Bladder Saltbush on loamy plains	LEEP2
	Low open woodlands of Western Myall +/- Black Oak over Chenopods	Western Myall / Black Oak over Pearl Bluebush, Black Bluebush, Bladder Saltbush shrubland	LEEP3
	Low open woodlands of Western Myall +/- Black Oak/Bullock Bush/False Sandalwood	Western Myall +/- Black Oak / Bullock Bush over Black Bluebush / Bladder Saltbush	LEEP 6
Samphire / Saltmarsh	Samphire +/- Chenopod shrublands with infrequent inundation/saline soils	Samphire / Mallee Hemichroa low shrubland on saline soils	LEEP1
Coastal Shrublands	Coastal Shrublands	Tall sclerophyll shrubland on sand	LEEP11
Chenopod Shrubland	Chenopod / Samphire low open shrubland on plains	Bladder Saltbush / Samphire on plains	LEEP15
	Chenopod open shrublands +/- emergent trees	Spiny Saltbush / Spiny Fanflower +/- Pearl Bluebush low shrubland, +/- sparse clusters of emergent False Sandalwood	LEEP14
	Low open Chenopod Shrublands	Black Bluebush / Bladder Saltbush low shrubland	LEEP4
		Pearl Bluebush +/- Black Bluebush low shrubland	LEEP13
		Bladder Saltbush / Thorny Lawrencia low shrubland on sandy saline plains	LEEP16

[1]Mixed shrublands in ephemeral drainage lines occur as a transitional community and represent a very small proportion of the disturbance footprint (less than 2 ha). They have been lumped in the Mallee group for offsetting purposes.

The major vegetation groups are described below and representative photos presented in Plate 5-6 to Plate 5-10 respectively.

Mallee

The Mallee group is described as mallee and low woodlands with open sclerophyll shrub over Chenopods on sand plains / low dunes over calcareous loams, including vegetation associations such as Yorrell / Red Mallee low woodland, False Sandalwood +/- Red Mallee over chenopod shrubland and Open Red Mallee +/- False Sandalwood / Bullock Bush over Bluebush Daisy and Chenopod and Red Mallee low woodland.

Acacia Woodlands (+/- Black Oak/False Sandalwood/Bullock Bush)

These communities occur in the lower rainfall areas / top third of the Eyre Peninsula around Whyalla, extending from Port Augusta through to Western Australia (Milne, Croft and Pedler 2008).

The group is described as low open woodlands of Western Myall (*Acacia papyrocarpa*) +/- Black Oak (*Casuarina pauper*) over Chenopods, including vegetation associations such as Western Myall over Black Bluebush (*Maireana pyramidata*), Pearl Bluebush (*M. sedifolia*) and Bladder Saltbush (*Atriplex vesicaria*) on loamy plains; Western Myall / Black Oak over Pearl Bluebush, Black Bluebush, Bladder Saltbush shrubland. Exotic species present include Ward's Weed (*Carrichtera annua*) moderately covering many bare areas between low shrubs and Wild Turnip (*Brassica* sp.) which is generally sparsely present.

Samphire / Saltmarsh

The samphire / saltmarsh vegetation group is located adjacent to artificial salt pans. Anecdotal evidence suggests some clay pan areas have been quarried and the vegetation is not connected to tidal areas, having been partially disconnected for establishment of the Whyalla Salt Pans / Steelworks.

Dominant species included Samphire (*Tecticornia halocnemoides* ssp*., T. tenuis, T. indica* ssp.), Mallee Hemichroa (*Hemichroa diandra*), and Round-leaf Pigface (*Disphyma crassifolium ssp. clavellatum*) (Plate 3.1). Several daisy species (*Brachyscome sp., Minuria cunninghamii*) and chenopods (Bladder Saltbush, Pale-fruit Bluebush (*Maireana appressa*) are sparsely present.

Coastal Shrublands

This vegetation group is dominated by three shrub species: Narrow-leaf Hop-bush (*Dodonaea viscosa*), Umbrella Bush (*A. ligulata*) and Desert Senna (*Senna artemisioides ssp. petiolaris*.

Other species include Gawler Ranges Senna (*S. cardiosperma ssp. gawlerensis*), Ruby Saltbush (*Enchylaena tomentosa*), Inland Pigface (*Carpobrotus modestus*), New Zealand Spinach (*Tetragonia tetragonoides*), New Holland Daisy (*Vittadinia* sp.), Bullock Bush (*Alectryon oleifolius*), Climbing Lignum (*Muehlenbeckia adpressa*) and Feather Spear-grass (*A. elegantissima*).

Three species of exotic plants were recorded in low to moderate densities: Onion Weed (*Asphodelus fistulosus*), Wards Weed (*Carrichtera annua*) and Common Iceplant (*Mesembryanthemum crystallinum*).

Chenopod Shrubland

The dominant chenopod species include Black Bluebush and Bladder Saltbush with other chenopod species present such as Topfruit Bluebush (*M. turbinata*), Hairy-fruit Bluebush (*M. trichoptera*), Two-horn Saltbush (*Dissocarpus biflorus var*.), Ruby Saltbush (*Enchylaena tomentosa*) and Desert Goosefoot (*Chenopodium desertorum* ssp.).

Additional low shrubs included Round-leaf Pigface (*Disphyma crassifolium ssp. clavellatum*), Bindyi (*Sclerolaena obliquicuspis*), Spear-grass (*Austrostipa nitida*) and Bindweed species (*Convolvulaceae* sp.). A dense cover of exotic flora (Ward's Weed *Carrichtera annua*) on bare earth between native shrubs was also observed at some sites.

Plate 5-6: Samphire

Plate 5-7: Acacia woodlands

Plate 5-8: Chenopod shrubland

Plate 5-9: Mallee

Plate 5-10: Coastal shrublands

Vegetation condition

Vegetation conditions range from medium to high, based on the condition scores recorded within the Baseline Ecology Assessment (Appendix B). Table 5-7 summarises the vegetation condition of each of the five broad vegetation communities, based on the relationship between condition score and condition rating shown in Table 5-6.

Table 5-6: Relationship between condition rating and relative condition score

Condition Rating[1]	Relative Condition Score
Very Low	<20
Low	20-35
Medium	36-55
High	56+

[1] Corresponds with bar graph in Electronic Sheet for Bushland Assessment survey sites (NVC 2020).

Table 5-7: Native vegetation condition in the Project area

Major Vegetation Group	BAM site	Vegetation Condition Score	Condition Rating
Mallee	LEEP5	64.00	High
	LEEP7	52.25	Medium
	LEEP8	54.00	Medium
	LEEP10	66.36	High
	LEEP12	63.20	High
Acacia Woodlands (+/- Black Oak/False Sandalwood/ Bullock Bush)	LEEP2	57.75	High
	LEEP3	59.38	High
	LEEP6	41.33	Medium
Samphire / Saltmarsh	LEEP1	77.40	High
Coastal Shrublands	LEEP11	62.50	High
Chenopod Shrubland	LEEP4	50.31	Medium
	LEEP13	66.51	High
	LEEP14	64.34	High
	LEEP15	60.05	High
	LEEP16	66.66	High

Threatened species and communities

Threatened Ecological Community

The EPBC Act Protected Matters Search Tool (PMST) modelled one EPBC listed Threatened Ecological Communities (TEC) as likely to occur: Subtropical and Temperate Coastal Saltmarsh (Vulnerable), however, no TECs were recorded within the Project area. The areas of samphire / saltmarsh vegetation that occur within and adjacent to the Project area do not meet the criteria for the TEC as they are 'stranded saltmarsh' (i.e. isolated from tidal influence). These areas are considered to be buffer vegetation (e.g. stranded saltmarsh that could support Migratory species but is not core habitat).

EPBC listed Flora

The PMST indicates that four EPBC-listed threatened flora species have the potential to occur within the Project area. However, the likelihood assessment presented in Appendix C determined that three of the four threatened species are unlikely to occur, based on a lack of historic records, a lack of suitable habitat and having not been observed during field surveys.

Although there are no records for any threatened EPBC listed flora species within the Project area, the Yellow Swainson-pea (*Swainsona pyrophila*) (Vulnerable) is considered 'possible' to occur in mallee

areas, given it can remain dormant and responds to fire and disturbance. The species was not detected during the surveys.

Although not predicted in the PMST output, the Baseline Ecology Assessment also suggested that the EPBC listed (Vulnerable) Bead Samphire (*Tecticornia flabelliformis*) could possibly occur in samphire shrubland adjacent to the Project area. However, there are no records for this species around Point Lowly / Port Bonython or along the coast north and south of Whyalla (BDBSA 2023, NatureMaps 2024) and given the stranded inundation regime and historical sand quarrying, the habitat may not be suitable. It has not been detected on surveys to date and is considered unlikely to occur in the Project area.

National Parks and Wildlife (NPW) Act listed flora

There are records for five state-listed flora species in a 5 km buffer of the PSL area. Three of these are considered unlikely to occur and two are considered likely: Sandalwood (*Santalum spicatum*) (listed as Vulnerable) and Australian Broomrape (*Orobanche cernua var. australiana*) (listed as Rare). These species were not recorded in field surveys.

EPBC listed fauna

The PMST identified 46 threatened fauna species as potentially occurring within the Project area, including 22 oceanic and marine species that were not considered further in this assessment.

The likelihood assessment (Appendix C), excluding oceanic and marine species, identified five EPBC-listed species that have potential to occur in the Project area. Three are known (Malleefowl, Southern Whiteface, Western Grasswren) and two have potential to occur (Blue-winged Parrot, Grey Falcon). The remaining nineteen species are considered unlikely, however, ten of these are shorebirds that have potential to occur at or are known to visit the adjacent saltfields / salt evaporation ponds.

Malleefowl is considered known to occur in the Project area in mallee habitat along Point Lowly Road and is listed as Vulnerable under both the EPBC Act and NPW Act. Malleefowl is wide-ranging in mallee dominant habitats and associated adjoining habitats. Deep sandy soils and abundance of leaf litter are required for breeding / nesting and over the course of a year the birds may range over 100 to 300 ha and home-ranges overlap considerably.

No Malleefowl mounds or evidence of Malleefowl were detected in the disturbance footprint within mallee habitats during targeted searches of the Project area conducted in March and August 2024, nor within the broader area to date. Potential Malleefowl mounds identified in LiDAR data were all verified in the field as not being Malleefowl mounds. Given the lack of deeper sand in the Project area and proximity to Point Lowly Road, it is likely that mallee in the Project area only represents foraging and cover habitat for the species. Nests are considered more likely to occur north of Point Lowly Road in the large patch (2870 ha) of mallee on Department of Defence (DoD) land that is contiguous with the Project area.

Southern Whiteface occurs across most of mainland Australia south of the tropics in a wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. The species is listed as Vulnerable due to population decline resulting from large scale habitat loss and fragmentation.

Within the Project area, suitable habitat occurs in areas of vegetation mapped as Western Myall Woodland over Chenopod, with or without other tree species such as Black Oak, False Sandalwood and Bullock Bush. Mallee will also provide suitable habitat for the species.

Southern Whiteface has been detected via song meter in the vicinity of the western end of the Project area. Several Biological Data Base South Australia (BDBSA) records exist within the Project area and adjacent areas.

Western Grasswren (Vulnerable) is scattered and widespread in the Myall Creek and Pine Creek drainages of the north-eastern Eyre Peninsula, bounded in the south by Munyaroo Conservation Park, in the north towards Lake MacFarlane and in the west by Mount Ive Station at the southern end of Lake Gairdner and Lake Gilles Conservation Park (Garnet and Baker 2021). The species is known to prefer low dense chenopod shrublands, mainly comprising Black Bluebush and Australian Boxthorn and spiny shrubs however, also inhabits semi-arid low open woodlands, mostly comprising Western Myall and Senna shrublands.

Western Grasswren are known to occur within the western part of the Project area. The Project area occurring east of Lincoln Hwy does not contain any 'preferred habitat' of drainage lines with dense Black Bluebush. The species was detected at five locations in the western part of the PSL area (three of which are in the Project area) during targeted field surveys conducted in 2024, in suboptimal habitat containing some potential roosting vegetation.

Based on anecdotal evidence, the species has been undergoing a 'boom' period in recent years, with increased detections through its range in both preferred, atypical and suboptimal habitats where they have not been detected previously (including east of Lincoln Highway). The individuals detected east of the Lincoln Highway would be considered part of small family groups on the edge of the entire population which spans over 170 km / 252,500 ha.

The **Blue-winged Parrot** is a migratory parrot listed as Vulnerable by both the EPBC Act and NPW Act. The species breeds in Tasmania and mainland Australia south of the Great Dividing Range in southern Victoria, and sometimes in the far south-east of South Australia. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales. The species is considered possible to occur, due to the extremely broad distribution of known range and habitat preference.

The Blue-winged parrot inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. The species favours grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones as well as altered environments such as airfields, golf-courses and paddocks. The Project area occurs within the species' occasional range. There are no records within 5 km of the Project area, and only one record in the broader region.

The **Grey Falcon**'s preferred habitat includes open plains and treed watercourses in arid inland areas. No large, treed watercourses are present within the Project area, but the species may forage widely and feeds exclusively on other birds. When not actively hunting it roosts in shady trees or communications towers. There is one record within 5 km of the Project area.

Native Parks and Wildlife (NPW) Act listed fauna

There are records for 27 state-listed species within a 5 km buffer of the Project area and surrounding PSL area. The Slender-billed Thornbill (Western) (*Acanthiza iredalei iredalei*) (Rare) is known to occur and a further six species (all listed as Rare) are considered likely to occur: Common Tern (*Sterna hirundo longipennis*), Elegant Parrot (*Neophema elegans elegans*), Rock Parrot (*Neophema petrophila zietzi*), Shy Heathwren (*Hylacola cauta cauta*), Sooty Oyster Catcher (*Haematopus fuliginosus fuliginosus*) and Spotless Crake (*Zapornia tabuensis*). A number of other species are considered possible or likely in aquatic habitats adjacent to the Project area or as overfly species.

Migratory fauna

The PMST identified 45 migratory species with potential to occur. Of these, 23 species were oceanic / marine species and were not considered further. Of the 22 migratory species considered to potentially occur in the Project area, nine species are also listed as threatened and were considered unlikely to occur in the Project area. Of the remaining twelve species, one is known (Forktailed Swift), but is an overfly species, four are considered unlikely in the Project area, but may occur in adjacent stranded saltmarsh areas if there is low lying water present (e.g. Common Sandpiper (*Actitis hypoleucos*), Pectoral Sandpiper (*Calidris melanotos*), Red-neck Stint (*Calidris ruficollis*), Marsh Sandpiper (*Tringa stagnatilis*)) and the remainder are considered unlikely. The majority of these migratory species are only likely to be present in summer, and when water is present in areas adjacent the salt pans that area adjacent to the Project area.

Weeds

Table 5-8 summarises the weeds detected at vegetation assessment sites and as opportunistic records during the 2023-24 site survey (Appendix B). There are database records for a further 17 exotic species in the Project area and surrounding PSL area, including numerous records of the declared weeds Salvation Jane (*Echium plantagineum*) and Buffel Grass (*Cenchrus ciliaris*). Previous surveys have highlighted the presence of Buffel Grass along Pont Lowly Road.

Table 5-8: Summary of weeds observed within the Project area (December 2023 / March 2024)

Name	Associated Vegetation Community	Weed Status	Comment
Wild Turnip *Brassica* sp.	Low Open Woodlands		Sparsely present throughout Project area
Horehound *Marrubium vulgare*	Low Open Woodlands Chenopod Open Shrublands	*Declared	Scattered clumps
Prickly Pear *Opuntia* sp.	Chenopod Open Shrublands	*Declared WoNS	One clump recorded
Mustard *Sisymbrium sp.*	Mallee with Sclerophyll and Chenopod		Sparsely present
Iceplant *Mesembryanthemum sp.*	Mallee with Sclerophyll and Chenopod Tall Sclerophyll Shrubland		Present in mallee areas
Ward's Weed *Carrichtera annua*	Low Open Woodlands Chenopod Open Shrublands Mallee with Sclerophyll and Chenopod Tall Sclerophyll Shrubland		Ranging from sparse to moderately dense across the Project area
Onion Weed *Asphodelus fistulosus*	Mallee with Sclerophyll and Chenopod Tall Sclerophyll Shrubland		Present in road reserve
African Boxthorn *Lycium ferocissimum*	Mallee with Sclerophyll and Chenopod	*Declared WoNS	Only one plant recorded

*Declared under Landscape SA Act, WoNS = Weed of National Significance

Pests

Four exotic fauna species were recorded during field surveys for the Baseline Ecology Assessment (European Fox (*Vulpes vulpes*), Feral Cat (*Felis catus*), Rabbit (*Oryctolagus cuniculus*) and Sheep (*Ovis aries*)), and nine other species of exotic fauna have database records within a 5 km buffer of the Project area and surrounding PSL area.

5.4.2. Impact assessment

Potential impacts to native vegetation and fauna mainly arise from the following activities:

- Earthworks associated with construction of access track(s) / laydown / work areas and rehabilitation.
- Earthworks associated with trenching and creation of associated stockpiles.
- Disturbance from site activities, e.g. light, noise, dust, erosion and people.
- Use of roads and movement of heavy vehicles and machinery.
- Access to contaminants, e.g. hydrotest water, spills, leaks and waste.
- Introduction or spread of weeds or pests.
- Welding and potential for fire.

The potential impacts resulting from these aspects of the Project are discussed below.

Disturbance / removal of native vegetation

Vegetation clearance and earthworks will result in direct impact to native vegetation along the construction right-of-way. Approximately 102 ha of native vegetation will be subject to temporary disturbance along the 22.5 km length of the pipeline alignment. Permanent disturbance at the mainline valve station at the eastern end is approximately 0.16 ha.

The vegetation communities / habitats found along the pipeline alignment are well represented in the region. The pipeline alignment has been selected to follow existing infrastructure corridors and to use existing disturbed areas where practicable to minimise impacts of vegetation clearance.

The right-of-way will be rehabilitated and vegetation will be encouraged to regenerate, with the exception of a strip several metres in width above the pipe, where the pipeline is kept free of trees and large shrubs to protect the pipe from potential root damage and to provide ease of access for operational or emergency maintenance. Additional reseeding will be carried out with selected local species that match the vegetation communities traversed.

The vegetation types on the alignment are expected to regenerate well following construction, based on observations of previous disturbance in the vicinity of the pipeline (e.g. adjacent hydrocarbon pipelines). The shrub layer is expected to regenerate quickly. Trees (where present) are relatively slow growing and may take longer to regenerate, however the regenerating shrub layer will provide suitable foraging habitat for most of the fauna species present.

A SEB under the NV Act will be achieved to offset vegetation clearance. It is anticipated that Epic Energy will make a payment into the Native Vegetation Fund to achieve the SEB requirements, however options for an on-ground offset in the Whyalla region will be investigated where available. Preliminary calculations for the SEB are provided in Appendix D and summarised in Table 5-9. Final details of vegetation clearance and the proposed SEB would be submitted at the activity notification stage (i.e. Stage 3 approvals under the ER Act) as discussed in Section 2.1.6.

Measures will be implemented to ensure that vegetation clearance is minimised and restricted to approved areas.

The impact of vegetation clearance will be relatively short term and localised to the construction right-of-way, which is aligned, where possible, with existing disturbance corridors. The vegetation clearance represents a very small proportion of native vegetation and habitat in the region, is manageable and will be offset by a SEB. The level of risk has been assessed as low (see Table 5-24).

Table 5-9: Vegetation clearance and estimated SEB requirement

Major vegetation group	BAM site(s)	Unit Biodiversity Score[1]	Area (ha)	Total Biodiversity Score	SEB Points required[2]	SEB payment	Admin fee
Mallee	LEEP 5, 7, 8, 10, 12	74.22	27.02	2,005.42	1,052.85	$89,882.67	$4,943.55
Acacia Woodlands	LEEP 2	69.24	6.79	470.14	246.82	$21,071.55	$1,158.94
	LEEP 3	71.19	11.01	783.80	411.50	$35,129.82	$1,932.14
	LEEP 6	49.55	16.00	792.80	416.22	$35,533.12	$1,954.32
Samphire / Saltmarsh	LEEP 1	92.8	2.80	3,098.10	161.75	$13,808.79	$759.48
Coastal Shrublands	LEEP 11	74.94	0.44	32.97	17.31	$1,477.87	$81.28
Chenopod Shrubland	LEEP 15	72.00	15.06	1,084.32	569.27	$48,598.98	$2,672.94
	LEEP 14	75.02	0.00	NA	NA	NA	NA
	LEEP 4, 13, 16	73.33	23.09	1,693.19	888.92	$75,888.38	$4,173.86
Total			**102.17**	**7,121.135**	**3,738.60**	**$319,167.67**	**$17,554.22**

[1]An average UBS was used for mapped vegetation groups that contained more than one BAM site

[2]SEB points required have been calculated using a reduction of 0.5 for ecological restoration initiated within 5 years

[3]NVC SEB documentation was updated in September 2024. For this calculation the 2023 version of the electronic BAM sheets and Agricultural Region Clearance Summary Table have been used in accordance with transitional provisions.

Impacts to threatened species and communities or migratory species

A significant impact assessment was undertaken for the Project in support of the EPBC Act referral by Lathwida Environmental (Appendix C). It concluded that the Project is not likely to have a significant impact on any EPBC-listed species or communities or migratory species. The findings of the significant impact assessment are summarised below, with additional discussion provided on state-listed species or communities where relevant.

It is noted that in the EPBC referral decision letter, the Commonwealth Minister indicated that, based on the information available in the referral, they considered that the Project is likely to have a significant impact on Western Grasswren and Southern Whiteface as a result of habitat clearance, and on migratory shorebirds as a result of indirect impacts from erosion, pollution and sedimentation.

Residual impacts to these species have been evaluated in more detail in the EPBC Act preliminary documentation, which has also concluded that the Project is not likely to have a significant impact on these matters. Epic Energy is confident that there will be no significant impact to migratory shorebirds. If, following assessment of the EPBC Act preliminary documentation, the Commonwealth Minister decides that residual impacts to Western Grasswren and Southern Whiteface are significant, Epic will implement offsets that provide an appropriate benefit to compensate for any significant residual impacts on these species.

Threatened ecological communities

There will be no impact to TEC as a result of the WHP as none are present within or immediately adjacent to the Project area.

Threatened flora

Threatened flora are unlikely to be impacted by the Project.

Although one EPBC-listed species (Yellow Swainson-pea) could possibly occur in mallee areas, it is unlikely to significantly impact an important population of this species or result in other impacts (e.g. fragmentation) that could cause the species to decline. As the species responds favourably to disturbance, the Project could facilitate germination of this species if present. See Appendix C (Section 3.6.1) for further information.

One state-listed threatened species (Sandalwood, listed as Vulnerable) is considered likely to occur in mallee habitats in the Project area, but has not been detected during field surveys. If this species is present, clearance for the Project may impact a small number of individuals on the construction right-of-way. There is extensive similar habitat surrounding the Project area and the WHP is not likely to impact an ecologically significant proportion of a population of this species if it is present.

Threatened fauna

The three known and two potentially occurring EPBC-listed fauna species are not likely to be significantly impacted by the Project, as summarised below. Further details are provided in Appendix C.

Western Grasswren: Temporary clearance of approximately 35 ha of suitable habitat and 41 ha of low suitable habitat represents a very small proportion of the available habitat in the region. No preferred habitat is present in the disturbance footprint and the temporary clearance of habitat occurs at or beyond the edge of the species previously known range where there is existing disturbance and a major highway. Whilst several individuals are present, they constitute a very small proportion of the wider population which extends well west and northwest of Whyalla.

Southern Whiteface: Temporary clearance of approximately 61 ha of suitable habitat and 23 ha of low suitable habitat represents a very small proportion of the available habitat for this species in the region and a very small proportion of its area of occupancy. Temporary clearance of a narrow strip of vegetation along an existing busy highway and other roads and tracks is unlikely to cause fragmentation, as movement between habitats will still be viable.

Malleefowl: Temporary clearance of approximately 27 ha of suitable foraging habitat represents less than 1% of the habitat available in the area surrounding the Project. No evidence of Malleefowl presence was detected in the proposed clearance area during targeted surveys and the Project area is considered to be suitable only for foraging rather than nesting. Areas of mallee that are cleared will initially revegetate with shrub and understorey species that will continue to provide suitable foraging habitat for Malleefowl. Clearance of a long narrow strip adjacent to an existing busy road is not likely to restrict movement of this species.

Grey Falcon: Preferred habitat for this species is not present. Temporary vegetation clearance will have a small and localised impact on habitat that may occasionally be used for hunting by this wide-ranging species. It is unlikely that any individuals are dependent on foraging habitat in the proposed disturbance area.

Blue-winged Parrot: Vegetation clearance will have a localised and short-term impact on a very small proportion of potential foraging habitat that may occasionally be used by this species during migration. The temporary vegetation clearance would not be significant in size or quality or importance to the species. There are no state-listed threatened fauna species likely to occur in the Project area. Other fauna (including species listed as Rare that are likely to occur) are unlikely to be impacted as the Project involves temporary disturbance of widespread habitat that represents a very small proportion of available habitat in the region.

Migratory species

The Project will not directly impact any migratory shorebird habitat. Where the WHP passes adjacent stranded saltmarsh / Whyalla Salt fields and beach areas, it is co-located with existing infrastructure

(roads and tracks) and is on the far side of Point Lowly Road. Given these separation distances and the presence of the existing major sealed road, indirect impacts to migratory wader habitat or birds that may occasionally be present near the Project area are considered unlikely to occur.

Impact summary

Impacts to threatened species and communities or migratory species are not considered to be significant and the level of risk has been assessed as low (see Table 5-24).

In the case of Western Grasswren or Southern Whiteface, if significant residual impacts are determined in the Minister's decision under the EPBC Act, they will be offset to provide an appropriate benefit.

Habitat fragmentation

Construction of the WHP is not expected to cause significant habitat fragmentation. Pipeline construction has the potential to cause localised disruption to small fauna species or plant species that are present in low numbers or have poor dispersal mechanisms. However, as buried pipeline easements are restricted in width, are allowed to regenerate and can be actively revegetated (with some restrictions on deep-rooted species over the pipe) they are not generally considered to present a long-term barrier to wildlife movement.

Impacts would be short term, localised and manageable. The level of risk has been assessed as low (see Table 5-24).

Indirect impacts on vegetation and fauna habitats

Earthworks, pipeline installation and use of unsealed roads and tracks can result in dust generation which may have temporary and localised impacts to vegetation. Fine particles can coat vegetation and limit its ability to maintain healthy function. Dust generation will be minimised by restriction of speeds on unsealed roads and tracks and spraying of unsealed roads and tracks with water to moderate the potential for dust generation where required.

Erosion and increased sediment load in surface water may affect sensitive environments adjacent to the Project area. No significant impacts to the adjacent saltmarsh habitat are anticipated as there is limited hydrogeological connectivity to the Project area, predominantly due to the distance the pipeline alignment is away from the saltmarsh habitat and the presence of Point Lowly Road. As discussed in Section 5.3.3, activities to ensure surface drainage patterns and water quality are maintained would avoid potential indirect impacts on native vegetation, fauna and particularly wetland communities.

Dewatering of groundwater inflows into the trench (if required) could have a localised impact on vegetation, particularly if groundwater is saline and dewatering to land occurs over a prolonged period. As discussed in Section 5.3, groundwater across the majority of the Project area is relatively deep and groundwater inflows to the trench are not expected, other than in the two locations near the saline flats where geotechnical investigations encountered shallow groundwater. Vegetation in these locations ('stranded' samphire shrubland) would have a relatively high tolerance to salinity, and short-term exposure to saline groundwater may have limited impact. Dewatering (if required) would be undertaken in accordance with the measures outlined in Sections 5.2.3 and 5.3.3, including a site-specific assessment of water quality and suitability of disposal to land. Dewatering procedures would be incorporated into the CEMP.

Impacts would be short term, localised and manageable. The level of risk has been assessed as low (see Table 5-24).

Fauna entrapment in excavations

Earthworks can potentially disturb or injure fauna and the open trench provides a temporary barrier to fauna movement. There is also the potential for ground-dwelling fauna to fall into the trench and become trapped and exposed to overheating, dehydration, predation and / or drowning.

Measures will be implemented to minimise the potential for fauna mortality due to machinery operation, collision with vehicles or entrapment (refer Section 5.4.3) and when implemented the risk to native fauna presented by the open trench or excavations is anticipated to be low.

Impacts would be short term, localised and manageable. The level of risk has been assessed as low (see Table 5-24).

Disturbance from site activities

Potential disturbance to native fauna from construction or maintenance activities (e.g. light, noise, presence of personnel) is short term, localised and generally of limited significance given the existing land uses and extent of history of industrial activity and habitat modification in the region.

Disturbance to fauna from operational activities is expected to be very limited. Away from the Whyalla Hydrogen Facility (where the Project's operation is a small component of overall site operations), the Project operations do not involve significant lighting or noise generation.

Impacts would generally be short term, localised and manageable. The level of risk has been assessed as low (see Table 5-24).

Use of roads and movement of heavy vehicles and machinery

The movement of vehicles and machinery along existing roads and access tracks has the potential to impact native fauna, principally through collisions.

The potential of vehicle strike is likely to be relatively insignificant due to the type of local fauna, level of existing traffic, the short-term nature of the activities and the limited extent of significant fauna habitats. Transport procedures (e.g. speed restrictions, limitation of movements at night) would also reduce the potential level of impact.

Impacts would be short term, localised and manageable. The level of risk has been assessed as low (see Table 5-24).

Access to contaminants

The potential for native fauna to access contaminants and waste is limited. Liquid storage areas will be fenced and any contaminants from spills or leaks will be immediately cleaned up. Waste would be stored in sealed bins before being transported off-site for disposal.

Impacts would be short term, localised and manageable. The level of risk has been assessed as low (see Table 5-24).

Weeds and pests

Introduction or spread of weeds

Introduction and spread of weeds can occur through soil disturbance and the movement of weed material or seeds on earthmoving equipment and vehicles. Imported fill can potentially introduce weed species, though this is unlikely as material should be obtained from weed-free sources and the padding is buried at depth in the trench. Other imported material (e.g. stored pipes, used fencing material) may also result in weed introduction if it is not cleaned before arrival.

The spread of environmental weeds (such as Buffel Grass) can potentially inhibit the regeneration of indigenous species on the disturbed construction sites, forming a longer term, perhaps permanent, weed cover, and can result in the invasion of adjoining, non-disturbed vegetation, particularly by species not currently present. Weed hygiene protocols would be implemented during construction activities to minimise the risk of weed spread and ongoing weed management would be undertaken where required.

The CEMP will include biosecurity and weed management measures that will limit the potential for weed spread and incursions. As such, impacts from introduction or spread of weeds are expected to be very limited and the level of risk has been assessed as medium (see Table 5-24).

Incursion of predators or pests

Project activities and the presence of access tracks are not expected to result in an increase in the existing level of pest species present in the Project area.

The construction of the pipeline is not expected to significantly increase the access of predatory pests to habitats as there are existing tracks or roads present along the majority of the proposed alignment. The CEMP and OEMP will include mitigation measures to avoid introduction or increase in abundance of predators and pests.

Waste will be managed and transported appropriately (e.g. in covered bins) to avoid increasing or facilitating predators and pests in the region. Adaptive pest management, monitoring and control would be undertaken where required, particularly during construction.

With the implementation of appropriate control measures, impacts from predators or pests are expected to be very limited and the level of risk has been assessed as low (see Table 5-24).

Fire

Fire initiated by site activities during construction or maintenance activities (e.g. welding, sparks from vehicles or equipment, cigarette butts) has the potential to impact large areas of vegetation. Measures would be in place to prevent fires including restriction of vehicles to the cleared right-of-way, access tracks and other cleared areas, maintenance of suitable fire-fighting equipment on site, liaison with the Country Fire Service and compliance with requirements of the *Fire and Emergency Services Act 2005* for 'hot work' permits on days of total fire ban.

Impacts as a result of fire are not expected to occur. The level of risk has been assessed as low (see Table 5-24).

5.4.3. Mitigation measures

General

- Undertake a walk through with an experienced ecologist, arborist and construction design specialist in order to further reduce the construction right-of-way, where possible, and to assist with demarcation of no – go zones for particularly sensitive areas.

- Clearly delineate no-go areas during construction works to limit human and vehicle incursion into these areas.
- Include content on ecological values in induction training to improve awareness of contractors working on the site.
- Ensure the CEMP includes controls relating to activities near salt pans and clay pans, weed hygiene, weed monitoring and progressive rehabilitation of all temporary construction areas.
- Develop and implement clear protocols for management of waste during construction to avoid an increase in, or attraction of, pest animals to the Project area.
- Integrate site-specific management strategies into the CEMP.

Remnant vegetation and habitat

- Use existing tracks and disturbance corridors wherever practicable.
- Minimise the removal of established trees and vegetation.
- Restrict disturbance (including vehicle access) to the right-of-way and designated work areas / access tracks
- Restrict speed on unsealed roads and tracks and spray with water where required.
- Clearly delineate boundaries in the field to identify the extent of vegetation clearing.
- Select locations for work areas outside the right-of-way (including lay-down areas, truck turn-arounds and cathodic protection facilities) that require minimal vegetation clearance and avoid tree clearance.
- Restrict the right-of-way width to the minimum necessary for safe pipeline construction.
- Reduce the width of the right-of-way in areas of higher ecological significance where practicable.
- Retain trees on the right-of-way where possible and trim branches that overhang the right-of-way rather than remove complete trees (whilst ensuring that safe access is maintained).
- Flag any areas of reduced right-of-way and where trees are to be trimmed or retained.
- Stockpile cleared vegetation and respread on the right-of-way following reinstatement. Burning of vegetation will not be carried out.
- Ensure that the reinstated pipeline does not alter hydrological characteristics.
- Manage dust during construction through standard suppression methods such as watering of high traffic areas or when construction works are in close proximity to any sensitive receptors.
- Rehabilitate disturbed areas following completion of construction activities, noting opportunities to undertake progressive rehabilitation will be identified and implemented.
- Allow native vegetation to regenerate on the right-of-way, with the exception of trees and large shrubs on the area above the pipe that is required to be kept clear for pipeline protection and maintenance purposes.
- Identify rehabilitation methodologies, including the respread of vegetation (including tree branches) and topsoil (in the reverse order of clearance) to facilitate natural regeneration in the CEMP.
- Undertake additional seeding using selected local species that match the vegetation communities traversed. Seed species selection will favour, where feasible, vulnerable fauna such as Western Grasswren, Southern Whiteface and Malleefowl.

- Monitor revegetation of the construction right of way until a vegetative cover has been successfully reestablished.
- If revegetation is not successful in areas, consider remedial actions such as site preparation and/or additional reseeding.
- Comply with the NV Act to achieve a SEB.

Fauna disturbance / mortality

- Ensure that vehicles travel at safe speeds that minimise environmental risks and vehicle movements at night are minimised.
- Install trench plugs with slopes no greater than 50% at regular intervals to provide ramps for fauna to exit the trench.
- Install measures to minimise fauna fatality in the trench and allow fauna to exit the trench (e.g. sawdust filled hessian sacks soaked in water, branches or ramped gangplanks).
- End cap welded pipe strings to prevent fauna entry.
- Undertake daily inspections of open trenches during the working cycle with any fauna handling or removal to be undertake in accordance with statutory requirements (e.g. the *National Parks and Wildlife Act 1972* , *Animal Welfare Act 1985*).
- Ensure presence of appropriately trained (and licensed) fauna handlers during construction to assist with removal of, and relocation of, any trapped (and / or injured) fauna displaced during vegetation clearance activities.
- Minimise, as far as practicable, the amount of time the trench or bore hole is open and undertake progressive backfilling to minimise the length of open trenches.

Threatened species

- Where practicable, avoid any identified areas of higher density preferred chenopod / spiny shrublands (potential Western Grasswren habitat), low woodland, or higher density and taller shrublands (potential Southern Whiteface habitat) and minimise clearance in mallee.
- Where the construction footprint comes within proximity to key habitats supporting EPBC species or communities, delineate the construction footprint boundary to avoid unintentional disturbance outside of defined construction areas.
- Prepare a Threatened Species Management Plan as a sub-plan to the CEMP. This would include pre-construction inspection of any areas with suspected EPBC species or habitat prior to commencement of access and clearing activities, waste management protocols, speed restrictions, weed hygiene, weed surveillance and follow-up controls for any weed outbreaks.
- Undertake pre-clearance surveys in mallee that cannot be avoided to detect any active or non-active Malleefowl nests, and undertake adaptive mitigation to avoid impacts to Malleefowl, if required (e.g. establish no go areas, relocate live Malleefowl or eggs in collaboration with DEW staff and in accordance with the *National Parks and Wildlife Act*, as required). If any active or potentially active Malleefowl nests are detected, implement construction constraints within 100 m vicinity where feasible.

Spread of environmental weeds

- Undertake pre-construction weed surveys and controls, post-construction weed surveys and controls, and ongoing weed survey and control during operation.

- Inspect all vehicles and plant to ensure that they are weed free prior to their initial commencement of works, and conduct washdowns where required.
- Implement weed management procedures detailing requirements for the following (where appropriate):
  - machinery, vehicle and personnel hygiene measures
  - screening of imported material (e.g. padding) for weeds
  - records management
  - monitoring during and following construction
  - post-construction control.
- Implement weed monitoring targeting WoNS and Declared Weed species (including Buffel Grass), with follow up controls as required for any identified weed outbreaks.
- Prepare and implement the OEMP prior to commissioning (e.g. including weed surveillance and control programs targeting WoNS and Declared Weed species (if weeds identified) on an annual basis).

Pests

- Store food and waste materials securely in sealed containers to prevent access by pests.
- Dispose of food waste and organic materials properly to avoid attracting pests to the construction site.

Contamination

Refer to measures presented in Section 5.2.3.

Fire

- Implement fire prevention procedures and maintain fire prevention and control equipment on site for high risk activities.
- Develop policies and procedures to appropriately manage bushfire risk to visitors, staff and contractors, including site induction, bushfire response, actions on forecast high fire danger days, reported bushfire emergencies, visitor management and site closure.
- Obtain any necessary permits under the *Fire and Emergency Services Ac*t for 'hot work' on days of total fire ban.
- Ensure contractors carry basic firefighting equipment (including fire extinguisher) along with communications devices in all vehicles during construction activities.
- When undertaking 'hot work' activities ensure:
  - the area of construction over which hot work will take place will be maintained free from combustible material
  - firefighting equipment, including a validated portable fire extinguisher, and trained personnel will be available
  - water trucks will be available.

5.5. Aboriginal Cultural Heritage

5.5.1. Existing environment

The WHP is located within the traditional lands of the Barngarla people. The Barngarla, as both the Traditional Owners and recognised native title parties of certain land on the Eyre Peninsula, are

represented by Barngarla Determination Aboriginal Corporation (BDAC) (refer Section 2.2.2 for information on native title).

The Barngarla people traditionally lived by the coast and visited inland seasonally and for ceremonial and special purposes. The Barngarla people's dreaming includes local stories and universal Dreamtime stories that link into other places and other tribes, such the Seven Sisters stories which connect to the moon, stars, landscapes and islands. Undisturbed coastal areas and salt lakes are generally accepted as having a high-risk profile for the presence of Aboriginal cultural heritage sites, objects or remains.

A search of the central archive, part of the Register of Aboriginal Sites and Objects maintained by Aboriginal Affairs and Reconciliation (AAR) within the Attorney-General's Department, was undertaken in early 2023 and again in May 2024. No registered or recorded sites, objects or remains were located within the proposed alignment.

Preliminary pipeline alignments have been revised and refined following completion of a formal cultural heritage survey with BDAC in May 2024 and in consultation with BDAC and its representatives, to avoid and minimise impacts to areas of cultural heritage value. The current proposed pipeline disturbance footprint has been designed as far as possible to avoid or minimise impacts on areas that may be of cultural heritage value to Aboriginal people or known Aboriginal cultural heritage sites. In particular, the alignment has been moved to avoid the salt pans located to the south and west of the current alignment and to avoid and minimise impact to two creeklines in the final section of the proposed alignment, following advice from the Barngarla people of the cultural importance of this area.

Epic Energy notes that Aboriginal sites, objects and remains are protected under the *Aboriginal Heritage Act 1988 (SA)*, whether known or unknown, and is committed to working with the Barngarla people and implementing appropriate measures, such as the preparation of a Cultural Heritage Management Plan (CHMP), to document all measures to be taken to avoid or minimise any impacts to cultural heritage. Refer Section 5.5.3.

5.5.2. Impact assessment

The following activity has been identified as a source of potential impact to Aboriginal cultural heritage:

- ground disturbance including vegetation clearance and earthworks.

Ground disturbance will be required to construct the pipeline, creating the potential for impacts on unknown, unrecorded and / or unregistered sites. Locating works to align with existing infrastructure corridors and disturbed areas wherever possible will reduce the risk of impacts to cultural heritage values, whether known or unknown.

Measures will be implemented prior to and during construction to minimise the risk of damage, disturbance or interference to Aboriginal sites, objects and remains (refer Section 5.5.3).

Damage to Aboriginal heritage is not expected to occur. The level of risk has been assessed as medium (see Table 5-24).

5.5.3. Mitigation measures

In addition to the formal survey that was conducted on 31 May 2024, mitigation measures that will be implemented to minimise potential impacts on cultural heritage values are summarised below. These measures will be implemented via ongoing cultural heritage monitoring through construction, inductions, a Cultural Heritage Management Plan (CHMP), the CEMP and the OEMP, and in consultation with BDAC:

- Locate works to align with existing infrastructure corridors and disturbed areas wherever possible.
- Continue working and consulting with BDAC to understand the cultural heritage values to Aboriginal people in the Project area.
- With BDAC, develop a CHMP to manage the avoidance and minimisation of impacts to cultural heritage sites, objects or remains during construction and which sets out the process in respect of any unexpected finds during construction.
- Engage cultural heritage monitors for all clearing and grading and trenching work during construction.
- Implement mandatory inductions for employees and contractors that include cultural awareness training and making copies of the CHMP readily accessible on site.
- Work and consult with BDAC to ensure any revision of the pipeline alignment avoids or minimises impacts to areas of potential cultural heritage importance.

5.6. Non-Aboriginal Heritage

5.6.1. Existing environment

The northern Spencer Gulf was first navigated by Matthew Flinders in 1802. Edward John Eyre reported the presence of iron stone in the nearby Middleback Ranges in 1840, with the first attempts at mining occurring in the 1890's.

Early European settlement in the region was a tiny work camp at Hummock Hill (Whyalla) set up as a service base for the construction of the nearby iron ore jetty by BHP in 1901 (Whyalla 2024). The city of Whyalla, located approximately 4.8 km from the most southerly of the proposed alignment, was proclaimed a town in 1914 and a city in 1961.

Several registered European heritage sites are located within Whyalla which reflect the city's European history, with two further sites located close to the end of line WHP facilities. None will be impacted by the WHP. Refer Table 5-10.

Table 5-10: Registered SA Heritage sites

Heritage Site	Heritage Number	Registered
Point Lowly Lighthouse Complex	16498	15 December 1994
Whyalla High School (formerly Whyalla Technical High School)	19155	25 September 2003
Bay View Hotel	26027	3 December 2010
Spencer Hotel	26028	3 December 2010
World War Two Gun Emplacements	16499	4 March 1993
Fitzgerald Bay	27685	17 May 2017
Whyalla Court House	25672	23 July 2010
Dwelling – Gay Street Cottage (relocated to the Mount Laura Homestead Museum Reserve in 1978)	16496	23 April 1992
Former Wooden Lock-up from Whyalla Policeman's Dwelling (relocated to the Mount Laura Homestead Museum Reserve in 1978)	16497	24 July 1980

The closest State-listed heritage place is the Point Lowly Lighthouse, located approximately 6 km south-east of the Project area and at a sufficient distance to not be impacted by the proposed works.

There are no Commonwealth Heritage places (heritage places owned or controlled by the Australian Government) in the Whyalla or Upper Spencer Gulf area.

The National Heritage List, maintained under the EPBC Act, includes places of outstanding heritage value to the nation and the Cuttlefish Coast Sanctuary Zone (CCSZ) was inscribed on that list on 24 February 2023. Located approximately 15 km northeast of Whyalla, the CCSZ is within the Upper Spencer Gulf Marine Park (refer Figure 5-6). It extends off the coast, commencing approximately 2.2 km from the proposed alignment at its closest point and well outside the area of potential direct impact. The CCSZ's heritage values are derived from the breeding aggregation of an iconic population of the Giant Australian Cuttlefish (*Sepia apama*), involving tens of thousands of individuals, which occurs there each winter.

5.6.2. Impact assessment

The following activities have been identified as sources of potential impacts to non-Aboriginal heritage values:

- ground disturbance including earthworks and vegetation clearance
- uncontrolled sedimentation from construction activities located inland from the CCSZ.

Ground disturbance

There are no registered heritage sites in the Project area and the WHP will not directly impact any known sites of heritage significance.

Ground disturbance for construction of the pipeline has the potential for impacts on unknown, unrecorded and / or unregistered non-Aboriginal heritage sites, however this is very unlikely given the nature, history and existing disturbance of the proposed alignment. Locating works within existing infrastructure corridors and disturbed areas wherever possible will reduce the risk of impact on any previously unknown heritage sites or places.

Damage to non-Aboriginal heritage is not expected to occur. The level of risk has been assessed as low (see Table 5-24).

Sedimentation and the CCSZ

The project will have no direct impact on the CCSZ and is unlikely to have an indirect impact (e.g. via sedimentation from construction activities) on the CCSZ.

The CCSZ is approximately 2.2 km away from the WHP at its closest point, separated by the sealed Point Lowly Road and numerous other unformed roads and tracks. The WHP will cross one well-defined drainage line that reaches the coast approximately 1.6 km west of the CCSZ (see Plate 5-5).

As stated in Section 5.3.1, the watercourses in this area are usually dry and only flow intermittently and for short periods in response to seasonal rainfall and storm events. These intermittent flows are characterised by high turbidity and high sediment loads.

Trenching and pipeline installation at watercourses would be undertaken in dry conditions, and sediment and erosion controls (such as berms on slopes, hay bales and geotextile fencing) would be in place during construction to control erosion on the construction right-of-way and sediment transport off the right-of-way.

Indirect effects from sedimentation as a result of the Project are not likely to occur in the CCSZ due to the distance of the proposed alignment from the coast and the CCSZ, the buffering provided by Point Lowly Road and unformed roads and tracks, the naturally high sediment loads carried by the ephemeral watercourses in the area, the relatively small width of disturbance on the construction

right-of-way in relation to the length of unvegetated channels downstream of the Project area and the standard sediment and erosion controls that will be in place during construction.

Section 5.2.3 discusses potential control measures for sediment and erosion control, spill prevention and cleanup and the nature of channel flows.

It is noted that in the EPBC referral decision letter, the Commonwealth Minister indicated they considered that, based on the information available in the referral, the Project is likely to have a significant impact on the CCSZ as a result of indirect impacts to natural heritage values. Residual impacts to the heritage values of the CCSZ have been further evaluated in the EPBC Act preliminary documentation. Epic Energy is confident that there will be no significant impact to the CCSZ for the reasons outlined above.

Impact to the heritage values of the CCSZ is not expected to occur. The level of risk has been assessed as low (see Table 5-24).

5.6.3. Mitigation measures

Mitigation measures that will be implemented to minimise potential impacts on non-Aboriginal heritage values are summarised below. These measures will be implemented via the CEMP and OEMP:

- Locate works to align with existing infrastructure corridors and disturbed areas wherever possible to reduce the risk of impacts to heritage values, whether known or unknown.
- Implement sediment and erosion controls outlined in Section 5.2.3.
- Implement management measures for watercourse crossings outlined in Section 5.3.3.

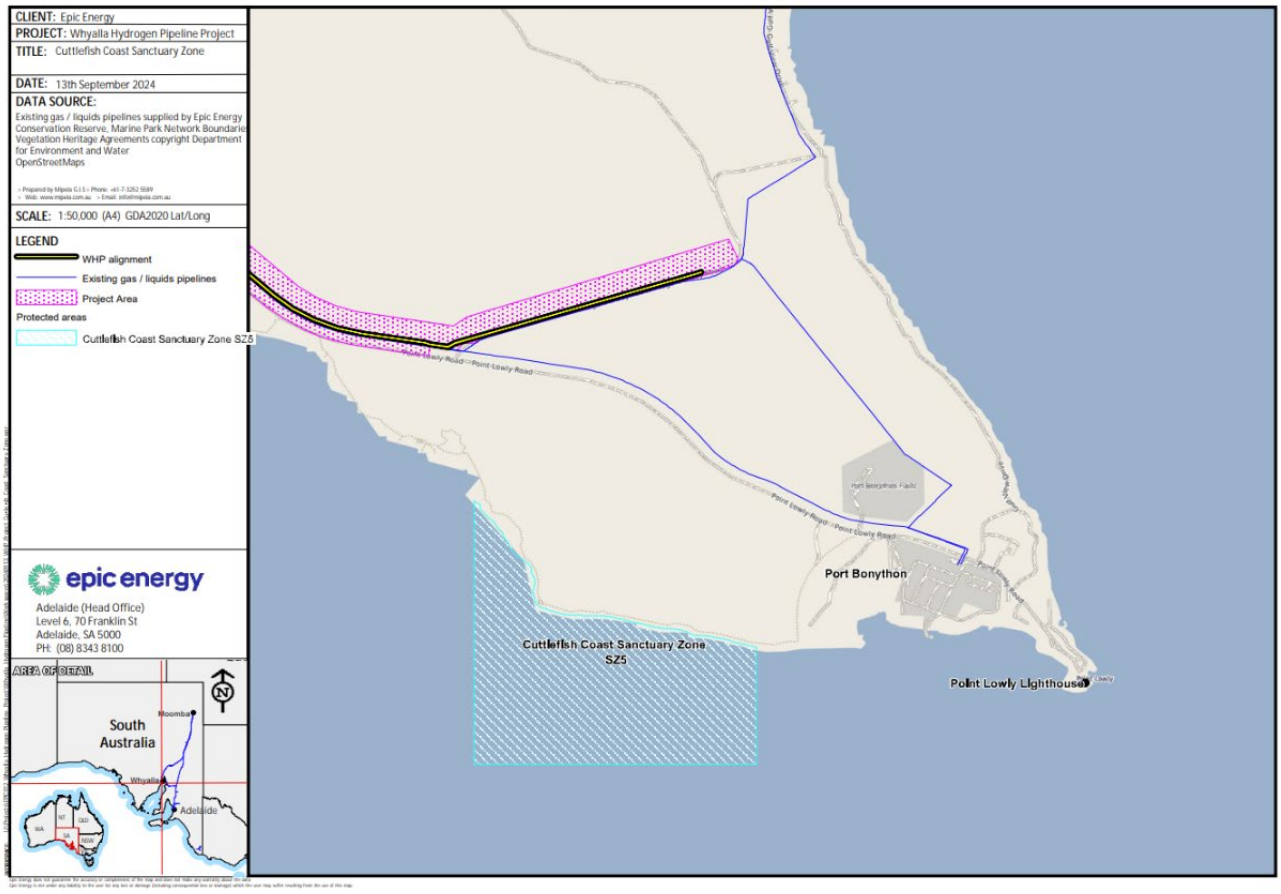

Figure 5-6: Proposed alignment location relative to the CCSZ

5.7. Air Quality

This section describes the potential air quality impacts of the WHP during construction and operation. It is a summary of the findings of the Air Quality Assessment (AQA) prepared by specialists Northstar Air Quality (2024), attached in Appendix E.

5.7.1. Existing environment

Study area

The AQA study area was defined as the land within a 250 m buffer, or 'screening area', surrounding the construction disturbance footprint, as shown in Figure 5-7. The AQA study area does not include the Whyalla Hydrogen Facility, as that forms part of a separate assessment conducted on behalf of OHPSA as part of its development approval.

Baseline air quality

Existing air quality in the Project area is considered generally good and similar to that experienced in South Australia's rural and remote semi-arid areas. Air quality in Whyalla has the potential to be affected from time to time by dust from industrial activities and the movement of bulk materials. Existing pollution sources in the broader area include the Whyalla Steelworks, vehicle emissions and dust generated by various construction activities underway in the region.

Particulate matter (PM_{10}) records from two EPA air quality monitoring stations (AQMS) in Whyalla were reviewed for the period 2019 to 2023[6]. The monitoring stations are located approximately 6.5 km south-west (Schulz Reserve) and south (Walls Street) of the AQA study area, as shown in Figure 5-7.

[6] Neither of the AQMS located proximate to the Project area measure concentrations of $PM_{2.5}$.

Figure 5-7: AQA screening area and baseline air monitoring locations (Source: Northstar, 2024)

Excluding the black summer bushfires and extended period of drought in late 2019 and early 2020, air quality at Schulz Reserve was generally good, with 24-hour average particulate matter concentrations (PM_{10}) rarely exceeding EPA criterion (50 µg/m^3). At Walls Street exceedances occurred 24, 20 and 8 times in 2021, 2022 and 2023 respectively and maximum concentrations were also higher at this site. The more frequent exceedance rate at Walls Street is likely to be the result of its closer proximity to the Whyalla Steelworks (less than 0.5 km), compared with Schulz Reserve (over 5 km).

Figure 5-8 and Figure 5-9 show air quality records from the two AQMS in Whyalla and highlight the higher occurrence of daily PM_{10} exceedance rate at the Walls Street location.

Meteorology

Wind data recorded at Whyalla airport for the period 2019-2023 indicated the prevailing winds were southerly and predominantly of light to moderate speeds (1.5 - 8.0 metres per second). The highest wind speeds (>8 metres per second) occurred 12.1% of the time.

Topography

As discussed in Section 5.2.1, topography around the Project area is relatively flat, with elevations typically ranging between 10 and 70 metres AHD, generally sloping towards the coast. Due to the uncomplicated topography of the area, topographical effects on air quality were not considered in the AQA.

Identification of sensitive receptors

'Sensitive receptors' refer to places where humans may be present for a period representative of the averaging period for the pollutant being assessed. Typically, these locations are identified as residential

properties although other sensitive land uses may include schools, medical centres, places of employment, recreational areas, or ecologically sensitive locations.

There are no residential zones or dwellings located in the AQA study area. The nearest residential dwellings are located in False Bay approximately 350 m from the pipeline and in Whyalla over 5 km from the compressor station and pipeline.

Due to the linear nature of the Project, sensitive receptor 'areas' were identified rather than individual receptor locations, by identifying land use zones within a 250 m screening distance from the construction disturbance footprint and assigning sensitivity values to these land use zones (refer Appendix E).

Air quality standards

The *Environment Protection (Air Quality) Policy 2016* (Air EPP) sets out measures for protection of air quality and defines ambient air quality standards for dominant pollutants. As operation of the Project does not involve fuel burning, and hydrogen is not classed as a pollutant under the Air EPP, it has limited application to the operation of the Project.

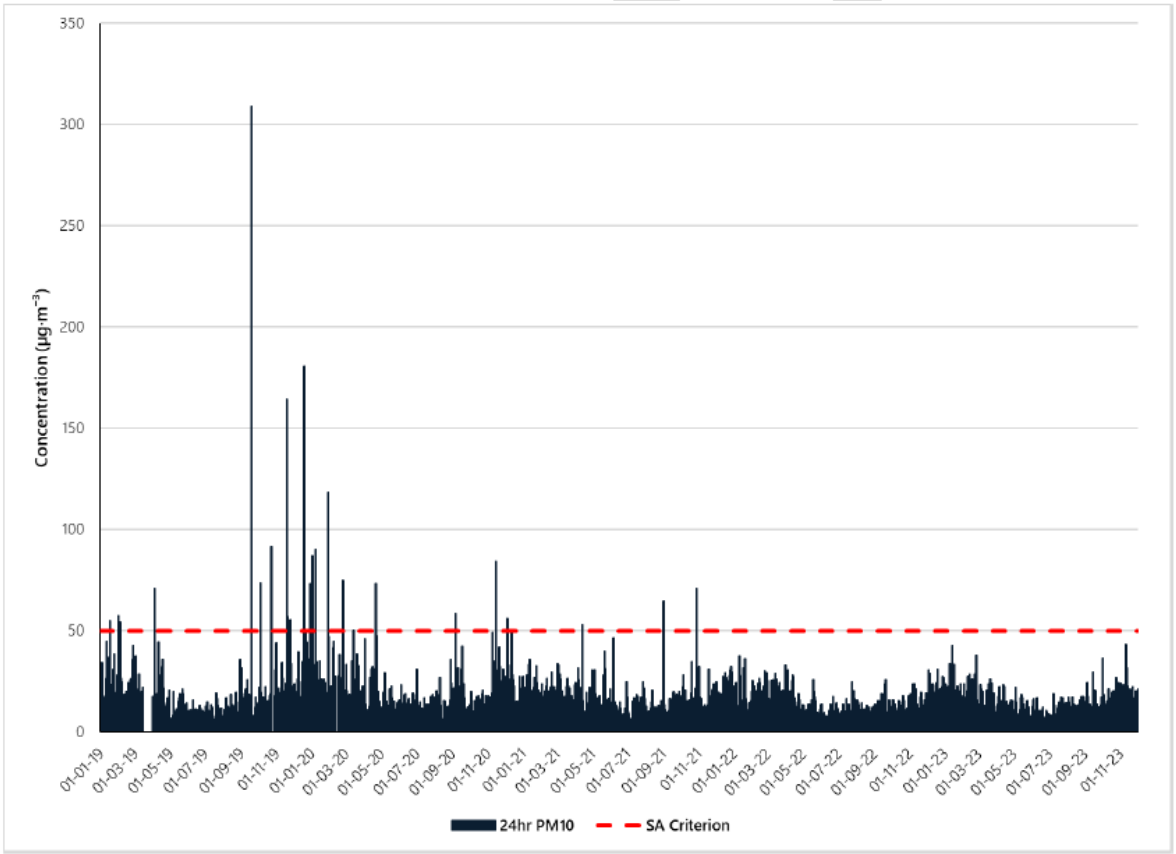

Figure 5-8: Schulz Reserve AQMS: 24-hour PM_{10} concentrations (Source: Northstar, 2024)

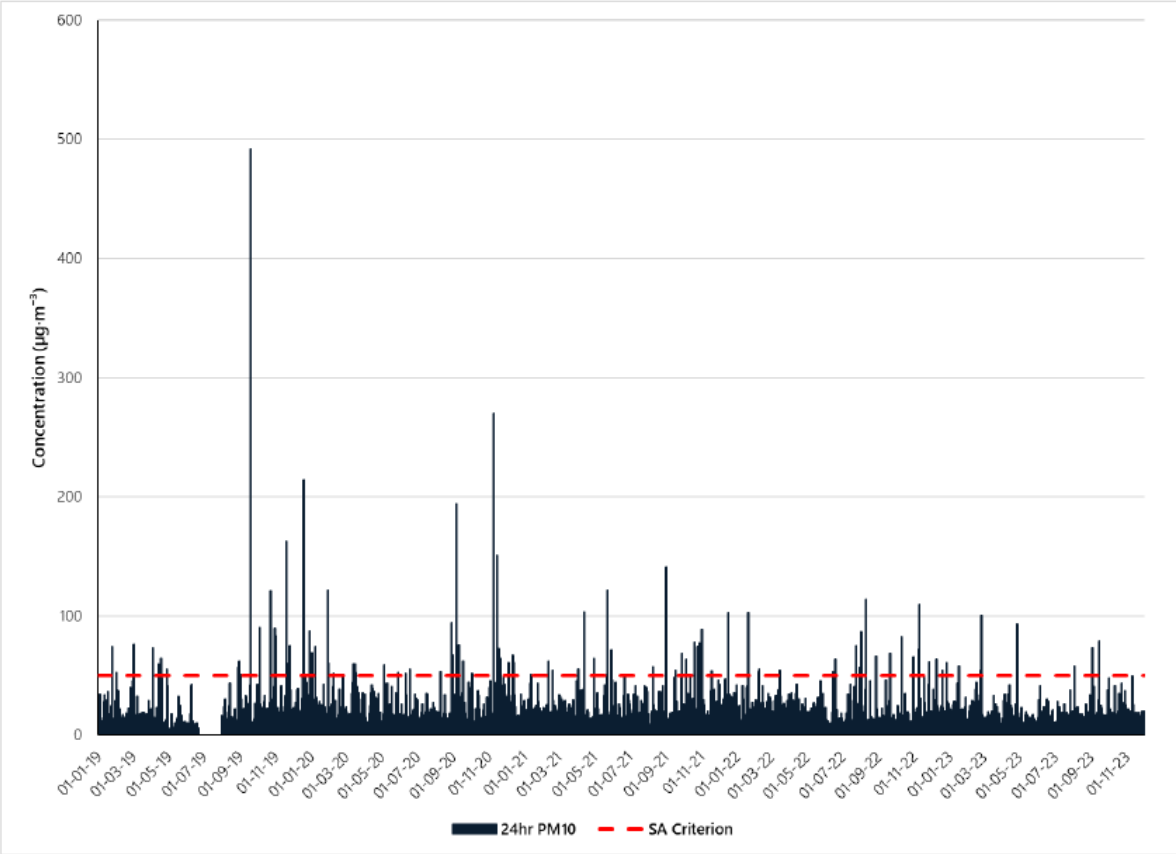

Figure 5-9: Walls Street AQMS: 24-hour PM_{10} concentrations (Source: Northstar, 2024)

5.7.2. Impact assessment

The following activities have been identified as sources of potential impacts to air quality:

- earthworks (including clear-and-grade operations, trenching, backfilling and reinstatement, or excavations ('dig-ups') during operations
- vehicle movements
- vehicle equipment emissions.

The potential impacts to air quality resulting from these aspects of the Project are discussed below.

Hydrogen emissions will also occur during operational venting and maintenance activities. However, as hydrogen is non-toxic and is not classed as a pollutant under the Air EPP, hydrogen emissions have been assessed in the context of public safety and risk (as it is flammable gas) and are addressed in Section 5.13.

Dust generation

Construction earthworks and vehicle movements have the potential to generate dust which can affect the amenity of adjacent land users and ecological receptors via impacts to air quality, dust deposition or visible dust plumes.

Construction activities are expected to generate short-term particulate (dust) emissions especially during trenching and backfilling, and from vehicle movements on unsealed roads. The generally dry conditions of the Project area are likely to increase the potential for dust generation. Potential impacts include dusting of vegetation and other nearby objects, and visual impairment which may affect land use and public safety. These impacts are expected to be temporary and localised, noting that no residential dwellings have been identified in the study area.

The potential for health impacts is considered to be low as the particulate size of construction dust is typically greater than that which can pose a health risk (typically smaller than 10 microns) (refer Appendix E).

Due to the prevailing semi-arid environment and the temporary nature of the construction works as they move along the alignment, no significant impacts to native flora and fauna are expected to occur.

During operations, dust caused by light vehicles or equipment undertaking pipeline inspection and maintenance works will be minor, short-term and localised.

The AQA undertook a risk-based assessment of air quality impacts during construction, based on land use sensitivity along the alignment. The assessment used a methodology developed by the Institute of Air Quality Management (IAQM, 2024).

The AQA found that during construction, the pre-mitigated risk (i.e. with no mitigation measures) for air quality impacts within a 250 m buffer of the proposed disturbance footprint (taking into account land use sensitivity) was largely negligible, with very limited areas of medium risk identified, as shown in Figure 5-10. Given the land use values surrounding the proposed alignments, and with the implementation of appropriate construction practices, impacts to air quality are expected to be localised, short-term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Vehicle emissions

Minor air emissions of nitrous oxides, sulphur oxides and carbon monoxide are associated with the exhausts of machinery and support vehicles and have the potential to result in minor localised impacts to air quality. In the context of the Project, given the area within which it is located and the nature of the sensitive receptor areas, these are expected to have negligible impact. The level of risk has been assessed as low (see Table 5-24).

5.7.3. Mitigation measures

Mitigation measures that will be implemented via the CEMP or OEMP to minimise potential impacts are summarised below.

- Minimise the period between clearing and restoration of the right-of-way.
- Implement a Dust Management Plan (DMP) with specific dust control measures in the CEMP.
- Incorporate engagement with the community prior to commencement of works on site into the stakeholder communications plan for the Project.
- Regularly inspect the site to monitor compliance with the DMP / CEMP.
- Prevent excessive dust generation using water sprays and other sediment suppression and erosion controls.
- Implement sediment controls along the right-of-way.
- Ensure vehicle loads are covered to prevent escape of materials.
- Limit vehicle speeds on access tracks and the right-of-way.
- Regularly inspect and maintain local access tracks and roads.
- Incorporate all highly recommended mitigation measures outlined in Appendix E in the Project CEMP.

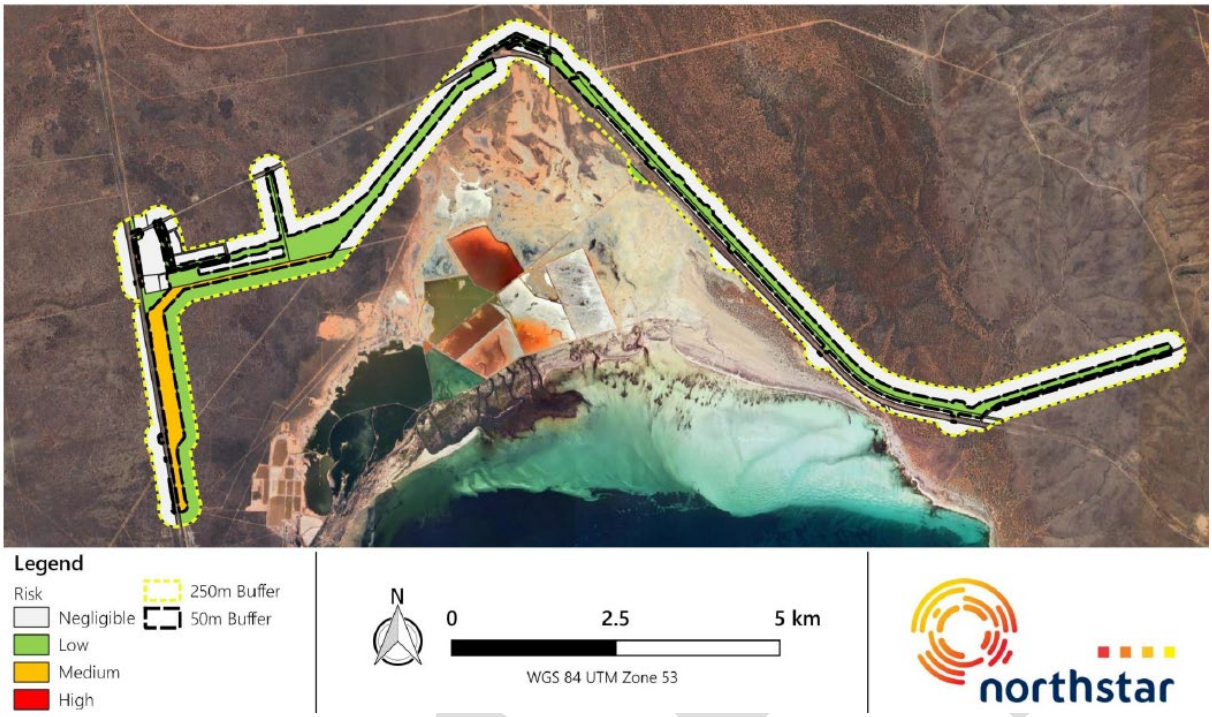

Figure 5-10: Pre-mitigation risk of air quality impacts during WHP construction

5.8. Noise and Vibration

This section describes the potential noise and vibration impacts of the WHP during construction and operation and summarises the findings of the Environmental Noise Assessment prepared by specialists Marshall Day Acoustics (2024), attached at Appendix F.

5.8.1. Existing environment

The existing noise environment of the broader Project area is predominantly influenced by traffic and existing industrial activities, as well as natural sources such as the wind and ocean (Spencer Gulf).

Sensitive receptors

In this section, the terms 'sensitive receptor' or ‘sensitive receiver’ refers to residential properties and other places where people spend extended periods of time (such as schools, medical centres, workplaces and recreational areas), or an ecologically sensitive location.

No sensitive receptors were identified in the Project area. A total of 32 receptors were identified surrounding the Project area, including residential, commercial, industrial and infrastructure. The closest residential receptors to the operational noise source (being the compressor station) are in Whyalla, more than 5 km to the southwest. Other receptors such as outdoor recreation places are located 5 km – 8 km from the compressor station.

Table 5-11 lists the receptors that were used in the assessment[7]. Residential receptors at False Bay are approximately 1,270 m (R06) and 350 m (R07) from the alignment and more than 12,400 m and 11,500 m respectively from the compressor station.

[7] A select number of the 32 sensitive receptors were chosen in the Environmental Noise Assessment for the purpose of assessing compliance with the relevant environmental noise requirements, as those nearest the Compressor and valve station that are used either for residential or business purposes or constitute a public recreation area.

Table 5-11: Potential receptors and their distance to the compressor station

No.	Receptor Ref:	Area:	Sensitivity / Type	Distance to Compressor Station (m)
1	R01	Whyalla	Residential	5,800
2	R02	Whyalla	Residential	5,500
3	R03	Whyalla	Residential	5,580
4	R04	Whyalla	Residential	5,750
5	R05	Whyalla	Residential	6,690
6	R06	False Bay	Residential	12,400
7	R07	False Bay	Residential	11,530
8	R11	Whyalla	Outdoor recreation	4,980
9	R12	Whyalla	Outdoor recreation	6,390
10	R13	Whyalla	Outdoor recreation	6,110
11	R15	Whyalla	Outdoor recreation	7,790

Figure 5-11: Nearest sensitive receptors

Baseline noise

Noise monitoring was conducted in Whyalla and False Bay in February and March 2024. Noise logger locations (M1 and M2) and the potential receptors are shown in Figure 5-12. The baseline noise monitoring results are provided in Table 5-12.

Table 5-12: Background and ambient noise[8] recorded at Whyalla and False Bay (Feb/March 2024)

Location	Time[1]	Background noise level[2] (Average, dB L_{A90})	Ambient noise level[3] (Average, dB L_{Aeq})
M1 (Whyalla)	day	41	54
	night	39	51
M2 (False Bay)	day	39	47
	night	43	47

[1] Day hours: 0700-2200; night hours: 2200-0700

[2] Background noise level: The minimum repeatable level of noise measured in the absence of the noise under investigation and short-term noises such as those caused by traffic, industry, lawnmowers, wind in foliage, insects and animals. It is quantified by the noise level that is exceeded for 90 % of the measurement period.

[3] Ambient noise level: Overall environmental noise level caused by all noise sources in the area, including traffic, industry, lawnmowers, wind in foliage, insects and animals. Assessed as an energy average over a set time period.

Figure 5-12: Baseline noise logger locations

[8] *Background noise* – refers to the environmental noise levels excluding short term intrusive noises (such as traffic, industry, lawn mowers, wind, etc.). *Ambient noise* refers to environmental noise levels caused by all noise sources, near and far, including traffic, industry, lawn mowers, wind, etc.

Noise and vibration limits

Construction phase

As the Project would be classed as 'public infrastructure', construction noise from the Project falls outside of the *Environment Protection (Commercial and Industrial Noise) Policy 2023* (the Noise EPP), however the general environmental duty under the Environment Protection Act is relevant.

The *Local Nuisance and Litter Control Act 2016* (LNLC Act) would generally apply to public infrastructure, with the exception of emergency works or works scheduled to avoid or reduce inconvenience or disruption to traffic or pedestrians. However, as the Project would be carried out under authorisations pursuant to the ER Act (i.e. the Pipeline Licence and the SEO) which impose requirements to minimise noise, the WHP would also be exempt from the LNLC Act[9].

Consequently, noise impacts from construction would need to comply with the general environmental duty provisions of the EP Act. To meet this duty, EPA guideline 425/23 *Construction noise* indicates that the Department for Infrastructure and Transport (DIT) *Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities* should be referenced for construction noise in relation to public infrastructure.

Under the EPA and DIT construction noise guidelines, construction noise that causes an adverse impact on amenity[10] should, where possible, be restricted to 7.00 am to 7.00 pm, Monday to Saturday. Outside these hours, the protocols outlined in the DIT guideline should be followed, which include further assessment, consultation and minimisation / mitigation.

Operation phase

Operational noise / vibration limits are defined by the Noise EPP, which provides a methodology and objective noise criteria for noise impact assessments. The daytime and nighttime indicative noise factors in Table 5-13 were derived in accordance with the Noise EPP.

Table 5-13: Indicative noise factors (dB)

Receptor	Land Zone	Land Use Category (EPP)	Day	Night
WHP (compressor & valve station)	Strategic Employment	General Industry	65	55
R01-R05	General Neighbourhood	Residential	52	45
R06- R07	Rural Shack Settlement Zone	Residential	52	45
R11, R12, R13, R15	Open Space	Rural Living in non-urban areas	47	40

Noise limits were calculated for each receptor according to the Noise EPP (Table 5-14). These are the maximum acceptable noise levels that can occur at each receptor location during operation of the WHP. For example, during the night time, noise levels must not exceed 35 dB (continuous for 15 minutes) at receptors R12, R13 and R15, and must not exceed 40 dB at all other receptors.

[9] Under Schedule 1, clause 5(d).

[10] For construction activities EPA guideline 425/23 defines an adverse impact on amenity as an average noise of 45dB(A) or any singular noise event with a maximum noise level of 60dB(A) at a noise receiver (such as a domestic premise).

Table 5-14: Noise limits for nearest sensitive receptors (dBAeq,15 min)

Receptor	Type	Land Zone	Day	Night
R01 – R05	Residential	General Neighbourhood	47	40
R06 – R07	Residential	Rural Shack Settlement Zone	47	40
R11	Outdoor recreation	Open Space	47	40
R12, R13, R15	Outdoor recreation	Open Space	42	35

5.8.2. Impact assessment

Construction noise

During the construction period, earthmoving machinery, vehicle movements and building works will be the key noise sources.

During construction of the pipeline, noise emissions will be concentrated at the work front. Earthmoving equipment, vehicles delivering pipeline and fill material, cranes and other machinery will be the main noise generating sources. Similarly, during construction of the compression facility and valve station, earthmoving equipment, vehicles and other building works will be the main noise sources.

Pipeline construction is not expected to adversely affect amenity at any sensitive receptors as they are generally distant from the proposed alignment. One residence at False Bay is approximately 350 m from the alignment (on the opposite side of Point Lowly Road) and the next closest residence is 1.27 km from the alignment. In addition, as the construction work front is mobile, noise generation at any particular location would be short term. Good work practices and targeted mitigation measures to reduce the impacts of construction noise and vibration will be implemented, including those measures that will be incorporated in the Project CEMP summarised in Section 5.8.3.

Impacts from construction noise would be localised, short-term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Operation noise

Key noise sources

Operational noise sources for the WHP are located at the Whyalla Hydrogen Facility site. There are no significant noise emissions associated with the valve station.

The WHP equipment inventory was used to identify the key noise emitting sources and their sound power levels, for use in the noise modelling. The key noise emitting sources are the three hydrogen compressor packages (and associated coolers and recycle values) at the compressor station, located at the Whyalla Hydrogen Facility.

The per unit sound power levels of key noise sources used in the noise modelling are provided in Table 5-15.

Table 5-15: Sound power levels per unit

Noise source	Octave Band Centre Frequency (Hz), dB							Overall dB L_{wA}
Compressor Station	**63**	**125**	**250**	**500**	**1000**	**2000**	**4000**	
Compressor cylinder & discharge bottle	120	121	130	121	117	113	112	125
Compressor motor	81	82	84	84	87	84	80	91
Cooler package	85	88	86	83	82	80	77	87
Recycle valve	97	97	97	102	107	112	117	121
Flare	124	115	115	114	116	122	131	133

Assumptions and limitations applied to the noise modelling included:

- Compressors operational for maximum 12 hours per day (50% duty).
- All compressors, coolers and pressure regulators will operate concurrently.
- Operations will consist of two windows per day – one for filling and one for emptying the pipeline.
- Noise emitted from vents, the instrument air package, and recycle valves will be intermittent / infrequent.
- Flaring events will be intermittent, infrequent and of less than 15 minutes duration.

Noise modelling results

Noise levels were calculated for four operational scenarios (Table 5-16), based on a 15 minute period that would generate the highest noise levels at the receptor locations. Scenario 2 (Base case with flaring) represents worst case noise emissions for the proposed Project – comprising three air compressors (and associated plant / equipment). Scenario 4 (Expansion with flaring) represents worst case noise emissions for a potential future scenario, in which a fourth air compressor (and associated plant / equipment) is added to the proposed Project.

Table 5-16: Operational noise modelling scenarios

Scenario	Description	Noise sources
1	Base case	3 x air compressors/cooler packages
2	Base case with flaring	As per scenario 1 PLUS flaring
3	Expansion	4 x air compressors/cooler packages
4	Expansion with flaring	As per scenario 3PLUS flaring

The noise levels calculated for each scenario are summarised in Table 5-17. Noise contours predicted from the highest impact scenario (Scenario 4) are illustrated in Figure 5-13. These indicated that Noise EPP compliance will be achieved at all receptor locations under all four scenarios.

Table 5-17: Predicted WHP operational noise levels at nearest sensitive receptors

Receptor	Scenario 1	Scenario 2	Scenario 3	Scenario 4	EPP noise limit (night)
R01	32	33	34	34	≤40
R02	33	33	34	35	≤40
R03	33	33	34	34	≤40
R04	33	33	34	34	≤40
R05	30	30	31	32	≤40
R06	20	20	21	21	≤40
R07	21	22	22	23	≤40
R11	35	35	36	36	≤40
R12	31	31	32	32	≤35
R13	32	32	33	33	≤35
R15	28	28	29	29	≤35

These results are conservative as they were based on all equipment operating continuously and concurrently, although compressors are expected to operate for a maximum of 12 hours per day and flaring is expected to be intermittent and short term.

Cumulative impacts

As the compressor station would be operating at the same time as the electrolysers and power station at the Whyalla Hydrogen Facility, the predicted cumulative noise levels for the WHP and HJP (based on AECOM 2024) have also been assessed. These are provided in Table 5-18. Scenario 4 was used in the cumulative noise modelling to determine a combined 'worst case' noise impact.

Table 5-18: Predicted cumulative noise levels for WHP and HJP at nearest sensitive receptors

Receptor	WHP (Scenario 4)	HJP (AECOM, 2024)	Combined WHP & WHP	EPP noise limit (night)
R01	34	31	36	≤40
R02	35	31	36	≤40
R03	34	32	36	≤40
R04	34	32	36	≤40
R05	32	33	36	≤40
R06	21	18	23	≤40
R07	23	19	24	≤40
R11	36	33	38	≤40
R12	32	31	35	≤35
R13	33	31	35	≤35
R15	29	27	31	≤35

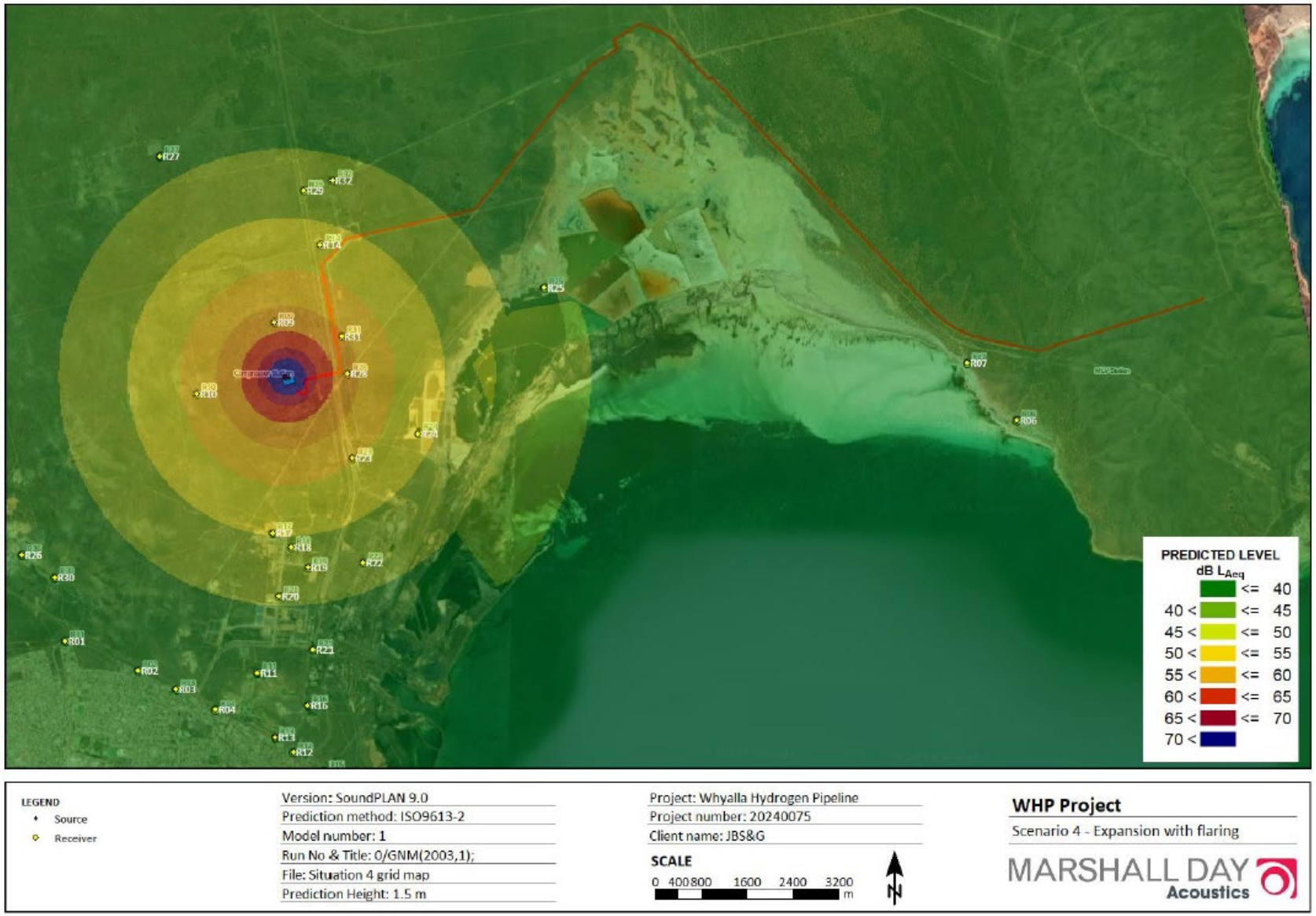

Figure 5-13: Predicted noise contours for Scenario 4: Expansion with flaring

The predicted cumulative operational noise levels at all receptor locations are below Noise EPP limits. As such, the concurrent operation of the WHP and HJP is predicted to comply with the relevant environmental noise requirements.

It should be noted that these results are highly conservative, as they assume the WHP compression plant / machinery is additional to the HJP compression plant / machinery (where in reality, it is likely to replace some or all of the HJP compression) and also assumes flaring is continuous (whereas flaring will be intermittent, infrequent and of less than 15 minutes duration).

Summary

Noise emissions from the WHP operations (without mitigation):

- Will be negligible at the valve station.
- Will be generated at the compressor facility (located the Whyalla Hydrogen Facility).
- Are predicted to be below Noise EPP limits at sensitive receptor locations during the day and night.
- Combined with noise generated by the HJP operations (cumulative noise), are predicted to meet Noise EPP limits at sensitive receptor locations during the day and night.

The level of risk has been assessed as low (see Table 5-24).

5.8.3. Mitigation measures

Construction

Best practice construction techniques and mitigation measures will be implemented to ensure nuisance noise impacts on the community and the environment are avoided or minimised. Mitigation measures will be developed in line with the DIT Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities and incorporated into the CEMP which may include:

- Scheduling construction activities that could have an adverse impact on amenity between 7.00 am to 7.00 pm, Monday to Saturday, as far as practicable.
- If unavoidable out of hours work is required during construction:
  - Undertaking consultation with any affected residents and the local Council
  - Undertaking assessment, management, mitigation and consultation consistent with the DIT Guideline.
- Ensuring that vehicles and equipment conform to appropriate noise control standards.
- Outlining all administrative and engineering controls for the management of noise at the site during construction in the Project CEMP.

Operation

- Undertake noise modelling during detailed design to confirm that noise levels will meet Noise EPP criteria.

5.9. Land Use and Third Party Infrastructure

As described in Section 3, the proposed WHP spans a linear alignment from approximately 4 km north of Whyalla then east to a point approximately 4.5 km north-west of Port Bonython, a distance of approximately 22.5 km. Epic Energy intend to establish an easement or other appropriate tenure over Crown land (e.g. licences) along the alignment, in negotiation with landowners.

A desktop assessment of landowners, land occupiers, land use, easements, encumbrances and other interests affecting land parcels with which the proposed pipeline alignment would interact has been conducted and are discussed in the following sections.

5.9.1. Existing environment

Epic Energy contracted Jones Lang Lasalle Infrastructure Advisory (JLL) to undertake a Landowner, Occupier and Interests Desktop Assessment (Land Report) for the Project which was completed in April 2024 (JLL, 2024).

Land tenure, ownership and use

The Land Report identified that the proposed alignment would traverse land with a mix of tenure types, including freehold and Crown Record, with ownership held by private entities in addition to the Australian Rail Track Corporation (ARTC), OneSteel Manufacturing and State government Ministers. Refer Table 5-19 for a complete list of details, including the existence of infrastructure easements.

Existing land uses within the Project area include three sealed roads, a rail line and predominantly large areas of undeveloped land with many unsealed tracks used by motorbikes and recreational vehicles. Existing uses in adjacent land include water and petroleum transmission pipelines.

Major industries in the broader region include iron ore mining, the Whyalla Steelworks, the Spencer Gulf Saltworks, Port Bonython gas fractionation plant and hydrocarbon import/export facility and water and gas pipelines (refer Figure 5-14). Renewable energy, particularly solar and hydrogen development, is a current focus for the region and there are two proposed solar farms (Cultana Solar Farm and Yoorndoo Ilga Solar project) adjacent to the proposed alignment. There are several electricity transmission lines in the vicinity of the Project area and proposed additional electricity transmission lines and a substation associated with the Hydrogen Jobs Plan. There is no significant agricultural activity in the locality. The proposed Whyalla Hydrogen Facility and associated infrastructure will be located at the western end of the Project area.

Conservation and tourism land uses are present in the broader locality including the Whyalla Conservation Park, although the WHP will not affect any land used for these activities.

Most of the coastline and marine environment south of the Project area is within the Upper Spencer Gulf Marine Park, which extends approximately 80 km from the northern extent of the gulf, near Port Augusta, to south of Whyalla. Wetlands of national importance exist to the south of central sections of the proposed pipeline alignment within False Bay, as discussed in Section 5.3. The proposed pipeline alignment avoids the Marine Park and the wetlands.

Table 5-19 provides a summary of land tenure, ownership and use on the proposed alignment.

Table 5-19: Land tenure, ownership and use

Land title and tenure	Description	Land Ownership	Land Use (SAPPA)/ Land Use (Details)	Easements
CT6144/358	Allotment 1000 in DP 79748 – in the area named Whyalla Barson, Hundreds of Cultana and Randell	The Corporation of the City of Whyalla	Site for the Whyalla Hydrogen Facility	Easements for power and telecommunications
CT 6118/597 Freehold	Allotment 61 in Deposited Plan 52447	Australian Rail Track Corporation Ltd	Utilities / Industry (railway infrastructure)	Easements for power
CT 6105/303 Freehold	Allotment 1 in Deposited Plan 90705	OneSteel Manufacturing Pty Ltd	Utilities / Industry (location of proposed Cultana Solar Farm (partial))	Easements for power
CR 5346/949 Crown Record	Allotments comprising pieces 6, 7, 8, 9, 10 and 11 in Deposited Plan 42001. Piece 6 is the land that will be traversed by the corridor.	Minister for Environment and Water* *Note this land is in the process of being transferred in freehold to a third party.	Vacant Urban Land Proposed alignment traverses AL6.	Subject to an annual licence to Cultana Solar Project Company Pty Ltd for an unregistered right-of-way/access
CR 6253/2 Crown Record	Allotment 5 in Deposited Plan 125055	Minister for Environment and Water *Note this land is in the process of being transferred in freehold to a third party.	Vacant Urban Land	Easement for power
Public Road Reserve	Not applicable	Under control of the Corporation of the City of Whyalla	Road Reserve	Nil
CR 5997/848 Crown Record	Sections 241 and 245, Hundred of Cultana in the area named Cultana	Minister for Environment and Water	Recreation / Reserves Adjacent / Parallel to Point Lowly Road	Easement for gas pipeline and power
CT 6303/143 Freehold	Minister for Energy and Mining	Allotment 202, DP133671 in the area named Cultana	Vacant Rural Land	Nil
CT 6298/549 Freehold	Minister for Energy and Mining	Allotment 201, DP 133671 in the area named Cultana	Vacant Rural Land	Nil

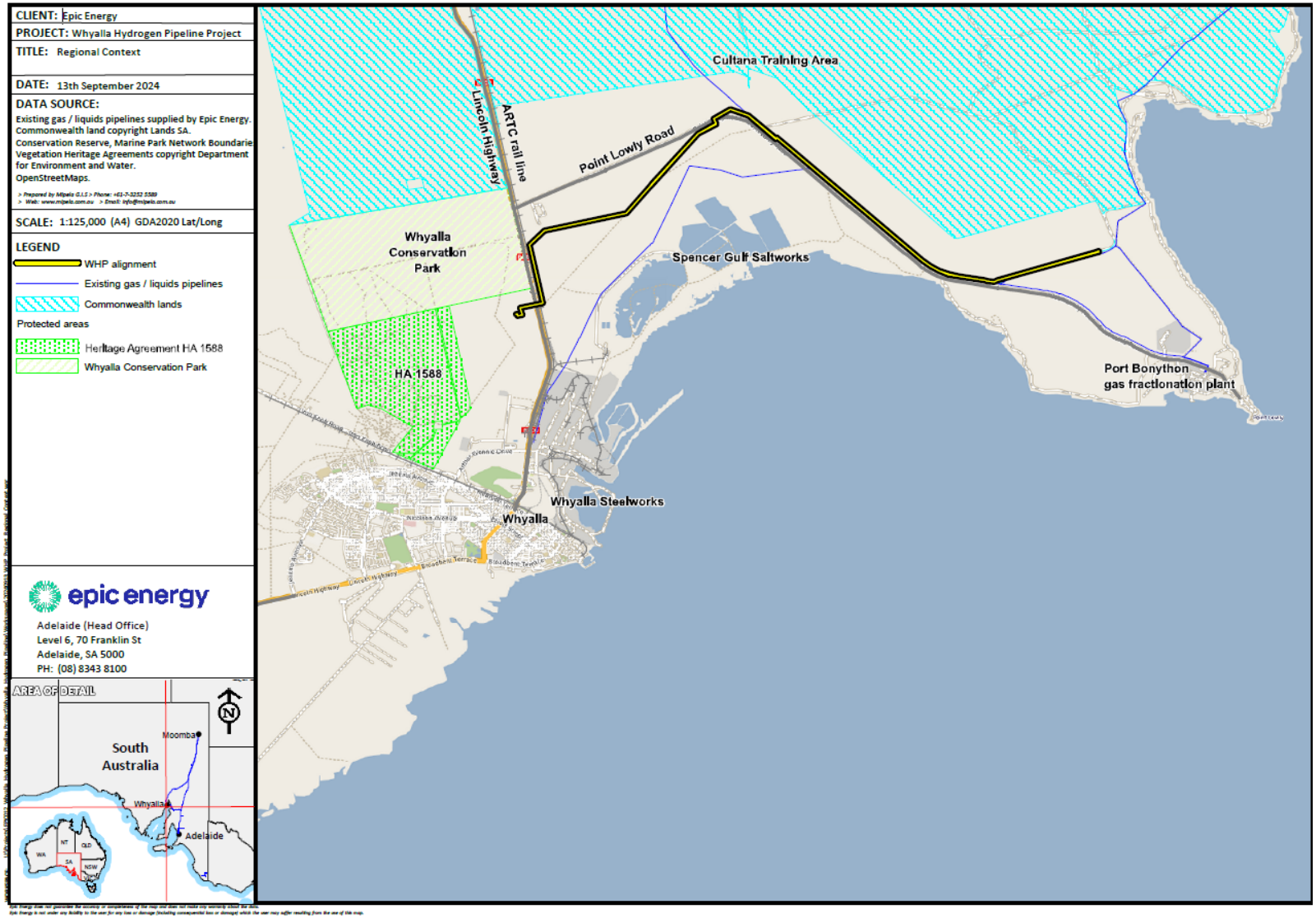

Figure 5-14: Regional land uses

Third party infrastructure

Existing third party infrastructure in the locality of the proposed pipeline alignment typically relates to industrial or utility land uses and includes (existing or proposed):

- pipelines both above ground and buried carrying water, gas and liquid hydrocarbons
- electricity transmission lines
- roads and rail infrastructure
- proposed infrastructure assets associated with the Hydrogen Jobs Plan (in addition to the WHP)
- bulk iron and steel production at the Whyalla Steelworks
- bulk handling, import and export facilities associated with the Whyalla Steelworks
- Spencer Gulf Saltworks and Beta-Carotene production facilities
- Port Bonython gas fractionation plant and hydrocarbon import / export facilities
- renewable energy production including solar farms both established, under construction or proposed.

Third party infrastructure which has the potential to be directly affected by the WHP is limited to roads, rail infrastructure, and other linear infrastructure necessitating co-location or crossing (including electricity transmission lines, gas, hydrocarbon and water pipelines).

5.9.2. Impact assessment

Construction

Pipeline construction has the potential to temporarily disrupt land use activities as a result of the disturbance of land on the construction right-of-way, and the presence of increased vehicle and machinery movements, construction laydown and infrastructure crossings. In particular, the following construction activities have the potential to affect land use activities within the Project area:

- construction access
- vegetation clearance and earthworks including trenching, pipeline installation, backfill and rehabilitation
- materials transport and storage
- storage and handling of small quantities of fuels and chemicals.

The potential impacts on land use as a result of pipeline construction activity include:

- temporary impedance/loss of land access during construction period
- interaction with existing infrastructure (including crossings).

Pipeline construction methodology and practice and its potential impacts to land use and infrastructure are generally well understood. Impacts are routinely demonstrated to be able to be managed to avoid the potential for significant impact. Aside from the construction of above-ground infrastructure such as the compressor station and valving equipment, impacts from pipeline construction are generally temporary in nature and cease once the construction phase is completed and the construction right-of-way has been rehabilitated.

The potential exists for UXO to be present in areas of land formerly utilised by the Department of Defence, in the east of the Project area. Signage is present adjacent to Point Lowly Road on both the northern and southern sides of the road reserve. The proposed pipeline alignment would not interact

with Defence land and therefore the risk of encountering UXO is considered to be relatively low. The existence of substantial existing linear infrastructure indicates the ability of this risk to be adequately mitigated through appropriate due diligence prior to the commencement of invasive groundwork. Epic Energy will take appropriate steps to ensure safe operating conditions prior to the commencement of invasive groundworks in any area which may be impacted.

Impacts on land use during construction are expected to be localised, short-term and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Operation

The operation of the WHP will generally not impact existing or proposed land use, as the pipeline will be buried and the construction right-of-way rehabilitated to as near as practicable to the pre-construction state. Existing buried pipeline infrastructure in the locality indicates successful rehabilitation and that the native vegetation has capacity to naturally regenerate and re-recruit across disturbed areas.

Existing land use activities will not be restricted over the pipeline, except for activities which have the potential to cause harm to the pipeline or the public (e.g. invasive groundworks, water bore installation, blasting, fence post installation, deep soil ripping). Future development over the pipeline which involves the construction of buildings would generally not be allowed.

Operational impacts to land use are very limited. The level of risk has been assessed as low (see Table 5-24).

5.9.3. Mitigation measures

The final pipeline route and construction methods for key areas such as infrastructure crossing points will be selected and refined in consultation with landowners and stakeholders.

To mitigate potential impacts to land use during the construction and operation of the WHP, the following measures will be implemented:

- Enter into formal easement agreements or other appropriate tenure arrangements outlining the legal responsibilities of both Epic Energy and the respective landowners.
- Work closely with landowners and managers to minimise conflict with existing and proposed land use activities in proximity to the proposed pipeline alignment
- Ongoing engagement with landowners through construction and operation
- Rehabilitate the construction right-of-way to as near as practicable to the pre-construction state.
- Undertake appropriate pre-construction ground surveys to ensure no UXO is present in proximity to work areas that may have been formerly utilised by the Department of Defence.
- Increase the depth of cover and install protection slabs at crossings of third-party infrastructure to reduce the risk of interference from the operations and maintenance of these third party assets.

Appropriate compensation for landowners impacted by the WHP will be agreed between Epic Energy and the respective landowners.

5.10. Traffic

A Traffic Impact Assessment (TIA) has been conducted for the WHP by specialists ESR Transport Planning (ESR Transport Planning, 2024; Appendix G), which considers the predicted traffic movements and anticipated vehicle types and volumes required to utilise the transport network in the locality of the WHP. This section summarises the results of the TIA.

5.10.1. Existing environment

The existing transport network carries traffic associated with a range of activities including industrial, agricultural, tourism and residential / commuter traffic. Several projects are proposed in the locality in addition to the WHP and associated development, which may present impacts to the transport network during their respective construction stages.

Lincoln Highway and Point Lowly Road, the two State maintained roads which are the principal focus of the TIA, are both approved B-double and oversize / overmass (OSM) vehicle routes, with the Lincoln Highway approved for a greater number of OSM types. Both roads provide sealed single carriageways with two-way traffic and speed limits of 110 km/h in the vicinity of the proposed pipeline alignment. Annual average daily traffic volumes on Lincoln Highway and Point Lowly Road in the vicinity of the Project area are 2,200 vehicles per day (vpd) and 400 vpd respectively.

The WHP requires that pipeline and plant equipment and componentry, construction equipment and construction materials be delivered to a construction materials laydown area and then transferred in stages to relevant sectors of the construction right-of-way to facilitate stringing, installation and commissioning of the proposed pipeline. Construction personnel will access the construction right-of-way during the construction and commissioning phase, representing a temporary increase in the overall traffic movements on the surrounding road networks accessing the relevant areas. Additionally, construction of the compressor station at the western extent of the proposed pipeline alignment will require access via the Lincoln Highway for the duration of the construction period.

Guidelines for road capacity specify that a two-lane road such as the Lincoln Highway and Point Lowly Road may accommodate in the order of 15,000 – 20,000 vpd without experiencing significant peak period delays. However, in the absence of flaring at intersections or intersection design which accounts for high traffic volumes, it is typically intersections which represent lower capacity constraints in road networks.

5.10.2. Impact assessment

Potential impacts on the transport network resulting from the WHP include:

- disruption to the efficient operation of roads as a result of high volumes of construction traffic, including OSM loads for plant and equipment deliveries
- impacts to intersection safety at Lincoln Highway / Point Lowly Road resulting from increased traffic volumes during materials delivery and construction
- impact to safe and efficient road operation as a result of construction vehicle and equipment access points to the construction right-of-way and laydown areas from Lincoln Highway and Point Lowly Road.

Operational traffic activity would be very low and could be absorbed onto the local road network without any material impact to safety or efficient operating conditions.

Road capacity

During construction it is estimated that approximately 2,500 steel pipe sections will be delivered to a predetermined laydown area and stored prior to being deployed along the construction right-of-way to the relevant section for preparation, stringing and installation. Most structural and plant components for the WHP are expected to be manufactured overseas and imported by sea to the Port of Adelaide, prior to being transported to the Project area by heavy vehicle along the A1 haulage route from the Outer Harbor Container Terminal to the Whyalla region. A small number of OSM loads are expected to be required for compressor station equipment deliveries.

The TIA anticipates that peak daily traffic movements associated with the construction phase of the WHP would be below 1,000 vpd. The roads modelled accommodate very low traffic volumes when compared to their designed capacity and are authorised to carry all anticipated vehicle types associated with WHP construction. The TIA considers that there will be ample spare capacity within these roads to absorb construction traffic, without undue risk of significant impact to efficient operating conditions.

Impacts are anticipated to be relatively minor and readily manageable. The level of risk has been assessed as low (see Table 5-24).

Site access

Road upgrades are proposed to be undertaken for the HJP at the entrance to the Whyalla Hydrogen Facility, including turning lanes at the site entry for vehicles travelling from both the north and south. These upgrades would enable safe access to this site for the WHP.

The TIA indicates that most potential access locations on Lincoln Highway and Point Lowly Road have good sight lines. Three locations have been identified on Point Lowly Road where sight distance may fall short of design guideline specified minimums. If access tracks in these locations are used to access the construction right-of-way, mitigations such as speed reductions would be implemented.

A traffic management plan would be developed, which would detail controls and management measures, including measures designed to ensure the safety of the public and workers during the construction phase of the Project.

Impacts are anticipated to be limited and readily manageable through standard procedures and protocols, including the implementation of a traffic management plan (TMP). The level of risk has been assessed as medium, as a result of the potential high consequence of a traffic accident (see Table 5-24).

5.10.3. Mitigation measures

The control and management of traffic impacts is anticipated to be undertaken through the implementation of a TMP in conjunction with the separate TMP being prepared for the Whyalla Hydrogen Facility. Anticipated management strategies to mitigate the potential for impacts on the road network include:

- Installation / implementation of appropriate temporary traffic management measures (e.g. trucks entering signage, other signage, construction zone speed limits, etc.) at key locations where significant volumes of construction traffic will be entering and exiting.
- Implementation of temporary construction zone speed limits at key locations, such as where entering and exiting volumes are significant.
- Ensure permits, the TMP, pilot vehicles, and other protocols for OSM activity in accordance with regulations are in place.

- The use of barriers, traffic control devices, and traffic controllers where construction activity is alongside road carriageways, such as at WHP road crossings, to enable general traffic to be stopped as necessary for safe work practices. Other similar items where necessary to give priority to entering and exiting construction traffic.
- Ensure any vegetation close to roadway carriageways near access intersections is trimmed if necessary to afford vehicles giving way an unobstructed sight line to through traffic in accordance with design minimum standards.
- In conjunction with OHPSA and in consultation with local council, upgrade critical road pavements / surfaces to ensure the increased construction traffic activity does not lead to significant deterioration that would become hazardous.
- Formation or upgrades of access tracks to / from the works area
- where access tracks intersect with arterial roadways, ensure a formed carriageway width accommodates simultaneous traffic in both directions with return radii that accommodate long vehicle swept paths.
- Implement a range of measures to ensure safe operation of vehicles along access tracks (e.g. staff induction / training, maximum operating speeds, speed zone signage, communication protocols).
- Ensure dust suppression activities and mud from works areas or access tracks is not deposited onto sealed roadways.

5.11. Visual amenity

5.11.1. Existing environment

The broader visual environment of the proposed WHP alignment is generally characterised by a landscape of low topographical relief which is vegetated by low arid zone shrubland and woodland and largely uninterrupted by large structures or landforms. The prominent structures associated with the industrial areas of Whyalla and the Whyalla Steelworks are located well to the south of the WHP alignment and are not obvious elements in the landscape of the Project area. Other visible infrastructure elements are generally of a low profile and linear nature including roads, rail lines and pipelines.

From Point Lowly Road, there are extensive areas of salt marsh to the south of the pipeline alignment which contribute to the generally unimpeded views to Spencer Gulf. An electricity transmission line runs the length of this section of the pipeline alignment. At the eastern end of Point Lowly Road, the Santos Port Bonython export facility is the dominant landscape feature.

The Whyalla Hydrogen Facility would be an industrial development located adjacent to the Lincoln Highway at the commencement of the WHP alignment. Approved development in the vicinity of the Project which will contribute to future changes to the visual environment include the Cultana and Yoorndoo Ilga solar projects, and associated transmission lines.

5.11.2. Impact assessment

The visual amenity impacts of construction and operation of the WHP on the existing and future landscape of the Project area will be localised, temporary and short-term.

Despite the flat landscape and absence of significant features, the proposed pipeline alignment is considered to have low visual sensitivity due to the presence of existing linear infrastructure, the buried nature of the pipeline and the absence of elevated vantage points where the permanent aboveground pipeline infrastructure elements would be visible.

Visual amenity impacts of buried pipelines are generally associated with the short-term disturbance associated with construction earthworks, removal of vegetation, the presence of construction vehicles, equipment and stockpiles and the permanent presence of aboveground facilities.

The disturbed appearance of the easement after construction and prior to vegetation regrowth would create local short-term reduction in visual amenity in areas visible to the public, such as travellers along Potin Lowly Road. These impacts are temporary and considered to be minor.

Following backfill and easement restoration, there will be no substantial or significant long-term change to the aesthetic appearance of the natural environments associated with the pipeline route. The WHP will be buried and the compressor station and inlet facility would be located within the Whyalla Hydrogen Facility, an insignificant impact to visual amenity in the context of the larger industrial infrastructure that would comprise that facility. At the eastern end of the alignment the small fenced main line valve compound would be the only visible aboveground infrastructure and is a permanent but unobtrusive visible presence. In addition, pipeline markers which are necessarily designed to be seen will not result in a significant visual impact.

The level of risk has been assessed as low (see Table 5-24).

5.11.3. Mitigation measures

The following mitigations measures will be implemented to reduce potential visual amenity impacts:

- Select the alignment to avoid areas of high visual impact.
- Minimise the extent of vegetation clearing.
- Maintain all working areas in a neat and orderly manner.
- Adopt appropriate waste management measures
- Restore, reinstall and rehabilitate the easement as soon as practicable following backfill.

5.12. Socio-economic environment

5.12.1. Existing environment

Social environment

Both Whyalla and Port Bonython, the nearest population centres to the WHP, are located within the Whyalla Local Government Area (LGA). The population for Whyalla at the 2021 Census was 21,244 people (Australian Bureau of Statistics (ABS), 2021a) and the population for Port Bonython was 14 people (ABS, 2021b).

The 2021 Census statistics for the Whyalla LGA provide the following snapshot for population, employment, occupation, housing and families in comparison to South Australia as a whole (refer Table 5-20) (ABS, 2021a).

Table 5-20: 2021 Census data – Whyalla LGA

Aspect	LGA	South Australia
People	• Male 50.2%, Female 49.8% • Median age 41 years	• Male 49.3%, Female 50.7% • Median age 41 years
Indigenous	• 5.5% • Median age 23 years	• 2.4% • Median age 24 years
Employment status	• Full time 56.3% • Part time 29.8% • Unemployed 7.6% • Away from work 6.3%	• Full time 54.1% • Part time 35% • Unemployed 5.4% • Away from work 5.5%
Occupation (top 5)	• Technicians and Trades Workers 17.4% • Machinery Operators and Drivers 15.2% • Professionals 14.1% • Community & Personal Service Workers 13.4% • Labourers 11.6%	• Technicians and Trades Workers 13.2% • Machinery Operators and Drivers 6% • Professionals 21.5% • Community & Personal Service Workers 13% • Labourers 10.5%
Industry of employment (top 5)	• Iron Smelting and Steel Manufacturing 12.8% • Hospitals (except Psychiatric) 5.5% • Supermarket and Grocery Stores 4.1% • Iron Ore Mining 4% • Primary Education 3.1%	• Iron Smelting and Steel Manufacturing 0.3% • Hospitals (except Psychiatric) 5% • Supermarket and Grocery Stores 3% • Iron Ore Mining 0.1% • Primary Education 2.2%
Families	• Couple family no children 41.9% • Couple family with children 34.9% • One parent family 21.6%	• Couple family no children 41% • Couple family with children 40.8% • One parent family 16.6%
Dwellings	• Occupied private dwellings 85.8% • Unoccupied private dwellings 14.2%	• Occupied private dwellings 89.2% • Unoccupied private dwellings 10.8%
Tenure type	• Owned outright 26.7% • Owned with a mortgage 30.9% • Rented 39.5%	• Owned outright 32.8% • Owned with a mortgage 35.6% • Rented 27.6%

Whyalla provides a wide range of essential services including:

- early childhood, primary and secondary schools
- an airport
- police and fire services
- marina, port and jetty
- health services including the Whyalla Hospital with a 24-hour accident and emergency service
- tourism and temporary accommodation; and
- government services such as Centrelink and NDIS.

The ability to accommodate workers who are not resident in the social locality or within a commutable distance is often a key consideration for major projects. A range of short-term visitor and tourist accommodation is available in the social locality particularly in Whyalla itself including motels, caravan parks, self-contained apartments, and hotels. These provide accommodation for a diverse range of customers including recreational travellers, tourists, and business travellers.

Private accommodation such as holiday homes and investment properties could potentially be used to house construction workers. At the 2021 Census, it was reported that unoccupied dwellings accounted for 14.2% (Table 5-20). The likelihood of that level of availability for workers coming into the city is low and providing sufficient and affordable housing for the increased regional workforce is a focus of the Whyalla City Council and the South Australian Government.

Economic environment

Whyalla economy

Whyalla is an industrial city and the major centre for manufacturing, steel production and mineral resources processing in the Upper Spencer Gulf. SIMEC Mining's iron ore mines in the nearby Middleback Ranges feed the Whyalla Steelworks with magnetite and hematite and other products exported globally through the Whyalla port. The mines, steelworks and port are major employers in the region and utilise local businesses and suppliers.

Historically Whyalla has been reliant on employment, training and other economic opportunities generated by the Middleback Ranges and the steelworks. This reliance makes it vulnerable to commodity price variations and, together with the costs required to upgrade and / or replace the infrastructure needed to continue mining operations and associated processing, has resulted in considerable economic uncertainty over the years.

As such, there has been a strong focus by the people of Whyalla to diversify industry and increase tourism opportunities (e.g. during the Giant Cuttlefish breeding season).

Employment and workforce

At the 2021 Census, Whyalla had a slightly higher percentage of full-time workers than the State average. However, Whyalla experiences a higher unemployment rate of 7.6% than the State average of 5.4%.

The highest proportion of workers in Whyalla were employed as Technicians and Trade Workers (17.4%), followed by Machinery Operators and Drivers (15.2%) with Labourers accounting for 11.6% of the working people in Whyalla (ABS, 2021). This indicates that the social locality provides a good labour force base upon which to service the Project.

Iron Smelting and Steel Manufacturing accounted for 12.8% of the people employed in Whyalla with Iron Ore Mining accounting for 4.0% (ABS, 2021).

The median weekly incomes of individuals, families and households in Whyalla are all below the State average (ABS, 2021).

Key projects in the region

Several key projects are underway with the aim of bolstering the economy and increasing employment in the region. These are summarised in Table 5-21.

Table 5-21: Key projects in the region

Project	Details
Hydrogen Jobs Plan (SA Government)	A 200MW renewable hydrogen power plant, 250MW of electrolysers and 100 tonnes of hydrogen storage.
Hydrogen Hub at Port Bonython (SA Government)	A large-scale clean hydrogen production precinct for both export and domestic markets
Direct Reduction Iron Plant and Green Arc Furnace (GFG Alliance)	Project to transform the Whyalla steelworks from coal-based to a low-carbon, green steel product with an electric arc furnace to be powered by renewable energy.

Project	Details
Northern Water Project (Infrastructure SA)	Proposed desalination plant to supply water to industry and communities on the eastern Eyre Peninsula, Upper Spencer Gulf and Far North.
Cultana Solar Farm (SIMEC Energy)	280 MW solar farm located east and south of the HJP project.
Yoorndoo Ilga Solar Farm (AMP Energy and BDAC)	300 MW solar farm located north of the Project and east of the Whyalla Conservation Park.
Green Cement Transformation Project (The Hallett Group)	Proposed manufacturing capability to process and distribute three streams of Australian generated industrial waste by-products into low carbon green cement products utilising established renewable energy sources.

An increase in workforce will be required to support construction and operations of the proposed projects in the region. Some elements will require a skilled workforce, therefore an influx of workers into the Whyalla area is likely. Epic Energy is committed to ensuring local industry is involved in the development of the WHP and as part of its procurement process will prioritise local businesses and employment where the requisite skills are available and commercially competitive suppliers exist.

As a preferred partner selected by the South Australian Government to develop the HJP in Whyalla, Epic Energy is part of the regional transformation that is currently underway.

5.12.2. Impact assessment

Impacts will primarily be experienced during construction of the WHP and will therefore be temporary. The key potential socio-economic impacts (both negative and positive) resulting from the WHP are set out below.

Employment and workforce

The Project would have positive impacts on employment in the region through the creation of direct employment opportunities during the 12 months of construction. Construction of the Project would generate direct employment for approximately 522 jobs at the peak of construction activity. In operation, it is anticipated to be direct employment for 4-6 full time workers.

The Project is also likely to indirectly support generation of employment in local, regional and national businesses and industries from increased economic activity and spending at businesses providing goods and services to support construction activities.

Without experience managing renewable electricity generation in concert with hydrogen production, Australia is unlikely to have the scale and experience necessary to support a hydrogen industry. The Project will increase the capability of the local workforce to construct and operate a large-scale plant and pipeline and to increase skills relevant to renewable energy technologies. The Project would leverage from the region's existing / developing expertise and make the Upper Spencer Gulf a unique place to train workers. The creation of employment opportunities from the Project also has the potential to support improved social and economic outcomes for individuals through increased incomes and skills development in a nascent and emerging area. This and other projects in the area would also enable workers to upskill and diversify their skills away from the traditional industries of Whyalla.

Stakeholder engagement activities highlighted the importance of local procurement and jobs and noted the perceived pressure on the local workforce from a tight labour market.

Demand on medical services and accommodation would increase, particularly during construction activities unless the various projects build and utilise accommodation camps or other facilities to house the expected increased workforce.

In some communities an influx of construction workers may negatively impact a person's sense of social cohesion and safety. Given Whyalla is an industrial city with a large proportion of its residents employed in the South Middleback Ranges or the steelworks, an increase in the construction workforce is unlikely to cause concern.

The following measures are proposed to address impacts:

- Identify opportunities to maximise the use of local suppliers, workforce and businesses in the provision of goods and services to the Project.
- Implement a local procurement policy for the Project prioritising local employment, services and materials where practicable and available, and in collaboration with OHPSA and the City of Whyalla.
- Continue ongoing engagement with Council, local businesses and suppliers, employment groups and social services to provide a better understanding of likely requirements for the WHP including timing of works and to minimise impacts to labour force shortages.

Housing and accommodation

Given the low vacancy rates and the shortage of available accommodation, the need for accommodation for these workers could have a negative impact on other local businesses who are also looking to accommodate workforces sourced from outside of Whyalla and the region.

It is possible that some construction workers may choose to rent within the social locality for the duration of the works. This has the potential to increase pressure on rental prices, particularly in the context of existing low rental vacancy rates within the social locality. Increases in rental costs may affect the availability of affordable rental housing and rental affordability for some groups on low or fixed incomes (e.g., unemployed, elderly, students), contributing to rental housing stress for some households or result in some households having to move to more affordable accommodation elsewhere. However, any such impacts from increased demand for rental accommodation are likely to be low given demand for rental accommodation near the social locality by workers is expected to be minimal.

The following measures are proposed to address impacts:

- Development of a temporary worker accommodation village by OHPSA to reduce demand on housing during the periods of greatest workforce requirements.
- Continued engagement with OHPSA, City of Whyalla and other major project proponents in the region to minimise impacts to short term rental and tourist accommodation.

Amenity

Construction noise and dust have the potential to cause a temporary decline in the way of life and associated health and wellbeing for residents. Construction activities for the Project would not result in significant construction noise, dust or lighting impacts for nearby communities, with the nearest permanent dwellings generally located more than 5 km from the Project. The Project is generally removed from social infrastructure and community facilities. As such, noise, dust and traffic from increased construction activities are not expected to affect the use or enjoyment of social infrastructure.

The Project's CEMP will include a consultation process which will enable any local businesses and residents to provide feedback and to lodge concerns or issues to be addressed during the construction process.

The Project will also operate a 1300 number 24-hours a day / 7 days a week to accept calls.

The Project's OEMP will include a consultation process which will enable any local businesses and residents to provide feedback and to lodge concerns or issues to be addressed during operation.

Local business

During construction, potential indirect benefits for businesses would mainly be associated with the provision of goods and services to support construction activities such as specialty trades, construction material supply, equipment hire and fuel supplies. By utilising local suppliers, this would help support local business growth and development within the social locality and broader region. Spending by workers on accommodation, food and services is also likely to have a positive indirect impact on businesses in the region.

Cumulative impact

The Project may need to compete for labour, accommodation and construction-related resources with other energy and public infrastructure projects that are under construction or planned to be developed in the social locality in the coming years.

The construction phase of the Project is anticipated to commence in early 2025 and at a time when it is likely that many of the above projects will also be starting construction. Interproject communication will likely be important for the Project to manage any cumulative impacts associated with the number and breadth of development in the region.

The Project is likely to contribute to the opportunities available for workers and businesses in the energy infrastructure sector and to further develop the skills which may have been obtained through employment on the above projects.

5.13. Other Matters

5.13.1. Greenhouse gas emissions

The transition to renewable, clean and carbon-free sources of energy is a critical component of the State's strategy to achieve its objectives of 50% greenhouse gas reduction by 2030 and net zero emissions by 2050.

The development of hydrogen resources is a mechanism for reducing emissions of greenhouse gases across a range of sectors currently deriving thermal energy from fossil fuel resources. Hydrogen is able to replace traditional thermal sources including natural gas, and thereby reduce operational greenhouse gas emissions. Hydrogen is not a listed pollutant under the EP Act.

The production (at the Whyalla Hydrogen Facility) and storage of hydrogen within the WHP represents a key opportunity to leverage South Australia's renewable energy potential. The WHP represents critical infrastructure to support this objective and contribute to lowering the State's emissions in line with the *Climate Change Action Plan 2021-2025* (Government of South Australia 2020) and associated legislation and policies including the *Hydrogen Action Plan* (Government of South Australia 2019).

The WHP and the related Whyalla Hydrogen Facility, as components contributing to the Hydrogen Jobs Plan project, have been identified as part of the *Climate Change Actions* (version 8, Government of South Australia 2022) as specifically contributing to Clean Energy objectives:

- accelerate the renewable energy economy
- develop a world-class renewable hydrogen industry
- support the scale-up of renewable hydrogen production for export and domestic use.

During pipeline construction greenhouse gases will be emitted by transport (namely light vehicle and pipeline trucks) and the use of construction machinery and equipment. Greenhouse gas emissions during construction activities are considered to be relatively minor and are not a significant source of greenhouse gas emissions, due to the limited duration.

The construction of the WHP as described in Section 3.4 and Section 3.5 will be undertaken with regard to the public safety and risk parameters addressed through Section 5.13, which will assist in mitigating the potential for fugitive emissions of hydrogen and limit emissions of hydrogen to the atmosphere. The WHP will not contribute significantly to greenhouse gas emissions during operation.

5.13.2. Public safety and risk

Hydrogen is the simplest and most abundant element in the universe. It is colourless, odourless, non-toxic and an excellent carrier of energy. It can be produced and stored as a gas or liquid, or made part of other chemicals, and has many uses such as fuel for transport or heating, a way to store electricity, or a raw material in industrial processes.

Whilst natural gas pipelines have an extensive history in Australia, with transport occurring over long distances with stringent regulations and design codes to ensure safety, hydrogen pipelines are emerging infrastructure with an evolving regulatory framework. The transition to hydrogen pipelines requires a cautious approach leveraging established gas pipeline safety practices, whilst acknowledging there are properties unique to hydrogen that require special consideration, such as embrittlement and flammability.

Designing and operating a hydrogen pipeline that will be subject to fatigue cycles necessitates a comprehensive risk assessment process that goes beyond that of traditional gas pipeline practices. Communications and engagement with stakeholders regarding the risk assessment process and outcomes will be essential in addressing the public perception of the risks associated with hydrogen.

The WHP design process will:

- leverage the established framework of AS 2885 and incorporate hydrogen specific considerations
- utilise international standards and advanced fatigue analysis methods to ensure a robust design and appropriate material selection
- adopt specialised construction techniques where appropriate
- involve expert collaboration, and
- incorporate long term monitoring of pipeline integrity.

Safety will be a key focus. As a flammable fuel, hydrogen must be treated carefully and handled safely. Hydrogen has been used for decades primarily for refining petrochemicals and making ammonia. The safety expertise, standards and regulations developed globally over this period for large scale hydrogen use will provide invaluable insight for the Project.

All the necessary approvals for construction and operation will be obtained, having established to the relevant Commonwealth and State regulatory agencies, that Epic Energy is equipped to operate the Project in a safe and reliable manner.

The key steps that will be implemented in the WHP design and operation include the following.

Project Definition and Requirements

A detailed engineering scope will be established, defining characteristics such as pipeline length, diameter, operating pressure, cycle basis, hydrogen flow rate, design life expectancy and fatigue cycle (frequency and stress range).

Speciality engineering firms experienced in hydrogen pipeline design and fatigue analysis will be engaged to calculate and validate the design life of the pipeline. The pipeline design will reference industry best practices and research findings related to hydrogen fatigue in pipelines. Detailed engineering criticality assessment with a multi-criteria assessment scope will be completed to assess how best to manage repeated stress cycles in both the line pipe-making process and the in-field welding process. The latest fracture mechanics software will be adopted and the pipes mechanical property assumptions will be tested (post manufacturing) to confirm these properties have been achieved.

Hazard Identification and Risk Assessment

A hazard identification and risk assessment process will be undertaken to identify potential failure modes specific to hydrogen pipelines in fatigue service which may include:

- Hydrogen embrittlement leading to crack initiation and propagation
- Fatigue cracking at welds and stress concentration points
- Leaks due to material degradation or weld defects.

An evaluation will be undertaken of the likelihood and consequence of each failure mode using risk assessment methodologies.

A Safety Management Study (SMS) will be completed in accordance with the requirements of AS 2885. The SMS will assist in the preparation of a Safety Management Plan which will stipulate a combination of physical and procedural measures to ensure that the pipeline design, construction, operation, maintenance and management will meet appropriate safety standards. The SMS outcomes and the Safety Management Plan will inform the public consultation process and will be critical in addressing and moderating the public perceptions of risk associated with hydrogen. The SMS and Safety Management Plan will:

- confirm primary location class (R1,R2,T1,T2) and secondary location class (S, E, I HI, CIC, C) based on measurement length
- identify threats
- confirm consequences
- risk rank credible threats
- mitigate unacceptable risks by modifying the design if required
- confirm risk ranking is as low as reasonably practicable.

The location analysis will consider land use related activities (e.g. pastoral grazing, heavy industrial, recreation) and crossing segments (e.g. main roads, utilities, and waterways). The location class in AS 2885 effects how potential threats are to be treated. In remote locations (called R1 and R2 locations) the consequence can be analysed for each identified potential threat to the integrity of the pipeline (e.g. excavators, horizontal drill rigs or farming equipment). For example, the effect of various size excavators can be analysed to see whether they could feasibly cause a pipeline leak or a rupture. Then the consequence of each threat is then determined and the risk ranking quantified. Where the

consequence of pipeline failure on the community or environment is high, the code designates the area as a 'no rupture' area and applies additional limitations on the maximum allowable leak (includes T1, T2, I, S and E locations and potentially HI and C locations). These limitations ensure that rupture is not credible from the largest threat identified. This ensures the safety of people in these areas based on the actual threats identified.

A credible threat to the pipeline can be assumed to include any element which can plausibly occur at the pipeline location with potential to cause pipeline failure, including threats due to location (including crossing and land use segments) and general threats common to the entire system (for example, corrosion). Threat identification considers threats due to external interference (deliberate and accidental) as well due to unsatisfactory design, construction, materials and operations. Threats due to natural events such as erosion and lightning are also considered.

For each credible threat, effective physical and procedural or design controls are identified and applied. Design control measures that eliminate a threat are preferred over physical and procedural controls that reduce the threat. If the threat reduction measures identified are not sufficient for the threat to be considered controlled, the threat is subject to a failure analysis to determine the extent of damage that it may cause to the pipeline. Where a loss of containment (i.e. any leak of hydrogen from pipeline) is a possible outcome, additional measures to control the threat are investigated and applied. If pipeline loss of containment is still possible even with the additional control measures applied, then the failure event is subject to risk assessment in accordance with AS 2885.6.

Material Selection and Design

AS 2885 has been adopted as the base for the design principles of the pipeline such as pressure containment and pipeline strength. Advanced fatigue analysis methods beyond those specified in AS 2885 will be employed, including:

- Established international standards for hydrogen pipelines such as DNV GL-ST-F101, which incorporate fatigue considerations specific to hydrogen service.
- ASME B31.12 Hydrogen Piping and Pipelines (US Standard).
- Hydrogen Assisted Fatigue Crack Growth Rate modelling using work from NIST laboratories (Amaro et al., 2018), and Code Case 220 referenced in ASME B31.12 from Sandia Laboratories (San Marchi et. Al., 2019).
- Engineering Criticality Assessment to assess the relationship of defects in the girth welding process to the overall design life of the asset.
- Finite element analysis to assess stress concentrations, particularly at girth welds, which are vulnerable to fatigue cracking. This advanced modelling technique can help identify critical areas and inform design modifications. This will be completed once the line pipe toughness is defined.
- Recommended safety factors.
- Detailed piping stress analysis to identify and reduce residual stress in the pipeline.

High grade carbon steels used in natural gas pipelines will not be selected as they are more prone to embrittlement if used for hydrogen. Specialist pipe manufacturing consultants will manage the stringent manufacturing tolerances and testing requirements in the pipe mill needed for line pipe suitable for fatigue service.

Construction Planning and Quality Control

Specialised construction techniques will be adopted for pipeline construction, including manual and automated welding procedures that minimise hydrogen entrapment, employ preheating, post-weld

heat treatment and low-hydrogen consumables. Strict welding procedures will be employed that specify parameters to ensure proper weld quality and minimise defects, such as heat input, travel speed and interpass temperatures. Only experienced welders qualified for hydrogen pipeline welding will be employed.

Enhanced manual and automated NDT will be used, such as ultrasonic testing, which is sensitive to hydrogen related defects. This will involve inspecting the entire weld length instead of a sampling approach and examination of the heat affected zone that can be susceptible to embrittlement.

Rigorous construction quality control measures will be implemented to ensure adherence to specifications and to minimise defects. These include:

- Maintaining a clean environment during construction to avoid contamination of the pipe material and welds with substances that could exacerbate hydrogen embrittlement. This may involve procedures such as pre-cleaning the pipe ends and using inert gas purging during welding.
- Ensuring proper pipe fit-up and alignment before welding to minimise stress concentrations at the weld joint after construction is complete, performing thorough cleaning and purging of the pipeline to remove any contaminants, and hydrostatic pressure testing to verify pipeline integrity before commissioning.
- Completion of a baseline ultrasonic testing inspection as part of pre-commissioning to verify the construction quality and provide a benchmark for monitoring crack growth over the life of the asset.

Operation and Maintenance Plan

The lower density and viscosity of hydrogen makes leaks harder to detect compared to natural gas. To account for this, technologies in addition to those set out in AS 2885 will be applied.

An operation and maintenance plan will be prepared for the Project and may include:

- A robust, specialist in line inspection (ILI) program with hydrogen specific techniques to detect and monitor potential fatigue cracks during operation. The probability of detection of a range of various in line inspection tools will be evaluated to determine the most suitable in line testing tooling. The frequency on these ILI runs will be adjusted based on the observed crack growth rates as required to maintain an accurate assessment of the design life of the asset.
- A preventative maintenance strategy addressing fatigue concerns including potential weld repairs and pipeline replacement based on inspection results.

Emergency Response Planning

A comprehensive emergency response plan or plans considering the unique properties of hydrogen (flammability and rapid dispersion) will be developed. Personnel will be trained on hydrogen pipeline emergencies and response procedures.

Other Matters

In addition to the matters described in this section, pipeline protection methods that will be considered and applied where appropriate are broadly described in Table 5-22.

Table 5-22: Pipeline Protection Safety Measures

Methods	Measures	Description
Physical Measure	Burial and depth of cover	The entire pipeline will be buried at depths in accordance with AS 2885.1.
	Barrier	Bollards will be installed where impact threats to above ground pipeline components are not sufficiently mitigated (e.g. within facilities).
	Exclusion	Fences will be installed around above ground facilities including the compression and valve facilities to limit access by unauthorised personnel.
	Wall thickness	Wall thickness for pressure containment will be calculated in accordance with AS 2885.1. Use design factor <0.5 consistent with Option A from ASME B31.12 and undertake mechanical testing of the pipe material to confirm suitability for hydrogen service at the design conditions.
	Barrier to Penetration	Protection slabs will be installed where an increased likelihood of excavation over the pipeline is expected (e.g. at foreign service crossings, under roadside drains).
	Hydrotesting	AS 2885 Part 5 has specific requirements for hydrotesting. This includes a strength test followed by a leak test. The strength test specified in AS 2885 is a minimum of 1.25 x Design Pressure but may have a higher equivalent test pressure factor if consumable wall thickness allowances are applied to the design (e.g. corrosion allowance). The adopted test pressure will be nominated at the lower of 1.5 x Design Factor, or equal to the mill test pressure.
Procedural Measure	Liaison – Contractors	Organisations such as councils or shires, utility or community groups that may present a threat to the pipeline will be contacted.
	Marker Signs	Pipeline signs will be installed at intervisible spacing to identify the location of the pipeline and will be posted in accordance with AS 2885.1.
	Marker Tape	Buried marker tape will be installed above the pipe in accordance with the risk assessment under AS 2885.1.
	Liaison – Landholders	Landowners will be contacted on an ongoing basis throughout project development, construction and operation.
	Cathodic Protection Surveys	Readings will be taken at Cathodic Protection test points (above-ground post) along the easement, typically twice per year.
	Testing and inspection of relief valves	Controlled venting of minimal quantities of gas to atmosphere will be done, typically once per year with a duration of approximately 30 seconds.
	One-call 1800 number and Before You Dig Australia service	Use of a one call 1800 number for efficient processing of public inquiries and reporting Use of the Before You Dig Australia service – (a free pre-excavation referral service for the Australian community) as a single point of contact to request information about any buried infrastructure.
	Patrolling	Quarterly vantage point patrolling and full patrols on an annual basis of the entire route throughout the life of the pipeline.
	Erosion events	Following major rainfall events creek lines or run-off areas on right-of-way can experience soil erosion. Repairs will be undertaken immediately following an erosion event and will include replacement with similar materials and soil re-profiling. Given the area is so flat, this is not expected to be a regular occurrence.
	Pigging	Intelligent pigging (requiring some venting of pipeline) will be conducted for in line inspections, typically every 5 years.

5.13.3. Waste management

Small amounts of general, commercial and industrial waste will be generated during pipeline construction and operation. The types of wastes expected to be generated, along with preferred options for disposal, are detailed in Table 5-23.

Table 5-23: Typical wastes and preferred disposal options

Waste Type	Disposal
Construction	
Packaging – ropes, cardboard	Licensed landfill / recycled
Used chemicals and oils – e.g. oily water, waste oil, lube oil, spent x-ray film developer chemicals, used tins from solvents, rust proofing agents, primers and pipe coatings	Licensed disposal facility
Scrap – steel, stainless steel, copper, clean wood	Recycle
Concrete, treated and untreated timber, construction and demolition waste	Recycle and reuse
Construction laydown – general waste, putrescibles, paper, timber and plastics	Compost, reuse, recycle, or licensed landfill
Liquid waste /effluent	Licensed disposal or recovery facility
HDD cuttings (if HDD is used)	Licensed landfill
Contaminated soils	Licensed landfill or recovery centre
Acid sulfate soils	Reuse/reburial
Drill mud	Reuse
Vegetation	Reuse during rehabilitation
Weeds including seeds	Licensed disposal facility
Operation	
Filters (non-oily)	Licensed landfill
Filters (oily)	Licensed disposal facility
Sludge (pigging)	Licensed disposal facility
Packaging (maintenance)	Recycle, e.g. timber pallets

Construction laydown areas require the provision of portable toilets or systems for the management of sewage wastes. Wastewater systems at laydown areas will be managed in accordance with the *South Australian Public Health (Wastewater) Regulations 2013* and wastewaters disposed in compliance with the *On-site Wastewater Systems Code* (SA Health 2013).

Impact assessment and mitigation measures

Incorrect disposal of wastes can be harmful to both humans and the environment if not handled appropriately, and pests and other fauna may be attracted to any accessible putrescible wastes.

The following mitigation and procedural measures that will be implemented in respect of waste management include:

- Development of specific waste management strategies for each waste stream prior to the commencement of any waste producing activities, based on the waste management hierarchy (avoid, reduce, reuse, recycle, recover, treat, dispose) which will be documented in a Waste Management Plan.

- Informing site personnel of the required waste management procedures and practices during the workforce induction program.
- Re-use or recycling of waste materials generated during construction where practicable, or collected and transported by licences contractors for disposal and appropriately licenced facilities.
- Covering of bins to prevent access by fauna and the spread of windblown waste.
- Managing hazardous wastes such as solvents, rust proofing agents, primers and pipe coatings in accordance with the requirements of relevant legislation and industry standards.
- Implementing appropriate management of sewage wastes, in accordance with the *South Australian Public Health (Wastewater) Regulations 2013* and the South Australian On-site Wastewater Systems Code (SA Health 2013) where relevant.
- Employing appropriate measures for hydrotesting water disposal as discussed in Section 5.2 and Section 5.3.
- Placing a high emphasis on housekeeping and cleanliness in and around construction sites and maintaining all work areas in a neat and orderly manner.
- Collecting hydrocarbon wastes, including lube oils, for safe transport off-site for reuse, recycling, treatment or disposal at approved locations.
- Storing and handling of chemicals in accordance with Section 5.13.4.
- Removing all waste material from the worksite upon completion.

5.13.4. Hazardous storage, spill and emergency response

Hazardous material storage

A variety of chemicals may be required on-site during pipeline construction activities. These include fuels, lubricant oils, solvents, rust proofing agents, primers and pipe coating materials. Potential impacts include localised contamination of soils, water resources and other sensitive environmental receptors in the event of spills. Such impacts have been detailed in Sections 5.2, 5.3 and 5.4 respectively.

Hazardous materials will be stored in appropriate containers or in appropriately contained areas, in accordance with relevant regulatory requirements including AS1940: *The storage and handling of flammable and combustible liquids.*

Spill and emergency management

It is a key objective to maintain, review and enhance crisis and emergency management procedures to ensure Epic Energy can implement those procedures efficiently and effectively while minimising impacts on the environment. Hazardous material storage and spill management mitigations will be managed as part of Epic Energy's Environmental Monitoring Program and Environmental Audit Program, which are described in Section 6.1.

Epic Energy is committed to ensuring open and proactive communication on pipeline safety issues with local communities in the Project area. In addition, regular briefings would be held with emergency services personnel and testing of crisis and emergency response procedures would occur regularly as part of its safety management processes.

The Epic Energy Incident Management Process is made up of the following plans and manuals that are enacted in an emergency:

- Crisis Management Plan to define how Epic Energy manages regulatory, media, executive, commercial, governmental and human resource processes in the event of an incident that has been declared an emergency.
- Incident Management Plan to provide guidelines to manage a crisis and determine the objectives for recovery from a crisis situation.
- Emergency Response Manual – Pipeline Control Procedures.
- Emergency Response Manual – Asset Response Procedures.

Mitigation measures

Mitigation measures to reduce the potential for hazardous substances and spill events to the environment and third parties will be included in the CEMP, OEMP and site induction for all staff and contractors:

- A spill prevention, response and cleanup procedure including refuelling techniques and chemical storage and handling requirements.
- Standard operating procedures for correct use of equipment to minimise the potential for spills.
- Procedure to ensure hazardous material is not stored in a manner which results in a leak or drain onto the ground.
- Storage of all fuels and hazardous materials used on-site in bunded areas in accordance with AS1940 and EPA Guideline 080/016 *Liquid Storage – Bunding and spill management.*
- Regular inspections of machinery for fuel and oil leaks and maintaining in good working order.
- Avoiding vehicle refuelling near watercourses, wetlands or the coast (e.g. within 50 m).
- Using drip tray and spill mats during refuelling truck operations
- Using spill mats and spill containment equipment on-site if diesel pumps are required on the right-of-way.
- Ensuring that materials and equipment required to respond to a hazardous spill event are readily available.
- Appropriately implementing clean-up / spill response procedures in the event of a spill.
- Maintaining material Safety Data Sheets for each chemical used on-site at a location that is readily accessible
- Instructing all personnel in spill prevention, safety and response practices as a component of the environmental induction process.

5.14. Environmental Risk Assessment Summary

Table 5-24 presents the results of the environmental risk assessment undertaken for the WHP. The risk assessment considers the information presented previously within Chapter 5 for each environmental element.

Table 5-24: Environmental risk assessment summary

RISK EVENT/ HAZARD	Potential environmental impact	EIR Section reference - mitigations	SEO objective	RISK ASSESSMENT			
				Factors contributing to uncertainty / risk	Consequence (worst case)[11]	Likelihood	Residual risk
Soils and terrain							
Earthworks and vegetation clearance	Erosion of disturbed ground or stockpiles	5.2.3	2	Extreme weather events; implementation and effectiveness of sediment and erosion controls; quality of rehabilitation	Minor	Possible	Low
Subsidence of trench backfill	Soil erosion on ROW	5.2.3	2	Extreme weather events; quality of work from earthworks contractor	Minor	Unlikely	Low
Soil inversion	Topsoil "loss" impacting success of rehabilitation	5.2.3	2	Construction methodology / implementation of stockpile management measures	Minor	Unlikely	Low
Soil compaction	Change in local drainage patterns / inhibition of plant regeneration	5.2.3	2	Implementation of management measures (e.g. rehabilitation of temporary disturbance)	Minor	Possible	Low
Disturbance of Acid Sulfate Soil	Creation of acidic conditions affecting soil quality	5.2.3	2	Uncertainty in ASS distribution data; implementation of management measures	Minor	Unlikely	Low
Spills from storage and handling of fuel, oil and chemicals	Contamination of soil	5.2.3	2	Unplanned event (e.g. due to accident); implementation of management measures	Minor	Possible	Low
Disturbance of existing contaminated soil	Environment, surface/ground water, human health	5.2.3	2	Potential for unexpected discovery; implementation of management measures	Minor	Unlikely	Low

[11] The risk assessment considers the credible worst-case consequence that could conceivably occur (and the likelihood of such a consequence occurring)

RISK EVENT/ HAZARD	Potential environmental impact	EIR Section reference - mitigations	SEO objective	RISK ASSESSMENT			
				Factors contributing to uncertainty / risk	Consequence (worst case)[11]	Likelihood	Residual risk
Dewatering (if required)	Soil erosion / decrease in soil quality	5.2.3	10	Quality of trench water; implementation of management measures	Minor	Unlikely	Low
Disposal of water for hydrostatic testing	Localised soil contamination	5.2.3	10	Locations for disposal; implementation of management measures	Minor	Remote	Low
Water resources							
Earthworks	Increased sediment load and turbidity in surface water	5.3.3	3	Extreme weather events; implementation of sediment and erosion controls; rehabilitation of temporary disturbance	Minor	Unlikely	Low
Earthworks	Interruption or modification to surface drainage patterns	5.3.3	3	Extreme weather events; implementation of management measures	Minor	Unlikely	Low
Spills from storage and handling of fuel, oil and chemicals	Contamination of surface water	5.3.3	3	Unplanned event (e.g. due to accident); implementation of management measures	Minor	Unlikely	Low
Dewatering (if required)	Contamination of surface water	5.3.3	3	Quality of trench water; implementation of management measures	Minor	Unlikely	Low
Disposal of water for hydrostatic testing	Contamination of surface water	5.3.3	3	Locations for disposal; implementation of management measures	Minor	Remote	Low
Earthworks	Changes to hydrological conditions (groundwater)	5.3.3	3	Depth to groundwater; groundwater flows; implementation of management measures	Minor	Remote	Low
Spills from storage and handling of fuel, oil and chemicals	Contamination of groundwater	5.3.3	3	Unplanned event (e.g. due to accident); implementation of management measures	Moderate	Remote	Low

RISK EVENT/ HAZARD	Potential environmental impact	EIR Section reference - mitigations	SEO objective	RISK ASSESSMENT			
				Factors contributing to uncertainty / risk	Consequence (worst case)[11]	Likelihood	Residual risk
Disposal of water for hydrostatic testing	Contamination of groundwater	5.3.3	10	Locations for disposal; implementation of management measures	Minor	Remote	Low
Flora and fauna							
Earthworks and vegetation clearance	Loss of native vegetation and habitat	5.4.3	4	Final definition of clearance areas; implementation of management measures (e.g. designated clearance areas)	Minor	Possible	Low
Earthworks and vegetation clearance	Removal of threatened flora	5.4.3	4	Occurrence (occurs where not detected / predicted); implementation of management measures (e.g. designated clearance areas)	Minor	Unlikely	Low
Earthworks and vegetation clearance	Clearance of habitat for threatened fauna	5.4.3	4	Occurrence (occurs where not detected / predicted); implementation of management measures (e.g. designated clearance areas); rehabilitation of temporary disturbance	Moderate	Remote	Low
Earthworks and vegetation clearance	Habitat fragmentation	5.4.3	4	Implementation of management measures (e.g. designated clearance areas); rehabilitation of temporary disturbance	Minor	Unlikely	Low
Earthworks and use of unsealed tracks	Dust generation impacts healthy function of flora	5.4.3	4	Extreme weather events; implementation of management measures	Minor	Possible	Low
Dewatering of saline groundwater inflows	Reduction in health of native vegetation	5.3.3	4	Extent of dewatering; quality of trench water; sensitivity of vegetation to salinity	Minor	Unlikely	Low

RISK EVENT/ HAZARD	Potential environmental impact	EIR Section reference - mitigations	SEO objective	RISK ASSESSMENT			
				Factors contributing to uncertainty / risk	Consequence (worst case)[11]	Likelihood	Residual risk
Earthworks (open excavations)	Impeded movement of fauna, injury or death of trapped fauna	5.4.3	4	Seasonal fauna abundance and activity; implementation of management measures	Negligible	Likely	Low
Site activities (e.g. light, noise, people)	Fauna disturbance	5.4.3	4	Seasonal fauna abundance and activity; construction timing	Negligible	Likely	Low
Road use and movement of heavy plant	Collision with fauna (injury or death)	5.4.3	4	Frequency of collision; implementation of management measures	Minor	Unlikely	Low
Fauna access to contaminants/waste	Injury or death of fauna	5.2.3	4	Unplanned event (e.g. due to accident or poor implementation of management measures)	Negligible	Remote	Low
Introduction or spread of weeds	Habitat degradation or inhibited regeneration	5.4.3	5	Weed presence at time of construction; implementation of management measures	Moderate	Unlikely	Medium
Incursion of exotic predators or pests	Predation of native flora and fauna	5.4.3	5	Implementation of management measures	Minor	Unlikely	Low
Fire initiated by site activities	Disturbance of flora and fauna	5.4.3	4	Implementation of management measures	Moderate	Remote	Low
Aboriginal cultural heritage							
Ground disturbance including earthworks and vegetation clearance	Disturbance, interference, damage to Aboriginal sites, objects or remains.	5.5.3	1	Occurrence of Aboriginal sites, objects or remains not detected in pre-construction surveys; implementation of management measures	Major	Remote	Medium
Non-Aboriginal heritage							
Ground disturbance including earthworks and vegetation clearance	Disturbance, interference or damage to items of heritage significance	5.6.3	1	Occurrence of unknown, unrecorded and/or unregistered heritage sites; implementation of management measures (e.g. designated clearance areas)	Minor	Remote	Low

RISK EVENT/ HAZARD	Potential environmental impact	EIR Section reference - mitigations	SEO objective	RISK ASSESSMENT			
				Factors contributing to uncertainty / risk	Consequence (worst case)[11]	Likelihood	Residual risk
Earthworks and vegetation clearance	Sedimentation from construction activities impacts the CCSZ	5.6.3	1	Extreme weather events; implementation of sediment and erosion controls; rehabilitation of temporary disturbance	Negligible	Remote	Low
Air quality							
Earthworks and vehicle movements	Dust generation impacts sensitive receptors	5.7.3	8	Extreme weather events; implementation / effectiveness of controls	Minor	Possible	Low
Vehicle/equipment emissions	Reduction in local air quality	5.7.3	8	Implementation of management measures	Negligible	Unlikely	Low
Noise and vibration							
Construction activities	Adverse impact to amenity of sensitive receptors	5.8.3	7	Construction hours in proximity of nearest residence	Minor	Unlikely	Low
Operation of the compressor station	Adverse impact to amenity of sensitive receptors	5.8.3	7	Modelling (e.g. noise higher than predicted); noise emissions from Whyalla Hydrogen Facility	Minor	Unlikely	Low
Land use and third party infrastructure							
Construction activities	Temporary impedance of land access/use	5.9.3	6	Location and timing of construction / access activities	Minor	Possible	Low
Construction activities	Disturbance to infrastructure	5.9.3	6	Location and timing of construction / access activities; implementation of management measures	Moderate	Remote	Low
Operational activities	Temporary impedance of land access/use	5.9.3	6	Location and timing of maintenance activities	Negligible	Possible	Low
Traffic							
Increased traffic during construction	Disruption to efficient operation of roads	5.10.3	9	Traffic predictions; implementation / effectiveness of controls	Minor	Unlikely	Low

RISK EVENT/ HAZARD	Potential environmental impact	EIR Section reference - mitigations	SEO objective	RISK ASSESSMENT			
				Factors contributing to uncertainty / risk	Consequence (worst case)[11]	Likelihood	Residual risk
Site access during construction	Reduced road safety at site access point	5.10.3	9	Implementation of controls including a traffic management plan	Major	Remote	Medium
Visual amenity							
Construction activities including earthworks and vegetation clearance	Reduction in visual amenity	5.11.3	6	Implementation of management measures; presence and sensitivity of receptors	Minor	Possible	Low
Presence of operational infrastructure	Reduction in visual amenity	5.11.3	6, 11	Rehabilitation of temporary disturbance; presence and sensitivity of receptors	Negligible	Likely	Low

6. ENVIRONMENTAL MANAGEMENT FRAMEWORK

6.1. Environmental Management System

The Epic Energy Environmental Management System (EMS) provides a framework for the management of environmental responsibilities, issues and risks associated with the operation, maintenance, construction and decommissioning of pipelines and associated infrastructure. The EMS ensures that commitments contained within Epic Energy's Environmental and Land Access Policy are achieved and provides clarity and direction for employees and contractors. The EMS is based on a continuous improvement model as defined in the Australian / New Zealand Standard ISO 14001:2015 *Environmental Management Systems – Requirements with guidance for use* (refer Figure 6-1).

The EMS applies to all personnel associated with and activities undertaken for Epic Energy and addresses pipeline construction (including route selection, design, land access and construction activities), pipeline operations and maintenance, and operation and maintenance of ancillary facilities.

The 'environment' is defined as the surroundings in which Epic Energy operates including:

- land, air, water (surface and underground), organisms and ecosystems
- buildings, structures, cultural artefacts, and other heritage factors
- social and economic life
- amenity value of an area.

The EMS is used to integrate objectives, plans and activities into daily operations to ensure a systematic approach to environmental management. The EMS consists of an Overview Manual and supporting documents including the policy, risk and compliance registers, management plans, procedures, work instructions, as well as monitoring and auditing programs. The EMS consists of five elements and associated sub elements:

1. Commitment
1. Planning
2. Implementation
3. Measurement and Evaluation
4. Review and Improvement.

The elements are interrelated, and the proper implementation of each element is essential for the effective functioning of the EMS. The relationship between these five elements is shown in Figure 6-1.

The following section details the key components of the EMS that are relevant to operation, maintenance, and construction of the WHP. Any contractors engaged by Epic Energy are required to undertake environmental inductions and carry out their work in compliance with Epic's EMS and associated procedures and work instructions. The EMS provides full description of environmental requirements including supporting documents.

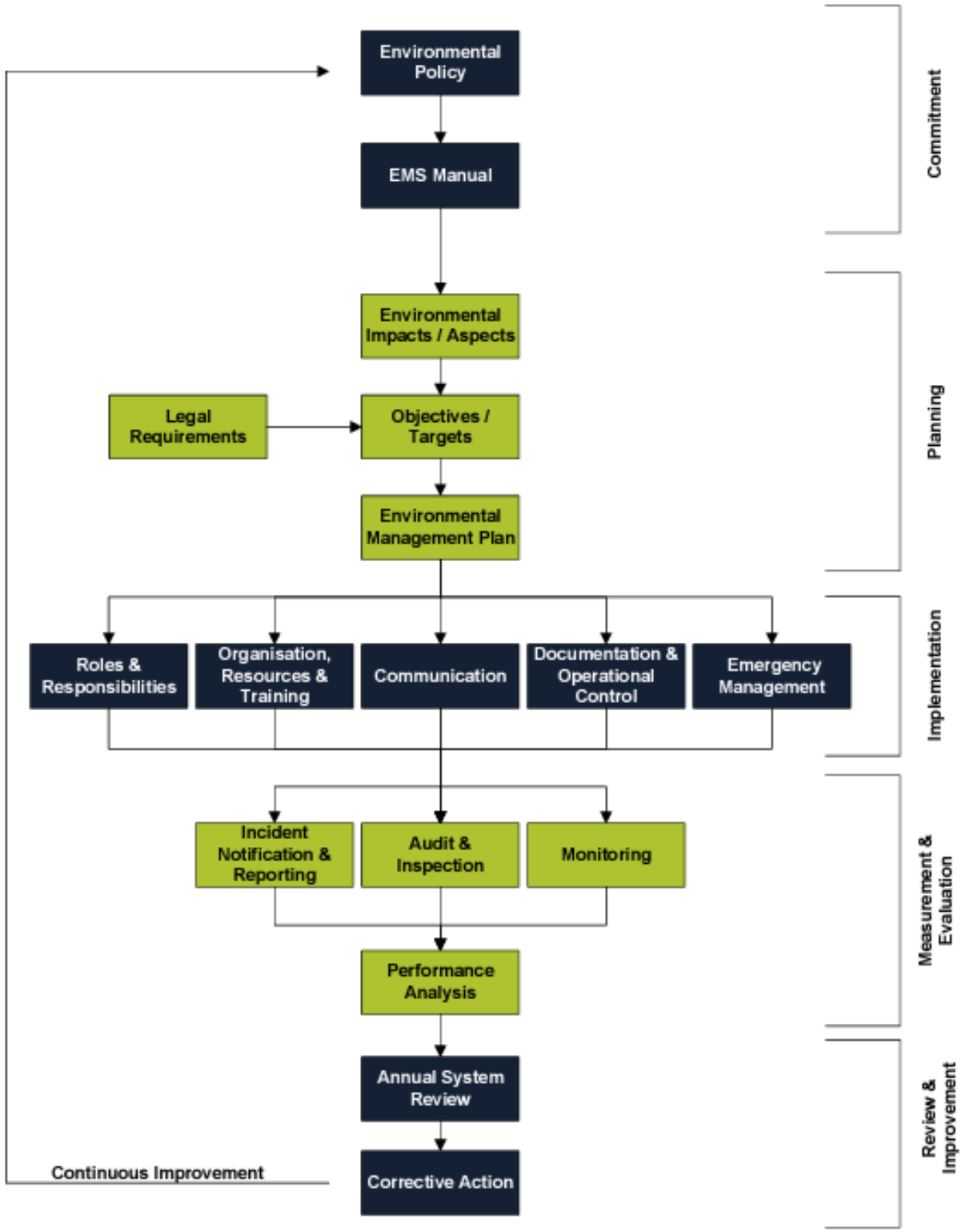

Figure 6-1: Structure of the Environmental Management System

6.1.1. Environmental commitment

Epic Energy has a sound environmental record and reputation and is committed to conducting its business operations in an environmentally responsible manner.

Environmental Values: Epic Energy has a culture which stresses environmental, health and safety excellence and makes this the responsibility of every employee and contractor. Epic seeks to be recognised as a leader in the protection of the environment, the public, its employees, contractors, and the communities it works with.

Policy: Epic Energy's Environmental and Land Access Policy outlines in broad terms how environmental objectives will be achieved. The policy is endorsed by the Chief Executive Officer, reviewed annually, and updated as required. It commits Epic Energy to achieve a high standard of environmental compliance. The Environmental and Land Access Policy is communicated by a number of methods to all personnel and contractors. It is available in all new contract's packages, communicated at corporate and field inductions, and displayed on the internet, intranet and in all foyer areas.

Leadership: Leadership accountability and visibility is key to the success of the EMS. Leaders direct the management system process, set objectives that challenge the organisation to achieve continuous improvement, and monitor progress via management review. Leaders demonstrate their commitment through engagement with the workforce, setting personal examples in day-to-day work and sharing information learned inside and outside of the workforce.

6.1.2. Planning

Epic Energy's activities are managed to reduce environmental impacts through the following methods:

- conducting activities in accordance with relevant regulatory and corporate obligations
- considering the concerns of the community and landowners
- conducting risk assessment workshops to identify environmental aspects and impacts
- implementing measures during the Project planning phase to minimise environmental impacts
- developing and documenting control measures for all activities considered to have a potentially significant impact on the environment
- defining responsibilities for the implementation of environmental control measures.

Environmental impacts and aspects

Epic Energy is committed to identifying and managing environmental impacts for all activities and maintains an Environmental Risk Register, managed via the online Corporate Governance Risk system, which documents key activities, environmental aspects and impacts, business consequence and control measures identified through risk assessment processes.

Control measures for environmental impacts are implemented through:

- development of control documentation such as environmental procedures, work instructions, guidelines, emergency response plans and management plans
- implementation of the above documentation via the Environmental Management Induction and the Operations Field Induction
- briefing staff on environmental responsibilities
- complying with regulatory requirements

- ongoing monitoring of the effectiveness of control measures
- corrective action to improve on control measures.

Legal requirements

Epic Energy is required to be compliant with the relevant regulatory obligations and other standards to which it subscribes. The Risk and Compliance Advisor maintains a Compliance Register and provides guidance on legislative obligations, including licences, codes, industry standards, commitments and relevant legislation to be consulted for particular licensing requirements.

Objectives and targets

Epic Energy has developed a number of environmental objectives, targets, indicators and programs consistent with the environmental policy and commitments. It aims to conduct its activities in line with the Environmental Objectives to ensure appropriate environmental work practices are applied.

In establishing the environmental objectives, targets and programs, Epic Energy has considered:

- Environmental Policy
- environmental aspects and impacts
- relevant Australian and other standards
- legal and other requirements
- measurability of objectives
- the drive for continuous improvement.

Statement of Environmental Objectives

This EIR forms the foundation for a SEO which includes measurable criteria used to assess whether the objectives are being achieved. In developing the SEO, the following is considered:

- environmental objectives and performance
- environmental aspects
- regulatory compliance.

6.1.3. Implementation

The successful implementation and operation of Epic Energy's EMS requires commitment from all levels of the organisation. Epic Energy's management ensures the availability of resources to establish, implement, maintain and improve the EMS.

Organisation, resources and training

Roles and responsibilities are defined, documented and communicated to facilitate effective environmental management.

Training and education ensure employees have the skills to undertake their work in an environmentally sound manner. All employees are required to complete:

- Corporate Induction, which provides introduction to the environmental program.
- Online Environmental Induction for all workers which introduces Epic Energy's EMS, environmental risks, documentation, responsibilities and implementation strategies

- Operations Field Induction, which includes an environmental component and provides a broad introduction to environmental risks and management requirements. All Epic Energy employees and contractors are required to complete the induction prior to engaging in field activities.
- Additional face to face training as required to address specific environmental issues or field based risks.

All Epic Energy staff are briefed on environmental responsibilities by line management prior to commencement of new activities.

Recruitment, selection and placement processes ensure that personnel with environmental responsibility have the required experience, knowledge and skills to undertake their position.

Environmental competency requirements and key accountabilities are defined for individual roles and included in position descriptions.

Communication

Continuous improvement to achieve best environmental practice requires effective liaison with local councils, government departments, industry associations (e.g. Australian Pipeline and Gas Association) and other gas utilities. This provides an opportunity to share expertise, co-ordinate efforts, and remain aware of new developments throughout the industry.

Where appropriate, documentation is maintained from meetings with regulatory agencies and key stakeholders. This includes:

- records of attendance
- agendas (including key discussion topics)
- issues discussed/minutes
- actions identified.

All landowner contact details, and other relevant information is maintained and updated on the Epic Energy Land Management System (LMS) known as X-Info Connect. Other details such as land-use, pipeline crossings, landholder concerns and issues are recorded on the LMS for future reference and reporting.

There is scheduled, formal contact with relevant landholders on an annual basis which complies with Australian Standard Pipelines – Gas and Liquid Petroleum, Part 3 Operation and Maintenance (AS 2885.3). Additional contact is conducted as required, or if there is perceived environmental risk. Landholder liaison involves discussion of relevant environmental issues or concerns. This ongoing process is designed to reduce the risk of third-party incidents and to encourage ownership of activities around the pipeline.

Internal meetings of Epic Energy workgroups foster discussion of environmental and safety issues and provide an opportunity for the dissemination of new technologies, standards, and procedures to all staff. Minutes of meetings are maintained, action items identified, and accountabilities assigned.

Documentation and operational controls

Epic Energy's environmental documentation supports the EMS and provides direction on environmental management. In addition to the Environmental and Land Access Policy and the 'planning' documents described above, Epic Energy has the following:

- Environmental Management System Overview Manual
- environmental procedures, work instructions and guidelines to address significant environmental aspects and ensure activities are undertaken consistently across the company;
- specific management plans such as weed management plans, Aboriginal Cultural Heritage Management Procedure
- Environmental Monitoring Program
- Environmental Audit Program.

Epic Energy aims to plan its operations to ensure consistency with its environmental policy, objectives and targets, by:

- establishing, implementing and maintaining processes and procedures to control situations where the absence of such measures could lead to deviation from the company's environmental policy, objectives and targets
- stipulating the company's required operating criteria in the procedures
- establishing, implementing and maintaining procedures related to the identified environmental aspects arising from Epic Energy environmental activities and relationships.

The identification of specific actions in documented procedures, work instructions, guidelines and management plans are based on:

- the consequences, including those to the environment, of not doing so
- the need to demonstrate compliance with legal and other requirements to which the organisation subscribes.

A Job Hazard Analysis (JHA) is also used to help personnel identify, analyse and manage the hazards that exist in the work they undertake. The JHA requires personnel to examine the task they are about to undertake and:

- break the job into separate, defined steps
- for each step, identify the potential hazards associated with that job step
- for each potential hazard, list the method to be followed to prevent the hazard causing an injury, loss, damage or environmental incident.

A JHA must be completed prior to the commencement of any task that has the potential to cause a significant adverse environmental or cultural impact (e.g. ground disturbance, vegetation clearing, handling hazardous materials and identified high risk activities).

Epic Energy's Environmental Monitoring Program and Environmental Audit Program are designed to measure compliance with regulatory requirements, SEO obligations, and the effectiveness of implemented procedures, work instructions, guidelines and management plans.

Emergency management

Crisis and emergency response plans have been developed and are in place for Epic Energy's pipeline systems and associated facilities. Resources are available to protect the public and environment in the event of an incident. The requirements of the crisis and emergency response plans are communicated to all relevant personnel.

6.1.4. Environmental monitoring program

Key characteristics of operations that can have a significant environmental impact are included in the Epic Energy Environmental Monitoring Program. The characteristics to be monitored are based on significant environmental aspects as per the risk assessment process, or regulatory requirements. The objectives of the monitoring program are:

- to assist in demonstrating compliance with regulatory requirements
- to measure performance against the Environmental Policy and SEO obligations.

Patrols

Regular patrols are undertaken to look for evidence of adverse environmental impacts from operations. The Environmental Advisor is advised of any issues requiring remediation.

Pre-work checklists

Pre-work checklists are used during excavation activities or land disturbance to ensure compliance with the requirements of internal procedures and work instructions. Copies are provided to the Environmental Advisor, with selected sites included in the Annual Environmental Monitoring Report.

Monitoring points

Environmental monitoring points are established along pipeline routes to maintain records of:

- different land systems and environmentally sensitive areas (e.g. vulnerable or actual soil erosion sites) along the route
- pre-disturbance and post-remediation condition of key areas along the route.

The location and interval for monitoring each of the points is maintained within the GIS database for future reference. A record is maintained of each of the Monitoring Points including a photograph and when the site was visited. Monitoring results are recorded in the Annual Environmental Monitoring Report.

Groundwater and soil contamination

Consultants are engaged as required, but at a minimum, every five years, to undertake environmental monitoring at Epic Energy facilities to monitor for groundwater contamination, bore water quality, soil contamination and water vapour contamination.

The purpose of the five yearly monitoring is twofold. First being to monitor any identified legacy contamination issues and continue with agreed remedial actions with the second element being to investigate and / or undertake remediation works if any ground and soil contamination issues arise.

Additional monitoring

Any additional site-specific monitoring requirements for new projects (e.g. resulting from a license or approval condition) are to be documented within a Project specific CEMP which will include accountabilities, review of results and reporting requirements. Once a pipeline or facility has been commissioned the relevant environmental information in the CEMP is to be included in the OEMP.

6.1.5. Environmental incidents

Epic Energy has an incident reporting and investigation process underpinned by the Incident Reporting and Investigation Procedure and managed within an online platform to:

- provide guidance and minimum requirements for incident notification and reporting
- ensure corrective actions have been identified to address each root cause and any other actions required to reinforce immediate controls
- enable final approval of the incident by the responsible manager.

All incidents are managed and recorded online. For non-emergencies, the Manager notifies the Environment Advisor and Risk and Compliance Advisor to determine the requirement for response and to provide relevant information to the regulatory bodies and Epic Energy management as required.

All significant incidents are investigated to identify root causes and / or contributing factors that need to be rectified in order to prevent recurrence.

Following the reporting and investigation of an incident, the relevant Manager is responsible for developing and implementing corrective actions to address the incident in a timely manner.

6.1.6. Auditing

The Epic Energy Environmental Audit Program assesses the implementation and effectiveness of the EMS and the management of significant environmental risks.

Regular inspections of all pipelines and facilities are completed to monitor the effectiveness of the defined control measures in minimising the environmental impacts of the activity.

Environmental compliance audits will be conducted on a recurring basis, so that at least one section of a pipeline is audited annually, with the audit criteria based on the relevant SEO.

Auditors are to be appropriately qualified and experienced in auditing environmental management systems including documentation and implementation. Each auditor shall complete a review of all relevant documentation, prior to undertaking the audit. This shall include the identification of key regulatory requirements, if an assessment of compliance to the requirements is to be included as part of the audit. Reference should also be made to the Compliance Register.

Audit results are to be discussed at the Health Safety and Environment (HSEC) Committee meeting, where the findings and recommendations will be used to determine the corrective actions required. Corrective Actions are managed and recorded online.

6.1.7. Review and improvement

The Epic Energy HSEC Committee meets regularly, providing a forum to manage, monitor and support the environmental objectives of the company and assists in setting the direction for environmental management, including:

- evaluating effectiveness of the EMS
- monitoring the Environmental Audit process
- reviewing changes to legislation and recommending updates to the EMS where required; and 14 S-1-101-ER-L-001 Environmental Impact Report
- ensuring that all corrective actions are addressed in a timely manner.

A regular review of the EMS shall be conducted to monitor overall effectiveness and determine areas for improvement. The review is to address as a minimum:

- the Environmental and Land Access Policy
- the relevance of the Key Environmental Objectives in light of changes to operations, legislation, industry best practice, results of audits and incidents/complaints
- progress of any recommended improvements, particularly the availability of resources to implement plans for the following year
- review of resourcing and the organisational structure for environmental management
- review of training needs with respect to environmental management
- the results from any audits with a focus on trends that require actioning
- trends from incidents or public comments
- efficiency of the EMS and recommendations for improvement.

The review will be used to inform changes to the EMS.

7. STAKEHOLDER CONSULTATION

7.1. Context for Community Engagement

As an experienced operator Epic Energy understands the importance of establishing credibility, trust and good relationships with the communities in which it operates and its responsibility to provide stakeholders with timely, accurate, accessible information.

Epic Energy is aware that the Whyalla and surrounding community is currently the focus of a number of significant projects ranging from the OHPSA Whyalla Hydrogen Facility and the Northern Water Project, to other proposed hydrogen-related and renewable energy projects. Epic Energy's engagement approach takes this into account when setting its engagement objectives and approach and ensuring that consultation is genuine, informative, targeted and responsive.

Epic Energy has worked closely with OHPSA to ensure that the community and interested stakeholders are fully informed, involved and able to actively contribute to the development of the Project and understand its role in the broader Whyalla Hydrogen Facility project. Epic Energy has already undertaken an extensive engagement program for the WHP environmental investigations and will continue with this approach during preparation of approvals documentation.

7.1.1. Engagement objectives

Epic Energy has adopted the principles and practices of the International Association for Public Participation to guide its consultation and engagement approach. Prior to commencing stakeholder consultation and engagement Epic Energy developed a Consultation and Engagement Plan to guide its approach to engagement with the engagement objectives being:

- collaboration with OHPSA and other delivery parties
- building genuine and respectful relationships to achieve a high level of awareness about the Project with stakeholders and community members
- encouraging participation and providing opportunities for stakeholders and community members to be involved
- communicating in a timely, clear, accessible, and easily understandable manner in respect of the Project
- demonstrating how community and stakeholder issues or concerns have been considered as the Project develops.

7.2. Stakeholder and Community Engagement

Epic Energy recognises the importance of public participation in developing and refining the Project. It has undertaken an extensive engagement program to ensure that the community and interested stakeholders are informed, involved and able to actively contribute to the development of the Project and during the preparation of the EIR and draft SEO.

7.2.1. Stakeholder identification

Commencing in March 2023, Epic Energy compiled a database of project stakeholders and identified those who have had and will continue to play an active part in the EIR process.

The identified stakeholders can be grouped into the following categories:

- community
- local business
- local government / associations and elected representatives
- government department and regulatory agencies
- identified landowners
- traditional owners
- infrastructure and utilities providers
- community interest and local business groups

Knowledge of stakeholders was also informed by data gathered during consultation and engagement activities.

7.2.2. Consultation methods

Epic Energy has used the methods outlined in Table 7-1 as part of consultation for the Project.

Table 7-1: Consultation Methods

Consultation Method	Details
Digital communications	
Website	• A Project specific webpage on Epic Energy's existing website contains up to date information and will be continually updated as the Project progresses. Website is: www.epicenergy.com.au
Social Media	• Promotion of community events including Community Drop-in sessions were advertised on the social media channels of OHPSA and the City of Whyalla.
Print communications	
Website Fact Sheets, FAQs and Brochures	• Fact sheets and other written communications have been developed to provide updates on the Project and provide specific information based on stakeholder feedback throughout the consultation period. • Fact sheets have been made available in hard copy at the OHPSA office in Whyalla, were available at the Community Drop in sessions and in soft copy on the Epic Energy website.
Media	• Media releases and media packs will be utilised at key project milestones (with the consent of OHPSA). • The Project has been promoted in the local media, including: o Industry Briefing sessions in November 2023 and February 2024 o Advertising of Community Information Sessions (Whyalla News, April 2024) o Whyalla News story
Direct engagement	
In person	• Meeting stakeholders face-to-face (in person or virtually) throughout the planning and development of the EIR.
Drop-ins	• Drop-in community information session(s) will be targeted at local residents, industry and people from the community.

Consultation Method	Details
	• Will include static displays and Project information on hand. • Will be hosted in an accessible public facility. • Drop-in Community Information Sessions were held in Whyalla on 10 and 11 April 2024.
1300 number	• A dedicated 1300 number has been set up for stakeholders to contact the Project team with any concerns or queries.
Community events	• Attending and participating in local events including supporting, exhibiting and contributing to community events where appropriate. • Epic Energy participated in the Industry Briefings held in Whyalla in November 2023 and February 2024.
Landowners	• Targeted consultation with directly affected and adjacent landowners has been undertaken. • Regular communication is maintained with landowners in accordance with their preferred communication method.

7.2.3. Early engagement activities and outcomes

Engagement activities undertaken since October 2023 have involved a broad range of stakeholders, community groups and individuals. Since the inception of the Project, Epic Energy has incorporated feedback from stakeholders and the community into the design of the Project and the pipeline alignment. By way of example, several revisions have been made to the pipeline alignment since the Project started in response to consultation and discussion with landowners and other stakeholders.

A summary of responses to issues raised in early engagement undertaken by Epic Energy prior to publishing of the EIR and SEO is included in Table 7-2. Table 7-3 provides a summary of early engagement activities.

Table 7-2: Summary of responses to early engagement

Issues Raised	Actions to Respond
Safety of hydrogen	• Early and clear engagement with stakeholders.
Confusion with other storage option for Hydrogen Jobs Plan	• Early and clear engagement with stakeholders which explains Epic Energy's role in the Hydrogen Jobs Plan project.
Cumulative impact of Major Projects in region	• Epic Energy is working with other project proponents in the area to ensure that we maximise opportunities to work collaboratively and to minimise community disturbance.
Workforce accommodation	• Working collaboratively with City of Whyalla and OPHSA to ensure adequate workforce accommodation is available during the HJP and Project construction and recognising the strain on local accommodation if adequate provision is not made.
Local employment and opportunity	• Epic Energy is committed to ensuring local industry is involved in project development. As part of our procurement process, we will require our partners and contractors to prioritise local procurement and employment where commercially competitive suppliers exist. Where available, local suppliers will also be prioritised for general bulk construction materials. • Early involvement of local Industry/local suppliers. • Epic Energy acknowledges that economic stimulation to the local area from the Project and the broader HJP is welcomed. The EIR assesses the social impact of increased economic activity in the local area generated by the Project including the opportunities for local employment.

Issues Raised	Actions to Respond
Concerns about the potential impact to Aboriginal cultural heritage	• Epic Energy will continue to engage with BDAC and will implement a Cultural Heritage Management Plan. • Epic Energy has revised the pipeline alignment to avoid or minimise impact to areas of significant cultural heritage sensitivity, in consultation with BDAC.
Management of land, cultural awareness, artefacts and opportunities for indigenous people	• Active and regular engagement with BDAC.
Concern over environmental impacts/ Real or perceived environmental or aesthetic impacts of the Project/ land rehabilitation	• Early engagement with stakeholders. • Clear promotion of environmental management systems, regulatory process. • Development of project maps, diagrams, images and other visuals (mitigate aesthetic concerns). • Epic Energy completed comprehensive ecological investigations for the EIR to inform measures to reduce or avoid the effects on listed, threatened and protected species in the Project area and along the pipeline route
Unforeseen health, safety or environmental incident(s) occurring	• Project Safety Management Plan. • Project Environment Management Plan. • Project Risk Assessment.

Table 7-3: Early engagement activities

Stakeholder /Group	Date	Method	Engagement activities / outcomes
Community			
Community	April 2024	Community Drop-in Sessions	• Two sessions held at the Whyalla Library. • Key areas of interest related to: o the opportunities for local businesses and employment o general interest - what is the Project about? how does the pipeline work? o land rehabilitation o any impact on False Bay shack owners • Overall sentiment of community members who attended was supportive of the Project.
	March / April 2024	Social Media	• Advertised community drop-in sessions on OHPSA and City of Whyalla socials.
	April 2024	News Media	• Advertised community drop-in sessions in local Whyalla News. • Story featured in respect of community drop-in session in local Whyalla News.
False Bay Shack Owners	April 2024	Email and Community Drop-in sessions	• Keen to understand whether the valve station at Port Bonython would be “operating” and noisy and to understand any impact during construction of the Project on the amenity of the shacks. • Advised that the valve station is not an “operating” station; there for maintenance purposes only; there will be noise and dust during construction but will be managed. • No further follow up required by attendees.
Local business			
Local Business	December 2023	Face to face	• Attended and presented at industry briefing on 12 December 2023 with local business and suppliers in attendance. • Key areas of interest related to the opportunities for local businesses and employment.
	February 2024	Face to face	• Attended and presented at industry briefing on 29 February 2024 with local business and suppliers in attendance. • Key areas of interest related to the opportunities for local businesses and employment.
South Australian Chamber of Mines and Energy	November 2023	Virtual meeting	• Introduction of proposed pipeline and Epic Energy as the proponent. • Key areas of interest related to the safety of hydrogen and location of pipeline.
SA-H2H Hydrogen Technology Cluster	December 2023	Face to face	• Introduction of proposed pipeline and Epic Energy as the proponent.

Stakeholder /Group	Date	Method	Engagement activities / outcomes
			• Key areas of interest related to the opportunities for local businesses and employment and the desire for the intellectual property and knowledge created from the Hydrogen Jobs Plan remaining in South Australia.
Industry Capability Network SA	Ongoing	Established ICN Gateway for Project from November 2023 to May 2024	• Not applicable.
Local government/ associations and elected representatives			
City of Whyalla Council	October 2023	Face to Face	• Epic Energy executive team met with CEO and Mayor
	Feb 2024	Email	• Introduction to Council; organising face to face meeting
	Feb 2024	Face to face	• Provision of project information/introduction of key project team members to Mayor/CEO
	Feb 2024	Face to face	• Provision of project information/introduction of key project team members to executive team of Council
	April 2024	Face to face	• Meeting with Director of City Growth about land access, community engagement and opportunities for Epic Energy to contribute to community/Council initiatives. • Working with Council on community initiatives and land available for laydown sites for project.
Eyre Peninsula Landscape Board	March 2024	Email	• Information pack on project provided. Email correspondence with Landscape Board. • Consider requirement for Water Affecting Permit for project.
Regional Development Australia Eyre Peninsula	February	Face to face	• Introduction of project to RDA; discussion regarding jobs/opportunities/other projects in the region • Invited to attend RDA Cultural Understanding for Recruitment and Retention Workshop
	March	Email	• Provision of information regarding workforce numbers and peak job numbers/schedule for construction
	March	Face to face	• Attendance at RDA Cultural Understanding for Recruitment and Retention Workshop in Whyalla
Eddie Hughes MP (State Member for Giles)	March 2024	Face to face	• Introduction of project team members and project. • Supportive of the Project.
Government departments and regulatory agencies			

Stakeholder /Group	Date	Method	Engagement activities / outcomes
Department for Climate Change, Energy, the Environment and Water (Commonwealth)	March 2024	Virtual meeting	• Pre-lodgement meeting for EPBC Referral • Referral background provided and Referral to be submitted as an action to the meeting via the EPBC/DCCEEW Portal
Department for Energy and Mining (SA)	Ongoing	Virtual meetings/face to face meetings; email	• Bi-monthly virtual and/or face to face meetings with Energy Regulation Division starting 17 November 2023 and ongoing engagement during preparation of PLA, EIR and SEO through to formal submission.
	March 2024	Face to face/virtual	• Attendance at Project HAZOP
	April 2024	Face to face/virtual	• Attendance at Project SMS Workshop
	February 2024	Email	• Introduction to Project
Department for Environment and Water (SA)	February 2024	Virtual Meeting	• Introduction to project; discussion of crown land process; discussion with respect of proposed route alignments
	April 2024	Virtual Meeting	• Discussion with respect to proposed crown land licence application for impacted crown land
Department for Infrastructure and Transport (SA)	February 2024	Virtual Meeting	• Introduction to project; discussion with respect to road crossing requirements; working in road reserves; land access to any DIT land
Office of Hydrogen Power SA	Ongoing	Email; virtual meetings; face to face meetings; phone calls	• Ongoing reporting to OHPSA as lead proponent for the Hydrogen Jobs Plan.
Primary Industries and Regions SA	April 2024	Attendance at community drop in session and engagement post sessions	• Discussion around jobs and opportunities for local business
Environment Protection Authority South Australia	Pending	Virtual meeting	• Agency advice will be sought by DEM as part of the pipeline licence application process.
Aboriginal Affairs and Reconciliation in the Attorney General's Department (AGD-AAR)	March 2024	Virtual meeting	• Meeting held to introduce project and to discuss consultation and engagement with Aboriginal groups and representatives.

Stakeholder /Group	Date	Method	Engagement activities / outcomes
Department of Defence (Commonwealth)	April 2024	Email (via OHPSA)	• Request made to meet to introduce proposed pipeline given proximity to Cultana Defence Training Ground. • No meeting organised yet.
Infrastructure SA	February 2024	Face to face	• Part of industry briefing where Epic Energy presented – discussion with CEO post briefing.
Identified Landowners			
OneSteel	December 2023	Email and phone	• Service of notice of entry
	February 2024	Email	• Request for meeting to discuss proposed pipeline alignment.
	March 2024	Virtual meeting	• Meeting to discuss proposed pipeline alignment and access to OneSteel parcel. • GIS maps provided of proposed pipeline alignments. OneSteel requested meeting be organised with ElectraNet and OneSteel to confirm ability to cohabitate relevant area on OneSteel parcel.
	April 2024	Virtual meeting	• Meeting held with OneSteel and ElectraNet. • Epic Energy to provide draft Easement documentation to OneSteel for review.
	April 2024	Email and phone	• Contact made to advise of proposed geotechnical survey work on relevant land.
	April 2024	Email	• Draft easement documentation and mapping provided.
	Ongoing	Email and virtual meeting	• Ongoing engagement regarding pipeline alignment, collaboration of project proponents
Minister for Environment and Water (Crown Land)	December 2023	Email and phone	• Service of notice of entry
	February 2024	Virtual Meeting	• Introduction to project; discussion of crown land process; discussion with respect of proposed route alignments
	April 2024	Virtual Meeting	• Discussion with respect to proposed crown land licence application for impacted crown land. • Epic Energy to submit crown land licence application.
	Ongoing	Emails and phone	• Ongoing engagement regarding pipeline alignment
Minister for Infrastructure and Transport (Crown Land)	As above	As above	• As per above for Minister for Environment – application to be made to include impacted land held by Minister for Infrastructure and Transport
Barngarla Determination Aboriginal Corporation (BDAC)	December 2023	Email	• Service of Notices of Entry in relation to impacted land
	February 2024	Email and phone	• Service of additional Notices of Entry in relation to impacted land; discussion with Norman Waterhouse regarding land access/native title/cultural heritage

Stakeholder /Group	Date	Method	Engagement activities / outcomes
	April 2024	Face to face	• Preliminary Cultural heritage monitoring on country with BDAC representatives
	May 2024	Face to face	• Formal cultural heritage survey on country with BDAC and Epic Energy representatives
	September/October 2024	Face to face	• Cultural heritage monitoring on country with BDAC representatives
	Ongoing	Email; phone	• Ongoing email and phone engagement with Norman Waterhouse on behalf of BDAC in respect of required statutory consents/indigenous land use agreements and other agreements
Australian Rail Track Corporation	December 2023	Email	• Service of notice of entry
	February 2024	Virtual meeting and email correspondence	• Engagement regarding proposed rail crossings and working near its railway infrastructure. • Information shared between parties to be incorporated into final detailed design of pipeline.
	April 2024	Virtual meeting	• Meeting with ARTC and A regarding crossing requirements • Information shared between parties to be incorporated into final detailed design of pipeline.
	April 2024	Email	• Email re land access in respect of relevant land
	Ongoing	Email	• Tenure discussions and negotiation of appropriate tenure agreement
Private Landowners	December 2023 and February 2024	Email	• Service of notices of entry. • No further feedback received. • Contact to be made by postal address to discuss land access requirements during construction only.
Traditional Owners			
Barngarla Determination Aboriginal Corporation (BDAC)	December 2023	Email and presentation pack (via OHPSA)	• Introduction of Project; presentation of 4 alternative pipeline route alignments to initial proposed route
	January 2024	Email and presentation pack (via OHPSA)	• Presentation of revised pipeline route alignments (revising 5 routes to 3 proposed routes); outcome of MCDA assessment process; request for cultural heritage monitors for geotechnical investigations

Stakeholder /Group	Date	Method	Engagement activities / outcomes
	February 2024	Phone and email	• Phone call and emails about proposed route alignments. • Feedback received that BDAC gratefully acknowledged the change in alignment to avoid CH areas of sensitivity in the salt pans and that it was happy to work with Epic Energy in respect of either Routes 2A or 2B.
	March 2024	Phone and email	• Phone calls and emails in respect of indigenous land use agreements, the engagement of CH monitors and the completion of a CH survey of the proposed route alignments.
	April 2024	Emails; phone calls and Alignment visit	• Cultural Heritage Survey team engagement and completion of Cultural Heritage survey with BDAC cultural heritage team. • Facilitated CH clearance for geotechnical investigations to be conducted.
	April 2024	Emails; phone calls and Alignment visit	• Cultural Heritage Monitoring during geotechnical investigations. • Geotechnical investigations being able to be completed with CH monitors in attendance.
	September/October 2024	Face to face	• Cultural heritage monitoring
	Ongoing	Emails, phone calls	• Ongoing engagement in respect of pipeline alignment, tenure arrangements, cultural heritage
Local Indigenous Businesses and Contractors	February 2024	Face to face	• Met with a number of indigenous businesses and contractors at the Industry Briefing on 29 February 2024 who are keen to be involved in the Project. • Recommended these businesses log their expressions of interest using the ICN Gateway for the pipeline project.
	March/April 2024	Phone	• Discussions with indigenous businesses and contractors about potential opportunities with respect of land rehabilitation post construction. • Ongoing discussion as rehabilitation plan is formulated.
Infrastructure and utility providers			
Santos (owner of Santos Moomba-Port Bonython Liquids Line)	April 2024	Virtual meeting	• Meeting to introduce Project. • Supportive of Project.
Amp Energy (proponent of Yoorndoo Ilga Solar Farm)	February 2024	Virtual meeting	• Meeting to introduce project and discuss proposed pipeline alignments. • To provide GIS mapping of proposed pipeline alignments and receive GIS mapping of panel layout and boundaries of YIS solar farm.

Stakeholder /Group	Date	Method	Engagement activities / outcomes
	February 2024	Email	• Mapping shared.
	February 2024	Virtual meeting	• Further discussion around cohabitation of projects.
	March 2024	Email	• Follow up on pipeline alignments. • No further feedback received from AMP Energy.
	August and September2024	Virtual meetings	• Further discussion around interfaces between two projects
SIMEC Energy (proponent of Cultana Solar Farm)	January 2024	Virtual meeting	• Engagement with SIMEC as the proponent of the Cultana Solar Farm and discussion of proposed route alignments. • Happy to work with Epic Energy and preliminary view was that no issues with pipeline being adjacent to solar farm.
	January 2024	Virtual meeting	• Engagement re use of port operated by SIMEC • Ongoing discussions regarding port use.
	January 2024	Virtual meetings	• Engagement re lateral alignment • No further engagement on this item.
	November 2024	Email	• Engagement re pipeline alignment
ElectraNet (electricity transmission infrastructure provider)	February 2024	Virtual meeting	• Introduced project and proposed pipeline alignments. Agreed to information sharing to ensure both parties informed of proposed works. • Feedback received that proposed Route2C is unworkable having regard to ElectraNet electricity infrastructure to be in same corridor. Decision made to drop Route 2C post this meeting.
	April 2024	Virtual meeting	• Meeting held with ElectraNet and OneSteel to confirm electricity infrastructure proposed on same relevant land parcel. • ElectraNet to confirm by email that ok with proposed pipeline alignment through OneSteel parcel.
ARTC	February 2024	Virtual meeting/emails	• Ongoing engagement with ARTC in respect of proposed rail crossings and working near its railway infrastructure. • Crossing requirements have been provided and will be included in final design.
SA Water	February 2024	Virtual meeting/emails	• Ongoing engagement in respect of co-habitation with water infrastructure and water requirements for the Project.
SA Power Networks	February 2024	Email	• Multiple emails requesting meeting but no response received.

Stakeholder /Group	Date	Method	Engagement activities / outcomes
			• No feedback has been received.
AARNet	February 2024	BYDA and email	• Multiple emails requesting meeting. • Crossing requirements have been provided and will be included in final design.

7.3. Consultation on EIR and SEO

Epic Energy published the EIR and SEO on its website and provided electronic versions to key government agencies and stakeholders, to provide feedback, in December 2024.

Note: This section will be completed following consultation on the EIR and SEO by Epic Energy and will include information on what consultation was undertaken. A summary of issues raised and Epic Energy's responses will be provided in Appendix H.

Following Epic Energy's consultation, the EIR and SEO will be updated as required to address any feedback and a revised version submitted to DEM. Any subsequent feedback as a result of DEM's formal consultation under the ER Act (see Section 2.1.5) will then be incorporated into a final version of the EIR and SEO. A summary of issues raised and Epic Energy's responses will be provided in Appendix I.

7.4. Ongoing Engagement

Epic Energy is committed to continuing to inform, consult and involve community members and stakeholders during the next phase of the Project.

Once all required approvals are obtained, the Project would start to prepare for construction. During the construction phase, one of the key priorities for Epic Energy would be to inform the community and key stakeholders of construction timing, associated activities and how they will be managed prior to works commencing. Epic Energy proposes to undertake the following communications and engagement activities during the construction phase of the Project:

- ongoing communications via project updates and newsletters, website information and email updates
- responding to phone enquiries
- community information sessions
- provision of community information at the OHPSA office in Whyalla.

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