



Bulloo Interlink Pipeline

Environmental Authority

Air Quality Impact Assessment

APA Bulloo Interlink Pipeline Pty Ltd

June 2026



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Executive summary

Project overview

APA Bulloo Interlink Pipeline Pty Ltd (APA), which is part of the APA group of companies (the APA Group), is planning to develop the Bulloo Interlink Pipeline, an underground high-pressure gas pipeline linking the South West Queensland Pipeline in Queensland with the Moomba to Wilton Pipeline in New South Wales (NSW). The Queensland section of the Bulloo Interlink Pipeline (referred to as 'the project' for the purposes of this document) is approximately 236 kilometres (km) long. Overall, the pipeline has a total length of approximately 339 km and will provide a more direct route for natural gas to travel from Australia's northern production areas to southern gas markets.

This report

This report has been prepared by GHD Pty Ltd (GHD) as part of the Environmental Authority (EA) for the project. The EA supports an application for approval of the project in accordance with the *Environmental Protection Act 1994* (Qld) (EP Act).

This report assesses the potential air quality impacts of the project in accordance with the environmental assessment requirements of the *Application requirements for petroleum activities guidelines* (DESI, 2024).

Existing environment

Key characteristics and data relevant to the study area for the air quality assessment include:

- Sensitive receptors:
 - Sixteen sensitive receptors have been identified within the study area. The nearest receptor, an unoccupied house (Kihee) is located approximately 254 metres (m) from the project site.
 - The temporary accommodation facilities, although project-related, have been included as a conservative approach.
- Background air quality: Data was collected from the nearest air quality monitoring station located at Tibooburra Airport in NSW. Particulate concentrations between 2020 and 2024 were typically well below relevant air quality objectives. Elevated particulate levels occurred mainly in 2020, associated with short-term dust and smoke events, with only isolated exceedances recorded in subsequent years.
- Existing sources of air pollutants: No facilities reported particulate matter (PM) emissions to the National Pollutant Inventory (NPI) during the 2023–2024 financial year and no other projects will be in construction within the study area.
- Climate and meteorology: Data was collected from the surrounding automatic weather stations (AWS). The predominant annual average wind direction is from the south-southeast, with an average wind speed of 17 kilometres per hour (km/h) at the nearest AWS, located at Tibooburra Airport.

Impacts from the project during construction

Dust generation during construction was identified as the primary potential air quality impact of the project. Accordingly, construction-phase dust impacts were assessed using a qualitative, risk-based approach in accordance with the Institute of Air Quality Management (IAQM) Guidance. The assessment considered the nature and scale of construction activities, the proximity and sensitivity of nearby receptors, and prevailing site conditions.

The IAQM assessment indicates a low pre-mitigation risk for all activities in relation to the potential for dust soiling, human health and ecological impacts. Although the outcomes of the assessment show a low risk of potential dust impacts, suitable mitigation and management measures will be implemented during construction to reduce the risk of impact.

Construction activities will produce diesel exhaust from equipment and vehicles, and from generators used at the temporary accommodation facilities. These emissions will be intermittent, localised, and limited to the construction period. The generators are small and temporary, so emissions are expected to disperse effectively and not affect air quality at sensitive receptors. Mitigation measures will be employed to minimise emissions, and overall, construction is not anticipated to cause significant air quality impacts.

Impacts from the project during operation

The pipeline will operate as a sealed, closed system with no point source or fugitive emissions during normal operation. Minor gas releases associated with infrequent internal cleaning (approximately once per year) will be small in volume and generate negligible emissions, with no associated odour as the gas is not odourised. Vehicle access for routine maintenance will result in minor, infrequent combustion emissions that will not affect local air quality.

No detailed operational air quality or odour assessment was required, and the project is expected to comply with relevant air quality legislation.

Impacts from the project during decommissioning

Decommissioning activities may affect air quality through emissions from diesel-powered machinery, dust from minor earthworks, and potential release or combustion of residual gas. Potential impacts will vary depending on site-specific conditions and will be managed through the decommissioning environmental management plan, which will define appropriate controls such as timing, equipment selection and monitoring to minimise emissions.

No adverse effects on air quality are expected.

Recommended mitigation and management measures

Management measures will be included in the Construction Environmental Management Plan (CEMP) and will be implemented to minimise dust and mitigate the potential impacts of construction on local air quality, human and ecological receptors to reduce the risk of impacts.

Acronyms and abbreviations

Acronym/abbreviation	Definition
µg	Micrograms
µm	Micrometres
Air NEPM	National Environment Protection (Ambient Air Quality) Measure 2021
APA	APA Group Pty Ltd
AQMS	Air quality monitoring station
AS 2885	<i>AS 2885 Pipelines – Gas and Liquid Petroleum series of standards</i>
AWS	Automated weather station
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
EA	Environmental authority
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EPP Air	<i>Environmental Protection (Air) Policy 2019</i>
ha	Hectares
HDD	Horizontal directional drilling
HDV	Heavy duty vehicle
IAQM	Institute of Air Quality Management
km	Kilometres
L	Litres
m	Metres
m ²	Square metres
m ³	Cubic metres
m/s	Metres per second
ML	Megalitres
mm	Millimetres
NATA	National Association of Testing Authorities
NEPC	National Environment Protection Council
NPI	National Pollutant Inventory
NSW	New South Wales
PM	Particulate matter
PM _{2.5}	Particulate matter (airborne dust) with a size of 2.5 micrograms
PM ₁₀	Particulate matter (airborne dust) with a size of 10 micrograms
RoW	Right of way
SEA	Strategic Environmental Area
TSP	Total suspended particulates

Glossary

Term	Definition
Construction footprint	The construction right of way (CRoW) and other areas of the project site that would be used to construct the project (including ancillary facilities, compounds and laydown areas). Encompasses some areas already leased by APA for existing operations.
Construction right of way (CRoW)	The area that would be directly disturbed to construct the pipeline within the project site (includes the trench, temporary storage areas and construction manoeuvring areas). The nominal corridor width is up to 40 m.
Pipeline alignment	The pipeline centreline.
Pipeline easement (the easement)	The permanent operational easement for the project that would be established to facilitate ongoing access and maintenance. Allows the pipeline operator a legal right to enter land to construct, operate and maintain the pipeline. It is registered on the underlying land title and remains on title. The nominal easement width for the project is 30 m.
Project	The project includes constructing, operating (including maintaining) and decommissioning approximately 236 kilometres of underground natural gas transmission pipeline located in Queensland, and associated above ground infrastructure to connect to the South West Queensland Pipeline.
Project site	The term 'project site' is used to refer to the land required to construct, operate (including maintain) and decommission the project, and defines the extent of land subject to project approval. The project site comprises the 40 m wide CRoW, within which the permanent easement and surface operational facilities would be located. It also includes additional land required outside the CRoW for temporary and ancillary facilities, including construction compounds, temporary workspaces, temporary accommodation facilities, access track works, and land required to support the project's water servicing strategy.
Stockpile	The project will have two main stockpile locations in Queensland which will serve as the primary pipe and material storage locations, and contractor office locations.
Study area	The full extent of land with the potential to be directly or indirectly affected by the project (e.g. by noise and vibration, visual or traffic impacts), assessed for environmental values, including the project site, and surrounding context. The 'study area', for the purposes of this report, consists of a 2 km buffer around the project site, including proposed new/upgraded access tracks, roads and intersections. This area is considered sufficient to capture potential construction air quality impacts from the project.
Sensitive receptors	A location where people are likely to work or reside, these may include a dwelling, school, hospital, office or public recreational area.
Track-out	Dirt, mud or other debris tracked onto a paved public roadway by a vehicle leaving a construction site, as well as suspension of dust from movement of vehicles on unpaved roads.
Trenching	Excavation of a trench for burial of a pipeline.

1. Introduction

1.1 Project overview

APA Bulloo Interlink Pipeline Pty Ltd (APA), which is part of the APA group of companies (the APA Group) is planning to develop the Bulloo Interlink Pipeline, an underground high-pressure gas pipeline that will link the South West Queensland Pipeline in Queensland with the Moomba to Wilton Pipeline in New South Wales (NSW).

The Bulloo Interlink Pipeline includes an approximately 236-kilometre (km) long section in Queensland, which will provide a more direct route for natural gas to travel from Australia's northern production areas to southern gas markets. The pipeline has a total length of approximately 339 km, comprising about 103 km in NSW.

The section of the Bulloo Interlink Pipeline located in Queensland (referred to as 'the project' for the purposes of this document) will require an environmental authority (EA) under the *Environmental Protection Act 1994* (Qld) (EP Act). Approval for the NSW section of the Bulloo Interlink Pipeline will be sought under a separate approval process in accordance with NSW legislation and approval requirements.

1.1.1 Location

The project is located within the Bulloo Shire local government area in the vicinity of the Noccundra township within the traditional Country of the Wangkumarra People and Kullilli People. The project site extends south from the tie-in point with the South West Queensland Pipeline for about 186 km, then traverses south-west for about 30 km, and south about 20 km to the Queensland–NSW border. The project location and key project features are shown in Figure 1.1.

1.1.2 Key project features

The project will be designed, constructed and operated in accordance with the *AS 2885 Pipelines – Gas and Liquid Petroleum* series of standards (AS 2885) and the Australian Pipelines and Gas Association (APGA) *Code of Environmental Practice – Onshore Pipelines* (APGA Code of Environmental Practice) (APGA, 2022).

The key operational features of the project include:

- an underground high pressure, steel gas transmission pipeline with a length of about 236 km
- a permanent easement of up to 30 metres (m)
- supporting surface infrastructure, including:
 - beginning of line facility, including a connection to the South West Queensland Pipeline
 - temperature control station, including main line valve
 - cathodic protection units
 - main line valve
 - pipeline marker signs
 - permanent access tracks.

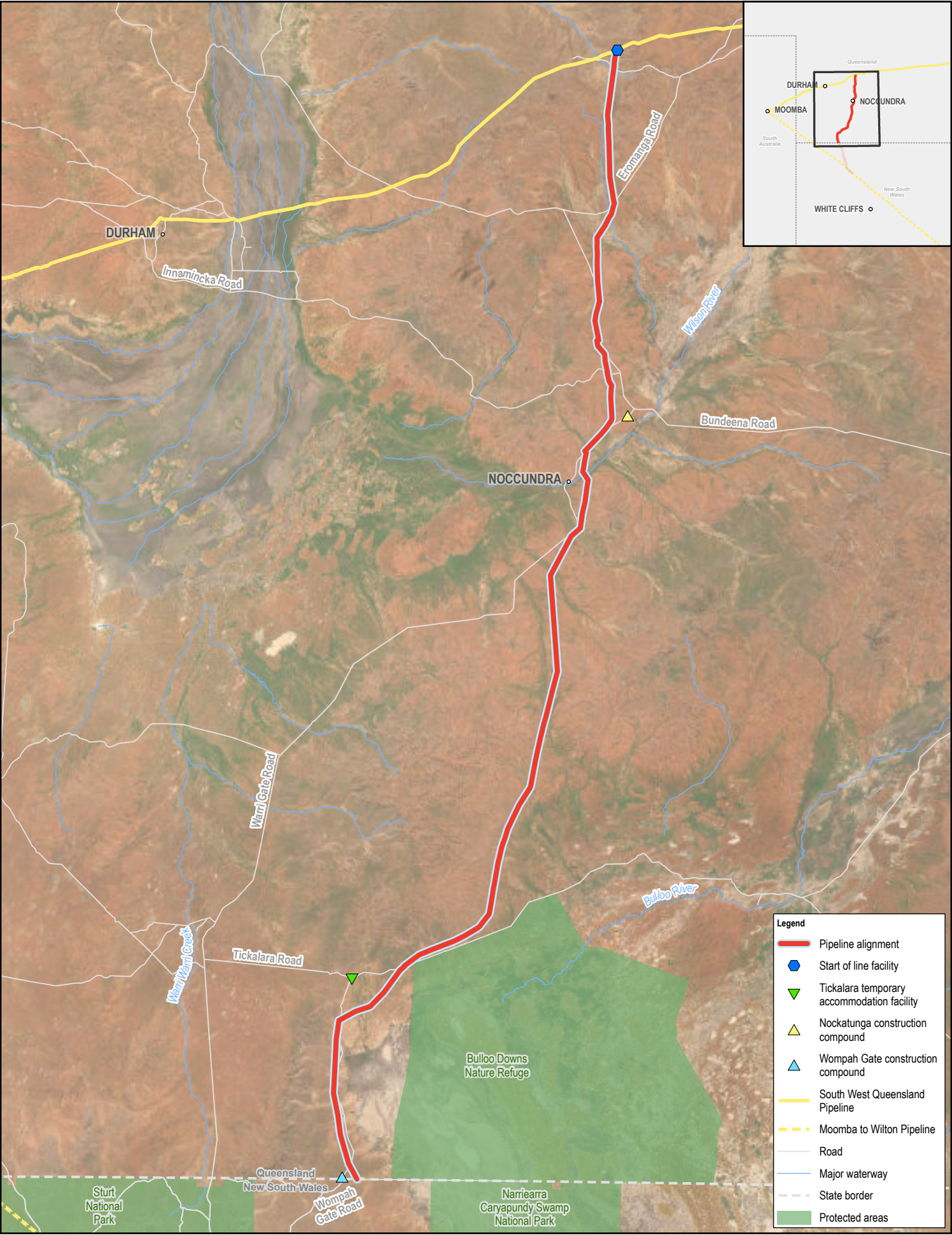
An approximately 40 m wide CRoW will be established to facilitate construction and access.

Key ancillary facilities and infrastructure outside the CRoW would include:

- a temporary accommodation facility located at the intersection of Wompah Gate Road and Tickalara Road
- a construction compound facility to stockpile line pipe located on Wompah Gate Road near the southern end of the project site.

Smaller temporary workspaces are also proposed at regular intervals along the CRoW to support construction activities.

Further information on the project's features and indicative construction methodology is provided in Chapter 4 (Project description) of the Environmental Authority Supporting Information Report.



1.2 Purpose and scope of this report

This report assesses the potential air quality impacts of the project in accordance with the environmental assessment requirements of the *Application requirements for petroleum activities* guidelines (DESI, 2024). This report:

- describes the existing environment with respect to air quality
- assesses the impacts of constructing, operating and decommissioning the project in relation to air quality
- recommends measures to mitigate and manage the impacts identified.

1.3 Report structure and content

The structure and content of this report are outlined in Table 1.1.

Table 1.1 *Structure and content of this report*

Section	Description
Section 1 – Introduction	Outlines the key elements of the project, relevant requirements, and the purpose of this report (this section).
Section 2 – Methodology	Describes the study area, potential emissions to air, regulatory framework and methodology for the assessment.
Section 3 – Existing environment	Describes the existing environmental values of the study area and project site relevant to air quality.
Section 4 – Construction impacts	Examines the potential for air quality impacts during construction.
Section 5 – Operational impacts	Examines the potential for air quality impacts during operation.
Section 6 – Cumulative impacts	Provides an assessment of cumulative impacts.
Section 7 – Decommissioning impacts	Examines the potential for air quality impacts during decommissioning.
Section 8 – Recommended mitigation and management measures	Recommends measures to mitigate and manage the potential impacts identified.
Section 9 – Conclusion	Provides the key findings of the assessment.

1.4 Limitations

This report has been prepared by GHD for APA Bulloo Interlink Pipeline Pty Ltd and may only be used and relied on by APA Bulloo Interlink Pipeline Pty Ltd for the purpose agreed between GHD and APA Bulloo Interlink Pipeline Pty Ltd as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than APA Bulloo Interlink Pipeline Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations and assumptions set out in this report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

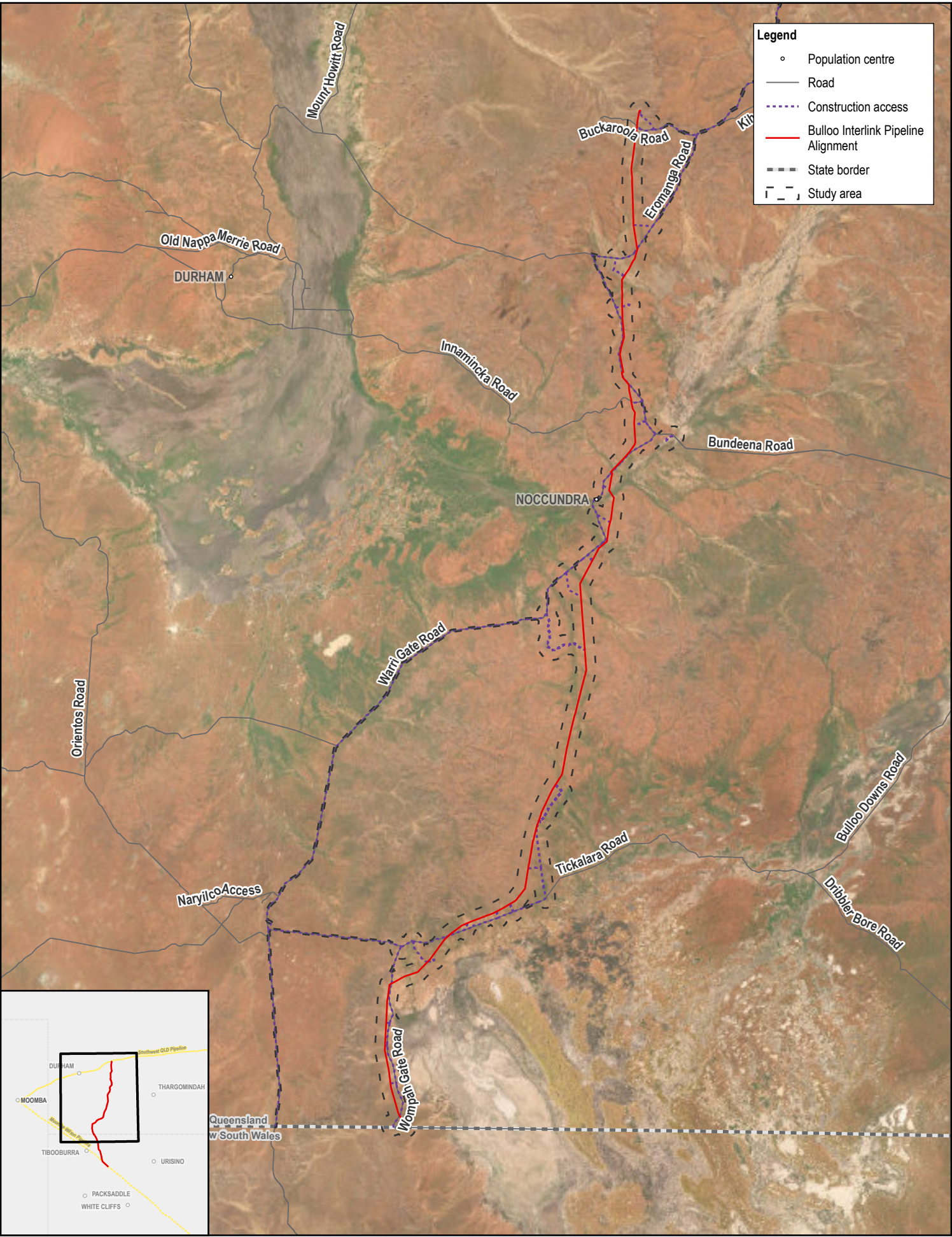
2. Methodology

2.1 Study area

The study area for the assessment consists of the following:

- A 2 km radius around the project site excluding proposed new/upgraded access tracks, roads and intersections.
- A 1 km radius around proposed new/upgraded access tracks, roads and intersections. This reduced radius is applied based on the anticipated reduced amount of works associated with upgrades to roads and tracks compared with works along the CRoW. In most areas of road and track works, works would be close to the CRoW such that the works area falls within the 2 km buffer.
- A 250 m radius around unsealed access tracks and roads that would be used by construction vehicles. This buffer distance has been adopted based on the distance from site entrances for which an assessment is required as per the IAQM Guidance (250 m).

These areas are considered sufficient to capture potential air quality (including any odour impacts) on sensitive receptors and are shown in Figure 2.1.



2.2 Legislative context and guidance

Guidelines and regulations relevant to the assessment are listed in Table 2.1. The assessment criteria and methodology for the assessment, developed in accordance with these requirements and guidelines, are provided in sections 2.3 and 2.4, respectively.

Table 2.1 Guidelines and regulations relevant to air quality impact assessment

Guidelines and regulations	Description
<i>Environmental Protection Act 1994 (Qld) (EP Act)</i>	The EP Act provides the framework for environmental assessments in Queensland, applicable to all community members, industries, and government bodies. The EP Act enables government departments to integrate environmental considerations into decision-making processes. The EP Act regulates impacts on the environment by establishing a framework of environmental values, environmental harm, and environmental nuisance.
<i>Environmental Protection (Air) Policy 2019 (Qld) (EPP Air)</i>	The purpose of the EPP Air is to identify the environmental values of the air environment that require protection or enhancement, to define the indicators and air quality objectives used to safeguard those values, and to provide a consistent, equitable and informed framework for decision-making in the management and assessment of air quality across Queensland. This policy and the EP Act work together to manage air quality in Queensland.
<i>Environmental Protection (Air) Amendment Policy 2024 (Qld)</i>	The relevant objective of the Environmental Protection (Air) Amendment Policy 2024 is to amend the air quality objectives for nitrogen dioxide, ozone, sulphur dioxide and PM _{2.5} to allow Queensland to remain consistent with the national standards under the National Environment Protection (Ambient Air Quality) Measure 2021.
<i>National Environment Protection (Ambient Air Quality) Measure 2021 (Air NEPM)</i>	The National Environment Protection Council of Environmental Ministers, now the National Environment Protection Council (NEPC), set uniform national standards for ambient air quality in May 2021. This is known as the Air NEPM. The Air NEPM sets non-binding standards and goals (for 2025). The Air NEPM contains goals for the identified relevant pollutants inclusive of particulates and concentration limits, averaging periods and number of allowed exceedances for each of the identified pollutants.
<i>Application requirements for activities with impacts to air (ESR/2015/1840) (DETSI, 2025)</i>	The guideline outlines how proponents of environmentally relevant activities must identify and assess potential air quality impacts as part of the application process. It provides direction on evaluating the environmental values of the receiving air environment, assessing the risks and potential impacts of proposed air emissions, and demonstrating appropriate mitigation measures to protect those values.
<i>Information sheet – Considering environmental requirements early in petroleum activity planning (ESR/2016/2357) (DETSI, 2024)</i>	This information sheet provides general advice regarding ways to avoid adverse outcomes when undertaking petroleum or gas activities by considering environmental regulatory obligations early in the planning process. The advice relates to petroleum activities that are environmentally relevant as defined in the EP Act.
<i>Assessment of dust from demolition and construction (IAQM Guidance) (IAQM, 2024)</i>	This document, developed by the Institute of Air Quality Management (IAQM), is designed to provide guidance for developers, their consultants and environmental health practitioners on how to undertake a construction dust impact assessment (including demolition and earthworks as appropriate). It is an industry-accepted contemporary guidance which has been used for a number of large projects across Australia.

2.3 Assessment criteria

Assessment criteria for the project were adopted from the guidelines and regulations described in section 2.2. The objective of the criteria is ambient air quality that minimises the risk of adverse health impacts from exposure to air pollution. There is an obligation during construction and operation of the project to comply with the criteria.

Relevant assessment criteria for the primary pollutants associated with the construction and decommissioning of the project are presented in Table 2.2. Pollutants were selected based on identified emitters in section 2.4, and include 2.5 micrometre (μm) and 10 μm diameter fractions of particulate matter ($\text{PM}_{2.5}$ and PM_{10} , respectively), total suspended particulate matter (TSP) and dust deposition.

Table 2.2 Air quality impact assessment criteria

Pollutant	Averaging period	Concentration	Unit	Source
$\text{PM}_{2.5}$	24 hours	25	$\mu\text{g}/\text{m}^3$	EPP Air
	Annual	8	$\mu\text{g}/\text{m}^3$	EPP Air
PM_{10}	24 hours	50	$\mu\text{g}/\text{m}^3$	EPP Air
	Annual	25	$\mu\text{g}/\text{m}^3$	EPP Air
TSP	Annual	90	$\mu\text{g}/\text{m}^3$	EPP Air
Dust deposition	1 month	120	$\text{g}/\text{m}^2/\text{month}$	ESR/2015/1840 (DETSI, 2025)

2.4 Assessment methodology

2.4.1 Tasks

The following methodology was used to assess the potential for air quality impacts and identification of sensitive receptors:

- confirming the study area for the assessment (see section 2.1)
- identifying sensitive receptors (human and ecological receptors) using aerial imagery in accordance with the IAQM Guidance and the *Application requirements for activities with impacts to air* (DETSI, 2025) (refer to section 3.2)
- reviewing existing regional ambient air quality and meteorology, including data obtained by the Australian Bureau of Meteorology (BoM) weather stations, Rural Air Quality Monitoring Network weather stations and NSW Department of Climate Change, Energy, the Environment and Water Air Quality Monitoring Stations (AQMS) (refer to sections 3.1 and 3.3)
- reviewing emissions from typical construction activities associated with the project and assessing the potential for air quality impacts at sensitive receivers by undertaking:
 - an assessment of potential dust impacts with reference to IAQM Guidance (see section 4.1)
 - consideration of the potential for odour impacts (see section 2.4.4)
 - a qualitative assessment of exhaust emissions from vehicles, plant and machinery based on the indicative construction methodology presented in Chapter 4 of the Environmental Authority Supporting Information Report (see section 4.2)
- a qualitative consideration of the potential for operational, decommissioning and cumulative impacts (refer to sections 5, 6 and 7)
- recommending reasonable and feasible air quality mitigation and management measures (refer to section 8).

Further information on key tasks, in particular how the IAQM Guidance has been applied to the assessment, is provided below.

2.4.2 Air quality – construction dust

The main source of potential air quality impacts for the project is dust emissions during construction. Conducting a quantitative modelling assessment to estimate potential dust emissions from construction activities requires numerous assumptions to calculate particulate emission rates for model inputs. However, the inherent uncertainties in such analyses limit their practical value, as they do not directly aid in identifying air quality control measures for effective risk management.

Given this, a qualitative, risk-based assessment has been conducted using available information to determine which construction activities could lead to off-site air quality impacts if not properly controlled. This approach enables suitable mitigation measures to be identified and integrated into the project design and relevant environmental management plans.

To assess construction phase impacts, the methodology outlined in the IAQM Guidance (IAQM, 2024) has been applied. Developed by the IAQM, this framework provides a structured qualitative assessment method. Minor modifications have been made to adapt the methodology to Australian conditions. The risk assessment and adopted assumptions are detailed in Appendix A. The approach outlined in the IAQM Guidance follows a four-step process to evaluate potential dust impacts from construction activities:

- **Step 1** is to screen the requirements for an assessment. Receptors are identified through the analysis of aerial imagery. Further assessment is required where there is:
 - a human receptor within:
 - 250 m of the site boundary; and/or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
 - an ecological receptor within:
 - 50 m of the site boundary; or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
- **Step 2** is to assess the risk of dust impacts with no mitigation applied. This is done separately for each of the dust-generating activities (e.g. demolition, earthworks, construction, and track-out) and consists of three sub-steps:
 - define the potential dust emission magnitude (Step 2a)
 - define the sensitivity of the area (Step 2b)
 - define the risk of unmitigated impacts (Step 2c).
- **Step 3** is to determine site-specific mitigation (in addition to basic project controls) for each of the four potential dust generating activities in Step 2.
- **Step 4** is to examine the residual effects and to determine whether these are significant.

Activities used for the assessment

Construction works for the project were grouped into three activities with the potential to create dust emissions:

- **Earthworks** – this would include vegetation removal, topsoil removal and stockpiling, backfill and site restoration. This includes works associated with road, track and intersection upgrades and establishment of new access tracks.
- **Construction** – all onsite pipeline installation activities and associated ancillary and surface facilities, including pipe handling and installation works, the temporary accommodation facility, and supporting infrastructure (including beginning of line facilities, mainline valves, temperature control stations and anode beds).
- **Track-out** – this would include movement of vehicles along unsealed access tracks and roads that could suspend dust (including both existing and proposed new/upgraded access tracks) and transport of dust and dirt from the project site onto the public road network (a broader definition of track-out compared to that used by the IAQM Guidance has been applied to capture the main potential dust impacts associated with vehicle movements).

These activities are assessed individually, because they would not necessarily occur at the same time at a single location. No demolition is required during the construction phase of the project.

2.4.3 Air quality – other

Other potential air emissions include exhaust emissions from diesel-powered plant, generators within the CRow and temporary accommodation facilities, and emissions from heavy and light vehicle movements and mobile construction machinery. These emissions have been qualitatively considered.

No significant stationary sources of air pollutants were identified during normal operations. Small, short-duration releases of methane associated with internal pipeline cleaning, estimated at approximately two cubic metres (m³) per event would occur on average once per year. These releases are anticipated to have minimal impact on the surrounding environment.

Vehicle access for pipeline maintenance would involve some combustion emissions; however, due to the low frequency these would not affect the local air quality.

2.4.4 Odour

Given the existing environment (agricultural grazing land), the key potential source of odour would be excavation of any odorous soils or materials such as contaminated soils or acid sulphate soils. Information on the existing soils environment is provided in Chapter 7 of the Environmental Authority Supporting Information Report. It is not anticipated that construction would encounter quantities of contaminated material, acid sulfate soils or other potentially odorous materials such that odour would be generated. Gas within the pipeline would not be odourised, and no emissions of odour are anticipated during commissioning. Therefore, no odour emissions or impacts are expected.

No sources of odour have been identified during operation as gas in the pipeline would be odourless, and no point sources are proposed.

Consequently, no further assessment of operational odour impacts has been undertaken.

3. Existing environment

3.1 Terrain, land use and local meteorology

In accordance with the *Application requirements for activities with impacts to air* (DETSI, 2025), the assessment is required to describe the project site topography and built environment and the prevailing wind conditions.

The project site is generally flat, with little height variation across the entire study area. The land surrounding the CRoW is undeveloped lease hold land and depicted in Figure 3.1.

A review of data collected by the BoM from surrounding active automatic weather stations (AWS) has been undertaken to characterise prevailing wind conditions. The AWS used in this assessment are listed in Table 3.1, with their locations shown in Figure 3.1.

Table 3.1 Meteorological stations surrounding the project

Name	Number	State	Easting (m)	Northing (m)	Approximate distance from pipeline alignment (km)
Tibooburra Airport	46126	NSW	602,482	6,742,268	51
White Cliffs AWS	46129	NSW	698,351	6,584,936	222
Fowlers Gap AWS	46128	NSW	566,843	6,560,623	236
Ballera Gas Field	45009	Queensland	580,217	6,968,910	101
Thargomindah Airport	45025	Queensland	776,875	6,901,078	130
Moomba Airport	17123	South Australia	420,981	6,891,492	232

The wind roses indicate consistent wind patterns across the region, with winds predominantly originating from the south-south-east. Between 2020 and 2024, wind speeds at the surrounding AWS were generally within the range of 3.0 metres per second (m/s) to 7.5 m/s. The highest wind speeds (greater than 7.5 m/s) were most frequently recorded at the Ballera Gas Field AWS, occurring during approximately 13.7 per cent of observed hours. In contrast, calm wind conditions (less than 0.5 m/s) were most common at the Fowlers Gap AWS, with an average of 5.9 per cent of hours over the same period.

These wind conditions are expected to influence air quality by controlling the dispersion and transport of air pollutants, with higher wind speeds generally aiding dispersion and dilution but also potentially promoting dust generation from exposed surfaces, while calmer conditions may allow localised accumulation near sources.

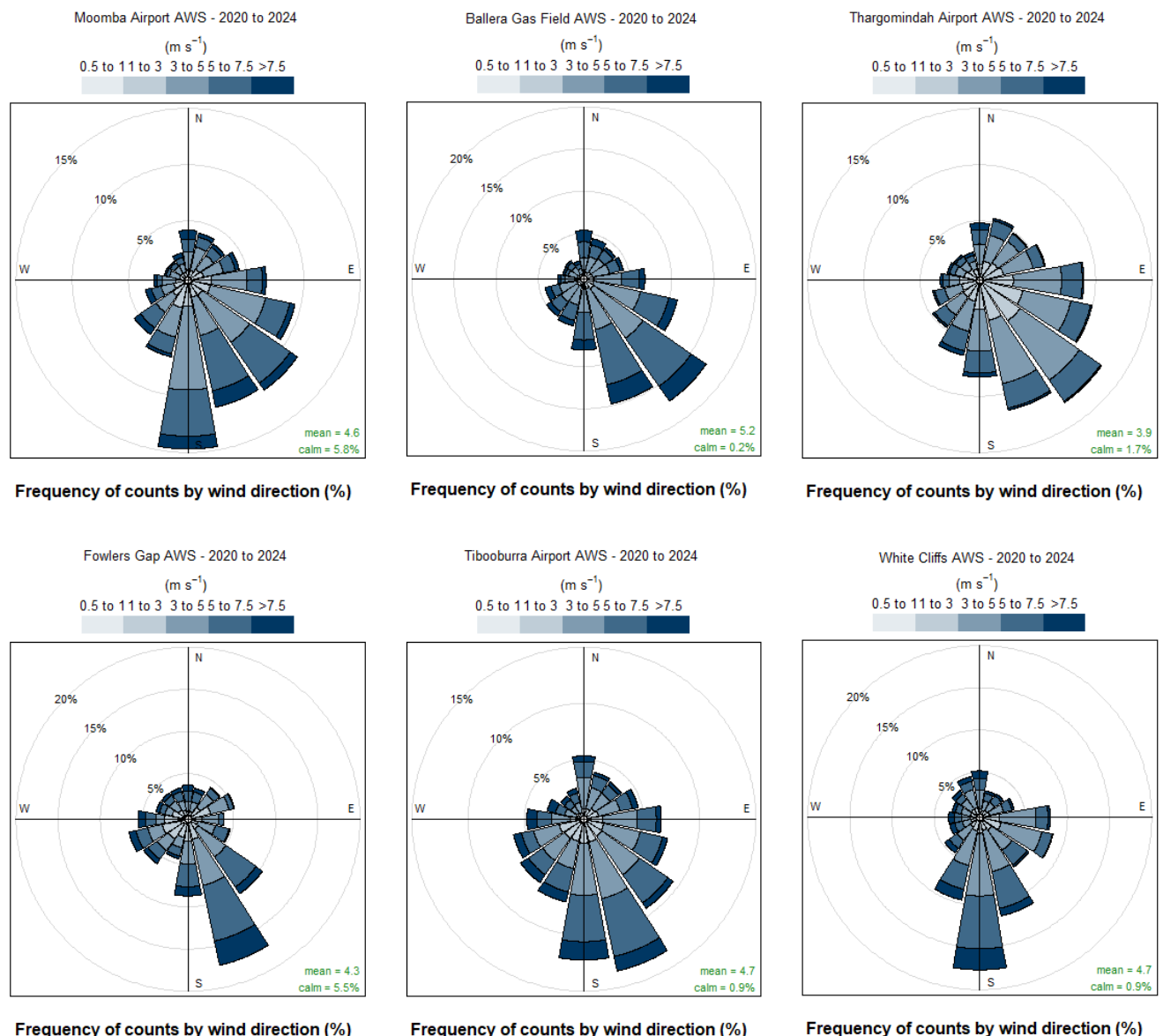


Figure 3.2 Wind roses at meteorological stations surrounding the project site

3.2 Sensitive receptors

As per the *Application requirements for activities with impacts to air* (DETSI, 2025), a sensitive place or receptor can include (but is not limited) to the following:

- a dwelling, residential allotment, mobile home or caravan park, residential marina, or other residential premises
- a motel, hotel, or hostel
- a kindergarten, school, university, or other educational institution
- a medical centre or hospital
- a protected area under the *Nature Conservation Act 1992*, the *Marine Parks Act 2004* or a World Heritage Area
- a public park or garden (passive recreation)
- a sporting field (active recreation)
- a place used as a workplace, including an office for business or commercial purposes.

The IAQM defines:

- A ‘human receptor’, as any location where a person or property may experience the adverse effects of airborne dust or dust soiling, or exposure to PM over a time period relevant to the air quality objectives.
- An ‘ecological receptor’ as any sensitive habitat affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats).

Discrete receptor locations have been identified in accordance with the *Application requirements for activities with impacts to air* (DETSI, 2025) and the IAQM Guidance, and represent areas most likely to experience the highest potential exposure during construction of the project. Table 3.2 details the locations of the receptors, along with their distances and orientations relative to the primary dust sources (the CRoW and construction access roads/tracks), with their locations shown in Figure 3.1.

As noted in section 1.1.2 the project includes construction and use of a temporary accommodation facility at the intersection of Wompah Gate Road and Tickalara Road (Camp 2 – Tickalara). Use would also be made of APA's existing temporary accommodation facility located on the ‘Nockatunga’ property on Warri Gate Road approximately 16 km east of Noccundra (Camp 1 – Nockatunga).

The temporary accommodation facilities have been included in this assessment as a conservative approach. Since staff will be working at or temporarily living in these facilities they are also classified as human receptors.

Ecological receptors that may typically be affected by dust deposition during construction include native vegetation and high value natural areas such as national parks. The pipeline alignment has been selected to avoid highly sensitive ecological areas. The project site consists of braided ephemeral channels, floodplains and wetlands within the riparian corridor of the Wilson River bordered by areas of grazing land to the north-west and south-east. The proposed action intersects the Channel Country Strategic Environmental Area (SEA) situated around the Wilson River crossing. These landscapes are not expected to be sensitive to dust deposition.

Table 3.2 *Sensitive receptors*

ID	Description	IAQM type	Easting (m)	Northing (m)	Distance to CRoW (m)	Distance to access roads/tracks used for construction (m)
R1	Residential (unoccupied)	Human receptor	664292	6972453	254	171
R2	Residential	Human receptor	668827	6932553	1,998	1,993
R3	Passive recreation	Human receptor	666062	6942304	2,268	38
R4	Residential	Human receptor	660225	6969538	2,345	53
R5	Residential	Human receptor	617801	6796298	2,846	1,551
R6	Passive recreation	Human receptor	656995	6921682	2,950	382
R7	Residential	Human receptor	617748	6831651	3,007	1,488
R8	Shed	Human receptor	656647	6921983	3,077	62
R9	Active recreation	Human receptor	656618	6921987	3,100	58
R10	Community centre	Human receptor	656592	6921982	3,124	33
R11	Commercial	Human receptor	656547	6922014	3,145	16
R12	Residential	Human receptor	656545	6921971	3,170	13
R13	Temporary accommodation	Human receptor	656488	6921978	3,213	41
R14	Passive recreation	Human receptor	669339	6937678	3,281	1,840
R15	Commercial	Human receptor	655150	6919455	4,496	1,073
R16	Commercial	Human receptor	655041	6919429	4,601	1,177
R18	Camp 1 (Nockatunga)	Human receptor	667638	6934626	Project-related	<1
R19	Camp 2 (Tickalara)	Human receptor	616000	6828991	Project-related	<1

3.3 Ambient air quality

A general description of ambient air quality at the location of the proposed activity including a review of any nearby activities that may emit air pollutants has been provided as follows.

A review of data collected by the Queensland Government and by the NSW Department of Planning Industry and Environment, from surrounding active ambient AQMS, has been undertaken to characterise background concentrations. The closest AQMS relative to the project site is the Tibooburra AQMS, which is part of the indicative Rural Air Quality Monitoring Network used to monitor dust and smoke in rural and remote areas of NSW (not NATA-accredited).

Located at the Tibooburra airport, it was commissioned in 2004 and is situated approximately 50 km to the south-west (refer to Figure 3.1). Data from 2020 to 2024 was analysed, and a summary presented in Table 3.3 and Figure 3.1. Comparisons against air quality standards are for indicative purposes only.

Table 3.3 Summary of background air quality – Tibooburra AQMS

Year	PM ₁₀			PM _{2.5}			TSP
	Annual mean (µg/m ³)	24-hour max. (µg/m ³)	No. of days of exceedances	Annual mean (µg/m ³)	24-hour max. (µg/m ³)	No. of days of exceedances	Annual mean (µg/m ³)
2020	8.5	234.3	14	2.0	111.5	4	9.2
2021	3.4	36.4	0	0.8	3.7	0	4.2
2022	2.9	35.6	0	0.8	6.5	0	4.3
2023	4.6	41.0	0	1.2	8.8	0	5.1
2024	4.0	30.6	0	1.2	27.0	1	4.5

Between 2020 and 2024, air quality at Tibooburra was an acceptable standard, with annual PM₁₀, PM_{2.5} and TSP concentrations remaining well below the EPP Air objectives. The maximum annual average PM₁₀ concentration was recorded in 2020 with 8.5 µg/m³. In 2020, there were 14 exceedances of the 24-hour PM₁₀ criterion and four exceedances of the 24-hour PM_{2.5} criterion. These events contributed to the elevated annual average concentrations observed for that year compared to the following years. No further exceedances were recorded during the assessment period, apart from a single day in 2024 when PM_{2.5} reached 27 µg/m³ on 22 December.

3.4 Existing sources of air pollutants

3.4.1 Source of particulates

The primary non-industrial emission sources include wind-blown dust from exposed undeveloped lease hold land and dust associated with vehicular traffic on the local road network.

The National Pollutant Inventory (NPI), operated under the *National Environment Protection (National Pollutant Inventory) Measure 1998*, provides publicly available information about emissions of 93 pollutants throughout Australia. Facilities that exceed prescribed threshold values are required to report their emissions to the NPI on a yearly basis.

A search of the NPI database was conducted and no industrial nor mining activities occurring within a 2 km radius of the project site were reported to the NPI. No other major projects have been identified as likely to be under construction within the study area.

Construction activities are present on sections of Warry Gate Road; however, these works are localised and do not constitute a corridor-wide upgrade. Recent rainfall has also prompted repair works, but these are limited to specific sections of the corridor.

4. Construction impacts

4.1 Construction dust

4.1.1 Step 1 – Screen the need for an assessment

Airborne particulate matter has the potential to cause adverse health or nuisance impacts if not properly managed.

According to Table 3.2 which presents the distances between receptors and the site boundary, as well as the routes used by construction vehicles, none of the residential receptors fall within the designated screening distances.

Receptor R1 is an unoccupied house and is located approximately 254 m from the site boundary, exceeding the 250 m screening distance. A detailed assessment will not typically be required; however, due to its close proximity to the site boundary, R1 has been conservatively included in the assessment. The temporary accommodation facilities (R18 and R19) are located within the site boundary and are situated less than 250 m from an existing public road or a proposed additional track designated for construction vehicle access. These locations will require further assessment.

Sensitive receptors requiring further assessment are listed in Table 4.1. As noted in section 3.2, no ecological receptors have been identified.

Table 4.1 Construction phase impact screening distances

ID	Description	Screening distances (m)	
		Project site boundary	Construction route
Human receptors		250 m	250 m
R1	Residential (unoccupied)	254	171
R18	Camp 1 (Nockatunga)	Within site boundary	<1
R19	Camp 2 (Tickalara)	Within site boundary	<1

4.1.2 Step 2a – Define the potential dust emission magnitude

Dust emission magnitudes for the assessed activities (section 2.4.2) were defined according to definitions of the IAQM Guidance, as presented in Appendix A. The project description was reviewed to assign dust emission categories for each construction activity, and assumptions and justification are shown in Table 4.2.

It is noted that only activities relevant to the construction of the project are included (i.e. demolition is excluded). In summary, the dust emission magnitude for earthworks, construction and track-out has been classified as 'large'.

Table 4.2 Categorisation of dust emission magnitude

Construction activity	Dust emission magnitude	Basis
Earthworks	Large	IAQM Guidance definition: Total site area >110,000 square metres (m²), moderately dusty soil type (e.g. silt), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height. The project: – typical width of the CRow will be 40 m – earthworks will progress at a rate of approximately 2.5 km/day – earthworks area per day is 100,000 m² – maximum of 50 km of trench could be open at any one time – typical stockpile width of 2.5 m and height of 1.5 m – maximum stockpile area at any one time is 125,000 m² – soil is prone to dust – higher wind speeds may increase dust generation through surface disturbance – approximately 57 heavy vehicles could be in use at earthworks peak. Although the formation of bunds and the soil type are within the 'medium' magnitude range, the total site area and the number of heavy vehicles, which have been estimated to provide a maximum scenario, correspond to a 'large' potential emission magnitude.
Construction	Large	IAQM Guidance definition: Total building volume >75,000 m³, on-site concrete batching, sandblasting. The project: – construction of unpaved access routes with high potential of dust release – trenching and installation of the pipeline is expected to occur at a rate of approximately 2.5 km/day – with a standard trench depth of 1.4 m and a maximum width of 1 m, the maximum estimated volume of excavated material is about 3,500 m³ per day – construction of surface facilities is not expected to be more intensive than trenching and installation of the pipeline – approximately 750 ha occupied by surface infrastructure, including retained access tracks – approximately 469 ha required for temporary use during construction only – infrastructure will have a maximum height of 3 m – materials with low potential for dust release (e.g. pipes, valves, etc.). Although no demolition will occur, the construction of access tracks will involve potentially dusty material, and the construction volume is within the 'large' magnitude range. The potential construction emission magnitude has been defined as 'large'.
Track-out (the movement of site material onto public roads by vehicles)	Large	IAQM Guidance definition: >50 heavy duty vehicles (HDV) (>3.5 t) outward movements in any one day, moderately dusty surface material (e.g., high clay content), unpaved road length >100 m. The project: Heavy vehicle movements for the transfer of materials between the construction compound/ancillary facilities and the CRow are estimated to be: – on public gravel roads or unpaved tracks – on 6.5 km minimum road length – more than 50 per day during peak times. More than 50 heavy vehicle movements per day and unsealed road lengths greater than 100 m, which have been assumed to provide a maximum scenario, correspond to a 'large' potential emission magnitude for track-out.

4.1.3 Step 2b – Define the sensitivity of the area

The sensitivity of different types of receptors to potential impacts such as dust soiling, health effects and ecological effects, was defined according to Tables A.1 to A.3 of the IAQM Guidance, as presented in Appendix A.

The assessed sensitivities for the areas of concern for all construction activities are summarised in Table 4.3 with the justification about how these ratings have been derived. The area surrounding the project site has been assessed as 'low' sensitivity for all potential impacts.

Table 4.3 Categorisation of the sensitivity of area to dust deposition and human health effects

Potential impact	Sensitivity of the area	Justification
Dust soiling	Low	The project: – Receptor sensitivity: high (residence). One residential receptor (R1) is considered to be located within 250 m from dust generating activities which corresponds to a 'low' sensitivity rating as per the definitions in Table A.1 of Appendix A.
Human health effects (PM ₁₀)	Low	The project: – receptor sensitivity: high (residence) and medium (workers at Camp 1 (R18) and Camp 2 (R19)) – up to 500 workers are expected to reside and work at the temporary accommodation facilities (R18 and R19) which are located less than 50 m from an unsealed construction access track – one residential receptor (R1) is considered to be located less than 250 m from dust generating activities – a maximum annual background PM₁₀ concentration of 8.5 µg/m³ was recorded at the Tibbooburra AQMS for the 2020 calendar year. Medium and high sensitivity receptors are exposed to low level of PM ₁₀ background concentration, which corresponds to a 'low' sensitivity rating as per the definitions in Table A.2 of Appendix A.

4.1.4 Step 2c – Define the unmitigated risk of impacts

The potential dust emission magnitude classification for each activity (refer to Table 4.2) was combined with the sensitivity of the area (refer to Table 4.3), using the IAQM Guidance risk rating matrix provided in Appendix A to determine the risk of dust-related impacts with no mitigations applied, with the results summarised in Table 4.4.

The proposed construction activities, including earthworks, construction and track-out, have been assessed as having a 'low' risk for dust soiling, as well as for impacts on human health and ecology, without mitigations.

Table 4.4 Summary of unmitigated risk of dust impacts during construction

Potential impact	Sensitivity of the area	Dust emission magnitude			Unmitigated risk		
		Earthworks	Construction	Track-out	Earthworks	Construction	Track-out
Dust soiling	Low	Large	Large	Large	Low risk	Low risk	Low risk
Human health	Low	Large	Large	Large	Low risk	Low risk	Low risk

4.1.5 Steps 3 and 4 – Determine site-specific mitigation and examine the residual effects

Although the overall unmitigated risk during construction has been assessed as 'low', section 8 outlines mitigation measures to further minimise the potential for dust emissions.

With the application of strategies detailed in section 8, dust generating activities are anticipated to be managed so that the risk of adverse air quality effects on nearby receptors is considered negligible.

4.2 Construction exhaust emissions

The main source of exhaust emissions would be the combustion of diesel fuel and petrol from heavy vehicles, mobile excavation machinery, and/or stationary combustion equipment.

The volume of emissions from construction vehicles and machinery would depend on the type of fuel used, the power output and condition of the engine, the number of light and heavy vehicles, and duration of use.

Exhaust emissions would involve periodically localised emissions of carbon monoxide, particulate matter (PM₁₀ and PM_{2.5}), oxides of nitrogen, sulfur dioxide, volatile organic compounds and polycyclic aromatic hydrocarbons associated with the combustion of diesel fuel and petrol.

Some vehicle exhaust emissions are expected during construction. Exhaust emissions would not materially contribute to concentrations of exhaust pollutants in ambient air in the study area; given the relatively short duration of construction, emissions would be dispersed along the project site and be intermittent and transient in nature, associated with particular construction activities.

Exhaust emissions are therefore not considered further in this assessment.

4.3 Summary of construction impacts

During construction, the primary impact to local air quality would be the generation of dust. Airborne particulate matter has the potential to cause adverse health or nuisance impacts if not properly managed.

Applying the risk-based approach using the IAQM Guidance identified a low risk of dust impacts. The IAQM Guidance specifies that where a site is assessed as having a low, medium or high risk of dust impacts, site-specific mitigation measures proportionate to the level of risk are required, with only negligible-risk sites not requiring additional measures beyond legislative obligations.

The outcome of the assessment based on the IAQM Guidance provides an indication of the level of mitigation required. Management measures included in the construction environmental management plan (CEMP) will be implemented to minimise dust and further mitigate the potential impacts of construction on local air quality, human and ecological receptors (refer to section 8).

Potential impacts at sensitive receivers are predicted to comply with the assessment criteria specified in the *Application requirements for activities with impacts to air* (DETSI, 2025), the Queensland EP Act and EPP Air.

5. Operational impacts

5.1 Operational emissions

The pipeline would be designed to operate in accordance with AS 2885 as a closed system and all above and below ground components would be sealed and would therefore not give rise to emissions, either as a point source or fugitive. No air quality impacts are expected during normal operation.

Releases of small quantities of gas would result from internal pipeline cleaning, conducted as part of routine maintenance, and would involve the release of approximately 2 m³ of gas into the atmosphere. These events would be infrequent and only occur once a year on average and would generate minimal emissions. The volume of gas released is negligible when considered in the context of overall regional or national greenhouse gas inventories. Comparison of operational emissions quantities against the total emissions of QLD and Australia is presented in the Greenhouse Gas Technical Report (Appendix H of the Environmental Authority Supporting Information Report). Gas within the pipeline would not be odourised, and no odour is expected.

Vehicle access for pipeline maintenance would involve some combustion emissions; however, due to the low frequency, these are considered negligible and would not affect the local air quality.

5.2 Summary of operational impacts

As no point source or fugitive emissions are expected during normal operation, no operational air quality or odour impacts are expected. The project would comply with the assessment criteria *Application requirements for activities with impacts to air* (DETSI, 2025), the Queensland EP Act and EPP Air.

6. Cumulative impacts

Cumulative impacts can be defined as the successive, incremental and combined effect of multiple impacts, which may in themselves be minor, but could become significant when considered together. The methodology and projects considered for the cumulative impact assessment are provided in chapter 6 of the EA.

No relevant major future projects in the vicinity of the project site have been identified from the Queensland Department of Housing and Public Works website that would be developed concurrently with the project.

If any projects were to occur concurrently with the project, cumulative impacts are not anticipated to be significant due to:

- the proposed rate of construction, resulting in short duration of construction disturbance in the vicinity of any sensitive receptor
- low numbers of sensitive receivers close to the project and the distance to these receivers
- limited impacts identified in this assessment.

Accordingly, cumulative air quality impacts are not anticipated.

7. Decommissioning impacts

At the end of the project's operational life, decommissioning would be undertaken in accordance with a structured, risk-based process as required by applicable legislation and industry standard including the Queensland *Petroleum and Gas (Production and Safety) Act 2004* and AS 2885, or equivalent regulations relevant at the time.

The management of residual gas in the pipeline would be managed as part of this process. It is expected that surface infrastructure would be disconnected and removed, and the underground pipeline would be cut, capped or filled as required, but left in place to minimise land disturbance. Only limited areas would be subject to surface works.

Activities with the potential to affect air quality impacts (if inadequately managed) include:

- operation of diesel-powered machinery and equipment, which may emit carbon monoxide, particulate matter (PM₁₀ and PM_{2.5}), oxides of nitrogen, sulfur dioxide, volatile organic compounds and polycyclic aromatic hydrocarbons, associated with the combustion of diesel fuel and petrol
- minor earthworks associated with the removal of surface facilities and excavation of bell holes, which may generate dust and fine particulate matter
- residual gas management, which may (depending on the outcomes of the safety management study and abandonment plan) involve controlled release or combustion using portable equipment, with the potential to emit gas, volatile organic compounds and combustion by-products
- general site works, including limited ground disturbance, which may contribute to localised dust generation and minor emissions from equipment.

It is noted that the final decommissioning activities will be determined through the safety management study and segment analysis, and may differ from those listed above depending on site-specific conditions and risk assessments. If controlled combustion or release of residual gas is required, the abandonment plan would define appropriate measures to minimise impacts.

Decommissioning activities are expected to have minimal potential to affect air quality as they will follow a structured process under AS 2885, ensuring risks are appropriately identified, assessed and managed. Activities would also be less intensive than construction, involving fewer personnel, less equipment and shorter durations of work at any given location.

Measures to manage emissions during decommissioning will be detailed in the decommissioning environmental management plan. This plan will be adapted from the CEMP to ensure continuity in environmental protection measures and compliance with regulatory requirements. The decommissioning management plan will include specific measures for managing air quality impacts, including:

- management of residual gas to ensure compliance with relevant air quality criteria
- dust suppression measures during earthworks and equipment operation.

As an outcome of the safety management study, the decommissioning environmental management plan (together with the abandonment plan) would ensure effective management of potential environmental impacts. Emissions are expected to remain within relevant air quality criteria and no impacts on sensitive receivers are expected.

Further information about the approach to environmental management during decommissioning is provided in Section 4.9 of the Environmental Authority Supporting Information Report.

8. Recommended mitigation and management measures

8.1 Approach to mitigation

The impact assessment identified that the main potential for air quality impacts would be during construction, when dust could be generated and impacts could occur if works are not appropriately managed. The key approach to managing air quality impacts during construction, including dust and emissions from construction plant, ground disturbance and use of access tracks, would involve preparing and implementing air quality management measures as part of the CEMP. The CEMP would define the processes, responsibilities and management measures to minimise potential impacts on air quality.

The CEMP would also include measures to further reduce the potential for impacts at sensitive receivers located close to access tracks (see Table 8.1). Undertaking rehabilitation of disturbed areas as soon as practicable after the pipeline is installed would also reduce potential for dust generation.

Further information on the CEMP is provided in chapter 8 (Approach to environment management and mitigation) of the EA supporting report.

8.2 Recommended mitigation measures

Recommended measures to minimise and manage the potential for air quality impacts are provided in Table 8.1.

Table 8.1 Recommended mitigation measures to manage potential impacts to air quality

Impact/issue	Mitigation measure	Timing
Construction air quality	Air quality management measures will be detailed in the CEMP, including responsibilities and processes to manage potential impacts to air quality during construction. This may include, but is not limited to: – a map identifying the locations of sensitive receptors – potential sources of emissions to air – air quality management objectives consistent with the EPP Air – management measures to be implemented, including preferred methods for dust suppression and triggers for implementation – a process for monitoring dust and weather conditions.	Pre-construction, construction
	Disturbed surfaces not required for permanent infrastructure will be reinstated as soon as practicable after the completion of construction works.	Construction
Rehabilitation of disturbed surfaces	Disturbed surfaces not required for permanent infrastructure will be reinstated as soon as practicable after the completion of construction works.	Construction
Construction vehicle movements	Measures to minimise dust emissions and potential amenity impacts will be defined in the CEMP and implemented where dust from project-related traffic movements is impacting, or has the potential to impact, sensitive receivers (including those within 250 m of unsealed access tracks and roads). These measures will include increased frequency of dust suppression as required.	Construction
	Vehicle movements will be restricted to designated access tracks to minimise potential dust emissions.	Construction
Emissions to air	Vehicles, plant and equipment (including generators) will: – comply with appropriate standards – not be used where they produce excessive emissions (based on a visual assessment) until service/maintenance can be undertaken to return them to normal working order – be turned off when not in use – be regularly maintained in accordance with the manufacturer's specifications.	Construction

Impact/issue	Mitigation measure	Timing
	Generators will be located as far away from the temporary accommodation facility buildings as practicable, and will be relocated if visible exhaust plumes, smoke or odours are observed within the buildings.	Construction
	Plant and equipment will be maintained in good condition to minimise fuel consumption and emissions. Plant, equipment and vehicle engines are to be switched off when not in use.	Construction, operation, decommissioning
Decommissioning air quality	Management measures will be included in the decommissioning environmental management plan to manage potential impacts to air quality during decommissioning. This may include, but is not limited to: – management of any residual gas to allow for compliance with relevant air quality criteria – dust suppression measures to be implemented during earthworks and equipment operation.	Decommissioning

9. Conclusion

This air quality impact assessment has been undertaken, in accordance with the assessment requirements and guidance outlined in section 2.1, to support the EA application for the project. Construction-related dust and particulate matter were identified as the project's primary source of potential impacts to air quality and a qualitative, risk-based assessment consistent with the IAQM Guidance was undertaken to evaluate potential dust impacts during construction.

The nearest sensitive receptor identified is an unoccupied residence located approximately 254 m from the project site boundary. Based on this separation distance, a detailed quantitative assessment of construction activities is not required. However, as a conservative approach, a screening assessment was undertaken, which also considered human receptors located at the temporary accommodation facilities.

The assessment indicated a low unmitigated risk of dust impacts for all identified activities and receptor sensitivity types, with minimal potential impacts predicted at sensitive receptors. While the assessed risk is considered low, appropriate mitigation and management measures will be implemented through the project CEMP so that potential air quality impacts remain negligible.

Given their temporary and intermittent nature, and with standard mitigation measures in place, exhaust emissions are expected to be minimal and to not result in significant air quality impacts.

No sources of odour were identified for the project during construction or operation, and therefore an odour assessment was not required.

No significant air quality impacts are expected during operation, as the pipeline is designed to operate as a sealed system with no continuous emissions. Similarly, decommissioning activities are expected to result in only short-term, localised emissions, which will be managed through a dedicated decommissioning management plan.

Overall, the project is not expected to result in adverse air quality impacts, and will comply with the assessment criteria specified in the *Application requirements for activities with impacts to air* (DETSI, 2025), the Queensland EP Act and EPP Air.

10. References

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Appendices

Appendix A

**Construction phase risk assessment
methodology**

Construction dust impact assessment methodology

The following sections outline the assessment methodology for undertaking a construction dust impact assessment as per the IAQM Guidance (IAQM, 2024).

Step 1 – Screen the need for a detailed assessment

The Step 1 screening criteria provided by the IAQM Guidance suggests screening out any assessment of impacts from construction activities where sensitive receptors (defined as receptors in this report) are located more than 250 m from the boundary of the site, more than 50 m from the route used by construction vehicles on public roads up to 250 m from the site entrance.

Step 2a – Define the potential dust emission magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as 'small', 'medium', or 'large'. The following are examples of how the potential dust emission magnitude for different activities can be defined. Note that in each case, not all the criteria need to be met, and that other criteria may be used if justified in the assessment.

Where relevant, multiple screening assessments may be completed for different development phases (or even sub-phases where demolition may be brief or there is a very short period of intense activity, for example). This may particularly be the case for linear schemes (i.e. new roads, railways).

Example definitions for demolition are as follows. Alternative screening values may be used here. This is justified based on a particular scheme:

- **Large:** Total building volume >75,000 m³, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level.
- **Medium:** Total building volume 12,000–75,000 m³, potentially dusty construction material, demolition activities 6–12 m above ground level.
- **Small:** Total building volume <12,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Example definitions for earthworks are:

- **Large:** Total site area >110,000 m², potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.
- **Medium:** Total site area 18,000–110,000 m², moderately dusty soil type (e.g. silt), 5–10 heavy earth moving vehicles active at any one time, formation of bunds 3–6 m in height.
- **Small:** Total site area <18,000 m², soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height.

The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. Example definitions for construction are:

- **Large:** Total building volume >75,000 m³, on site concrete batching, sandblasting.
- **Medium:** Total building volume 12,000–75,000 m³, potentially dusty construction material (e.g. concrete), on site concrete batching.
- **Small:** Total building volume <12,000 m³, construction material with low potential for dust release (e.g. metal cladding or timber).

Factors which determine the dust emission magnitude during track-out are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying track-out into one of the dust emission magnitude categories. Example definitions for track-out are:

- **Large:** >50 HDV (>3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m.
- **Medium:** 20–50 HDV (>3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50–100 m.
- **Small:** <20 HDV (>3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

Step 2b – Define the sensitivity of the area

Step 2b of the assessment process requires the sensitivity of the area to be defined. The sensitivity of the area takes into account:

- the specific sensitivities of receptors in the area
- the proximity and number of those receptors
- in the case of PM₁₀, the local background concentration
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

The type of receptors at different distances from the site boundary or, if known, from dust generating activities, should be included. Consideration also should be given to the number of 'human receptors'. Exact counts of the number of 'human receptors' are not required. Instead, it is recommended that professional judgement is used to determine the approximate number of receptors (noting that a residential unit is one receptor) within each distance band. For receptors which are not dwellings, professional judgement should be used to determine the number of human receptors for use in the tables (e.g. a school is likely to be treated as being in the >100 receptor category).

The likely routes for construction traffic should also be included to enable the presence of track-out receptors to be included in the assessment. As general guidance, without site-specific mitigation, track-out may occur along the public highway up to 500 m from 'large' sites (as defined in Step 2A), 200 m from 'medium' sites and 50 m from 'small' sites, as measured from the site exit.

A number of attempts have been made to categorise receptors into 'high', 'medium' and 'low' sensitivity categories; however, there is no unified sensitivity classification scheme that covers the quite different potential effects on property, human health and ecological receptors.

Table A.1 provides guidance on the sensitivity of different types of receptors to dust soiling, health effects, and ecological effects.

Table A.1 *Guidance for categorising receptor sensitivity (IAQM, 2024)*

Value	High sensitivity receptor	Medium sensitivity receptor	Low sensitivity receptor
Dust soiling	Users can reasonably expect enjoyment of a high level of amenity; or The appearance, aesthetics or value of their property will be diminished by soiling; and The people or property will reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Users will expect to enjoy a reasonable level of amenity, but will not reasonably expect to enjoy the same level of amenity as in their home; or The appearance, aesthetics or value of their property could be diminished by soiling; or The people or property will not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	The enjoyment of amenity will not reasonably be expected; or Property will not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling; or There is transient exposure, where the people or property will reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land.
	Indicative examples include dwellings, museums, and other culturally important collections, medium- and long-term car parks and car showrooms.	Indicative examples include parks and places of work.	Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.
Health effects	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM ₁₀ (in the case of the 24-hour objectives). A relevant location will be one where individuals may be exposed for eight hours or more in a day).	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM ₁₀ (in the case of the 24-hour objectives). A relevant location will be one where individuals may be exposed for eight hours or more in a day).	Locations where human exposure is transient.
	Indicative examples include residential properties. Hospitals, schools, and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM ₁₀ , as protection is covered by workplace health and safety regulations.	Indicative examples include public footpaths, playing fields, parks, and shopping streets.

According to the IAQM Guidance, the sensitivity of the identified individual receptors (as described above) is then used to assess the sensitivity of the area surrounding the active construction area, taking into account the proximity and number of those receptors, and the local background PM₁₀ concentration (in the case of potential health impacts) and other site-specific factors. Additional factors to consider when determining the sensitivity of the area include:

- any history of dust-generating activities in the area
- the likelihood of concurrent dust-generating activity on nearby sites
- any pre-existing screening between the source and the receptors
- any conclusions drawn from analysing local meteorological data which accurately represent the area, and if relevant, the season during which the works will take place
- any conclusions drawn from local topography
- duration of the potential impact, as a receptor may become more sensitive over time
- any known specific receptor sensitivities which go beyond the classifications given in this document.

The approach outlined in the IAQM Guidance for assessing the sensitivity of an area to dust soiling is shown in Table A.2. The sensitivity of the area should be derived for each of the activities relevant to the modification (i.e. construction and earthworks).

Table A.2 Guidance for categorising the sensitivity of an area to dust soiling effects

Receptor sensitivity	Number of receptors	Distance from the source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10–100	High	Medium	Low	Low
	1–10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Note: Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20 m of the source and 95 high sensitivity receptors between 20–50 m, then the total of number of receptors <50 m is 102. The sensitivity of the area in this case will be high.

The methodology included in the IAQM Guidance for assessing the sensitivity of an area to health impacts is shown in Table A.3. The methodology takes into account the PM₁₀ background concentration for receptors with 'high' sensitivity. Given that the PM₁₀ concentrations in the IAQM Guidance methodology is based on air quality objectives in the United Kingdom, these concentrations are slightly modified for application in assessments performed in Australia.

Table A.3 Guidance for categorising the sensitivity of an area to dust health effects

Receptor sensitivity	Annual mean PM ₁₀ concentration	Number of receptors	Distance from source (m)			
			<20	<50	<100	<250
High	>25 µg/m ³	>100	High	High	High	Medium
		10–100	High	High	Medium	Low
		1–10	High	Medium	Low	Low
	21–25 µg/m ³	>100	High	High	Medium	Low
		10–100	High	Medium	Low	Low
		1–10	High	Medium	Low	Low
	17–21 µg/m ³	>100	High	Medium	Low	Low
		10–100	High	Medium	Low	Low
		1–10	Medium	Low	Low	Low
	<17 µg/m ³	>100	Medium	Low	Low	Low
		10–100	Low	Low	Low	Low
		1–10	Low	Low	Low	Low
Medium	>25 µg/m ³	>10	High	Medium	Low	Low
		1–10	Medium	Low	Low	Low
	21–25 µg/m ³	>10	Medium	Low	Low	Low
		1–10	Low	Low	Low	Low
	17–21 µg/m ³	>10	Low	Low	Low	Low
		1–10	Low	Low	Low	Low
	<17 µg/m ³	>10	Low	Low	Low	Low
		1–10	Low	Low	Low	Low
Low	–	>1	Low	Low	Low	Low

Step 2c – Define the risk of impacts

The dust emission magnitude determined in Step 2a should be combined with the sensitivity of the area determined at Step 2b, to determine the risk of impacts with no mitigations applied. Table A.4 (demolition), Table A.5 (earthworks and construction) and Table A.6 (track-out) below provide methods of assigning the level of risk for each activity.

Table A.4 Risk categories for demolition activities

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Medium risk
Medium	High risk	Medium risk	Low risk
Low	Medium risk	Low risk	Negligible risk

Table A.5 Risk categories for earthworks and construction activities

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Low risk
Medium	Medium risk	Medium risk	Low risk
Low	Low risk	Low risk	Negligible risk

Table A.6 Risk categories for track-out activities

Sensitivity of area	Dust emission magnitude		
	Large	Medium	Small
High	High risk	Medium risk	Low risk
Medium	Medium risk	Low risk	Negligible risk
Low	Low risk	Low risk	Negligible risk



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