Initial Advice Statement

Centurion North Development

Company	Centurion Coal Mining Pty Ltd (a subsidiary of Peabody Energy Australia Pty Ltd)
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Marianne Gibbons		Craig Wilson
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Acronyms and Abbreviations

Acronym/ Abbreviation	Definition
ABS	Australian Bureau of Statistics
AEP	Annual Exceedance Probability
AFC	Armoured Face Conveyor
AHD	Australian Height Datum
AQMP	Air Quality Management Plan
ASGS	Australian Statistical Geography Standard
AUD	Australian Dollar
AUSRIVAS	Australian River Assessment System
BBAC	Barada Barna Aboriginal Corporation
BOM	Bureau of Meteorology
CAH	Carbon Abatement Hub
CCM	Centurion Coal Mine
CHMP	Cultural Heritage Management Plan
CHPP	Coal Handling and Preparation Plant
CMJV	Coppabella and Moorvale Joint Venture
CND	Centurion North Development
CO_2	Carbon Dioxide
COI	Concerned or Interested Party
CSG	Coal Seam Gas
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAF	Department of Agriculture and Fisheries
dBA	A-weighted decibel
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEHP	Department of the Environment and Heritage Protection
DES	Department of Environment and Science
DESI	Department of Environment, Science and Innovation
DETSI	Department of Environment, Tourism, Science and Innovation
DEWHA	Department of the Environment, Water, Heritage and the Arts

Acronym/ Abbreviation	Definition
DNRMMRRD	Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development
DRDMW	Department of Regional Development, Manufacturing and Water
DSDIP	Department of State Development, Infrastructure and Planning
DSDSATSIP	Department of Seniors, Disability Services and Aboriginal and Torres Strait Islander Partnerships
EA	Environmental Authority
EIS	Environmental Impact Statement
EP Act	Environmental Protection Act 1994
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPBC Act EO Policy	EPBC Act Environmental Offsets Policy 2012
EPP	Environmental Protection Policy
EPP (Water and Wetland Biodiversity)	Environmental Protection (Water and Wetland Biodiversity) Policy 2019
ERA	Environmental Relevant Activity
ERC	Estimated Rehabilitation Cost
EVs	Environmental Values
FBA	Fitzroy Basin Association
FIFO	Fly-in, Fly-out
FPIC	Free, Prior and Informed Consent
FTE	Full-time Equivalent
GDE	Groundwater-dependent Ecosystem
GHG	Greenhouse Gas
GL	Gigalitres
GM	Goonyella Middle
GMA	Groundwater Management Area
GWDB	Registered Groundwater Bore Database
HDPE	High-density Polyethylene
HES	High Ecological Significance
HEV	High Ecological Value
HV	High Voltage
IAR	Impact Assessment Report
IAS	Initial Advice Statement
IESC	Independent Expert Scientific Committee

Acronym/ Abbreviation	Definition
IPPS	Indigenous Peoples Policy Statement
IRC	Isaac Regional Council
ISO	International Standards Organisation
LDAR	Leak Detection and Repair
LNG	Liquified Natural Gas
LOM	Life of Mine
MAW	Mine Affected Water
MDL	Mining Development Licence
MIW Regional Plan	Mackay, Isaac and Whitsunday Regional Plan
ML	Mining Lease
MNES	Matters of National Environmental Significance
MR	Mineral Resources Act 1989
MSES	Matters of State Environmental Significance
Mtpa	Million tonnes per annum
MW	Mega Watts
MWTP	Moranbah Water Treatment Plant
NC Act	Nature Conservation Act 1992
NOx	Nitrogen Oxide
NQGP	North Queensland Gas Pipeline
NRM	Natural Resource Management
NT Act	Native Title Act 1993
OGIA	Office of Groundwater Impact Assessment
PAA	Priority Agriculture Areas
PAG Act	Petroleum and Gas (Production and Safety) Act 2004
PDA	Priority Development Area
PLV HCC	Premium Low Volatile Hard Coking Coal
PJ	Petajoules
PL	Petroleum Lease
PM	Particulate Matter
PMF	Probable Maximum Flood
PRC Plan	Progressive Rehabilitation and Closure Plan
QFAO	Queensland Floodplain Assessment Overlay
QLD	Queensland

Acronym/ Abbreviation	Definition
RBL	Rating Background Level
RE	Regional Ecosystem
RIDA	Regional Interest Development Application
RNTBC	Registered Native Title Body Corporate
ROM	Run-of-Mine
RPC	Regional Planning Committee
SCA	Strategic Cropping Areas
SDPWO Act	State Development and Public Works Organisation Act 1971
SIA	Social Impact Assessment
SIMP	Social Impact Management Plan
SIS	Surface-to-Inseam
SLC	Strategic Cropping Land
TEC	Threatened Ecological Communities
TMR	Department of Transport and Main Roads
TSP	Total Suspended Particulates
UDA	Urban Development Area
UG	Underground
UIS	Underground-to-in-Seam
VM Act	Vegetation Management Act 1999
WAC	Widi Aboriginal Corporation
WMP	Weed Management Plan
WQO	Water Quality Objective

Executive Summary

Centurion North Development

Centurion Coal Mining Pty Ltd (Centurion) is a subsidiary of Peabody Energy Australia Pty Ltd (Peabody) and the proponent for the Centurion North Development (CND). The CND comprises an integrated project involving gas extraction and underground (UG) longwall coal mining operations, that occupy a similar geographic area just north of Peabody's existing Centurion Coal Mine (CCM), previously known as the North Goonyella Coal Mine.

The UG longwall mining will be a continuation of existing operations at the CCM north into the CND area and involves extraction of premium low vol hard coking coal (PLV HCC) using the UG longwall mining method. The UG longwall mining operations will utilise existing infrastructure at the CCM, such as the existing Coal Handling and Preparation Plant (CHPP) and rail infrastructure.

CSG extraction will commercialise high purity methane gas from CSG reserves contributing to energy supply via the Queensland gas network. Associated infrastructure required to transport and commercialise gas, including the design, environmental approvals, construction and operations, will be the responsibility of a third party via a commercial agreement with Centurion and are not within the scope of this Initial Advice Statement (IAS).

The CND will utilise an integrated approach, commencing initially with Coal Seam Gas (CSG) extraction to facilitate subsequent UG longwall mining operations**.**

It is important to note that Centurion is seeking 'Coordinated Project' status for the **on-lease components** that constitute the CND only.

Economic, Employment and Environmental Benefits

Centurion estimates total costs of approximately $1.4 billion to commercialise the gas resource (i.e., CSG pre-drainage and goaf activities) and $17.4 billion to deliver PLV HCC to customers over the life of the CND.

The high concentration of CSG in the CND area has historically been problematic for UG mining operations due to safety and economic feasibility concerns, however the CSG extraction will address these issues by capturing and reusing gas to meet the electricity needs of the UG longwall mining operations whilst increasing domestic gas supply via the Queensland gas network.

The CND area also contains substantial PLV HCC reserves. PLV HCC has very low impurities and excellent strength both in low and high temperatures. PLV HCC is highly sought after by customers across the globe as it makes the steelmaking process more efficient by using less coal, creating fewer emissions and supporting decarbonisation targets.

The CND will support economic growth and job creation in regional Queensland communities. These benefits include:

- The Project will secure the jobs of up to 525 employees and contractors currently working at the CCM, ensuring ongoing stability for workers and their families. This jobs

figure is conservative, as constructing and operating a larger mining area is expected to create more employment opportunities.
- Build on the local content investment by CCM.
- Peabody estimates an investment of approximately $662 million for CND following an approximately $752 million investment for the CCM redevelopment, a total of approximately $1.4 billion for the Centurion Mine Complex.
- The CND is expected to contribute an estimated $5.8 billion in royalties to the Queensland State Government over the life of the mine (LOM).
- Mineral Development Licence (MDL) 3010 was previously considered uneconomic, however the CND provides economical opportunity to unlock its value.

Approval Pathways

Given the development complexities of the CND, Centurion considers that the CND meets the criteria to be declared a 'Coordinated Project' under the *State Development and Public Works Organisation Act 1971* (SDPWO Act), with the assessment to be conducted through an Environmental Impact Statement (EIS).

A preliminary environmental risk assessment confirms the requirement for an EIS-level assessment, highlighting medium to high potential environmental impacts for the CND. The integrated nature of the gas extraction and UG longwall mining operations necessitates a coordinated and comprehensive environmental regulatory approach.

A referral to the commonwealth government will be submitted for the CND under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). It is anticipated that the CND will be assessed via the bilateral agreement between the state and commonwealth governments.

Potential approvals being sought for the CND include, but are not limited to:

- Commonwealth approvals:
  - EPBC Act referral and approval (EPBC Act)
  - Environmental offset strategy (*EPBC Act Environmental Offsets Policy 2012*)
  - Right to Negotiate (*Native Title Act 1993*)
- State approvals:
  - Environmental Offsets strategy (*Environmental Offsets Act 2014*)
  - Environmental Authority Amendment (*Environmental Protection Act 1994*)
  - Progressive Rehabilitation and Closure Plan (PRCP) Amendment (*Mineral and Energy Resources (Financial Provisioning) Act 2018*)
  - Estimated Rehabilitation Cost (*Mineral and Energy Resources (Financial Provisioning) Act 2018*)
  - Petroleum Lease (*Petroleum and Gas (Production and Safety) Act 2004*)
  - Mining Lease (*Mineral Resources Act 1986*)
  - Water allocation or water licence (*Water Act 2000*)
  - Cultural Heritage Management Plan (*Aboriginal Cultural Heritage Act 2003*)
  - Regional Interests Development Approval (*Regional Planning Interests Act 2014*)
  - Social Impact Management Plan (*Strong and Sustainable Resources*

Communities Act 2017)
- Species Management Program (*Nature Conservation Act 1992*)
- Protected Plant Clearing Permit (*Nature Conservation Act 1992*)

Environmental Considerations

There has been extensive environmental baseline surveys and impact assessments carried out over the CND area to date, resulting in a substantial understanding of the associated environmental values and risks to these.

As a result of these assessments, Centurion has identified the key environmental constraints associated with the CND and will design the associated infrastructure, as far as practicable, to prevent or minimise impacts to identified environmental values.

Centurion maintains a strong environmental management record, with clearly established mitigation strategies to address environmental risks effectively. Centurion will complete rigorous environmental impact assessments in line with contemporary State and Commonwealth requirements (i.e., Terms of Reference) for all relevant environmental matters, including but not limited to water resources, terrestrial ecology, aquatic ecology, air quality, greenhouse gas emissions, noise and vibration, social impacts, land resources, and cultural heritage.

1 Introduction

Centurion Coal Mining Pty Ltd (Centurion) is a subsidiary of Peabody Energy Australia Pty Ltd (Peabody). Centurion is the proponent for the Centurion North Development (CND). Centurion proposes to develop the CND, which includes underground (UG) longwall coal mining operations and an integrated coal seam gas (CSG) pre-drainage program (the Project).

The CND is located approximately 40 kilometres (km) north of Moranbah within the Isaac Regional Council (IRC), central Queensland. The CND occupies a geographic area immediately north of Peabody's existing Centurion Coal Mine (CCM), previously known as North Goonyella Coal Mine.

Centurion considers that the CND meets the requirements under the *State Development and Public Works Organisation Act 1971* (SDPWO Act) for the Coordinator General to declare the CND a 'Coordinated Project', due to the scale, complexity of the project elements, scope of studies required, and approvals complexity. Discussion of these topics are outlined under **Section 1.3**.

1.1 Purpose and Scope of the Initial Advice Statement

This Initial Advice Statement (IAS) has been prepared by Centurion in accordance with section 27AB(a) of the SDPWO Act and the *Application Guideline: Coordinated project declaration under the State Development and Public Works Organisation Act 1971* (July 2023).

This IAS has been provided as part of the application to the Coordinator-General to declare the CND a 'Coordinated Project' under the SDWPO Act. Should the Project be declared a Coordinated Project, it is proposed to be assessed via the Environmental Impact Statement (EIS) process. Discussion and justification for Centurion's proposed assessment approach is detailed under **Section 2**.

1.2 Document Structure

This IAS has been prepared to align, where possible, with the recommended structure in the *Application Guideline: Coordinated project declaration under the State Development and Public Works Organisation Act 1971* (July 2023). Therefore, this IAS is set out as follows:

- **Section 1 - Introduction**: Outlines the purpose, scope and structure of this IAS.
- **Section 2 - Proposed Impact Assessment Approach**: Outlines how the CND meets the criteria set out under 27(2) of the SDPWO Act and justifies assessment via an EIS process.
- **Section 3 - The Proponent**: Summarises Centurion's corporate structure, project experience, and environmental record.
- **Section 4 - Nature of the Proposal**: Details the justification, feasibility and alternatives for the CND.
- **Section 5 - Scope of the Project**: Provides an overview of the CND components, land use and location.

- **Section 6 - Existing Environment**: Provides an overview of the existing environmental conditions and sensitive receptors within the CND area, addressing the following aspects:
  - Land use and built environment
  - Terrestrial ecology
  - Aquatic ecology
  - Surface water
  - Groundwater
  - Air quality
  - Noise
  - Traffic and transport
  - Social environment, and
  - Aboriginal cultural heritage.
- **Section 7 - Environmental Considerations**: Provides a high-level risk assessment, summarises potential environmental impacts, proposed mitigation measures and EIS assessments for the CND.
- **Section 8 - Approvals Required for the Project**: Provides a summary of the indicative approvals necessary to undertake the CND.
- **Section 9 - Community and Stakeholder Engagement**: Details Centurion's approach to stakeholder engagement for the CND.
- **Section 10 - References**: Provides the list of references cited in this document.

1.3 Background

Centurion proposes to develop the CND, which includes UG longwall coal mining operations and an integrated CSG pre-drainage program. The CND is located over Mining Lease (ML) 1790, ML 70495, and a south-western portion of Mining Development License (MDL) 3010 (Dabin), immediately north of CCM located on ML 6949. The CND location is presented in **Figure 1-1**.

The CCM is owned by Centurion and scheduled to restart UG longwall operations in 2026. CCM is an UG longwall mine that, when operational, will produce Premium Low Volatile Hard Coking Coal (PLV HCC) for steel making purposes. The coal reserves at the CCM will be depleted as mining progresses, and the operation will move towards the end of its current scheduled Life of Mine (LOM), anticipated to be during 2029. The CND will allow Centurion to continue operations north from the CCM. The CCM begun operations in 1994 and has an Environmental Authority (EA) authorised Run of Mine (ROM) production rate of up to 10.2 Mtpa. Upon commencement of operations a workforce of up to 525 employee and contractor roles will be required.

The prompt development of the CND is critical to achieve compliance with the conditions of ML 1790, and to maintain production to preserve employment opportunities and other economic benefits in the region. Centurion became the authorised holder of ML 1790 and ML 70495 on 23 August 2024 via a commercial agreement with Stanmore SMC Pty Ltd. The conditions outlined in ML 1790 state, amongst other matters, that: *By 1 January 2030, mining activities have commenced on the Mining Lease. Extraction of gaseous hydrocarbons must only occur with an appropriate Drainage Plan approved by the Department that details the*

method of extraction, storage, disposal or use as appropriate to the operation. The CND will extend the LOM of CCM to the north from 2029 to 2055. Consequently, up to 525 employee and contractor roles will be secured into the future.

Prior to mining in the CND area, CSG pre-drainage is required to allow the safe progression of mining activities. During the process of acquiring ML 1790 and ML 70495, Centurion has identified that the gas reserves in the target coal seam are of suitable quality and abundance for commercial uses. Centurion is finalising options for commercialisation of the gas. Options being considered include processing via a proposed third-party Carbon Abatement Hub (CAH), electricity generation to power on-site needs, transmission into Queensland's gas distribution network, and potential export via a Liquified Natural Gas (LNG) refrigeration hub.

The CSG pre-drainage and UG longwall mining operations will be conducted concurrently and progressively across ML 1790, ML 70495, and a portion of MDL 3010. CSG pre-drainage will commence ahead of and throughout UG longwall mining operations. The CSG pre-drainage component of the CND will commercialise the CSG resource whilst providing for the safe and timely progression of UG longwall mining operations.

Given the development complexities and schedule requirements, Centurion considers the CND meets the criteria to be declared a 'Coordinated Project', for which an EIS will be required. Centurion considers this assessment approach to be appropriate under section 27(2) of the SDPWO Act. Detailed justifications for assessing the CND via an EIS are provided in **Section 2**.

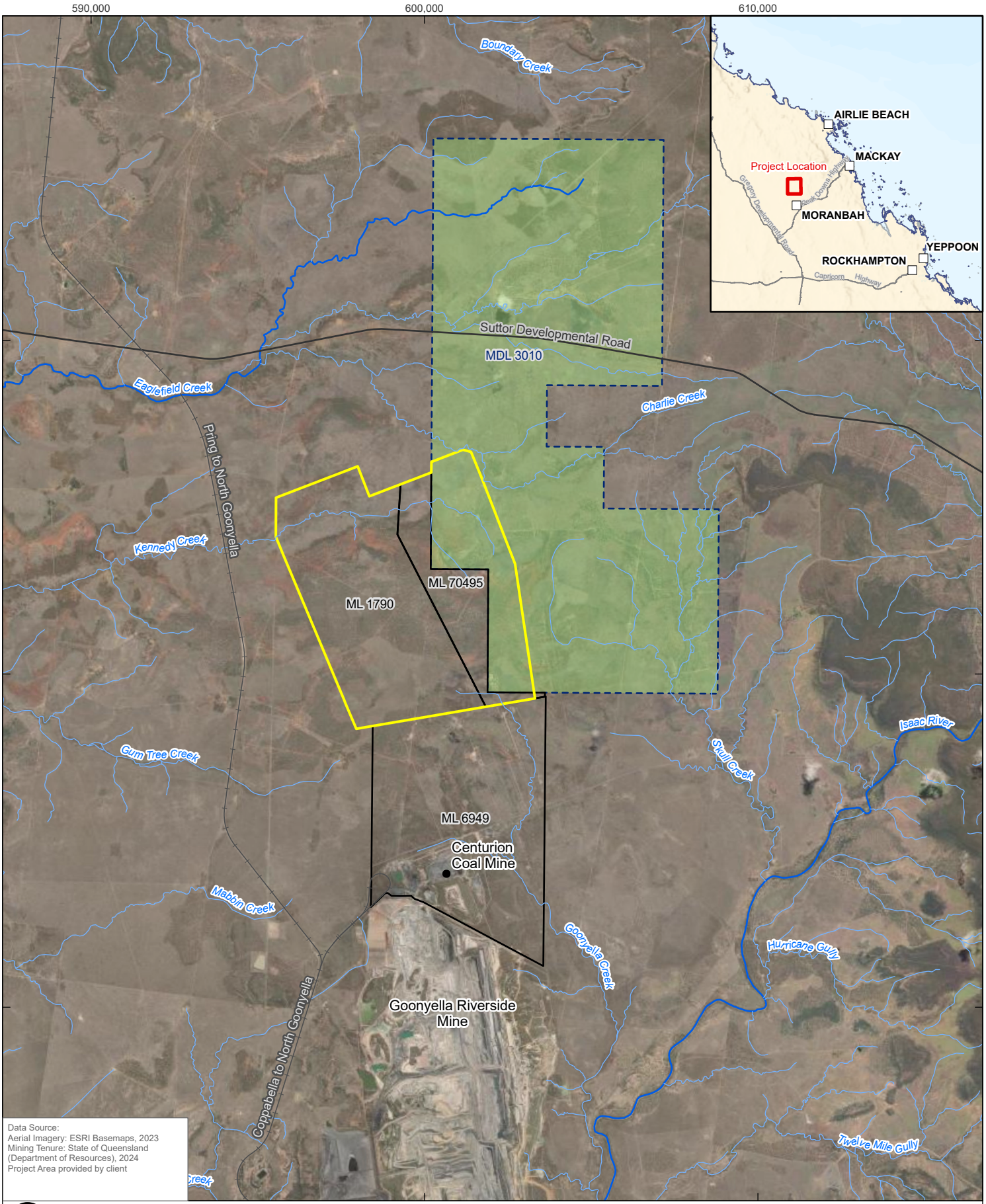
The CND satisfies the criteria set out under 27(2) of the SDPWO Act, as summarised below:

- The CND will require multiple complex State and Commonwealth approvals, within compressed timeframes. Details of approval requirements for the CND are outlined in **Section 8.** In summary, the CND will include the following primary approval requirements:
  - Resource tenure applications under the *Petroleum and Gas (Production and Safety) Act 2004* (PAG Act) and *Mineral Resources Act 1989* (MR Act).
  - A Site-Specific Environmental Authority (EA) application and an EA Amendment application under the *Environmental Protection Act 1994* (EP Act).
  - Approvals under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- The CND will provide for the continuation of employment for up to 525 employees and contractors at the CCM.
- Centurion estimates total costs of approximately $18.8 billion to commercialise the gas resource and develop the UG longwall mining operations over the LOM.
- Peabody estimates an investment of approximately $662 million for CND following an approximately $752 million investment for the CCM redevelopment, a total of approximately $1.4 billion for the Centurion Mine Complex.
- The CND will contribute approximately $5.8 billion in State Government Royalties over the life of the Project.
- Significant environmental effects are anticipated for the CND as discussed in **Section 7.**

It is important to note that Centurion is seeking ‘Coordinated Project’ status for the on-lease components of the CND only.

The UG longwall mining operations will utilise existing infrastructure at the CCM, such as the existing Coal Handling and Preparation Plant (CHPP) and rail infrastructure.

Associated infrastructure required to transport and commercialise gas, including the design, environmental approvals, construction and operations, will be the responsibility of a third party via a commercial agreement with Centurion and are not within the scope of this IAS.



Data Source:
Aerial Imagery: ESRI Basemaps, 2023
Mining Tenure: State of Queensland (Department of Resources), 2024
Project Area provided by client

0 2.5 5 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:150,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Rail Network
- Road
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence (Dabin)
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

PROJECT LOCATION

CENTURION

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

FIGURE 1.1

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F01-01_Project Location

2 Proposed Impact Assessment Approach

The CND will require multiple State and Commonwealth approvals, including a site-specific Environmental Authority (EA) under the *Environmental Protection Act 1994* (EP Act), a Mining Lease over MDL 3010 under the *Mineral Resources Act 1989* (MR Act), and a Petroleum Lease under the *Petroleum and Gas (Production and Safety) Act 2004* (PAG Act). A comprehensive assessment of the required approvals is presented in **Section 8**.

2.1 State Approvals

In summary, Centurion believes the CND should be assessed via the EIS process, as provided for under Section 26 of the SDPWO Act.

Section 4 of *Application Guideline: Coordinated project declaration under the* SDPWO Act outlines the following with respect to the Coordinator-General requiring an EIS:

> *(a) Projects that require an EIS exhibit the potential for high levels of risk to the environment and/or are major projects that may not be well defined or been developed before. Such projects will often have multiple components and complex approval requirements.*

Section 26(1) of the SDPWO Act permits the Coordinator-General to require an EIS for projects that present significant environmental effects. Centurion considers that the CND meets this threshold due to its nature, scale, complexity, scope of studies required and potential environmental impacts. Located on ML 1790, ML 70495, and part of MDL 3010, the CND will utilise existing relevant infrastructure from the adjacent CCM.

2.2 Commonwealth Approvals

A referral will be submitted to the Commonwealth Environment Minister under the EPBC Act. The potential for significant impacts to land resources, surface and groundwater, air, ecosystems, and regional socio-economic conditions, and subsequent risk of environmental harm resulting from the CND, justifies a “controlled action” decision.. Therefore, it is anticipated that the CND would be assessed under the bilateral agreement between the state and commonwealth governments. A discussion of environmental impacts and a preliminary environmental risk profile are provided in **Section 7.1**

3 The Proponent

Centurion confirms its intention to own and operate the on-lease components of the CND. The off-lease development and infrastructure required to transport and commercialise gas, including engineering, design, environmental approvals, construction and operations, will be the responsibility of a third party via a commercial agreement with Centurion.

3.1 Corporate Structure

Centurion owns the CCM and is the proponent for the CND. Centurion is a subsidiary of Peabody, the Australian-based holding company owned by the United States of America (USA) based Peabody Energy Corporation. Peabody's primary business is the mining, sale, and distribution of coal, providing essential products to produce affordable, reliable energy and steel. Peabody Energy Corporation's operations are located in the USA and Australia. Peabody's Queensland based operating mines include the CCM, Coppabella Mine, Moorvale Mine and Moorvale South Mine. Peabody is also a joint venture participant in the Queensland based Middlemount Mine.

Peabody has approximately 5,600 employees in the USA and Australia. Peabody strives to build a strong, united workforce with a commitment to safety as a way of life. In 2024, the company achieved a global safety incidence rate of 0.81 incidents per 200,000 hours worked.

3.2 Project Experience

Peabody operates seven (7) mines in New South Wales (NSW) and Queensland. Through the development and operation of these sites, Peabody has the required experience to progress and complete the CND and has the in-house capability for the preparation and submission of tenure and environmental authority applications. Typically, Peabody will engage an experienced lead consultant to develop environmental application supporting material such as impact assessments.

In support of the CND approvals program, Peabody has engaged SLR Consulting Australia Pty Ltd (SLR), a multi-disciplinary environmental services firm, as the lead consultant responsible for delivering the environmental impact assessments and approvals for the CND. Peabody has worked with SLR on other projects in Queensland and NSW and has a well-established relationship with the key project team members from SLR and with several of SLR's technical discipline team leaders. SLR brings a highly skilled technical project team with regulatory engagement experience and with prior experience on several large resources approvals projects, including BMC's Wards Well Project, over which the CND is located.

Peabody is in a well-informed position regarding the likely assessment requirements, project impacts and risks to environmental values. Coupling Peabody's own experience with Major EA Amendments and EIS level assessments and that of SLR, Peabody has confidence regarding its understanding of the technical requirements and costs associated with obtaining the required approvals for the CND and has the financial and technical resources to meet those requirements.

3.3 Environmental Record

Centurion has an excellent record of responsible environmental management and a strong commitment to the communities and the environments in which it operates. Centurion has no convictions for breaches of environmental management requirements and regularly reviews environmental performance and publicly reports on progress. Centurion is not, to its knowledge at the date of this IAS, subject to any other proceedings or actions relating to its management of the environment.

Approximately 40 km from the CND area, Peabody has set a benchmark in environmental stewardship through the Burton Mine Rehabilitation Project. This project transformed a once active open cut mining site into a thriving landscape of biodiversity and sustainable agriculture, resulting in over 1,479 hectares of land been rehabilitated, including the creation of two creek diversions and repurposed water storage dams in drought prone areas. The project incorporates over 15,000 native plants and fosters a habitat for diverse wildlife, including emus, black swans, freshwater crabs, and pelicans, while returning the land to grazing use for local farmers. Peabody had been progressively rehabilitating land at Burton well before the Queensland Government implemented changes to legislation in 2019, mandating a Progressive Rehabilitation and Closure Plan (PRCP). Peabody adheres to an internal metric aimed at restoring (regraded) one acre of mined land for every acre of disturbed land annually across its operations in Australia and the US.

Peabody's environmental, social and governance programs, including corporate ethics, compliance, safety and environmental programs, are subject to ongoing evaluation and oversight. The Board of Directors achieves responsible corporate governance practices through a dotted line reporting relationship between management's compliance function and the Board's Nominating and Corporate Governance Committee, and through regular compliance reporting to both the board's Nominating and Corporate Governance and Health, Safety, Security and Environmental Committees.

Peabody maintains an Environmental Policy that is championed by our Executive Leadership Team, who have overall responsibility for Peabody's environmental performance. Our board of directors and the board's Health, Safety, Security and Environmental (HSSE) Committee provide oversight for this policy and supporting functions. The committee's oversight responsibilities include significant risks and opportunities identified in the HSSE areas; objectives, policies, programs and performance metrics; and efforts to advance progress on sustainable development.

Peabody's environmental approach considers the full mining lifecycle, from exploration through mining, processing, closure and release responsibilities. The Peabody Health, Safety, Environment & Communities Policy, our environmental programs and supporting environmental standards drive the sustainable use and protection of natural resources, mitigate operational risk and establish expectations regarding consultation and collaboration with communities of interest. Establishing a risk-based framework, our Safety and Sustainability Management System is the basis for continuous improvement in health, safety and environmental stewardship. This includes:

- Our commitment to comply with all applicable environmental standards.

- Appropriate training to ensure all employees and vendors are equipped and knowledgeable to comply with all regulations and our programs.
- Regular review of risk and opportunities, including aspects that could impact the environment; Regular monitoring and auditing to ensure program alignment.
- Corrective action plans that address opportunities for improvement.

Peabody utilises industry-leading practices to efficiently use natural resources and minimise our environmental impact. This strategy includes a focus on reducing greenhouse gas intensity, reducing energy consumption, applying progressive land reclamation to lessen surface disturbance, conserving water and advancing recycling and waste management programs.

3.4 Gas Commercialisation Projects

The CSG pre-drainage component of the CND will produce high purity methane gas for sale to the domestic market. There will be a particular focus on customers in the Townsville region due to proximity to the North Queensland Gas Pipeline (NQGP). The gas commercialisation from the CND is justified as it supports domestic energy security, assists in meeting industrial and electricity generation demand, reduces emissions compared to flaring, and provides direct economic benefits such as employment, royalties, and flow-on effects to the local economy.

Associated infrastructure[1] related to the CND will include a combination of the following:

- A 5 MW gas fired power station (for which Centurion has lodged an application for a Development Approval).
- Potential upgrade of the power station from 5 MW to approximately 21 MW capacity.
- A CAH to collect and process extracted CSG.
- A LNG refrigeration hub.

Development and infrastructure required to transport and commercialise gas, including engineering, design, environmental approvals, construction and operations, will be the responsibility of a third party via a commercial agreement with Centurion. Centurion is in the process of investigating commercial agreements with multiple potential gas commercialisation partners.

[1] **Associated infrastructure** refers to the structures, facilities, and systems that are necessary to support the primary operation or activity of a project but are not the main feature of the project itself. These components are integral to the operation, often ensuring functionality, accessibility, and compliance with legal or operational requirements.

4 Nature of the Proposal

4.1 Feasibility and Justifications

The CND area includes significant reserves of high purity methane gas from CSG. The CSG pre-drainage activities will be integrated with the UG longwall mining operations to reduce emissions while contributing to energy supply via the Queensland gas network. The high concentration of CSG in the CND area has historically been problematic for UG mining operations due to safety and economic feasibility concerns regarding pre-drainage. The CSG pre-drainage program aims to address these issues by capturing and reusing gas to meet the electricity needs of the remaining CND activities and increasing domestic gas supply via the Queensland gas network.

The CSG pre-drainage component of the CND will supply up to 10 petajoules (PJ) per annum to the Queensland gas network, which is enough to power more than 190,000 Queensland homes each year. This represents approximately 3% of the Queensland domestic market, while also reducing overall emission footprint of the remainder of the CND.

The CND area also contains substantial PLV HCC reserves. PLV HCC has very low impurities and excellent strength both in low and high temperatures. PLV HCC is highly sought after by customers across the globe as it makes the steelmaking process more efficient by using less coal, creating fewer emissions and supporting decarbonisation targets. The coal reserves contained in the CND are limited across the world, making the CND one of the very few operations capable of bringing new production of this type of coal to the market in the next decade.

The CND will support economic growth and job creation in regional Queensland communities. These benefits include:

- The CND will secure the jobs of up to 525 employees and contractors currently working at the CCM, ensuring ongoing stability for workers and their families.
- Build on the local content investment by CCM.
- Peabody estimates an investment of approximately $662 million for CND following an approximately $752 million investment for the CCM redevelopment, a total of approximately $1.4 billion for the Centurion Mine Complex.
- The CND is expected to contribute an estimated $5.8 billion in royalties to the Queensland State Government over the life of the CND.
- MDL 3010 was previously considered uneconomic; however, the CND now provides economical opportunity to unlock the value of the gas and coal reserves in this area.

4.2 Project Need, Justification and Alternatives Considered

Centurion will take advantage of increasing demand in several overseas markets. For metallurgical coal, market demand is growing strongly in India and South-East Asia including Indonesia in line with their current high rates of macro-economic expansion. In comparison, the more mature markets for seaborne metallurgical coal such as Japan and Europe, show a declining growth. Australia is the main supplier of seaborne metallurgical coal to the world and the market offer covers all quality types from hard coking coal (HCC), Semi-Hard coking coal

(SHCC), Semi Soft Coking Coals (SSCC) and Pulverized Coal Injection (PCI) coal. While Australia supplies just over half of the seaborne metallurgical coal demand, it also supplies over two thirds of the HCC to the seaborne market.

Mongolian and Russian metallurgical coal is being aggressively promoted to compete in the Chinese and seaborne markets but most of these new supplies will be SSCC or SHCC and so unable to compete with Australian HCC's such as CCM's product. Mongolian coal is currently restricted by lack of access to seaborne export ports and therefore is targeted at the land-based China market. Metallurgical coals from both these regions have different properties to Australian coals.

It is clear the supplies for HCC will struggle to keep up with demand and will at least retain and likely increase their price premium as compared to the SHCC and especially the SSCC product types. Indian demand is focused heavily on the HCC quality typified by CCM's product.

The UG longwall mining component of the CND has the benefit of utilising existing infrastructure and resources on the CCM to produce cost and time efficiencies. Additionally, the CND is to be located immediately adjacent to the existing CCM, which is already a heavily disturbed environment because of multiple mining operations.

The CSG pre-drainage component of the CND will produce high purity methane gas (~99%) that will be suitable for heating applications in industrial processes, use in gas turbines for the generation of electricity and for use in agricultural, mining, transport and industrial applications for fuelling internal combustion engines. As the Queensland and Australian economies transition to a higher portion of renewable power generation, gas fired power generation will play an important role in providing base load, backup, peaking and firming electricity supply due to its flexibility and dispatchability.

In Queensland, there is a significant amount of natural gas that is exported to international markets, particularly through the port of Dalrymple Bay Coal Terminal . The export market absorbs a large portion of gas production from Queensland due to relatively strong pricing compared to domestic markets, thereby providing a supply constrained domestic market that has typically experienced high price volatility. State and Commonwealth governments have both introduced policy[2] measures to prioritize domestic supply to ensure that demand is met, and this is likely to provide a more stable domestic price environment.

Queensland consumed around 300-350PJ of natural gas in 2022 according to the Australian Energy Market Operator (AEMO). The mix of users is expected to change as the energy transition occurs over the next 20-30 years, however the use of natural gas in industrial processes is expected to support long-term domestic demand fundamentals over that timeframe.

[2] Australian Government. Department Industry, Science and Resources. Future Gas Strategy https://www.industry.gov.au/publications/future-gas-strategy

The CSG pre-drainage component of the CND will supply up to 10PJ per annum representing approximately 3% of current Queensland domestic market share. As the CND does not currently have a commercially feasible connection to a gas export terminal (such as Dalrymple Bay Coal Terminal), the CND CSG customer base is limited to domestic markets, particularly around Townsville where the project is able to feasibly connect to the NQGP that is located within 10 km of the CND area. The customer base may also extend to those within economical trucking distance for liquified gas that could be produced at the site or from a site connected to the NQGP. Townsville is a significant industrial centre with growth opportunities due to its population and access to export markets for industrial products. Off-lease infrastructure required to transport and commercialise gas, including the design, environmental approvals, construction and operations, will be the responsibility of a third party via a commercial agreement with Centurion.

The alternatives to developing the CND are to:

1. Proceed with CSG pre-drainage only, or
2. Flare the CSG in advance of the UG longwall mining operations, or
3. Not proceed with the CND, or
4. Proceed with mining the GLB2 seam within ML 6949, i.e. the CCM.

Alternatives 1. and 3. are not an optimal use of the resource and would result in the loss up to 525 direct job opportunities in the region, loss of State Government income from royalties, and loss of flow on economic benefits to the local and regional communities.

Flaring the gas resource and/ or not proceeding with commercialising the gas resource would also result in a reduction of available domestic gas supply and a significant increase in overall emissions as the gas from the project is unable to substitute other sources of emissions.

Alternative 4. is not preferred because it is more hazardous, more expensive to develop the lower seam, and of inferior coal quality.

All of these alternatives are not an optimal use of the resource and would result in loss of employment opportunities in the region, loss of State Government income from royalties, and loss of flow on economic benefits to the local and regional communities.

4.3 Government Policies and Strategic Alignment

No conflicts in relation to State policies or Government priorities have been identified at this stage. The EIS process will cover details on the applicable requirements for the CND, including assessments against all relevant state planning policies. Centurion’s engagement with Government to date indicates strong support for securing Queensland’s energy future, continuation of PLV HCC exports and streamlining of environmental approval processes. Further, the CND will provide employment opportunities for up to 525 full time equivalent (FTE) employees and contractors.

4.4 Economics and Financing

Peabody estimates an investment of approximately $662 million for CND following an approximately $752 million investment for the CCM redevelopment, a total of approximately $1.4 billion for the Centurion Mine Complex.

Over the life of the CND, Centurion estimates total costs of approximately $18.8 billion to commercialise the gas resource and to execute the UG longwall mining operations. This comprises direct investment in the CSG pre-drainage program of approximately $508 million to develop the CSG pre-drainage operations and approximately $893 million in off-site costs to deliver gas to the domestic market, of which approximately $125 million will be payable in State Government Royalties. It additionally comprises of direct site costs for UG longwall mining operations, of approximately $8.2 billion and approximately $9.2 billion in off-site costs to deliver PLV HCC to export terminals with access to the seaborne metallurgical coal market, which includes approximately $5.8 billion payable in State Government royalties.

Funding for the development of the CND and for delivering gas to the commercialisation infrastructure will be provided by the proponent’s parent company, Peabody, and from operating cashflows generated by the CCM. Peabody has a strong balance sheet with sufficient cash reserves and access to existing unutilised credit facilities to fully finance the combined CND projects comprising, the restart of operations at CCM and the CND.

5 Scope of the Project

5.1 Location

The CND is located approximately 40 km north of Moranbah, and 140 km west of Mackay in the Isaac Regional Council Local Government Area in central Queensland. It is immediately north of the existing CCM tenure (located on ML 6949) and will encompasses ML 1790, ML 70495 and a south-western portion of MDL 3010, immediately north of the existing CCM on ML 6949.

Access to the CND area will be from Moranbah via the Goonyella Road, the Red Hill Road, the North Goonyella Mine Access Road, and the council owned Mabbin Road. From the Mabbin Road access point (Easting 600516.3903, Northing 7605043.667), existing access tracks within ML 6949 will provide a direct route to ML 1790 (Easting 599165.0211, Northing 7608560.132). The CND area encompasses a total of 4,381 ha. The location of the CND is shown on **Figure 1-1**.

5.2 Land Use and Ownership

Currently, the land within the CND area is used predominantly for cattle grazing on native grasses. The land is zoned as ‘rural’ under the IRC. The CND area is located within a modified landscape, impacted largely by agricultural and mining land uses. It is proposed that the land be used for CSG pre- drainage and mining activities as outlined in this IAS. Details of mining tenure held by Centurion for the CND are outlined in **Table 5-1** and illustrated on **Figure 5-1**.

Table 5-1 CND Mining Tenure

No.	Name	Holder	Mineral	Expiry	Area (ha)
ML 1790	Wards Well	Centurion Coal Mining Pty Ltd	Coal and Gaseous Hydrocarbons	31 July 2041	2,722.82
ML 70495	Wards Well South-East	Centurion Coal Mining Pty Ltd	Coal	31 May 2038	747.75
MDL 3010	Dabin	Peabody West Burton Pty Ltd (86.665%) CITIC Australia Coal Pty Ltd (13.335%)	Coal	28 February 2027	10,827

The resource tenure not owned by Peabody, but which overlap the CND area, are presented in **Table 5-2** and illustrated on **Figure 5-1**.

Table 5-2 Overlapping Resource Tenure

No.	Holder	Mineral/ Purpose	Expiry	Overlapping Centurion Interests
EPC 739	Byerwen Coal Pty Ltd	Coal	24 November 2029	ML 1790
ATP 1103	CH4 PTY LTD	CSG, Petroleum	26 March 2025	ML 1790, ML 70495, MDL 3010

No.	Holder	Mineral/ Purpose	Expiry	Overlapping Centurion Interests
PCA 258	CH4 PTY LTD	Petroleum	26 March 2025	ML 1790, ML 70495, MDL 3010
EPG 2046	Australis Energy Pty Ltd	Geothermal	Application	ML 1790, ML 70495, MDL 3010
PPL 2073	QPM Energy Pty Ltd	Petroleum Pipeline	13 February 2054	ML 1790, ML 70495
PFL 33	QPM Energy Pty Ltd	Petroleum Facility	13 February 2054	ML 70495

Details of relevant land ownership within the CND area are outlined in **Table 5-3** and illustrated on **Figure 5-2**. Centurion has compensation agreements in place with all relevant parties, i.e. Stanmore and the IRC.

A new Cultural Heritage Management Plan (CHMP) has been developed with the Widi People of Nebo Estate #1 and Centurion for the area covered by ML 1790 and ML 70495. The CHMP is currently being finalised and prepared for execution. The CHMP will be amended at later date to eventually include the future tenement over MDL 3010. The CHMP has been prepared to include all Project activities including field investigations, construction, operations and rehabilitation. Any ground disturbing activities undertaken in accordance with the CHMP satisfies the Duty of Care obligations under Section 23(1) of the *Aboriginal Cultural Heritage Act* 2003 (Qld).

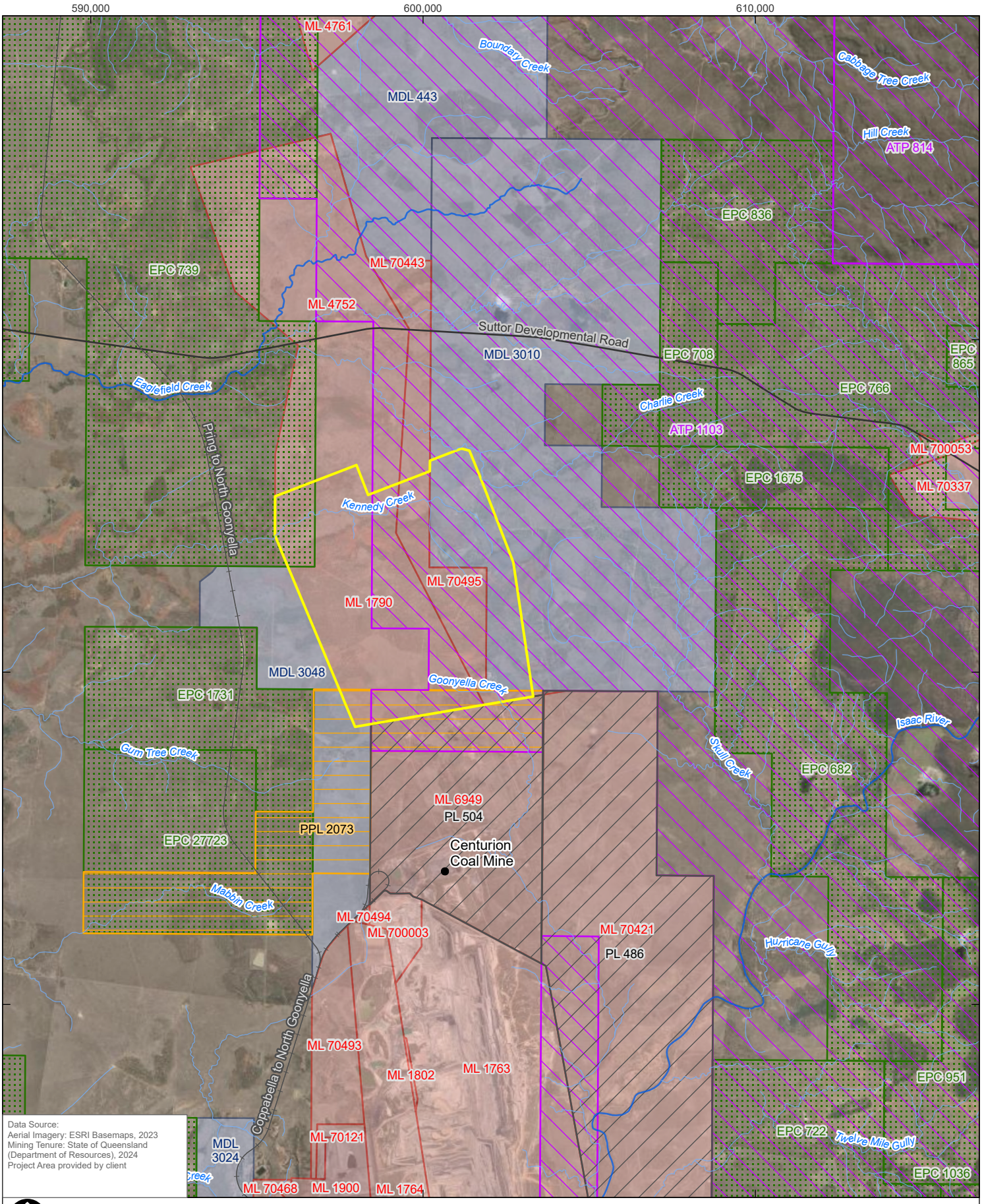
Table 5-3 Land Ownership

Title	Lot Number	Plan Number	Tenure Type	Owner
ML 1790	2	SP214117	Leasehold	Stanmore SMC Pty Ltd
	11	SP262530	Freehold	Stanmore SMC Pty Ltd
	N/A	N/A	Road Parcel	Isaac Regional Council
ML 70495	2	SP214117	Leasehold	Stanmore SMC Pty Ltd
	N/A	N/A	Road Parcel	Isaac Regional Council
MDL 3010	2	SP214117	Leasehold	Stanmore SMC Pty Ltd
	N/A	N/A	Road Parcel	Isaac Regional Council

5.3 Interested and Affected Parties

Affected persons are defined under section 38 of the EP Act and include groups and persons with rights or interests in the land affected by a project including landowners, Traditional Owners, and First Nations Peoples. Interested persons are defined under section 41 (3)(b) of the EP Act and may include persons who have a financial or non-financial interest in the local government area in which the project would be situated (e.g., unincorporated community or environmental bodies, industry bodies).

Centurion has outlined a detailed approach to community and stakeholder engagement under **Section 9**, and has provided a list of interested and affected parties under **Appendix A**.



Data Source:
Aerial Imagery: ESRI Basemaps, 2023
Mining Tenure: State of Queensland (Department of Resources), 2024
Project Area provided by client

0 2.5 5 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:150,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Rail Network
- Road
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Petroleum Lease
- Petroleum Pipeline Licence
- Authority to Prospect - Petroleum
- Exploration Permits for Coal
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

RESOURCE TENURE

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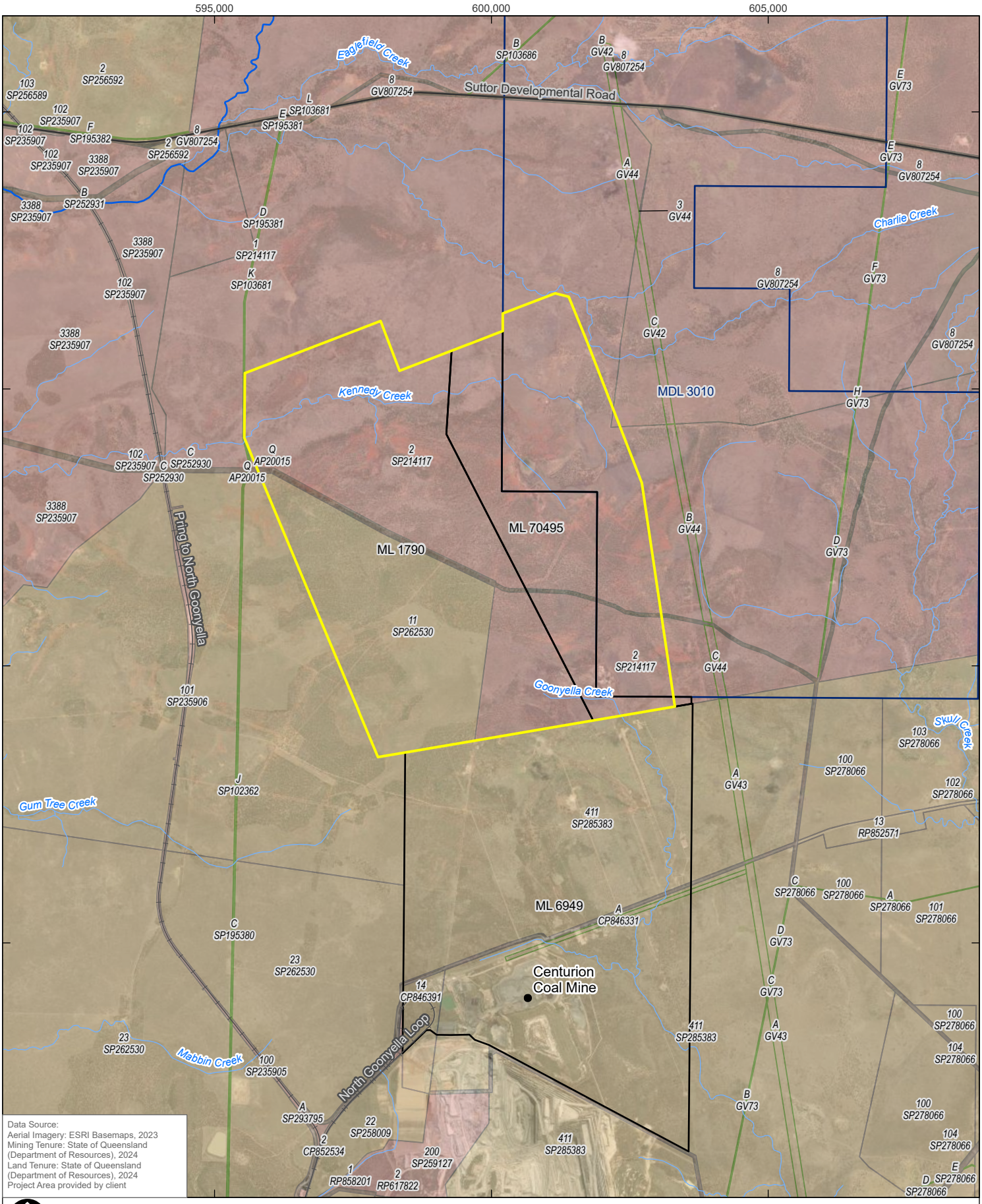
FIGURE 5.1

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F05-01_Resource Tenure



Data Source:
Aerial Imagery: ESRI Basemaps, 2023
Mining Tenure: State of Queensland (Department of Resources), 2024
Land Tenure: State of Queensland (Department of Resources), 2024
Project Area provided by client

0 1 2 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:90,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Rail Network
- Road
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

Land Tenure

- Easement
- Freehold
- Lands Lease
- Main Road
- State Land

CENTURION NORTH DEVELOPMENT

LAND TENURE

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FIGURE 5.2

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F05-02_Land Tenure

5.4 Components, Developments, Activities and Infrastructure that Constitute the CND

The CND aims to utilise the substantial reserves (both CSG and PLV HCC) of the Goonyella Middle (GM) coal seam in central-east Queensland, with the objective to commercially utilise CSG reserves from CSG pre-drainage activities (refer to **Section 1.3** and **Section 4**). The CND will be constructed and operated progressively across the CND area. An overview of the infrastructure and activities required for CSG pre-drainage, and UG longwall mining operations are provided below.

CSG pre-drainage activities must commence by 2027 to allow sufficient time to extract CSG prior to the commencement of UG longwall mining by 1 January 2030, in accordance with the ML 1790 conditions outlined in **Section 1.3**. .

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The CSG pre-drainage and commercialisation will require the development of infrastructure and activities on ML 1790, ML 70495, and MDL 3010. The key components of the CSG pre-drainage and commercialisation are outlined below:

- A network of up to 150 surface-to-inseam (SIS) pairs of vertical and lateral wells, across up to 260 well pads yielding a total of 104.6 PJ of gas between 2027 and 2054, at a maximum extraction rate of up to 10 PJ per annum
- Associated infrastructure, including flares, pumps, water holding tanks, mobile office/workshops and lighting.,
- Gas pipeline network connecting the vertical (production) wells to offsite third-party infrastructure (such as the carbon abatement hub or power plant).
- Water management to capture, transport and treat the groundwater associated with extraction of CSG, including pipelines and ponds.
- Power infrastructure including diesel generators and high-voltage (HV) powerline to provide electricity.
- Access tracks for light and heavy vehicles.
- Quarry to supply materials to support infrastructure construction.
- The extracted gas will be transported offsite to a third-party facility for commercial purposes and to power the ongoing operations at CCM.

Off-lease infrastructure required for gas transport and commercialisation, including the design, environmental approvals, construction and operations, will be the responsibility of a third-party via a commercial agreement with Centurion. The conceptual layout of the CSG pre-drainage infrastructure is shown on **Figure 5-3**. A detailed description of the infrastructure and activities associated with CSG pre-drainage is provided in **Section 5.4.1**.

The UG longwall mining operations are a continuation of existing operations at the CCM, which is located immediately south of ML 6949. These activities will progressively follow the extraction of CSG (CSG pre-drainage) as mining of coal becomes safe. The UG longwall mining operations will extract up to 7.1 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal from 2029 to 2055, totalling up to 148 Mtpa of ROM coal over this period. It is important

to note that resource definition, in accordance with SEC regulations (SK1300) will continue, likely refining ROM and product coal projections over time. The UG longwall mining operations will utilise existing infrastructure at the CCM.

The key infrastructure requirements for the UG longwall mining operations are all located on-lease and will include the following:

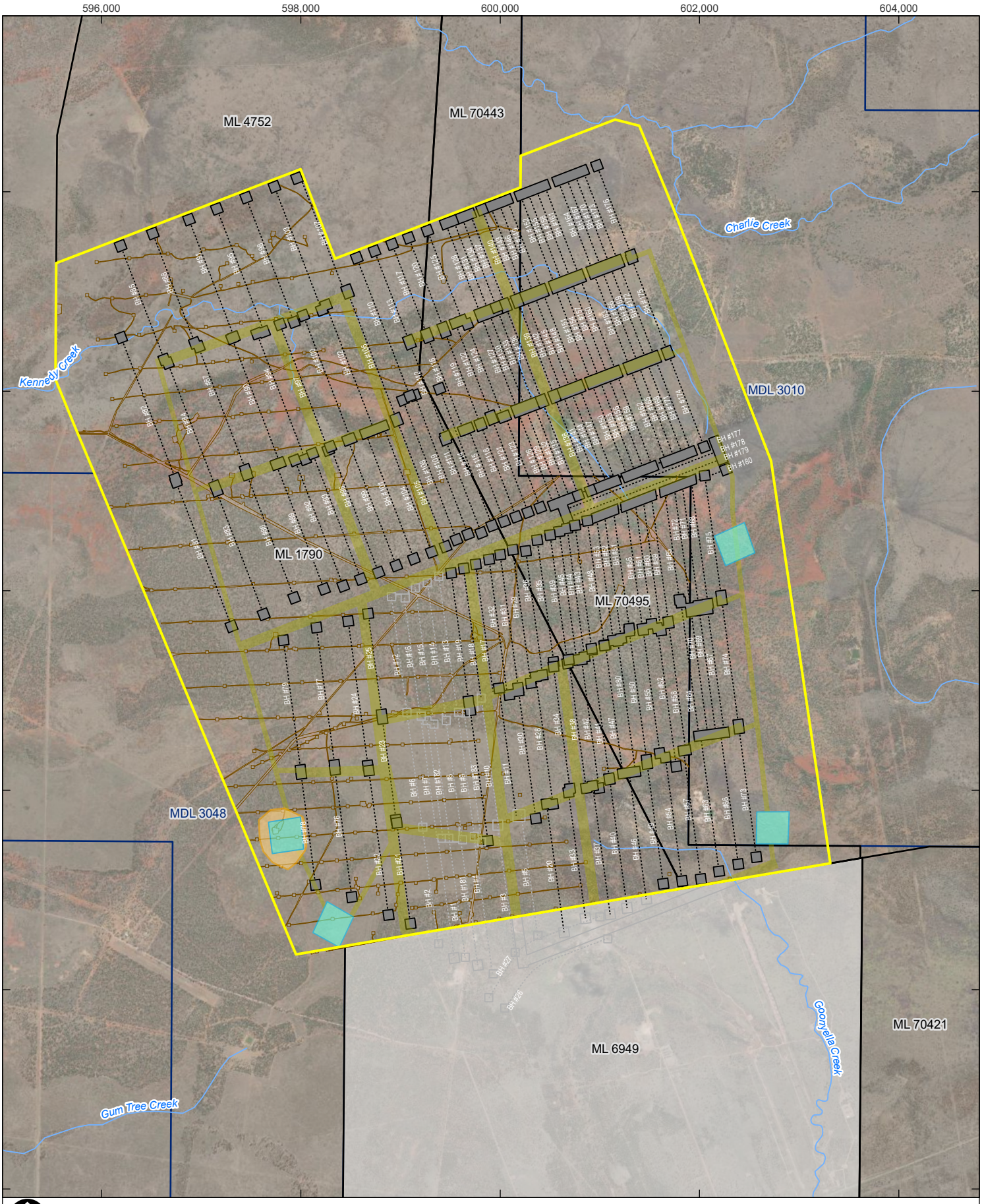
- A main infrastructure pad located on ML 1790 (USS2).
- Primary ventilation shafts and secondary ventilation shafts.
- Goaf gas drainage infrastructure and access tracks within the subsided zones.
- UG gate road conveyors and extension of mains conveyors.
- UG piped services such as fire protection raw water, compressed air, and longwall emulsion.
- Dewatering infrastructure, including additional mine water management dams at surface.
- HV reticulation system, including extension of an existing HV line and 66kv/11kv substation at USS2.
- Ancillary infrastructure such as administrative facilities, and additional fuel and lubricant storage, satellite washrooms, crib-rooms, health, first aid, medical and emergency response facilities also associated with the northern mine access shaft.

The conceptual layout of the UG longwall mining infrastructure is shown on **Figure 5-4**. A detailed description of the infrastructure and activities associated with UG longwall mining is provided in **Section 5.4.2**.

The following existing infrastructure at the CCM located on ML 6949 will be shared for both CSG pre-drainage and UG longwall mining activities:

- CHPP, for which no upgrade is required.
- Mine-waste co-disposal facility.
- ROM and product coal stockpiles.
- Workshops and administrative buildings.
- Water management infrastructure.
- Train load-out facility and rail loop for coal transport to Dalrymple Bay Coal Terminal.
- Mine access road.

The use of the nearby off-site accommodation village will continue for the CND.



0 0.5 1 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:50,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area
- Existing Surface Disturbance
- Activities authorized under EA EPML00815613 (12 February 2024)
- Gas Pre-Drainage Infrastructure (not subject of coordinated project application)
- Conceptual Gas Pre-Drainage Infrastructure
- Conceptual Water Management Infrastructure
- Indicative Quarry Area Only (quarry resources investigations ongoing)
- Conceptual Services Corridor (Gas, Water, Power, Access)

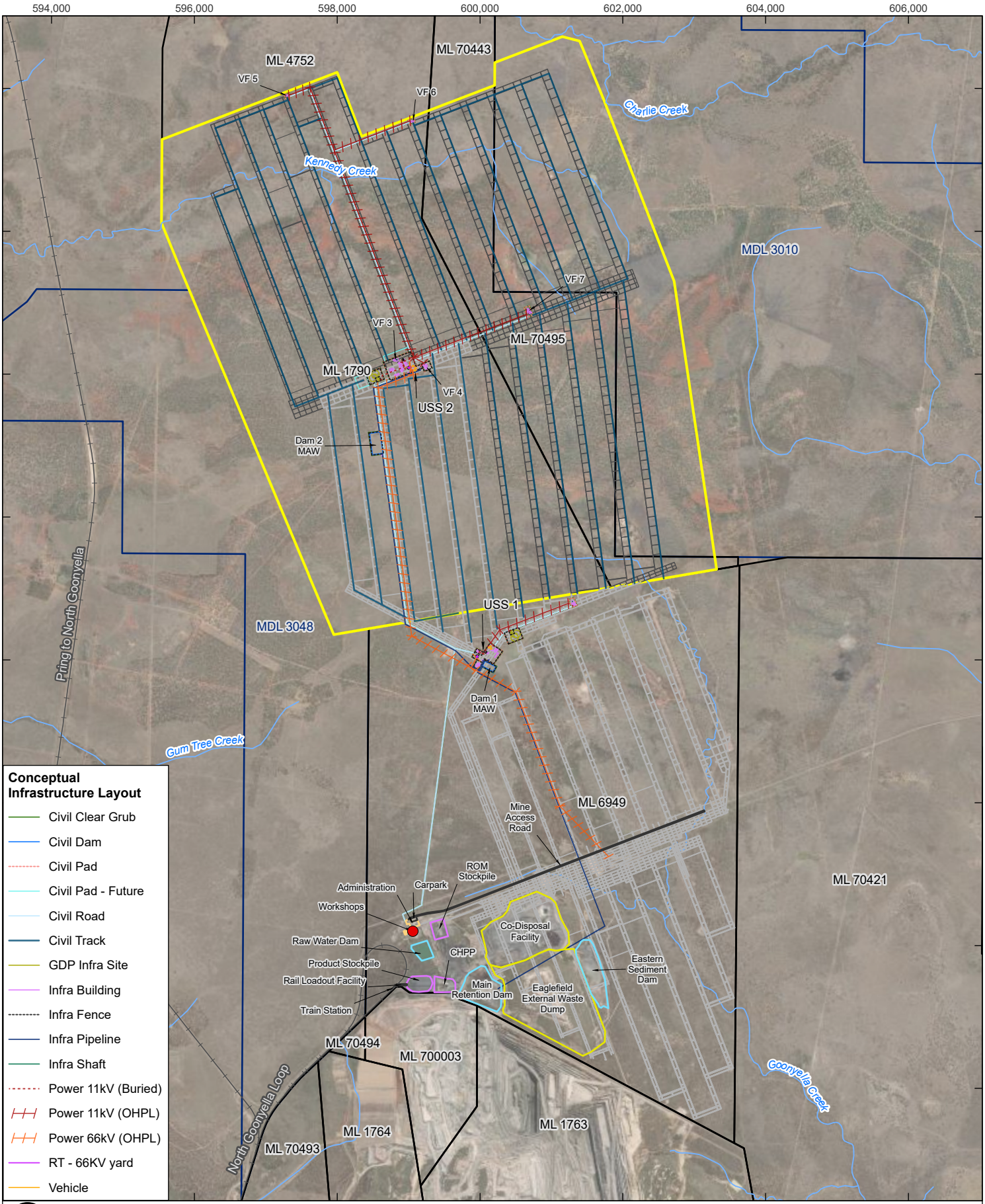
CENTURION NORTH DEVELOPMENT

CONCEPTUAL PROJECT LAYOUT – INFRASTRUCTURE ASSOCIATED WITH GAS PRE-DRAINAGE

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

FIGURE 5.3

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F05-03_Conceptual Gas Project Layout



0 1 2 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:70,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Portal
- Rail Network
- Watercourse
- Underground Mine Plan (not subject of coordinated project application)
- Underground Mine Plan
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

Facility

- Mine Operation
- Operation Facility
- Transport
- Waste
- Water Management

CENTURION NORTH DEVELOPMENT

CONCEPTUAL PROJECT LAYOUT – INFRASTRUCTURE ASSOCIATED WITH UNDERGROUND MINING

DISCLAIMER: All information within this document may be based on external sources. SLR Consulting Pty Ltd makes no warranty regarding the data's accuracy or reliability for any purpose.

FIGURE 5.4

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F05-04_Conceptual Mining Project Layout

5.4.1 CSG Pre-Drainage

Key construction and operation requirements specific for CSG pre-drainage are detailed below.

5.4.1.1 Construction Processes

The construction phase for CSG pre-drainage activities is defined as clearing and construction of access tracks and well pads, drilling of vertical and lateral wells and installation of supporting infrastructure. The EIS will provide detailed methodology and disturbance footprints for clearance of regulated vegetation, Matters of National Environmental Significance (MNES), Matters of State Environmental Significance (MSES), and Strategic cropping areas (SCA) within the CND area.

Key construction requirements anticipated for CSG pre-drainage are described below.

Well Pads

Wellheads will be located within the boundaries of up to 260 well pads, each measuring up to 100 m X 100 m, will be required for the CND.

Infrastructure to be located within the boundaries of a well pad includes:

- Drilling equipment such as a drill rig and pumps.
- CSG extraction equipment including wellheads, separators, flares, compression units, meter station, sensors, control systems, and pipelines.
- Water management infrastructure including water holding tank and pipelines.
- Mobile office/workshop.
- Power supply (i.e. diesel generator or electricity connection).

Vertical and Lateral Wells

Up to 150 pairs of vertical and lateral wells will be drilled to extract CSG from the target coal seam. Well infrastructure includes:

- Wellhead assembly (valves, gauges, and pressure control systems) to control CSG and water flow.
- Pumps to lift water from the target coal seam to the surface, reducing pressure and allowing CSG to flow.
- Gas separator to separate CSG from the co-produced water.
- Water management facilities including holding tanks and pipelines to manage the co-produced water.
- Casing (such as steel, fibre glass or high-density polyethylene (HDPE)) cemented in place to prevent groundwater and gas from moving outside of the well and between geological layers. Perforations are made in the casing at the coal seam level to allow gas to flow into the well.

Following development of the well pads, construction methodology for the wells is as follows:

- A larger diameter hole (12 ¾" diameter) is drilled to a shallow depth (24 m) and a steel casing is installed to prevent the well from collapsing. The hole is then drilled to the target GM coal seam depth (290 m - 570 m).
- For lateral wells, using directional drilling techniques, the wellbore is gradually deviated from the vertical to horizontal, forming a curve. This requires specialised downhole motors and tools.
- Once the curve is horizontal, it is drilled along the coal seam (1,000 m -1,900 m) for a specified distance to connect with the vertical well. The horizontal well maximises exposure to the coal seam, enhancing gas recovery and the spatial extent of data acquisition.
- Drilling fluid (mud) is used to lubricate the bit, control pressure, and carry cuttings to the surface. The cuttings will then be collected at the surface, where they will be disposed of in line with the CCM waste management procedure.
- Casing (such as steel, fibre glass or HDPE) is run into the hole to the total depth and cemented in place to prevent groundwater and gas from moving outside of the well and between geological layers. Perforations are made in the casing at the coal seam level to allow gas to flow into the well.
- The well is then completed with necessary equipment for gas extraction.

Gas Pipeline

A network of gas pipelines will be constructed within a 150 m wide corridor to connect the wells to a third-party facility for commercial purposes. The network will consist of individual gas pipes, connecting to a primary trunk pipeline.

5.4.1.2 Operational Processes

The operation phase of the CND CSG pre-drainage activities is defined as the extraction of CSG from the target coal seam and transportation to third-party infrastructure. The key operational requirements are detailed below.

Well Pad

During operation of the CND, the well pad will serve as a centralised, organised area for equipment and infrastructure required for efficient and safe CSG extraction. Infrastructure to be located within the boundaries of a well pad includes CSG extraction equipment, water management infrastructure, mobile office/workshop, and power supply. No additional surface disturbance is anticipated for well pads following construction.

Vertical and Lateral Well

Following drilling of the vertical and lateral wells and installation of the necessary extraction and monitoring equipment, CSG will be extracted as follows:

- Water in the GM coal seam (formation water) will be removed through the vertical well, reducing the pressure in the coal seam (by approximately 40 kpa/day) throughout the lateral well that each vertical well is paired with.
- Pumps at the base of the vertical wells are operated to bring co-produced water to the surface.

- It is anticipated that depressurising of the coal seam will take up to 90 days.
- Co-produced water will be managed at surface water management dams where it can be stored and treated prior to transfer to CCM or for beneficial third-party use.
- The reduction in pressure within the coal seam allows CSG to be desorbed from the coal.
- The CSG will migrate through the coal's natural fractures (cleats) through the perforations made in the casing and into the well.
- The desorbed CSG will flow along the lateral well and up into the connected vertical well to the surface, where it will be separated from any remaining water.

The CSG pre-drainage activities will extract a total of up to 104.6 PJ of gas from 2027 to 2054. The CSG production rate per well is anticipated to peak at an average of approximately 140 litres per second (Lps) during 2028. Based on 85% operational efficiency for each well, CSG production peaks at an average flow rate per well of 34 Lps. Each well is anticipated to produce CSG for up to 10 years, subject to well performance, with a maximum extraction rate of up to 10 PJ per annum. It is anticipated that the CSG will comprise >99% methane (CH_4).

Gas Pipeline

Extracted CSG will be transferred via a network of gathering pipelines that will converge into the main trunk line. The trunk line will connect to a third-party facility, and be located off the CND area, for commercial purposes. The pipeline network will have sufficient capacity to transfer extracted gas safely offsite.

5.4.1.3 Rehabilitation and Closure

Well pads, wells and associated infrastructure will be progressively decommissioned and rehabilitated when individual wells reach the end of their production life.

Wells will be plugged and abandoned, which typically involves removing well completion hardware, testing the integrity of the casing installed during drilling, and filling the well with cement to prevent gas or water from travelling up or down the well. The well will be grouted near the top of the casing and top approximately two metres of the casing below the ground surface will be removed. This approach ensures no obstructions to future land use such as ploughing or ripping.

The well pads will be rehabilitated to an appropriate post land use classification. Drilling fluids and cuttings will be disposed, portable infrastructure would be removed, and sumps would be backfilled. At the completion of rehabilitation, the land is currently planned to be used for cattle grazing.

5.4.2 UG Longwall Mining

Key construction and operation requirements specific for UG longwall mining are detailed below.

5.4.2.1 Construction Processes

Some construction works in the CND area are required to support the UG longwall mining operations. Mine infrastructure requirements are outlined in **Figure 5-4**.

The mining activities represent the continuation of operations of the CCM north from ML 6949 into the CND area and as such there are no significant construction requirements. The mining activities will utilise infrastructure already established at CCM. There are also no off-lease construction requirements, as access roads and coal transport infrastructure are established for the CCM.

The construction requirements will consist of civil earth works, and establishment of equipment and plant to support the UG operations. The construction process will include the following:

- Survey and pegging of clearing boundaries.
- Establishment of temporary construction laydown areas, vehicle washdown bay and temporary crib facilities.
- Clearing of vegetation and grubbing as required.
- Dust suppression.
- Pushing of cleared vegetation.
- Trucking of fill and/ or aggregate and other materials.
- Civil earth works.
- Topsoils will be established in topsoil management areas (for use in future rehabilitation).
- Transport of equipment and plant to the site.
- Installation and testing of equipment and plant.

Mining activities will prioritise construction impacts to previously cleared areas, such as clearing completed for CSG pre-drainage activities (**Section 1.1.1**), or other historically impacted areas, where practical.

The main infrastructure pad (USS2) will be established early during the CND, as this area will include critical infrastructure for the UG operations to progress.

Some construction processes will be progressive, such as the following:

- Establishing goaf management infrastructure at surface.
- Establishment of mine dewatering and management infrastructure.
- Formalising access roads.
- Underground-to-in-seam (UIS) gas drainage riser bores.
- Secondary ventilation shafts.
- Installation of UG conveyors and extension into the new workings of other UG services.

5.4.2.2 Operational Processes

Mine Design

The mine plan was designed to address potential geotechnical issues encountered under current geological and mining conditions, such as mining depth, mining height and entry widths. In addition, the mine layout and extraction sequence has been designed taking into consideration operational factors including safe operating gradients for equipment, mine dewatering and mine ventilation.

Longwall panels will typically be up to 310 m wide and up to 4 km long, subject to panel geometries constrained by faults or coal thickness. The depth of cover ranges from 160 to 540m across the CND area and GM seam thickness ranges typically from 5 to 8 m increasing from west to east.

The typical roof controls for the development and longwall mining system include:

- Mains developments will have a five-to-seven entry system, with pillar size of 80 m x 42 m.
- Longwall gate roads will consist of two entries, with pillar widths of 40 m to 52 m.
- Crosscut centres will typically be up to 133m.
- Crosscut drivages will typically be up to 5.4m wide.
- Entries will be mined up to 8.5m wide and permanent supports installed.
- Secondary roof support will be required ahead of longwall retreat.

The mine plan is provided on **Figure 5-4**.

Mining Method

The UG development will progress from the CCM into the CND area. In preparation for the UG longwall mining operations, the longwall panel is defined by excavating pairs of UG roadways, with a series of cut throughs off the main access roadways within the coal seam and around the perimeter of the panel. The conventional longwall mining methodology will then extract coal from the GM seam, involving a single pass coal extraction cut with a dual drum longwall shearer.

The longwall extraction method will not provide for sufficient cut height to extract the full GM seam thickness, however, has been selected based on safety, efficiency, coal quality control and proven performance of the method at CCM. The reduced coal seam cut height will range between 3.2 m to 4.5 m. The reduced cut height will also result in a reduction in the surface subsidence impact comparatively to taking the entire GM seam. This approach will also reduce water and gas inflow rates to the mine workings.

Mine Sequence

The mining sequence is summarised below:

- Construct UG access roadways from the existing workings within ML 6949 to enable access to each longwall panel area of coal to be extracted.

- Progressively install support systems such as roof bolts, roof mesh, and ventilation controls to ensure safety. Advance power supply, water management, and communication systems into newly developed mine workings.
- Excavate and support roadways and chambers for the initial set up of the longwall equipment at the start of each longwall panel.
- Install the longwall equipment, including the dual drum longwall shearer, armoured face conveyor (AFC), roof support shields, coal feeder breakers and transfer chutes, flexible belt conveyor systems and associated power and control systems.
- Start the longwall shearer to cut and extract coal along the face. The AFC transports coal from the longwall panel onto the flexible belt conveyors which transport the coal to the surface at CCM for processing and product transportation.
- As the longwall advances, the roof support shields are systematically moved forward.
- Continuous roof monitoring and installation of additional roadway support as needed.
- Maintain ventilation to control air quality, gas content and temperature.
- Once a longwall panel is mined out, the longwall equipment is recovered and relocated to the next longwall panel.
- Longwall mining will be followed by a decommissioning and rehabilitation period lasting up to five years following completion of mining.

Production Schedule

The mining operations will extract up to 7.1 Mtpa of ROM coal from 2029 to 2055, extracting up to 148 Mt of ROM coal over this period. Product coal output is expected to peak at up to 5.7 Mtpa of PLV HCC, producing a total of up to 121 Mt over the LOM. The final production sequence will depend on economic, scheduling, operational and infrastructure constraints. It is important to note that resource definition, in accordance with SEC regulations (SK1300), will be ongoing and will likely refine the ROM and product coal projections discussed in this IAS over time.

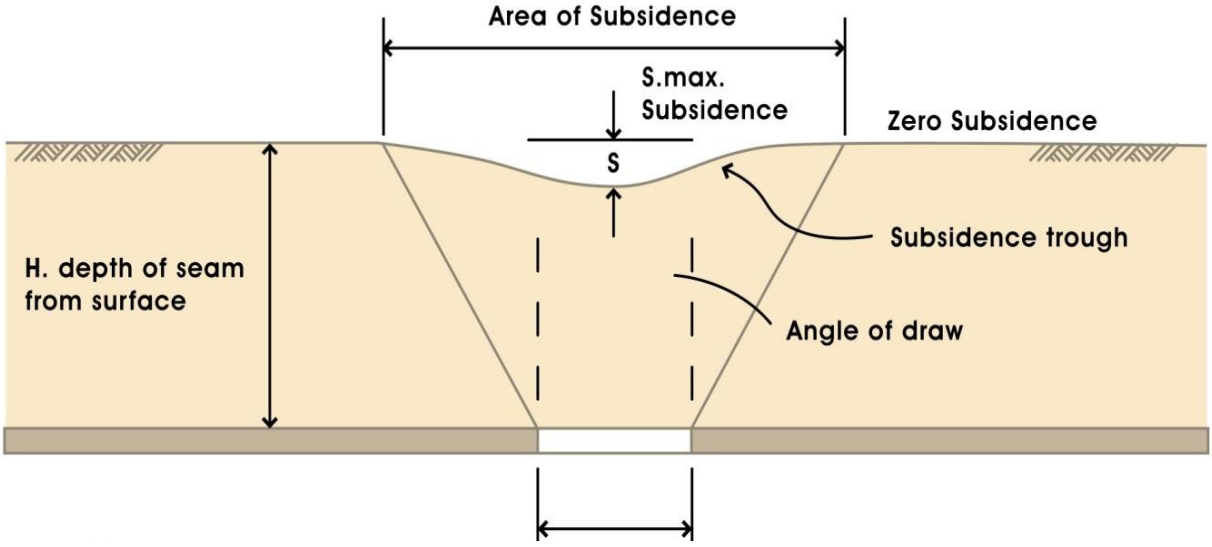
Subsidence

Subsidence is the gradual sinking or settling of the ground surface due to the extraction of UG coal seams. As mining progresses, the unsupported strata, will progressively collapse into the mined void. The rate of subsidence is dependant, amongst other things, on the depth of mining below ground level, thickness of coal extraction, site geology and its geotechnical characteristics. A conceptualisation of the subsidence impact at ground surface is presented in **Figure 5-5**.

Subsidence will commence once the longwall face has extracted a sufficient area of the longwall block of coal for the strata to be unstable and begin to cave behind the longwall face. As the longwall face advances further along the length of the block of coal, the overlying strata will collapse a short distance behind the face in a wave like manner. With time the overlying strata progressively fails into the void to a lessening degree as height above the extracted seam increases. This strata failure will eventually present as a lowering of the ground surface relative to the original ground level. Initial subsidence at the surface may start to occur within 1 to 2 months of the underlying coal extraction and will typically have substantially settled to final position 1 to 2 years after the initial surface movement.

Preliminary subsidence modelling has been completed for the mining activities of the CND. Subsidence is predicted to be up to 3.5 m in the shallower extraction areas to the west, generally trending towards reduced subsidence as the longwall panels progress to the deeper extraction areas to the east. The depth of cover ranges from 160 m to 540 m. The mining method and reduced cut height will result in a reduction in the surface subsidence impact compared to taking the entire GM seam.

Figure 5-5 Conceptual Subsidence Impact Profile



Mining Equipment

The mining equipment, including the longwall, utilised at CCM will be transferred to the CND as operations at CCM move into ML 1790. The mining equipment list is provided in **Table 5-4**.

Table 5-4 Mining Equipment

Stage	Equipment Type	Manufacturer/Model	No. of Units
Development	Continuous Miner	Komatsu 12CM30	3
	Feeder Breaker	Komatsu BF-14	2
	Shuttle Car	Komatsu 10SC32	4
	Loader	Sandvik LS190	5
	Loader	Torque Titan	5
	Personnel Transporter	AME Mine Cruisers MK8	10
	Power Center	AMP Control	2
	Ancillary Fan	Howdens 24m3	4
Longwall	Shearer	CAT EL3000	1
	Shields	CAT 2m 1501t	153
	AFC	Cat PF6 1242mm	1
	Stageloader & Crusher	Cat BSL	1

Stage	Equipment Type	Manufacturer/Model	No. of Units
	Hydraulic System	Kamat	1
	Power Center	AMP Control	1

5.4.2.3 Rehabilitation and Closure

Rehabilitation and closure will focus on creating a safe, stable, and non-polluting post-mining landform. The process begins with a detailed assessment of subsidence impacts to identify areas requiring stabilisation or regrading. This will include backfilling sinkholes, leveling surface depressions, and ensuring that drainage systems are reconfigured to prevent water pooling or erosion. Where necessary, engineered solutions like retaining walls, culverts, or subsidence-resistant landscaping may be installed to enhance stability and ensure long-term safety. Contaminated areas, such as those impacted by acid mine drainage, are treated through measures such as lime dosing, water treatment systems, or capping to prevent pollutant release.

Revegetation efforts will include using native species to stabilise the soil and restore the ecological function of the area. Ultimately, the goal is to return the CND area to a condition that supports a post-mining land use that will be determined as part of the PRCP assessment and approval process.

Rehabilitation of all CSG pre-drainage, mining, and supporting infrastructure areas will occur progressively and at times overlap, commencing with the decommissioning of CSG pre-drainage infrastructure first, followed by mining infrastructure areas, and lastly, shared infrastructure.

5.4.3 Shared Infrastructure

5.4.3.1 Water Management

Centurion estimates that approximately 2,000 kL per well of raw water is anticipated to be required for construction of the well pads and wellheads. Water will be also required for dust suppression, vehicle washdown, and fire protection.

Construction water requirements will be sourced from the CCM raw water dam and supplied to CND area via water trucks initially while water infrastructure is established. The CCM raw water dam is supplied by the Burton Gorge Dam and is treated at the onsite CCM water treatment plant. The CCM water allocation is sufficient to manage ongoing CCM operations and supply the CND during the construction phase.

Co-produced water will be transferred to one of four surface water management dams where it can be stored and treated prior to transfer to CCM or for beneficial third-party use. During construction a network of water pipelines will be constructed to transfer co-produced water from the wells to surface water management dams. Water pipelines will be located with existing access tracks where practical.

Water will be required for dust suppression, vehicle washdown, and fire protection. This water will be sourced from the CCM raw water dam or water produced during operation of the

boreholes. The estimated water take for the CSG pre-drainage activities is approximately 20 kilolitres per day (kL/day) per well, averaged over the production life of the wells.

Co-produced water collected during the extraction of CSG will be managed in holding tanks located on the relevant well pad. Each holding tank is designed to hold a capacity of 20 kL of water / sufficient for one day of pumping during initial depressurising of the target coal seam. The holding tank will be connected to a network of pipelines that will transfer water to water management facilities and treated prior to being used for supplementing site water demand, an offsite beneficial use (e.g. agriculture), or discharged.

The details of water management and volumes will be further refined throughout the EIS process, including those related specifically to mining activities.

5.4.3.2 Power Supply

During the construction phase, electricity is required to power equipment at well pads such as pumps, wellhead equipment and instrumentation. Diesel generators are anticipated to be required during the construction phase up until power infrastructure is established.

During the operation phase, electricity will be required to power the equipment such as the well pumps, monitoring equipment, lighting, and mobile office/workshop facilities located on the well pads.

It is proposed that operational power is supplied initially by a diesel generator at certain operating well pads. Thereafter, well pads will be connected to a Powerlink substation via a network of 11kV powerlines. The existing CCM power supply and substation are expected to be adequate for the requirements of the CND.

The details of power supply will be further refined throughout the EIS process, including those related specifically to mining activities.

5.4.3.3 Access Track Network

The existing access track network within the CND area will be used to access well pads where possible. Additional access tracks will be required to allow access between well pads, along pipelines and to water management facilities.

In addition, upgrade to the intersections onto the existing Council-owned Mabbin Road, which divides CCM and the CND, would be required to facilitate operational traffic.

Road traffic generated during the construction phase will relate to the delivery of equipment and materials and transport of the construction workforce.

The access track network established during the construction phase will continue to be used during the operation phase of the CND. Road traffic generated during the operation phase will relate to the continued delivery of equipment and materials and transport of the operation workforce.

5.4.3.4 Amenities

Within the boundaries of well pads there will be a mobile office/workshop which can be relocated as drilling progresses to subsequent drill sites. The existing workshops, warehouses and maintenance facilities at CCM will be used during the construction and operational phases of the CND. No new facilities are required.

5.4.3.5 Quarry Materials

Construction of access tracks, well pads, gas pipelines, water pipelines and water management facilities will require aggregate materials. Subject to geotechnical testing, it is proposed that a quarry within the CND area and/or CCM area are used to supply the aggregate material.

5.4.3.6 Accommodation

The existing CCM Village will provide accommodation for the workforce during all phases of the CND. The CCM Village is a 446-bed accommodation village located on Ellensfield Road near Burton Gorge Dam. The village will continue to be maintained and upgraded to contemporary accommodation facilities and standards for the duration of the CND.

It is important to note that the CND includes employees and contractors who live in local townships. Further, Centurion encourages the workforce to reside in local townships and actively incentivises this approach to enhance social integration and community wellbeing.

5.4.4 Workforce Requirements

The operation of the CND will provide for the continuation of employment for up to 525 employees and contractors and will remain consistent with the operations at CCM. The workforce will include employees involved in operating and maintaining the wells and UG workings, and skills required for operation will include electricians and engineers. The CND will provide additional indirect opportunities for local employment in construction, transport and the supply of goods and services. The operating roster for the CND will be the equivalent as that for CCM. It is a 7-on/ 7-off cycle, with four panels working alternate weeks of day and night shifts. The structure of the roster is as follows:

- Night shifts are 6:00 pm to 6:00 am.
- Six of the seven Day shifts are 6:00 am to 6:30 pm
- The last Day shift of the rotation is 6:00 am to 3:00 pm.

The construction activity required for the CND is limited due to the use of existing infrastructure already used by the CCM such as the underground access portals, administration, coal processing, train loading and water & waste management facilities, and the offsite accommodation camp. Nevertheless, the construction activities such as installation of new ventilation shafts, extension of mine services, new water storage infrastructure and establishment of site access will require a peak construction workforce of around 125 workers. Some of the construction workforce will transition into operational roles and others will be required intermittently on a campaign basis during the life of the CND. The CND construction activity is not expected to result in a significant increase in overall workforce size due to the

concurrent timing of initial construction of the CND and operations transitioning from the CCM to the CND. The workforce skills required for construction include heavy equipment operators, boilermakers, carpenters, electricians and engineers.

The rehabilitation and closure workforce for the CND will include a reduced workforce to be determined in due course.

5.5 Associated Infrastructure Requirements

Associated infrastructure required to transport and commercialise gas, including the design, environmental approvals, construction and operations, will be the responsibility of a third party via a commercial agreement with Centurion.

Associated infrastructure[3] related to the CND will include a combination of the following:

- A 5 MW gas fired power station (for which Centurion has lodged an application for a Development Approval).
- Potential upgrade of the power station from 5 MW to approximately 21 MW capacity.
- A CAH to collect and process extracted CSG.
- A LNG refrigeration hub.

5.6 Project Timeframes

The UG longwall mining operations at the CCM are planned to re-start in 2026 and continue to 2029. The longwall will then be moved into the CND area during 2029 following the development of UG workings to facilitate the efficient extraction of coal from the GM seam. The CND LOM is 2029 to 2055, followed by up to five (5) years of decommissioning, rehabilitation and closure.

The CSG pre-drainage activities are currently planned to commence in 2027 and new well construction will continue until 2045. The operation of each well will commence following its construction and thus operations will be staggered. Each well will have an operational life of up to 10 years, with 19 wells being the maximum number of wells being built in a year and 133 wells being the maximum number of wells operating at any one time. The closure of the wells will also be staggered, with the conclusion of operations estimated to be in 2054.

[3] **Associated infrastructure** refers to the structures, facilities, and systems that are necessary to support the primary operation or activity of a project but are not the main feature of the project itself. These components are integral to the operation, often ensuring functionality, accessibility, and compliance with legal or operational requirements.

6 Existing Environment

6.1 Climate

The CND area is in a subtropical climate zone, characterised by hot, humid summers and cooler, dry winters. Seasonal weather patterns bring a variety of natural hazards to the area, with flooding, cyclonic winds, and drought posing as primary risks. The nearest climate monitoring station is located at the Moranbah Water Treatment Plant (MWTP), approximately 38 km south of the CND area. The MWTP was operated by the Bureau of Meteorology (BoM) for the period of 1972 to 2012. A summary of the long term monthly averaged climate data is presented in **Table 6-1**.

Table 6-1 Climate Statistics: Moranbah Water Treatment Plant BoM (1972 – 2012)

Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Annual
Mean maximum temperature (°C)	33.9	33.1	32.2	29.6	26.5	23.7	23.6	25.5	29.3	32.3	33.1	33.9
Mean minimum temperature (°C)	21.9	21.8	20.2	17.6	14.2	11.1	9.8	11.1	14.1	17.6	19.4	21.1
Mean rainfall (mm)	103.8	100.7	55.4	36.4	34.5	22.1	18	25	9.1	35.7	69.3	103.9

6.2 Land Use and Built Environment

As described in **Section 5.2**, the CND lies on the Collinsville Shelf on the western margin of the Bowen Basin in central Queensland. Historically, land within the CND area and the surrounding region has been primarily used for beef cattle grazing. Over the past 30 years, however, coal exploration and has increased significantly within this region.

The following sections describe the environmental values relative to land use and the built environment for the CND.

6.2.1 Land Resources

6.2.1.1 Topography

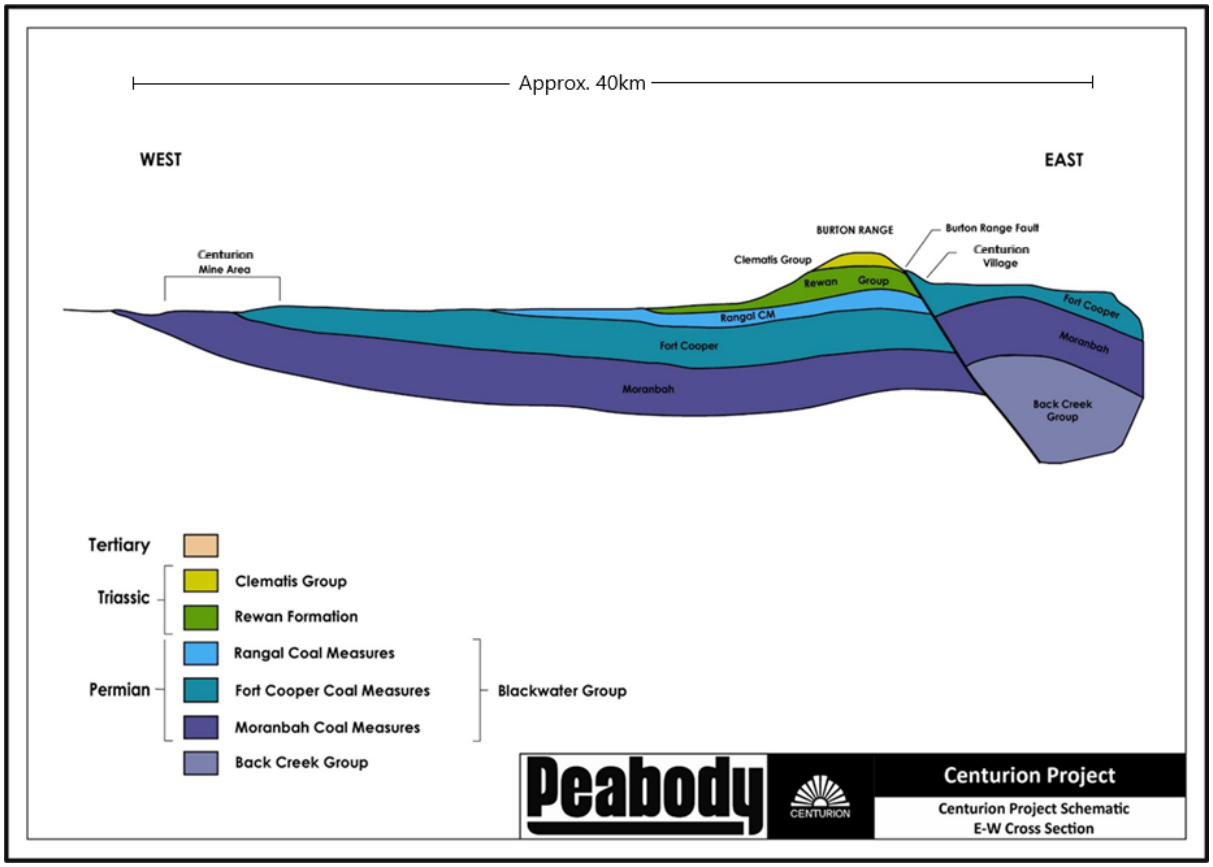
The primary natural feature in the broader landscape is the Burton Range, which extends in a north south direction approximately 10 km to the east of the CND.

The natural topography of the CND comprises predominantly of flat slopes to undulating low hilly lands, which is consistent and typical for the region. Surface elevations range from approximately 280 m Australian height datum (m AHD) in the southeast, to approximately 355 m AHD on the western side MDL 3010.

6.2.1.2 Geology

Regionally, the stratigraphic sequence is presented in **Figure 6-1** as a schematic West-East cross-section through the CND. The stratigraphic sequence contains the Permo-Triassic sediments of the Bowen Basin which are overlain by a thin covering of unconsolidated Quaternary alluvium and colluvium, poorly consolidated Tertiary sediments of the Tertiary Suttor and Duaringa formations and, in places, remnants of Tertiary basalt flows. The Triassic Rewan Formation underlies the Tertiary units across most of the CND, and a few outcrops of the Moolayember Formation and Clematis Sandstone can be found in outcrops in the northern area. The Permian Blackwater Group coal measures and associated over- and interburden are located below the Triassic strata and overly the Back Creek Group, the basement of the CND area. The geology of the CND is illustrated on **Figure 6-1**.

Figure 6-1 Schematic Regional Geological Section (Peabody Energy Corporation, 2024)



6.2.1.3 Soils

Soil units for the majority of the CND area were mapped as part of the 'Wards Well: Soil Survey' in 2012 (SKM, 2012). In combination with broad scale regional soil mapping, the soil units identified are illustrated on **Figure 6-2** and summarised below:

- Dermosol – characterised by a strong texture transition between the A and B horizons and are not uniformly calcareous. Dermosols are commonly found on low-angle pediments with sparse shrublands.
- Kandasols – non-texture contrast soils (with little or gradual increase in clay content with depth) that have massive (i.e. weakly to non-structured) subsoils (B horizons).

Kandosols are often found in conjunction with ferricrete deposits, within level to gently undulating plains.

- Sodosol – characterised by a strong texture contrast between topsoil and subsoil, with clayey, sodic and often highly dispersive subsoils. Sodosols are often formed on alluvial and part-colluvial deposits, as well as igneous, sedimentary and metamorphic rocks.
- Vertosol – characterised by high clay content, and when dry, crack to a considerable depth. These soils are moderately to well drained and become very alkaline with depth. Vertosols generally occupy undulating plains and extensive floodplains of inland streams, and are derived from alluvial clayey sediments, shales, mudstones, limestone, and basalts.

6.2.1.4 Agricultural Land

Lands within the CND area have historically been used for beef cattle grazing. The majority of the CND has been cleared for improved pasture, with Buffel Grass well established in most soil units. The Queensland *Regional Planning Interests Act 2014* identifies 'areas of regional interest' including Priority Agriculture Areas (PAA) and Strategic Cropping Areas (SCA). There are no PAA's within the CND. The CND, however, is located within the Western Cropping Zone with a portion of the CND located on trigger mapped strategic cropping land as shown on **Figure 6-2**.

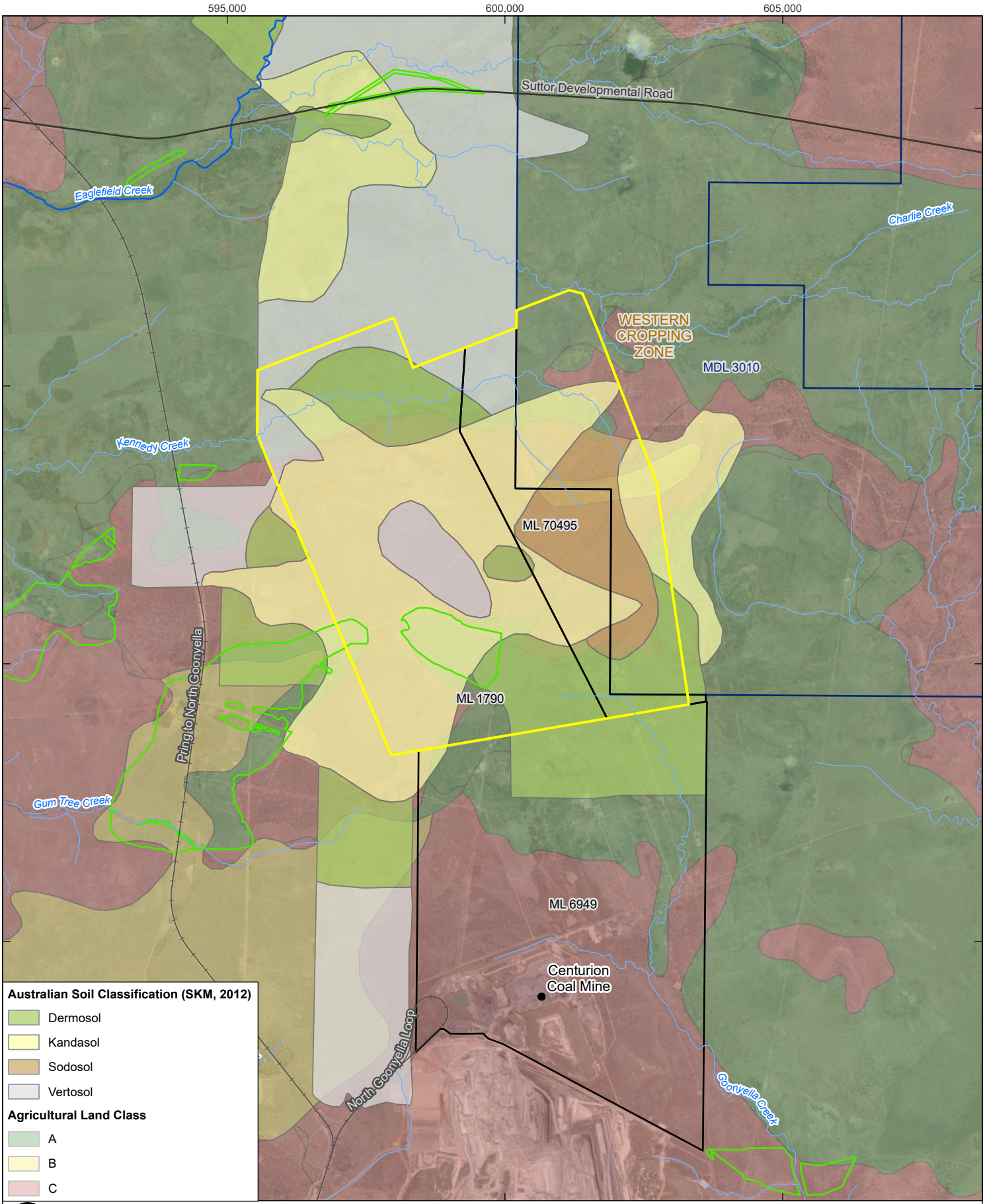
6.2.1.5 Nature Conservation Areas

No vegetation management wetlands, MSES Wetlands and Watercourses, Protected Areas or Legally Secured Offset Areas are mapped within the CND (E2M, 2024). The nearest protected area is Homevale National Park which is located approximately 48 km east of the CND.

There are no World Heritage properties, National Heritage places or Wetlands of International Importance that have been identified within, or in proximity to (within 25 km of), the CND (E2M, 2024).

6.2.1.6 Native Title

The Widi People of the Nebo Estate #1 (QCD 2019/004 DET) are the determined native title holders for the southeastern portion of the CND. Refer to **Figure 6-10** for further details.



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Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:90,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Rail Network
- Road
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area
- Strategic Cropping Land

CENTURION NORTH DEVELOPMENT

SOILS AND LAND RESOURCES

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FIGURE 6.2

6.2.2 Built Environment

The CND area is designated as regional landscape and rural production area under the 'Mackay Isaac Whitsunday Regional Plan 2012' (Queensland Government, 2012) and is zoned as 'rural' under the 'Isaac Regional Planning Scheme Version 1.1' (Isaac Regional Council, 2021).

The majority of the existing health, education and accommodation infrastructure within the region are located within the townships of Moranbah and Mackay. A number of currently operating and proposed coal mining operations are located in the vicinity of CND, including the existing CCM located to the immediate south of the CND and is scheduled for restart of longwall operations in 2026. Centurion has recently been granted an amendment to EA (P-EA-100658735) to undertake exploration activities, which consist of a pilot CSG exploration and extraction programme, within the CND on ML 1790.

6.3 Terrestrial Ecology

E2M Pty Ltd has been engaged by Centurion to undertake preliminary desktop and field assessments for the CND ecology study area which encompasses the CND, and surrounds associated with ML 1790, ML 70945, ML 70443 and MDL 3010. Field assessments were undertaken during the following seasons:

- Late wet season in March 2024, comprising vegetation verification and targeted species surveys.
- Dry season in July 2024, consisting of refinement of vegetation and habitat mapping as well as targeted fauna surveys.

The initial findings of these surveys have been used to inform the existing terrestrial ecology for the CND and are summarised below.

6.3.1 Vegetation Communities

6.3.1.1 Matters of National Environmental Significance

Desktop assessments identified four Threatened Ecological Communities (TECs) as potentially occurring within the CND ecology study area. Field assessments confirmed the presence of three of these TECs as outlined in **Table 6-2** and presented in **Figure 6-3**.

Table 6-2 Ground-Truthed TECs within the Ecology Study Area

TEC	EPBC Act Status	Present Within Ecological Study Area
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	Confirmed present
Natural grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	Confirmed present
Poplar box grassy woodland on alluvial plains	Endangered	Confirmed present
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar bioregions	Endangered	Not present

6.3.1.2 Matters of State Environmental Significance

Desktop assessment identified the following MSES within the CND ecology study area:

- MSES Regulated Vegetation including:
  - Prescribed regional ecosystems (RE) containing an Endangered RE.
  - Prescribed regional ecosystem containing an of concern RE.
  - Prescribed regional ecosystems within a defined distance from the defining banks of a relevant watercourse or drainage feature.
- Essential habitat for ornamental snake, squatter pigeon (southern subspecies), king bluegrass and finger panic.
- Connectivity Areas associated with mapped prescribed regional ecosystems.
- Protected wildlife habitat for 18 threatened or conservation significant flora and fauna species listed under the Queensland *Nature Conservation Act 1992* (NC Act).
- Category B Environmentally Sensitive Areas containing Endangered REs. These areas were mapped in association with Queensland's Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD) mapped REs 11.5.15 and 11.8.13.

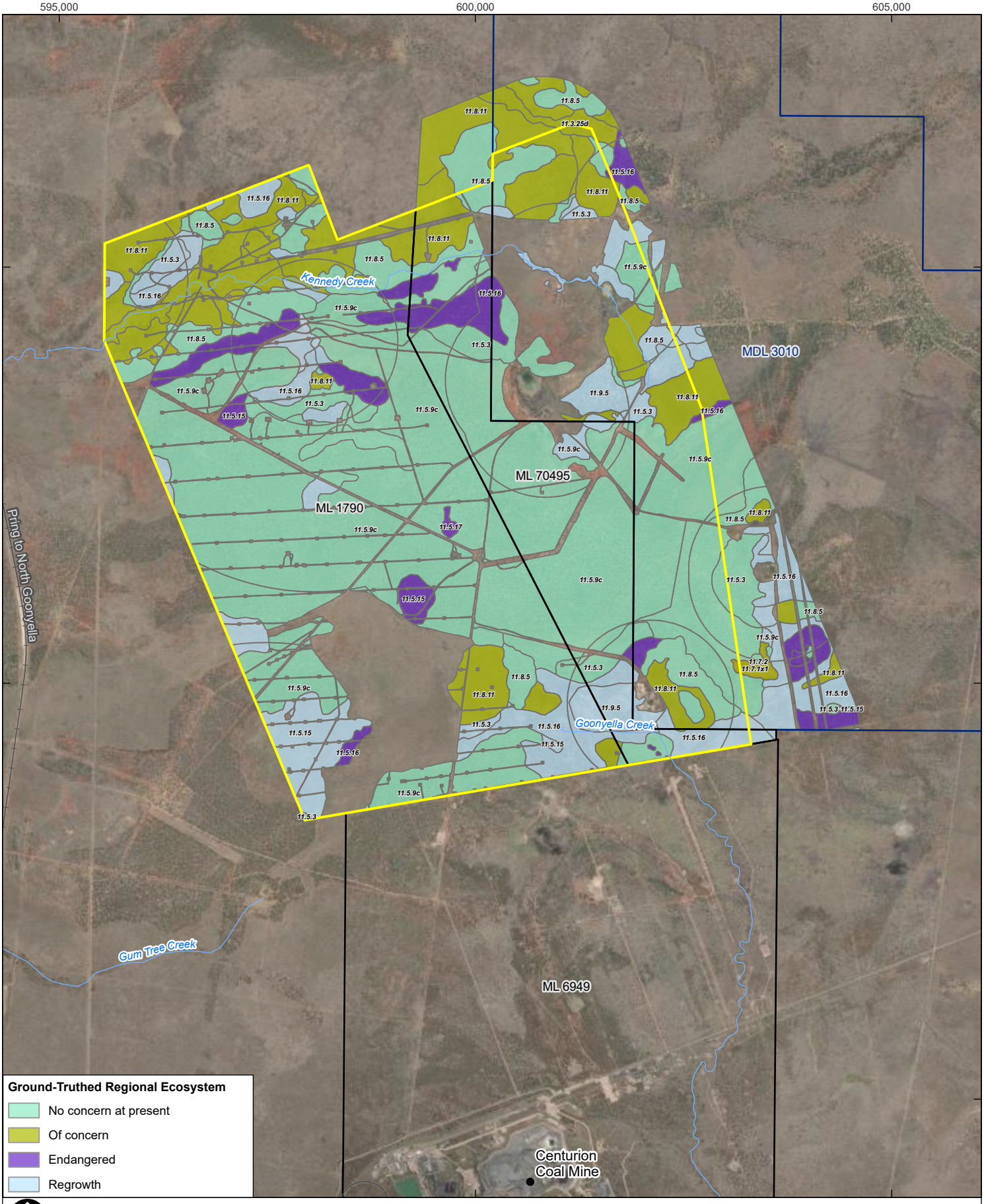
No vegetation management wetlands, MSES Wetlands and Watercourses, Protected Areas, or Legally Secured Offset Areas were mapped within the CND ecology study area. Regional ecosystems identified in the desktop assessments were ground-truthed during field assessments. The REs identified during the field assessments are presented in **Table 6-3** and shown on **Figure 6-4**.

Table 6-3 Ground-Truthed REs within the Ecology Study Area

RE	RE Type	Biodiversity Status	VM Act Class
11.3.25d	Remnant	Of concern	Least concern
11.5.3	Remnant	No concern at present	Least concern
	Mature Regrowth[1]	No concern at present	Least concern
11.5.15	Remnant	Endangered	Least concern
	Mature Regrowth[1]	Endangered	Least concern
11.5.16	Remnant	Endangered	Endangered
	Mature Regrowth[1]	Endangered	Endangered
11.5.17	Remnant	Endangered	Endangered
11.5.9c	Remnant	No concern at present	Least concern
	Mature Regrowth[1]	No concern at present	Least concern
11.7.1x1	Remnant	Of concern	Least concern
11.7.2	Remnant	No concern at present	Least concern
11.8.11	Remnant	Of concern	Of concern
11.8.5	Remnant	No concern at present	Least concern
	Mature Regrowth[1]	No concern at present	Least concern

RE	RE Type	Biodiversity Status	VM Act Class
11.9.5	Mature Regrowth[1]	Endangered	Endangered
Non-remnant	Non-remnant	-	-

1. Mature regrowth vegetation is native vegetation regrowth that is greater than 15 years old.



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Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:60,000 at A4
Project Number:	620.040594.00001
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Drawn by:	RB

LEGEND

- Rail Network
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

GROUND-TRUTHED REGIONAL ECOSYSTEMS

CENTURION

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FIGURE 6.3

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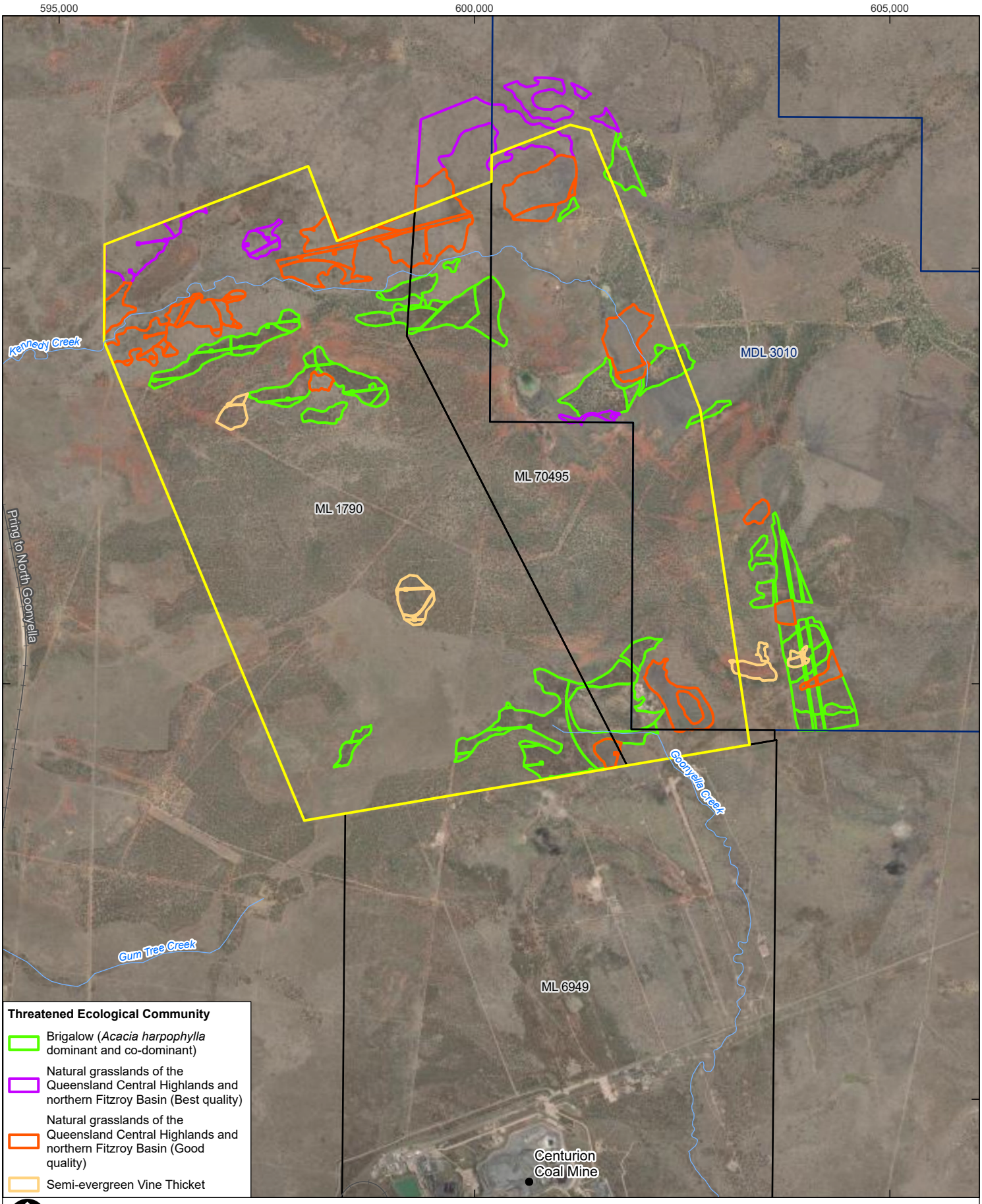

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LEGEND

- Rail Network
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

THREATENED ECOLOGICAL COMMUNITIES

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FIGURE 6.4

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6.3.2 Flora

Desktop assessments identified six threatened flora species as listed under the EPBC Act and six threatened flora species as listed under the NC Act, as potentially occurring within the CND ecology study area.

Only two threatened flora species were identified during field assessments. The details of these species are provided in **Table 6-4**.

Table 6-4 Known to Occur Conservation Significant Flora Species

Scientific Name	Species Common Name	EPBC Act Status	NC Act Status
Dichanthium queenslandicum	King bluegrass	E	E
Digitaria porrecta	-	-	NT

6.3.3 Fauna

Desktop assessments identified 22 threatened fauna species as listed under the EPBC Act, and 19 threatened or conservation significant fauna species and 14 special least concern fauna as listed under the NC Act as potentially occurring within the CND ecology study area.

Two threatened fauna species and one conservation significant species were identified during the field assessments. It was determined that an additional seven species are likely to occur within the CND ecology study area due to the presence of suitable habitat. The detail of these species and likelihood of occurrence is provided in **Table 6-5**.

Table 6-5 Potentially Occurring Conservation Significant Fauna Species

Scientific Name	Species Common Name	EPBC Act Status	NC Act Status	Likelihood
Phascolarctos cineresu	Koala	E	E	Known to occur
Geophaps scripta scripta	Squatter pigeon (southern)	V	V	Known to occur
Tachyglossus aculeatus	Short-beaked echidna	-	SLC (non-migratory)	Likely to occur
Rostratula australis	Australian painted snipe	E	E	Likely to occur
Gallinago hardwickii	Latham's snipe	V,M	V	Likely to occur
Hirundapus caudacutus	White-throated needletail	V,M	V	Likely to occur
Apus pacificus	Fork-tailed swift	M	SLC	Likely to occur
Plegadis falcinellus	Glossy ibis	M	SLC	Likely to occur
Cuculus optatus	Oriental cuckoo	M	SLC	Likely to occur

6.3.4 Introduced Species

Eight introduced species (three flora and five fauna) were identified within the CND ecology study area during field assessments. These species and the corresponding Queensland *Biosecurity Act 2014* restricted matter listing are provided in **Table 6-6**. The three flora species are also listed Weeds of National Environmental Significance.

Table 6-6 Pest Flora and Fauna Identified within the Ecology Study Area

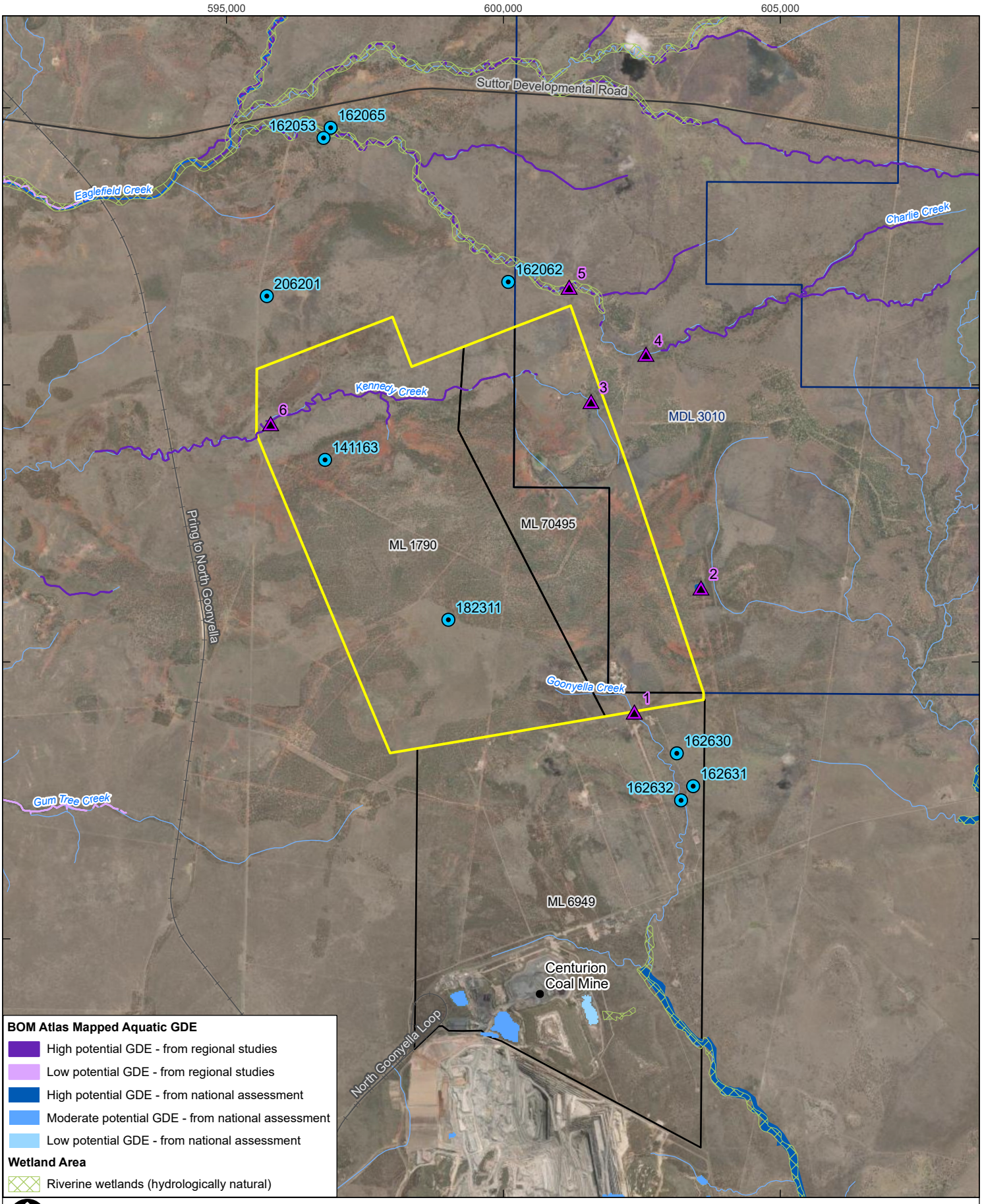
Scientific Name	Common Name	Biosecurity Act Status
Flora		
Harrisia martinii	Harrisia cactus	3
Opuntia tomentosa	Velvet tree pear	3
Parthenium hysterophorus	Parthenium	3
Fauna		
Rhinella marina	Cane toad	-
Felis catus	Feral cat	3,4,6
Canis lupus	Wild dog	3,4,6
Oryctolagus cuniculus	European rabbit	3,4,5,6
Sus scrofa	Feral pig	3,4,6

6.4 Aquatic Ecology

Hydrobiology Pty Ltd (2024) was engaged by Centurion to undertake an aquatic desktop assessment and preliminary field surveys for the CND. An early-wet survey was conducted from the 12th to the 16th of February 2024, once flows had commenced within the catchment. A late-wet survey was carried out from the 22nd to the 25th of April 2024, following the peak flows of the wet season.

Six representative sites were selected as the aquatic ecology study area for aquatic habitat surveys, aimed at validating aerial imagery and assessing the presence of aquatic Groundwater Dependent Ecosystems (GDEs). These sites included two (2) on Charlie Creek, two (2) on Kennedy Creek (one (1) at a dam), and one (1) each on Skull Creek (dam) and Goonyella Creek. Sampling, conducted where sufficient water was available, included electrofishing, trapping, and macroinvertebrate collection in accordance with Australian River Assessment System (AUSRIVAS) and Queensland stream protocols.

The initial findings from these surveys have been used to inform the existing aquatic ecology values and are summarised in the following sections. The aquatic ecology values at the CND are detailed below and outlined on **Figure 6-5**.



0 1 2 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:90,000 at A4
Project Number:	620.040594.00001
Date Drawn:	04-Sep-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Stygofauna Survey Site
- Aquatic Values Survey Site
- Rail Network
- Road
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

AQUATIC ECOLOGY

CENTURION

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FIGURE 6.5

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F06-05_Aquatic Ecology

6.4.1 Local Context

6.4.1.1 Aquatic and Wetland Processes

Early wet and late-wet surveys confirmed the ephemeral nature of the creeks in the CND aquatic ecology study area. All creek sites were dry during both surveys, except for shallow water observed at one Kennedy Creek site in February following rainfall. Only a freshwater crab (*Austrothelphusa transversa*), adapted to ephemeral systems, and fairy shrimp (Anostraca sp.), known for their desiccation-resistant cysts, were recorded, highlighting the creeks' temporary water-dependent ecology.

The dam sites on Skull Creek and Kennedy Creek are likely perennial in nature, as they contained water during both surveys. However, the Kennedy Creek dam is unlikely to support fish or macrocrustaceans due to its steep embankments and its location off Skull Creek's main flow path. The dam ecosystem on Skull Creek recorded four fish species: Ambassis agassizii (Agassiz's glass fish), Melanotaenia splendida (Eastern rainbowfish), Neosilurus hyrtlii (Hyrtl's catfish), and Leiopotherapon unicolor (spangled perch), as well as the microcrustacean Cherax quadricarinatus (redclaw crayfish). This dam is likely to provide dry-season refugia, where extreme rainfall events have created connectivity between the dam and Skull Creek.Aquatic Habitat

All sites exhibited low macro and microhabitat diversity. Sites with water (Skull Creek dam, Kennedy Creek dam, and Kennedy Creek during the early-wet survey) contained only sandy/silt pool macrohabitat. The microhabitat at the two dam sites consisted solely of detritus due to dense submerged macrophytes. Creek sites contained large woody debris, with small woody debris observed only at Goonyella and Charlie Creeks, and overhanging or trailing vegetation present only at Goonyella Creek.

River bioassessments were conducted at all creek sites. Bioassessment scores were consistent across both surveys and ranged from poor to fair, with the Goonyella Creek site being the only one to receive a fair rating. Most sites were impacted by grazing, heavily eroded, dominated by fine sediment, and affected by scouring and channelisation, all of which contributed to lower scores. All creek sites are highly ephemeral systems, which also contributed to their poor habitat score because of reduced macrohabitat diversity.

6.4.1.2 Aquatic Fauna

None of the fish or macrocrustacean species recorded during the surveys are protected, and all are common and widespread throughout Queensland. The redclaw crayfish is native to northern Queensland, and the CND aquatic ecology study area lies outside its native range.

6.4.1.3 Environmental Values

Refer to **Section 6.5.3** for a discussion of environmental values that relate to surface water.

6.4.2 Matters of National Environmental Significance

Results from the EPBC Act Protected Matters Search Tool indicate that two MNES important species or their habitats may occur within the CND aquatic ecology study area. These species

are the white-throated snapping turtle (*Elseya albagula*), listed as Critically Endangered under the EPBC Act, and the Fitzroy River turtle (*Rheodytes leukops*), listed as Endangered under the EPBC Act.

Both species have not been recorded in the CND aquatic ecology study area, and the closest record of both species is in the Connors River, over 100 km south-east of the aquatic ecology study area. Neither the white-throated snapping turtle nor the Fitzroy River turtle was caught or observed during the early-wet or late-wet surveys. Survey methods included fyke netting, cathedral trapping, and visual observation for turtles, but muddling and snorkelling were not conducted due to shallow habitats and poor water clarity.

A combination of all suitable habitat characteristics required by these species (e.g., permanent waterbodies, riffles, submerged macrophytes, gravel/sand substrate) was absent from the CND aquatic ecology study area. Both species require perennial and preferably flowing habitats, but the creeks within the study area are highly ephemeral and impacted by livestock, making them unsuitable for these species. While both species are known to occur in off-stream habitats such as farm dams, billabongs, or floodplains (Limpus et al. 2011), no such habitats were observed within the CND aquatic ecology study area.

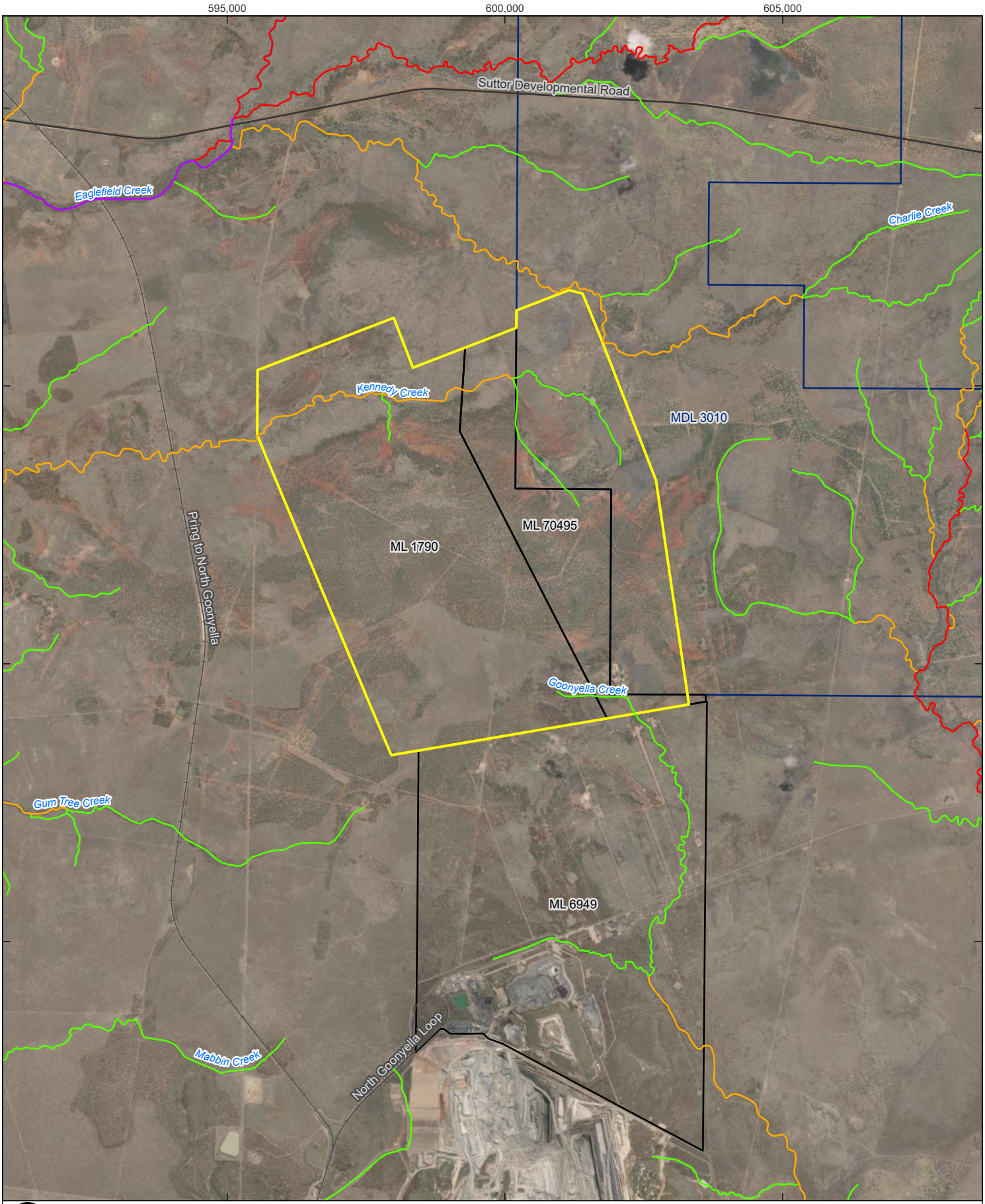
Lake Elphinstone, a Nationally Important Wetland, is located within the 50 km buffer search area of the Protected Matters Search Tool (25 km west of the ecology study area). The creeks within and adjacent to the CND aquatic ecology study area do not drain into Lake Elphinstone.

No national or world heritage properties listed under the EPBC Act are located within the CND aquatic ecology study area or its surrounding catchment (<100 km). There are no mapped Wetlands of International Significance within the CND aquatic ecology study area. The nearest such wetlands, Shoalwater and Corio Bays Area (200 km southeast) and Bowling Green Bay (255 km northwest) are outside the CND aquatic ecology study area's catchment and are not connected by drainage. Additionally, no Commonwealth marine waters are mapped within the CND aquatic ecology study area or its catchment (<100 km).

6.4.3 Matters of State Environmental Significance

The white-throated snapping turtle and Fitzroy River turtle (discussed above) are listed under the NC Act as critically endangered and endangered, respectively. High Ecological Significance (HES) or High Ecological Value (HEV) waters are located within a 50 km radius of the CND aquatic ecology study area, however, the creeks within the CND aquatic ecology study area do not drain into these waterbodies.

There are no protected areas within the CND aquatic ecological study area or surrounding catchment (<100 km). There are no protected fish habitat areas, under the *Fisheries Act 1994*, within the CND aquatic ecological study area or surrounding catchment (<100 km). The waterways that provide for fish passage, under the *Fisheries Act 1994*, which are potentially impacted by the CND are Kennedy Creek (moderate/low risk waterway), Charlie Creek (moderate/low risk waterway), Skull Creek (low risk waterway), and Goonyella Creek (low risk waterway). The mapped waterways for fish passage are shown in **Figure 6-6**.



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Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:90,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Rail Network
- Road

Waterways for Fish Passage

- Low
- Moderate
- High
- Major

- Mineral Development Licence
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

WATERWAYS FOR FISH PASSAGE

CENTURION

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FIGURE 6.6

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F06-06_Waterways for Fish Passage

6.5 Surface Water

6.5.1 Regional Hydrology

The CND area spans two primary water basins: the Burdekin River Basin and the Fitzroy River Basin. The majority of ML 1790, the northern portion of ML 7045, and part of MDL 3010 lie within the Burdekin River Basin. The major rivers of this basin include the Burdekin River, Bowen River, Belyando River, Suttor River, and Cape River. A map of the drainage is provided in **Figure 6-7**.

A small portion of the southeastern corner of ML 1790, the southern part of ML 70495, and part of MDL 3010 are located within the Fitzroy River Basin. The major tributaries of the Mackenzie River in this basin include the Isaac River, Connors River, and Comet River.

6.5.2 Local Hydrology

Within the Burdekin River Basin, the CND area is situated in the Suttor River sub-basin and the Upper Suttor River catchment. Kennedy Creek flows east to west across ML 70495 and ML 1790. Two minor first-order streams drain into the creek from the south before flowing into Eaglefield Creek. These creeks ultimately drain into the Suttor River, which continues north to Lake Dalrymple (130 km to the northwest) and then feeds into the Burdekin River. Within the Fitzroy River Basin, the CND area is situated in the Isaac River sub-basin and the Isaac Northern Rivers catchment, draining toward Goonyella Creek, with headwaters located in ML 1790.

Local hydrological features primarily consist of ephemeral creeks and tributaries. Goonyella Creek originates in the southeastern corner of ML 1790, flowing east along the southern boundary of ML 70495 before turning south and joining the Isaac River approximately 9 km downstream. This is a non-perennial, first-order watercourse. Kennedy Creek, a second-order watercourse, crosses ML 70495 and ML 1790, flowing into Eaglefield Creek approximately 10 km west of the CND area. Eaglefield Creek drains into the Suttor River, contributing to the Burdekin River system. Gum Tree Creek, located about 2 km southwest of the CND area, is an ephemeral creek that drains westward toward the Suttor River. A map of the drainage is provided in **Figure 6-7**.

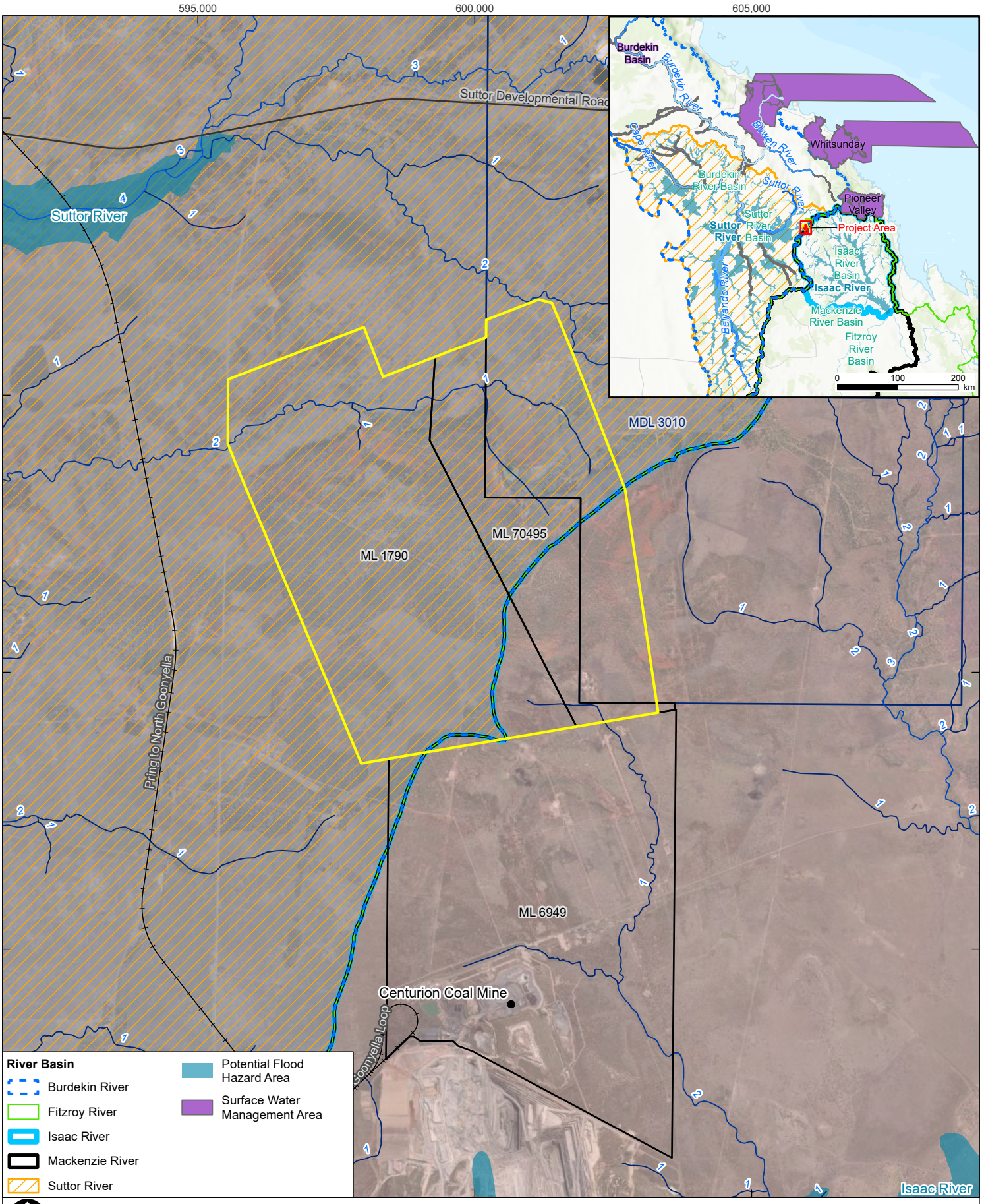
The region's creeks are highly rainfall-dependent, with variability significantly impacting water availability. Due to their ephemeral nature, these creeks experience extreme fluctuations in both water quality and volume as part of the natural system. In a typical year, local waterways may remain dry from March through November, with intermittent flows or flooding occurring after high-intensity rainfall events between November and March. During this period, flow slows and forms stagnant pools that gradually dry out, returning to the usual dry conditions.

Streamflow gauging stations are sparse in the region, with none located near the CND area. The nearest gauging station, approximately 30 km northwest on the Suttor River at Eaglefield (#120304A), has a catchment area of approximately 1,915 km². Flow data from this station demonstrate the river's ephemeral nature, which is representative of nearby creek systems. For ungauged catchments in the region, peak streamflow discharges can be estimated using empirical techniques, as recommended in *Australian Rainfall and Runoff 2019*.

The intermittent nature of these creeks also leads to fluctuating water quality, which often deteriorates during dry periods due to stagnant pools. Regional water quality is further influenced by agricultural and industrial activities, particularly mining, within the Isaac River catchment.

6.5.3 Environmental Values

The *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP [Water and Wetland Biodiversity]) establishes environmental values (EVs) and water quality objectives (WQOs) for Queensland's waters. The environmental values associated with the Suttor River sub-basin (Upper Suttor River EPP environmental value zone) include aquatic ecosystems, irrigation, farm supply/use, stock watering, aquaculture, human consumption, primary recreation, secondary recreation, visual recreation, drinking water, and cultural and spiritual values. The environmental values for the Isaac River sub-basin (Isaac Western Upland Tributaries EPP environmental value zone) include aquatic ecosystems, irrigation, and farm supply/use.



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Project Number:	620.040594.00001
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Drawn by:	RB

CENTURION NORTH DEVELOPMENT

REGIONAL DRAINAGE

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FIGURE 6.7

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F06-07_Regional Drainage

6.6 Groundwater

6.6.1 Hydrostratigraphy

The CND area consists of three main hydrostratigraphic layers including:

- Quaternary Alluvium: The Quaternary alluvium forms an unconfined aquifer and includes alluvial deposits associated with local creeks. Where present, the thickness of the alluvium is likely to be highly irregular, with estimates of maximum thicknesses in the range of 15 m to 25 m. (Golder, 2020).
- Tertiary Strata (including basalt flows and sediments): The Tertiary Strata includes thick basalt flows interbedded with sediments. The flows and sediments occupy Tertiary paleochannels in the Permian coal measures basement. The basalt is often vesicular and sometimes underlain by tertiary sand lenses. These strata represent the most significant groundwater resource in the region.
- Permian Strata: The Permian strata comprise siltstone, sandstone, calcareous and carbonaceous shale and coal seams. The coal seams and jointed sandstone units are generally the most transmissive units within the coal measures with water moving through the coal seams via joints and fractures. The lower permeability interburden/overburden units (siltstones and mudstones / shales) may have some fracture permeability but typically confine groundwater within the coal seams.

6.6.2 Flow and Recharge

Groundwater flow within the Quaternary alluvium (if and where saturated) will follow topographic gradients. However, it is considered unlikely that the alluvium forms a continuous saturated aquifer where present. Recharge to the Quaternary alluvium occurs via direct infiltration of rainfall and occasional creek flow or flooding during the wet season (Golder, 2020). Discharge mechanisms from the alluvium include evapotranspiration, leakage to underlying or adjacent aquifers, and groundwater extraction. Previous conceptualisations have noted that all creeks in the area are ephemeral.

Groundwater within the basalt of the Tertiary strata is stored and transmitted through fractures, joints, and discontinuities within the rock mass. The aquifer is stratified due to the presence of sediments and weathering horizons that develop between individual flows. Additionally, low permeability associated with massive basalt in the centre of the flows typically separates the higher-permeability vesicular basalts, which develop at the tops and bottoms of individual flows (Golder, 2017).

In most areas, the basalt is underlain by sediments of variable thickness. However, in some locations, the basalt is in direct contact with the underlying Permian strata. These underlying sediments occasionally express as lenses of sand that may be hydrogeologically significant due to high primary porosity and hydraulic conductivity. Golder (2017) presents geological model data, including mapping for the base of the Tertiary, basalt thickness, and the inferred thickness of Tertiary sediments underlying the basalt across ML 1790 and the immediate surroundings. The basalts are thickest along the western, northwestern, and northern edges of ML 1790, with thicknesses reaching up to 150 m. However, the basalt is not considered a major aquifer in the region due to its variable thickness and heterogeneity.

Recharge to the Permian strata occurs via downward seepage from overlying aquifers, through faults or discontinuities, and where the unit outcrops through direct rainfall infiltration or overland flow (Golder, 2020). Discharge from the Permian is expected to occur through downgradient flow, downward seepage through structural discontinuities, and groundwater extraction, including dewatering activities (Golder, 2020;).

6.6.3 Hydraulic Properties

Hydraulic conductivity estimates for the Quaternary alluvium range from 2 m to 20 m per day (m/day), based on testing of the Suttor Creek alluvium and regional studies. However, no site-specific testing has been conducted. Hydraulic conductivity estimates from one bore in the Tertiary sediments (sandy sediments of the Suttor Formation) range from 0.3 m/day to 0.8 m/day. The silt and clay layers of this formation are expected to have permeabilities several orders of magnitude lower. The Tertiary sediments distribution model (Silwa, 2011) indicates a varied composition and distribution of sand, clay, and mixed material within these sediments.

Two long term pumping tests in the basalt (Streamline Hydro, 2012) were conducted at the northern end of ML 1790,10 km north of the proposed production well area. The hydraulic conductivity, transmissivity and storage of the Tertiary basalt is likely to vary significantly across the CND area. Hydraulic conductivity estimates for the Permian interburden/overburden range from 2×10^{-6} m/day to 0.33 m/day. Hydraulic conductivity estimates for the Permian coal seams ranged from 2×10^{-6} m/day to 0.47 m/day.

6.6.4 Groundwater Management Areas

The southeastern corner of ML 1790 and the southern half of ML 70495 fall within the Isaac-Connors Rivers catchment of the Fitzroy Basin and the Isaac-Connors Groundwater Management Area (GMA). The remainder of ML 1790 lies in the Suttor River catchment of the Burdekin Basin, with the southwestern portion within the Highlands Underground Water Area. Groundwater intersecting the Isaac Connors GMA is managed under the Queensland Environmental Protection Policy (Water and Wetland Biodiversity) 2019 and classified as Isaac Groundwaters of the Isaac River Sub-basin under the Fitzroy Basin water plan (WQ1310).

Legislated EVs for these groundwaters include:

- Biological Integrity - Maintaining aquatic ecosystems through groundwater support of streams and waterholes.
- Human Use - Suitability for irrigation, farm/domestic water supply, stock watering, potable supply, recreation (e.g., swimming), and cultural/spiritual activities (e.g., recreational fishing, heritage sites).
- Schedule 1 in EPP (Water and Wetland Biodiversity) for Burdekin, Don and Haughton River Basins lists that the alluvium in the Suttor River catchment has EVs for aquatic ecosystem, irrigation, stock water and cultural and spiritual values. The Highlands Underground Water Area, the Water Act regulates groundwater activities, including water extraction and specific works under the Planning Act.

According to the Water Regulation 2016, no water entitlement, permit, or seasonal assignment is needed in the Highlands Underground Water Area for stock, domestic use, or certain prescribed activities in mining. These activities include equipment washing, water supply for temporary camps, temporary construction, road building, riparian rehabilitation, and certain well operations. Any dewatering in this area will require a water entitlement, permit, or seasonal assignment. The location of Highlands Underground Water Area is provided in **Figure 6-8**.

6.6.5 Water Supply Bores

A search of the Queensland Government's Registered Groundwater Bore Database (GWDB) (DRDMW, 2024) was undertaken to identify registered bores within the 10 km of the CND Area. The search returned 52 bores with the following uses:

- Mine monitoring (28 bores).
- Petroleum exploration (1 bores).
- Water supply (7 bores).
- Sub-artesian monitoring (5 bores).
- Unknown use (10 bores).
- Decommissioned (1 bores).

After excluding monitoring, exploration, and decommissioned bores, no registered water supply bores were found within the search area. A 2012 landholder bore census conducted for the Wards Well EIS by AGE included 21 bores, identifying six unregistered bores used for stock watering. The location of registered and unregistered bores in the area is provided in **Figure 6-8**.

6.6.6 Groundwater Dependent Ecosystems

There were no indicators of aquatic GDEs present at the Kennedy Creek or Charlie Creek sites, i.e. cracking clays were present, flow did not increase downstream in the absence of inflow, flow did not continue all year during low rainfall periods, and the water level was not maintained during extended dry periods. A groundwater elevation assessment was conducted by comparing groundwater levels in nearby bores and the elevation of Kennedy Creek and Charlie Creek. The results indicate that groundwater may interact with surface water (groundwater level was < 3 m below the elevation of creeks), however, this may potentially only occur during peak flow events where groundwater levels rise to contribute to surface flows. However, further groundwater monitoring is required to confirm surface water and groundwater interactions in Kennedy and Charlie Creeks. Potential GDEs are outlined on **Figure 6-8**.

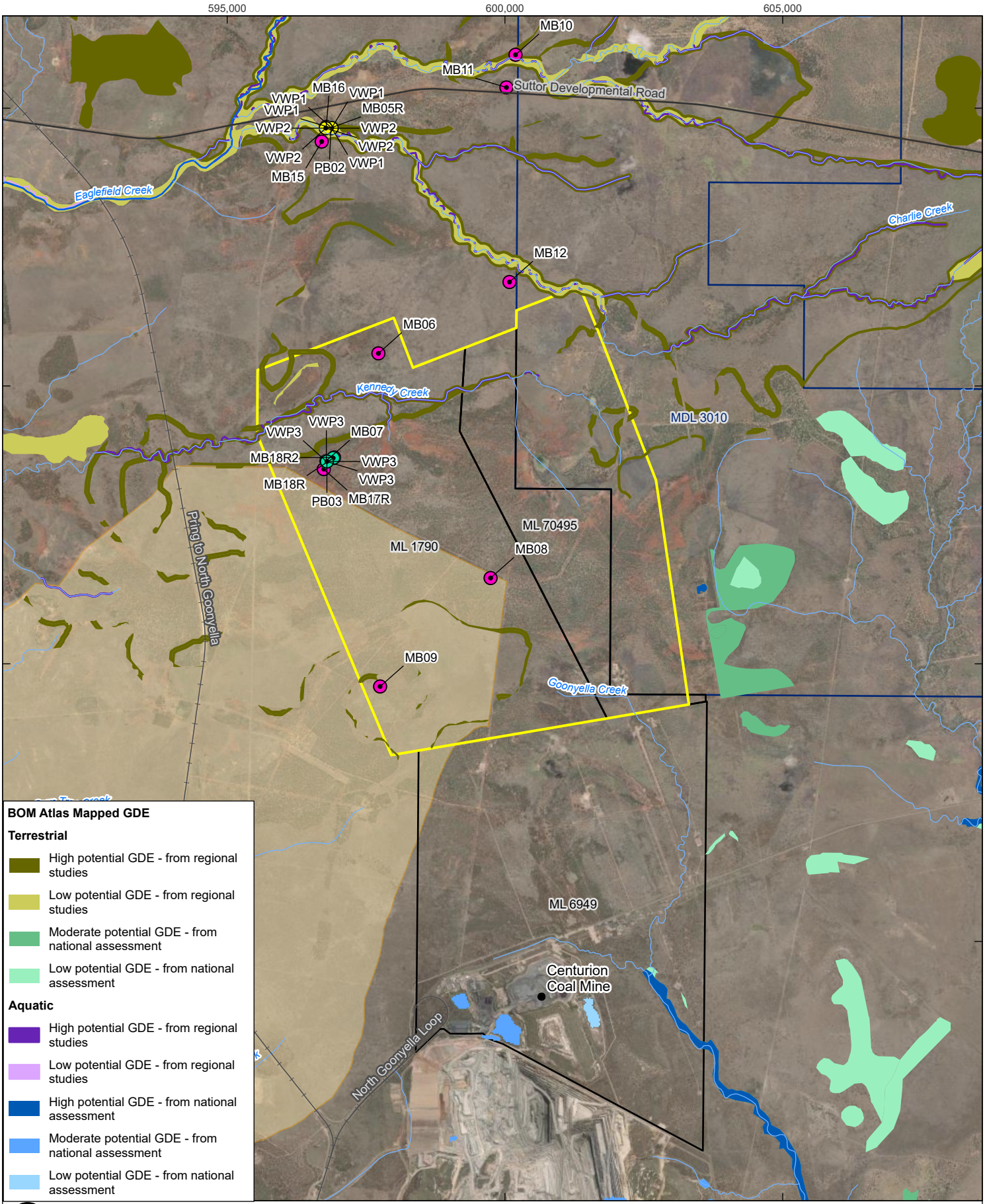
6.6.6.1 Terrestrial Groundwater Dependent Ecosystems

There are 34.70 ha of mapped terrestrial GDEs within the CND ecological study area (E2M, 2024).

Preliminary assessment by E2M (2024) suggest that terrestrial GDEs are unlikely to occur within the CND ecology study area. A detailed terrestrial GDE assessment will be presented in the EIS.

6.6.6.2 Subterranean fauna – Stygofauna

Two main hydrogeological units that could provide subterranean habitat exist in the CND ecology study area: Quaternary Alluvium and Tertiary Suttor Formation Aquifers (dissociated minor sand lenses and basalt units where present) and Permian Coal Measures (interbedded layers of low permeability sandstone/siltstone (aquitards) and coal seams (aquifers). No true stygofauna or short-range endemic stygofauna were collected during the stygofauna pilot survey during the early-wet season.


595,000
600,000
605,000
7,620,000
7,615,000
7,610,000
7,605,000
MB10
MB11
Suttor Developmental Road
MB16
VWP1
VWP1
VWP1
MB05R
VWP2
VWP2
VWP2
VWP2
VWP1
PB02
MB15
Eaglefield Creek
Charlie Creek
MB12
MB06
Kennedy Creek
MDL 3010
VWP3
VWP3
MB07
MB18R2
VWP3
VWP3
MB18R
PB03
MB17R
ML 70495
ML 1790
MB08
Pring to North Goonyella
MB09
Goonyella Creek
ML 6949
Centurion
Coal Mine
North Goonyella Loop
BOM Atlas Mapped GDE
Terrestrial
High potential GDE - from regional studies
Low potential GDE - from regional studies
Moderate potential GDE - from national assessment
Low potential GDE - from national assessment
Aquatic
High potential GDE - from regional studies
Low potential GDE - from regional studies
High potential GDE - from national assessment
Moderate potential GDE - from national assessment
Low potential GDE - from national assessment
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1
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Scale: 1:90,000 at A4
Project Number: 620.040594.00001
Date Drawn: 23-Oct-2025
Drawn by: RB
LEGEND
Centurion Coal Mine
Monitoring Bore
Basalt
Permian (Coal)
Permian (Interburden/Overburden)
Tertiary Sediments
Rail Network
Road
Major Watercourse
Minor Watercourse
Mining Lease
Mineral Development Licence
Centurion North Development Area
Highlands Underground Water Area
CENTURION NORTH DEVELOPMENT
GROUNDWATER DEPENDENT ECOSYSTEMS AND REGISTERED BORE LOCATIONS
CENTURION
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FIGURE 6.8
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6.7 Air Quality

Under the Queensland *Environmental Protection (Air) Policy 2019* (EPP (Air)), the environmental values to be enhanced or protected relevant to the CND include:

- The qualities of the air environment that are conducive to protecting the health and biodiversity of ecosystems.
- The qualities of the air environment that are conducive to human health and wellbeing.
- The qualities of the air environment that are conducive to protecting the aesthetics of the environment, including the appearance of buildings, structures and other property.
- The qualities of the air environment that are conducive to protecting agricultural use of the environment.

The following section describes the typical air environment for the CND and identifies potential sensitive receptors where environmental values relative to air may be impacted.

6.7.1 Ambient Airshed

Regional air quality relative to the CND is expected to be influenced by emissions of dust from existing proximal coal mining operations and agricultural activities. The nearest ambient air monitoring stations to the CND are Department of Environment, Science, Tourism and Innovation (DETSI) owned and operated Moranbah (Utah Drive) and Moranbah (Cunningham Way) (Queensland Government, 2024). These monitoring stations are located approximately 40 km southeast of the CND, and the data collected has been used in conjunction with 'Queensland air monitoring 2023 National Environment Protection (Ambient Air Quality) Measure' (DESI, 2024a), to estimate background levels of pollutants for the CND area. A summary of these estimates is provided in **Table 6-7**.

Table 6-7 Estimates of Background Level Pollutants

Pollutant	Environmental Value	Averaging Period	Background Estimate	Source
Carbon monoxide	Health and wellbeing	8 hours	370 µg/m^3	QLD(4)
Nitrogen dioxide	Health and wellbeing	1 hour	60.4 µg/m^3	QLD(5)
		1 year	14.5 µg/m^3	QLD(5)
	Health and diversity of ecosystems	I year	14.5 µg/m^3	QLD(5)
PM_{10}	Health and wellbeing	24 hour	24.4 µg/m^3	DESI(2)
	Health and wellbeing	Annual	23.8 µg/m^3	DESI(2)
$PM_{2.5}$	Health and wellbeing	24 hour	7.6 µg/m^3	DESI(2)
	Health and wellbeing	Annual	6.8 µg/m^3	DESI(2)
TSP	Health and wellbeing	Annual	47.6 µg/m^3	DESI(2,3)
Dust deposition	Nuisance	30 day	47 mg/m^3/day	AQMP(1) (CMJV)

1. Air Quality Management Plan: Coppabella-Moorvale Joint Venture – Draft, dated 13 March 2023.

2. Based on 2023 data from the DETSI Moranbah (Utah Drive) monitoring station. Estimates for the 24-hour averages are conservatively based on the 90th percentile.
3. TSP is not collected at the DETSI Moranbah monitoring stations. The estimate for the annual average is based on the assumption that 50% of TSP is in the form of PM_{10}.
4. Queensland Government's Queensland air monitoring 2023 National Environment Protection (Ambient Air Quality) Measure. Estimate based on the maximum 90th percentile 8-hour average concentration from the Boyne Island monitoring station over the period 2010 through 2023. Note that concentrations of carbon monoxide are only reported for the Boyne Island and Woolloongabba monitoring stations in 2023. Carbon monoxide ceased to be measured at the North Toowoomba monitoring station in 2010.
5. Queensland Government's Queensland air monitoring 2023 National Environment Protection (Ambient Air Quality) Measure. Estimate based on the maximum 90th percentile 1 hour average or annual average concentration of nitrogen dioxide from the South Gladstone monitoring station over the period 2010 through 2023.

6.7.2 Wind Direction

Meteorological data is available from the MWTP (Station #034038), located approximately 38 km southwest of the CND. The MWTP is the closest long-term weather station and has collected climatic records since 1972 through April 2012 (BOM, 2024). The average annual wind direction at 9am and 3pm is predominantly easterly, at 7.3 km/h and 8.3 km/h respectively.

6.7.3 Sensitive Receptors

Eleven sensitive receptors where the environmental values relative to air may be impacted by the CND have been identified through a desktop review of historical information (e.g. publicly available EIS, EA amendments etc) and analysis of available aerial photographic images. The sensitive receptors identified are illustrated on **Figure 6-9**, and the ownership/ agreement status is detailed in **Table 6-8**.

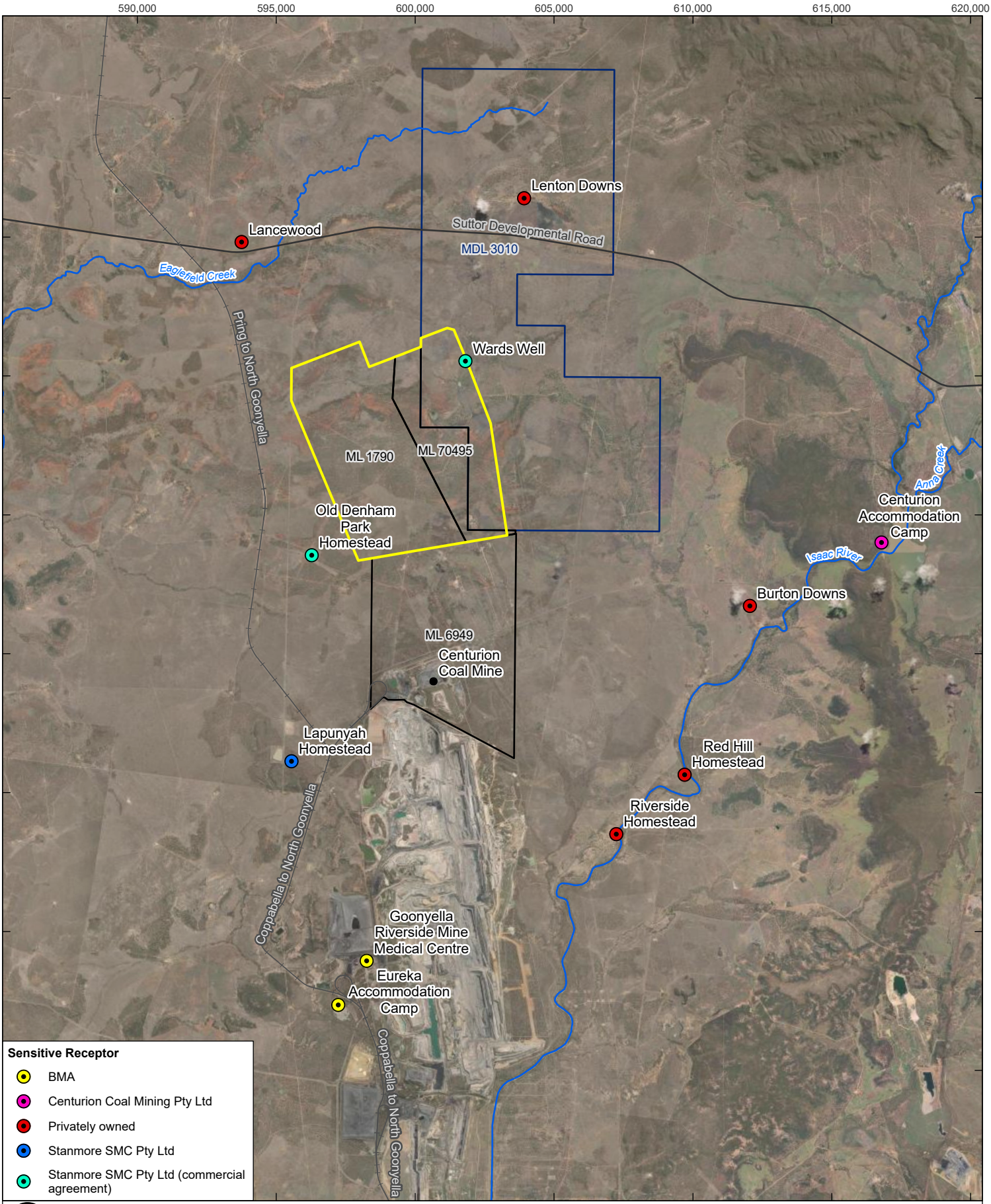
The closest receptor is Old Denham Park Homestead, which is located approximately 3.1 km west of the CND area boundary and is owned by Stanmore SMC Pty Ltd with which there is an existing agreement in place. The nearest privately owned receptor is Lancewood which is located approximately 4.7 km northwest of the CND area boundary.

Table 6-8 Sensitive Receptors

ID	Receptor Name	Easting (m)[1]	Northing (m)[1]	Ownership/Agreement Status
1	Old Denham Park Homestead	596275	7608546	Stanmore SMC Pty Ltd (commercial agreement)
2	Wards Well	601809	7615534	Stanmore SMC Pty Ltd (commercial agreement)
3	Lapunyah Homestead	595547	7601128	Stanmore SMC Pty Ltd
4	Lancewood	593750	7619821	Privately owned
5	Lenton Downs	603922	7621398	Privately owned
6	Centurion Accommodation Camp	616790	7609005	Centurion Coal Mining Pty Ltd
7	Burton Downs	612051	7606721	Privately owned
8	Red Hill Homestead	609702	7600644	Privately owned

ID	Receptor Name	Easting (m)[1]	Northing (m)[1]	Ownership/Agreement Status
9	Riverside Homestead	607241	7598505	Privately owned
10	Goonyella Riverside Mine Medical Centre	598253	7593944	BMA
11	Eureka Accommodation Camp	597230	7592356	BMA

1. GDA 2020 MGA Zone 55 projection.



0 2.5 5 km

Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:180,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Rail Network
- Road
- Major Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

SENSITIVE RECEPTORS

CENTURION

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FIGURE 6.9

Path: \\au.slr.local\Corporate\Projects-SLR\620-BNE\620-BNE\620.040594.00001 North Centurion Environmental\06 SLR Data\01 CADGIS\GIS\North Centurion Environmental\North Centurion Environmental.aprx\620040594_IAS_F06-09_Sensitive Receptors

6.8 Noise and Vibration

Under the Queensland *Environmental Protection (Noise) Policy 2019*, the environmental values to be enhanced or protected relevant to the CND include:

- The qualities of the acoustic environment that are conducive to protecting the health and biodiversity of ecosystem.
- The qualities of the acoustic environment that are conducive to human health and wellbeing, including by ensuring a suitable acoustic environment for individuals to do any of the following:
  - Sleep.
  - Study or learn.
  - Be involved in recreation, including relaxation and conversation.
- The qualities of the acoustic environment that are conducive to protecting the amenity of the community.

The following section describes the typical noise environment for the CND and identifies potential sensitive receptors where environmental values relative to noise may be impacted.

6.8.1 Acoustic Environment

The acoustic environment for the CND was characterised in 2013 as part of the 'Red Hill Mining Lease: Environmental Impact Statement' (BMA, 2013). Noise loggers were used at the locations detailed in **Table 6-8** to determine the Rating Background Level (RBL). This historical data provides an indication of the baseline acoustic conditions that are likely to be experienced at the CND and the results have been summarised in **Table 6-9**.

Table 6-9 Baseline Noise Monitoring Results Summary (BMA, 2013)

Monitoring Location Description			Rating Background Level (dBA)		
			Day (7 am – 6 pm)	Evening (6 pm – 10 pm)	Night (10 pm – 7 am)
ID 1	Old Denham Park Homestead	Noise logger located in south-eastern corner of front yard, approximately 15 m from the homestead	28	25	25
ID 6	Burton Downs Homestead	Noise logger located in centre of front yard, approximately 100 m from the homestead (between homestead and working shed, next to fruit garden)	25	24	24
ID 8	Riverside Homestead	Noise logger located in north-eastern corner of tennis court, approximately 40 m from the homestead	30	23	23
ID 10	Eureka Accommodation Camp	Noise logger located approximately 200 m from Eureka Creek & approximately 500 m from Riverside Mine Road	36	39	36

Monitoring Location Description			Rating Background Level (dBA)		
			Day (7 am – 6 pm)	Evening (6 pm – 10 pm)	Night (10 pm – 7 am)
ID 11	Lapunyah Homestead	Noise logger located in south-eastern corner of front yard, approximately 20 m from the homestead	26	30	28

The historical data indicated that the observed noise levels were typical for a rural environment, primarily consisting of natural sounds such as bird calls, light wind through trees, and insects, along with contributions from mining activity associated with the Goonyella Riverside Mine complex (immediately south of CCM).

Excluding the Eureka Camp, RBL ranged from 25 dBA to 30 dBA during the daytime, and 23 dBA to 30 dBA during both the evening and night-time. RBLs at the Eureka Village ranged between 36 dBA to 39 dBA during the daytime, evening and night-time. The ambient noise environment at this location was largely controlled by local (i.e. camp-related) vehicle movements, mechanical plant noise from within the camp and noise from Goonyella Riverside Mine.

6.8.2 Sensitive Receptors

Eleven sensitive receptors where the environmental values relative to noise may be impacted by the CND have been identified through a desktop review of historical information (e.g. EIS, EA amendments etc) and analysis of available aerial photographic images. These sensitive receptors and ownership/ agreement status are further detailed in **Table 6-8** and illustrated on **Figure 6-9**.

6.9 Traffic and Transport

The road and rail networks are key transport infrastructure that will be utilised for the CND. The following section describes the existing key transport networks in the vicinity of the CND and details the current capacity of the relevant road networks.

6.9.1 Road Network

The CND is located approximately 40 km north of Moranbah and is accessible via Goonyella Road, Red Hill Road, and North Goonyella Mine Access Road. In addition, the CND is situated approximately 140 km east of Mackay, with access from Mackay available via the Peak Downs Highway, Suttor Developmental Road, Red Hill Road, and North Goonyella Mine Access Road.

These roads are used by the general public (mainly Peak Downs Highway or Suttor Developmental Road), by nearby mines for the transportation of equipment, or by mining personnel, whether traveling from nearby accommodation or from fly-in, fly-out (FIFO) operations via Moranbah or Mackay Airport. An overview of each road is provided below.

6.9.1.1 Peak Downs Highway

The Peak Downs Highway (33A) is a state-controlled road which extends approximately 276 km from Mackay to Clermont. It functions as a major link within the Isaac Regional Council area, providing the primary road connection between several townships and mines within Central Queensland and the regional hub of Mackay. The Annual Average Daily Traffic volume for Peak Downs Highway was 3,044 vehicles per day in 2021 at traffic census site 150012: 150 m West of Isaac River (TMR, 2021).

6.9.1.2 Suttor Development Road

The Suttor Developmental Road (82A) is a state-controlled Road operated by the Department of Transport and Main Roads. It extends 162 km in length, connecting Nebo at Peak Downs Highway and Mount Coolon at Bowen Developmental Road. Suttor Developmental Road is an undivided two-way two-lane road, with sealed and unsealed sections of flat to rolling terrain. The seal width of the road is approximately between 6 m and 9 m.

6.9.1.3 Goonyella Road

Goonyella Road extends approximately 26 km north from Mills Avenue in Moranbah to the Goonyella Riverside and Broadmeadow mine complex, providing the only route between the mine and town. Goonyella Road is an undivided, sealed, two lane road with no overtaking lanes. Goonyella Road is a council-controlled road between Mills Avenue and the Railway Overpass (Blair Athol Railway line crossing). North of the railway line, the road is controlled and maintained by BMA.

6.9.1.4 Red Hill Road

Red Hill Road is predominately a council-controlled road that extends approximately 35 km north from its intersection with Goonyella Road to its intersection with Suttor Developmental Road. Between Goonyella Road and the Broadmeadow Mine Access Road, Red Hill Road is an undivided, sealed, two lane road. From the Broadmeadow Mine Access Road north to Suttor Developmental Road, Red Hill Road is unsealed. There are no overtaking lanes on Red Hill Road and in addition, unfenced livestock are present.

6.9.1.5 Other Roads

Several minor roads, including North Goonyella Mine Access Road and Mabbin Road, as well as unsealed exploration roads and tracks are also located within and in the vicinity of the CND.

6.9.2 Rail Network

The Goonyella railway line and loop is located on the southwestern boundary of ML 6949. The Goonyella railway line is part of the Goonyella System, one of four systems in Aurizon's Central Queensland Coal Network. The Goonyella System services the Bowen Basin in Central Queensland and carries product, including coal, to the ports at Hay Point and other destinations by way of connections to the North Coast Line at Yukan and the Central Line via Gregory to Burngrove (Aurizon, 2017).

6.10 Social Environment

The CND is located in the northern region of the Bowen Basin, approximately 30 km south of Glenden, 40 km north of Moranbah, and 150 km southwest of Mackay, within the Emerald mining district of Central Queensland. The CND area is divided into two localities within the IRC, which are Moranbah and Burton. The closest urban centres are Moranbah and Glenden. Approximately 30% of the CND area lies within the Moranbah locality, specifically in the southwestern portion of ML1790. The remaining area is situated within the Burton locality, which includes the rest of ML1790 and the entire CND area within ML4759, ML70342, ML70341, and ML70340.

The surrounding area of the CND includes mining, gas exploration, and agricultural activities. Within ML1790, 153.2 ha are designated as strategic cropping land, and the primary land use within the CND area is grazing of native vegetation (State of Queensland, Department of Resources, 2024). Notable coordinated projects located near the CND include the Red Hill Mining Lease Project and the Northern Missing Link Project, a rail link connecting the North Goonyella and Newlands rail systems in the Bowen Basin (State of Queensland, Department of Resources, 2024).

As discussed in **Section 5.6**, both the construction and operation of the CND will enable the ongoing employment of existing workers at the CCM. Where possible, Peabody will implement a local hiring policy and the provision of training programs to upskill the local workforce for specialised roles involved at the construction and operational phases of the CND. Peabody will maintain the current arrangements for the CND which involve drive-in drive-out (DIDO) and fly-in fly-out (FIFO) employees.

The existing CND accommodation camp will continue to be used to house employees throughout the operational and construction phases of the CND. Where additional capacity is required, accommodation options in local communities will be used where possible. Additionally, as is consistent with Peabody's existing procurement policies, locally sourced goods and services will be obtained where practicable to support the CND and its workforce, while also supporting the local economy.

Each mining facility owned by Peabody and its subsidiaries has its own engagement strategy and program within the local community, including donations to local schools, charities and emergency services, and supporting arts programs, sports programs and organisations (Peabody Energy, 2025). A stakeholder engagement strategy is under development for the CND which will aim to assist in supporting the local communities surrounding the site.

Outcomes from preliminary engagement with stakeholders have been positive and supportive of the CND. Early engagement has included government regulatory authorities, local government, including Isaac Regional Council, traditional owners, and several key suppliers to the existing mine. Further community engagement will follow the engagement strategy that is under development.

How the CND is anticipated to impact the social environment is discussed further in **Section 7.10**.

6.10.1 Planning Context

Mackay Isaac Whitsunday Regional Plan 2012

The Mackay, Isaac and Whitsunday Regional Plan (MIW Regional Plan) establishes a vision and direction for the region to 2031 (State of Queensland, Department of Local Government and Planning, 2012). The plan was developed with guidance from the Regional Planning Committee (RPC), comprising representatives from local and state governments, federal bodies, industry, and community sectors, with additional input from Aboriginal and Torres Strait Islander representatives. The MIW Regional Plan emphasises ongoing engagement with adjacent regions, involvement of Traditional Owners, and partnerships across government, industry, and communities to support resilient, resource-based communities.

The region encompasses diverse, dispersed communities, and is experiencing significant population growth, particularly in coastal areas. The community encompassing Aboriginal and Torres Strait Islander, Australian South Sea Islander, and European influences, which contribute to a strong sense of community identity. Projected growth over the next 20 years indicates increasing residential, industrial, and commercial development on urban fringes. The MIW Regional Plan highlights challenges such as limited access to services and public transport, particularly in rural areas, and pressures on housing availability. Additionally, the non-resident workforce is not accounted for in official population data which complicates growth planning. With respect to community values, the plan highlights a commitment to responsible management of natural assets, fostering diverse employment and educational opportunities, and nurturing a resilient, inclusive society that supports a healthy, active lifestyle for both residents and visitors.

As is consistent with the MIW Regional Plan, throughout the life of the CND, Centurion is committed to ongoing engagement with Traditional Owners and building relationships with government, industry and communities. The goal is for the CND to be a positive contributor to the local community in both the short- and long-term. This commitment is formalised in the Community and Stakeholder Engagement Plan, which is currently in preliminary stages of development. The Community and Stakeholder Engagement Plan will be developed through an iterative process with stakeholders and is discussed further in **Section 9.3**.

Moranbah Urban Development Area Development Scheme 2011

Moranbah is experiencing high growth due to the current expansion pressures of the local coal mining operations within the area. The Moranbah Priority Development Area (PDA) was established to provide land for housing and urban development, encompassing sites within the existing Moranbah town and a large area west of Goonyella Road. The development of Moranbah's Urban Development Area (UDA) involved the Isaac Regional Council and local planning authorities, which focussed on supporting sustainable growth which accommodates both residents and the non-resident workforce.

According to Economic Development Queensland (2024) the UDA scheme (July 2011) was compiled as a regulatory document to guide in planning, carrying out, promoting, coordinating and controlling land development within the PDA. The UDA covers 1,218 ha and aims to provide affordable housing by increasing the supply of residential land and offering a variety

of housing types to meet community needs. The plan integrates high-quality, non-resident worker accommodations within the town and prioritises redevelopment to reinforce the Moranbah Town Centre as the hub of retail and civic activity. Environmental considerations, such as air quality impacts from nearby mines like Caval Ridge and the potential Moranbah South mine, were incorporated into the planning process. The UDA scheme emphasises affordable, diverse housing options for families, key workers, and non-resident workers, while promoting connectivity through pedestrian-friendly infrastructure that links residential areas to community amenities.

The CND aligns with the UDA scheme as it is not expected the CND workforce will place noticeable increased pressure on housing availability in local communities. This is because the CND workforce will be housed at the existing accommodation camp at CCM. However, CND employees are likely to utilise nearby towns, such as Moranbah, Nebo and Glenden, for other purposes such as retail, dining, and civic services which further supports the objectives of the UDA scheme.

Isaac Region

The following description of the planning context for the Isaac Region was compiled from information contained in the Isaac Regional Planning Scheme 2021 (State of Queensland, 2021), Isaac 2035 Community Strategic Plan (Isaac Regional Council, 2015) and the Isaac Regional Council Community-Corporate Plan 2023-2028 (Isaac Regional Council, 2023).

The social environment of the Isaac Region is shaped by its economic reliance on the mining and resources sector. The region comprises 17 distinct communities, including modern mining towns like Moranbah, Middlemount, Dysart, and Glenden; historic settlements such as Nebo, Clermont, and St Lawrence; and smaller rural and coastal localities. These communities contribute to a connected social structure influenced by shared experiences in a resource-dependent economy (State of Queensland, 2021; Isaac Regional Council, 2023 and Isaac Regional Council, 2015). Towns such as Moranbah, Dysart, Middlemount, and Glenden serve as service hubs, providing housing, employment, and urban infrastructure for residents and transient workers. Coppabella differs as a privately owned railway settlement, focused on its railway service function. Smaller rural communities, including Clarke Creek and Mistake Creek, support social connections through shared infrastructure, while coastal areas cater to both residents and tourists (Isaac Regional Planning Scheme, 2021 and Isaac Regional Council, 2015).

The Isaac Regional Council prioritises inclusivity, liveability, and sustainability. Accessible social systems include housing, healthcare, and childcare services and public spaces. Sustainability efforts target responsible environmental management and economic diversification to reduce dependency on mining. Resilience is a focus, addressing economic fluctuations, environmental challenges, and natural hazards like floods (Isaac Regional Council, 2023 and Isaac Regional Council, 2015). The transient workforce, particularly FIFO workers, may present challenges to community cohesion, therefore, workforce accommodations have been integrated into towns to enhance inclusivity and community character. Therefore, workforce accommodations are aimed at integrated into towns to enhance inclusivity and community character. Youth engagement, mental health initiatives,

and partnerships with government and businesses further support the region's goals for a sustainable and inclusive future (Isaac Regional Council, 2023 and Isaac Regional Council, 2015).

Being a significant resource project, the CND is consistent with the current context of the Isaac Region. However, Centurion is cognisant of the issue faced by many rural towns within the Isaac Region which are reliant on the transient workforce from resource projects for economic development. As such, as a part of the social impact management for CND, Centurion will develop strategies aligned with the objectives of:

- Investing in local businesses and supply chains that can operate beyond the resource sector.
- Providing workforce training focused on transferable skills.
- Supporting alternative industries such as renewable energy, agriculture, and/or tourism.
- Rehabilitating the site following operations to ensure the land can be used for alternative purposes post-mining.
- Maintaining appropriate and ongoing engagement with stakeholders.

Centurion is committed to contributing to a more resilient and self-sustaining community within the Isaac Region. Further information will be provided in the EIS process.

Demographics

The Australian Statistical Geography Standard (ASGS), a hierarchical system defined by the Australian Bureau of Statistics (ABS) for collecting and disseminating official statistics, was used to describe the existing social environment presented in the section. The CND falls within the Mackay - Isaac - Whitsunday Statistical Area Level 4 (SA4) and includes Statistical Area Level 2 (SA2) regions of Moranbah (southwestern portion of ML 1790) and Broadsound – Nebo (remaining CND area) (ASGS 2021). The demographics of these statistical areas are provided below.

<u>Mackay-Isaac-Whitsunday SA4</u>

Statistical information provided below was retrieved from the Queensland regional profiles: Resident profile - Mackay-Isaac-Whitsunday Statistical Area Level 4 (SA4) (ASGS 2021) (Queensland Government Statistician’s Office, 2024a). As of June 2023, the Mackay-Isaac-Whitsunday region, has a population of 189,643 and is growing by 1.6% annually. The population is projected to increase to 236,081 by 2046. The region displays strong economic performance, particularly in mining, and has a youthful, growing population. Challenges include housing availability and an ageing population.

Key demographic and economic insights are outlined below:

- Population Growth and Ageing: The current annual growth rate is 1.6% and the median age projected to increase from 38.4 years to 41.5 years by 2046.
- Age Distribution: The percentage of the population aged 0–14 years is 19.4% and those aged 65 years are 14.9%.
- Aboriginal and Torres Strait Islander population comprise 6.0% of residents.

- Migration: There is high internal migration with 16.4% of resident migrated within a year and 40.2% relocated within five years according to the 2021 Census.
- Economy and Employment: The median annual personal income of residents is $45,656 with a low unemployment rate (3.5%).
- Key industries: The mining industry accounts for 14% of the workforce and 11.1% of the workforce is from the health care/social assistance sectors.
- Housing: There are housing challenges in the region with a homelessness rate of 36.7 per 10,000 persons. Dwellings primarily comprise separate houses (83.5%) and 34.5% are under purchase agreements.

Moranbah SA2 and Broadsound-Nebo SA2

Statistical information provided below was retrieved from Queensland regional profiles: Time series profile - Moranbah Statistical Area Level 2 (SA2) (ASGS 2021) (Queensland Government Statistician's Office, 2024b) and Queensland regional profiles: Time series profile - Broadsound-Nebo Statistical Area Level 2 (SA2) (ASGS 2021) (Queensland Government Statistician's Office, 2024c). The demographic and economic characteristics of Broadsound-Nebo SA2 and Moranbah Nebo SA2 have been influenced by their industries and growth trends.

Broadsound-Nebo has a population of 9,119 (as of mid-2023). The annual growth rate over the past 20 years was 0.4%. The population is ageing, with those aged 65 and older increasing from 4.0% in 2001 to 9.0% in 2023. The percentage of Aboriginal and Torres Strait Islander residents grew to 5.6% in 2021. The economy is primarily supported by agriculture, forestry, and fishing, which employ 14.1% of the workforce. The mining sector contributes 36.6% share of employment.

The population of Moranbah SA2 is 9,909 and displayed a strong annual growth rate of 1.9% over the past 22 years. However recent growth has slowed to 1.3%. Moranbah has a relatively young population with a median age of 32 years. The proportion of residents aged 65 and older rose to 2.9% by 2023. Indigenous Australians comprise 5.7% of the resident population in 2021, and the area's linguistic diversity is increasing, with English-only speakers at home dropping to 75.3%. Mining is the main employment sector contributing to 41.2% of the workforce and mining businesses have grown by 150% from 2021 to 2023.

The CND is expected to assist in maintaining the low unemployment rate of the Mackay-Isaac-Whitsunday region by providing the opportunity for the ongoing employment of approximately 525 workers at CCM.

6.10.2 Native Title

There is one native title party for the CND area:

1. the Widi People of the Nebo Estate #1 (QCD 2019/004) (Widi #1 Determination) are the determined native title holders for the southeastern portion of the CND area (refer to **Figure 6-10**) and have been granted Native Title Protection Conditions.

The Widi Aboriginal Corporation (WAC) Registered Native Title Body Corporate (RNTBC) (ICN 8911) is the agent registered native title body corporate under the *Native Title Act 1993* (NTA) for the Widi common law holders under the Widi #1 Determination.

6.11 Aboriginal and Non-Aboriginal Cultural Heritage

6.11.1 Aboriginal Parties

The main Aboriginal Party for the CND area is the Widi People of the Nebo Estate #1 (QCD 2019/004 DET) as the determined native title holders illustrated on **Figure 6-10**. The WAC is the prescribed body corporate for the Widi People of the Nebo Estate #1 and is the organisation through which cultural heritage matters are managed for the group.

6.11.2 Aboriginal Cultural Heritage

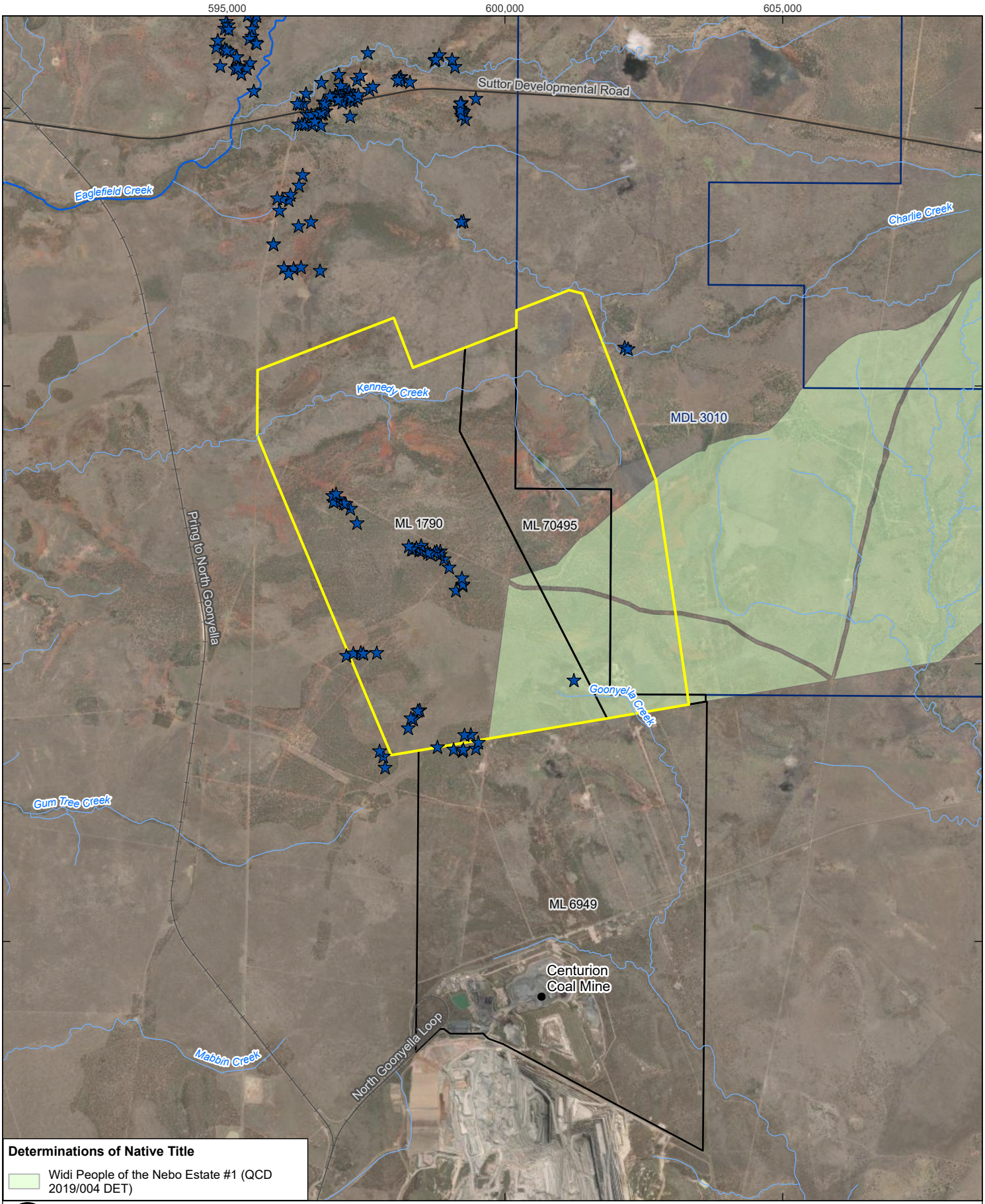
A review of the Department of Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts Cultural Heritage Database and Register, identified a number of scarred/ carved trees and artefact scatters within the CND (refer to **Figure 6-10**).

6.11.3 Non-Aboriginal (historical) Cultural Heritage

The following heritage registers were reviewed to identify any potential non-Aboriginal values within the CND area:

- World Heritage List.
- Commonwealth Heritage List.
- National Heritage List.
- Queensland Heritage Register.
- National Trust of Australia (Queensland) Heritage Register.
- Isaac Council Regional Heritage Overly Maps.

No non-Aboriginal heritage sites listed on local, Queensland, or national registers were identified within or in the immediate vicinity of the CND. The closest known significant historical sites are Nebo Hotel and Barclay's Battery, located approximately 72 km east, and 64 km northwest of the CND respectively (DCCEEW, 2024; Queensland Government, 2023).



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Coordinate System:	GDA2020 MGA Zone 55
Scale:	1:90,000 at A4
Project Number:	620.040594.00001
Date Drawn:	23-Oct-2025
Drawn by:	RB

LEGEND

- Centurion Coal Mine
- Registered Artefact Find
- Rail Network
- Road
- Major Watercourse
- Minor Watercourse
- Mining Lease
- Mineral Development Licence
- Centurion North Development Area

CENTURION NORTH DEVELOPMENT

NATIVE TITLE AND CULTURAL HERITAGE CONSIDERATIONS

CENTURION

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FIGURE 6.10

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6.12 Hazard and Risk and Health and Safety

6.12.1 Flooding and Cyclonic Activity

Regional flood risks arise from heavy rainfall and tropical cyclones, especially during the wet season, which can bring significant precipitation and high winds. High floods associated with low pressure systems from active or decaying Tropical Cyclones have also been experienced in all tributaries of the Fitzroy and Burdekin Rivers, especially the Dawson, Mackenzie, Comet and Nogoa Rivers.

There have been relatively few cyclones in the past 120 years in the CND area. The most intense cyclone, a Category 3 event, occurred in March 2010 in Airlie Beach and caused significant wind damage in coastal regions. Several Category 1 and 2 cyclones have been reported in the Mackay region over the last 120 years; however, these cyclones have tended to be weak in intensity and have caused limited damage.

The State Planning Policy Interactive Mapping System identifies the CND area as being within a designated flood hazard area, as confirmed by local government flood mapping. Outside the CND area, Flood Hazard Area Level 1, as mapped by the Queensland Floodplain Assessment Overlay (QFAO), includes a portion of land to the north on parcel 2SP214117. According to Isaac Region Online Mapping (which incorporates the Isaac River Regional Flood Study) the southern portion of land parcel 2SP214117, falls within the Isaac River's Probable Maximum Flood (PMF) extent and the 1% Annual Exceedance Probability (AEP) (Q100) plus climate change scenario, indicating a 1% annual flood risk influenced by tributaries of the Isaac River.

6.12.2 Bushfire Risk

Subtropical climates with dry winter conditions can increase the risk of bushfires, particularly when vegetation dries out, creating fire-prone conditions. The State Planning Policy Interactive Mapping System indicates that there are various medium potential bushfire prone areas (including potential impact buffers) located within the CND area.

6.12.3 Drought

The Isaac Region has historically experienced periodic drought conditions, with dry winters often impacting water availability. However, according to the Drought Duration Report (Queensland Government, 2024), the region has been drought-free for 37 months to 48 months as of November 4, 2024, and remains not drought-declared as of November 11, 2024. Since 1964, the region has been officially drought-declared approximately 30 % to 40% of the time, which reflects the variable climatic conditions in the region.

7 Environmental Considerations

7.1 Project Risk Summary

A risk assessment of the CND was conducted, and the findings are presented in **Table 7-1**. The risk assessment aimed to broadly identify the most significant risks to critical environmental matters. Details of the assessment methodology are provided in **Appendix B**. A qualitative assessment of risks for each environmental value is individually detailed in **Sections 7.2** to **Section 7.13**.

Table 7-1 Summary of Potential Risks Associated with the CND

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
Land Resources	▪ Large scale subsidence affecting surface integrity, water flow, and reducing agricultural productivity post-rehabilitation. ▪ Large scale impacts to land capability. ▪ Loss of agricultural productivity. ▪ Potential impacts to strategic cropping land (SCL). ▪ Increase in erosion risks due to construction and earthworks. ▪ Surface disturbance due to construction of well pads and infrastructure. ▪ Loss and/or degradation of soil resource. ▪ Some loss of land suitability due to surface disturbance and/ or contamination.	▪ Minimise disturbance footprint during construction by considering overland flow and, for UG longwall mining, locating surface infrastructure and predicted subsidence outside SCL. ▪ Store and manage hydrocarbons and hazardous materials appropriately to prevent land contamination, e.g., using bunding. ▪ Implement measures to govern drainage designs to minimise catchment area of soil disturbance works. ▪ Progressively rehabilitate the land in accordance with a PRCP to achieve a post-mining land use consistent with local planning schemes, regional plans and or state planning policies. ▪ Stage UG longwall mining to maximise ongoing agricultural use in unaffected areas.	4	4	High
Terrestrial Ecology	▪ Large scale subsidence and resulting inundation causes loss of ecosystems and habitat. ▪ Clearing of ecosystems and habitat for infrastructure. ▪ Loss of or displacement of MSES and MNES fauna.	▪ Minimise new construction by using existing infrastructure and limiting ecological disturbance through design refinements and habitat buffers. ▪ Conduct pre-clearance surveys, monitor vegetation and habitats, and implement targeted management plans for species, weeds, and pests.	4	4	High

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
		▪ Progressively rehabilitate land to achieve safe, stable, and sustainable post-mining uses in line with the PRCP. ▪ Limit the extent of land disturbance where possible. ▪ Relocate habitat features to create refuges in adjacent habitats. ▪ Implement a Threatened Species Management Plan with rescue protocols.			
Aquatic Ecology	▪ Large scale subsidence altering surface water flows, impacting GDEs leading to habitat loss and degradation. ▪ Degradation of aquatic habitats due to land clearing, mining, and subsidence. ▪ Deterioration of water quality due to erosion and sedimentation causing harm to aquatic ecosystems and biodiversity. ▪ Changes to hydrology due to subsidence impacts downstream ecosystems. ▪ Loss of aquatic habitat diversity and potential for sediment-related impacts. ▪ Introduction and spread of aquatic weeds (salvinia, water hyacinth, cabomba etc.) through equipment use. ▪ Disruption of aquatic ecosystems by limiting access to critical habitats such as feeding, nesting,	▪ Implement comprehensive monitoring and management plans, including those for GDEs, erosion, subsidence, and invasive species. ▪ Develop and execute spill response plans and conduct aquatic fauna salvage as per guidelines. ▪ Monitor aquifers for water quality changes and progressively rehabilitate land to meet safe, sustainable post-mining uses. ▪ Implement erosion and sediment control measures. ▪ Design and construct watercourse infrastructure to support ecological connectivity and hydrological functionality.	4	3	High

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
	and spawning areas during construction.				
Surface Water	▪ Water quality deterioration in ephemeral creeks due to: o Improper handling, storage, or transport of contaminants (hydrocarbons, produced water, drilling chemicals), particularly during heavy rainfall. o Inadequate stormwater management during construction, causing contamination and sedimentation. o Increased erosion and sedimentation from backfilling and infrastructure removal. o Spills or overflow of saline produced water during CSG pre-drainage. o Residual contamination from incomplete infrastructure removal or improper well plugging. ▪ Alteration of natural drainage and flood behaviour due to: o Earthworks (clearing, grading, excavating) impeding or redirecting flows, causing localised flooding. o Permanent infrastructure placement and increased disturbance footprint, raising mine-affected water (MAW) catchment areas. o Inadequate mitigation or	▪ Implement site-specific water use and management measures in accordance with CCM's overarching water management framework. o Development and implementation of a Subsidence Management Plan, Erosion and Sediment Control Plan and a Stormwater Management Plan. ▪ Establishment and implementation of a water quality monitoring program. ▪ Ensure proper handling and storage of fuel and hazardous materials in compliance with relevant standards. ▪ Implement engineered controls, such as sediment traps, oil-water separators, and stormwater treatment systems, to minimise pollutant discharge and manage sediment runoff into waterways. ▪ Design and manage infrastructure to maintain natural flow paths and hydrological regimes, ensuring minimal disruption to creeks. ▪ Implement beneficial use scheme for excess water (i.e. supply to mines in the region, agricultural enterprises, etc.).	4	4	High

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
	rehabilitation failing to restore natural drainage. o Localised subsidence and erosion risks from UG longwall mining. o Addition of up to 6 GL/year of MAW from UG longwall dewatering into existing CCM. water management systems.				
Groundwater	▪ Changes in groundwater flow may reduce surface water baseflows and affect ecosystems, including GDEs. ▪ Changes in groundwater flow may impact regional users and increase subsidence risk. ▪ Increased risk of groundwater contamination due to spillages of fuels and chemicals. ▪ Drawdown impacts and potential changes to aquifer flow dynamics. ▪ Potential groundwater contamination due to spillages of chemicals and hazardous substances. ▪ Alteration of groundwater hydraulic gradients. ▪ Reduction in water resources for GDEs and third-party users.	▪ Conduct predictive groundwater modelling to assess drawdown, flow changes, and aquifer recharge impacts. ▪ Implement groundwater monitoring and management plans to detect and mitigate impacts. ▪ Ensure groundwater extraction complies with the Water Act through proper approvals and licensing. ▪ Robust groundwater monitoring during all project phases. ▪ Design and apply aquifer-specific well-sealing techniques to prevent cross-contamination during and after project closure. ▪ Develop management strategies to address cumulative impacts, particularly in areas with high aquifer connectivity.	5	4	High
Air Quality and GHG	▪ Dust and emissions from earthworks and operations may impact sensitive receptors.	▪ Adequate dust suppression techniques. ▪ Undertake real-time periodic air quality monitoring.	3	3	Medium

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
	▪ Increased GHG emissions from diesel use, and fugitive methane during operations and rehabilitation.	▪ Develop and implement an Air Quality Management Plan and GHG Abatement Plan. ▪ Limit vegetation clearing and implement dust control measures[4]. ▪ Backfill and revegetate disturbed areas to prevent erosion and stabilise soil. ▪ Use low-emission or electric-powered equipment, optimise machinery operations, and implement a leak detection and repair (LDAR) program for gas infrastructure. ▪ Real-time and periodic monitoring for PM_{10}, $PM_{2.5}$, and other pollutants.			
Noise and Vibration	▪ Disturbance to nearby receptors and fauna due to short-term noise and vibrations (construction) and continuous noise and low-frequency vibrations (operation). ▪ Potential nuisance to nearby sensitive receptors.	▪ Utilise low-noise, low-vibration equipment and advanced technologies like broadband reversing alarms. ▪ Maintain equipment per manufacturer guidelines, ensure regular servicing, and shut down machinery when not in use.	3	3	Medium
Traffic and Transport	▪ Increased traffic affecting road infrastructure and safety.	▪ Use existing access and develop and implement a Traffic Management Plan. ▪ Conduct traffic awareness training for workers and immediately adjacent communities.	2	1	Low

[4] *It is important to note that, under the Vegetation Management Act 1999, vegetation may only be cleared for a 'relevant purpose' (section 22A). If the CND is designated as coordinated, clearing of vegetation pursuant to the VM Act is allowed.*

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
		▪ Keep local communities informed about traffic activities and provide a clear process for addressing concerns.			
Social	▪ Realisation of economic benefits. ▪ Increased pressure on community services and housing. ▪ Potential social and amenity impacts, including land use changes, reduced cohesion, and environmental concerns. ▪ Positive impact due to continued long-term employment of workforce. ▪ Contribution to local economy through demand for goods and services. ▪ Deterioration in sensitive receptor well-being due to potential impacts such as noise, air quality, and increased traffic.	▪ Promote local hiring and upskilling and engage in regular consultations to maintain transparency and perform health and safety assessments, where possible.	4	3	Medium
Cultural Heritage	▪ Potential disturbance to culturally significant sites.	▪ Assess and implement CHMPs with Traditional Owners to manage and protect cultural heritage, including actions for significant finds. ▪ Assess non-Aboriginal impacts and undertake a non- Aboriginal heritage survey.	2	3	Medium
Hazard and Safety	▪ Altered drainage patterns and subsidence increase flooding, ground instability, and environmental risks.	▪ Implement integrated risk, health, safety, and environmental management systems aligned with ISO standards and regulatory requirements.	3	5	High

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
	▪ Equipment operation, CSG extraction and mining activities heighten bushfire, contamination, and safety risks. ▪ Heavy equipment and construction traffic pose increased accident risks. ▪ Fire and explosion risks from flammable materials, gas leak and infrastructure failures.	▪ Design flood-resilient infrastructure and water management structures. ▪ Provide regular hazard and emergency preparedness training for personnel.			
Visual Amenity	▪ Altered landscape views from infrastructure, subsidence and lighting.	▪ Design surface infrastructure to minimise visual impact. ▪ Implement progressive rehabilitation to restore subsided areas. ▪ Use directional and shielded lighting to reduce light pollution. ▪ Restore areas post-operations to original conditions.	3	1	Low
Economics	▪ Boost local and regional economy through job creation, increased demands for goods and services and generation of revenue from resource extraction. ▪ Challenges long-term economic diversification through reliance on mining.	▪ Maximise local employment and supply chain use and promote economic diversification by supporting alternative industries, where possible. ▪ Implement local hiring and training programs and consider establishing community investment plans.	4	4	High
Biosecurity	▪ Introduction of invasive species due to construction and operations. ▪ Potential contamination of surrounding environments,	▪ Implement Weed and Pest Management Plan. ▪ Implement strict biosecurity protocols, including monitoring, cleaning equipment, and controlling movement of materials.	2	3	Medium

Environmental Value	Potential Impacts	Potential Mitigation and Management Measures	Risk Likelihood	Consequence	Environmental Risk
	affecting agricultural productivity and natural habitats.	▪ Conduct regular environmental monitoring and engage with stakeholders to ensure adherence to biosecurity measures.			
Geochemistry / Mineral Mine Waste	▪ Potential for acid mine drainage or leachate generation, impacting water quality and ecosystems. ▪ Contamination risks from improper handling or disposal of waste rock and tailings. ▪ Long-term stability issues with mine waste storage, leading to environmental degradation or land use challenges.	▪ Conduct regular monitoring of water quality and geochemical stability to detect and mitigate acid mine drainage or leachate risks. ▪ Design and maintain mine waste storage facilities for long-term stability, minimising environmental and land use impacts. ▪ Implement robust waste management plans, including proper handling, storage, and disposal of waste rock and tailings to prevent contamination.	4	4	High
Rehabilitation and Closure	▪ Ineffective rehabilitation results in unstable, polluting landforms. ▪ Failure to rehabilitate land adequately for post-project use. ▪ Land restoration challenges, including subsidence repair and leading to not achieving post-mining land use goals. ▪ Delayed ecosystem recovery and slower re-establishment of biodiversity.	▪ Develop and implement a rehabilitation schedule and prioritise progressive rehabilitation where possible. The Rehabilitation Plan should address subsidence, restore landforms, and achieve sustainable post-mining land uses. ▪ Develop long-term water management strategies to mitigate impacts on drainage and groundwater systems. ▪ Monitor and adaptively manage ecosystem recovery to ensure biodiversity restoration and compliance with environmental standards.	2	4	Medium

7.2 Land Use and Built Environment

A description of the existing land use and the built environment for the CND is outlined in **Section 6.2**. The following section identifies key potential land use, and the built environment impacts for the CND along with their management and mitigation measures.

7.2.1 Potential Impacts

The CND area is zoned as rural under the *Isaac Regional Planning Scheme Version 1.1* and designated as a Regional Landscape and Rural Production Area under the *Mackay Isaac Whitsunday Regional Plan 2012*. Access to overlapping tenures will follow processes set out in the *Mineral Resources Act 1989* (MR Act) and the *Queensland Mineral Energy Resources (Common Provisions) Act 2014*. There are no inconsistencies with the local planning, schemes, regional plans or state planning policies.

Key potential impacts to land use and the built environment environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Loss of soil resources due to erosion, compaction, or contamination (from chemical spills, machinery leaks, gas leaks, and poor wastewater management), as well as physical disturbances (vegetation clearance, spoil placement, access track use, drainage alteration, and heavy machinery operation).
- Clearing of vegetation and minor earthworks for the construction of supporting surface infrastructure increasing erosion risk.
- Reduced alternative land use availability.
- Reduction in soil quality and fertility including nutrient loss.
- Inadequate rehabilitation leading to soil resources failing to meet post-development land use needs.
- Localised changes to the landform due to subsidence from UG longwall mining operations may cause:
  - Surface tensile cracking.
  - Changes to natural overland flow patterns, leading to localised ponding, increased erosion and changes to sediment deposition processes.
  - Changes to soil physical characteristics, including compaction and loss of fertility, potentially reducing agricultural productivity following rehabilitation.

7.2.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to land use and the built environment include, but are not necessarily limited to:

- Minimise disturbance footprint as far as practicable, considering overland flow when establishing disturbance boundaries to protect land resources during construction. For UG longwall mining operations, minimise the disturbance footprint during construction by locating surface infrastructure and predicted subsidence areas outside SCL zones where practicable.
- Store and manage hydrocarbons and hazardous materials appropriately to prevent land contamination, e.g., using bunding.

- Implement measures to govern drainage designs to minimise catchment area of soil disturbance works.
- Progressively rehabilitate the land in accordance with a PRCP to achieve a post-mining land use consistent with local planning schemes, regional plans and or state planning policies. As per the PRCP, the final landform must be safe, stable, non-polluting and capable of sustaining post-mining land uses where appropriate.
- UG longwall mining operations will be staged to allow agricultural activities to continue for as long as possible in areas not required for operations.

Plans to support the monitoring and management of land use and built environment impacts include an Erosion and Sediment Control Plan and Rehabilitation Management Plan that incorporates drainage designs to limit the catchment of disturbed soils, and requires the installation, monitoring and maintenance of erosion–sediment controls. A Subsidence Management Plan will be implemented for UG longwall mining operations, based on the understanding of subsidence at the CCM at the time.

As part of the EIS a detailed land resources assessment will be undertaken in line with the final Terms of Reference (ToR). This will include establishment of baseline conditions through desktop research and field surveys, laboratory analysis of soil samples, assessment of impacts on environmental values, and identification of mitigation measures. Findings will be presented in a land resources technical report and supporting EIS chapter.

As part of the EIS process a baseline land resource survey in accordance with the *Guideline for Surveying Soil and Land Resources and the Assessment of Strategic Cropping Land*. Approximately 171 ha of mapped SCL is within the CND area. The SCL will be verified to determine whether it meets SCL criteria. If confirmed, potential impacts will be assessed, and if necessary, a Regional Interests Development Approval (RIDA) application will be prepared.

7.3 Terrestrial Ecology

A description of the existing terrestrial ecology environment for the CND is outlined in **Section 6.3**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the identified terrestrial ecology values.

7.3.1 Potential Impacts

Key potential impacts to terrestrial ecology environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Project activities (such as clearing, of native vegetation, and grading, soil stripping, stockpiling, excavations, backfilling and removing infrastructure, operation of plant and heavy equipment, etc) for development, operation and decommissioning of the CND and supporting infrastructure may cause land disturbance affecting terrestrial ecology. Further habitat degradation may occur from fragmentation and edge effects, and to the displacement of threatened species.
- Increased risk of invasive species introduction due to regular human presence and movement.

- Increase in noise, light, and dust, potentially disturbing nocturnal species.
- Increase in vehicular traffic for final setup, contributing to noise and potential fauna road strike.
- Subsidence due to longwall mining may result in alteration of surface water flows, surface cracking and ponding (including potential chemical or physical changes in soils) resulting in habitat loss and degradation.
- Inadequate rehabilitation management leading to failure in the achievement of vegetation related milestones for the intended post mine land use.
- It is important to note that, under the *Vegetation Management Act 1999 (VM Act)*, vegetation may be cleared for a 'relevant purpose' (section 22A). If the CND is designated as a Coordinated Project, clearing of vegetation pursuant to the VM Act will be considered as being for a relevant purpose.

7.3.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to terrestrial ecology environmental values include, but are not necessarily limited to:

- Utilisation of existing infrastructure within CCM where practicable to reduce disturbance.
- Conduct pre-clearance and fauna spotter surveys with qualified personnel.
- Limit disturbance extents to what is necessary for earthworks, infrastructure footprints and vehicles access. Mark areas not to be cleared and use directional or progressive clearing to facilitate fauna movement.
- Relocate habitat features to create refuges in adjacent habitats, where necessary.
- Monitor vegetation communities and habitats within potential subsidence areas for degradation.
- Progressively rehabilitate the land in accordance with a PRCP to achieve a post-mining land use and revegetation milestones. As per the PRCP, the final landform must be safe, stable, non-polluting and capable of sustaining post-mining land uses where appropriate.

Plans to support the monitoring and management of terrestrial ecology impacts includes Receiving Environment Monitoring Program, Threatened Species Management Plan, and a Weed and Pest Management Plan.

As part of the EIS a detail terrestrial ecology assessment will be undertaken in line with the final ToR. This will include establishment of baseline conditions through desktop research and seasonal field surveys to inform habitat quality assessments. Assessment of impacts on environmental values will be undertaken in line with the '*Guideline Application Requirements for Activities with Impacts to Land*' (DES, 2021) and will provide detailed methodology and disturbance footprints and disturbance areas for clearance of regulated vegetation, MNES, MSES, and Strategic cropping area. Identification of mitigation measures will be presented. Findings will be presented in a terrestrial ecology technical report and supporting EIS chapter.

Significant impact assessments will be undertaken to address the need for an environmental offset in accordance with:

- MSES in accordance with 'Queensland Environmental Offsets Policy: Significant Residual Impact Guideline' (DEHP, 2014).
- MNES in accordance with the 'Significant Impact Guidelines 1.1 - Matters of National Environmental Significance' (DEWHA, 2013).

7.4 Aquatic Ecology

A description of the existing aquatic environment for the CND is outlined in **Section 6.4**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the identified aquatic ecology values.

7.4.1 Potential Impacts

Key potential impacts to aquatic ecology environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Physical disturbance of watercourse beds and banks caused by clearing, grubbing, and soil/sediment stockpiling, leading to sedimentation in creeks and direct loss of aquatic species, aquatic habitat, riparian vegetation, and terrestrial and surface expression GDEs.
- Construction of watercourse crossings may restrict access to feeding, nesting, and spawning areas for aquatic life.
- Improper handling, storage or transport of co-produced water, hydrocarbons, drilling chemicals and other contaminants, combined with inadequate stormwater and erosion controls on cleared areas may introduce hydrocarbons and suspended sediments into ephemeral creeks, degrading aquatic habitats and water quality.
- Changes to hydrology and hydraulics (such as reduction in water table depth of flow patterns) due to dewatering of shallow aquifers may affect baseflow to aquatic GDEs during dry periods, or alter water chemistry, reducing available aquatic habitat during dry periods.
- Increased water connectivity between shallow aquifers and deeper aquifers through drilling for CSG pre-drainage may lead to a potential decline in water quality in the shallow aquifers.
- UG longwall mining operations causing localised subsidence resulting in alteration to drainage patterns, leading to localised ponding, increased bank and bed erosion, bank instability, and downstream aggradation, which may degrade aquatic habitats.
- Introduction and/or spread of weeds and feral animals degrading aquatic and riparian habitats, increase competition, and reduce ecosystem health and biodiversity.
- Inadequate rehabilitation management leading to failure in the achievement of aquatic vegetation related milestones for the intended post mine land use.

7.4.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to aquatic ecology environmental values include, but are not necessarily limited to:

- Development of a spill emergency response plan, including appropriate spill containment and training that is consistent with good practice and relevant legislative requirements.
- Conduct aquatic fauna salvage during dewatering and as needed, in accordance with Fish Salvage Guidelines (DAF, 2022) and low-risk species management plans.
- Design and construct watercourse crossings and waterway barrier works to maintain fish passage and accommodate expected flows.
- Ensure CSG production wells comply with the "Code of Practice for constructing and abandoning coal seam gas wells and associated bores in Queensland."
- Monitor groundwater levels and aquatic ecosystems to detect early changes and implement contingency plans to minimise environmental harm.
- Conduct regular aquifer monitoring to detect water quality changes and leakage.
- Progressively rehabilitate the land in accordance with a PRCP to achieve a post-mining land use and revegetation milestones. As per the PRCP, the final landform must be safe, stable, non-polluting and capable of sustaining post-mining land uses where appropriate.

Plans to support the monitoring and management of aquatic ecology impacts includes a GDE Management and Monitoring Plan, Receiving Environment Monitoring Program, Erosion and Sediment Control Plan, Subsidence Management Plan and a Weed and Pest Management Plan.

These measures will be refined and expanded upon as part of the environmental assessments to be conducted for the EIS, in line with the final ToR, addressing both predicted and yet-to-be-identified impacts. As part of the EIS a detailed aquatic ecology assessment will be undertaken. This will include establishment of baseline conditions through desktop research and seasonal field surveys to inform habitat quality assessments. Terrestrial, surface expression and subterranean GDEs will be considered in accordance with the Independent Expert Scientific Committee's 'Information Guidelines – *Assessing groundwater-dependent ecosystems*' (IESC, 2018). An assessment of impacts on environmental values will be undertaken in line with the '*Guideline Application Requirements for Activities with Impacts to Land*' (DES, 2021). Identification of mitigation measures will be presented. Findings will be presented in an aquatic ecology technical report and supporting EIS chapter.

Significant impact assessments will be undertaken to address the need for an environmental offset in accordance with:

- MSES in accordance with 'Queensland Environmental Offsets Policy: Significant Residual Impact Guideline' (DEHP, 2014).
- MNES in accordance with the 'Significant Impact Guidelines 1.1 - Matters of National Environmental Significance' (DEWHA, 2013).

7.5 Surface Water

A description of the existing surface water values for the CND is outlined in **Section 0.** The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the identified surface water values.

7.5.1 Potential Impacts

Key potential impacts to surface water environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Water quality deterioration due to contamination of ephemeral creeks due to:
  - Improper handling, storage, overflow or transportation of contaminants (produced water, hydrocarbons, drilling chemicals) particularly during heavy rainfall events.
  - Inadequate stormwater management during construction may contribute to contaminants and sediments in local watercourses.
  - Increased erosion and sedimentation in local creeks, resulting from backfilling activities and infrastructure removal in areas with loose soil, particularly during heavy rainfall events.
  - Spillages or overflows of large volumes of produced water (which is highly saline) due to CSG pre-drainage activities may potentially impact downstream surface water systems.
  - Residual contamination in ephemeral creeks caused by improper plugging of wells or incomplete removal of infrastructure required for CSG pre-drainage.
- Modification and/or alteration of natural drainage, overland flow and flood behaviour due to:
  - Undertaking earthworks (clearing, grading, stripping, excavations, backfilling, infrastructure removal, heavy equipment use) may impede or redirect flows and trigger localised flooding.
  - Placement of permanent infrastructure within ephemeral systems, plus expansion of the CCM disturbance footprint, including water-storage dams and access tracks which increases the mine affected water (MAW) catchment area.
  - Insufficient mitigation or rehabilitation that prevents natural drainage pathways being fully restored.
  - Localised subsidence and increased erosion risk due to UG longwall mining.
  - The addition of up to 6 gigalitres per year (GL/y) on average over the life of mine (LOM) of MAW from dewatered UG longwall panels into the existing CCM water management system required for UG longwall mining.

7.5.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to surface water environmental values include, but are not necessarily limited to:

- Minimise surface disturbance areas and implement temporary erosion control measures.
- Maintain spill recovery equipment at key locations and train personnel in spill response protocols. Store fuels and hazardous materials in compliance with standards (e.g., AS1940:2004), away from waterbodies where practical.
- Design and install sediment traps, oil-water separators, and stormwater treatment systems to prevent pollutants from entering waterways and reduce sediment runoff.
- Regularly monitor stormwater and surface water quality for hydrocarbons, salinity, and heavy metals, and adapt ongoing management measures as necessary.

- Consider treatment of produced water (from CSG pre-drainage) to remove contaminants for reuse where feasible and ensure all discharges comply with water quality standards.
- Design and manage infrastructure to maintain natural flow paths and hydrological regimes, ensuring minimal disruption to creeks.
- Minimise water consumption by utilising water efficient techniques for operation water (dust suppression and vehicle washdown).
- Consider implementing beneficial use scheme for excess water (i.e. supply to mines in the region, agricultural enterprises, etc.).

Further work undertaken as part of the EIS process will include a baseline water quality assessment and a comprehensive surface water impact assessment.

The surface water impact assessment will establish baseline conditions through desktop resources and field surveys including hydrological assessment and surface water quality monitoring. Hydrological and hydraulic modelling will be conducted for clean water diversions, sediment basins, and flood scenarios, consistent with Australian Rainfall and Runoff guidelines (ARR2019). A water balance model will also be prepared. Assessments will identify surface water impacts and propose mitigation measures. Measures identified will be refined during subsequent environmental assessments conducted within the EIS, addressing both predicted and potential impacts. The EIS will also include Flood and Geomorphology Assessment, to evaluate potential surface water impact. Impact assessments will be undertaken in line with the 'Guideline Application Requirements for Activities with Impacts to Water' (DESI, 2024b) and in accordance with the final agreed ToR.

7.6 Groundwater

A description of the existing groundwater values for the CND is outlined in **Section 6.6**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the identified groundwater values.

7.6.1 Potential Impacts

Key potential impacts to groundwater environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Deterioration of groundwater quality due to localised contamination and/or contamination of aquifers due to:
  - Spillages of drilling fluids, fuel, or other construction materials that could infiltrate shallow aquifers, and cause downstream effects from contamination to surface water systems (dependent on surface water and groundwater connectivity).
  - Leaks or failures of water management infrastructure (required for CSG pre-drainage).
- Alteration of groundwater quantity, levels and flow regimes due to:
  - Localised drawdown caused by the extraction of large volumes of water, resulting in temporary lowering of water levels and availability in the Quaternary Alluvium.
  - Long-term changes to groundwater levels, flow direction and quality in the vicinity of the final landform.

- Water migration between aquifers due to changes in pressure regimes:
  - Reduced pressure in the Permian coal seams may alter the groundwater hydraulic gradient, potentially enhancing vertical leakage between different aquifer units.
  - Drilling boreholes for CSG pre-drainage in areas with high transmissivity (such as the Permian coal seams) may create vertical connectivity pathways and disrupt natural aquifer flow regimes.
  - Upward propagation of drawdown from the depressurised coal seams through the overburden into the basalt aquifer related to CSG pre-drainage.
- Impacts to GDEs due to:
  - Groundwater extraction (for up to 90 days) required for CSG pre-drainage, which could disrupt water levels.
  - Alteration of groundwater flows and levels, which may impact GDEs reliant on stable groundwater conditions, causing a loss of ecological function.
- Drawdown of groundwater aquifers resulting from dewatering (due to mining) of up to 6 GL/y on average over the LOM of MAW, which may may cause the following:
  - Alteration to groundwater flow directions.
  - Reduction in baseflow to surface water systems, if hydrologically connected.
  - Impacts to ecological ecosystems including GDEs.
  - Impacts to other groundwater users in the region.
  - Increased risk of subsidence.

The potential impacts outlined above are based on the existing groundwater environment and are informed by the following guidelines:

- Environmental assessments: The role of the Office of Groundwater Impact Assessment (OGIA) and the Independent Expert Scientific Committee (IESC) on Coal Seam Gas and Large Coal Mining Development in environmental assessments. Australian Government (2024a).
- Coal seam gas extraction and co-produced water: Fact sheet. Australian Government (2024b).
- Information guidelines explanatory note: Using impact pathway diagrams based on ecohydrological conceptualisation in environmental impact assessment. IESC (2024a).
- Information guidelines for proponents preparing coal seam gas and large coal mining development proposals. IESC (2024b).
- Information guidelines explanatory note: Subsidence associated with coal seam gas production. Leonardi, C. (2024).

7.6.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to groundwater environmental values include, but are not necessarily limited to:

- Implementation of a robust groundwater monitoring during all CND phases to track changes in levels and quality.
- Design and apply aquifer-specific well-sealing techniques for CSG pre-drainage activities to prevent cross-contamination during and after closure.

- Develop management strategies to address cumulative impacts, particularly in areas with high aquifer connectivity.
- Undertaking predictive groundwater modelling to assess the extent and magnitude of drawdown, flow alterations and changes to impacted aquifer recharge.
- Ensuring extraction of groundwater is approved, licensed and carried out in accordance with the requirements of the Water Act.

Plans to support the monitoring and management of groundwater impacts includes a Subsidence Management Plan and Groundwater Management Plan and groundwater quality monitoring program to monitor, manage, mitigate, or remediate impacts and detect changes to groundwater resources across all Project phases. Preparation of water management plans and monitoring programs will be in accordance with the Monitoring and Sampling Manual: Environmental Protection (Water) Policy (DES 2018).

These measures will be refined and expanded upon as part of the environmental assessments to be conducted for the EIS, addressing both predicted and yet-to-be-identified impacts. The EIS will include a detailed hydrological modelling to assess the potential impacts to ground waters. Impact assessments will be undertaken in line with the 'Guideline Application Requirements for Activities with Impacts to Water' (DESI, 2024b) and in line with the final ToR.

7.7 Air Quality and Greenhouse Gases

A description of the existing air quality environment for the CND is outlined in **Section 6.7**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the identified air quality values and GHG emissions.

7.7.1 Potential Impacts

Key potential impacts to air quality and GHG environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Generation of particulate matter (dust) emissions from earthworks that exceed air quality objectives, reducing air quality for proximal receptors. Particulate matter generated may include:
  - TSP
  - PM_{10} (a subset of TSP)
  - $PM_{2.5}$ (a subset of TSP and PM_{10}).
- Air pollutants emitted from diesel powered equipment.
- Direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions (GHGs), including:
  - Electricity and diesel usage.
  - Fugitive emissions of coal seam methane release during flaring or accidental leaks.

7.7.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to groundwater environmental values include, but are not necessarily limited to:

- Dust suppression techniques employed within disturbance areas.

- Undertake real-time periodic air quality monitoring for PM10, PM2.5, and other pollutants.
- Use low-emission or cleaner-burning equipment and generators, consider electric machinery where feasible, and optimise engine operation to minimise emissions.
- Implement a leak detection and repair (LDAR) program for gas infrastructure.

Potential plans to support the monitoring and management of air quality and GHG impacts include Air Quality Management Plan and GHG Abatement Plan.

These measures will be refined and expanded upon as part of the environmental assessments to be conducted for the EIS, in line with the final ToR, addressing both predicted and yet-to-be-identified impacts. An Air Quality, GHG Assessment and GHG Abatement Plan will be undertaken to model representative construction and operation scenarios during the CND to predict the potential air quality impacts at private receptors and inform the requirement for mitigation measures.

7.8 Noise

A description of the environmental values relative to noise for the CND is outlined in **Section 6.8**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the identified noise environmental values.

7.8.1 Potential Impacts

Key potential impacts to noise quality environmental values during the construction, operational, closure and decommissioning for the CND may include:

- Generation of short-term noise and ground vibrations during activities such vegetation clearing, topsoil clearing, vehicular movements, construction and dismantling of infrastructure.
- Generation of continuous noise and low-frequency vibration from operation of equipment such as compaction rollers, drill rigs, diesel generators, compressors and pipeline infrastructure.

7.8.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to noise environmental values include, but are not necessarily limited to:

- Where practicable, schedule the nosiest construction activities to the less sensitive daytime period.
- Construct and operate plant and equipment to minimise noise emissions as far possible whilst maintaining efficiency of function.
- Operational plant equipment to include noise mitigation (e.g., silencing, noise barrier, enclosure) where the detailed noise impact assessment identifies non-compliance with the noise limits.
- Use vibration-dampening mats, and low-noise, low-vibration equipment such as advanced compressors and generators.

- Operate all plant and equipment in accordance with the manufacturer's instruction and regularly maintained in order to minimise noise emission levels.
- Shutting down equipment when not in use.
- Broadband "buzzer", not tonal "beeper", reversing alarms should be utilised on all mobile plant.

These measures will be refined and expanded upon as part of the environmental assessments to be conducted for the EIS, in line with the final ToR, addressing both predicted and yet-to-be-identified impacts.

The EIS will also include a Noise and Vibration Assessment, to assess the potential impacts to nearby sensitive receptors. The impact assessment will be undertaken in line with the 'Guideline Application Requirements for Activities with Noise Impacts' (DESI, 2024c).

7.9 Traffic and Transport

A description of key traffic and transportation routes within and proximal to CND is outlined in **Section 6.9**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to traffic and transport.

7.9.1 Potential Impacts

Potential impacts during construction, operation, decommissioning and closure include increased light and heavy vehicle traffic on local and council roads; Peak Downs Highway (state-controlled), Goonyella Road (council-controlled road), and Red Hill Road (predominantly council-controlled) for transporting equipment, materials, and workforce resulting in:

- Delays and inconvenience to local residents.
- Increased wear and tear.
- Increased road safety risks.
- Dust generation, particularly on unsealed and minor private roads.

The need for road or intersection upgrades is not currently understood and will be refined as part of the EIS process. No upgrades to the existing rail network will be required. A traffic impact assessment will be undertaken for both local government and state-controlled roads to support the project's transportation requirements during construction and operation. The traffic impact assessment will provide quantification of expected traffic requirements and determine whether the traffic generated falls within the Queensland Roads and Investment Program 2024-2025 to 2027-2028 and Isaac Regional Council roads' programs.

7.9.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to traffic and transport includes, but are not necessarily limited to:

- Utilisation of the existing access points to the CND to reduce unnecessary new disturbance areas.

- Informing local communities about traffic increases, routes, and schedules, and provide a complaints resolution process.
- Maintaining and repair sealed and unsealed roads regularly (including dust suppression measures).
- Conducting defensive driver training for workers and ensure vehicles are properly maintained.
- Conducting regular inspection of sealed and unsealed roads to identify maintenance and repair requirements.

In line with the final ToR, plans to support the monitoring and management of traffic and transport impacts includes a Traffic Management Plan (to include designated routes, signage, restricted speed limits, and off-peak scheduling for heavy vehicles).

7.10 Social Environment

A description of the social environment relative to CND is outlined in **Section 6.10**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to the social environment.

7.10.1 Potential Impacts

Key potential impacts to social environment during the construction, operational, closure and decommissioning for the CND may include:

- Positive impact due to continued long-term employment and training of workforce, however there may be limited opportunities for locals if specialised skills are required.
- Contribution to local economy through demand for goods and services, resulting in an injection of wealth into the local and regional economies.
- Generation of revenue for State and Commonwealth Government through taxes and royalties which may be further invested in local and regional communities.
- Negligible change in existing workforce requirements and accommodation requirements for mining activities, the extension of the existing CCM panels into the new disturbance area will be undertaken using the existing CCM workforce.
- Additional labour requirements may cause:
  - Demographic change in regional and rural areas and potential impacts on social cohesion.
  - Increased demand on community services and infrastructure (e.g. Childcare and health services).
- Change of land use due to CND activities temporally and long-term post mining and CSG pre-drainage.
- Deterioration in sensitive receptor well-being due to potential amenity impacts such as noise, air quality, and increased traffic.

7.10.2 Potential Management and Mitigation Measures

Measures that may be implemented, including the continuaiton of measures already implemented for the CCM, to manage the potential impacts to the social environment includes, but are not necessarily limited to:

- A local hiring policy and provision of training programs to upskill the local workforce for specialised roles, including diversified training, which are transferable across other sectors.
- Employment incentives, which may include provision of company housing or local living allowances, to relocate to or remain in local communities.
- Targeted local employment programs such as apprenticeships and traineeships that will focus on hiring existing residents from local communities including nearby townships of Moranbah, Glenden and Nebo.
- Limited company subsidisation of FIFO commute arrangements to maximise the composition of the workforce that are DIDO from the Mackay-Isaac-Whitsunday region rather than FIFO from more distant communities. It is expected that the DIDO portion of the workforce will remain at or above 60% because of these arrangements during the life of the CND.
- Local sourcing policy that maximises those goods and services required for the CND that are obtained from local communities where practicable.
- Notifications to local providers and structured local tendering processes to promote local business and industry procurement.
- Active stakeholder engagement and grievance procedure to facilitate and promote communication with sensitive receptors and stakeholders.
- Regular health and safety assessments to minimise impacts on local communities.

These measures will be refined and expanded upon as part of the environmental assessments to be conducted for the EIS, in line with the final ToR, addressing both predicted and yet-to-be-identified impacts.

Future work as part of the EIS process will include forecasting workforce needs, review current workforce details, and plan accommodation. It will include meetings with landholders and the community, completing studies on traffic, noise, dust, economics, and preparing a Social Impact Assessment (SIA) and social impact management plan (SIMP) including community engagement and support for local businesses.

7.11 Aboriginal Cultural Heritage

A description of Aboriginal cultural heritage matters for the CND is outlined in **Section 6.11**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to Aboriginal cultural heritage.

7.11.1 Potential Impacts

Key potential impacts to Aboriginal cultural heritage during the construction, operational, closure and decommissioning for the CND may include:

- Direct contact between equipment and known heritage values which may result in in physical damage to, degradation or destruction of the heritage value.
- Potential impacts to intangible cultural heritage values within the CND area.
- Soil stability changes from subsurface activities during UG longwall mining operations, which may result in minor ground movements that could indirectly result in the degradation and destruction of known heritage values.
- Inadvertent impacts to unknown tangible and intangible heritage values from earthworks, vegetation clearing, construction and maintenance activities, or machinery operations.

7.11.2 Potential Management and Mitigation Measures

Peabody has several policy documents and standards that govern the management of cultural heritage across all Australian operations. These include an Indigenous Peoples Policy Statement, Australian Cultural Heritage Management Standard and an Australian Community Engagement Standard. Together these documents set the expectations and minimum requirements for responsible and proactive management of cultural heritage and serve to support continuous improvement in our community engagement and collaboration processes. Where sites have an existing management plan in place (either for Indigenous heritage or a conservation management for non-indigenous heritage), the management and approvals pathway outlined in the plan are followed, including agreed protocols and mitigation strategies for impacts to identified cultural material.

Additionally, Peabody has a Ground Disturbance Permit (GDP) procedure which must be completed prior to undertaking any ground disturbance in areas not subject to previous significant ground disturbance. All employees, project personnel and contractors are also required to complete a Cultural Heritage Management induction and a Cultural Awareness and Capacity induction prior to undertaking ground disturbing activities on site. The GDP process determines whether any further cultural heritage assessment is required including archaeological survey or salvage.

7.11.2.1 Aboriginal Cultural Heritage

A new Cultural Heritage Management Plan (CHMP) has been developed with the Widi People of Nebo Estate #1 and Centurion for the area covered by ML 1790 and ML 70495. The CHMP is currently being finalised and prepared for execution. The CHMP will be amended at later date to eventually include the future tenement over MDL 3010. The CHMP has been prepared to include all Project activities including field investigations, construction, operations and rehabilitation. Any ground disturbing activities undertaken in accordance with the CHMP satisfies the Duty of Care obligations under Section 23(1) of the Aboriginal Cultural Heritage Act 2003 (Qld).

7.11.2.2 Native Title

A detailed tenure and title investigation accompanies the environmental impact assessment for the CSG pre-drainage area to determine potential effects on native title rights and interests. Where proposed activities constitute a future act under the Native Title Act 1993, the right-to-negotiate process is applied. Any new native title claims over undeveloped sections within the

project footprint will follow the same process. Leases ML 1790 and ML 70495 permit coal seam gas extraction and supply under the Mineral Resources Act 1989, while ML 6949 and its associated petroleum lease cover land where native title has been extinguished. As a result, extraction rights under these leases do not trigger additional native title procedures.

7.12 Non-Aboriginal Culture Heritage

A description of non-Aboriginal cultural heritage matters for the CND is outlined in **Section 6.11.3**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to non-Aboriginal cultural heritage matters.

7.12.1 Potential Impacts

No non-Aboriginal heritage sites listed on local, Queensland, or national registers were identified within or in the immediate vicinity of the CND. Therefore, there are no predicted potential direct or indirect impacts to any non-Aboriginal heritage sites or values.

7.12.2 Potential Management and Mitigation Measures

Currently, no known non-Aboriginal heritage values have been identified within the CND area. For completeness, a detailed non-Aboriginal heritage assessment will be undertaken as part of the EIS assessment process and any management actions will be determined based on the results of the survey and in line with the final ToR. If any non-Aboriginal significant values are identified, the potential impacts will be assessed, and appropriate management and mitigation measures implemented.

7.13 Hazard and Risk and Health and Safety

A description of hazard and risk and health and safety matters for the CND is outlined in **Section 6.12**. The following section identifies the key potential impacts, and management and mitigation measures for works associated with the CND relative to hazard and risk and health and safety matters.

7.13.1 Potential Impacts

Key potential impacts to hazard and risk and health and safety matters during the construction, operational, closure and decommissioning for the CND may include:

- Increased bushfire risk due to operation of equipment and the potential for accidental gas leaks in fire-prone areas, especially during CSG pre-drainage activities.
- Risk of soil, surface water and groundwater contamination resulting from accidental spills or leaks of hazardous substances.
- Risk of traffic incidents involving heavy equipment, construction vehicles, and public vehicles.
- Changes to overland flow characteristics and natural drainage patterns due to UG longwall mining, potentially increasing risk of flooding in proximal areas. Potential impacts may result from:
  - Improperly designed clean water diversions.
  - Construction of supporting infrastructure such as water storage dams and access tracks.
  - Localised subsidence due to longwall mining.
- UG longwall mining increasing risk of subsidence, de-stabilising nearby ground areas.
- Increased risk to human health and safety, including potential for fatalities due to improper ventilation or inadequate management of UG longwall mining environments.

7.13.2 Potential Management and Mitigation Measures

Measures that may be implemented to manage the potential impacts to hazard and risk and health and safety matters includes, but are not necessarily limited to:

- Identify and manage hazards and risks as per ISO 31000:2018 and ISO 31010:2019 and adopt appropriate health and safety systems in accordance with the Coal Mining Safety and Health Act 1999.
- Undertake hazard and risk and emergency preparedness training (including regular refresher training) for all personnel.

Centurion will implement its Integrated Environmental Management System for the CND to guide the implementation of environmental management commitments and strategies. The Environmental Management System would also guide the monitoring and review process with the aim of continually improving environmental performance at the operations.

Centurion will also employ a team of appropriately qualified environmental personnel to monitor compliance with relevant legislation, approval instruments and environmental planning frameworks. Construction and operation management plans would be developed in consultation with relevant stakeholders and utilised for day-to-day management of the CND operations/activities.

8 Approvals Required for the Project

A summary of the indicative approvals required for the CND is provided in **Table 8-1**. Approval requirements will be confirmed throughout the course of the impact assessment process.

Table 8-1 CND Approvals Register

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
Commonwealth Approvals					
Environment Protection and Biodiversity Conservation Act 1999	EPBC Act referral and approval	Referral to the Commonwealth Minister of the Environment and Water is required if a project may have a significant impact on MNES to determine if the project is a 'Controlled Action' requiring approval under the EPBC Act.	A referral will be submitted to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a decision as to whether the CND will constitute a Controlled Action under the EPBC Act due to impacts to identified MNES. Centurion anticipates the CND will be determined a Controlled Action. This would be expected to be followed by assessment via an accredited process, as provided for by the Bilateral Agreement between the Commonwealth and the State of Queensland under section 45 of the EPBC Act relating to Environmental Assessment.	DCCEEW	Yes
EPBC Act Environmental Offsets Policy 2012	Environmental Offset Strategy	A significant residual impact on a prescribed environmental matter.	The CND may require offsets under EO Policy for significant residual impacts to MNES. Offsets under State and Commonwealth jurisdiction (i.e. relating to both matters of MSES and MNES) can be addressed together under a consolidated Environmental Offset Strategy.	DCCEEW	Yes
Native Title Act 1993	Right to Negotiate	Acts or dealings in relation to land and waters that affect native title need to comply with the NT Act to be validly done. A registered native title claim gives a native title party certain procedural rights with applicants	The Widi People of the Nebo Estate #1 (QCD 2019/004 DET) are the determined native title holders for the southeastern portion of the CND area and have been granted Native Title Protection Conditions.	National Native title Tribunal	No

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
		regarding the grant of mining authorities for the areas covered by the claim.			
State Approvals					
State Development and Public Works Organisation Act 1971	Coordinated Project Process	The Coordinator-General may declare that a project is a Coordinated Project if it has: ▪ Complex approval requirements, involving Local, State and Federal governments. ▪ Significant environmental effects. ▪ Strategic significance to the locality, region or State, including any infrastructure, economic and social benefits, capital investment or employment opportunities it may provide. ▪ Significant infrastructure requirements.	This IAS forms part of the application for the declaration of the CND as a Coordinated Project. The Coordinator-General will consider the application and determine whether the CND meets the requirements for declaration as a Coordinated Project. If declared a Coordinated Project, it is likely that it will be declared on the basis that an EIS is required for CND which will be prepared in accordance with Part 4 of the SDPWO Act, allowing the Coordinator-General to coordinate the process. Detailed justifications for assessing the CND via the EIS process is outlined in **Section 4**.	Office of the Coordinator-General (OCG)	Yes
Environmental Protection Act 1994	Environmental Authority Amendment	An EA is required to perform an environmentally relevant activity (ERA). ERAs are industrial, resource or intensive agricultural activities with the potential to release contaminants into the environment. They include mining and resource activities.	An EA amendment is required for P-EA-100658735 to permit UG longwall mining operations on ML 1790, ML 70495 and to incorporate the ML required over the southwestern extent of MDL 3010. The following ERAs will be amended and/or added to the EA for the entirety of the CND area:	DETSI	Yes

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
			• Schedule 3 ERA 13 Mining black coal • Schedule 2 ERA 8 Chemical storage • Schedule 3 ERA 9 Drilling associated with mining activities Mineral processing, waste, and crushing, milling, grinding and/or screening activities will occur on ML6949 at existing CCM and will be authorised under the current EA for CCM. Thus, these ERAs will not be required in the amendment of P-EA-100658735. Additionally, a site-specific EA application will also be required for the CSG pre-drainage activities, including co-produced water, to be located on a proposed Petroleum Lease (PL) over the CND area. ERA 3 is required if a petroleum activity is likely to have a significant impact on a Category A or B environmentally sensitive area ERA 9 is required if CSG to be processed for commercial use. ERA 9 is required if CSG to be processed for commercial use. All other ERA's (such as for chemical storage, hydrocarbon gas refining, sewage treatment, water treatment, regulated structure (dam) are subject to separate EAs.		

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
	Progressive Rehabilitation and Closure Plan	The PRCP and its supporting schedule must be prepared and submitted in an approved form before Centurion may carry out any activities under the EA.	If the CND is declared a Coordinated Project, for which the impacts will be assessed via an EIS, the Progressive Rehabilitation and Closure Plan will be amended and submitted as part of the EIS for assessment and approval.	DETSI	Yes
	Estimated Rehabilitation Cost	Estimated Rehabilitation Cost (ERC) is the estimated cost of: ▪ Rehabilitating the land on which UG longwall mining operations are carried out. ▪ Preventing or minimising environmental harm, or rehabilitating or restoring the environment, in relation to the CND.	The ERC will be submitted by Centurion following approval of the PRC Plan to DESTI for consideration. The ERC is not a requirement of the EIS process.	DETSI	No
Petroleum and Gas (Production and Safety) Act 2004	Petroleum Lease	A PL provides the right to explore, test for and/or produce petroleum within a defined area,	The CND will require a PL, which will be associated with the abovementioned site-specific EA to authorise the production of CSG. The PL will be located over the CND area.	Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development (DNRMMRRD)	Yes
Mineral Resources Act 1986	Mining Lease	Coal mining and production and associated activities including processing must be conducted within a ML.	A ML is required for mining activities on the southwestern portion of MDL 3010. An ML Application will be lodged by Centurion in concurrence with the EIS process.	DNRMMRRD	No
Water Act 2000	Water allocation or water licence – Use and take of surface	A water licence is an authority granted under the Water Act to take water, interfere with water or both interfere with and take water	The EIS will assess the impacts of the UG longwall mining on water resources and will determine the approval requirements under the Water Act.	Department of Local Government, Water and Volunteers	Yes

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
	water or groundwater.	where these 2 activities are inextricably linked. A water licence is generally needed to take UG water in groundwater areas established through the Water Regulation 2016 or a water plan. The *Water Plan (Fitzroy Basin) 2011* (s.51(1)) and the *Water Plan (Burdekin Basin) 2007* states that a water licence is not required if groundwater extraction is within 5 ML per year.	Centurion anticipates that a water licence to take or interfere with associated water will be required. There are no water allocation requirements for the CND.		
Aboriginal Cultural Heritage Act 2003	Cultural Heritage Management Plan (CHMP)	Under the ACH Act, a person carrying out an activity has a duty of care, where they must take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage.	A new Cultural Heritage Management Plan (CHMP) has been developed with the Widi People of Nebo Estate #1 and Centurion for the area covered by ML 1790 and ML 70495. The CHMP is currently being finalised and prepared for execution. The CHMP will be amended at later date to eventually include the future tenement over MDL 3010. The CHMP has been prepared to include all Project activities including field investigations, construction, operations and rehabilitation. Any ground disturbing activities undertaken in accordance with the CHMP satisfies the Duty of Care obligations under Section 23(1) of the *Aboriginal Cultural Heritage Act* 2003 (Qld).	Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Yes
Regional Planning Interests Act 2014	Regional Interest Development Approval	Where resource activities impact on an area of regional interest (i.e., strategic cropping area, priority agricultural areas, priority living	The CND is within the Western Cropping Zone and located on trigger mapped SCL. The requirement for a RIDA will be	Department of State Development,	Yes

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
		areas and strategic environmental areas) and regulatory exemptions do not apply, a RIDA will be required.	confirmed during the environmental impact assessment process.	Infrastructure and Planning (DSDIP)	
Environmental Offsets Act 2014	Environmental Offset Strategy	Where an activity has a significant residual impact on a prescribed environmental matter, an environmental offset may be required, to counterbalance this impact. The EO Act establishes the framework for delivery of environmental offsets at the State level, without limiting the functions or powers under the SDPWO Act.	The CND may require offsets under EO Act for significant residual impacts to MSES. Offsets under State and Commonwealth jurisdiction (i.e. relating to both MSES and MNES) can be addressed together under a consolidated Environmental Offset Strategy. Any applicable offsets will be conditioned as part of the Environmental Authority and the EPBC Act approval.	DETSI	Yes
Strong and Sustainable Resource Communities Act 2017	Social Impact Assessment (SIA) and approved Social Impact Management Plan (SIMP)	SIA and an approved SIMP is mandatory for EISs for large resource projects.	The CND will likely be considered a 'large resource project' requiring a SIA and SIMP to be lodged as part of the EIS.	DSDIP	Yes
Nature Conservation Act 1992	Species Management Program	Clearing of breeding habitat.	A Species Management Program may be required. This will be confirmed during the EIS process. If required, this will be prepared in accordance with section 335 of the *Nature Conservation (Animals) Regulation 2000* for approval by the DETSI prior to tampering with an animal breeding place.	DETSI	Yes
	Protected plant clearing permit	Protected plant clearing permit is required if:	The CND may be required to obtain a clearing permit to authorise the clearing of	DETSI	Yes

Legislation	Approval	Approval Trigger	Relevance to Project	Administering Authority	Within EIS Scope
		▪ The area is within a 'high risk area'; or ▪ The proponent is aware of any EVNT species within the area to be cleared. If an area to be cleared is not identified on a flora survey trigger map as a high-risk area, a flora survey is not required	EVNT species under the NC Act. This will be confirmed during the EIS process.		

9 Community and Stakeholder Engagement

9.1 Peabody's Community Engagement Framework and Standards

Peabody is committed to engaging respectfully with communities across all its Australian operations, contributing to their socio-economic development, and seeking to identify and mitigate actual and potential impacts directly affecting communities.

Peabody's process for community engagement is governed by our corporate Communities of Interest Framework (the Framework) which sets out our approach, management commitments and process requirements. A key part of the Framework is the Peabody Australia Standard for Community Engagement (PA-ENV-STD-EN03) (the Standard). The Standard sets out the minimum requirements for respectful and effective community engagement including free, prior and informed consent (FPIC), and ensuring compliance with legislative obligations and agreements. It covers key areas such as stakeholder identification, community planning, engagement and dialogue, feedback handling, impact management, and reporting.

The Framework emphasises inclusivity, cultural awareness, and transparency while setting clear roles, responsibilities, and timelines for implementation. It is designed to contribute to socio-economic development, manage impacts, and prioritise meaningful relationships with Peabody's communities of interest.

9.2 Key Stakeholder Groups

Peabody's engagement focuses on stakeholders with a genuine interest in a particular project. Peabody has identified several key stakeholder groups for the Centurion North Development (CND) as shown in **Table 9-1**.

Table 9-1 CND Stakeholders

Community of Interest	Name	Key Statistics, Data & Characteristics
Local Government	Isaac Regional Council.	Population: 22,046. Median age: 34. Occupations: Machinery Operators/Drivers (23.8%), Technicians/Trades Workers (18.7%), Managers (12.7%). Industry: Coal Mining (28.5%).
State and Federal Government	Federal: Department of Energy, Environment, Climate Change, and Water; CSIRO. State: Department of Primary Industries.	Broad jurisdictional oversight on environmental, resource, and agricultural matters. Population and workforce data varies by department focus.
Towns/Communities within 100km of Site	Moranbah, Middlemount, Nebo, Dysart.	Moranbah: Population: 9,425. Median age: 31. Main Industry: Coal Mining (29.4%). Middlemount: Population: 1,899. Median age: 32. Coal Mining (50.3%).

Community of Interest	Name	Key Statistics, Data & Characteristics
First Nations	Widi, Barada Barna, Barada Kabalbara Yetimarala, Cultural Heritage Bodies.	Focus on access to/caring for country, water quality, culturally significant sites, and respectful partnerships.
Industry Groups/Peak Bodies	Australian Minerals Council, Queensland Resources Council, Chambers of Commerce, Agforce, Growcom.	Represent industry standards, policy development, and advocacy. Members include agricultural and mining industry leaders.
Other Mining	Anglo American, BHP Mitsubishi Alliance, Stanmore, Yancoal, Wesfarmers, Fitzroy Resources.	Major operators in the mining industry within the region, contributing to resource workforce and land use.
Education Providers	CQUniversity, The University of Queensland, local schools (e.g., Moranbah State High, Dysart SS).	Engagement includes school well-being programs, research collaboration, and opportunities for traineeships or internships.
Environmental Interest Groups	Environmental Defenders Office QLD, Queensland Conservation Council.	Focus on wildlife protection, habitat conservation, and climate change mitigation.
Community Interest Groups	Landcare, volunteer networks, citizen science groups.	Emphasis on community-driven environmental protection initiatives and education.
Resource Workforce	Mining Workforce.	Key stakeholders in skills training, workforce development, and community economic impact.
Land Managers	Private agricultural and commercial producers, public entities like National Parks.	Focus on educational training, research collaboration, and sustainable land management projects.
Near Neighbours & Fence Line Landholders	Private Landholders.	Concerns over environmental impacts, land use planning, and land access negotiations.
Community Groups & Support Providers	Local organisations (sports clubs, historical associations).	Community cohesion projects, social programs, and volunteer support networks.
Media	ABC Capricornia, WIN News, Daily Mercury, CQ Today.	Key for information dissemination and public engagement related to regional development and mining activities.

The identified stakeholders have also been prioritised as tier one, tier two and tier three stakeholders.

Tier One Stakeholders include those likely to be impacted most frequently and most heavily, such as:

- Local Community.
- Title holders.
- Property Managers on land across the tenements.
- Traditional owners and custodians.
- Local government.

- Local business owners.

Tier Two Stakeholders include those likely to be impacted with less frequency and less severely, but who will still have a high degree of interest in the opportunities and potential outcomes of the CND:

- Nearby education institutions.
- Local financial institutions.
- Community groups and organisations.
- Community engagement officers working with the local councils.
- Voluntary and welfare volunteers or organisations.
- Providers of services like power and water to the tenement.
- State government departments.

Tier Three Stakeholders include those likely to be impacted infrequently and negligibly affected by the CND:

- State organisations.
- Non-Governmental Organisations (NGOs).
- Businesses geographically removed from the immediate project areas.

The scale at which stakeholders operate and are engaged is also important for effective consultation. The diagram in **Figure 9-1** outlines a structure of stakeholders relevant to the CND, from those with a narrow interest, i.e. Micro-level, or geographic focus immediate to Peabody's area of operations scaling up to those at a Macro-level such as State and national bodies, industry groups and government departments.

Figure 9-1 CND Stakeholder Scale of Interest

9.3 CND Engagement Approach

Peabody has partnered with the Fitzroy Basin Association (FBA) to explore and co-design a collaborative model for more equitable community engagement and improved measurement. The FBA is highly regarded locally, across Queensland, and nationally for creating and delivering effective engagement programs that help communities and stakeholders manage natural resources sustainably. In the Bowen Basin, FBA leads the region's Natural Resource Management (NRM) plan, CQSS2030, using evidence-based, accessible solutions. This collaboration has allowed Peabody to enhance their engagement strategies (whilst leveraging FBA's comprehensive knowledge base and regional connections), strengthened community relationships, and supported evidence-based solutions for addressing impacts and aligning with community aspirations.

Peabody is in the process of updating their community engagement plan for the CCM to align with new corporate frameworks and standards, and input from communities based on their preferred engagement methods and key issues. Peabody's community engagement sessions have commenced in Q4 2024 and remain ongoing.

A comprehensive consultation program will be developed and implemented for the CND and will continue throughout the EIS process. The consultation program will be undertaken with all affected and interested persons as defined under sections 38 and 39 of the EP Act and as identified in accordance with Peabody's community engagement standard and the community engagement plan for CCM.

Stakeholder engagement undertaken to date for the CND is presented in **Table 9-2**.

Table 9-2 CND Stakeholder Engagement Log

Stakeholder		Meeting Purpose
State and Federal Government	Department of Resources (now DNRMMRRD)	March 2024, Coal and Gas Hub Project Briefing
Near Neighbours & Fence Line Landholders	Private Landholders	March 2024, Local Landholder briefing
State and Federal Government	Department of Treasury	April 2024, CND briefing
State and Federal Government	DESI (now DETSI)	April 2024, CND briefing
State and Federal Government	Office of the Coordinator General (OCG)	June 2024, CND briefing
State and Federal Government	DNRMMRRD /DEI/OCG	August 2024, CND briefing
State and Federal Government	Office of the Coordinator General	December 2024, CND briefing
State and Federal Government	Office of the Coordinator General	February 2025, CND briefing
State and Federal Government	Department of Resources (now DNRMMRRD)	March 2025, Peabody project portfolio update
State and Federal Government	OCG	June 2025, CND briefing

9.4 Consultation with First Nations

There are two statutory Aboriginal parties for CCM (ML 6949) as defined under Part 4 section 35 of the Aboriginal Heritage Act (QLD): the Widi Aboriginal Corporation (WAC) and the Barada Barna Aboriginal Corporation (BBAC). WAC's cultural heritage area covers the northern portion of ML 6949 as well as tenements ML 1790 and ML 70495, and the BBAC covers the south of ML 6949 only. Peabody regularly engages with both Aboriginal parties at defined intervals with this engagement taking place both on Country at Centurion Mine and at Peabody's corporate head office in Brisbane. These engagements will continue, in parallel with the consultation program developed for the CND.

10 References

Australian Government. (2024a). Environmental assessments: The role of the Office of Groundwater Impact Assessment and the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development in environmental assessments. Commonwealth of Australia. Retrieved from http://www.iesc.environment.gov.au/

Australian Government. (2024b). Coal seam gas extraction and co-produced water: Fact sheet. Commonwealth of Australia. Retrieved from http://www.iesc.environment.gov.au/

Bureau of Meteorology (BoM), 2024. Groundwater Dependent Ecosystems Atlas.

Economic Development Queensland. (2024). Moranbah Priority Development Area (PDA). Retrieved from https://www.edq.qld.gov.au/our-work/priority-development-areas-pda/moranbah

Independent Expert Scientific Committee. (2024a). Information guidelines explanatory note: Using impact pathway diagrams based on ecohydrological conceptualisation in environmental impact assessment. Commonwealth of Australia. Retrieved from http://www.iesc.environment.gov.au/

Independent Expert Scientific Committee. (2024b). Information guidelines for proponents preparing coal seam gas and large coal mining development proposals. Commonwealth of Australia. Retrieved from http://www.iesc.environment.gov.au/

Isaac Regional Council (2023). Community-Corporate Plan 2023-2028 (Resolution No. 8476). Isaac Regional Council. Retrieved from https://www.isaac.qld.gov.au

Isaac Regional Council. (2015). 2035 Community Strategic Plan: Isaac's 20-year vision. Isaac Regional Council. Adopted on 28 April 2015 (Resolution #4045). Retrieved from https://www.isaac.qld.gov.au

Leonardi, C. (2024). Information guidelines explanatory note: Subsidence associated with coal seam gas production. Commonwealth of Australia. Retrieved from http://www.iesc.environment.gov.au/

Queensland Government Statistician's Office. (2024a). Queensland regional profiles: Resident profile - Mackay-Isaac-Whitsunday Statistical Area Level 4 (SA4) (ASGS 2021). Queensland Treasury. https://www.qgso.qld.gov.au

Queensland Government Statistician's Office. (2024b). Queensland regional profiles: Time series profile - Moranbah Statistical Area Level 2 (SA2) (ASGS 2021). Queensland Treasury. Retrieved from https://www.qgso.qld.gov.au

Queensland Government Statistician's Office. (2024). Queensland regional profiles: Time series profile - Broadsound-Nebo Statistical Area Level 2 (SA2) (ASGS 2021). Queensland Treasury. https://www.qgso.qld.gov.au

State of Queensland - Department of Resources (2024). Queensland Globe

State of Queensland. (2021). Isaac Regional Planning Scheme, Version 1.1 (Gazettal Date: 1 April 2021). Isaac Regional Council.

State of Queensland, Department of Local Government and Planning (2012). Mackay, Isaac and Whitsunday Regional Plan 2012. Brisbane, QLD: Department of Local Government and Planning.

State of Queensland, Urban Land Development Authority. (2011). Moranbah Urban Development Area Development Scheme. Brisbane, QLD: Urban Land Development Authority.

Aurizon. 2017. *Goonyella System Information Pack: Issue 7.0.*

BMA. 2013. *Red Hill Mining Lease: Environmental Impact Statement*.

BOM. 2024. *Climate statistics for Australian locations*. Website: http://www.bom.gov.au/climate/data/index.shtml. Date accessed: September 2024.

DCCEEW. 2022. *Significant Impact Guidelines 1.3: Coal seam gas and large coal mining developments - impacts on water resources*.

DCCEEW. 2024. *Australian Heritage Database*. Website: https://www.environment.gov.au/cgi-bin/ahdb/search.pl. Date accessed: November 2024.

DEHP. 2014. *Queensland Environmental Offsets Policy: Significant Residual Impact Guideline.*

DESI. 2021. *ESR/2015/1839 Application requirements for activities with impacts to land.*

DESI. 2024a. *Queensland air monitoring 2023: National Environment Protection (Ambient Air Quality) Measure*.

DESI. 2024b. *ESR/2015/1837 Application requirements for activities with impacts to water*.

DESI. 2024c. *ESR/2015/1838 Guideline Application Requirements for Activities with Noise Impacts*.

DEWHA. 2013. *Significant Impact Guidelines 1.1 - Matters of National Environmental Significance*.

DSDSATSIP. 2024. *Cultural Heritage Database and Register*. Website: https://www.culturalheritage.qld.gov.au/achris/public/home. Date accessed: November 2024.

E2M. 2024. *Centurion North: Initial Advice Statement – Terrestrial Ecology Inputs*.

Golder Associates Pty Ltd. 2017. *Wards Well Water Management Options Assessment*. Report prepared for BHP Mitsui Coal Pty Ltd on 30 May 2017. Report number 1668010-003-R-Rev1.

Golder Associates Pty Ltd. 2020. *Wards Well Mine – Progressive Rehabilitation and Closure Plan: Hydrogeological Conceptual Model*. Report prepared for BHP Billiton Mitsui Coal on 23 December 2020. Report number 20360652-001-E-Rev0.

IESC. 2018. *Information Guidelines Explanatory Note: Assessing groundwater-dependent ecosystems.*

Isaac Regional Council. 2021. *Isaac Regional Planning Scheme Version 1.1*

Isaac Regional Council. 2024. *Isaac Regional Council Online Mapping: Heritage Overlay Maps*. Website: https://www.isaac.qld.gov.au/Your-Council/Corporate-Information/Online-Mapping. Date accessed: November 2024.

National Trust Queensland. 2024. *National Trust of Australia (Queensland) Heritage Register*. Website: https://nationaltrustqld.org.au/what-we-do/Heritage-Conservation/heritage-register/ntaq-heritage-register. Date accessed: November 2024.

Peabody Energy Corporation. 2024. *Technical Report Summary Centurion Mine - Centurion Mine, SK-1300.*

Queensland Government. 2012. *Mackay, Isaac and Whitsunday Regional Plan*.

Queensland Government. 2023. *Queensland Heritage Register*. Website: https://apps.des.qld.gov.au/heritage-register/. Date accessed: November 2024.

Queensland Government. 2024. *Air monitoring network stations*. Website: https://apps.des.qld.gov.au/air-quality/regions/. Date accessed: September 2024.

SKM. 2012. *Wards Well Soil Survey*. Sinclair Knight Merz.

TMR. 2021. *Traffic census for the Queensland state-declared road network: 2021 traffic census data*.

APPENDIX A

INTERESTED AND AFFECTED PARTIES

Centurion North Development - Initial Advice Statement

Table 1 Interested and Affected Parties Centurion North Development

Group type		Group name	Interest
Centurion Mine	Project team	Centurion Coal Mining Pty Ltd a subsidiary of Peabody Energy Australia Pty Ltd	Centurion North Development - Proponent
	Other	Employees and Contractors	Centurion Coal Mine
Landowners	Project Area	Stanmore SMC Pty Ltd	2SP214117
			11SP262530
		SunWater Limited	Q/AP20015
	Adjacent landowners	Private landholder	8GV807254
		The State of Queensland (Represented by the Department of Natural Resources and Water)	3GV44
		Centurion Coal Mining Pty Ltd	411SP285383
		SunWater Limited	1SP214117
	Surrounding landowners	Private landholder	103SP278066
			102SP278066
			104SP278066
		Private landholder	2SP256592
		Private landholder	
		Private landholder	3388SP235907
		EMIN Pastoral Company Pty Ltd	
		Eagle Field Pastoral Company Pty Ltd	
		Bilyana Pastoral Company Pty Ltd	
		Rhodes Creek Pastoral Company Pty Ltd	
		The State of Queensland (Represented by Department of Transport and Main Roads)	102SP235907
			101SP235906

Group type		Group name	Interest
			100SP235905
			42SP235904
		Aurizon Network Pty Ltd	2CP852534
		BHP Coal Pty Ltd QCT Mining Pty Ltd BHP Queensland Coal Investments Pty Ltd QCT Investment Pty Ltd Mitsubishi Development Pty Ltd	22SP258009
			200SP259127
			100SP278066
			2RP617822
		Centurion Coal Mining Pty Ltd	13RP852571
			14CP846391
		Stanmore SMC Pty Ltd	23SP262530
Tenements	Mining Lease	Centurion Coal Mining Pty Ltd	ML 1790
			ML 70495
	Mining Development Licence	Peabody West Burton Pty Ltd	MDL 3010
		CITIC Australia Coal Pty Ltd	
	Petroleum Pipeline Licence	QPM Energy Pty Ltd	PPL 2073 (overlapping ML 1790 and ML 70495)
	Pipeline Facility Licence		PFL 33 (overlapping ML 70495)
	Exploration Permits	Byerwen Coal Pty Ltd	EPC 739 (overlapping ML 1790)
		Australis Energy Pty Ltd	EPG 2046 – application (overlapping ML 1790, ML 70495 and MDL 3010)
	Authority to Prospect	CH4 Pty Ltd	ATP 1103 (overlapping ML 1790, ML 70495 and MDL 3010)
	Potential Commercial Area		PCA 258 (overlapping ML 1790, ML 70495 and MDL 3010)

	Group type	Group name	Interest
Government	Commonwealth Departments	Department of Climate Change, Energy, the Environment and Water	Administering authority of EPBC Act and EPBC Act EO Policy. Determine 'controlled action' decision and Federal environmental approval and conditions.
		Department of the Prime Minister and Cabinet	Administering authority of NT Act (Native Title)
	State Departments	Department of Environment, Tourism, Science and Innovation	Responsible for protecting the state's natural environment, developing the government's tourism, science and innovation strategy. Administering authority of EP Act (EA authority), EO Act (Environmental Offsets Strategy), NC Act (Species Management Program, protected plant clearing permit).
		Department of Natural Resources and Mines, Manufacturing, and Regional and Rural Development	Administering authority of PAG Act (petroleum leases and licences), MR Act (mining leases), RPI Act (RIDA)
		Department of Local Government, Water and Volunteers	Administering authority of Water Act (Water licence).
		Department of State Development, Infrastructure and Planning	The Office of the Coordinator General, which determines 'Coordinated Project' status. Administering authority of SSRC Act (Social Impact Assessment; Social Impact Management Plan)
		Department of Women, Aboriginal and Torres Strait Islander Partnerships and Multiculturalism	Administering authority for ACH Act
		Department of Transport and Main Roads	Transport infrastructure
		Department of Primary Industries	Agriculture, biosecurity, fisheries and forestry
	Local Government Authority	Isaac Regional Council	Local Government Authority in which the CND is located.
		Mackay Regional Council	Neighbouring Local Government Authority to the Isaac Regional Council.
	Emergency services	Queensland Fire Department (QFD)	The primary provider of fire and emergency services in Queensland.
		Queensland Rural Fire Service	The volunteer arm of the QFD operating in rural, semi-rural and urban fringe areas where there is no urban fire service coverage.
		Queensland Police Service	Principal law enforcement agency responsible for policing the Australian state of Queensland.
		Queensland Ambulance Service	State emergency ambulance and patient transport provider in Queensland.
		Queensland Health	Coal Mine Workers' Health Scheme
	Regulatory Advisory Body / Government Expert Stakeholder Group	Independent Expert Scientific Committee on Unconventional Gas Development and Large Coal Mining Development	Statutory committee that independently advises government regulators on the impacts that unconventional gas and large coal mining developments may have on Australia's water resources.
	Scientific and Technical Stakeholder	CSIRO	Australian Government agency responsible for scientific research and its commercial and industrial applications.

Group type		Group name	Interest
Utilities and infrastructure	Energy	Ergon Energy Network	Electricity provider to regional Queensland (including Moranbah).
	Gas	Australian Gas Networks	Gas provider to Moranbah and surrounds.
	Water	SunWater	Water provider to regional Queensland (including Moranbah).
	Rail	Aurizon Holdings Limited	Owner of the Goonyella railway line which transports coal to the ports.
	Telecommunications	Telstra Regional	Telecommunications provider to regional Queensland.
	Road	Department of Transport and Main Roads	Own and maintain key roads in relation to the CND, including Peak Downs Highway and Suttor Development Road.
		BHP Mitsuibishi Alliance	Control and maintain Goonyella Road.
First Nations	First Nation community	Widi People of the Nebo Estate #1	2SP214117
			8GV807254
		Wiri People #2	2SP214117
		Barada Barna	
	Aboriginal Corporations	Gangali Narra Widi Aboriginal Corporation	The Gangali Narra Widi Aboriginal Corporation is the registered native title body corporate nominated as the agent of the Widi People
		Barada Barna Aboriginal Corporation	Maintenance and support of Country, traditions, lore, language and culture as well as the provision of economic, social and cultural benefits, including housing, support and education to the Barada Barna People.
Associations/Peak bodies		Australian Chambers of Commerce and Industry	Economic growth, industry development
		Business Chamber Queensland	Business opportunities, regional economy
		Agforce	Agricultural impact, land use
		Growcom	Horticultural interests, water resources
		Anglo American	Mining operations
		BHP	Mining operations
		Australian Minerals Council	Policy advocacy, resource sustainability
		Queensland Resources Council	Resources development, policy and advocacy
		Minerals Council of Australia	National mining policy, industry growth
		Australasian Institute of Mining and Metallurgy	Professional standards, industry training
		Association of Mining and Exploration Companies	Exploration opportunities, investment

Group type		Group name	Interest
Water Associations		qldwater	Sustainable water use, infrastructure
		Water Queensland	Water resource management, supply security
		Australian Water Association	Water quality, environmental sustainability
		Sewerage and Water Environmental Advisory Panel	Wastewater impact, environmental health
		Queensland Water & Land Carers	Environmental conservation, land management
		Fitzroy Basin Association	Basin health, waterway sustainability
Community	Associations and Special Interest Groups	Agricultural Stakeholders	Land access, water allocation
		Moranbah Community Workers Club	Community support, recreational facilities
		Local Disaster Management Group	Emergency response, safety management
		Private agricultural and commercial producers	Economic impact, land use viability
		Conservation Volunteers Australia	Conservation projects, volunteering
		Australian Citizen Science Association	Citizen science engagement, data collection
		Volunteering Queensland	Community development, volunteer opportunities
		CQUniversity	Research opportunities, local partnerships
	Community Support Service	Greater Whitsunday Communities	Regional support, community growth
		Moranbah and District Support Service	Social services, community resilience
		Elam Moranbah	Business opportunities, economic participation
		Moranbah Neighbourhood Centre Association	Community engagement, support services
	Environment Interest Groups	Environmental Defenders Office QLD	Legal advocacy, environmental protection
		Queensland Conservation Council	Environmental advocacy, biodiversity
		Wildlife Preservation Society of Queensland	Species protection, habitat conservation
		Wildlife Queensland	Conservation, public education
		Climate Council	Climate policy, emissions impact
	Education providers – Statewide & Regional	The University of Queensland	Research funding, environmental studies
		Queensland Minerals and Energy Academy	Workforce training, industry skills
		Education Queensland	Student education, career pathways

Group type	Group name	Interest
	MRAEL	Workforce development, training programs
Education providers - Moranbah & Surrounds	Moranbah State High School	Education, student opportunities
	MSHS P&C President	School funding, community involvement
	Glenden State School (near Moranbah)	Local education, community support
	Dysart State High School (near Moranbah)	Education services, student engagement
	Middlemount Community School (near Moranbah)	Education quality, community impact
	Nebo State School (near Moranbah)	Education resources, student welfare
Education providers – Mackay & Surrounds	Mackay North State High School	Education quality, partnerships
	Mackay State High School	Education access, regional ties
	Sarina State High School (south of Mackay)	Education opportunities, local development
	Pioneer State High School	Education quality, future workforce
	St Patrick's College, Mackay	Student outcomes, community involvement
	Whitsunday Anglican School, Mackay	Private education, local contributions
Land Managers	Queensland Parks and Wildlife Service	Ecosystem protection, land management
	Mining Workforce	Job security, workplace safety
	Resource Workforce	Employment opportunities, training
	Landcare Australia	Land rehabilitation, community engagement
	NRM Regions Queensland	Natural resource management, partnerships
Residents	Moranbah	Local development, community services, jobs, housing, health, environment
	Middlemount	Local development, community services, jobs, housing, health, environment
	Nebo	Local development, community services, jobs, housing, health, environment
	Dysart	Local development, community services, jobs, housing, health, environment
Road safety	RACQ CQ	Road safety, transport infrastructure
	Mackay Road Accident Action Group (RAAG)	Road safety, community awareness
Sports Clubs	Greg Cruickshank Aquatic Centre	Recreational facilities, local engagement
	Guides Queensland – Moranbah	Youth programs, leadership skills

Group type		Group name	Interest
		Scouts Australia - Moranbah	Youth engagement, community service
		Moranbah Athletics Club	Sporting facilities, youth development
		Moranbah Bulldogs Australian Rules Football Association	Local sport, community health
		Moranbah BMX Club	Recreational facilities, youth activities
		Moranbah Bowls Club	Social activities, community participation
		Moranbah Boxing Sporting Club Incorporated	Fitness, youth engagement
		Moranbah Bulls Rugby Union Club	Local sport, team development
		Moranbah Darts Association	Social recreation, club participation
		Moranbah Golf Club Incorporated	Recreation, community well-being
		Moranbah Hawks Football Club Senior Social 8's	Sport participation, fitness
		Moranbah Horse Race Club	Local events, community engagement
		Moranbah 'Miners' Rugby League Football Club	Local sport, community involvement
		Moranbah Netball Association Inc.	Sporting events, community participation
		Moranbah Rodeo Association	Local events, cultural engagement
		Moranbah Tennis Association Incorporated	Recreation, youth development
		Moranbah Touch Football	Sport engagement, teamwork
		Moranbah Workers Club quash and Volleyball Centre	Recreation, sports participation
Health	Hospitals	Collinsville Hospital	Healthcare access, regional health
		Moranbah Hospital	Community healthcare, regional services
	Heath and community centres	Glenden Community Health Centre	Local health services, patient care
		Glenden Medical Centre	Health care access, community well-being
		Glenden Dentist	Dental health, patient care
	Services	Royal Flying Doctor Service	Emergency health services, rural support
Business		BHP Mitsuibishi Coal	Mining operations, profitability
		Yancoal	Mining operations, regional growth

Group type		Group name	Interest
		Wesfarmers	Investment returns, operational success
		Fitzroy Resources	Resource development, profitability
		Moranbah Traders Association	Local business growth, economic impact
		Agforce	Farming impact, land management
		Bank of Queensland - Moranbah	Local banking, economic participation
		Nebo Hotel	Local business, hospitality services
		Nebo Roadhouse	Business operations, regional support
		Mackay Chamber of Commerce	Business advocacy, regional development
		Mackay Area Industry Network	Industry partnerships, growth
		Mackay Tourism	Tourism promotion, local economy
		Greater Whitsundays Alliance	Regional growth, industry collaboration
Media	Print	Daily Mercury	Local news, public engagement
		CQ Today	Regional news, community awareness
	Radio	ABC Capricornia	Public broadcasting, regional issues
	TV	WIN News	News coverage, community engagement

APPENDIX B

ENVIRONMENTAL RISK ASSESSMENT METHODOLOGY

Centurion North Development: Initial Advice Statement

Table 1 Likelihood level

Likelihood Level	Description
Almost certain (5)	Predicted to occur several times a year during the Project life >95% likely to occur
Likely (4)	Predicted to occur at least once per year during the Project life 70% - 95% likely to occur
Possible (3)	Could occur every 5 years during the Project life 40% - 70% likely to occur
Unlikely (2)	Could occur every 10 years during the Project life 5% - 40% likely to occur
Rare (1)	May occur at some stage during Project life <5% likely to occur

Table 2 Consequence rating

Consequence	Description
Major (5)	Severe change, disturbance or degradation. Severe Environmental Harm, significant mitigation required. Extending beyond the Project site.
High (4)	Extensive change, disturbance or degradation. Environmental Harm, mitigation required. Localised to the Project site and directly affecting adjacent interests.
Medium (3)	Moderate change, disturbance or degradation. Potential Environmental Harm/ Nuisance, some mitigation required. Localised to the Project site and may affect adjacent interests.
Low (2)	Slight change, disturbance or degradation. Potential Environmental Nuisance, occasional mitigation may be required. Multiple small areas of the Project site, unlikely to affect adjacent interests.
Minor (1)	Negligible change, disturbance, degradation or Environmental Nuisance No mitigation required. A single contained area on the Project site, no effect on adjacent interests.

Table 3 Risk matrix

	Consequence				
Likelihood	*Minor (1)*	*Low (2)*	*Medium (3)*	*High (4)*	*Major (5)*
Almost certain (5)	Medium	Medium	High	High	High
Likely (4)	Medium	Medium	Medium	High	High
Possible (3)	Low	Low	Medium	Medium	High
Unlikely (2)	Low	Low	Medium	Medium	Medium
Rare (1)	Low	Low	Low	Medium	Medium

Table 4 Descriptions of risk rating

Risk Level	Risk Measures
High	Significant environmental risks require immediate mitigation and senior management oversight. Implement robust controls and detailed planning.
Medium	Targeted mitigation and ongoing monitoring for effective risk management. Clear assignment of responsibilities and proactive management.
Low	The impact is minimal and can be effectively managed with routine operational controls. No significant changes to existing processes are needed, and necessary mitigation measures are straightforward and cost-effective.