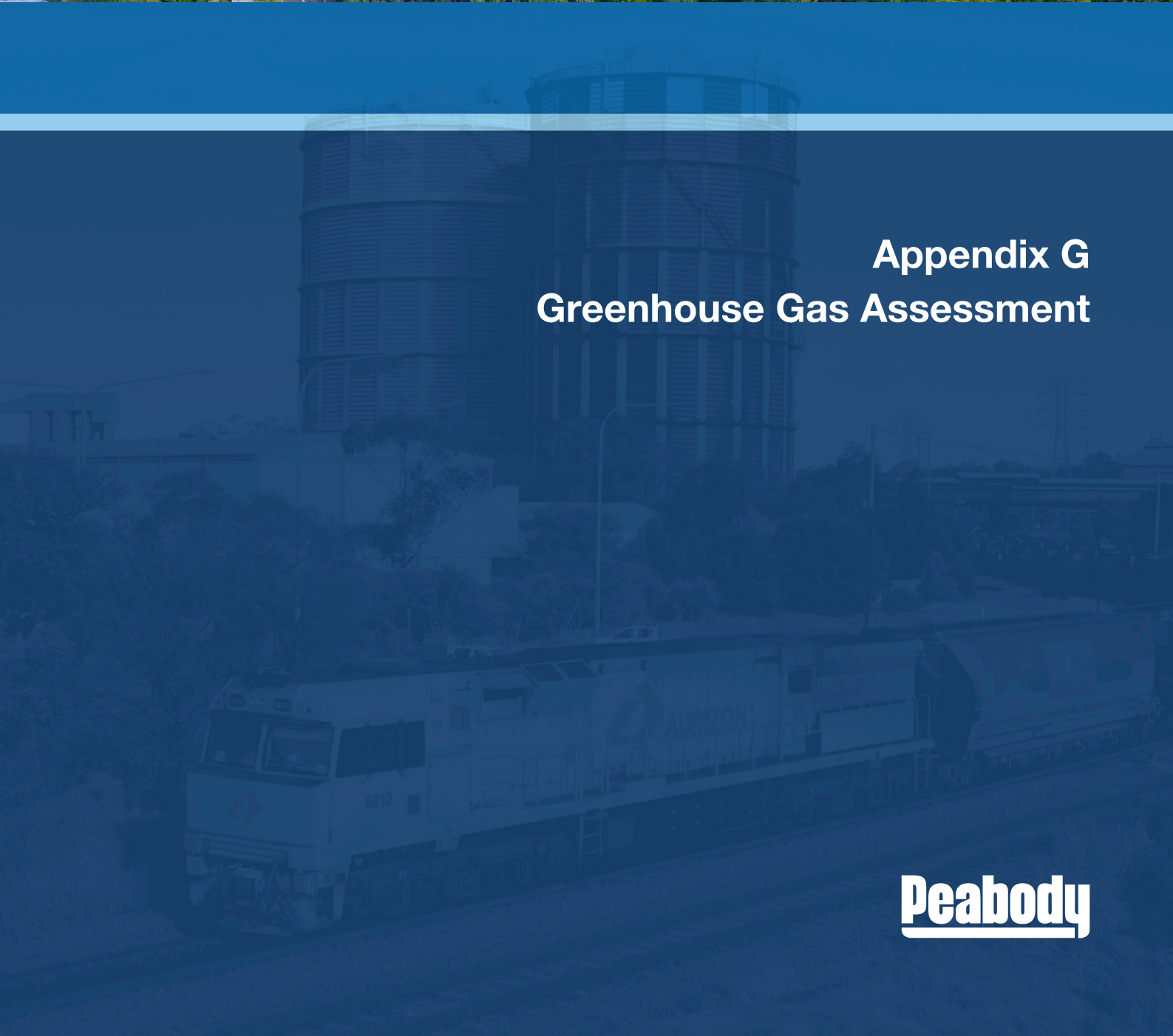




Metropolitan Coal Mine



Appendix G Greenhouse Gas Assessment

Peabody

TABLE OF CONTENTS

1	INTRODUCTION.....	1
1.1	METROPOLITAN COAL MINE	1
1.2	OVERVIEW OF THE MODIFICATION.....	3
1.3	GREENHOUSE GASES AND IPCC SECTORS AND SUBSECTORS.....	8
1.4	ASSESSMENT REQUIREMENTS.....	11
2	LEGISLATIVE AND POLICY CONTEXT.....	15
2.1	GLOBAL.....	15
2.2	NATIONAL	16
2.3	STATE	21
2.4	CORPORATE	28
3	GREENHOUSE GAS EMISSIONS ASSESSMENT AND MITIGATION PLAN	31
3.1	ASSESSMENT BOUNDARY	31
3.2	GREENHOUSE GAS ASSESSMENT.....	33
3.3	APPLICATION OF GREENHOUSE GAS OFFSETS	41
3.4	THE MODIFICATION'S RELATIVE GREENHOUSE GAS EMISSIONS CONTRIBUTION	41
3.5	POTENTIAL IMPACTS OF THE MODIFICATION	44
3.6	ADAPTIVE MANAGEMENT	46
4	CONCLUSION	48
5	REFERENCES.....	50

LIST OF TABLES

Table 1	Safeguard Baseline Decline Rate
Table 2	Guiding Principles and Objectives of the Net Zero Future Act
Table 3	Summary of Key Potential Greenhouse Gas Emission Sources
Table 4	Summary of Greenhouse Gas Emissions Estimates for the Current Baseline Scenario
Table 5	Summary of Greenhouse Gas Emissions Estimates for the Modification Scenario
Table 6	Summary of Greenhouse Gas Emissions Estimates for the Modification Only Scenario
Table 7	Summary of Scope 1 Greenhouse Gas Emissions Estimates for the Approved Baseline Scenario
Table 8	Summary of Scope 1 Greenhouse Gas Emissions Estimates for the Modification Only Versus Approved Baseline Scenario
Table 9	Summary of Expected Export Countries for the Metropolitan Coal Mine and their NDCs

LIST OF FIGURES

Figure 1	Regional Location
Figure 2a	Existing/Approved Metropolitan Coal Mine Longwall Layout
Figure 2b	General Arrangement of the Major Surface Facilities Area
Figure 3	Modified General Arrangement
Figure 4	Indicative General Arrangement Ventilation Shaft Layout
Figure 5	Schematic Diagram Adopted Greenhouse Gas Assessment Boundary
Figure 6	Approved Longwall Mining Areas to be Relinquished

LIST OF GRAPHS

- Graph 1 Breakdown of Total Predicted Scope 1 Emissions for the Metropolitan Coal Mine Modification Scenario by Source

LIST OF CHARTS

- Chart 1 Approved and Modified Mine Schedule (Including and Excluding the Modification)
- Chart 2 Modification Only Versus Approved Baseline Scenario Emissions
- Chart 3 Projected Emissions Abatement Achieved by Flaring
- Chart 4 NSW Net Zero Interim Targets as Annual Average Net Reduction Rates
- Chart 5 NSW Sectoral Performance 2005-2022 (Excluding Land Sector) - Compared to NSW Net Zero Targets

LIST OF ATTACHMENTS

- Attachment A Greenhouse Gas Calculations Report

1 INTRODUCTION

The Metropolitan Colliery (Metropolitan Coal Mine) is situated approximately 30 kilometres (km) north of Wollongong, adjacent to the township of Helensburgh, New South Wales (NSW) (Figure 1). The Metropolitan Coal Mine is operated by Metropolitan Collieries Pty Ltd (Metropolitan Coal), a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody).

The potential environmental impacts of the existing Metropolitan Coal Mine were assessed in the Metropolitan Coal Project Environmental Assessment (Metropolitan Coal EA) (Helensburgh Coal Pty Ltd, 2009). The Metropolitan Coal EA included an Air Quality Impact Assessment, which included assessment of greenhouse gas emissions. A Preferred Project Report (PPR) was submitted to the then Department of Planning in April 2009. The key changes in the PPR were a reduction to the extent of the longwall mining area to avoid subsidence impact to pool drainage along the downstream section of Waratah Rivulet and reorientation of the longwall panels.

Project Approval (08_0149) for the Metropolitan Coal Mine was granted on 22 June 2009 by the Minister for Planning under section 75J of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). The Metropolitan Coal Project included the continuation, upgrade and extension of underground coal mining operations (Longwalls 20-27 and Longwalls 301-317) and surface facilities at the Metropolitan Coal Mine.

This Greenhouse Gas Assessment has been prepared to accompany the proposed Metropolitan Coal Longwalls 317 & 318 Modification (the Modification). This Greenhouse Gas Assessment assesses the likely greenhouse gas emissions of the Modification, including consideration of Commonwealth and NSW climate change policy settings, guidelines and programs, and presents Metropolitan Coal's plans for Metropolitan Coal Mine greenhouse gas mitigation and adaptation, reflective of the status of the Modification.

This Greenhouse Gas Assessment also considers the *NSW Guide for Large Emitters - Guidance on how to prepare a greenhouse gas assessment as part of NSW environmental planning processes* (the Guide) (NSW Environment Protection Authority [EPA], 2025).

1.1 METROPOLITAN COAL MINE

The Metropolitan Coal Mine is one of the longest continually running coal mining operations in Australia, with a history dating back to the 1880s.

Mining operations at the Metropolitan Coal Mine are approved until 22 June 2032 at an approved operational capacity of up to 3.2 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal under Project Approval (08_0149).

Product coal produced at the Metropolitan Coal Mine is primarily sold as a metallurgical coal used in steelmaking with approximately half of the metallurgical product coal being sold to BlueScope's Port Kembla Steelworks. The remaining metallurgical product coal is sold to overseas markets. The Metropolitan Coal Mine also produces coal rejects which are exported via rail to Port Kembla Coal Terminal and typically sold for energy producing purposes or for use in manufacturing processes.

The Metropolitan Coal Mine comprises an Underground Mining Area and Surface Facilities Area. The Surface Facilities Area includes administration buildings, workshop, bath house and ablution facilities, haul roads, access road, fuel and consumables storage facilities, hardstand areas, water management infrastructure, a Coal Handling and Preparation Plant (CHPP), stockpiles (including ROM coal, product coal and coal reject stockpiles) and associated coal handling infrastructure (e.g. conveyors, transfer points and buffer bins).



AME 23-34 UW317-318 Mod. GHG 2014

Source: Geoscience Australia, 2006; NSW Spatial Services (2025)
Metropolitan Coal (2025)



- LEGEND**
- Mining Lease Boundary
 - Exploration Licence (EL 9364)
 - Road
 - Railway
 - National Parks and Wildlife Estate
 - Local Government Area
 - Mining Operation

Peabody
METROPOLITAN COAL
Regional Location

Figure 1

1.2 OVERVIEW OF THE MODIFICATION

As mining operations have progressed at the Metropolitan Coal Mine, ongoing exploration activities have identified geological and geotechnical constraints which affect the available coal resource. To maintain safe and efficient operations, a reduced underground mine layout has been implemented for the Metropolitan Coal Mine. In addition, longwalls have been shortened to reduce subsidence effects on watercourses. These changes have resulted in a reduction in ROM coal extraction compared to the approved underground mine layout in the PPR (Figure 2a and 2b).

As a result, Metropolitan Coal is proposing a modification to maximise efficient coal extraction and allow for the continuation of underground mining and processing operations at the Metropolitan Coal Mine until approximately May 2032. The Modification would extend longwall mining operations immediately west of the approved Metropolitan Coal Mine through the reconfiguration of Longwall 317 and addition of Longwall 318.

Compared to the existing approved Metropolitan Coal Mine, the Modification would comprise the following components (Figures 3 and 4):

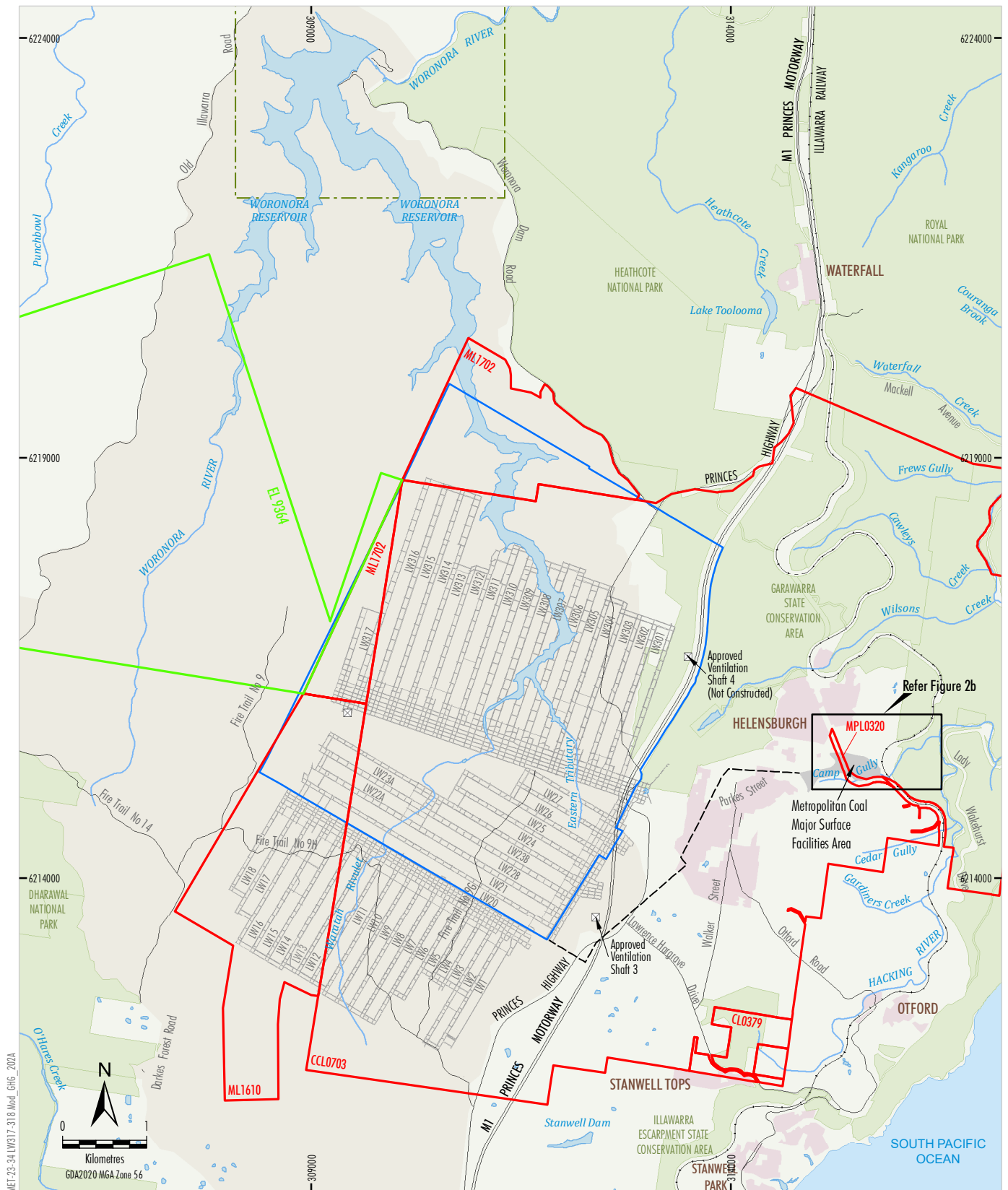
- extension of the approved Longwall 317 to the north;
- addition of Longwall 318 to the west of the approved longwalls;
- extension of the approved 300-series Mains to the west;
- extraction of an additional 3.2 million tonnes (Mt) of ROM coal;
- relinquishment of 14 Mt of approved ROM coal;
- relocation of the approved (but not yet constructed) Ventilation Shaft 4;
- continued transportation of coal rejects off-site for the life of the mine via a combination of rail and road; and
- relinquishment of approved surface development and underground mining areas.

The Modification would also include the establishment of an access track within the approved disturbance area to reinstate rock-armouring along a section of the embankment toe at the Surface Facilities area near Camp Gully Creek. The access track would allow for Metropolitan Coal to undertake further stabilisation works through the reinstallation of sandstone boulders and native revegetation.

No other changes to the approved Metropolitan Coal Mine (including mine life) would be required for the Modification.

The Modification would enable the ongoing supply of metallurgical coal for steelmaking, including to BlueScope's Port Kembla Steelworks, with the remainder exported to overseas markets. Coal rejects would also continue to be sold for energy production or for use in manufacturing processes.

A detailed Modification description is provided in Section 3 of the Modification Report. A discussion of why the Modification is required, the history of Metropolitan Coal Mine approvals, consideration of alternatives, and the consequences of not proceeding with the Modification are also detailed in Sections 1 and 7 of the Modification Report.



LEGEND

- Mining Lease Boundary
- Exploration Licence (EL 9364)
- Project Underground Mining Area
- Longwalls 20-27 and 301-317
- Existing Underground Access Drive (Main Drift)
- Woronora Special Area
- Railway
- Road
- Woronora Notification Area
- Existing and Approved Metropolitan Coal Mine Longwall Layout

Note:

The Longwalls 301 to 316 layout shown reflects the layouts in the approved and proposed Extraction Plans.

Peabody

METROPOLITAN COAL
Existing/Approved Metropolitan Coal Mine
Longwall Layout

Figure 2a



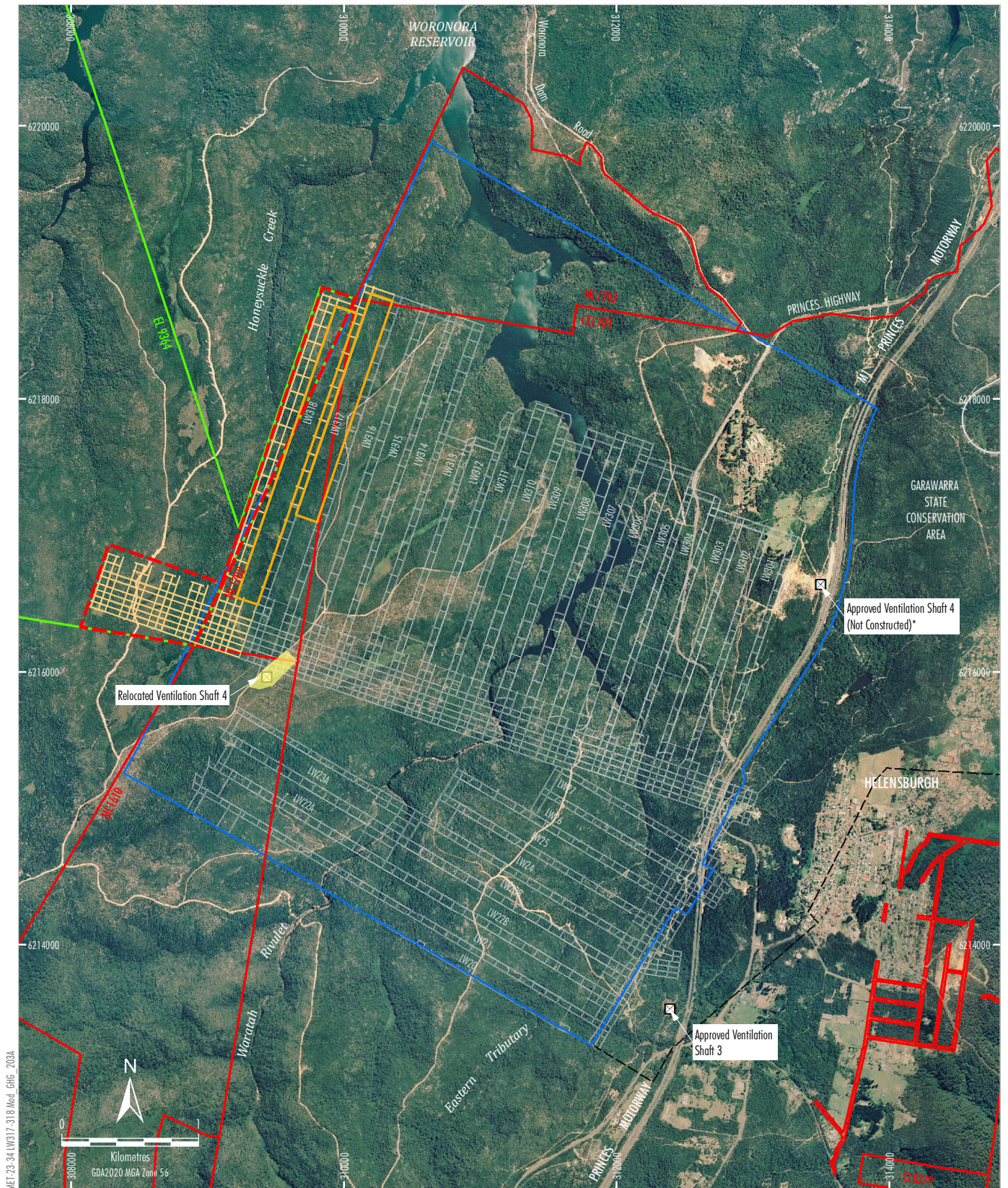
LEGEND
 Approximate Extent of Major Surface Facilities Area

Peabody
 METROPOLITAN COAL

General Arrangement of the
 Surface Facilities Area

Source: NSW Spatial Services (2020)
 Orthophoto: Nearmap (2021)

Figure 2b



Source: Land and Property Information (2015); Date of Aerial Photography 1998; Department of Industry (2015); Metropolitan Coal (2025)

LEGEND

- | | | | |
|--|--|---|--|
| | Mining Lease Boundary | | Proposed First Workings |
| | Exploration Licence (EL 9364) | | Indicative Longwalls 317 and 318 Extraction Area |
| | Indicative Mining Lease Application Area | | Relocated Ventilation Shaft 4 |
| | Railway | | |
| | Shafts | | |
| | Project Underground Mining Area | | |
| | Longwalls 20-27 and 301-317 | | |
| | Existing Underground Access Drive (Main Drift) | | |
| | Existing Approved Underground Development | | |

Note:

The Longwalls 301 to 316 layout shown reflects the layouts in the approved and proposed Extraction Plans.
 * The approved location of Ventilation Shaft 4 is shown.
 The construction footprint would be of a similar size to the proposed relocation

Peabody

METROPOLITAN COAL

Modified General Arrangement

Figure 3



- LEGEND**
- | | |
|--|---|
| Mining Lease Boundary | Liner Fabrication Area |
| Existing /Approved Underground Development | Liner Storage |
| Proposed First Workings | Spoil Stockpiles |
| Shaft Infrastructure | Sediment Dam |
| Collection Drain | Stormwater Detention Basin |
| Culvert | Concrete Lined Sediment Receiving Basin |
| Road | Clean Water Tanks |
| Sediment Dam Bund | Concrete Pad |
| Sediment Fence Perimeter | Transformer, Switchroom and Boreholes |
| Ventilation Shaft 4 Construction Area | Car Park |
| Ventilation Shaft | Site Office |
| | Service and Return Water Boreholes |

Source: ATC Williams (2025); Land and Property Information (2015); Department of Industry (2015); Metropolitan Coal (2025); MSEC (2025)

Peabody
METROPOLITAN COAL
Indicative General Arrangement
Ventilation Shaft Layout

Figure 4

1.3 GREENHOUSE GASES AND IPCC SECTORS AND SUBSECTORS

1.3.1 Relevant Greenhouse Gases and Global Warming Potential

In the context of the Modification, the most relevant greenhouse gases are carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and sulphur hexafluoride (SF₆)¹.

Greenhouse gas emissions are typically standardised by expression as a carbon dioxide equivalent (CO₂-e) based on their Global Warming Potential (GWP). The GWP is determined by the differing periods that greenhouse gases remain in the atmosphere and their relative absorption of outgoing infrared radiation. The GWP of CH₄ is 28 (i.e. one tonne of CH₄ emissions has 28 times the potential to contribute to global warming than one tonne of CO₂ emissions), while the GWP of N₂O is 265 and the GWP of SF₆ is 23,500 (Commonwealth Department of Climate Change, Energy, the Environment and Water [Cth DCCEEW], 2024a).

To simplify greenhouse gas accounting, the emissions of these greenhouse gases (typically estimated in tonnes [t]) are converted to tonnes of carbon dioxide equivalent (t CO₂-e) before being summed to determine total greenhouse gas emissions. This can be expressed as:

$$t \text{ CO}_2\text{-e} = t \text{ CO}_2 \times 1 + t \text{ CH}_4 \times 28 + t \text{ N}_2\text{O} \times 265 + t \text{ SF}_6 \times 23,500$$

1.3.2 Greenhouse Gas Emission Scope

The Greenhouse Gas Protocol (GHG Protocol) (World Business Council for Sustainable Development [WBCSD] and World Resources Institute [WRI], 2024) contains methodologies for calculating and assessing greenhouse gas emissions. As recognised in the definition of "GHG Protocol" in the Guide (NSW EPA, 2025):

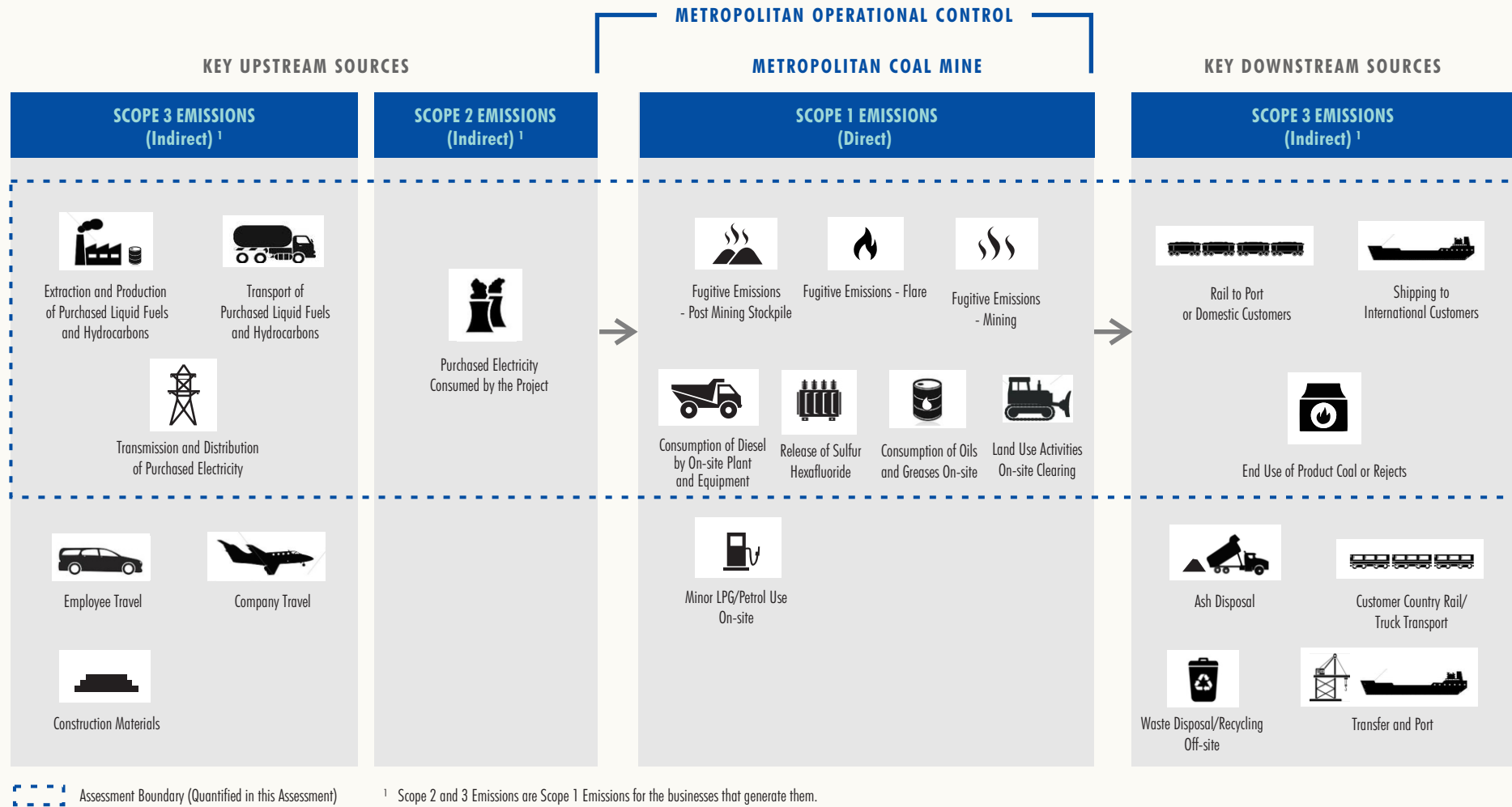
The GHG Protocol is a widely recognised and widely used accounting standard for measuring and managing greenhouse gas emissions. It provides guidelines and methodologies for organisations and governments to quantify and report their greenhouse gas emissions accurately and consistently. The GHG Protocol helps track emissions, set emission goals, and develop strategies to address climate change.

The GHG Protocol covers the accounting and reporting of the seven greenhouse gases covered by the *Kyoto Protocol*, including the four greenhouse gases most relevant to the Modification as described above.

Under the GHG Protocol, an entity's operational boundaries are established by identifying emissions associated with its operations, categorising them as direct or indirect emissions, and identifying the scope of accounting and reporting for indirect emissions. Three 'Scopes' of emissions (Scopes 1, 2 and 3) are defined for greenhouse gas accounting and reporting purposes. This is explored further below.

A diagrammatic representation of the three greenhouse gas emission Scopes and key elements included in this Modification's greenhouse gas assessment is presented on Figure 5.

¹ Minor incidental volumes of SF₆ have been estimated for completeness as arising from high-voltage electrical equipment (TAS, 2025).



Peabody
 METROPOLITAN COAL
 Schematic Diagram
 Adopted Greenhouse Gas
 Assessment Boundary
Figure 5

Scope 1 – Direct Greenhouse Gas Emissions

Direct greenhouse gas emissions are defined as emissions that occur from sources that are owned or controlled by the entity (WBCSD and WRI, 2024). Direct greenhouse gas emissions are emissions that are principally the result of the following types of activities undertaken by an entity:

- Generation of electricity, heat or steam – these emissions result from combustion of fuels in stationary sources (e.g. boilers, turbines and furnaces).
- Physical or chemical processing – most of these emissions result from the manufacture or processing of chemicals and materials (e.g. production of cement, ammonia and aluminium, or waste processing).
- Transportation of materials, products, waste, and employees – these emissions result from the combustion of fuels in mobile combustion sources (e.g. trucks, trains, ships, aeroplanes, cars, motorcycles and buses) owned/controlled by the entity.
- Fugitive emissions – these emissions result from intentional or unintentional releases (e.g. equipment leaks from joints, seals, and gaskets; methane emissions from coal mines and venting; hydrofluorocarbon emissions during the use of air conditioning and refrigeration equipment; and methane leakages from gas transport) (WBCSD and WRI, 2024).

The Modification's key Scope 1 emissions can be categorised into the following sectors using the Intergovernmental Panel on Climate Change (IPCC) Sectors as applied within Australia's national emission projections:

- **Fugitives – Underground Coal Mines**
(i.e. fugitive gaseous emissions that are liberated during underground mining – approximately 99.5 percent [%]).
- **Stationary Energy (Excluding Electricity Generation) – Mining**
(i.e. off-road mobile equipment diesel consumption associated with mining operations – approximately 0.5%).

Consideration of Cth DCCEEW and NSW projections for coal mining emissions in the Fugitive and Stationary Energy Sectors in Australia and comparison to the projected emissions of the Modification are presented in Attachment A.

Scope 2 – Electricity Indirect Greenhouse Gas Emissions

Scope 2 emissions are a category of indirect emissions that account for greenhouse gas emissions associated with the generation of purchased electricity consumed by the entity.

Purchased electricity is defined as electricity that is purchased or otherwise brought into the organisational boundary of the entity (WBCSD and WRI, 2024). Scope 2 emissions physically occur at the facility where the electricity is generated (WBCSD and WRI, 2024). Entities report the emissions associated with the generation of purchased electricity (consumed in equipment or operations owned or controlled by the entity) as Scope 2.

Scope 3 – Other Indirect Greenhouse Gas Emissions

Scope 3 emissions are indirect emissions other than scope 2 emissions that are generated in the wider economy, which occur due to the activities of a facility but from sources not owned or controlled by that facility's business. The United States EPA (2024) helpfully defines Scope 3 emissions as follows:

Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly affects in its value chain. An organization's value chain consists of both its upstream and downstream activities. Scope 3 emissions include all sources not within an organization's scope 1 and scope 2 boundary. The scope 3 emissions for one organization are the scope 1 and 2 emissions of another organization. Scope 3 emissions, also referred to as value chain emissions, often represent the majority of an organization's total greenhouse gas (GHG) emissions.

Some examples of Scope 3 emissions provided in the GHG Protocol are those from the extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services (WBCSD and WRI, 2024).

The GHG Protocol notes that reporting Scope 3 emissions can result in double counting of emissions. For example, greenhouse gas emissions from the burning of coal to produce energy are the Scope 3 emissions of the mines approved to produce the coal, as well as the Scope 1 emissions of the businesses that burn the coal to generate electricity. Those emissions will also be the Scope 2 emissions of the businesses that purchase the electricity.

The Modification's key Scope 3 emissions would be largely categorised as:

- **Category 4 – Upstream Transportation and Distribution**
(i.e. transport of purchased liquid fuel, hydrocarbons and electricity – approximately 0.04%).
- **Category 9 – Downstream Transportation and Distribution**
(i.e. transport of coal to third-parties – approximately 2.12%).
- **Category 11 – Use of Sold Products**
(i.e. end use of product coal – approximately 97.84%).

Todoroski Air Sciences Pty Ltd (TAS) has also estimated some key upstream Scope 3 emissions associated with supply of energy to the site, as well as key downstream emissions from distribution of product coal to the Port Kembla, and international shipping, as well as the combustion of Modification coal products (Figure 3 and Section 3.4).

1.4 ASSESSMENT REQUIREMENTS

1.4.1 Environment Protection Authority Assessment Guidance

Under its Climate Change Policy and Action Plan, the NSW EPA is taking further action to help the NSW Government achieve its greenhouse gas emission reduction targets.

In January 2025, NSW EPA released the Guide, following a period of consultation from May to July 2024. The Guide requires proponents of major greenhouse gas emitting projects to assess emissions and mitigation opportunities, both in the short-term and long-term. The Guide sets out a description of NSW's emission reduction objectives, types of greenhouse gases, and the EPA's suggested greenhouse gas assessment and mitigation requirements to be addressed in Environmental Impact Statements and Modification Reports. The Guide also includes a description on how measures to avoid or reduce emissions should be identified and evaluated, including setting out the NSW greenhouse gas mitigation hierarchy.

Metropolitan Coal also notes that the evolution of NSW guidance materials is set to continue during the assessment of the Modification (i.e. EPA has indicated that sectoral guidance and best practice guidance for NSW coal mines are also currently in preparation) (NSW EPA, 2025).

In the absence of guidance on what constitute best-practice greenhouse gas emission abatement for NSW coal mines as is currently in preparation by the NSW EPA, the Guide states (NSW EPA, 2025):

Best practice refers to the most effective combination of processes and technologies, including how an installation or activity is designed, built, maintained, operated and decommissioned to avoid and minimise environmental impacts from GHG emissions.

1.4.2 Classification of the Modification for the Purposes of the Guide

Section 2.3 (Box 3) of the Guide provides guidance on how the Guide applies for modification proposals:

Box 3. GHG assessment boundary for the modification proposals

The GHG assessment boundary for the project defines which emission sources and activities are included and excluded in the assessment.

For a modification proposal:

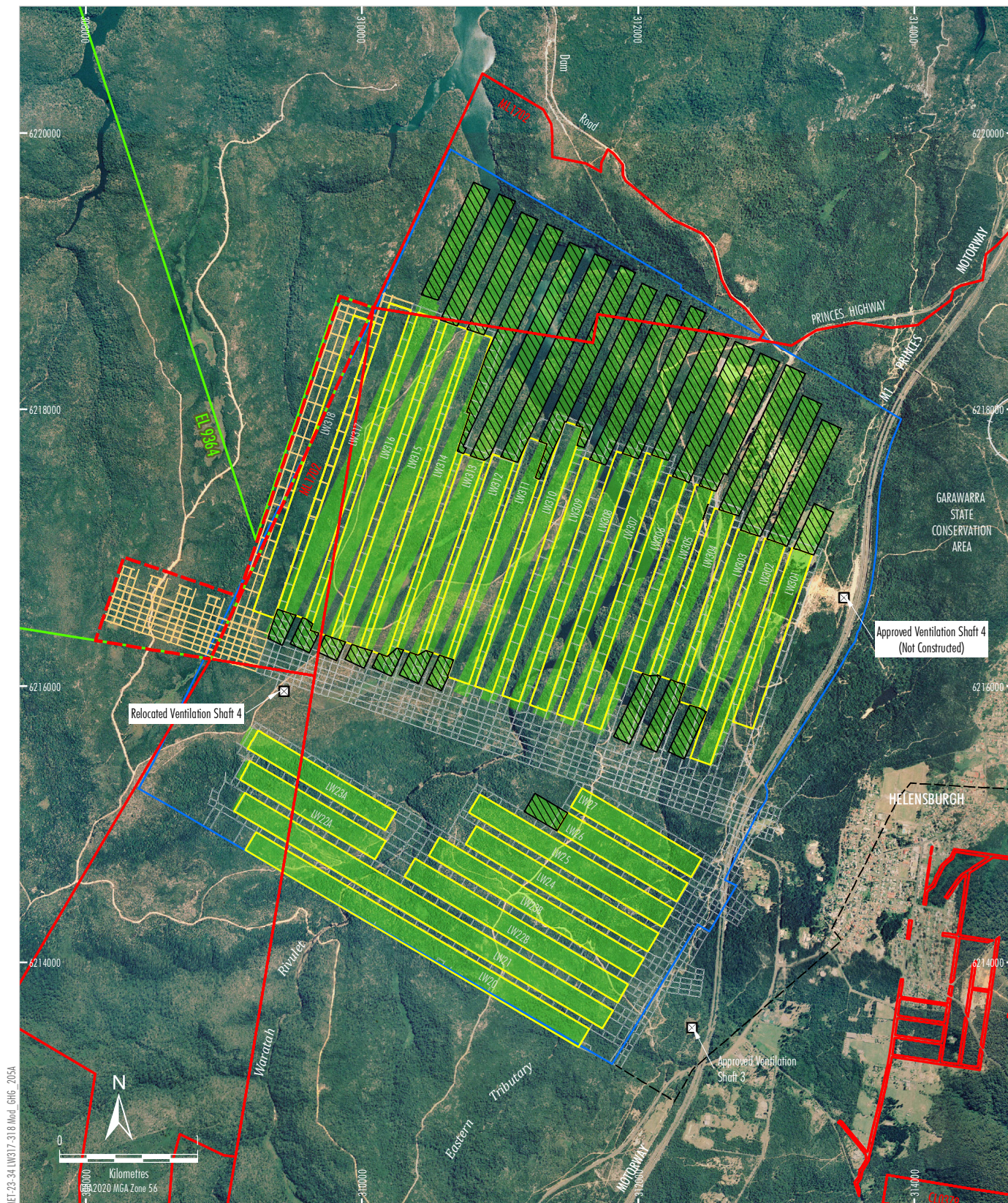
- *The assessment boundary must be defined to account for any emission increases or decreases at the premises related to the project. It must define which emission sources and activities are included in the assessment and which are excluded. This will allow the overall impact of the GHG emissions resulting from the modification to be assessed.*
- *The 25,000 tonne CO₂-e threshold relates to additional GHG emissions expected to be emitted due to the modification of the licensed premises, not the entire premises. For example, if the existing premises emits more than 25,000 tonnes CO₂-e per annum, but the modification will not increase GHG emissions by an additional 25,000 tonnes CO₂-e per annum, then that modification would not be subject to the assessment requirements within this guide.*

Section 3.1 of the Guide also relevantly states that for modifications:

*If a modification is likely to increase or decrease emissions from existing operations, the affected sources related to these existing operations must be included within the assessment boundary for the project. In this manner the overall (net) impact of the project on GHG emissions may be assessed in a 'project only' scenario. As a minimum, parts of the operation where emissions will increase must be included. Further scenarios that **must** be included for project modifications are set out in Box 5.*

The Modification includes the relinquishment of approved longwall mining areas, totalling approximately 14 Mt of ROM coal or a net reduction of 10.8 Mt of ROM coal (Chart 1) when accounting for the additional Modification coal as shown on Figure 6. The Modification also does not seek to extend the approved life of the Metropolitan Coal Project.

The proposed relinquishment of coal would lead to a net reduction in greenhouse gas emissions compared to the currently approved mining operations. When accounting for the decrease in approved coal extraction, the Modification serves to offset a portion of the reduced coal production and would not result in an increase of 25,000 tonnes or more of CO₂-e emissions in any financial year (see Section 3.2.2 of the Guide). Accordingly, and in line with the Guide, the Modification does not trigger the assessment requirements outlined in the Guide (see section 2.1 of the Guide).



LEGEND

- Mining Lease Boundary
- Exploration Licence (EL 9364)
- Indicative Mining Lease Application Area
- Railway
- Shafts
- Project Underground Mining Area Longwalls 20-27 and 301-317
- Existing Underground Access Drive (Main Drift)
- Existing/Approved Underground Development
- Proposed First Workings

- Completed and Proposed Secondary Extraction
- Preferred Project Report Longwall Layout
- Approved Longwall Mining Areas to be Relinquished

Note:
The Longwalls 301 to 316 layout shown reflects the layouts in the approved and proposed Extraction Plans.

Source: Land and Property Information (2015); Date of Aerial Photography 1998; Department of Industry (2015); Metropolitan Coal (2025); MSEC (2025);

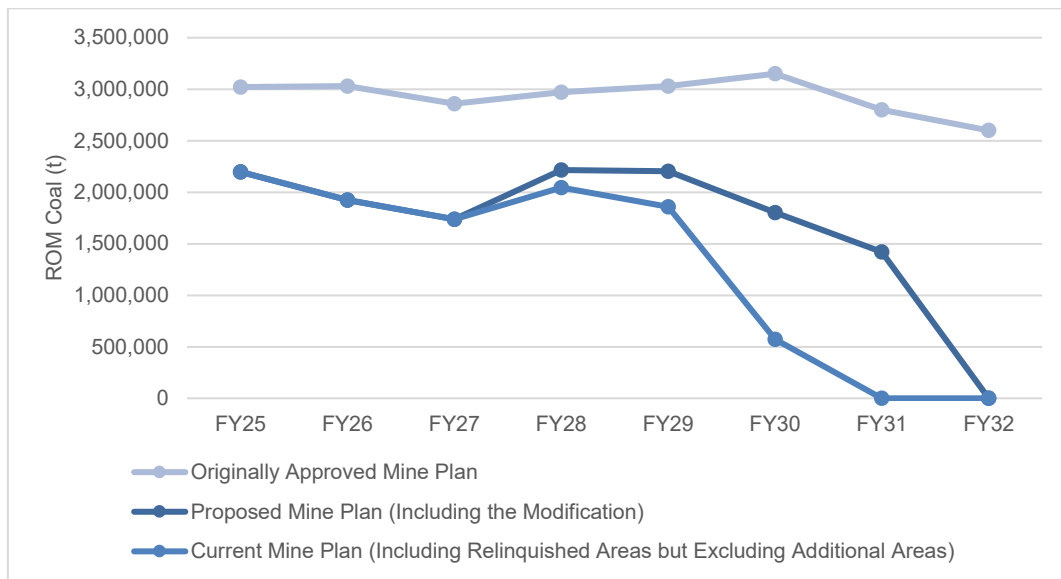
Peabody

METROPOLITAN COAL

Approved Longwall Mining Areas
to be Relinquished

Figure 6

Chart 1
Approved and Modified Mine Schedule (Including and Excluding the Modification)



Notwithstanding, this Greenhouse Gas Assessment considers objectives and content provided in the Guide and provides an estimate of greenhouse gas emissions for activities that would increase emissions as a result of the Modification when compared to the current mine plan.

As the Modification represents a continuation and extension of the operation of the approved Metropolitan Coal Mine, for the purposes of this Greenhouse Gas Assessment, the greenhouse gas assessment boundary has been defined to include identified material on-site Scope 1 emissions arising from mining operations, Scope 2 emissions arising from electricity consumption by the Metropolitan Coal Mine, and some key upstream and downstream Scope 3 emissions have also been evaluated for completeness (Figure 5).

2 LEGISLATIVE AND POLICY CONTEXT

2.1 GLOBAL

The international framework addressing greenhouse gas emissions, and the global response to climate change, commenced with adoption of the United Nations Framework Convention on Climate Change (UNFCCC) in 1992.

The UNFCCC has close to global membership, with 198 Parties (UNFCCC, 2024a). While a number of negotiating sessions are held each year, the largest is the annual Conference of the Parties (UNFCCC, 2024a). Two of the most important progressions of the UNFCCC were at the third Conference of the Parties (in 1997) and the 21st Conference of the Parties (in 2015), with the adoption of the *Kyoto Protocol* and the *Paris Agreement*, respectively.

The *Kyoto Protocol* entered into force in 2005 and imposed limits on the greenhouse gas emissions of developed countries listed in Annex 1 to the UNFCCC, with an initial commitment period of 2008 to 2012 (UNFCCC, 2024b). The UNFCCC requires parties to submit national inventories of greenhouse gas emissions and report on steps taken to implement the Kyoto Protocol (UNFCCC, 2024b). The *Doha Amendment* to the *Kyoto Protocol* was adopted at the 18th Conference of the Parties (in 2012), which included a second commitment period of 2013 to 2020 (UNFCCC, 2024b). The *Doha Amendment* entered into force in December 2020 (UNFCCC, 2024b).

The goal of the *Paris Agreement* is to limit global temperature increases to well below 2 degrees Celsius (°C) above preindustrial levels (UNFCCC, 2024c). In order to achieve that goal, Parties aim to reach peak global emissions as soon as possible, "so as to achieve a balance between anthropogenic emissions by sources and removals by sinks in the second half of this century" (UNFCCC, 2024d).

The *Paris Agreement* does not specify how global emission reductions are to be achieved. It requires Parties to prepare, communicate and maintain nationally determined contributions (NDCs) and to pursue domestic measures to achieve them (UNFCCC, 2024d; UNFCCC, 2024e). The NDCs are to be communicated every five years, with each successive NDC to represent a progression beyond the previous NDC. "Intended" NDCs were submitted in 2015. First, updated, enhanced and second NDCs were submitted before 2024, with a new round of NDCs due to be submitted in 2025 and another round due in 2030 (UNFCCC, 2024e).

Scope 1 greenhouse gas emissions from the Modification, as well as any Scope 2 and 3 emissions related to the Modification that will be emitted in Australia, would be accounted for and managed in accordance with Australia's domestic law adopted to implement Australia's NDC. Greenhouse gas emissions produced by the end use of Modification coal overseas would be accounted for and managed in accordance with the laws that have been adopted to implement the NDCs of the countries to which the coal is exported. The NDCs of key countries to which Metropolitan Coal currently exports coal and the key countries to which coal from the Modification is expected to be exported (expected export countries) are described in Section 3.5.2.

At the 24th Conference of the Parties to the UNFCCC (in 2018), the *Katowice Climate Package* was agreed. The *Katowice Climate Package* contains, among other things, detailed guidance on the features of NDCs and the information each country should provide to improve transparency regarding NDCs, as well as highlighting the need to ensure that double counting of greenhouse gas emissions is avoided (UNFCCC, 2024e).

At the 26th Conference of Parties (held in 2021), the *Glasgow Climate Pact* was reached. The *Glasgow Climate Pact* reaffirms the long-term global goal to hold the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels. The agreement also invites Parties to consider further actions to reduce non-carbon dioxide greenhouse gas emissions, including methane, by 2030 (UNFCCC, 2024a).

A country is assisted to meet the emission targets provided for in its NDC by utilising the international trading (or crediting) mechanisms established by Article 6 of the *Paris Agreement*. The effect of Article 6 is that a country that overachieves against its NDC targets can gain greenhouse gas emission credits to sell to other countries, and, conversely, if it falls short, it can purchase international credits approved under the *Paris Agreement* to meet its NDC target.

2.2 NATIONAL

Australia's first NDC under the Paris Agreement communicated a greenhouse gas emission reduction target of 26% to 28% below 2005 levels by 2030 (Commonwealth of Australia, 2015).

In 2022, the Commonwealth *Climate Change Act 2022* (Climate Act) was introduced to outline Australia's greenhouse gas emissions reduction targets. Section 10(1) of the Climate Act states:

- (1) *Australia's greenhouse gas emissions reduction targets are as follows:*
- (a) *reducing Australia's net greenhouse gas emissions to 43% below 2005 levels by 2030;*
 - ...
 - (b) *reducing Australia's net greenhouse gas emissions to zero by 2050.*

Section 3 of the Climate Act defines the objects of the Act:

- (aa) *to advance an effective and progressive response to the urgent threat of climate change drawing on the best available scientific knowledge; and*
- (a) *to set out Australia's greenhouse gas emissions reduction targets which contribute to the global goals of:*
 - (i) *holding the increase in the global average temperature to well below 2°C above pre-industrial levels; and*
 - (ii) *pursuing efforts to limit the temperature increase to 1.5°C above pre-industrial levels; and*
- (b) *to promote accountability and ambition by requiring the Minister to:*
 - (i) *prepare annual climate change statements; and*
 - (ii) *cause copies of those statements to be tabled in each House of the Parliament; and*
- (c) *to ensure that independent advice from the Climate Change Authority informs:*
 - (i) *the preparation of annual climate change statements; and*
 - (ii) *the greenhouse gas emissions reduction targets to be included in a new or adjusted nationally determined contribution.*

Australia's first NDC under the *Paris Agreement* was updated to commit to further reductions in emissions to achieve the national greenhouse gas target of 43% below 2005 levels by 2030 and reaffirmed the target to achieve net zero emissions by 2050 (Commonwealth of Australia, 2022).

Australia's third NDC is currently under development and must be announced in 2025. Relevant considerations in setting Australia's next NDC, include (Cth DCCEEW, 2025):

- global trade and investment trends;
- the pace and scale of technology development and deployment;
- development of new industries in Australia, including as part of a future made in Australia; and
- our ability to play a positive global role through ambition and practical delivery.

The Australian Government has indicated it will set an ambitious and achievable 2035 emissions reduction target that accelerates climate action, consistent with Australia's global peers (Cth DCCEEW, 2025). It is noted that the Modification does not seek an extension of the approved mine life and longwall mining would cease prior to 2035.

The Climate Act does not impose specific requirements on Metropolitan Coal to implement measures to reduce, avoid and monitor greenhouse gas emissions. Nevertheless, the Climate Act is considered and addressed in this Greenhouse Gas Assessment.

2.2.1 Assessment

National Greenhouse Account Factors

Australia's National Greenhouse Accounts are prepared by the Cth DCCEEW. The Cth DCCEEW publishes the greenhouse gas emission factors used in preparing the National Greenhouse Accounts. The *National Greenhouse Accounts Factors: 2024* (Cth DCCEEW, 2024a) is the latest such publication and has been used to calculate the Modification emission projections (Attachment A).

2.2.2 Reporting

National Greenhouse and Energy Reporting Scheme

The Commonwealth *National Greenhouse and Energy Reporting Act 2007* (NGER Act) is a national framework for reporting greenhouse gas emissions, energy production and energy consumption by corporations. The greenhouse gas emissions and energy data reported under the NGER Act is used by the Commonwealth Government in compiling Australia's national greenhouse gas emission inventory to meet its reporting obligations under the UNFCCC.

Under the NGER Act, corporations that have operational control of facilities must report their greenhouse gas emissions and energy data if they meet the thresholds for reporting. The thresholds are:

- a) emitting 25,000 t CO₂-e of greenhouse gas emissions or producing or consuming 100 terajoules (TJ) of energy (for an individual facility); or
- b) emitting 50,000 t CO₂-e of greenhouse gas emissions or producing or consuming 200 TJ of energy (cumulatively for all facilities under the operational control of the corporation).

Reporting requirements of the NGER Act include both Scope 1 and Scope 2 emissions. To avoid the potential double counting of emissions, the NGER Act does not cover Scope 3 emissions. The Metropolitan Coal Mine has triggered the reporting requirements of the NGER Act (Peabody Australia Holdco Pty Ltd overall group emissions also trigger the operational control reporting requirements of the NGER Act) and Metropolitan Coal reports on its group greenhouse emissions each financial year under its entity Peabody Australia Holdco Pty Ltd (which is the relevant "controlling corporation" for the purposes of reporting under the NGER Act). Metropolitan Coal would continue to comply with its reporting obligations under the NGER Act, should the Modification be approved.

2.2.3 Mitigation

A range of legislation and policies, including the Safeguard Mechanism (which has legislative effect via the NGER Act), the Renewable Energy Target and the National Energy Productivity Plan have been implemented to help Australia meet its greenhouse gas commitments.

In October 2021, the previous Australian Government published *Australia's Long Term Emissions Reduction Plan* (Commonwealth of Australia, 2021) (the Plan), which includes a range of policy initiatives to deliver net zero greenhouse gas emissions by 2050. The Plan is focused on reducing the cost of low emissions technologies whilst increasing their availability nationwide. As explained below, it is noted that the current Australian Government is developing a Net Zero 2050 plan.

The NGER Act introduced a single national reporting framework for the reporting and dissemination of corporations' greenhouse gas emissions and energy use. The Safeguard Mechanism (underpinned by the Commonwealth *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015* [Safeguard Rule]) was established through the NGER Act and provides baseline emissions and offset requirements for applicable facilities that emit over 100,000 t CO₂-e per year, which currently includes the existing Metropolitan Coal Mine and would extend to include the Modification, should it be approved.

The Safeguard Mechanism sets a baseline level of emissions for facilities. If a facility exceeds its baseline level, it is required to surrender to the Clean Energy Regulator (CER) Australian Carbon Credit Units (ACCUs) (or following recent reforms, alternatively Safeguard Mechanism Credit units [SMCs]) equivalent to the exceedance.

In 2023, the Commonwealth Government introduced reforms to facilitate greater abatement and offset requirements for Safeguard Mechanism facilities (discussed further below).

Reformed Safeguard Mechanism

The Safeguard Mechanism Reforms (Cth DCCEEW, 2024b) introduced an amendment to the NGER Act and other legislation (including the Climate Act) to establish a framework to give effect to key elements of the reforms, such as introducing a requirement for facilities to achieve greenhouse abatement via annual downward adjustment of baseline levels.

There are three main types of safeguard facility baselines:

- standard (as applies to the Metropolitan Coal Mine facility);
- landfill; and
- sectoral (i.e. electricity generators).

Standard baselines are determined based on the amount of product each facility produces in a financial year.

The reforms apply a decline rate to a facility's baseline so that baselines are reduced predictably and progressively over time (initially 4.9% per annum until the end of FY30) on a proportionate trajectory consistent with achieving Australia's emission reduction targets of 43% below 2005 levels by 2030, and net zero by 2050 (Cth DCCEEW, 2024c) in combination with other greenhouse gas reduction measures in the economy.

At the end of each year, the facility's baseline will therefore be calculated via its:

- production quantities;
- the emissions-intensity values for each product it produces; and
- the decline rate.

It is noted that the target of 43% reduction by 2030 is tied to 2005 emission levels. Table 1 below summarises the Safeguard Mechanism baseline decline rate which has been calculated with sufficient headroom allowance for higher than expected growth at new and existing Safeguard facilities (CER, 2025).

Table 1
Safeguard Baseline Decline Rate

Financial year	Decline rate	Emission reduction contribution
2023–24	4.9%	95.1%
2024–25	4.9%	90.2%
2025–26	4.9%	85.3%
2026–27	4.9%	80.4%
2027–28	4.9%	75.5%
2028–29	4.9%	70.6%
2029–30	4.9%	65.7%
2030–ongoing*	3.285%	62.4%

Source: CER (2025)

* The decline rate indicated in the above table for 2030 onwards is indicative. From 2030 decline rates will be set in 5-year blocks by the Cth DCCEEW.

Schedule 1 of the Safeguard Rule defines a range of products produced at Safeguard Mechanism facilities. For each product, Schedule 1 sets out one or more metrics (each of which is a production variable), the units relevant to those production variables and the circumstances in which they are applicable to the particular Safeguard Mechanism facility. This includes the assignment of a default emission intensity for each production variable. A facility's baseline is therefore adjusted annually based on actual site production metrics.

Because of the high diversity of existing emission intensities in the coal sector, a hybrid approach was adopted for existing coal mines. In this case, the ROM coal Safeguard emissions intensity is calculated by progressively decreasing the proportion of site-specific emissions intensity, which has the effect of achieving a 50% application of the default ROM coal production variable by FY30.

Metropolitan Coal also notes that ROM coal is listed in Schedule 2 of the Safeguard Rule as a 'trade-exposed production variable'. However, a conservative approach has been adopted herein to assessing greenhouse gas emissions such that no adjustment has been made for trade-exposed production (despite the fact that the Modification's ROM coal production may be trade-exposed and that Metropolitan Coal may seek a determination to that effect from the CER in due course should the Modification be approved).

Pursuant to transitional arrangements under the Safeguard Rule, the default ROM coal production variable has been set at 0.0653 t CO₂-e / ROM t. In accordance with Subdivision C of the Safeguard Rule, a responsible emitter can apply to the CER for an Emissions Intensity Determination (EID). Metropolitan Coal has applied to the CER for an EID for the Metropolitan Coal Mine.

The EID for the Metropolitan Coal Mine for ROM coal is 0.2969 t CO₂-e / ROM t (CER, 2024a). Further consideration of the Modification emission estimates in comparisons with key emissions reduction targets is provided in Section 3.

Metropolitan Coal Mine is and will continue to be a designated large facility as defined by the NGER Act. The Safeguard Mechanism therefore applies to Metropolitan Coal and will continue to apply to Metropolitan Coal Mine including the Modification.

Net Zero Plan

The Commonwealth Government is currently developing a Net Zero Plan in conjunction with developing and setting Australia's 2035 emission reduction targets. It is noted that the Modification does not seek an extension of the approved mine life and longwall mining would cease prior to 2035.

The Australian Government recognises several major steps for decarbonising the economy that will apply differently across each emissions sector depending on the availability of cost-effective low emissions technologies (Cth DCCEEW, 2025). These steps are (Cth DCCEEW, 2025):

1. *increasing the materials and energy efficiency of the economy (including through circular economy principles);*
2. *decarbonising and growing the electricity grid using renewables to unlock greater decarbonisation across other sectors by electrifying activities wherever possible;*
3. *switching remaining activities to hydrogen, low-carbon liquid fuels, and other replacements for fossil fuels;*
4. *innovation to expand low and zero emission technology options and reduce their costs; and*
5. *scaling up nature-based and technological carbon sequestration.*

Sector Pathways Review

In the *Sector Pathways Review*, the Commonwealth Climate Change Authority (CCA) examined potential technology transition and emissions pathways in six key emission sectors to support Australia's transition to net zero emissions by 2050 (CCA, 2024a):

- electricity and energy;
- transport;
- industry and waste;
- agriculture and land;
- resources; and
- the built environment.

The CCA identified the range of emissions reductions that are achievable through the deployment of available and prospective technologies, and examined the relevant barriers, opportunities and enablers for each key sector. Part 1 of the *Sector Pathways Review* addresses the Resources sector, which incorporates Australian mining, oil and gas industries (CCA, 2024b).

Key findings of Part 1 of the Sector Pathways Review (Resources) of potential relevance to the Modification include (CCA, 2024b):

Decarbonisation of the (Resources) sector requires widespread electrification, and deployment of fugitive abatement technologies in oil, gas and coal mining operations.

...

Barriers to electrification and deployment of fugitive abatement measures across the sector include high upfront capital costs, integration challenges within existing facilities and the lack of access to a sufficient firmed supply of renewable electricity.

...

2.2.4 Offsets

The Commonwealth CCA's (2024a) *Targets, Pathways and Progress* paper describes that some sectors have very hard-to-abate emissions and may be unable to achieve net zero, whereas the land sector already achieves net negative emissions by removing carbon from the atmosphere.

In the *Targets, Pathways and Progress* paper, the CCA (2024b) provides a description of Australia's approach to achieve net zero, which is to balance both continuing emissions and offsets or carbon sequestration in a manner that is economically responsible and reflective of the constraints and opportunities available to the various sectors of the Australian economy. Australia has also declared that it will utilise Article 6 of the *Paris Agreement* (international trading of emission allowances) to meet its mitigation targets.

The CCA also articulates that Australia's ambition is not to achieve zero emissions by 2050, it is rather to achieve net zero emissions by 2050 and articulates that Australia will continue to rely (as it has to date) to a large degree on the land use sector to remove carbon from the atmosphere and offset emissions that continue to occur elsewhere in the economy.

2.3 STATE

2.3.1 Legislation and Policies

NSW Government

The NSW Government released the *NSW Climate Change Policy Framework* (Office of Environment and Heritage [OEH], 2016), which committed NSW to the long-term objective of achieving net zero emissions by 2050.

NSW Climate and Energy Action published the *Net Zero Plan Stage 1: 2020 – 2030* (Department of Planning, Infrastructure and Environment [DPIE], 2020) (the Net Zero Plan) in March 2020, which describes how, over the next decade, the NSW Government intends to work towards its objective of achieving net zero emissions by 2050, and an objective to reduce emissions by 70% by 2035, compared to 2005 levels. For example, the Net Zero Plan supports a range of initiatives which includes reducing emissions from the mining and use of coal. In this regard, the Net Zero Plan specifically identifies the Coal Innovation Program (noting that investment in this Program is underway) and relevantly states:

New South Wales' \$36 billion mining sector is one of our biggest economic contributors, supplying both domestic and export markets with high quality, competitive resources. Mining will continue to be an important part of the economy into the future and it is important that the State's action on climate change does not undermine those businesses and the jobs and communities they support.

The Net Zero Plan has been supported by Net Zero Plan Stage 1: 2020 – 2030 implementation updates, which address the policies under the Net Zero Plan as well as emissions reduction projections for NSW (DPIE, 2021).

The NSW Government has subsequently enshrined in legislation whole-of-government climate action in the *Climate Change (Net Zero Future) Act 2023* (Net Zero Future Act).

The Net Zero Future Act legislates:

- guiding principles for action to address climate change that consider the impacts, opportunities and need for action in NSW (Section 2.3);
- emissions reduction targets for NSW, comprising:
 - 50% reduction on 2005 levels by 2030;
 - 70% reduction on 2005 levels by 2035; and
 - net zero by 2050.
- an objective for NSW to be more resilient to a changing climate; and
- establishing an independent, expert Net Zero Commission (NZC) to monitor, review, report on and advise on progress towards these targets.

It is noted that the Modification does not seek an extension of the approved mine life and longwall mining would cease prior to 2035.

Neither the Net Zero Future Act nor any other relevant policies in NSW impose specific requirements on the Modification to implement measures to reduce, avoid and monitor greenhouse gas emissions. Generally speaking, any specific requirements for the Modification to implement measures to reduce, avoid and monitor greenhouse gas emissions for the Modification would likely be contained in any modified Development Consent granted under Part 4 of the EP&A Act for the Modification, consistent with the current approach for the Metropolitan Coal Mine. The Metropolitan Coal Mine Project Approval (08_0149) imposes specific requirements on Metropolitan Coal with respect to greenhouse gas management at the Metropolitan Coal Mine).

Table 2 provides the Guiding Principles and Objectives of the Net Zero Future Act and indicates that Metropolitan Coal generally concurs with the application of these guiding principles to development in the State.

It is noted that this Greenhouse Gas Assessment does not identify all of the documents which comprise the suite of NSW policies, programs and guidelines concerning greenhouse gas emissions and climate change. For example, other potentially relevant documents in this regard may include the 2020 NSW Energy Package Memorandum of Understanding between the Commonwealth and NSW Governments, which relevantly had the aim of achieving emissions reductions. It is also noted that additional NSW policies, programs or guidelines may potentially be released prior to the determination of the Modification.

NSW Environment Protection Authority

The NSW EPA's *Climate Change Policy* (NSW EPA, 2023a) outlines the NSW EPA's role in environmental regulation in NSW and how the NSW EPA is expanding its focus to explicitly regulate the causes and consequences of climate change.

As identified in the NSW EPA's Climate Change Policy, section 6 of the *Protection of the Environment Administration Act 1991* (POEA Act) outlines the NSW EPA's statutory objectives to protect the environment and human health. These objectives include:

- to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development; and
- to reduce the risks to human health and prevent the degradation of the environment.

The NSW EPA also notes, on p 15, that these objectives "extend to protecting the environment and human health from climate change". It further notes that the NSW EPA is required to consider these statutory objectives when exercising licensing functions under the NSW *Protection of the Environment Operations Act 1997* (POEO Act). The POEO Act is the key piece of environment protection legislation administered by the NSW EPA, with the Metropolitan Coal Mine constituting a "scheduled activity" under Schedule 1 of the POEO Act which requires licensing by the NSW EPA under an Environment Protection Licence (EPL). Metropolitan Coal currently holds EPL Number 767 for the Metropolitan Coal Mine and would seek any variations required to cover the Modification should it be approved.

Section 9 of the POEA Act imposes a statutory duty on the NSW EPA to develop environmental quality objectives, guidelines and policies to ensure environment protection. This includes protection of the environment from climate change. In this regard, the NSW EPA's Climate Change Policy identifies, on p 15, that its main purpose is to address both:

- the NSW EPA's statutory objectives to protect, restore and enhance the quality of the environment in NSW, and to reduce the risks to human health and prevent the degradation of the environment, under section 6(1) of the POEA Act; and
- the NSW EPA's statutory duty to develop environmental quality objectives, guidelines and policies to ensure environment protection from climate change under section 9(1)(a) of the POEA Act.

The delivery of the NSW EPA's *Climate Change Policy* is through an accompanying plan (i.e. the *Climate Change Action Plan 2023–26* [NSW EPA, 2023b]) that sets out specific actions the NSW EPA will take over the next three years and the stronger regulatory action taken over the medium to longer term to support the NSW Government's climate change commitments and policies.

2.3.2 Reporting

NSW Government/Net Zero Commission

Under the Net Zero Future Act the NSW Government has established a NZC in 2024.

The NZC has a number of responsibilities under the Net Zero Future Act, including providing annual reporting to the Government on NSW's progress towards the State's greenhouse gas emission reduction primary targets (and interim targets), and adaptation to climate change.

Table 2
Guiding Principles and Objectives of the Net Zero Future Act

NSW Guiding Principles and Objectives	Metropolitan Coal Position
<i>There is a critical need to act to address climate change, which is a serious threat to the social, economic and environmental wellbeing of New South Wales.</i>	✓
<i>Action to address climate change should be taken as early as possible to minimise the cost and adverse impacts of climate change.</i>	✓
<i>Action to address climate change should be taken in a way that—</i> (a) <i>is fiscally responsible, and</i> (b) <i>promotes sustainable economic growth, and</i> (c) <i>considers the economic risks of delaying action to address climate change, and</i> (d) <i>considers the impact on rural, regional, and remote communities in New South Wales.</i>	✓
<i>Action to address climate change should be consistent with the right to a clean, healthy and sustainable environment.</i>	✓
<i>Action to address climate change should be consistent with the principles of ecologically sustainable development described in the Protection of the Environment Administration Act 1991, section 6(2).</i>	✓
<i>Action to address climate change should involve appropriate consultation with affected persons, communities and stakeholders.</i>	✓
<i>Action to address climate change should take into account the following—</i> (a) <i>the knowledge and perspectives of Aboriginal communities,</i> (b) <i>the best available science,</i> (c) <i>the knowledge of rural, regional and remote communities in New South Wales,</i> (d) <i>the need to support local communities, including Aboriginal communities, who may be affected by the action, including by—</i> (i) <i>considering the impact on local employment and industries, and</i> (ii) <i>diversifying local economies, and</i> (iii) <i>encouraging local procurement, and</i> (iv) <i>optimising job creation and employment transition opportunities, and</i> (v) <i>considering the impact on the amenity of local communities,</i> (e) <i>the need for education and skills diversification,</i> (f) <i>the need to ensure essential utilities and infrastructure are provided, including energy, water, telecommunications and transport,</i> (g) <i>the impact of the action on consumer costs in New South Wales, including energy costs,</i> (h) <i>the need to reduce the risk climate change poses to human health,</i> (i) <i>equity and social justice impacts on socially disadvantaged groups and economically vulnerable regions,</i> (j) <i>the need to reduce the risk climate change poses to the survival of all species.</i>	✓
<i>Action to address climate change should take into account the impact on animals.</i>	✓
<i>The Government of New South Wales is responsible for—</i> (a) <i>urgently developing and implementing strategies, policies and programs to address climate change, and</i> (b) <i>ensuring the Government of New South Wales pursues best practice in addressing climate change.</i>	N/A
<i>The adaptation objective is that New South Wales is more resilient to a changing climate.</i>	✓
<i>The Premier and the Minister must ensure New South Wales achieves the target by 30 June 2050 to reduce net greenhouse gas emissions in New South Wales to zero.</i>	N/A

After: Part 2 of the Net Zero Future Act.

2.3.2.1 2024 Annual Report – Net Zero Commission

The Net Zero Commission prepared its first annual report in 2024 (NZC, 2024). In this initial report the Net Zero Commission stated (NZC, 2024): "Direct emissions from the resources sector have declined since 2005, primarily due to coal mine closures, yet still account for 11 per cent of NSW emissions [in 2022, excluding the land sector]".

For context, at 12% of State emissions, the Resources Sector is one of the lower emitting sectors in NSW, according to data presented by the NZC (NZC, 2024) (Figure 2.1.A):

- **Electricity Sector** (largest contributor) – contributes some **40%** of NSW emissions and this sector's emissions have reduced some **28%** since 2005.
- **Transport Sector** (2nd largest contributor) – contributes some **22%** of NSW emissions and this sector's emissions have reduced some **1%** since 2005.
- **Agriculture Sector** (3rd largest contributor) – contributes some **20%** of NSW emissions and this sector's emissions have reduced some **5%** since 2005.
- **Industry and Waste Sector** (4th largest contributor) – contributes some **18%** of NSW emissions and this sector's emissions have reduced some **26%** since 2005.
- **Resources Sector** (5th largest contributor) – contributes some **12%** of NSW emissions and this sector's emissions have reduced some **34%** since 2005.
- **Built Environment Sector** (smallest contributor) – contributes some **7%** of NSW emissions and this sector's emissions have increased some **92%** since 2005.
- **Land Sector** (negative emissions) – is the only sector analysed with negative emissions (**-19%**), with acceleration of emissions abatement in this NSW sector being observed since 2005.

Further consideration of NSW sectoral emissions performance is provided in Section 3.4.

New South Wales Environment Protection Authority

The NSW EPA reports progress against its climate change action plan in its NSW EPA Annual Report and will review its climate change policy and action plan in 2026, in line with the reporting cycles for the NSW EPA's strategic planning and *NSW State of the Environment* reports (NSW EPA, 2023a).

It is anticipated that licensed facilities in NSW will also progressively be required to expand their annual environmental reporting to include greenhouse gas emissions in accordance with applicable EPL condition updates (Section 2.3.1).

2.3.3 Mitigation and Adaptation

NSW Government

Major emissions reductions initiatives in NSW to reduce greenhouse gas emissions include the:

- NSW Electricity Infrastructure Roadmap, which will deliver a modern energy system for the State and unlock investment in renewable energy;
- NSW Net Zero Industry and Innovation Program, which will help reduce emissions from NSW's industrial sector and invest in new clean technologies for the future;
- NSW Electric Vehicle Strategy, which will accelerate the uptake of electric vehicles;
- NSW Hydrogen Strategy, which will support the growth of a hydrogen industry;

- NSW Waste and Sustainable Materials Strategy, which will reduce emissions through better waste and materials management; and
- NSW Primary Industries Productivity and Abatement Program, which will drive sustainable land management, boost productivity and help reduce emissions.

In a Ministerial Statement regarding the *Net Zero Plan Stage 1: 2020-2030 implementation updates*, the NSW Government stated (NSW Government, 2024):

While acknowledging that sectors of the NSW economy will decarbonise at different rates, the Government's policy is that all sectors need to ratchet down their emissions to meet NSW's legislated targets and the targets that will be established for 2040 and 2045.

Some sectors require long lead-times to secure emissions reductions. The Government's policy is that entities involved in assessment and decision-making processes under the planning system – including the NSW Department of Planning, Infrastructure and Housing (DPHI) and the Independent Planning Commission (IPC) – should consider NSW's emissions-reduction targets and, to the extent relevant, the Climate Change Act's guiding principles when examining new developments.

NSW's emissions reduction targets and the Net Zero Future Act guiding principles are considered in this assessment (Sections 2.3 and 3.2.5).

NSW Environment Protection Authority

The NSW EPA's *Climate Change Action Plan 2023-26* (NSW EPA, 2023b) includes an action to progressively place greenhouse gas limits on new or existing licenced facilities, informed by emission targets to be identified for key industries and implemented in consideration of reporting under the NGER Act (i.e. to reduce duplication of reporting).

The NSW EPA has three current major greenhouse gas/climate change focus areas (NSW EPA, 2024b):

1. Inform and plan:

- *work with industry, government and experts to improve the evidence base on regulating climate change;*
- *embed climate change into planning and regulatory decisions;*
- *support licensees to prepare, implement and report on climate change mitigation and adaptation management plans; and*
- *work with Aboriginal people and our Environment Youth Advisory Council to improve the EPA's evolving climate change response.*

2. Mitigate:

- *establish cost-effective emission reduction targets for key industry sectors;*
- *provide industry with best-practice guidelines to support it to reduce its emissions; and*
- *phase in greenhouse gas emission limits on licences for key industry sectors.*

3. Adapt:

- *develop resilience programs and best-practice adaptation guidance; and*
- *harness citizen science and develop and implement community education programs.*

2.3.4 Offsets

The NSW Government has many climate policies and programs that interact with, or rely upon, a market for carbon offsets. In its submission to the Independent Review of ACCUs (NSW Government, 2022), it stated:

NSW relies on ACCUs for many of its policies

The NSW Government relies on Australian Carbon Credit Units (ACCUs) being robust and trusted by the community and has an interest in ensuring that confidence in the domestic carbon market is restored. ...

Key NSW policies and programs relevant for the ACCU market include:

- *the Primary Industries Productivity and Abatement Program (PIPAP), which supports NSW farmers and land managers to optimise productivity, reduce emissions, access carbon markets and seize new market opportunities. ...*
- *the Vehicle Emissions Offset Scheme, which will provide consumers with the opportunity to offset their CO₂ emissions at the point of registration renewal. The NSW Government will be purchasing ACCUs on behalf of consumers who have chosen to offset their vehicle emissions*
- *the National Parks and Wildlife Service, under the Carbon Positive by 2028 plan, will generate revenue for park management through the sale of premium carbon credits (ACCUs with biodiversity co-benefits)*
- *programs that work with stakeholders who purchase ACCUs or other carbon credits as part of their decarbonisation pathways, such as the Net Zero Industry and Innovation Program and the Business Decarbonisation Support Program*
- *NSW Government agencies who currently or may in the future purchase ACCUs to offset their emissions*
- *...*

In addition, the NSW Government also advocates for carbon farming in NSW (NSW Climate and Energy Action, 2025):

Carbon farming is an essential part of taking action on climate change. Storing carbon in plants and soil is one of the most cost-effective means of removing carbon from the atmosphere. This removal will be needed alongside emissions reduction activities to avoid the most severe impacts of climate change.

In its 2023 emission projections report, the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) also provided the following context for NSW Safeguard Mechanism facilities (NSW DCCEEW, 2024):

Industrial facilities will need to meet their Safeguard Mechanism declining emissions baseline obligations through a combination of onsite reduction and through the surrender of Australian carbon credit units (ACCUs) or Safeguard Mechanism credits (SMCs). How each facility in New South Wales will meet their obligations is not known at this stage, however, for the purpose of NSW's projections, assumptions are made for some sectors/facilities that a certain amount of onsite abatement can be achieved through technology. Any remaining emission reductions obligations under Safeguard Mechanism declining emissions baseline will need to occur through industry surrendering ACCUs or SMCs.

...

The NSW DCCEEW has also recognised that onsite abatement, or the application of offsets within NSW are not required by the Safeguard Mechanism (NSW DCCEEW, 2024):

Although there is no current requirement for onsite abatement, or to offset within New South Wales, there is an opportunity for the NSW Government to leverage existing policies and programs, including Net Zero Industry and Innovation Program (NZIIP) and the EPA's climate change policy and action plan (CCPAP; EPA 2023a,b), to prioritise onsite reduction over offsetting where possible. Furthermore, there is additional opportunity and need to prioritise offsetting within New South Wales, to help New South Wales remain on track to achieve its interim net zero targets. For example, in the draft NSW EPA guide for large emitters, a GHG emissions management hierarchy is outlined, prioritising onsite emissions reductions over offsetting if possible and a preference for NSW based offsets.

The NZC also states the following with respect to offsets and the NSW resources industry (NZC, 2024):

The Safeguard Mechanism aims to incentivise the most cost-effective abatement activities by requiring facilities to keep emissions below their baseline, while facilities that remain below their baseline can sell credits to others. Facilities that do not meet requirements can purchase offsets in the form of Australian Carbon Credit Units or Safeguard Mechanism Credits. The Safeguard Mechanism sets a baseline decline rate of 4.9 per cent per year until 2030. However, prevailing and expected price levels in credit markets may not be sufficient to incentivise some options to reduce emissions, and some emitting mines are not covered in the Safeguard Mechanism because their emissions are below the inclusion threshold.

2.4 CORPORATE

2.4.1 Peabody Greenhouse Gas Policy

Decarbonisation Goals

Peabody Energy Corporation recognises the effects of climate change must be addressed and that a concerted global effort is required to reduce greenhouse gas emissions, including those resulting from the use of energy sources such as coal.

Peabody Energy Corporation acknowledge that, in collaboration with its stakeholders, Peabody Energy Corporation has a responsibility to reduce its greenhouse gas emissions to fulfill its ambition of achieving net zero emissions by 2050 (Peabody Energy Corporation, 2022).

In 2024, Peabody Energy Corporation met its initial short-term goal, reducing Scope 1 and Scope 2 greenhouse gas emissions by 15% from its 2018 baseline. The company has now set a new target to reduce Scope 1 and Scope 2 emissions by 20% from its 2023 baseline by 2030 (Peabody Energy Corporation, 2025).

Emission Intensity Reduction Targets

Emissions intensity reduction obligations, as set by the Safeguard Mechanism, apply to six of Peabody Australia Holdco Pty Ltd operating assets, namely the Metropolitan Coal Mine, Wambo Coal Mine, Coppabella Coal Mine, Moorvale Coal Mine, Centurion Coal Mine and Middlemount Coal Mine. Peabody's operating assets covered by the Safeguard Mechanism will be required to reduce their 'baseline' emissions intensity based on a facility-specific ratio and the default 4.9% per year emissions intensity reduction through to FY30 (i.e. Safeguard facilities with a high facility-specific emissions intensity will have to reduce emissions more aggressively compared to facilities with lower historical emissions intensity).

The emissions intensity reduction obligations set by the Safeguard Mechanism at present to the Metropolitan Coal Mine would apply to the Modification as well, given the Modification relates to an existing Safeguard facility.

2.4.2 Mitigation

Fugitive Emissions Abatement

Fugitive emissions accounted for approximately 64% of Peabody Energy Corporation's Scope 1 emissions in FY24 (Peabody Energy Corporation, 2025). Peabody's current emission reduction opportunities it is exploring for its mines include (Peabody Energy Corporation, 2025):

- coal seam gas drainage;
- flaring;
- gas sales;
- power generation;
- sealing underground mining areas; and
- regenerative thermal oxidation.

In addition, Peabody will continue to support the research, development and deployment of technology that will reduce emissions within our value chain. These efforts include investments in renewables development on previously mined land through the R3 joint venture and support of high-efficiency, low-emissions coal-fuelled generation. Peabody also invests in carbon capture technologies by funding the not-for-profit organisation Low Emission Technology Australia. This organisation focuses on identifying, researching and developing technologies that capture and permanently store CO₂ or reuse CO₂ in other applications.

Metropolitan Coal plans to flare pre-drainage gas from the Bulli Coal Seam using a flare system that is scheduled for construction under the existing Project Approval (08_0149) in 2026. Although this flare system is not part of the Modification, its construction has been proposed as it would also support the Modification, given the Modification aims to extract additional coal reserves. Abatement initiatives specific for the Metropolitan Coal Mine are further described in Section 3.2.4.

Fuel Emissions Abatement

Diesel emissions accounted for approximately 26% of Peabody Energy Corporation's Scope 1 emissions in FY24, with the majority emitted at the Coppabella, Moorvale and Middlemount Coal Mines (Peabody Energy Corporation, 2025).

Metropolitan Coal has invested in adopting the DRIFTEX electric vehicle for the Metropolitan Coal Mine, a solution designed to improve underground mining operations. Developed to reduce carbon emissions, noise and particulate matter, the DRIFTEX significantly improves worker safety and environmental performance by replacing diesel powered underground fleet (Peabody Energy Corporation, 2025).

DRIFTEX vehicles have been acquired and charging stations have been installed at Metropolitan Coal Mine. DRIFTEX vehicles have received regulatory approval and will commence underground in 2025.

2.4.3 Adaptation

Metropolitan Coal would prepare a Climate Change Mitigation and Adaptation Plan in consultation with the NSW EPA for the Metropolitan Coal Mine, should the Modification be approved (Section 3.6).

2.4.4 Offsets

The adoption of carbon offsets (i.e. ACCUs in this context) may in some cases be the most reasonable and feasible opportunity to address difficult to abate emissions associated with fugitive emissions in the short-to-medium-term at any material scale. Metropolitan Coal expects to continue to rely on carbon credits to meet the majority of its Safeguard Mechanism obligations for the foreseeable future.

3 GREENHOUSE GAS EMISSIONS ASSESSMENT AND MITIGATION PLAN

3.1 ASSESSMENT BOUNDARY

The Greenhouse Gas Assessment for the Modification adopts a practical boundary, encompassing key Scope 1, Scope 2, and Scope 3 emission sources (Figure 5). This approach prioritises material emissions from the proposed mining activity (i.e. those significant to the Modification's environmental impact) while also evaluating whether these emissions would occur if the Modification were not implemented.

Greenhouse gas emission scope boundaries for the Modification are discussed in Section 1.4. A summary of key potential greenhouse gas emissions sources considered for the Modification is provided in Table 3 and illustrated schematically on Figure 5.

3.1.1 Scope 1 Emissions

As an underground coal mine, Metropolitan Coal Mine primarily generates fugitive emissions, which dominate its greenhouse gas profile. The assessment boundary encompasses fugitive emissions from mining and post-mining activities, emissions from high-voltage electrical equipment (i.e. SF₆), and emission reductions achieved through the installed flare unit.

Additional minor Scope 1 emissions within the assessment boundary include diesel, oil, and grease consumption and land clearing activities. TAS (2025) evaluated the inclusion of liquid petroleum gas and petrol usage but deemed their contributions negligible.

3.1.2 Scope 2 Emissions

Scope 2 emissions arise from the consumption of purchased electricity used in equipment or operations owned or controlled by the entity. These emissions, classified as indirect, are generated off-site at power plants or other facilities supplying the electricity and are attributed to the entity based on its energy usage.

For the Metropolitan Coal Mine, Scope 2 emissions primarily stem from electricity consumed for the CHPP, ventilation systems, lighting, machinery used in underground mining activities and other surface infrastructure. The assessment boundary includes these emissions.

3.1.3 Scope 3 Emissions

Scope 3 emissions potentially incorporate a very wide range of sources that are both upstream and downstream of the Modification (Figure 5).

Consistent with the approach adopted for Scope 1 emissions, Metropolitan Coal has evaluated the Scope 3 emissions (upstream and downstream) that are more material in nature and most relevant to the key Modification Scope 1 and Scope 2 emission sources as well as the transport and use of coal products.

On this basis, upstream Scope 3 emissions considered in the assessment include those from the production and supply of diesel fuel used on-site and the transmission losses associated with electricity delivered to the mine. However, emissions from company or employee travel and upstream production of construction materials have been excluded due to their negligible impact.

Table 3
Summary of Key Potential Greenhouse Gas Emission Sources

Component	Direct Emissions	Indirect Emissions	
	Scope 1	Scope 2	Scope 3
Diesel consumption (including during decommissioning and construction activities)	Emissions from the combustion of diesel to fuel mobile and stationary plant equipment.	N/A	Upstream third-party emissions attributable to the extraction, production and transport of diesel consumed.
Oil and grease consumption (including during decommissioning and construction activities)	Emissions from the combustion of oil and grease to fuel mobile and stationary plant equipment.	N/A	Upstream third-party emissions attributable to the extraction, production and transport of oil and grease consumed.
Land (vegetation) clearing	Loss of carbon sink due to removal of vegetation.	N/A	N/A
Explosives	N/A	N/A	N/A
Fugitive ¹	Fugitive emissions from extraction of coal including venting, flaring and drainage, occurring both during operation and post mine decommissioning.	N/A	N/A
Post-mining	Fugitive emissions from post mining activities such as the release of residual gases from stockpiling of coal.	N/A	N/A
Electricity consumption for the processing of ROM coal and other on-site uses	N/A	Emissions from the consumption of purchased electricity used during underground mining activities, processing of ROM coal and operation of site infrastructure.	Upstream third-party emissions from the extraction, production and transport of fuel burned for the generation of electricity consumed, and the electricity lost in delivery in the transmission and distribution network.
Product coal transport	N/A	N/A	Downstream third-party emissions from the combustion of diesel used during domestic rail transport and international shipping.
Combustion of product coal	N/A	N/A	Downstream third-party emissions from the combustion of product coal and rejects from the Modification.

After: TAS (2025).

¹ Minor incidental volumes of fugitive SF₆ have also been estimated for completeness as arising from high-voltage electrical equipment (TAS, 2025).

Downstream Scope 3 emissions are highly variable, influenced by factors such as the destination country, transportation methods, handling processes, and the efficiency of coal use. The assessment includes emissions from railing product coal and rejects to the port, international shipping, and combustion of product coal and rejects. Emissions from international port coal handling, in-country transport by customers, and ash disposal have not been estimated (Figure 5).

3.2 GREENHOUSE GAS ASSESSMENT

3.2.1 Greenhouse Gas Emissions Estimation Methodology and Scenarios

The Metropolitan Coal Mine's direct and indirect greenhouse gas emissions have been estimated by TAS (2025) for the three primary scenarios described below using published emission factors from the National Greenhouse Accounts (NGA) Factors where possible (Cth DCCEEW, 2024a).

Where NGA Factors were not available (e.g. for rail and ship transport), greenhouse gas emissions have been estimated based on emissions projections for the same activities for similar projects consistent with the Safeguard Rule as well as relevant guidance for land clearing (Transport Authorities Greenhouse Group, 2013).

Emission factors for electricity usage were obtained from *Australia's emissions projections 2024* (Cth DCCEEW, 2024c). These emission factors are based on projections for the decarbonisation of the NSW electricity grid over time.

The energy contents, emission factors and activity data used to estimate the greenhouse gas emissions for the following three primary scenarios are detailed in Attachment A:

- **Current Baseline scenario** – continuation of Metropolitan Coal Mine operations under the current mine plan (FY28 to FY30). Includes indicative abatement achieved by flaring under the current mine plan. This is referred to as the 'business-as-usual' scenario in the Guide.
- **Modification scenario** – continuation of Metropolitan Coal Mine operations under the proposed mine plan, consistent with the Modification proposal (FY28 to FY31). Includes indicative abatement achieved by flaring under the proposed mine plan. This is referred to as the 'modified business' scenario in the Guide.
- **Modification Only scenario** – the incremental increase in emissions due to the Modification when compared against the current mine plan and the proposed mine plan (i.e. the difference in emissions between the Current Baseline scenario and the Modification scenario). This is referred to as the 'Project only' scenario in the Guide.

In addition to the above scenarios, emissions for the following two sub-scenarios have been estimated to provide a comparison between the originally approved mine and proposed Modification for the purposes of assessing the Modification emissions against the Guide:

- **Approved Baseline scenario** – continuation of the Metropolitan Coal Mine as approved under Project Approval (08_0149).
- **Modification Only Versus Approved Baseline scenario** – the incremental decrease in emissions due to the Modification when compared against the originally approved mine plan (i.e. the difference in emissions between the Approved Baseline scenario and the Modification scenario).

These two sub-scenarios are excluded from Attachment A.

3.2.2 Greenhouse Gas Calculations

The greenhouse gas emissions estimated by TAS (2025) for each primary scenario are summarised in the following sections. Greenhouse gas emissions for the primary scenarios have been calculated in accordance with the requirements of the NGER Act and with reference also Guide (Section 2).

Current Baseline Scenario

The greenhouse gas emissions estimated by TAS (2025) for the Current Baseline scenario are summarised in Table 4.

Table 4
Summary of Greenhouse Gas Emissions Estimates for the Current Baseline Scenario

Component	Estimated Greenhouse Emissions (Mt CO ₂ -e)		
	Scope 1	Scope 2	Scope 3
Annual Average*	0.49	0.014	4.20
Total*	1.8	0.045	12.6

After: TAS (2025).

Note: Mt CO₂-e = Million tonnes of carbon dioxide equivalent.

* The annual average values exclude the decommissioning phase, but the total values include the decommissioning phase.

Modification Scenario

The greenhouse gas emissions estimated by TAS (2025) for the Modification scenario are summarised in Table 5. The total estimated Scope 1 greenhouse gas emissions for the Modification scenario, disaggregated by key source, is detailed in Attachment A and summarised in Graph 1.

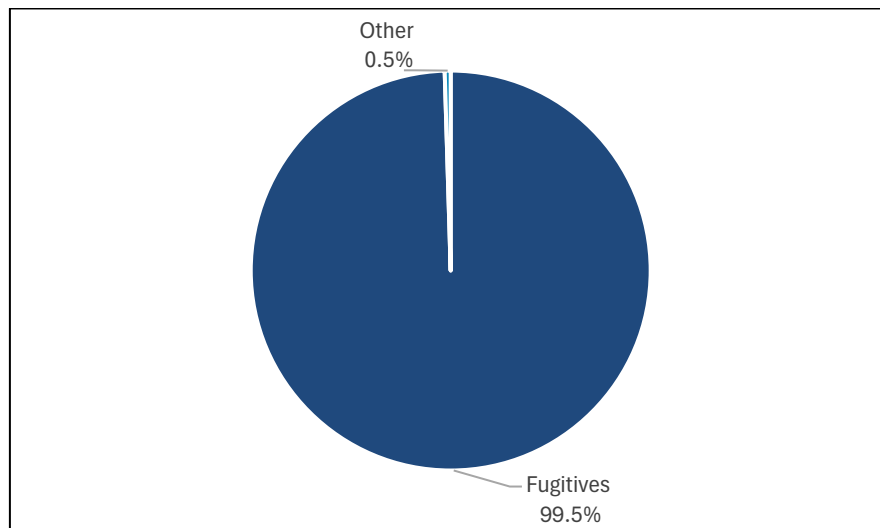
The difference in annual average Scope 1 emissions between the Baseline and Modification scenarios can be primarily attributed to the final year of mining in the Current Baseline scenario, which yields only approximately 570,000 t of ROM coal, substantially less than the approximately 1,420,000 t produced in the Modification scenario final year. This lower final-year production skews the Current Baseline scenario annual average downward compared to the Modification scenario.

Table 5
Summary of Greenhouse Gas Emissions Estimates for the Modification Scenario

Component	Estimated Greenhouse Emissions (Mt CO ₂ -e)		
	Scope 1	Scope 2	Scope 3
Annual Average*	0.81	0.012	5.36
Total*	3.6	0.049	21.5

After: TAS (2025).

* The annual average values exclude the decommissioning phase, but the total values include the decommissioning phase.



Graph 1
Breakdown of Total Predicted Scope 1 Emissions for the Metropolitan Coal Mine Modification Scenario by Source

Modification Only Scenario

The greenhouse gas emissions estimated by TAS (2025) for the Modification Only scenario are summarised in Table 6.

Table 6
Summary of Greenhouse Gas Emissions Estimates for the Modification Only Scenario

Component	Estimated Greenhouse Emissions (Mt CO ₂ -e)		
	Scope 1	Scope 2	Scope 3
Annual Average*	0.39	0.001	2.22
Total	1.8	0.003	8.9

After: TAS (2025).

* The annual average values exclude the decommissioning phase, but the total values include the decommissioning phase.

Approved Baseline Scenario

As previously discussed, a reduced underground mine layout has been implemented at the Metropolitan Coal Mine to support safe and efficient operations (Section 1.2). Accordingly, the Current Baseline scenario already incorporates the relinquishment of certain previously approved longwall mining areas. As a result of this, it is not feasible to reproduce detailed annual mine plans for the Approved Baseline scenario. Consequently, TAS did not undertake a greenhouse gas calculation for this scenario.

To provide an approximation of Scope 1 emissions that would be generated by the originally approved mine plan, the approved mine ROM coal schedule, based on ROM production assessed in the Metropolitan Coal Project greenhouse gas assessment (Holmes Air Sciences, 2008), was multiplied by the Current Baseline Scenario emission intensity of 0.382 t CO₂-e / ROM t (refer Section 3.2.3). This provides an indicative annualised Scope 1 emissions for the originally approved mine plan.

The indicative annual ROM coal schedule and the estimated emissions for the Approved Baseline scenario are provided in Table 7.

Table 7
Summary of Scope 1 Greenhouse Gas Emissions Estimates for the Approved Baseline Scenario

Component	FY28	FY29	FY30	FY31	Total	Annual Average
Approved Baseline Scenario ROM coal (Mt)	2.97	3.03	3.15	2.80	14.55	2.91
Estimated Approved Mine Plan Emissions (Mt CO ₂ -e)	1.14	1.16	1.20	1.07	4.57	1.14

Modification Only Versus Approved Baseline Scenario

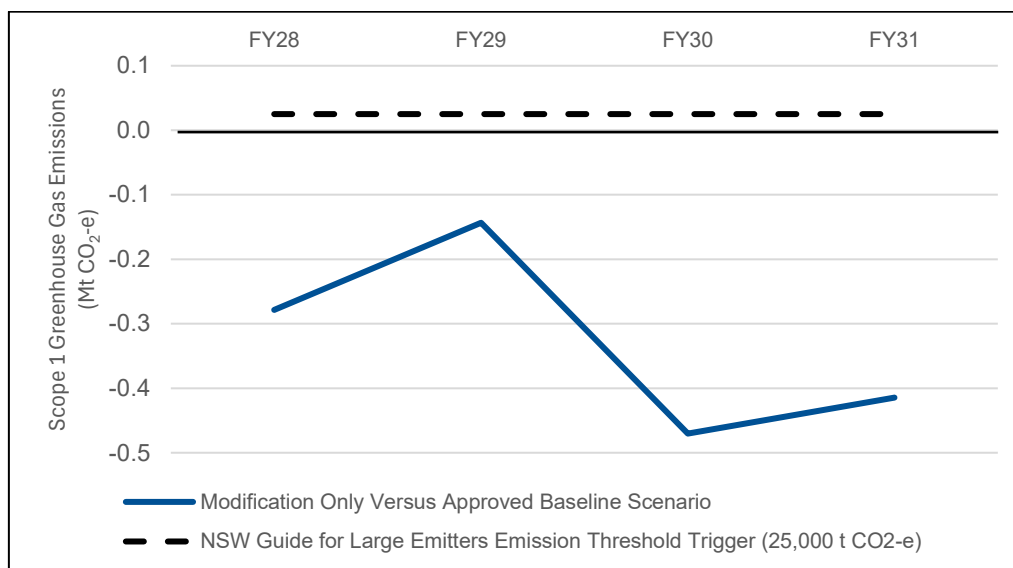
The estimated greenhouse gas emissions for the Modification Only Versus Approved Baseline scenario are summarised in Table 8. During the operational years of the Modification (i.e. FY28 to FY31), the Modification is expected to result in a net decrease of approximately 1.1 Mt CO₂-e compared to the originally approved mine plan. This reduction is a conservative estimate given this analysis only considers a net reduction of approximately 4.3 Mt of ROM coal (from the commencement of FY28) instead of the net reduction of 10.8 Mt of ROM coal that the Modification proposes.

Table 8
Summary of Scope 1 Greenhouse Gas Emissions Estimates for the Modification Only Versus Approved Baseline Scenario

Component	FY28	FY29	FY30	FY31	Total	Annual Average
Estimated Approved Mine Plan Emissions (Mt CO ₂ -e)	1.14	1.16	1.20	1.07	4.57	1.141
Estimated Modification Scenario Emissions (TAS, 2025) (Mt CO ₂ -e)	0.87	1.01	0.73	0.66	3.47	0.81
Estimated Modification Only Versus Approved Baseline Scenario (Mt CO ₂ -e)	-0.27	-0.15	-0.47	-0.41	-1.10	-0.48

The Modification Only Versus Approved Baseline scenario does not exceed the 25,000 t CO₂-e annual threshold described in the Guide (and is in fact negative for all Modification years) and therefore the Modification is not subject to the assessment requirements of the Guide (Chart 2). Nevertheless, the Guide has been considered in preparing this assessment.

Chart 2
Modification Only Versus Approved Baseline Scenario Emissions



The Modification Only Versus Approved Baseline Scenario is not assessed further in this Greenhouse Gas Assessment as it is intended solely to provide an indicative estimate of the emission reductions achieved by the Modification compared to the mine plan approved by Project Approval (08_0149).

Metropolitan Coal Mine Safeguard Mechanism Baseline

The Modification would be incorporated into the Metropolitan Coal Mine and reported as a single facility under the NGER Act with one baseline under the Safeguard Mechanism.

The Safeguard Mechanism baseline value may change over time in accordance with the provisions of the NGER Act and the applicable rules and regulations. Metropolitan Coal would be required to retire ACCUs or SMCs for any exceedance of the baseline.

Discussion of the greenhouse gas emission intensity of the Metropolitan Coal Mine for each scenario is provided in Section 3.2.3, and details of the Metropolitan Coal Mine's relative greenhouse gas contribution at a global, national and state level is provided in Sections 3.4 and 3.5.

3.2.3 Greenhouse Gas Emissions Intensity

Current Baseline Scenario

The estimated Scope 1 and 2 greenhouse gas emissions intensities for the Current Baseline scenario are estimated to be approximately 0.382 and 0.012 t CO₂-e / t ROM coal, respectively (Attachment A).

Modification Scenario

The estimated Scope 1 and 2 greenhouse gas emissions intensities for the Modification scenario are estimated to be approximately 0.428 and 0.006 t CO₂-e / t ROM coal, respectively (Attachment A).

The increase in estimated Scope 1 emissions per t of ROM coal factor for the Modification scenario compared to the Current Baseline scenario is due to the increase in fugitive emissions (as the proportion of methane increases for the Modification longwalls).

3.2.4 Mitigation Measures Incorporated in the Assessment

Metropolitan Coal notes that the Guide provides that future emission abatement opportunities should not be pursued ‘at any cost’ (NSW EPA, 2025):

Emissions reductions are often achieved through efficiency measures or new technologies and processes that may provide cost savings or returns on investment in the short, near or long term. However, mitigation measures may also result in costs to the proponent. While it is not expected that emissions reductions be pursued at any cost, it is expected that the proponent will consider plausible cost-recovery options and other benefits gained to help balance the costs and improve the financial viability of measures. The overall mitigation assessment must consider the cost of abating emissions...

The NSW EPA (2025) provides further guidance regarding decision making regarding the potential feasibility of abatement measures for an individual operation, and the importance of preferred options being cost-effective:

Decisions with respect to achievability will have regard to technical, logistical and financial considerations. Technical and logistical considerations include a wide range of issues that will influence the feasibility of an option: for example, whether a particular technology is compatible with an enterprise’s production processes. Financial considerations relate to the financial viability of an option. It is not expected that reductions in emissions should be pursued ‘at any cost’. Nor does it mean that the preferred option will always be the lowest-cost option. However, it is important that the preferred option is cost-effective. The costs need to be affordable in the context of the relevant industry sector within which the enterprise operates. This will need to be considered on a case-by-case basis through discussions with the EPA.

Existing Greenhouse Gas Management and Mitigation Measures

Condition 10, Schedule 4 of the Metropolitan Coal Mine Project Approval (08_0149) requires Metropolitan Coal to:

...implement all reasonable and feasible measures to minimise:

- (a) energy use on site; and*
- (b) the scope 1, 2 and 3 greenhouse gas emissions produced on site, to the satisfaction of the Director-General.*

Metropolitan Coal currently mitigates greenhouse gas emissions from the Metropolitan Coal Mine in accordance with the Metropolitan Coal Mine Air Quality and Greenhouse Gas Management Plan, which has been prepared in accordance with Condition 13, Schedule 4 of the Metropolitan Coal Mine Project Approval (08_0149).

The current management and mitigation measures include:

- regular maintenance of plant and equipment to minimise fuel consumption and associated emissions; and
- continuing to select plant and equipment that are energy efficient (e.g. electric pumps, fans, compressors or replace all lighting with energy saving light-emitting diodes).

As outlined in Section 2.4.2, Metropolitan Coal has invested in electric vehicle solutions, such as the DRIFTEX, to replace conventional diesel-powered vehicle emissions with clean alternatives. Charging stations are installed at the Metropolitan Coal Mine, and DRIFTEX vehicles have been acquired. Metropolitan Coal Mine has installed underground charging infrastructure, received regulatory approval with the first 2 vehicles to be operational in 2025.

Existing greenhouse gas emission reduction measures that are applied at the Metropolitan Coal Mine in accordance with the Air Quality and Greenhouse Gas Mitigation Plan have been adopted as 'business as usual' for the purposes of the estimation of all scenarios in the Greenhouse Gas Calculation Report (Attachment A) and have not been separately itemised. Any existing greenhouse gas management and mitigation measures would continue for the Modification.

Additional Greenhouse Gas Management and Mitigation Measures

Metropolitan Coal plans to flare pre-drainage gas from the Bulli Coal Seam using a flare system that is scheduled for construction under the existing Project Approval (08_0149) in 2026. While the flare system was approved under the existing Project Approval (08_0149) it has not been constructed to date due to the reduced underground mine layout (i.e. reduced longwall panels to the north) and lower methane levels (Figure 6).

As part of the methane flaring system, gas would be conveyed to the methane flare unit via a surface-to-seam borehole located adjacent to Ventilation Shaft No. 3.

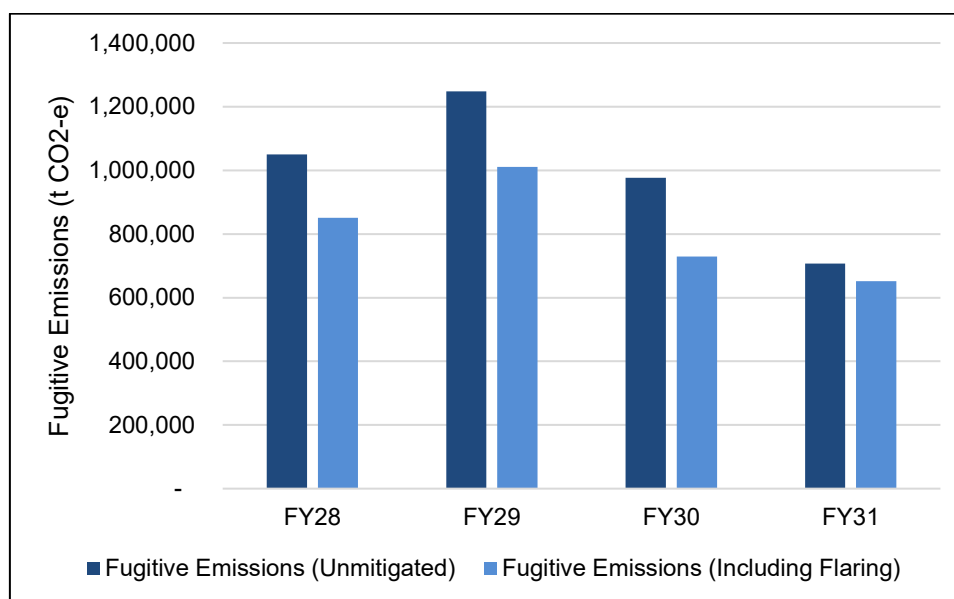
Although this flare system is approved and not part of the Modification, the proposed flare system's construction will support the Modification by reducing greenhouse gas emissions, facilitating the sustainable extraction of additional coal reserves. Further, in the absence of the Modification, Peabody would be unlikely to make significant capital investments into greenhouse gas measures given the limited remaining mine life.

As a result of the proposed flaring of the pre-drainage gas, a reduction in Scope 1 greenhouse gas emissions of approximately 17%, or approximately 700,000 t CO₂-e is anticipated for the Modification (Chart 3).

The flaring system has been adopted for all scenarios and has been separately itemised (Attachment A).

The proposed Modification would extend the operational life of the Metropolitan Coal Mine by approximately two years (compared to the currently approved mining schedule), however, would not extend the mine life beyond the currently approved date (i.e. June 2032). Metropolitan Coal is replacing conventional diesel-powered vehicles with electrical alternatives like the DRIFTEX. With the implementation of a flare system, adoption of electrical vehicle alternatives and the relinquishment of 14 Mt of ROM coal relative to the originally approved mine plan, there are no other reasonable and feasible greenhouse gas mitigation measures that would achieve meaningful emission reductions at the Metropolitan Coal Mine.

Chart 3
Projected Emissions Abatement Achieved by Flaring



3.2.5 Modification Emission Reduction Goals

National

TAS's calculations indicate the average greenhouse gas emissions intensity of the Metropolitan Coal Mine incorporating the Modification would be approximately 0.428 t CO₂-e / t ROM for Scope 1 and 0.006 t CO₂-e / t ROM for Scope 2 emissions (Attachment A).

By way of comparison, the greenhouse gas intensity for Scope 1 emissions at the Metropolitan Coal Mine is considerably higher than the industry default Scope 1 emissions intensity of 0.0653 t CO₂-e / t ROM as set under the Safeguard Rule (Section 2.2.3). The elevated emission intensity is primarily due to the fugitive methane emissions inherent to underground coal mining operations like the Metropolitan Coal Mine, which release greater quantities of methane compared to open cut mines.

Given that Metropolitan Coal Mine is designated as a large facility under the NGER Act, it will have a declining emissions baseline over time, in line with Australia's NDC under the *Paris Agreement* (i.e. reducing net greenhouse gas emissions to 43% below 2005 levels by 2030) (Section 2.3.3).

Under the Safeguard Mechanism, Metropolitan Coal is required to surrender ACCUs or SMCs when Metropolitan Coal Mine's covered emissions exceed the prescribed declining baseline emissions.

Metropolitan Coal is and will continue to meet its obligations under the Safeguard Mechanism, including for the Modification, by retiring ACCUs or SMCs as required.

State

NSW's net emission reduction targets as legislated in the Net Zero Future Act are as follows (Section 2.3):

- 50% reduction on 2005 levels by 2030;
- 70% reduction on 2005 levels by 2035; and
- net zero by 2050.

These targets can be represented graphically as shown on Chart 4. The Net Zero Future Act emission reduction targets established by NSW for 2030 and 2035 are more ambitious than the current Commonwealth targets as set out in Australia's first (updated) NDC (EPA, 2025). However, when considered over whole of the relevant periods between 2005 and 2030 (2% per annum), 2030 and 2035 (4% per annum) and 2035 and 2050 (2% per annum) the annual emission reduction rates are generally comparable to, or lower than, the reformed Safeguard Mechanism decline rates (Table 1).

The relative performance of various NSW economic sectors excluding the significant influence of the land use sector was assessed against the NSW interim emission reduction targets (Chart 5). This comparison reveals the resources sector is the only emitting sector which had an average reported emission reduction rate of approximately 2% per annum, consistent with the average decline rate required to meet the NSW net zero target between 2005 and 2030.

The observed reduction in reported resource sector emissions between 2005 and 2022 occurred prior to the introduction of the reformed Safeguard Mechanism in 2023, which will act to drive further industry net emission reductions, including at the Metropolitan Coal Mine.

The Safeguard Mechanism decline rates have been derived to allow for future growth at both existing and new Safeguard facilities. Based on the above, the Safeguard Mechanism emission decline rates are more ambitious than the average rate of emissions decline that is required between 2005 and 2030 to achieve the NSW interim 2030 target of 50%.

It is noted that the Modification does not seek an extension of the approved mine life and longwall mining would cease prior to 2035.

Ongoing compliance with the Commonwealth Safeguard Mechanism will result in the Modification making a meaningful contribution to NSW emission reduction targets.

3.3 APPLICATION OF GREENHOUSE GAS OFFSETS

In FY24, Metropolitan Coal surrendered 108,846 ACCUs for the Metropolitan Coal Mine. As the Safeguard Mechanism imposes progressive reduction rates (i.e. a decline of 4.9% per annum until 1 July 2029, followed by 3.285% per annum from 1 July 2029 to 1 July 2034) Metropolitan Coal anticipates a continued rise in the volume of surrendered ACCUs.

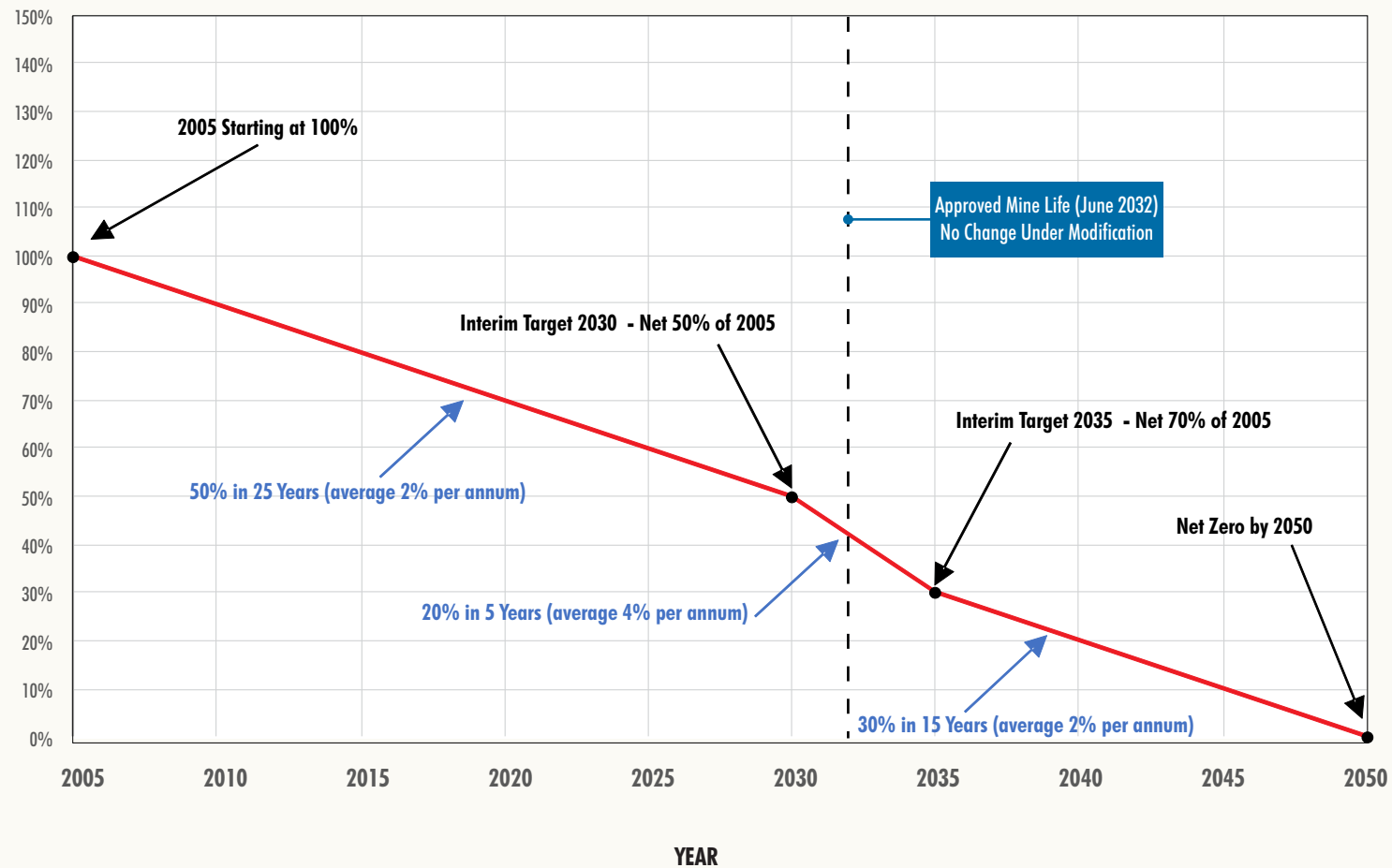
However, with the commissioning of the flare system, the annual surrender of ACCUs is projected to decrease by an average of approximately 175,000 ACCUs from FY28. Metropolitan Coal would continue to fulfill its obligations under the NGER Act and the Safeguard Mechanism by retiring ACCUs or SMCs as required.

3.4 THE MODIFICATION'S RELATIVE GREENHOUSE GAS EMISSIONS CONTRIBUTION

The estimated greenhouse gas emissions of the Modification can be considered in the context of global greenhouse gas emissions associated with anthropogenic sources.

Emissions from power generation (including the combustion of coal and gas), transport (e.g. automobiles, aeroplanes and ships), agriculture for food production and industrial processes all contribute to global emissions.

\\MET-23-34\W0317-318 Mod_GHG_002A

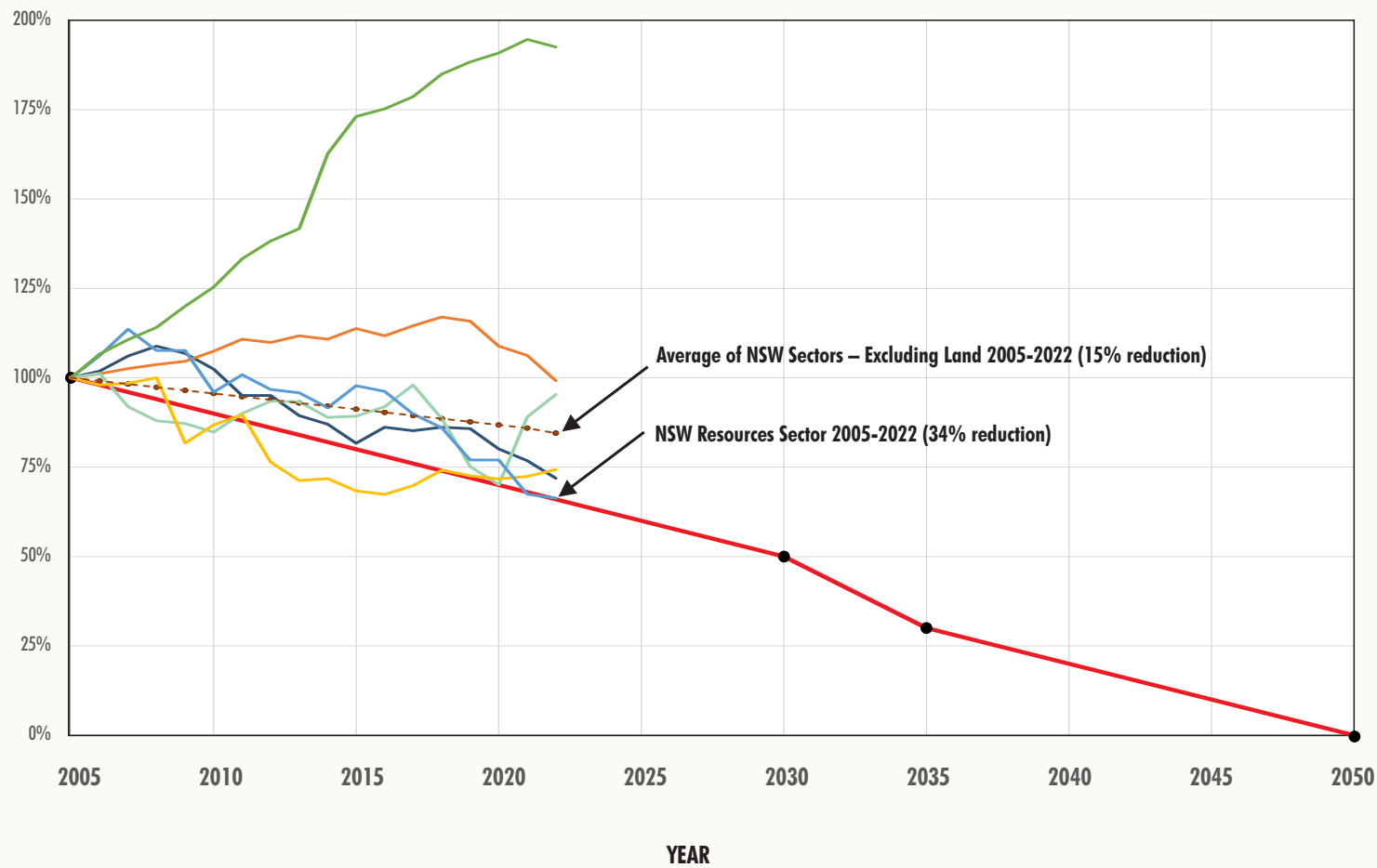


LEGEND
● NSW Net Zero Interim Targets

Source: Metropolitan Coal (2025)

Peabody
METROPOLITAN COAL
NSW Net Zero Interim Targets as
Annual Average Net Reduction Rates

\\MET-23-34\W0317-318 Mod_GHG_003A



- LEGEND
- Electricity Generation
 - Transport
 - Agriculture
 - Industry and Waste
 - Resources
 - Built Environment
 - NSW Average (excluding Land)
 - NSW Net Zero Targets

Source: NZC (2024)

Peabody

METROPOLITAN COAL

NSW Sectoral Performance 2005-2022 (Excluding Land Sector)
- Compared to NSW Net Zero Targets

Chart 5

To gain an understanding of the Modification in the context of the global coal market and global greenhouse gas emissions, the Modification's annual coal production volume can be compared to the current global coal demand and the Modification's greenhouse gas emissions can be compared to total estimated anthropogenic greenhouse gas emissions. The International Energy Agency (IEA) estimates the current global coal demand to be approximately 8,868 Mtpa (IEA, 2025). The proposed peak annual production rate of the Modification of 2.2 Mtpa represents approximately 0.02% of the current estimated annual global coal demand.

Comparison of the Modification's annual average Scope 1 emissions during mining (approximately 0.39 Mt CO₂-e per annum on average [Table 6]) to the total anthropogenic greenhouse gas emissions globally (excluding land use change) in 2023 of approximately 53,100 Mt CO₂-e (United Nations Environment Programme, 2023) indicates that the Modification's Scope 1 emissions would contribute approximately 0.0007% in the context of cumulative global emissions.

Further, comparison of the annual average Scope 3 emissions of customer entities combusting metallurgical coal produced by the Metropolitan Coal (approximately 2.22 Mt CO₂-e per annum on average [Table 6]) to the total anthropogenic greenhouse gas emissions globally (excluding land use change) in 2023 (i.e. 53,100 Mt CO₂-e) indicates these emissions would be approximately 0.004% of global anthropogenic emissions.

Further discussion of the Modification's relative greenhouse gas emissions contribution, in the context of NSW and Australian greenhouse gas emissions, is provided in Section 3.5.

3.5 POTENTIAL IMPACTS OF THE MODIFICATION

3.5.1 Modification Scope 1 and 2 Emissions

The Modification's contribution to Australian emissions would be relatively small, as estimated annual average Scope 1 and 2 emissions from the Metropolitan Coal Mine during the life of the Modification represent approximately 0.35% of the estimated total greenhouse gas emissions in NSW from 2022 (111 Mt CO₂-e) and approximately 0.09% of Australia's annual greenhouse gas emissions from 2023 (440.6 Mt CO₂-e up to June 2024) (Attachment A).

If the Modification is approved and proceeds, the Modification's contribution to global climate change effects would be proportional to its contribution to global greenhouse gas emissions. Greenhouse gases directly generated at the Metropolitan Coal Mine (i.e. Scope 1 emissions) and indirect emissions associated with the on-site use of electricity (i.e. Scope 2 emissions) have together been estimated at approximately 0.39 Mt CO₂-e per year during operations as a result of the Modification Only (Table 6). These emissions would be small in the context of global greenhouse gas emissions (Section 3.4).

Metropolitan Coal would continue to report on its contribution to Australian greenhouse gas emissions inventories through its obligations for reporting under the NGER Act and would comply with other applicable laws and policies implemented by the Commonwealth Government to manage emissions under Australia's progressive NDCs, including under the Safeguard Mechanism as set out above.

Modification Fugitive Emissions

Fugitive emissions associated with the Modification would primarily arise from the disturbance of coal seams during underground mining and the exposure of coal in surface stockpiles and have been calculated by TAS (2025). Fugitive emissions will be reduced with the commissioning of a flaring unit in 2026. The NSW Net Zero Emissions Dashboard provides estimates of future emissions categorised using the IPCC Sectors (NSW Government, 2024). The Modification's contribution to NSW's projected fugitive emissions is predicted to represent approximately 1.3% (in FY33) to 7.4% (in FY29) of the annual NSW fugitive emissions during the life of the Modification (Attachment A).

Modification Stationary Energy Emissions

Stationary energy (excluding electricity generation) emissions associated with the Modification would occur from the consumption of diesel, gasoline, oil and grease and have been calculated by TAS (2025). The Modification's contribution to NSW's projected stationary energy emissions is predicted to represent approximately 0.01% (FY32 and FY33) to 0.03% (in FY29 to FY31) of the annual NSW stationary energy emissions during the life of the Modification (Attachment A).

3.5.2 Modification Scope 3 Emissions

The estimated greenhouse gas emissions of the Modification can be considered in the context of global greenhouse gas emissions associated with anthropogenic sources. Emissions from power generation (including the combustion of coal and gas), transport (e.g. automobiles, aeroplanes and ships), agriculture for food production and industrial processes (e.g. steel production) all contribute to global emissions.

The Modification's Scope 1 and 2 emissions would be significantly less than the Scope 3 emissions produced by customers using Metropolitan Coal Mine product coal. It is anticipated that the majority of the Scope 3 emissions from the use of Metropolitan Coal Mine coal would occur overseas. The estimated Scope 3 emissions associated with the combustion of coal produced by the Metropolitan Coal Mine by customer entities would represent approximately 0.004% of the total anthropogenic greenhouse gas emissions globally (excluding land use change) in 2023 (Section 3.4).

Under the *Paris Agreement*, each Party is required to prepare, communicate and maintain NDCs that will contribute to the long-term goals of the *Paris Agreement* (UNFCCC, 2024d).

It is important to note that under the *Paris Agreement*, each NDC reflects the country's ambition for reducing emissions, taking into account its domestic circumstances and capabilities (UNFCCC, 2024e). Each country will have its own range of opportunities and priorities to trade off various alternative emission reduction (and carbon sink) options having regard to the economic priorities and physical attributes of the country.

Table 9 provides a high-level summary of the NDCs under the *Paris Agreement* of the expected export countries for Metropolitan Coal Mine product coal. It should be noted that, under the *Paris Agreement*, these NDCs are successive and are to be updated every five years, with the next round of NDCs due by the end of 2025 (UNFCCC, 2024e). The review mechanisms under the *Paris Agreement*, therefore, provide for increasing the stringency of emission control measures as required over time to achieve the goals of the *Paris Agreement*.

Given the highly variable nature of the international coal market, it is inherently difficult to predict the percentage of Modification product coal that would be sold into each potential international market. Notwithstanding, based on historical data of future coal product sales, Metropolitan Coal anticipates the Modification would provide approximately 60% of its product coal to international customers. The remainder is used for steelmaking in Australia.

Table 9
Summary of Expected Export Countries for the Metropolitan Coal Mine and their NDCs

Destination Country / State	Summary of NDC
Australia	A 43% reduction in greenhouse gas emissions below 2005 levels by 2030. Net zero emissions by 2050.
Vietnam	A 15.8% reduction in greenhouse gas emissions compared to the business-as-usual projection for 2030 by 2030, or a total of approximately 146.3 Mt CO ₂ -e in 2030 (unconditional with domestic resources). A 43.5% reduction in greenhouse gas emissions compared to the business-as-usual projection for 2030 by 2030, or a total of approximately 403.7 Mt CO ₂ -e in 2030 (conditional with international support). Vietnam has adopted a target of net zero emissions by 2050 in its National Climate Change Strategy although its NDC contributions are to 2030.
India	A 45% reduction in greenhouse gas emissions intensity from 2005 level by 2030. Net zero emissions by 2070.
Sweden	A 50% reduction in greenhouse gas emissions below 2005 levels by 2030.
Argentina	A target not to exceed net emissions of 349 Mt CO ₂ -e by 2030. Net zero emissions by 2050.

After: Commonwealth of Australia (2022); Government of Vietnam (2022); Government of India (2022); European Union (2023); Government of Argentina (2021).

¹ Based on a historical average sales composition projected forward, changing global and domestic market dynamics could lead to alternate distribution of product.

3.6 ADAPTIVE MANAGEMENT

Condition 13 of Schedule 4 of Project Approval (08_0149) requires the development of an Air Quality and Greenhouse Gas Management Plan for the Metropolitan Coal Mine.

Metropolitan Coal anticipates that the existing Air Quality and Greenhouse Gas Management Plan will either be updated or replaced with a new Climate Change Mitigation and Adaptation Plan in consultation with the NSW EPA. Should the Modification be approved, Metropolitan Coal anticipates that the Development Consent conditions for the Modification would reflect contemporary NSW EPA guidance on the content of a Climate Change Mitigation and Adaptation Plan, including:

- Measures to avoid and reduce Modification greenhouse gas emissions applying the NSW EPA's mitigation hierarchy (avoid, reduce, substitute and offset), inclusive of:
 - A description of measures that would be implemented to reduce site Scope 1 and Scope 2 emissions, including:
 - whether the proposed measures represent best-practice;
 - the likely effectiveness of the mitigation measures; and
 - benchmarking of predicted emissions intensity per unit production to other comparable project and the Safeguard Mechanism default intensity.
- Measurable greenhouse gas emission goals.
- Detailed energy efficiency plans.
- Commitment to monitoring, reporting and reviewing performance of greenhouse gas abatement measures and emissions.
- Expected impacts of the Safeguard Mechanism Baseline on year-to-year emissions.

- Comparison of emissions to NSW Government's legislated emissions reduction targets.
- Strategies to offset excess greenhouse gas emissions.
- Description of the monitoring and reporting on greenhouse gas emissions performance, including performance benchmarking and the NGER Act's reporting obligations.
- A timetable for periodic review of the Climate Change Mitigation and Adaption Plan and associated proposed mitigation, reporting and the overarching greenhouse gas management goals of Metropolitan Coal.

4 CONCLUSION

As mining operations have progressed at the Metropolitan Coal Mine, ongoing exploration activities have identified geological and geotechnical constraints which affect the available coal resource. To maintain safe and efficient operations, a reduced underground mine layout has been implemented for the Metropolitan Coal Mine. The reduced underground mine layout incorporates shortened starting (i.e. northern) and finishing (i.e. southern) ends of Longwalls 301-316 and shortened starting position of Longwall 26 compared to the approved underground mine layout. Approximately 26% of the Metropolitan Coal Mine approved underground mine layout area would not be mined.

As a result, Metropolitan Coal is proposing the Modification to maximise the recovery of coal resources within the currently approved mine life (until mid-2032).

The Modification would result in a net reduction of 10.8 Mt of ROM coal and decrease of approximately 1.1 Mt CO₂-e when compared to the originally approved Metropolitan Coal Mine. Notwithstanding, this assessment has estimated potential Scope 1, Scope 2 and Scope 3 greenhouse gas emissions for the Modification.

The greenhouse gas calculations completed for this assessment indicate the average greenhouse gas emissions intensity of the Metropolitan Coal Mine incorporating the Modification would be approximately 0.428 t CO₂-e / t ROM for Scope 1 emissions. These greenhouse gas emissions from the Modification would be mitigated by a methane flare unit being constructed in 2026 under Project Approval (08_0149). As a result of the proposed flaring of the pre-drainage gas, a reduction in Scope 1 greenhouse gas emissions of approximately 700,000 t CO₂-e (or 17%) is anticipated compared to unflared fugitive emissions. Metropolitan Coal is also replacing diesel-powered underground fleet with an electric powered fleet. There are no other reasonable and feasible greenhouse gas emission reduction opportunities for the life of the Metropolitan Coal Mine.

The Modification's contribution to NSW and Australian emissions would be relatively small, as estimated annual average Scope 1 and 2 emissions from the Metropolitan Coal Mine during the life of the Modification represent approximately 0.35% of the estimated total greenhouse gas emissions in NSW from 2022 (111 Mt CO₂-e) and approximately 0.09% of Australia's annual greenhouse gas emissions from 2023 (440.6 Mt CO₂-e up to June 2024) (Attachment A).

Reformed Safeguard Mechanism decline rates have been derived by the Commonwealth Government to conservatively account for future growth at both existing and new facilities and are more aggressive than the average rate of emissions decline that is required between 2005 and 2030 (2%) to achieve the NSW interim 2030 target of 50%. Metropolitan Coal is and will continue to meet its obligations under the Safeguard Mechanism, including for the Modification, by retiring ACCUs or SMCs as required.

If the Modification is approved and proceeds, the Modification's contribution to global climate change effects would be proportional to its contribution to global greenhouse gas emissions. Greenhouse gases directly generated at the Metropolitan Coal Mine (i.e. Scope 1 emissions) and indirect emissions associated with the on-site use of electricity (i.e. Scope 2 emissions) including the Modification have together been estimated at approximately 0.39 Mt CO₂-e per year during operations. These emissions would be small in the context of global greenhouse gas emissions.

The Modification would produce approximately an additional 3.2 Mtpa of ROM coal. In the context of current global coal production and consumption, the Modification production is minor. It is anticipated that the majority of the Scope 3 emissions from the use of Metropolitan Coal Mine coal would occur overseas. The estimated scope 3 emissions associated with the combustion of coal produced by the Metropolitan Coal Mine by customer entities would represent approximately 0.004% of the total anthropogenic greenhouse gas emissions globally (excluding land use change) in 2023.

In relation to greenhouse gas emission, climate change and the principles of ecologically sustainable development, it is noted that:

- Greenhouse gas emissions estimates for the Modification (Scope 1, 2 and 3) have accounted for uncertainty by adopting conservative assumptions (Attachment A).
- The assessment of greenhouse gas emissions of the Modification allows the effective integration of social, economic and environmental consideration in the decision-making process.
- Metropolitan Coal would continue to implement mitigation measures to minimise the Modification's Scope 1 greenhouse gas emissions.
- The greenhouse gas emissions associated with the combustion of the Metropolitan Coal Mine product coal will be primarily addressed and regulated by the expected export countries, under their NDCs.

In relation to Australian and NSW laws and policies, it is noted that:

- There is nothing in existing climate change laws and policies which prohibits the approval of new coal mining development (including 'brownfield' extensions such as the Modification).
- None of the mechanisms or measures that Australia has adopted for the purpose of meeting its NDC under the projected include restrictions on coal mine extensions.
- Metropolitan Coal would continue to comply with the Federal Government's Safeguard Mechanism offsetting its emissions above its baseline, or otherwise managing compliance.
- None of the mechanisms or measures that NSW has adopted for the purpose of meeting the Net Zero Future Act include restrictions on coal mine extensions.
- Modification ROM coal production would be completed well before 2050, which is the target date for NSW and Australia achieving net zero emissions.
- It is the NSW Government's policy² that coal in NSW continues to be developed in recognition of the significant social and economic benefits to NSW that result from the efficient development of mineral resources.

Metropolitan Coal would continue to supply metallurgical coal to BlueScope's Port Kembla Steelworks for a further two years under the Modification.

The analysis conducted for this assessment indicates that ongoing compliance with the Commonwealth Safeguard Mechanism will result in the Modification making a meaningful contribution to NSW emission reduction targets.

² As embodied in the NSW *Mining Act 1992*, the *State Environmental Planning Policy (Resources and Energy) 2021*, the Net Zero Plan (DPIE, 2020) and the *Strategic Statement on Coal Exploration and Mining in NSW* (NSW Government, 2020).

5 REFERENCES

- Clean Energy Regulator (2024) *Emissions intensity determination data for safeguard facilities*.
Website: <https://cer.gov.au/markets/reports-and-data/emissions-intensity-determination-data-safeguard-facilities>
- Clean Energy Regulator (2025) *Safeguard baselines*.
Website: <https://cer.gov.au/schemes/safeguard-mechanism/safeguard-baselines>
- Commonwealth Climate Change Authority (2024a) *Sector Pathways Review*.
- Commonwealth Climate Change Authority (2024b) *Targets, Pathways and Progress paper*.
- Commonwealth Department of Climate Change, Energy, the Environment and Water (2024a) *National Greenhouse Accounts Factors: 2024*.
- Commonwealth Department of Climate Change, Energy, the Environment and Water (2024b) *Safeguard Mechanism – About the Safeguard Mechanism and the reforms*.
Website: <https://www.dcceew.gov.au/sites/default/files/documents/safeguard-mechanism-reforms-factsheet-2023.pdf>
- Commonwealth Department of Climate Change, Energy, the Environment and Water (2024c) *Australia's emissions projections 2024*.
- Commonwealth Department of Climate Change, Energy, the Environment and Water (2025) *Net Zero*.
Website: <https://www.dcceew.gov.au/climate-change/emissions-reduction/net-zero>
- Commonwealth of Australia (2015) *Australia's Intended Nationally Determined Contribution to a new Climate Change Agreement*.
- Commonwealth of Australia (2021) *Australia's Long Term Emissions Reduction Plan*.
- Commonwealth of Australia (2022) *Australia's Nationally Determined Contribution Communication 2022*.
- European Union (2023) *Update of the NDC of the European Union and its Member States*.
- Government of Argentina (2021) *Argentina Second NDC (Updated submission)*.
- Government of Australia (2022) *Australia's Nationally Determined Contribution Communication 2022*.
- Government of India (2022) *India's Updated First Nationally Determined Contribution Under Paris Agreement. August 2022 Submission to UNFCCC*.
- Government of Vietnam (2022) *Nationally Determined Contribution (NDC) (Updated In 2022)*.
- Helensburgh Coal Pty Ltd (2009) *Metropolitan Coal Project Environmental Assessment*.
- Holmes Air Sciences (2008) *Air Quality Impact Assessment: Metropolitan Coal Project*.
- International Energy Agency (2025) *Global coal consumption, 2000–2026*.
Website: <https://www.iea.org/data-and-statistics/charts/global-coal-consumption-2000-2026>

Net Zero Commission (2024) *2024 Annual Report*.

Website: <https://www.parliament.nsw.gov.au/tp/files/190092/Enclosure%201%20-%20Net%20Zero%20Commission%202024%20Annual%20Report.pdf>

New South Wales Climate and Energy Action (2025) *Carbon farming benefits*.

Website: <https://www.energy.nsw.gov.au/business-and-industry/programs-grants-and-schemes/primary-industries-productivity-and-abatement/carbon-farming-benefits>

New South Wales Department of Climate Change, Energy, the Environment and Water (2024) *NSW greenhouse gas emissions projections 2023 Methods Paper*.

New South Wales Department of Planning, Infrastructure and Environment (2020) *Net Zero Plan Stage 1: 2020-2023*.

New South Wales Department of Planning, Infrastructure and Environment (2021) *Net Zero Plan Stage 1: 2020-2030 implementation update*.

New South Wales Environment Protection Authority (2023a) *Climate Change Policy*.

New South Wales Environment Protection Authority (2023b) *Climate Change Action Plan 2023–26*.

New South Wales Environment Protection Authority (2024) *Consultation summary – Climate Change Assessment Requirements and the supporting Guide for Large Emitters*.

New South Wales Environment Protection Authority (2025) *NSW Guide for Large Emitters – Guidance on how to prepare a greenhouse gas assessment as part of NSW environmental planning processes*.

New South Wales Government (2020) *Strategic Statement on Coal Exploration and Mining in NSW*.

New South Wales Government (2022) *Independent Review of Australian Carbon Credit Units: Call for submissions*.

Website: <https://consult.dcceew.gov.au/independent-review-of-accu/submission/view/205>

New South Wales Government (2024) *Ministerial Statement Updates regarding Net Zero Plan Stage 1: 2020–2030 and previous Implementation Updates*.

New South Wales Office of Environment and Heritage (2016) *NSW Climate Change Policy Framework*.

Peabody Energy Corporation (2022) *Peabody Statement on Climate Change*.

Peabody Energy Corporation (2025) *2024 Sustainability Report*.

Todoroski Air Science Pty Ltd (2025) *Metropolitan Coal Calculation Report*.

Transport Authorities Greenhouse Group (2013) *Greenhouse Gas Assessment Workbook for Road Project*.

United Nations Framework Convention on Climate Change (2024a) *Glasgow Climate Pact*.

Website: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf

United Nations Framework Convention on Climate Change (2024b) *What is the Kyoto Protocol?*

Website: https://unfccc.int/kyoto_protocol

United Nations Framework Convention on Climate Change (2024c) *What is the Paris Agreement?*

Website: <https://unfccc.int/process-and-meetings/the-paris-agreement/what-is-the-paris-agreement>

United Nations Framework Convention on Climate Change (2024d) *Nationally Determined Contributions (NDCs)*.

Website: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-parisagreement/nationallydetermined-contributions-ndcs>

United Nations Framework Convention on Climate Change (2024e) *The Katowice climate package: Making the Paris Agreement Work For All*.

Website: <https://unfccc.int/process-and-meetings/the-paris-agreement/katowice-climate-package#eq-1>

United States Environmental Protection Agency (2024) *Scope 3 Inventory Guidance*.

World Business Council for Sustainable Development and World Resources Institute (2024) *Greenhouse Gas Protocol*.

**ATTACHMENT A
GREENHOUSE GAS CALCULATIONS REPORT**



TODOROSKI
AIR SCIENCES

GREENHOUSE GAS CALCULATIONS METROPOLITAN COAL LONGWALL 317 AND 318 MODIFICATION

Metropolitan Collieries Pty Ltd

21 May 2025

Job Number 24101783

Prepared by

Todoroski Air Sciences Pty Ltd

Suite 2B, 14 Glen Street

Eastwood, NSW 2122

Phone: (02) 9874 2123

Email: info@airsciences.com.au

Greenhouse Gas Calculations

Metropolitan Coal Longwall 317 and 318 Modification

DOCUMENT CONTROL

Report Version	Prepared by	Reviewed by
FINAL - 001	PH	AT

This report has been prepared per the scope of works between Todoroski Air Sciences Pty Ltd (TAS) and the client. TAS relies on and presumes accurate the information (or lack thereof) made available to it to conduct the work. If this is not the case, the findings of the report may change. TAS has applied the usual care and diligence of the profession prevailing at the time of preparing this report and commensurate with the information available. No other warranty or guarantee is implied in regard to the content and findings of the report. Preparing this report involves the use of confidential intellectual property that belongs to TAS. The report is provided on the basis that any documents, including modelling files etc. that may contain this intellectual property will not be provided by TAS to any party under any circumstances (including where this intellectual property is part of any new work developed for this report). The report has been prepared exclusively for the use of the client, for the stated purpose and must be read in full. No responsibility is accepted for the use of the report or part thereof in any other context or by any third party.

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Overview of Metropolitan Coal	1
1.2	Overview of the Modification	1
2	GREENHOUSE GAS INVENTORY	3
2.1	Emission sources	3
2.1.1	Modification scenario	4
2.1.2	Baseline scenario	4
2.1.3	Modification Only scenario	4
2.1.4	Scope 3 sources	5
2.2	Emission factors	6
2.3	Calculated GHG emissions for Baseline, Modification and Modification Only scenarios	7
2.4	Summary of GHG Emissions	10
2.5	Contribution of GHG emissions	10
2.6	Comparison with projected future GHG emissions for NSW	11
3	SUMMARY AND CONCLUSIONS	14
4	REFERENCES	15

LIST OF TABLES

Table 2-1: Summary of quantities of materials estimated for the Modification scenario	5
Table 2-2: Summary of quantities of materials estimated for the Baseline scenario	5
Table 2-3: Summary of emission factors	6
Table 2-4: Summary of emission factors for electricity usage (t CO ₂ -e/MWh).....	7
Table 2-5: Summary of CO ₂ -e emissions for the Modification scenario (kt CO ₂ -e).....	8
Table 2-6: Summary of CO ₂ -e emissions for the Baseline scenario (kt CO ₂ -e).....	8
Table 2-7: Summary of CO ₂ -e emissions for the Modification only scenario (kt CO ₂ -e).....	8
Table 2-8: Summary of CO ₂ -e emissions per unit of production for the Modification scenario	9
Table 2-9: Summary of CO ₂ -e emissions per unit of production for the Baseline scenario	10
Table 2-10: Summary of CO ₂ -e emissions per scope (Mt CO ₂ -e)	10

LIST OF FIGURES

Figure 1-1: General project arrangement	2
Figure 2-1: ROM production rate for the Baseline and Modification scenarios	4
Figure 2-2: Summary of CO ₂ -e emissions for the Modification scenario.....	9
Figure 2-3: Summary of CO ₂ -e emissions for the Baseline scenario.....	9
Figure 2-4: Comparison of Scope 1 emissions for the Modification with projected future GHG emissions for NSW	12
Figure 2-5: Comparison of Fugitive emissions for the Modification with projected future Fugitive emissions for NSW	12
Figure 2-6: Comparison of Stationary Energy emissions for the Modification with projected future Stationary Energy emissions for NSW	13

1 INTRODUCTION

Todoroski Air Sciences Pty Ltd has prepared these greenhouse gas calculations for the proposed Metropolitan Coal Longwall 317 and 318 Modification (hereafter referred to as the Modification).

1.1 Overview of Metropolitan Coal

The Metropolitan Colliery (Metropolitan Coal Mine) is an underground coal mining operation located approximately 30 kilometres (km) north of Wollongong, adjacent to the township of Helensburgh in New South Wales (NSW). The Metropolitan Coal Mine is operated by Metropolitan Collieries Pty Ltd (Metropolitan Coal), a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody).

Mining operations at the Metropolitan Coal Mine are approved under Project Approval (PA) 08_0149 and permit mining operations until 22 June 2032 with approval to extract up to 3.2 million tonnes (Mt) of run-of-mine (ROM) coal in a calendar year and transport up to 2.8 Mt of product coal in a calendar year.

1.2 Overview of the Modification

Metropolitan Coal is proposing to modify PA 08_0149 to allow for the optimisation and continued operations at the Metropolitan Coal Mine. In summary, the Modification would comprise the following components:

- ✦ extension of the approved Longwall 317 to the north;
- ✦ addition of Longwall 318 to the west of the approved longwalls;
- ✦ extension of the approved 300-series Mains to the west;
- ✦ continued development of the 300-series main to the west of approved mains development;
- ✦ extraction of an additional 3.2 Mt of ROM coal;
- ✦ relinquishment of 14 Mt of approved ROM coal;
- ✦ relocation of the approved (but not yet constructed) Ventilation Shaft 4;
- ✦ continued transportation of coal rejects off-site for the life of the mine via a combination of rail and road; and
- ✦ relinquishment of approved surface development and underground mining areas.

No other changes to the approved Metropolitan Coal Mine (including the existing infrastructure and surface facilities) would be required for the Modification.

A general project arrangement is shown in **Figure 1-1**.

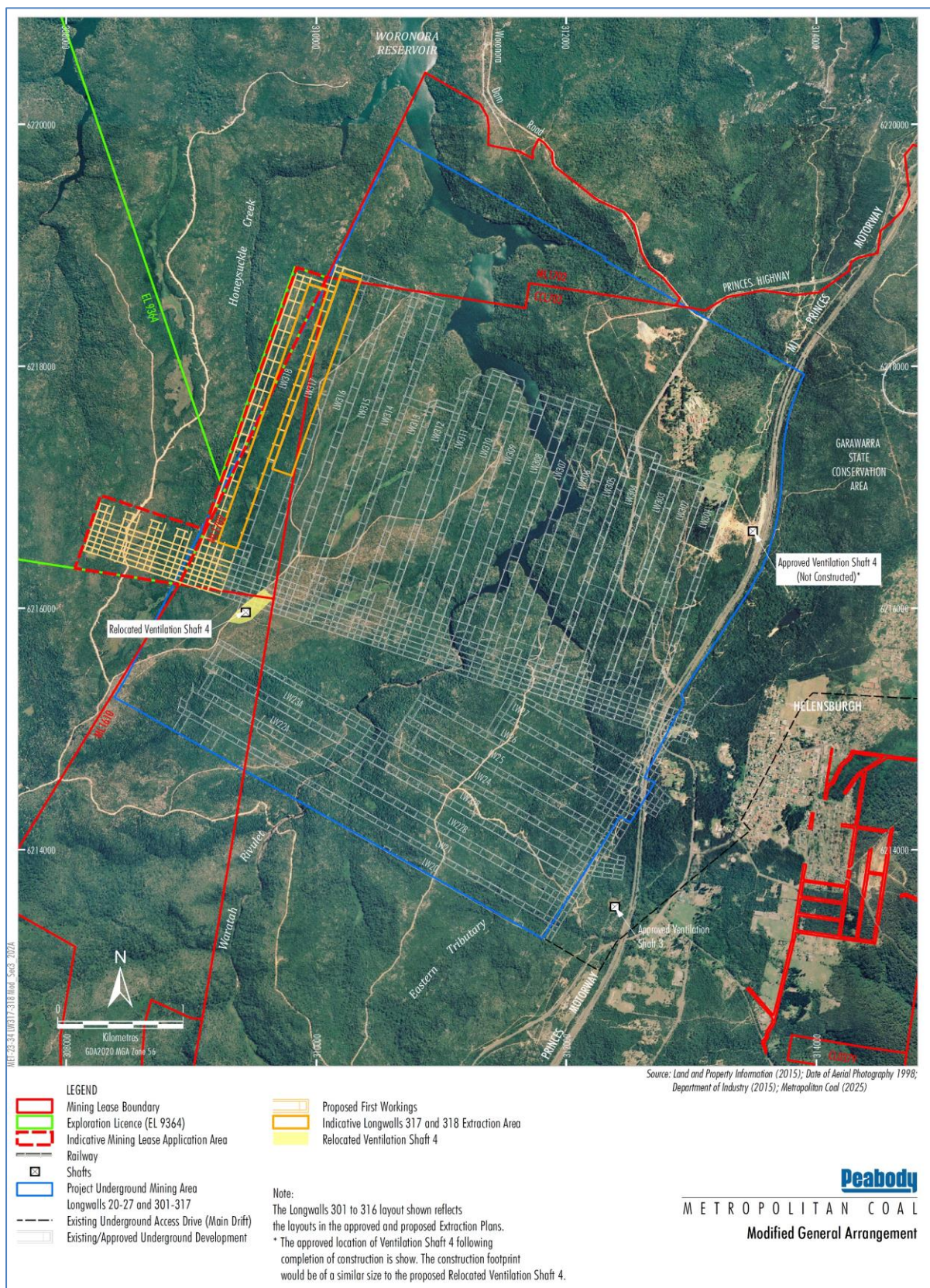


Figure 1-1: General project arrangement

2 GREENHOUSE GAS INVENTORY

The Australian *National Greenhouse Accounts Factors* (NGA Factors) document published by the Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) (2024a) defines three scopes (Scope 1, 2 and 3) for different emission categories based on whether the emissions are from "direct" or "indirect" sources.

Scope 1 emissions encompass the direct sources from the Modification defined as:

"...produced from sources within the boundary of an organisation and as a result of that organisation's activities" (Cth DCCEEW, 2024a).

Scope 2 emissions are produced by the burning of fossil fuels to generate electricity and defined as:

"...indirect emissions which occur as a result of activities that generate electricity, heating, cooling or steam that is consumed by an organisation but which is generated outside that organisation's boundaries" (Cth DCCEEW, 2024a).

Scope 3 emissions are other indirect emissions which:

"...occur outside of the boundary of an organisation as a result of actions by the organisation" (Cth DCCEEW, 2024a).

For the purpose of this assessment, emissions generated in all three scopes defined above provide a suitable approximation of the total greenhouse gas (GHG) emissions generated from the Modification and the approved Metropolitan Coal Mine (in terms of Scope 1 emissions) and the key GHG emissions indirectly associated with the Modification that are generated by third parties (in terms of Scope 2 and 3 emissions).

Scope 3 emissions can be a significant component of the total emissions inventory. However, these emissions are not controlled by the operation; rather, they are indirectly associated with the operation. These emissions are understood to be the Scope 1 emissions from other organisations (such as the customers who purchase Metropolitan Coal Mine coal).

2.1 Emission sources

Scope 1 GHG emission sources identified from the Metropolitan Coal Mine, and that would be GHG emission sources for the Modification, are the on-site combustion of diesel fuel, petroleum-based oils and greases, release of sulfur hexafluoride (SF₆) from gas insulated switchgear and fugitive emissions from the exposed coal seams. Scope 2 GHG emission sources are associated with the generation of purchased electricity. Scope 3 emissions have been identified as resulting from the purchase of consumables for use on-site and the transport of and final use of the product coal.

Estimated quantities of materials and variables used to calculate the potential GHG emissions associated with Scope 1, 2 and 3 emissions for the Metropolitan Coal Mine, both with and without the Modification, have been described for the operational and decommissioning phases. These estimates are based on the planned Metropolitan Coal Mine and Modification production and would provide a reasonable worst-case approximation of the potential GHG emissions for the purpose of this assessment.

The construction phase of the Modification has not been considered separately, as the mine is already operational and any additional construction emissions have been factored into the early years of the Modification.

2.1.1 Modification scenario

Table 2-1 summarises the quantities of materials estimated for the operational and decommissioning phases under the Modification scenario, which is referred to as the 'modified business' scenario in the *NSW Guide for Large Emitters (NSW Environment Protection Agency [EPA], 2025)*.

For the purposes of this assessment, it is assumed the Modification begins in financial year 2028 (FY28).

The decommissioning phase involves activities to prepare the site for closure and is projected to occur over a two-year period from FY32 to FY33 under the Modification scenario.

2.1.2 Baseline scenario

Estimates for a Baseline scenario based on the current approved operations under PA 08_0149 have been calculated. Note that in the *NSW Guide for Large Emitters (NSW EPA, 2025)* the Baseline scenario is referred to as the 'business-as-usual' scenario.

The decommissioning phase involves activities to prepare the site for closure and is projected to occur over a two-year period from FY31 to FY32 under the Baseline scenario.

Emission sources identified for the Baseline scenario's operational and decommissioning phases is provided in **Table 2-2**.

2.1.3 Modification Only scenario

The Modification Only scenario is the difference between the Modification scenario and the Baseline scenario presented in Sections 2.1.1 and 2.1.2, respectively. Note that in the *NSW Guide for Large Emitters (NSW EPA, 2025)* the Modification Only scenario is referred to as the 'project only' scenario.

The ROM production rate for the Baseline and Modification scenarios are presented in **Figure 2-1**. The additional ROM production associated with the Modification is shown as the stacked green bars, occurring from FY28 to FY31. This additional ROM production corresponds to the Project only scenario.

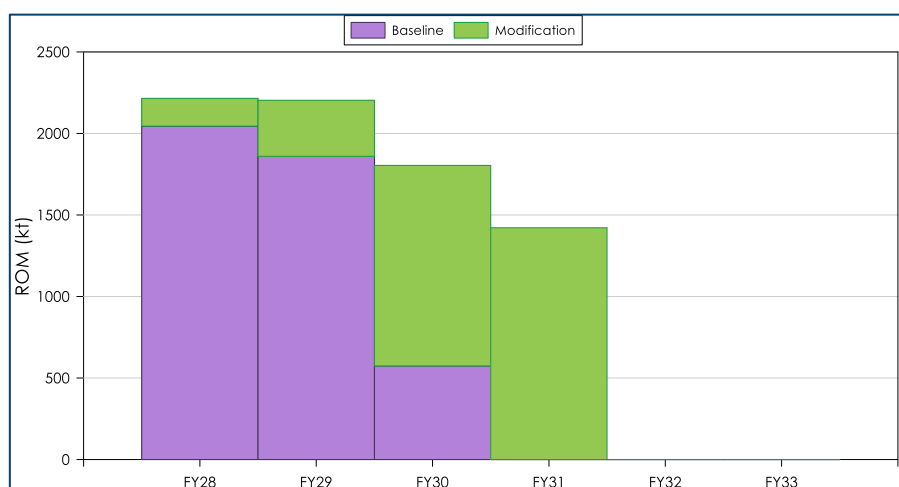


Figure 2-1: ROM production rate for the Baseline and Modification scenarios

Table 2-1: Summary of quantities of materials estimated for the Modification scenario

	Units	FY28	FY29	FY30	FY31	FY32*	FY33*
ROM	Mt	2.2	2.2	1.8	1.4	-	-
Product	Mt	1.7	1.7	1.4	1.1	-	-
Diesel oil	kL	1,366	1,366	1,366	1,197	327	173
Diesel oil - Transport	kL	14	14	14	12	3	2
Petroleum based oils	kL	199	199	184	152	50	50
Petroleum based greases	kL	6.0	6.0	6.0	5.0	4.0	4.0
SF ₆	kg	0.3	0.3	0.3	0.3	0.3	0.3
Electricity	MWh	57.2	57.2	57.2	42.9	22.3	8.9
Land Clearing	ha	3.8	-	-	-	-	-

Note: Mt = million tonnes, kL = kilolitre, kg = kilogram, MWh = megawatt hour and ha = hectare

* Decommissioning phase

Table 2-2: Summary of quantities of materials estimated for the Baseline scenario

	Units	FY28	FY29	FY30	FY31*	FY32*	FY33
ROM	Mt	2.0	1.9	0.6	-	-	-
Product	Mt	1.6	1.5	0.4	-	-	-
Diesel oil	kL	1,366	1,366	683	327	173	-
Diesel oil - Transport	kL	14	14	7	3	2	-
Petroleum based oils	kL	199	199	61	50	50	-
Petroleum based greases	kL	6	6	5	4	4	-
SF ₆	kg	0.3	0.3	0.3	0.3	0.3	-
Electricity	MWh	57.2	57.2	57.2	22.3	8.9	-
Land Clearing	ha	3.8	-	-	-	-	-

* Decommissioning phase

2.1.4 Scope 3 sources

Scope 3 emissions for the transport and final use of the coal may have the potential to vary in the future depending on the market situation at the time. For the purpose of this assessment, these assumptions include emission factors for the key transport modes of Australia rail and international shipping and the associated average weighted distance travelled for the export coal to markets in Vietnam, India, Sweden and Argentina.

Product coal and product reject material is transported to Port Kembla by rail and then transferred to coal loaders before being delivered to the Port Kembla Steel Mill or shipped to its final destination. The approximate rail distance is taken to be 70 km (return distance). The shipping distance varies depending on the destination:

- ✦ Vietnam: 13,000 km (return distance);
- ✦ India: 17,000 km (return distance);
- ✦ Sweden: 42,000 km (return distance); and,
- ✦ Argentina: 21,000 km (return distance).

The distribution of product coal is based on projected sales, with on average approximately 60 percent (%) shipped to Vietnam, 18% to India, 15% to Sweden and 7% to Argentina.

The emissions generated from the end use of product coal or rejects produced have been assumed to be used in either power generation or coking coal, with a distribution of 32% and 68%, respectively. This usage is considered equivalent to that in Australia. The type of coal consumed is classified as bituminous coal.

Other Scope 3 emissions also arise from a number of other sources indirectly associated with the operation of the Metropolitan Coal Mine such as emissions generated by employees travelling to and from the site. These relatively minor individual contributions are difficult to accurately quantify due to the diversity and nature of the sources and have not been considered further in this assessment.

2.2 Emission factors

To quantify the amount of carbon dioxide equivalent (CO₂-e) material generated, emission factors were obtained from:

- ✦ the NGA Factors (**Cth DCCEEW, 2024a**); and
- ✦ emission factors for Scope 3 transport based on factors presented in the *National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015*; and,
- ✦ emission factors for land clearing (**TAGHGG, 2013**).

The emission factors used in this assessment are summarised in **Table 2-3**.

Table 2-3: Summary of emission factors

Type	Energy content factor (GJ/kL)	Emission factor			Units	Scope
		CO ₂	CH ₄	N ₂ O		
Diesel - Stationary	38.6	69.9	0.1	0.2	kg CO ₂ -e/GJ	1
		17.3	-	-		3
Diesel - Transport	38.6	69.9	0.01	0.5	kg CO ₂ -e/GJ	1
		17.3	-	-		3
Petroleum based oils	38.8	13.9	-	-	kg CO ₂ -e/GJ	1
		18	-	-		3
Petroleum based greases	38.8	3.5	-	-	kg CO ₂ -e/GJ	1
		18	-	-		3
Rail transport	-	16.3	-	-	t CO ₂ -e/Mt-km	3
Ship transport	-	5.39	-	-	t CO ₂ -e/Mt-km	3
Land clearing – open forest		521			t CO ₂ -e/ha	1
Thermal coal*	27	90	0.04	0.2	kg CO ₂ -e/GJ	3
Coking coal	27	107	0.03	0.2	kg CO ₂ -e/GJ	3

*Assumes type of coal is bituminous coal

Note: GJ/kL = gigajoule per kilolitre, CO₂ = carbon dioxide, CH₄ = methane, N₂O = nitrous oxide, kg CO₂-e/GJ = kilograms of carbon dioxide equivalent per gigajoule, t CO₂-e/ha = tonnes of carbon dioxide equivalent per hectare and t CO₂-e/Mt-km = tonnes of carbon dioxide equivalent per million tonne-kilometres

Fugitive emissions were calculated from modelled CO₂ and CH₄ emissions for each longwall. Fugitive emissions are also assumed to arise from the coal stockpiles at the site and have been considered in the assessment. The estimated fugitive emissions (in kilotonnes of carbon dioxide equivalent [kt CO₂e]) have been provided for the assessment and presented in the following section (**Table 2-5** and **Table 2-6**).

To assist with the management of fugitive emissions from the mining operations, Metropolitan Coal plans to operate a gas drainage plant which utilises a flare to combust methane gas instead of releasing it to the atmosphere. Although this flare system is not part of the Modification, its construction has been proposed as it would also support the Modification, given the Modification proposes to extract additional coal reserves. The estimated abatement achieved through the operation of the flare has been

provided and is also presented in the following section (**Table 2-5** and **Table 2-6**) and shown as a negative number to indicate the reduction potential.

Emission factors for electricity usage were obtained from *Australia's emissions projections 2024* (**Cth DCCEEW, 2024b**). These emission factors are based on projections for the decarbonising of the NSW electricity grid over time. The Scope 2 and 3 emissions factors for electricity usage are presented in **Table 2-4**.

Table 2-4: Summary of emission factors for electricity usage (t CO₂-e/MWh)

Period	Scope 2	Scope 2 and 3	Scope 3*
2025	0.51	0.55	0.04
2026	0.47	0.5	0.03
2027	0.4	0.43	0.03
2028	0.34	0.36	0.02
2029	0.21	0.23	0.02
2030	0.15	0.16	0.01
2031	0.15	0.16	0.01
2032	0.13	0.14	0.01
2033	0.09	0.09	0
2034	0.09	0.09	0
2035	0.07	0.08	0.01
2036	0.06	0.07	0.01
2037	0.06	0.06	0
2038	0.06	0.06	0
2039	0.06	0.06	0
2040	0.03	0.03	0

Source: **Cth DCCEEW (2024b)**

* Calculated by subtracting the Scope 2 column from the Scope 2 and 3 column.

Note: The emission factors for electricity usage are based on calendar years, but have been used to calculate emissions from electricity usage on a financial year basis. t CO₂-e/MWh = tonnes of carbon dioxide equivalent per megawatt hour.

2.3 Calculated GHG emissions for Baseline, Modification and Modification Only scenarios

Table 2-5 and **Table 2-6** summarises the estimated annual CO₂-e emissions for the Modification scenario and the Baseline scenario, respectively. The estimated annual CO₂-e emissions for the Modification Only scenario is the difference between the Modification scenario and the Baseline scenario and is summarised in **Table 2-7**.

The estimated annual CO₂-e emissions for the life of the mine and the Baseline and Modification scenarios are also presented graphically in **Figure 2-2** and **Figure 2-3**. These figures illustrate that the majority of emissions generated by the Metropolitan Coal Mine (including as continued by the Modification) under either scenario would be from fugitive emissions.

Table 2-8 and **Table 2-9** present a summary of the estimated CO₂-e emissions per tonne of ROM coal for the Modification scenario and the Baseline scenario, respectively. These estimates exclude the contribution from the decommissioning phase to avoid distorting the values with lower post-mining emissions (thus correlating with the period of ROM coal production only).

The results indicate that on average the Modification scenario would generate approximately 0.429 tonnes of carbon dioxide equivalent per tonne of run-of-mine coal (t CO₂-e/ t ROM) for Scope 1 and 0.006 t CO₂-e/ t ROM for Scope 2. The Baseline scenario would generate approximately 0.383 t CO₂-e/ t ROM for Scope 1 and 0.012 t CO₂-e/ t ROM for Scope 2.

The increase in estimated Scope 1 emissions per tonne of ROM coal for the Modification scenario compared to the Baseline scenario is due to the increase in fugitive emissions in the later years of mining. Conversely, the estimated Scope 2 emissions per tonne of ROM coal factor for the Modification Scenario reduces compared to the Baseline scenario, due to the projected electricity requirements and with the progressive decarbonisation of the NSW electricity grid over the longer mine life.

Table 2-5: Summary of CO₂-e emissions for the Modification scenario (kt CO₂-e)

	Scope	FY28	FY29	FY30	FY31	FY32*	FY33*
Diesel oil	1	3.7	3.7	3.7	3.2	0.9	0.5
Diesel oil - Transport	1	0.038	0.038	0.038	0.033	0.009	0.005
Petroleum based oils	1	0.107	0.107	0.099	0.082	0.027	0.027
Petroleum based greases	1	0.001	0.001	0.001	0.001	0.001	0.001
SF ₆	1	0.008	0.008	0.008	0.008	0.008	0.008
Land Clearing	1	1.98	-	-	-	-	-
Electricity	2	16.0	15.5	10.9	4.7	1.3	0.2
Fugitive (including stockpiles)	1	1,050	1,248	976	707	213	107
Flaring	1	-199	-238	-247	-55	-	-
Consumables	3	2.2	2.8	1.6	0.9	0.3	0.2
Rail	3	2.5	2.5	2.1	1.6	-	-
Shipping	3	137	136	100	70	-	-
Thermal coal	3	1,748	1,739	1,424	1,122	-	-
Coking coal	3	4,337	4,315	3,532	2,783	-	-

* Decommissioning phase

Table 2-6: Summary of CO₂-e emissions for the Baseline scenario (kt CO₂-e)

	Scope	FY28	FY29	FY30	FY31*	FY32*	FY33
Diesel oil	1	3.7	3.7	1.9	0.9	0.5	-
Diesel oil - Transport	1	0.038	0.038	0.019	0.009	0.005	-
Petroleum based oils	1	0.107	0.107	0.033	0.027	0.027	-
Petroleum based greases	1	0.001	0.001	0.001	0.001	0.001	-
SF ₆	1	0.008	0.008	0.008	0.008	0.008	-
Land Clearing	1	1.98	-	-	-	-	-
Electricity	2	16.0	15.5	10.9	2.5	0.5	-
Fugitive (including stockpiles)	1	781	704	332	213	107	-
Flaring	1	-172	-167	-14	-	-	-
Consumables	3	2.2	2.8	1.1	0.3	0.2	-
Rail	3	2.3	2.1	0.7	-	-	-
Shipping	3	124	110	50	-	-	-
Thermal coal	3	1,613	1,467	453	-	-	-
Coking coal	3	4,003	3,641	1,124	-	-	-

* Decommissioning phase

Table 2-7: Summary of CO₂-e emissions for the Modification only scenario (kt CO₂-e)

	Scope	FY28	FY29	FY30	FY31	FY32*	FY33*
Diesel oil	1	-	-	1.9	2.4	0.4	0.5
Diesel oil - Transport	1	-	-	0.019	0.024	0.004	0.005
Petroleum based oils	1	-	-	0.066	0.055	-	0.027
Petroleum based greases	1	-	-	0.000	0.000	-	0.001
SF ₆	1	-	-	-	-	-	0.008
Land Clearing	1	-	-	-	-	-	-
Electricity	2	-	-	-	2.3	0.8	0.2
Fugitive (including stockpiles)	1	270	544	644	493	107	107
Flaring	1	-27	-70	-233	-55	-	-
Consumables	3	-	-	0.5	0.7	0.1	0.2
Rail	3	0.2	0.4	1.4	1.6	-	-
Shipping	3	17	33	65	70	-	-
Thermal coal	3	135	271	971	1,122	-	-
Coking coal	3	334	673	2,409	2,783	-	-

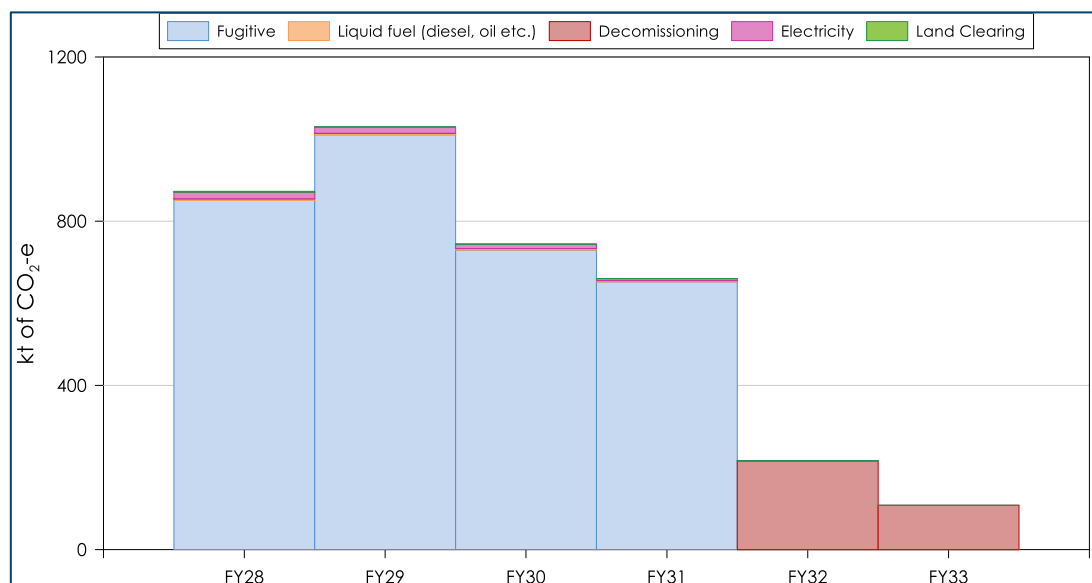


Figure 2-2: Summary of CO₂-e emissions for the Modification scenario

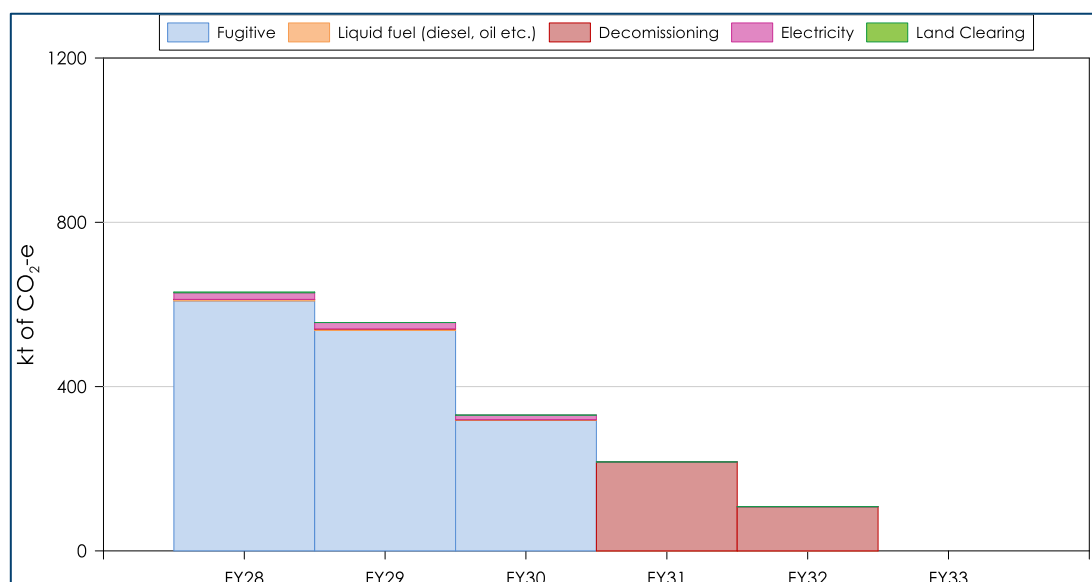


Figure 2-3: Summary of CO₂-e emissions for the Baseline scenario

Table 2-8: Summary of CO₂-e emissions per unit of production for the Modification scenario

	Units	FY28	FY29	FY30	FY31	Average
ROM	t	2,215,462	2,203,951	1,804,365	1,421,674	1,911,363
Scope 1	t CO ₂ -e	856,704	1,014,220	733,407	655,489	814,955
Scope 2	t CO ₂ -e	16,026	15,454	10,875	4,722	11,769
Scope 1 per unit production	t CO ₂ -e / t ROM	0.386	0.460	0.406	0.461	0.429
Scope 2 per unit production	t CO ₂ -e / t ROM	0.007	0.007	0.006	0.003	0.006

Note: t = tonnes and t CO₂-e = tonnes of carbon dioxide equivalent.

Table 2-9: Summary of CO₂-e emissions per unit of production for the Baseline scenario

	Units	FY28	FY29	FY30	Average
ROM	t	2,044,904	1,859,935	574,062	1,492,967
Scope 1	t CO ₂ -e	614,359	540,508	319,688	491,519
Scope 2	t CO ₂ -e	16,026	15,454	10,875	14,118
Scope 1 per unit production	t CO ₂ -e / t ROM	0.299	0.291	0.557	0.383
Scope 2 per unit production	t CO ₂ -e / t ROM	0.008	0.008	0.019	0.012

2.4 Summary of GHG Emissions

The Modification seeks to extract approximately 2.8 Mt of additional ROM coal and effectively allow mining for one additional year within the mine life. In comparison to the Baseline scenario, there is an increase in GHG emissions as expected. **Figure 2-2** and **Figure 2-3** show the estimated annual emissions for the Modification scenario and the Baseline scenario over time.

The change in emissions is quantified as the Modification Only scenario (i.e. the difference between the Modification scenario and the Baseline scenario). **Table 2-10** summarises the average annual and total emissions associated with the Modification scenario, Baseline scenario and the Modification Only for Scopes 1, 2 and 3 as presented in **Table 2-5** to **Table 2-7**.

Table 2-10: Summary of CO₂-e emissions per scope (Mt CO₂-e)

Period	Scenario	Scope 1	Scope 2	Scope 3
Annual Average *	Modification	0.81	0.012	5.36
	Baseline	0.49	0.014	4.20
	Modification Only^	0.39	0.001	2.22
Total	Modification	3.6	0.049	21.5
	Baseline	1.8	0.045	12.6
	Modification Only	1.8	0.003	8.9

* Excludes decommissioning phase

^ Calculated over the entire Modification scenario period, the annual average is lower than in the other scenarios. This is due to the inclusion of Baseline Scenario years with negligible emissions, which reduces the overall average when compared to scenarios covering only periods of active emissions.

Note: Mt CO₂-e = million tonnes of carbon dioxide equivalent

2.5 Contribution of GHG emissions

The estimated annual GHG emissions for Australia up to June 2024 was 440.6 Mt CO₂-e (**Cth DCCEEW, 2024c**). In comparison, the estimated annual average GHG emission for the Modification Only is 0.39 Mt CO₂-e (Scope 1 and 2) and the Modification scenario is 0.83 Mt CO₂-e (Scope 1 and 2). Therefore, the annual contribution of GHG emissions from the Modification Only scenario in comparison to the Australian GHG emissions for the 2024 period is estimated to be approximately 0.09% and for the Modification scenario is approximately 0.19%.

At a state level, the estimated GHG emissions for NSW in the 2022 period were 111.0 Mt CO₂-e (**Cth DCCEEW, 2025**). The annual contribution of GHG emissions from the Modification Only scenario (Scopes 1 and 2) in comparison to the NSW GHG emissions for the 2022 period is estimated to be approximately 0.35%. The annual contribution of GHG emissions for the Modification scenario is approximately 0.74% of the NSW GHG emissions for the 2022 period.

24101783_MetropolitanCoal_Modification_GHG_Calculations_250521.docx



The Scope 3 emissions from the Modification Only scenario include the use of coal by other parties. It is reasonable to expect that there may be future policy changes in the countries which receive Australian coal due to the Paris Agreement or other influencing factors. As such, it is also reasonable to expect that Peabody would monitor such changes and adjust the Metropolitan Coal Mine accordingly to any new policy, guidelines, carbon pricing, coal demand and trade contracts.

2.6 Comparison with projected future GHG emissions for NSW

The projected future GHG emissions for NSW to 2050 can be obtained from the *Net Zero Emissions Dashboard* (NSW Government, 2025). Projections are provided for three scenarios: Business as Usual (BAU), as originally designed, and as currently tracking. The BAU scenario factors in historical state policies but excludes the impact of actions outlined in the *Net Zero Plan Stage 1: 2020-2030* (NSW Government, 2020) and other current government policies and programs. The 'as originally designed' scenario adjusts the emissions trajectory based on the designed abatement and timelines in the existing NSW and Commonwealth policies and programs. The 'as currently tracking' scenario further adjusts the 'as originally designed' scenario to reflect increased uncertainties in the expected emissions reductions under certain programs and policies.

Figure 2-4 presents a comparison of the annual Scope 1 emissions for the Modification with the projected future GHG emissions for NSW to 2050.

In comparison to the projected future GHG emissions for NSW, the Scope 1 emissions associated with the Modification (in the absence of additional reasonable and feasible emission abatement measures) would range from approximately 0.2% (during decommissioning in FY33) to 1.2% (in FY29 when Modification Scope 1 emissions peak as a proportion of NSW projections) of the NSW emissions per the program/policy abatement as originally designed.

Figure 2-5 and **Figure 2-6** present comparisons of the annual fugitive emissions and stationary energy emissions for the Modification with the projected future fugitive emissions and stationary energy emissions for NSW to 2050.

The fugitive emissions associated with the Modification (in the absence of additional reasonable and feasible emission abatement measures) would range from approximately 1.3% (during decommissioning in FY33) to 7.4% (in FY29 when Modification fugitive emissions peak as a proportion of NSW projections) of the NSW emissions per the program/policy abatement as originally designed. For stationary energy emissions, the Modification (in the absence of additional reasonable and feasible emission abatement measures) would range from approximately 0.01% (during decommissioning in FY32 to FY33) to 0.03% (in all years of the Modification) of the NSW emissions per the program/policy abatement as originally designed.

It is noted that the projections presented in **Figures 2-3 to 2-5** assume that the Metropolitan Coal Mine is not already included in the NSW projections in some form (which is unlikely to be the case).

Further, these projections do not account for any reasonable and feasible emission reduction measures that may be adopted over the life of the Modification.

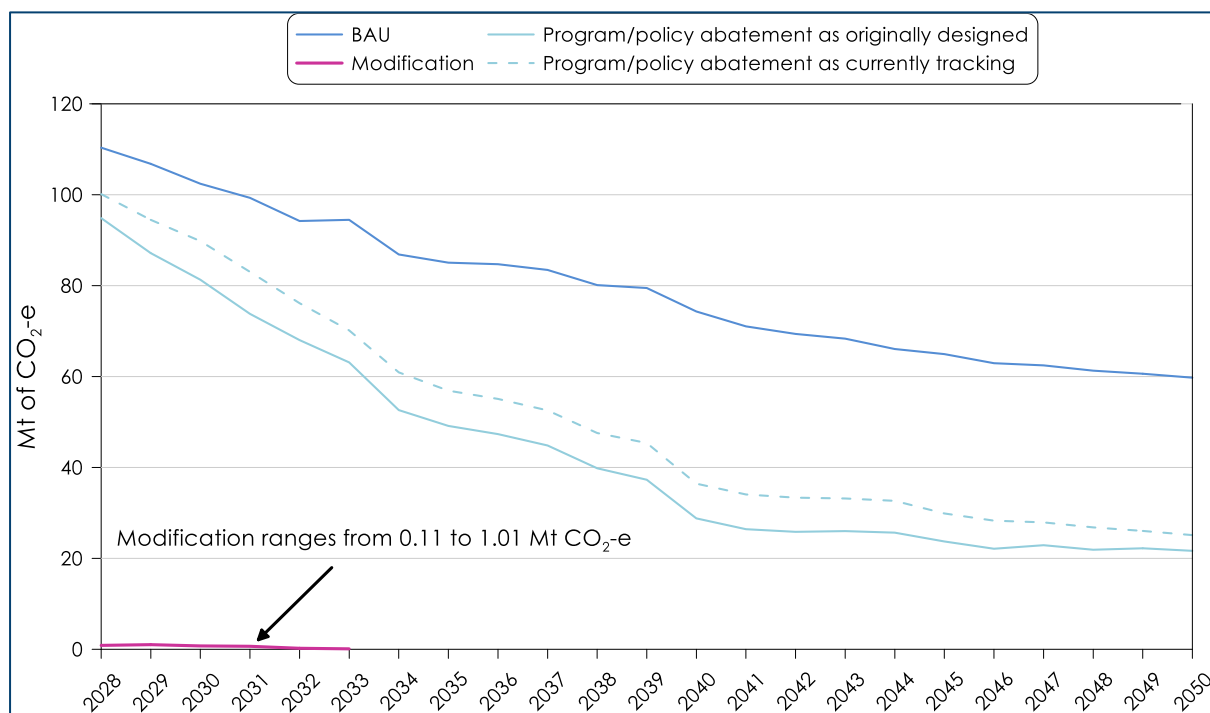


Figure 2-4: Comparison of Scope 1 emissions for the Modification with projected future GHG emissions for NSW

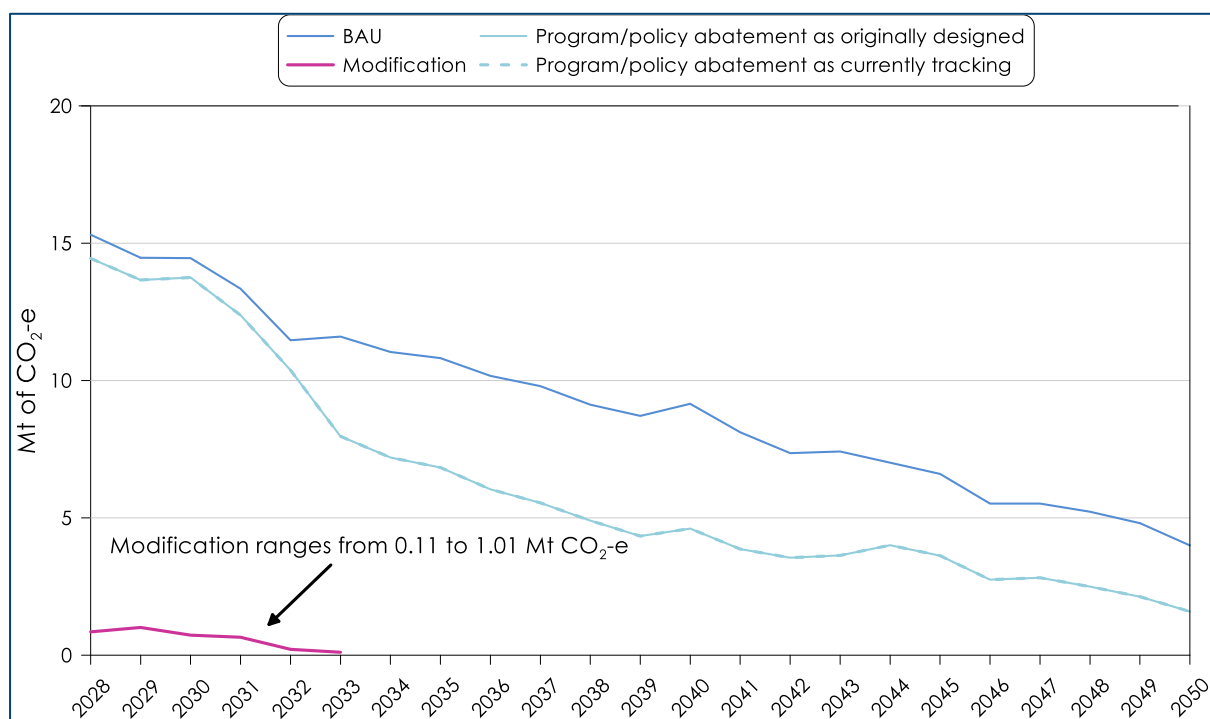


Figure 2-5: Comparison of Fugitive emissions for the Modification with projected future Fugitive emissions for NSW

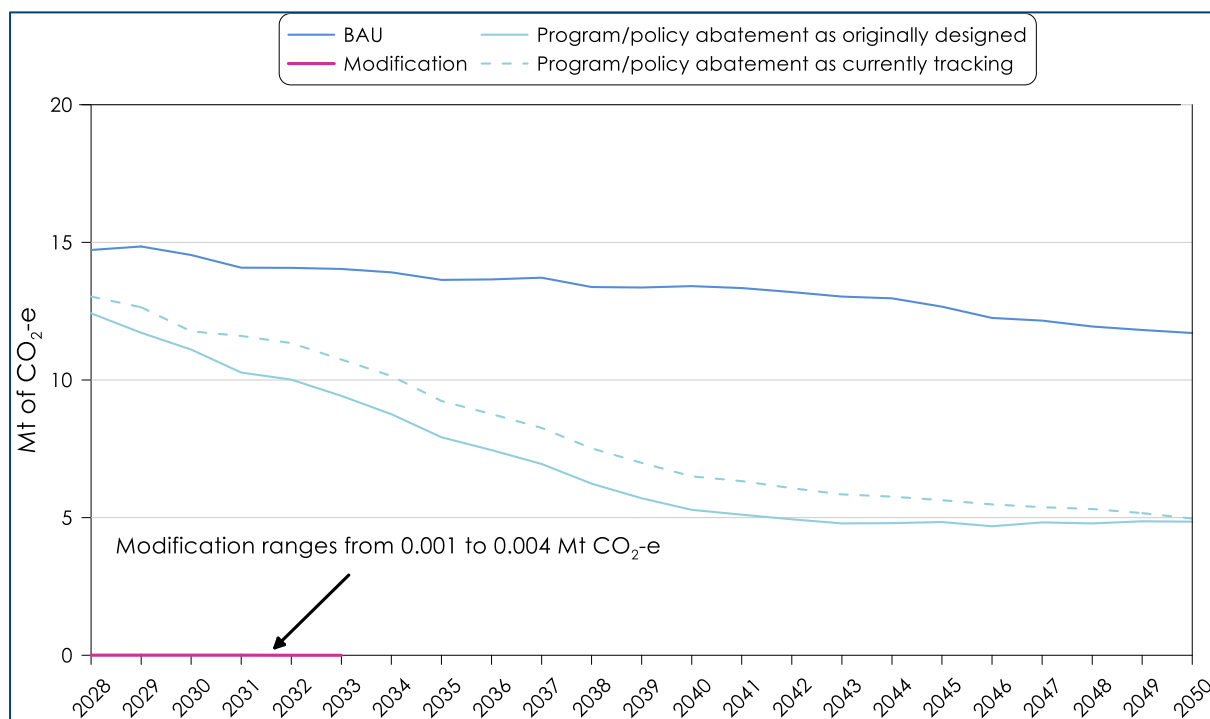


Figure 2-6: Comparison of Stationary Energy emissions for the Modification with projected future Stationary Energy emissions for NSW

3 SUMMARY AND CONCLUSIONS

This study has assessed the potential GHG emissions associated with the Modification.

The Modification seeks to extract approximately 3.2 Mt of ROM coal from the additional area and result in the continued employment of the existing workforce for approximately two years. The additional ROM extraction corresponds to an increase in GHG emissions generated relative the Baseline scenario.

The estimated annual average GHG emission for the Modification Only scenario is 0.39 Mt CO₂-e (Scope 1 and 2), which is calculated to be approximately 0.09% of the Australian GHG emissions for the period to June 2024 and approximately 0.35% of the NSW GHG emissions for the 2022 period.

In comparison to the projected future GHG emissions for NSW, the Scope 1 emissions associated with the Modification scenario (in the absence of additional reasonable and feasible emission abatement measures) would comprise approximately 0.2% (during decommissioning in FY33) to 1.2% (in FY29 when Modification Scope 1 emissions peak as a proportion of NSW projections) of the NSW emissions per the program/policy abatement as originally designed.

The emissions for the Modification scenario (in the absence of additional reasonable and feasible emission abatement measures) are also projected to range from 1.3% (during decommissioning in FY33) to 7.4% (in FY29 when Modification fugitive emissions peak as a proportion of NSW projections) for fugitive emissions, and range from 0.01% (during decommissioning in FY32 to FY33) to 0.03% (in all years of the Modification) for stationary energy emissions projections for NSW per the program/policy abatement as originally designed.



4 REFERENCES

Commonwealth Department of Climate Change, Energy, the Environment and Water (2024a)

"Australian National Greenhouse Accounts Factors – For individuals and organisations estimating greenhouse gas emissions", Department of Climate Change, Energy, the Environment and Water [DCCEEW], August 2024.

Commonwealth Department of Climate Change, Energy, the Environment and Water (2024b)

"Australia's emissions projections 2024" prepared by the Department of Climate Change, Energy, the Environment and Water [DCCEEW], November 2024.

Commonwealth Department of Climate Change, Energy, the Environment and Water (2024c)

"Quarterly Update of Australia's National Greenhouse Gas Inventory: June 2024", Department of Climate Change, Energy, the Environment and Water [DCCEEW], November 2024.

Commonwealth Department of Climate Change, Energy, the Environment and Water (2025)

State and Territory greenhouse gas inventories: 2022 emissions - Department of Climate Change, Energy, the Environment and Water [DCCEEW] website, Accessed January 2025.

<https://www.dcceew.gov.au/climate-change/publications/national-greenhouse-accounts-2022/state-and-territory-greenhouse-gas-inventories-2022-emissions>

NSW Environment Protection Agency (2025)

"NSW Guide for Large Emitters", NSW Environmental Protection Authority, January 2025.

NSW Government (2020)

"Net Zero Plan Stage 1: 2020-2030" Department of Planning, Infrastructure and the Environment, March 2020

NSW Government (2025)

NSW Net Zero Emissions Dashboard website. Accessed January 2025.

<https://www.seed.nsw.gov.au/net-zero-emissions-dashboard>

Transport Authorities Greenhouse Group (2013)

"Greenhouse Gas Assessment Workbook for Road Project", Transport Authorities Greenhouse Group (TAGHGG), February 2013.

