Appendix C – Coal Resource Recovery Plan

SIMEC

MEMBER OF GFG ALLIANCE

Tahmoor Coal Pty Ltd

COAL RESOURCE RECOVERY PLAN

Tahmoor North - Western Domain
Longwalls West 3 and West 4

May 2021

simecgfg.com

This page has been left blank intentionally.

Document Control

APPLICANT:	Tahmoor Coal Pty Ltd
MINE:	Tahmoor Coal Mine
DEVELOPMENT APPROVAL:	DA 57/93 (as modified) and DA 67/98 (as modified)
MINING LEASES:	ML 1376 and ML 1539
DOCUMENT TITLE:	Tahmoor North - Western Domain Longwalls West 3 and West 4 Coal Resource Recovery Plan
DOCUMENT NUMBER:	TAH-HSEC-327
PUBLICATION DATE:	May 2021
DOCUMENT STATUS:	Final (Version 1)
PREPARED BY:	April Hudson Approvals Specialist Tahmoor Coal – SIMEC Mining
APPROVED BY:	Zina Ainsworth Environment and Community Manager Tahmoor Coal – SIMEC Mining Signature: Zina Ainsworth Date: 10 May 2021 Malcolm Waterfall Mining Engineering Manager Tahmoor Coal – SIMEC Mining Signature: Malcolm Waterfall Date: 10.05.2021 Peter Vale Head of Coal Mines Tahmoor Coal – SIMEC Mining Signature: Peter Vale Date: 10-5-21

simecgfg.com

This page has been left blank intentionally.

Table of Contents

List of Figures

List of Tables

This page has been left blank intentionally.

1 Introduction

1.1 Background

Tahmoor Coal Mine (Tahmoor Mine) is an underground coal mine located approximately 80 kilometres (km) south-west of Sydney between the towns of Tahmoor and Bargo, New South Wales (NSW) (refer to **Figure 1-1**). Tahmoor Mine produces up to three million tonnes of Run of Mine coal per annum from the Bulli Coal Seam. Tahmoor Mine produces a primary hard coking coal product and a secondary higher ash coking coal product that are used predominantly for coke manufacture for steel production. Product coal is transported via rail to Port Kembla and Newcastle for Australian domestic customers and export customers.

Tahmoor Mine has been operated by Tahmoor Coal Pty Ltd (Tahmoor Coal) since Tahmoor Mine commenced in 1979 using bord and pillar mining methods, and via longwall mining methods since 1987. Tahmoor Coal is a wholly owned entity within the SIMEC Mining Division of the GFG Alliance group.

Tahmoor Coal has previously mined 33 longwalls to the north and west of Tahmoor Mine's current pit top location. The current mining area, the 'Western Domain', is located north-west of the Main Southern Rail between the townships of Thirlmere and Picton. The Western Domain is within the Tahmoor North mining area and is within Mining Lease (ML) 1376 and ML 1539.

The mine plan for the Western Domain includes four longwalls - Longwalls West 1 to West 4. An Extraction Plan for the first two longwalls in the Western Domain, Longwalls West 1 and West 2 (LW W1-W2), was approved by the NSW Department of Planning, Industry and Environment (DPIE) on 8 November 2019. Longwalls West 1 (LW W1) was the first longwall to be extracted in the Western Domain and was completed on 6 November 2020. The extraction of Longwalls West 2 (LW W2) commenced on 7 December 2020.

Longwalls West 3 and West 4 (LW W3-W4) are an extension of LW W1-W2 and will be the focus of this Extraction Plan. LW W3-W4 are illustrated in **Figure 1-2**.

1.2 Purpose

This Coal Resource Recovery Plan (CRRP) has been prepared to support an Extraction Plan for the secondary extraction of coal from LW W3-W4. This CRRP has been prepared to demonstrate the efficient recovery of the available resource by secondary extraction of LW W3-W4 from the Bulli Coal Seam with ML 1376 and ML 1539 using conventional longwall retreat mining methods.

1.3 Scope

The Study Area applicable to this CRRP is defined as the surface area that is likely to be affected by the extraction of LW W3-W4 from the Bulli Coal Seam. This Study Area has been calculated by combining the areas bound by the following limits:

- The predicted limit of vertical subsidence, taken as the 20 millimetre (mm) subsidence contour resulting from the extraction of LW W3-W4; and
- A 35^{o} angle of draw line from the limit of proposed extraction for LW W3-W4.

The Study Area is illustrated in **Figure 1-2**.

The scope of this CRRP includes description of the following:

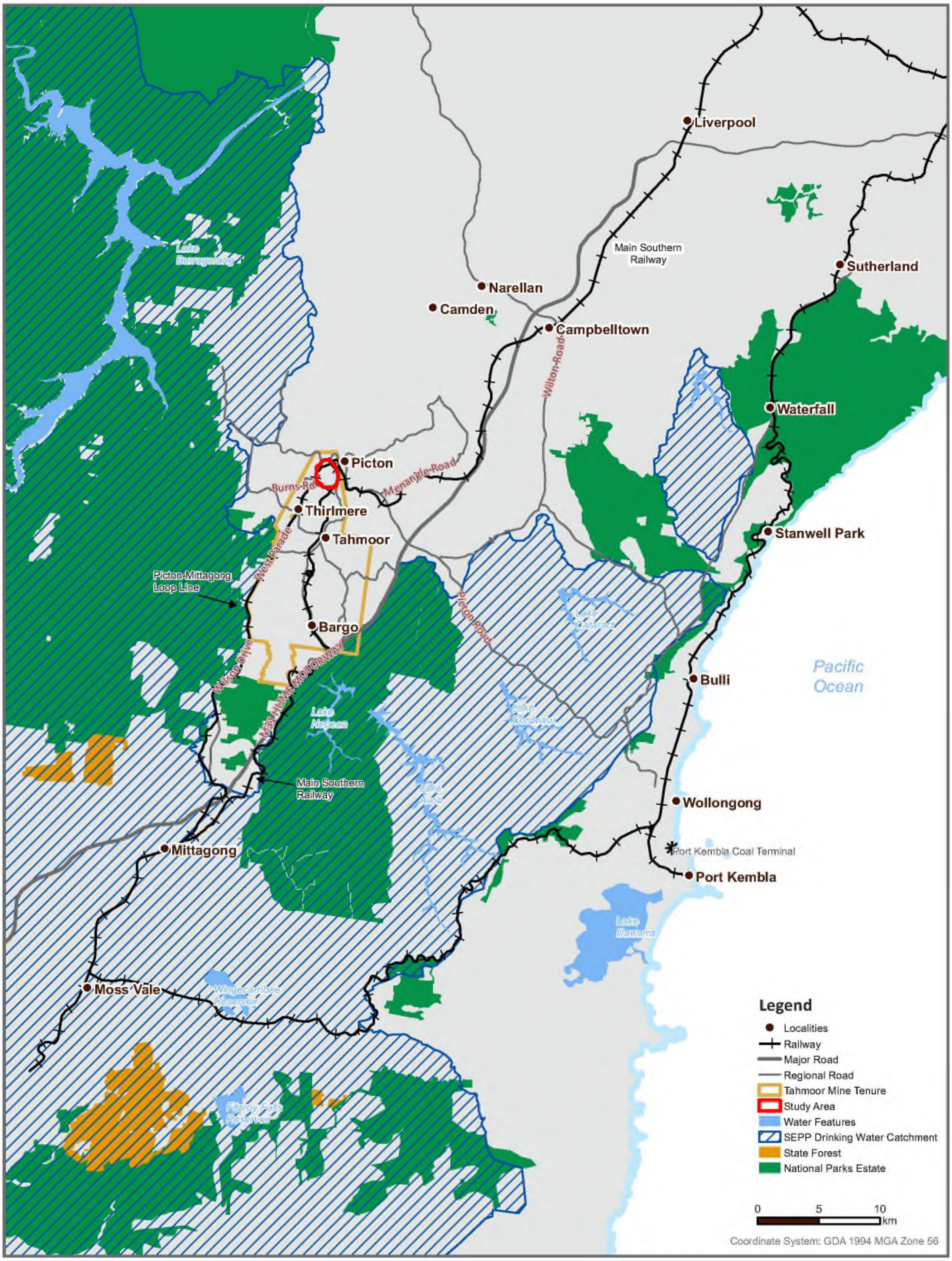
- Coal resources available within the Bulli Coal Seam;
- Proposed mining method, schedule and mine plan;
- Resource recovery and effects on future mining;
- Outline of proposed geological and geotechnical hazards; and
- Justification for the mine plan.

This CRRP has been prepared based on the contents of the following technical reports:

- Subsidence Predictions and Impact Assessments for Natural and Built Features due to the Extraction of the Proposed Longwalls W3 and W4 in Support of the Extraction Plan Application (MSEC, 2021).

The CRRP has been prepared in accordance with Section 8 of the DPIE *Draft Guidelines for the Preparation of Extraction Plans – Draft V5* (Department of Planning and Environment (DPE), 2015).

Graphical Plans (included as **Volume 3** of the Extraction Plan) provide details of the coal resources, existing and proposed workings, predicted impacts to surface features and additional supporting information.



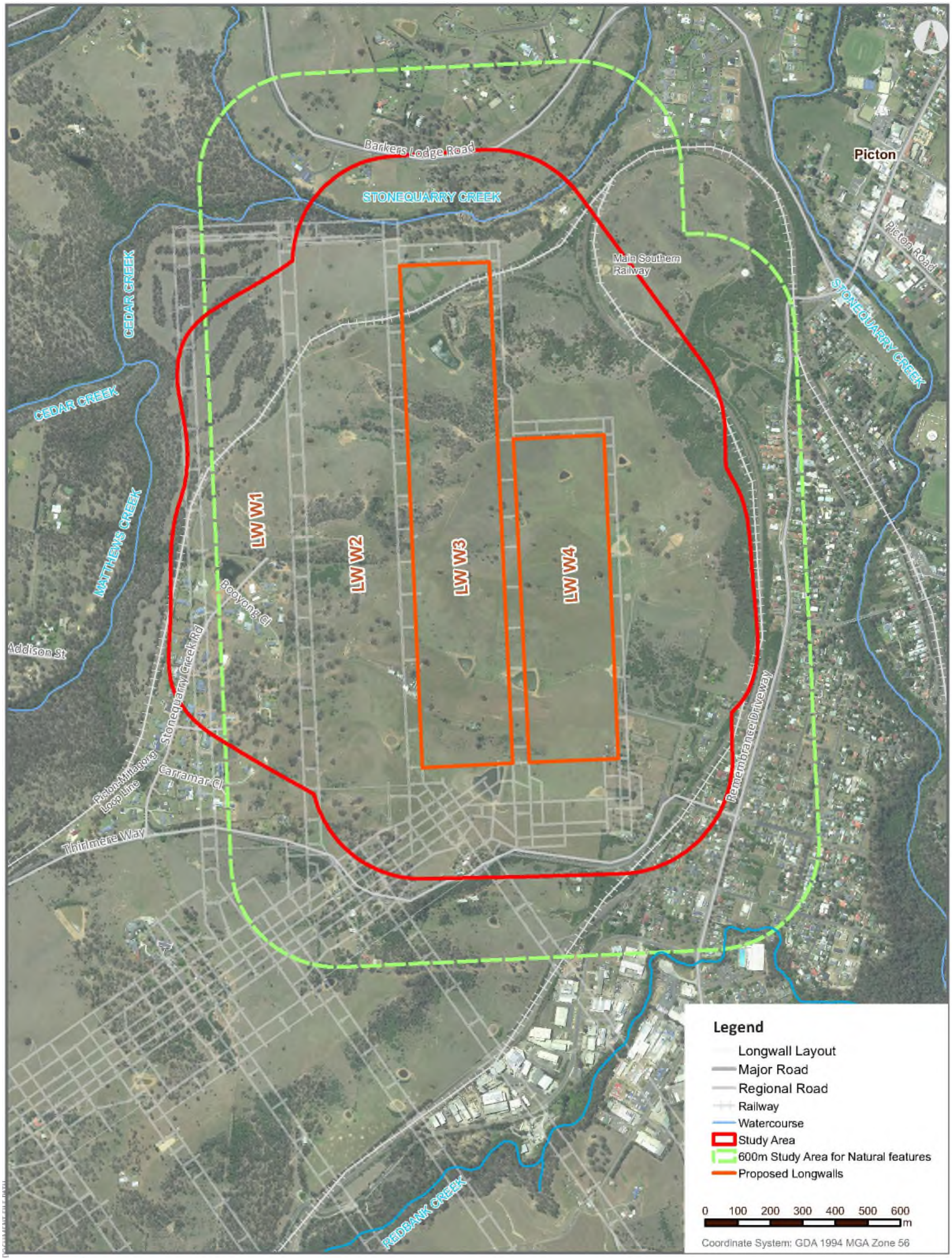
REGIONAL CONTEXT

Tahmoor North Western Domain Longwalls West 3 and West 4 Extraction Plan

FIGURE 1-1

Date: 22/12/2020

Data Sources:
© NSW DFSI (2019); © NSW Mining (2019); © SIMEC (2019)



EXTRACTION PLAN STUDY AREA

Tahmoor North Western Domain Longwalls West 3 and West 4
Extraction Plan

FIGURE 1-2

Date: 10/05/2021

Data Sources:
© NSW DFSI (2019); © NSW Mining (2019); © SIMEC (2019)
Aerial Imagery: © Photomapping Services (November 2018)

Access and Use Constraints:
This webmap is intended to be used by SIMEC Mining and other stakeholders involved in the development and operation of SIMEC Mining's mines.
Access to this webmap is restricted to users authorised by SIMEC Mining only. You may not reproduce, adapt, modify, communicate or use any part of this webmap other than for activities related to development and operation of SIMEC Mining's mines.

Disclaimer:
The data displayed in this webmap has been collated from various sources.
The source data may contain inconsistencies or omissions, may not be to scale, may not be current and may present indicative information only. SIMEC Mining does not warrant the accuracy or completeness of the contents of this webmap.

2 Regulatory Requirements

2.1 Project Approval

2.1.1 Development Consent

Tahmoor Coal's operations are conducted in accordance with applicable Commonwealth and State environmental, planning, mining safety, and natural resource legislation. A register of relevant environmental legislative and regulatory requirements is maintained by Tahmoor Coal in a compliance database.

The proposed LW W3-W4 will be operating in the Tahmoor North mining area under Development Consents DA 57/93 and DA 67/98, as discussed further in **Section 3.2.1** of the Extraction Plan Main Document. DA 57/93 was originally granted covering development within ML 1376 and DA 67/98 was subsequently granted to include areas excluded from DA 57/93 including areas under the Main Southern Rail Line and the Picton–Mittagong Loop Line, which are covered by ML 1539.

DA 67/98 provides the conditional planning approval framework for mining activities in the Western Domain to be addressed within an Extraction Plan and supporting management plans. Conditions relevant to this CRRP from DA 67/98 are detailed in **Table 2-1**.

Table 2-1 Key Conditions from DA 67/98 regarding Coal Resource Recovery

<table>
<tr><th>Condition</th><th colspan="2">Condition Requirement</th><th>Section(s) Addressed</th></tr>
<tr><td colspan="4">Performance Measures – Natural and Heritage Features</td></tr>
<tr><td>13A</td><td colspan="2">The Applicant must ensure that extraction of Longwall 33 and subsequent longwalls does not cause any exceedances of the performance measures in Table 1.
Note: The Applicant will be required to define more detailed performance indicators (including impact assessment criteria) for each of these performance measures in the various management plans that are required under this consent.</td><td rowspan="5">Section 4 and Section 7</td></tr>
<tr><td rowspan="4">Excerpt from Table 1</td><td>Feature</td><td>Performance Measure</td></tr>
<tr><td colspan="2">Mine workings</td></tr>
<tr><td>First workings</td><td>• To remain long term stable and non-subsiding</td></tr>
<tr><td>Second workings</td><td>• To be carried out only within the approved mine plan, in accordance with an approved Extraction Plan</td></tr>
<tr><td colspan="4">First Workings</td></tr>
<tr><td>13G</td><td colspan="2">The Applicant may carry out first workings within the underground mining area approved mine plan, other than in accordance with an approved Extraction Plan, provided that the Resources Regulator is satisfied that the first workings are designed to remain stable and non-subsiding in the long – term, except insofar as they may be impacted by approved second workings.</td><td>Section 4 and Section 7</td></tr>
</table>

Condition	Condition Requirement	Section(s) Addressed
	Notes: • *The intent of this condition is not to require an additional approval for first workings, but to ensure that first workings are built to geotechnical and engineering standards sufficient to ensure long term stability, with negligible resulting direct subsidence impacts.* • *Resources Regulator should be consulted when designing first workings in order to provide comment on matters relating to coal resource recovery.*	
Extraction Plan		
13H	The Applicant must prepare an Extraction Plan for all second workings in Longwall 33 and subsequent longwalls to the satisfaction of the Secretary. Each Extraction Plan must:	Extraction Plan Main Document
13H(iii)	include detailed plans of existing and proposed first and second workings and overlying surface features, including any applicable adaptive management measures;	Graphical Plans in Volume 3 of Extraction Plan
13H(iv)	include adequate consideration of mine roof and floor conditions, pillar width to height ratio, final pillar design dimensions and the long-term stability of pillars which has been undertaken in consultation with the Resources Regulator;	Section 4 and Section 7
13I	The Applicant must not undertake second workings following the extraction of Longwall 32 except in accordance with an Extraction Plan approved by the Secretary and must implement Extraction Plans as approved by the Secretary. • Notes: • *The preparation and implementation of Extraction Plans may be staged, with each plan covering a defined area of underground workings. In addition, these plans are only required to contain management plans that are relevant to the specific underground workings that are being carried out.* • *The burden of proof that any declines in performance of privately-owned registered bores and wells were not due to mining impacts rests with the Applicant.*	Section 4 and Section 7

2.1.2 Extraction Plan Guideline

This CRRP has been prepared in accordance with the DPIE *Draft Guidelines for the Preparation of Extraction Plans V5* (DPE, 2015), as illustrated in **Table 2-2**.

Table 2-2 Extraction Plan Guideline Requirements for Key Component Plans

Extraction Plan Guideline Content	Section(s) Addressed
Any required Coal Resource Recovery Plan should also be included as an attachment.	This Coal Resource Recovery Plan

2.2 Relevant Legislation

The relevant Acts and regulations governing mining and resource extraction in New South Wales are detailed in the sections below.

2.2.1 Mining Act 1992

The overarching objective of the *Mining Act 1992* (Mining Act) is to encourage and facilitate the discovery and development of mineral resources in NSW, having regard to the need to encourage ecologically sustainable development. The Mining Act controls the granting of exploration and mining titles and, amongst other legislative instruments, places controls on methods of exploration and extraction, the disposal of mining waste, and rehabilitation and environmental management activities.

The objects of the Mining Act are to encourage and facilitate the discovery and efficient development of mineral resources of the State. Part1, Clause 3A of the Mining Act outlines the objectives of the Act, which are:

> *3A Objects*
>
> *The objects of this Act are to encourage and facilitate the discovery and development of mineral resources in New South Wales, having regard to the need to encourage ecologically sustainable development, and in particular:*
>
> *(a) to recognise and foster the significant social and economic benefits to New South Wales that result from the efficient development of mineral resources, and*
>
> *(b) to provide an integrated framework for the effective regulation of authorisations for prospecting and mining operations, and*
>
> *I to provide a framework for compensation to landholders for loss or damage resulting from such operations, and*
>
> *(d) to ensure an appropriate return to the State from mineral resources, and*
>
> *I to require the payment of security to provide for the rehabilitation of mine sites, and*
>
> *(f) to ensure effective rehabilitation of disturbed land and water, and*
>
> *(g) to ensure mineral resources are identified and developed in ways that minimise impacts on the environment.*

This CRRP demonstrates that the LW W3-W4 Extraction Plan meets the Clause 3A objectives of the Mining Act to be an efficient development and utilisation of coal resources. This CRRP outlines the mine design and mining method that adequately recovers coal resources and provides an appropriate return to the State and fosters significant social and economic benefits.

2.2.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) consolidates and contains specific planning provisions related to mining, petroleum production and extractive industries, and is the principal environmental planning instrument that governs the carrying out of the proposed development.

The Mining SEPP recognises the importance of mining, petroleum production, and extractive industries within the State. Part 1, Clause 2 of the Mining SEPP sets out the aims of the policy, which are:

11 *Aims of Policy*

The aims of this Policy are, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries:

(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and

(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and

(b1) to promote the development of significant mineral resources, and

I to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources, and

(d) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development:

(i) to recognise the importance of agricultural resources, and

(ii) to ensure protection of strategic agricultural land and water resources, and

(iii) to ensure a balanced use of land by potentially competing industries, and

(iv) to provide for the sustainable growth of mining, petroleum and agricultural industries.

Part 3, Clause 15 of the Mining SEPP deals with resource recovery and requires that resource recovery is efficient, optimised and minimises waste, which states:

15 Resource recovery

(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.

(2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.

(3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.

2.2.3 Mining Lease Condition

Coal mining leases typically contain conditions of the grant of lease that require efficient coal resource recovery and that the lease holder must optimise recovery of the minerals that are the subject of this mining lease to the extent economically feasible.

The proposed longwalls (LW W3-W4) will extract coal within two mining leases – ML 1376 and ML 1539. The Mining Lease for the rural areas is ML 1376. The Mining Lease for railway corridors and certain urban areas is ML 1539.

Condition 1 of both ML 1376 and ML 1539 state the following:

> *The lease holder shall extract as large a percentage of the coal in the subject area as is possible consistent with the provisions of the Mining Act and regulations thereunder and shall comply with any direction given or which may be given in this regard by the Minister.*

2.3 Consultation

2.3.1 Consultation with Division of Resources and Geosciences

A letter was sent to the Department of Regional NSW – Resources Regulator (addressed to Ray Ramage) on 14 August 2020 with information on the first workings of Tahmoor Coal Mine for LW W3-W4 as required under Condition 13G(4) of DA 67/98. The Resources Regulator noted the contents of this letter on 17 August 2020.

A letter was sent to Department of Regional NSW – Resources Regulator (addressed to Dr Gang Li) and to the Department of Regional NSW – Mining Exploration and Geoscience (MEG) (addressed to Adam Bannister) to introduce the Extraction Plan for LW W3-W4. Tahmoor Coal provided a figure of the Extraction Plan Study Area, and an overview of the longwalls.

Dr Gang Li acknowledged the receipt of this letter on 25 September 2020, however no comments have been received as of 30 April 2021. No response from MEG has been received as of 30 April 2021.

3 Geology

3.1 Regional Geology

3.1.1 Sydney Basin

The Sydney Basin is a large sedimentary basin on the east coast of Australia covering almost 50,000 km^2, whereby approximately 44,000 km^2 is located onshore and another 5,000 km^2 located offshore extending to the edge of the continental shelf. The basin forms part of the larger Sydney Gunnedah-Bowen Basin system, as outlined on **Figure 3-1**, which extends 1,700 km north from coastal southern NSW to Townsville.

The Sydney Basin is sedimentary in origin, with deposition of sediments occurring from the early Permian (290 million years ago) through to the latter part of the Triassic (200 million years ago). The Sydney Basin on-laps the Lachlan Fold Belt to the west and south, with basin depth increasing to the north and east.

The geological strata of the Sydney Basin can be summarised (from youngest to oldest) as following:

- Unconsolidated alluvial deposits along the major rivers and dune/beach deposits along the coast (Tertiary and Quaternary in age);
- Fractured volcanic intrusive and flows (and associate dyke swarms and occasional sills) within the Sydney Basin (Jurassic and Tertiary in age);
- Sedimentary rocks (including substantial coal measures at depth) of the Sydney Basin (Permian and Triassic age); and
- Fractured basement rocks below the Sydney Basin (Palaeozoic age).

3.1.2 Southern Coalfield

The Southern Coalfield comprises the southern portion of the Sydney Basin, as outlined on **Figure 3-1**, covering an area south of Sydney almost to Batemans Bay, bounded in the west by the towns of Camden and Mittagong, and Helensburgh and Wollongong in the east.

The geology of the Southern Coalfield consists of the basal Permian Talaterang and Shoalhaven groups, overlain by the Permian Illawarra Coal Measures, and the Triassic Narrabeen Group.

These are overlain by the Hawkesbury Sandstone, Mittagong Formation and Wianamatta Group, as shown on **Figure 3-2**. The principal coal resource is situated within the Illawarra Coal Measures, with additional coal-bearing sequences also occur in the Clyde Coal Measures in the Talaterang Group.

Coal in the Southern Coalfield is extracted via underground mining methods and has been utilised as a resource for Coal Seam Gas (CSG) operations, with gas from coal being extracted within the underground mines in addition to above ground CSG operations. The coal in the Southern Coalfield differs in rank from the other coalfields of the Sydney Basin. It is generally low to high volatility bituminous coal, in contrast to the medium to high volatility bituminous coal which predominates in other regions. The coal is buried at depths of greater than 300 m.

The Sydney Subgroup contains all of the economic coal reserves of the Illawarra Coal Measures within the Southern Coalfield. It is composed of conglomerate, sandstone, conglomeratic sandstone, coal, claystone, siltstone and some tuff.

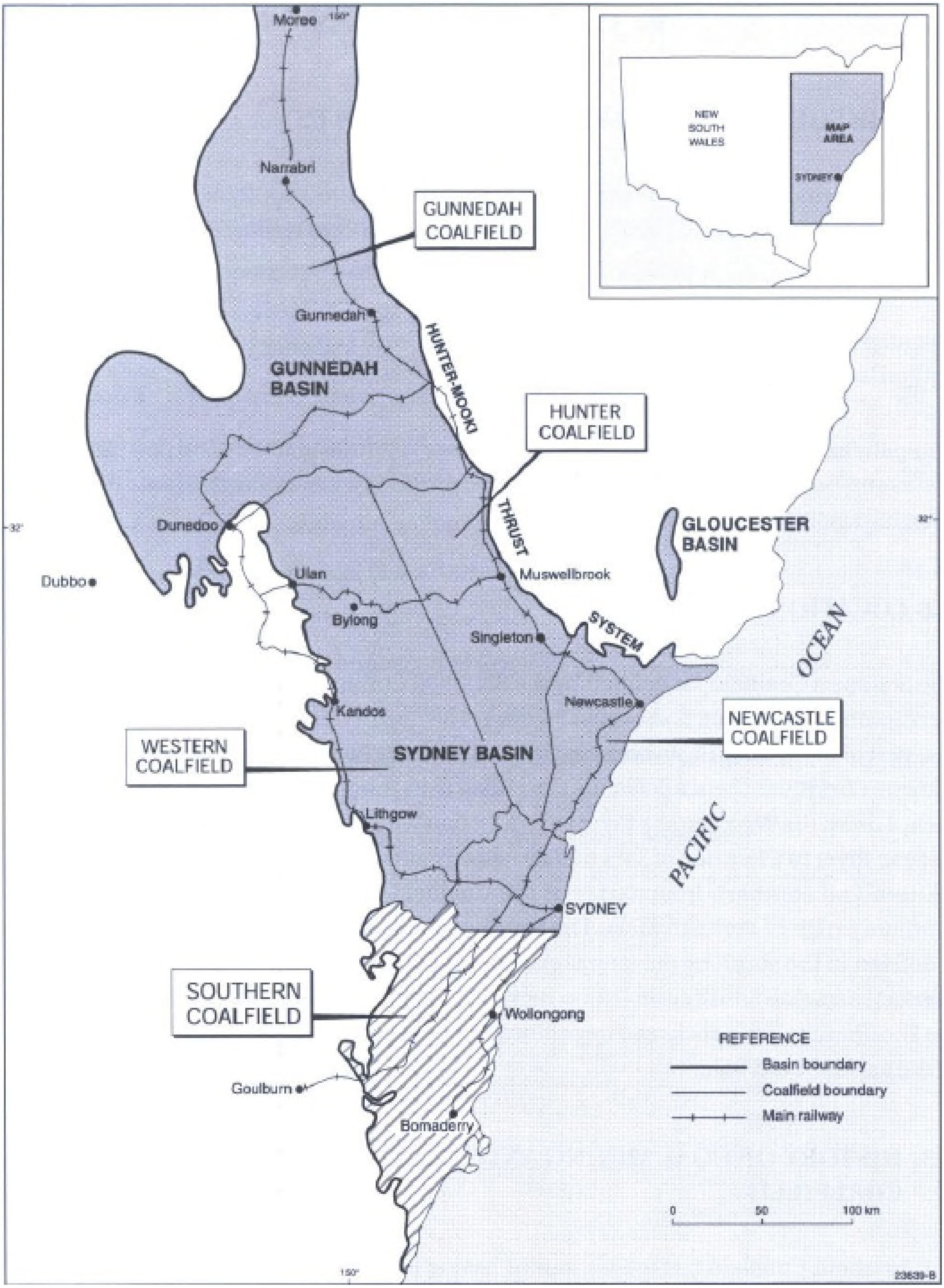


Figure 3-1 **Sydney Basin and the Southern Coalfields**

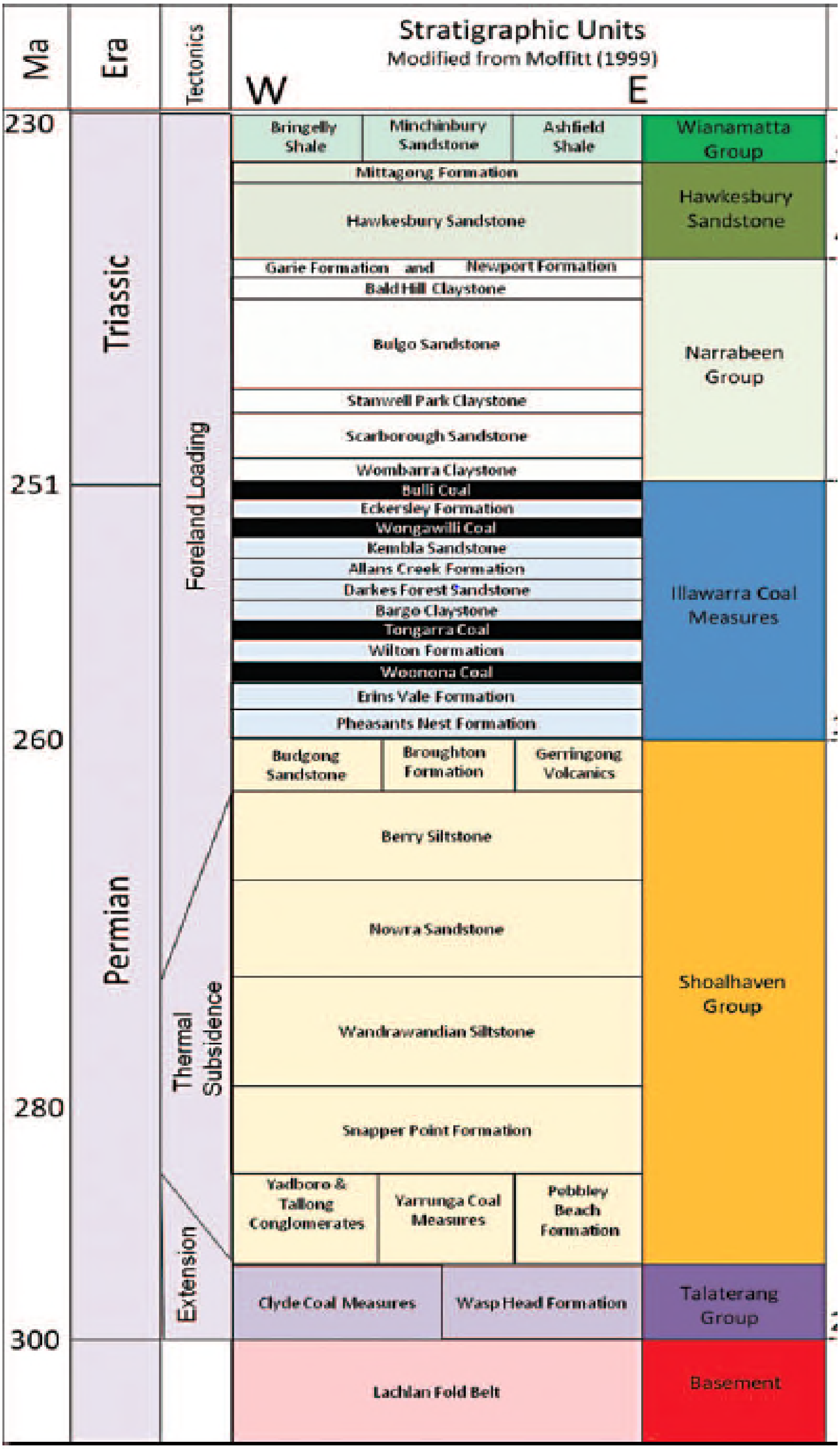


Figure 3-2 Southern Coalfield Stratigraphy

3.2 Local Geology

3.2.1 Wianamatta Group

The Wianamatta Group is the youngest geological layer member of the Sydney Basin, and lies at the highest layer member. It was deposited in connection with a large river delta, which shifted over time from west to east. This is evidenced by the sequence of strata, which clearly show the transition from marine deposits in front of the delta to deposits on land.

The Ashfield Shale was formed from clayey marine sediments. The subsequent Minchinbury Sandstone emerged from beach and the Bringelly Shale became alluvial in a marshy plain deposited on the delta.

The shales generally comprise fine grained sedimentary rocks such as shales and laminites with less common sandstone units. Weathering of the shale units produces a rich clayey soil, often with poor drainage. These clay soils are recognised as being reactive with considerable shrink-swell capacity.

3.2.2 Hawkesbury Sandstone

The Hawkesbury Sandstone is a quartz sandstone unit composed of very thick beds of heavily compacted sand, with a small quantity (about 5%) of shale in discontinuous beds one to three metres (m) thick. The thickness of the Hawkesbury Sandstone in the Southern Coalfield varies depending on the amount of erosion, but is typically 100-200 m thick, with some sections up to 300 m thick.

The individual sandstone beds are generally 1-10 m thick, but continue laterally for only 100-300 m. For this reason, the sandstone beds are described as being 'lenticular'. The joints in the Hawkesbury Sandstone are sub-vertical and normally spaced slightly wider than the bedding planes.

The surface and regional geology in the Tahmoor Mine locality is outlined on **Figure 3-3**.

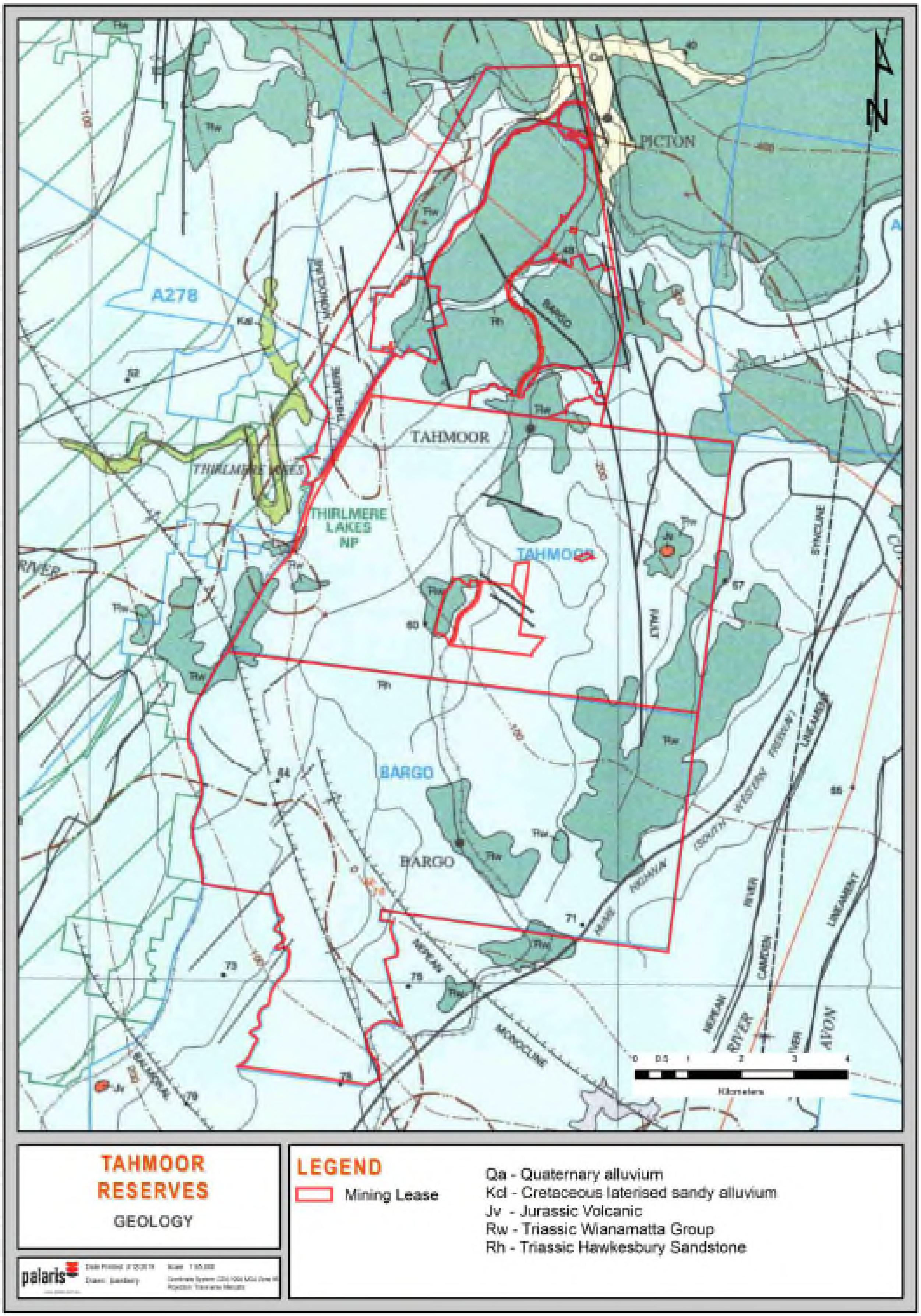


Figure 3-3 Surface and Regional Geology (Palaris, 2019)

3.2.3 Narrabeen Group

The overall thickness of the Narrabeen Group in the Southern Coalfield is approximately 300 m, of which 200 m is the Bulgo Sandstone and 24 m is the overlying Bald Hill Claystone. The Bald Hill Claystone is generally thought to act as a confining or sealing layer (aquitard) between the Bulgo and overlying Hawkesbury Sandstone.

The Narrabeen Group is also characterised by its petrological features:

- Grains of the sandstones are a mix of quartz and lithic fragments, rather than quartz. The sand-sized lithic fragments make up 20-30% of the clastic part of the unit, and are not as well sorted as in the Hawkesbury Sandstone; and
- Unweathered sandstones are typically more cemented, denser and less porous than those of the Hawkesbury Sandstone, and the cement is principally carbonate (more siderite than calcite).

Unweathered rocks are light to dark grey in colour due to a fine siderite cement and can be found 1-2 m below the surface. Hawkesbury Sandstone is by contrast often weathered and orange-brown to depths of 30 m and greater.

3.2.4 Illawarra Coal Measures

The geological units of major economic significance in the Southern Coalfield are the late Permian Illawarra Coal Measures, a 240 m thick deltaic sequence that occurs above the Shoalhaven Group and beneath the Hawkesbury Sandstone and Narrabeen Group. The Illawarra Coal Measures are divided into two subgroups, the basal Cumberland Subgroup, containing both the Pheasants Nest Formation and Erins Vale Formation, and the Sydney Subgroup which contains the economic coal seams (Bulli, Balgownie, Wongawilli, and Tongarra seams).

The coal measures outcrop above sea level approximately 20 km to the north of Wollongong. The Illawarra Coal Measures dip at approximately four degrees to the north-west in the Illawarra that creates the outcrop pattern that extends from sea level about 20 km north of Wollongong before turning westward to track the northern side of the Shoalhaven River valleys.

3.3 Coal Resource

3.3.1 Coals Seams

The principal coal-bearing units of the Illawarra Coal Measures are the Bulli, Balgownie, Wongawilli and Tongarra coal units, of which the Bulli Coal Seam and the Wongawilli Coal Seam have the largest resources, as shown on **Figure 3-4**.

Other coal members include the Cape Horn, Hargrave, Woronora, American Creek and Woonona. The other coal seams are uneconomic due to the high ash content, low thickness and thin coal intervals in addition to being laterally discontinuous.

3.3.2 Bulli Coal Seam

The Bulli Coal Seam is present throughout most of the Southern Coalfield, but its absence has been documented at the southernmost region of the coalfield and basin. It is considered to contain the bulk of the Southern Coalfield's reserves.

The Bulli Coal Seam is stratigraphically the top seam in the Illawarra Coal Measures and represents the majority of the coal reserves. The seam is generally 2-3 m thick, apart from the northern section of the coalfield where it increases to 5 m. It comprises interbanded dull and bright coal plies, with sub-bands of siderite and claystone. The seam is medium ash (8-9% in the east, and increasing westward), medium volatile matter (21.5-27.5%, air dry) and has a relatively low sulphur content.

Underground mining is used to extract the Bulli Coal Seam. The Bulli Coal Seam reaches depths of up to 800 m in the central north of the coalfield and is situated at more than 850 m below the surface in the north-west. To the north of the coalfield, the Bulli Coal Seam is 5 m at its thickest and in other regions varies in thickness between 2 and 3 m. The thicker sections of the Bulli Coal Seam occur in synclines and down-thrown fault blocks.

The Bulli Coal Seam consists of interbanded coal seams, composed of dull and bright plies. In addition to the coal, minor claystone and siderite is present in the seam. The Bulli Coal Seam contains 8-9% ash, 21.5-27.5% volatile matter, 30-55% vitrinite and a high inertinite percentage, up to 55%.

The Bulli Coal Seam is a prime quality coking coal with medium to high ash and low to medium volatiles, with an average raw yield ranging from 70-85% and average of approximately 76%. The regional dip of the Bulli Coal Seam towards the north-west is about 2.5 degrees. Where igneous intrusive bodies occur near the Bulli Coal Seam, the economic potential has been decreased due to thermal alteration of the coal.

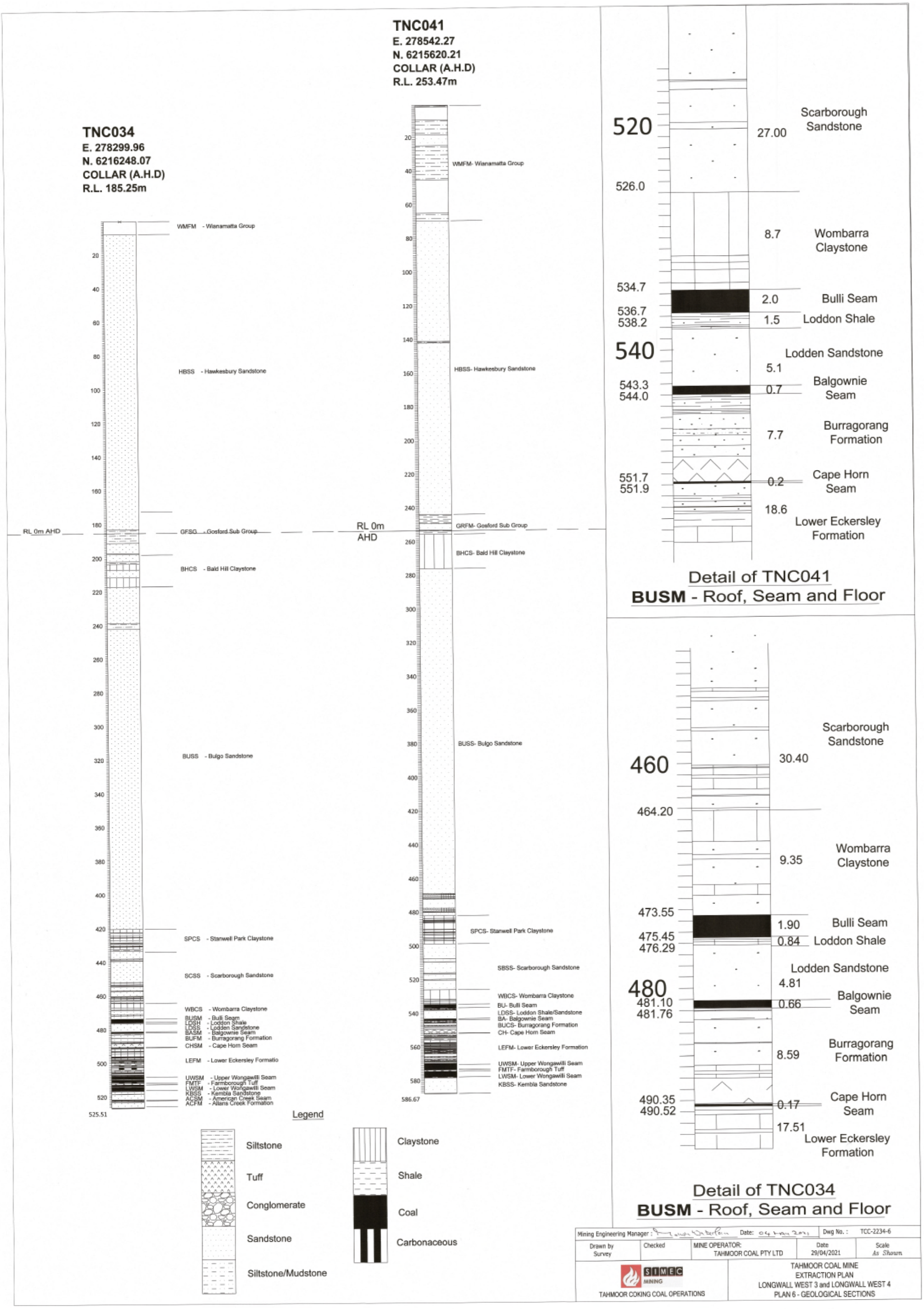


Figure 3-4 Tahmoor Mine – Typical Stratigraphy in the Western Domain (TNC034 and TNC041)

3.4 Overburden Stratigraphy

Locally the stratigraphy of the area (from youngest to oldest) can be summarised as:

- Alluvial sediments – sediments consisting of sand, gravel, silt and clay overlie the Wianamatta Shales and Hawkesbury Sandstone along the major rivers and creeks. These sediments are rarely more than 20 m thick;
- Wianamatta Group – the Triassic Wianamatta Group comprises the surficial geology over most of the area. It can be very thin to more than 100m thick in some of the more elevated areas. The Wianamatta Group primarily comprises shales, with occasional calcareous claystone, laminate and coal. The Ashfield Shale is the most widespread rock type, at surface, across the area;
- Mittagong Formation – separates the Ashfield Shale from the underlying Hawkesbury Sandstone. It is a thin layer (generally less than 10 m thick) comprising dark grey to grey alternating beds of shale laminate, siltstone and quartzose sandstone;
- Hawkesbury Sandstone – alluvial in origin, with a thickness of approximately 170 m in the region. Sandstone thicknesses increase to the north. The Triassic Hawkesbury Sandstone is generally medium to coarse grained quartz sandstone, with interbedded siltstone, finer grained sandstone and shale lenses. Shale lenses are common within this formation;
- Narrabeen Group – the total thickness of these Triassic rocks is approximately 450 m across the area and consists of the following subgroups:
  - Gosford Sub-group:
    - Newport Formation – medium grained, light to dark grey, quartzose sandstone interbedded with siltstone;
    - Garie Formation – a thin, cream kaolinite claystone, which grades upwards to grey;
  - Clifton Sub-group:
    - Bald Hill Claystone – grey to red/brown claystones and mudstones, occasional siderite nodules and generally softer than the overlying Garie Formation;
    - Bulgo Sandstone – white to grey coarse grained sandstone, fining upwards to coarse pebbly sandstone, with interbedded siltstone;
    - Stanwell Park Claystone – alternating light grey/green to brown sandstone and claystone intervals, with minor conglomerate;
    - Scarborough Sandstone – fine to very coarse grained, white to grey sandstone, with occasional siltstone and conglomerate laminae;
    - Wombarra Claystone – light grey/green to dark grey claystone, siltstone, mudstone with minor quartz lithic sandstone and conglomerate;
- Illawarra Coal Measures – the sedimentary thickness is approximately 300 m in the central area of the Southern Coalfield. The upper sections of the Permian Illawarra Coal Measures (Sydney Sub-group) contain the major coal seams including the Bulli, Balgownie and Wongawilli Coal seams. The underlying Cumberland Sub-group generally contains thin coal seam development;
- Shoalhaven Group – The Permian Budgong Sandstone is shallow marine to littoral, typically comprising fine and course grained sandstone; and

- Basement geology – The Southern Sydney Basin Permian and Triassic rocks have been deposited upon early to middle Palaeozoic basement rocks of the Lachlan Fold Belt. These rocks consist of intensely folded and faulted slates, phyllites, quartzite sandstones and minor limestones of Ordovician to Silurian age.

3.5 Structural Geology

3.5.1 Sydney Basin

The Sydney Basin formed as part of the regionally extensive Early Permian East Australian Rift System through northeast to southwest directed extensional stresses during the Late Carboniferous to Early Permian. Subsequently during the Mid-Permian to Late Triassic, a foreland basin system developed in front of the accreting New England Fold Belt.

The rift and foreland basin system that includes the Sydney, Gunnedah and Bowen basins, extended from south eastern Queensland to south-central New South Wales. Sediment thickness within the basins reach a thickness of about 5,500 m and thin significantly to the north and west.

Figure 3-5 outlines the structure of the Sydney Basin.

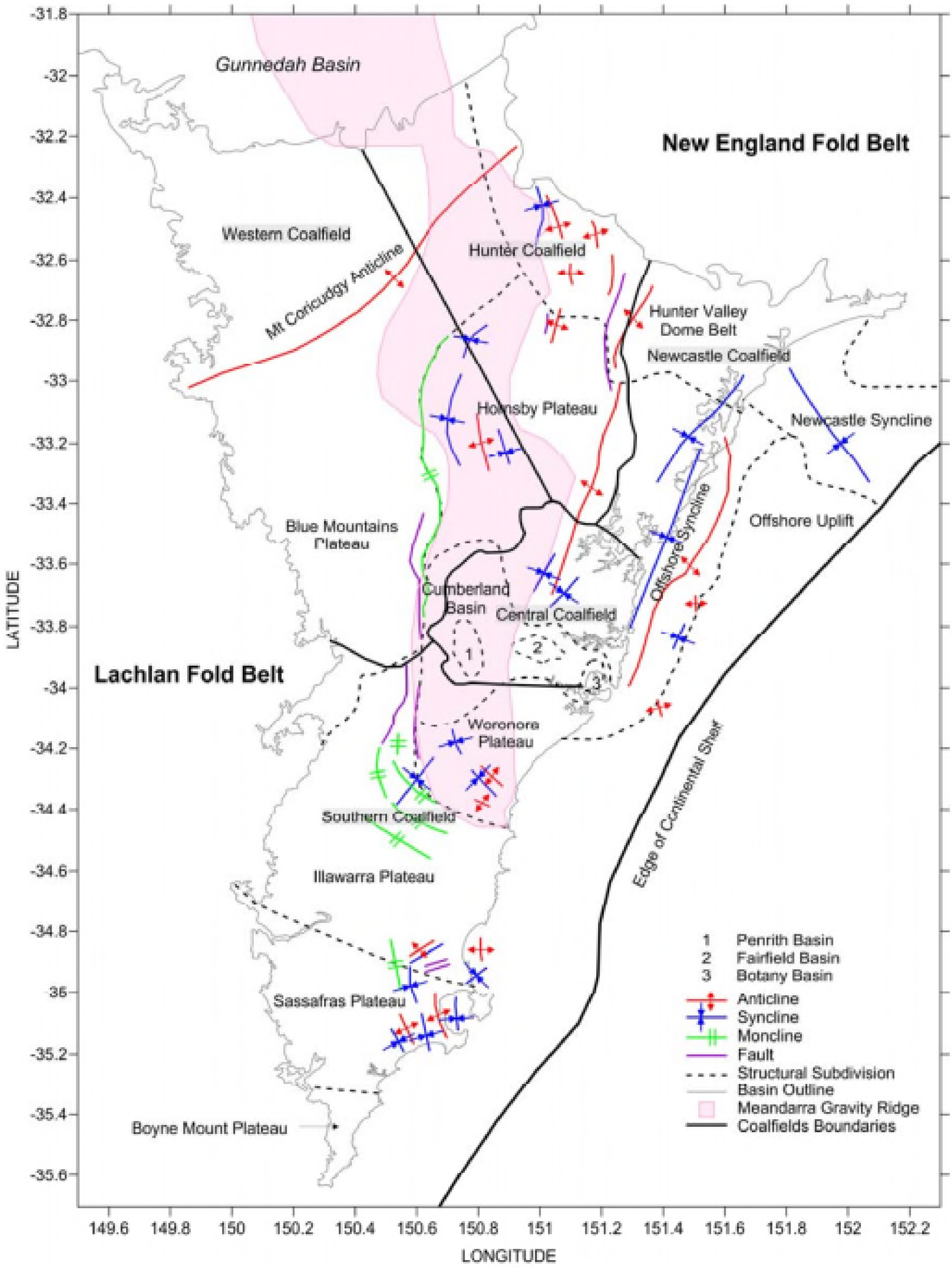


Figure 3-5 Structure and Tectonic Map of the Sydney Basin

3.5.2 Southern Coalfields

Structurally, the Southern Coalfields is dominated by the north, north-east plunging Camden Syncline, which is a broad and gentle warp structure. The Camden Syncline is bounded in the west and truncated in the south-west by the north-south trending Nepean Structural Zone, part of the Lapstone Structural Complex.

The normal and strike slip faults encountered at Tahmoor Mine have a distinct north-west trend, as opposed to the north-east trend of the reverse faults. The throw on all faults is typically <0.5 m. The north-west trending faults may also be associated with dykes. North-west trending dykes, normal faults and strike-slip faults have been negotiated in a number of longwall panels at Tahmoor Mine.

The structural geology of the Southern Coalfields is shown on **Figure 3-6** and the Tahmoor Mine on **Figure 3-7**.

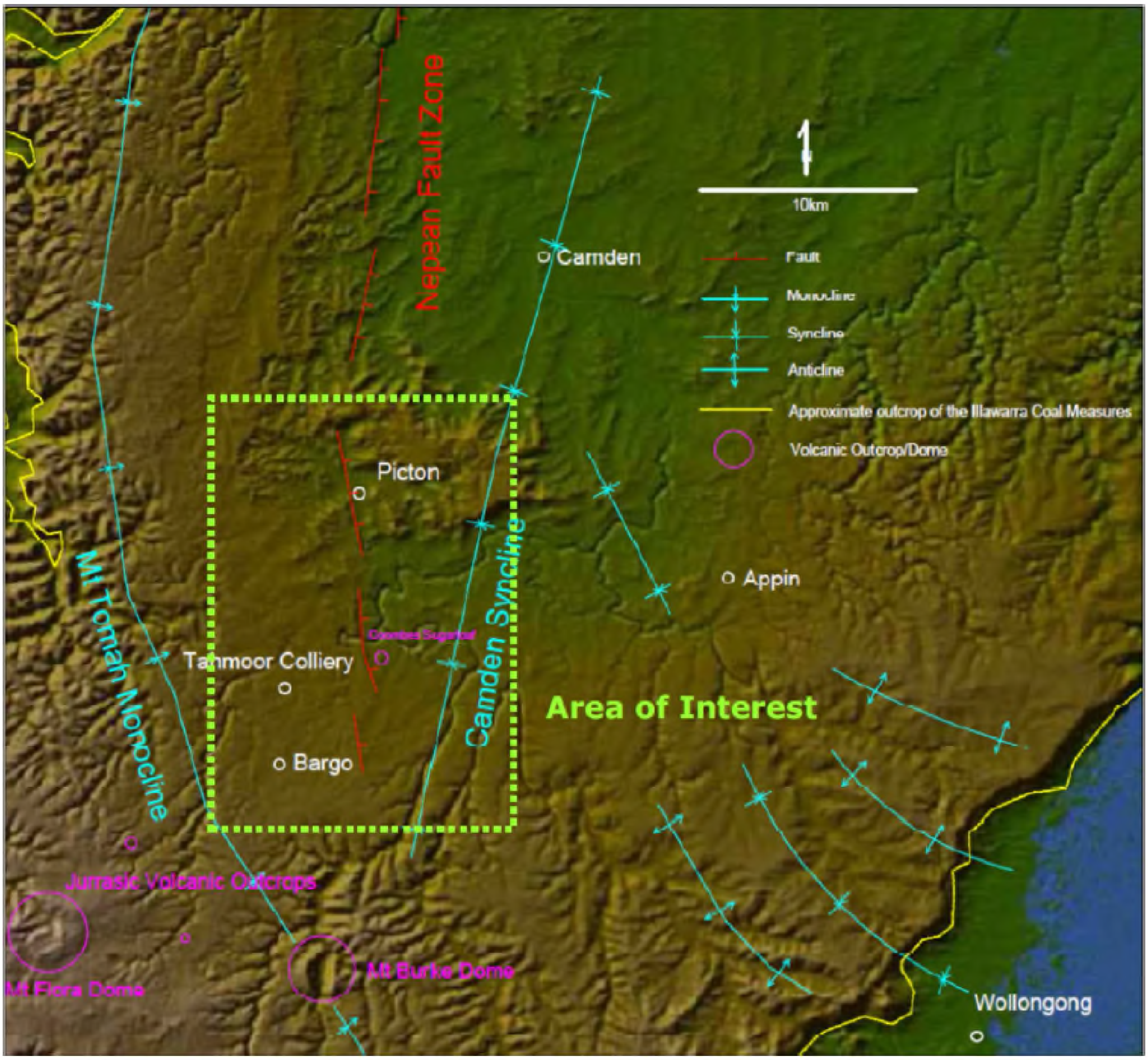


Figure 3-6 Structural Geology of the Southern Coalfields

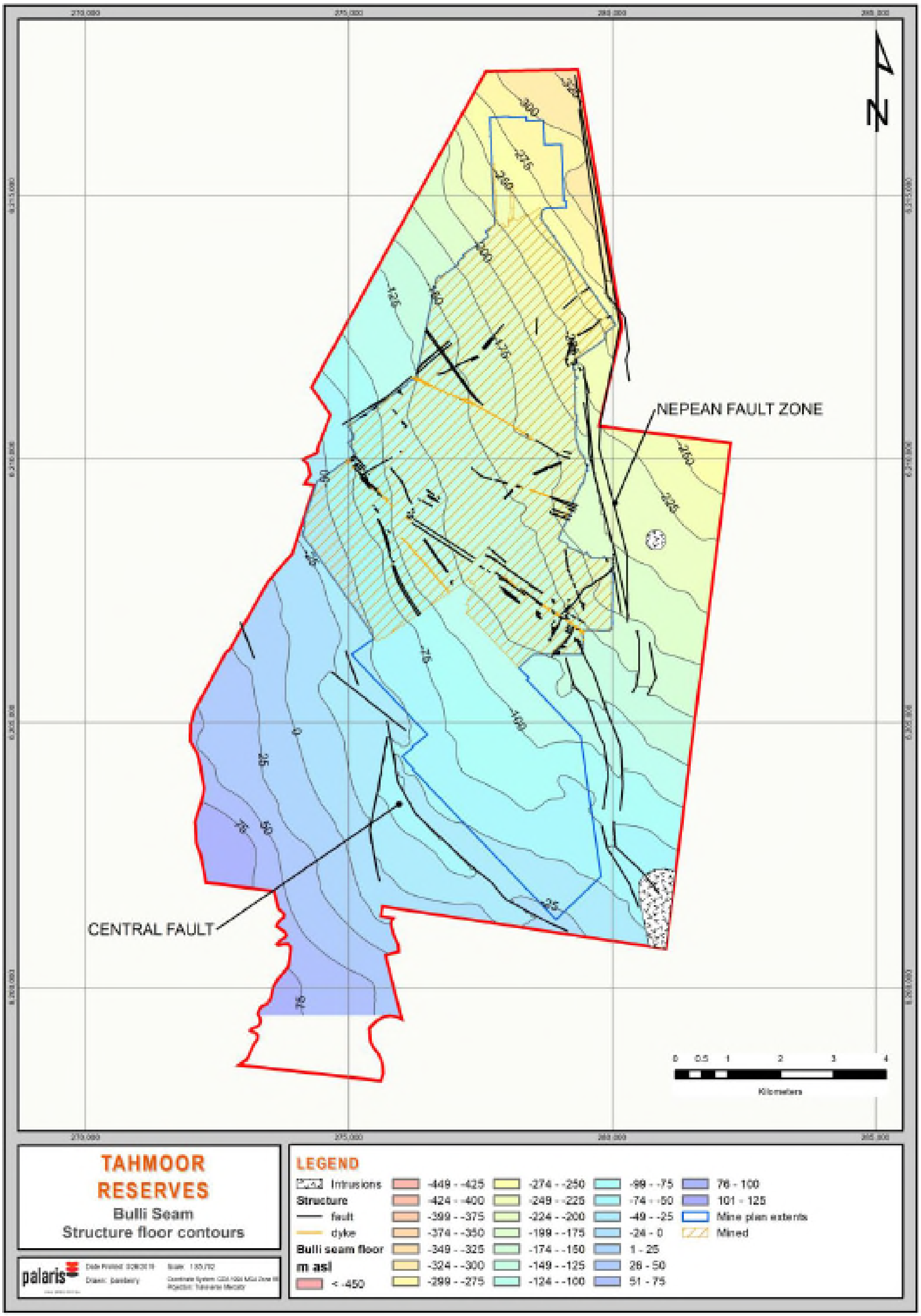


Figure 3-7 Structure of the Bulli Coal Seam (Palaris, 2019)

4 Mine Geotechnical Overview

4.1 Depth of Cover

The depth of cover over LW W3-W4 ranges from between a minimum of 480 m above the commencing end of LW W3 and a maximum of 540 m in the middle of LW W3 and on the northern edge of LW W4.

The changes in depth of cover relates to the seam dip and changes in surface topography.

4.2 Roof Stata Characteristics

The immediate Bulli Coal Seam roof consists of an interbedded sandstone, siltstone and mudstone sequence of varying thickness, stratigraphically named the Wombarra Claystone. This sequence is overlain by the more thickly bedded Scarborough Sandstone.

Generally, the overburden for the 50 m of roof above the Bulli Coal Seam averages 60-80 Mpa. Roof strengths range typically 40-80 Mpa. The immediate 0.5 m roof strength is typically in the range 40-70 Mpa. The average strength of the 0-2 m horizon is generally stronger, ranging between 50-80 Mpa. The 2-8 m roof horizon ranges in strength from 60-90 Mpa.

Roof conditions vary with both the roof lithology and local stress conditions. Tahmoor Coal undertakes extensive roof monitoring, including roof sampling at specified locations.

4.3 Floor Strata Characteristics

The Bulli Coal Seam floor typically consists of carbonaceous mudstone grading into the coarser Loddon Sandstone sediments below.

Floor strengths range typically 40-70 Mpa. In the current Tahmoor mining area, the immediate floor 0.2-0.5 m below the Bulli Coal Seam averages 50-80 Mpa.

Floor heave is commonly observed during development at Tahmoor. Floor brushing is carried out, usually at least once, to provide adequate clearance within the first two weeks of mining. Typically, 0.5 m of floor is brushed in development roadways.

A laboratory strength range for the coal of the Bulli Coal Seam is about 15-20 Mpa.

4.4 Seam Dip

The Bulli Coal Seam has a gentle dip to the northeast, averaging 1.7°, although can range with dips up to 3.6° being recorded. This northeast dip is consistent to being positioned on the western arm of the Camden Syncline and western edge of the Sydney Basin.

The Bulli Coal Seam average gradient is 3-5% (i.e. 1 in 20) or from 9-15 m across the proposed longwall face width within the mining area of LW W3-W4.

4.5 Seam Thickness and Working Section

The main part of the Bulli Coal Seam at Tahmoor Mine is a consistent seam of bright and dull coal. The thickness of the Bulli Coal Seam section ranges from 1.8-2.4 m in Tahmoor North and is mainly in the 2.0-2.2 m range, however in the LW W3 and LW W4 the seam is typically between 2.00–2.10 m thick.

The Bulli Coal Seam is currently mined on a full seam working section. Within the Tahmoor North domain, the seam profile is devoid of any significant stone bands and consists solely of coal of varying degrees of brightness and inherent mineral matter (ash). As such, dilution within the product is generally a function of longwall cutting heights and profiles and the product yield is primarily determined by seam thickness and inherent mineral matter.

4.6 Faulting

Faults and seam continuity have been interpreted from exploration drilling, extensive seismic surveys and underground mapping.

No significant geological structures have been identified within the LW W3 and W4 from underground workings by Tahmoor Coal. Two small faults have been encountered to date in the roadway development for LW W1 and LW W2, with approximate displacement of <0.05 m.

The Nepean Fault encountered at Tahmoor Mine is part of the regional Nepean Fault system. The Nepean Fault is located east of the LW W3-W4 mining area, approximately 500 m from the edge of LW W4.

This system is the southern extension of the Lapstone Monocline, and at Tahmoor, it consists of closely spaced sub-vertical en-echelon faults in a zone up to 400 m wide. The net displacement of the faults is approximately 30 m at Picton, diminishing to 10 m at Tahmoor North, and 3 m in Tahmoor South. The Nepean Fault Zone is the only hydraulically charged geological structure encountered during mining to date.

4.7 Igneous Intrusions

No igneous intrusions have been identified within the LWW3-W4 in underground workings by Tahmoor Coal.

To the southeast of the Tahmoor Mine leases, the Bulli Coal Seam is extensively intruded and/or cindered to the east of Bargo. The north-western limits of this intrusion partly encroach on the south-eastern part of Tahmoor South.

These intrusions typically have North-west to south-east orientated and have been intersected in workings in Tahmoor in southern regions. These bodies have presented as dykes with associated sill material, ranging from very strong fresh material to weak highly altered rock.

In the eastern part of the mining leasehold, a plug, which is exposed at the surface, is considered to be present at Bulli Coal Seam level. This feature is external to current mine plans.

4.8 Seam Splitting

The Bulli Coal Seam is represented by a single, thick uniform seam. In parts of the central and southern parts of Tahmoor Mine, a basal stone band is developed and below this, a localised split of the Bulli Coal Seam is developed.

Within the LW W3-W4 mining area, no seam splitting has been observed within exploration drilling, gas drainage drilling and roadway development so only the full seam is relevant.

4.9 Geotechnical Design Parameters

Chain pillars at Tahmoor Mine mostly range between 35-40 m. The use of 44 m wide double abutments chain pillars is relatively standard in the local mining district. Narrower chain pillars down to 25 m have been adopted where single sided abutment is planned.

4.10 Stability of Underground Workings

The Coal Mine Roof Rating (CMRR) is routinely measured at Tahmoor Mine to characterise the immediate roof strata. The CMRR throughout Tahmoor North ranges between 40-55.

Due to the laminated immediate roof, goafing is typically directly behind the shields and large en-masse roof falls are not a feature of longwalling in the Bulli Coal Seam at Tahmoor Mine.

The Tahmoor Mine Hazard Plan summarises the main features affecting the longwall stability as:

- Roadway stability due to stress notching;
- Cross grades across the face; and
- Minor strike slip faulting.

5 Coal Quality

Tahmoor Mine is a well-established and consistent metallurgical coal brand in the global marketplace that borders on being a hard coking coal. The Tahmoor Mine sells coking coal products to steel producers in Australian domestic market and export markets to European, Indian and Asian customers.

High quality coking coal is the primary product of the Tahmoor Mine. This product has a target ash of an average 9.3% with 9% product moisture. A higher ash coal is produced as a secondary product, which is washed to a target ash of 22% with a product moisture of 9%.

Cold and hot coke strength limit the classification and value of this coal to a premium semi-hard or a discounted hard coking coal generally trading at a slight discount to the Platts Low Vol Hard Coking Coal price.

Shipping results indicate coal quality parameters such as rank, ash, sulphur to be consistent with fluidity generally 2,000-4,000 ddpm, as outlined in **Table 5-1**. Volatile matter and dilatation vary slightly across the mining area.

Table 5-1 Tahmoor Coking Coal – Typical Specifications

Analysis	Units	Tahmoor Coking Coal
GCV	(ad)	7,610
Total Moisture	%ar	9.0
Volatile Matter	%ad	28.0
Ash	%ad	9.5
Sulphur	%ad	0.40
Phosphorus (in coal)	%ad	0.065
Vitrinite	%	53
HGI (ASTM)		65
CSN		7
RoMax	Rank	1.02
Grey King		G4
Average Max. Fluidity	ddpm	3,500
Total Dilatation	%	120
G / Y	% / mm	85/15
CSR	%	59
MMR	%	1.04
Loadport		PKCT or Newcastle

6 Mine Subsidence

The predicted incremental vertical subsidence contours resulting from the extraction of the proposed longwalls are outlined within **Table 6-1**. The incremental parameters represent the additional movements due to the extraction of each of the proposed longwalls.

Table 6-1 Maximum Predicted Incremental Conventional Subsidence, Tilt and Curvature

Longwall	Maximum predicted incremental vertical subsidence (mm)	Maximum predicted incremental tilt (mm/m)	Maximum predicted incremental hogging curvature (km^{-1})	Maximum predicted incremental sagging curvature (km^{-1})
LW W3	650	4.5	0.05	0.09
LW W4	600	4.5	0.05	0.08

The predicted total vertical subsidence contours resulting from the extraction of the proposed longwalls are outlined within **Table 6-2**. The predicted total parameters represent the accumulated movements due to the extraction of all proposed longwalls within each of the mining areas.

Table 6-2 Maximum Predicted Total Conventional Subsidence, Tilt and Curvature

Longwall	Maximum predicted incremental vertical subsidence (mm)	Maximum predicted incremental tilt (mm/m)	Maximum predicted incremental hogging curvature (km^{-1})	Maximum predicted incremental sagging curvature (km^{-1})
LW W3	950	5.0	0.06	0.10
LW W4	1025	5.0	0.06	0.10

7 Mining System

7.1 Mining Method

First workings (primary extraction / development mining) for LW W3-W4 utilise continuous miners and shuttle cars to develop roadways which form the longwall panels. The two heading development roadways for LW W3-W4 are typically 5.2 m wide and 2.7 m high by single pass continuous miners.

Development mining equipment required for first workings includes, but is not limited to:

- Continuous miners;
- Shuttle cars;
- Breaker feeders;
- Auxiliary fans;
- Graders;
- Underground personnel transporters; and
- Underground load haul dumps.

Second workings (secondary extraction / longwall mining) for LW W3-W4 will utilise longwall retreat method of mining to extract coal from the Bulli Coal Seam. Longwall mining is supported by continuous miner development operations. Each panel will progress in a direction towards the main headings, working north to south.

Longwall mining equipment required for second workings includes, but is not limited to:

- Longwall shearer – to cut coal from the face of the seam;
- Face conveyor – to collect sheared coal and carry it to a coal sizer and stage loader;
- Panel conveyor – to transfer the coal to a trunk conveyor in one of the main headings; and
- Hydraulic roof supports – to temporarily hold up the roof strata to provide a working space for the shearing machinery and face conveyor. After each slice of coal is removed, the hydraulic roof supports, face conveyor and shearing machinery are moved forward and the roof immediately above the seam is allowed to collapse into the void that is left as the face retreats (the goaf).

ROM coal from Tahmoor Mine is conveyed to the surface via a series of conveyor belts and discharged to the ROM Stockpile area, where the coal is reclaimed and transferred to the Coal Handling Preparation Plant (CHPP). At the CHPP, the ROM coal is processed by crushing, washing, sizing and dewatered and then transferred to the product coal stockpile by conveyor. Product Coal is reclaimed and transferred by conveyors to the Rail Load Out Bin, and then loaded into rail coal wagons for transport to either Port Kembla or the Port of Newcastle by rail.

Coal is mined from within the Bulli Coal Seam, producing hard coking coal for steel production. Product coal is marketed to Australian domestic customers and export customers.

7.2 Mine Design

The underground mine designs take the following criteria into account:

- Seam access;
- Pit bottom location with respect to geological structure;
- Access to shaft locations;
- Seam dip;
- Alignment with geological structure;
- Major horizontal stress;
- Depth of cover;
- Subsidence limits;
- Ventilation and gas drainage; and
- Timing of government approvals.

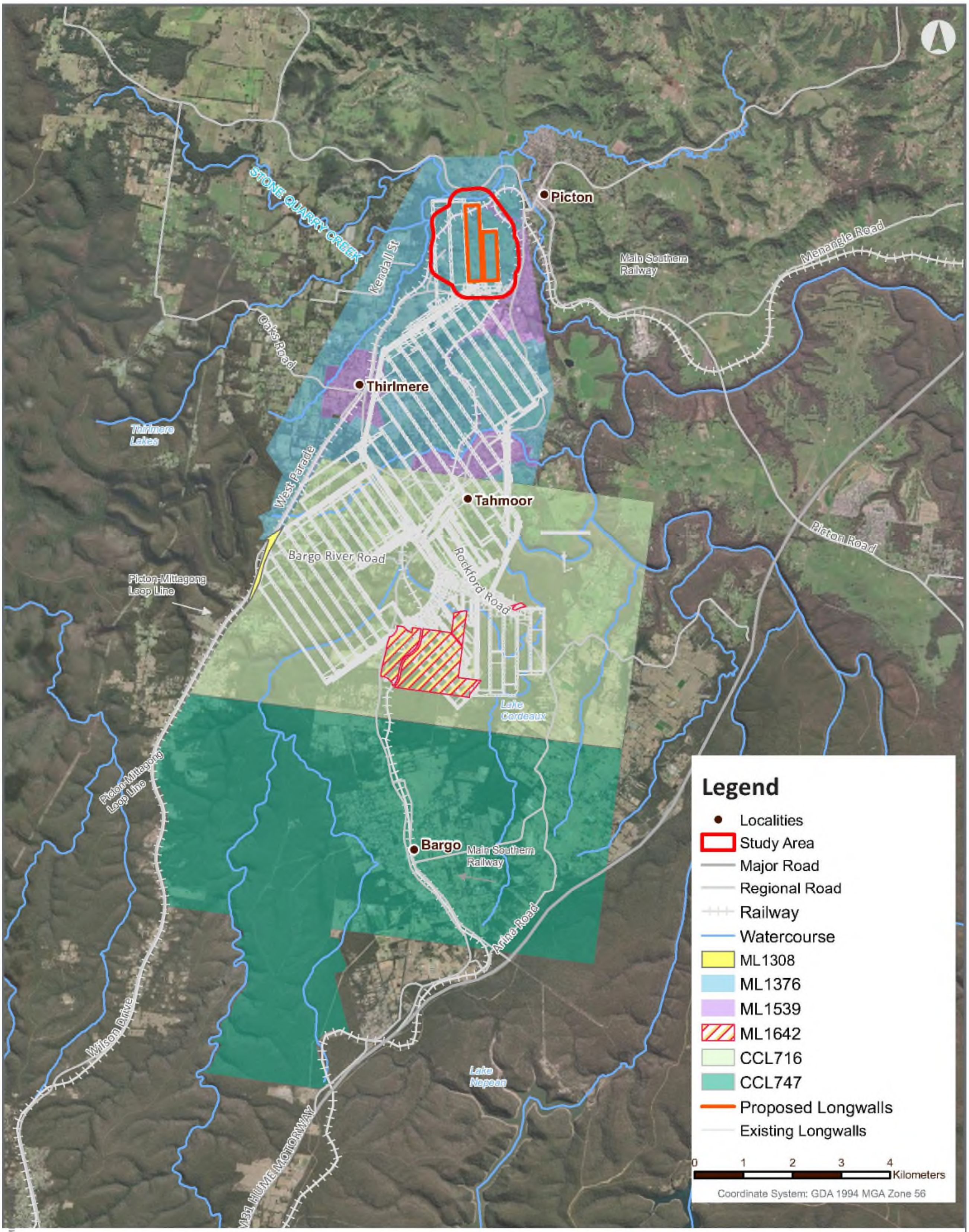
The mine plan for the Western Domain and the extracted longwalls within the Tahmoor North mining domain are shown on **Figure 7-1**.

The Western Domain mine plan has been refined over time since the approved 1993 EIS (Kembla Coal and Coke, 1993) and the approved 1998 EIS (Olsen Environmental Consulting, 1998). The mine plan for the Western Domain presented within the 2014 LW 31-37 SMP Application (Glencore, 2014) was further reviewed and refined during 2017. This mine design review resulted in reorientation of longwalls in the Western Domain from a north-west to south-east orientation to a north to south orientation to avoid mining directly under streams of third order or above.

These design changes were implemented to reduce subsidence-related impacts to Matthews Creek, Cedar Creek and Stonequarry Creek, which are located along the western and northern areas of the Western Domain. According to the current mine plan, Stonequarry Creek is located approximately 120 m north of the commencing end of LW W3, and Cedar Creek is located approximately 350 m north west of the commencing end of LW W4. Matthews Creek is not located within 600 m of LW W3-W4. The mine plan design minimises subsidence impact risks to surface water, aquatic habitat, and Aboriginal heritage sites located along these creeks.

LW W3-W4 are positioned with enough set back from the boundary of ML1376 to provide an adequate (in excess of 20 m) external barrier around the edge of the mining lease extent. Both ML 1376 and ML 1539 contain barrier conditions related to the Main Southern Rail Line and the Picton – Mittagong Loop Line. However, DA 67/98 was granted to include extraction of areas under the Main Southern Rail Line and the Picton – Mittagong Loop Line, which are covered by ML 1539.

First workings at Tahmoor Mine are typically 5.2 m wide resulting in stable first workings with minimal mine subsidence risk. The first working design at Tahmoor Mine does not trigger the requirement for a High-Risk Activity application for driving an underground roadway, which is triggered if first workings are greater than 5.5 m wide.



Tahmoor Mining Area and Tenure

Tahmoor North Western Domain Longwalls West 3 and West 4 Extraction Plan

FIGURE 7-1

Date: 7/04/2021

Data Sources:
© NSW DFSI (2019); © NSW Mining (2019); © SIMEC (2019)
Aerial Imagery: © Photomapping Services (November 2018)

Access and Use Constraints:
This webmap is intended to be used by SIMEC Mining and other stakeholders involved in the development and operation of SIMEC Mining's mines.
Access to this webmap is restricted to users authorised by SIMEC Mining only. You may not reproduce, adapt, modify, communicate or use any part of this webmap other than for activities related to development and operation of SIMEC Mining's mines.

Disclaimer:
The data displayed in this webmap has been collated from various sources.
The source data may contain inconsistencies or omissions, may not be to scale, may not be current and may present indicative information only. SIMEC Mining does not warrant the accuracy or completeness of the contents of this webmap.

7.3 Mining Geometry

LW W3-W4 are to be developed north of the main headings in the Western Domain, will be orientated in a north to south direction, and will be mined from north to south as illustrated in **Figure 8-1**. LW W3 will be mined first, followed by LW W4.

The LW W3-W4 panels will be 283 m (LW W3) and 285 m (LW W4) in width (272.6 m (LW W3) and 274.6 m (LW W4) excluding first workings). The length of the longwalls will be 1,544 m for LW W3 and 996 m for LW W4 (excluding first workings). The overall void length is approximately 8 m greater than the lengths of longwall extraction, owing to the installation headings.

The mining height of the longwalls is anticipated to be a continuous 2.15 m and will be kept constant for the length of the longwall.

A summary of the dimensions of the longwalls is provided in **Table 7-1**.

Table 7-1 LW W3-W4 Design Parameters

Longwall Panel Parameters	Units	LW W3	LW W4
ROM Coal Extracted	tonnes	1,568,548	993,760
Gate Road Width	m	5.2	5.2
Gate Road Height	m	2.7	2.7
Maingate (MG) Chain Pillar Width	m	44 (1 to 12) 37 (12 to 13) 30 (13 to 18)	25
Tailgate (TG) Chain Pillar Width	m	39	44
Pillar Width/Height Ratio		14.4	9.5
Tailgate (TG) Chain Pillar Length	m	101	105
Longwall Void Width (Goaf)	m	283	285
Longwall Extraction Width	m	272.6	274.6
Longwall Void Length	m	1,552	1,004
Longwall Extraction Length	m	1,544	996
Longwall Extraction Height	m	2.15	2.15
Coal Seam thickness	m	2.00	2.10
Minimum Depth of Cover	m	480	500
Maximum Depth of Cover	m	540	540

7.4 Mining Hazards

A number of potential mining hazards for LW W3-W4 were identified and reviewed as part of the mine planning process and design considerations.

In summary, the more significant mining and general mine operating issues identified include:

- Longwall panel length being shorter than recent Tahmoor Mine longwalls;
- Ventilation of panels;
- Number of development units required to support a highly productive longwall;
- Mains development requirement;
- Scoping accurate productivity levels;
- Frequency of longwall and development relocations due to shorter longwall lengths;
- Resourcing with ramp up of Tahmoor South pre-approval development labour requirements;
- Geological information and level of certainty; and
- Mine planning effectiveness.

Tahmoor Mine prepares mining and geotechnical hazard plan for each longwall in advance of mining.

8 Resource Recovery

8.1 Coal Reserves

The geological definition of Tahmoor North has primarily been determined by the TNC series of boreholes which was undertaken in two separate programs, being TNC1 to TNC26 in the early 1990's and TNC27 to TNC46 from 2008-2010. Near term geological data is gained by a longwall block strip sampling regime and selective input of inseam exploration/gas drainage drill holes.

Coal Reserve for the Tahmoor North Western Domain mining area has been reported in accordance with the JORC Code, 2012. The reserves are estimated as at 31 December 2019 and generally reflect the mine design currently used for the Tahmoor North underground life of mine plan and are outlined within **Table 8-1**.

Table 8-1 Tahmoor North – Western Domain – Coal Reserve Estimate

Domain	Proved (Mt)
ROM Reserve	
Tahmoor North – Western Domain – LW W1-W4 Bulli Coal Seam (5% M_{ROM})	8.6
Marketable Reserve	
Coking Coal (8% M_{Prod}, 9.3% Ash)	5.8
Secondary Coking Coal (10% M_{Prod}, 17% Ash)	0.8
Total Product	6.5
Yield	
Product Yield (%)	76

The estimated coal resource recovery tonnages are outlined within **Table 8-2**.

Table 8-2 Estimated Coal Resource Recovery

Longwall	ROM tonnes (t)	Coking Coal Product tonnes (t)	High Ash Secondary product tonnes (t)	Reject tonnes (t)	Yield (%)
LW W3	1,568,549	1,063,993	19,831	501,143	69.1
LW W4	993,760	725,472	12,344	266,381	74.2

8.2 Mining Schedule

Mining of LW W3-W4 is scheduled to commence in September 2021. The two panels are anticipated to be extracted within one year and one month, and each panel is anticipated to be extracted over a four-month (LW W3) to seven-month (LW W4) period, as outlined within **Table 8-3**.

The rate of longwall retreat is anticipated to range from 50-60 m per week, depending on geological conditions and support regime.

Tahmoor Coal operates seven days a week, 24 hours a day on a roster basis.

Table 8-3 Mine Schedule for LW W3-W4

Longwall Panel	Estimated Start Date	Estimated Duration	Estimated Completion Date
Longwall West 3	5/9/2021	201 (7 months)	25/3/2022
Longwall West 4	22/4/2022	133 (4 months)	2/9/2022

8.3 Future Mining Proposed

There are no further longwalls planned in the Western Domain.

9 Justification Statement

The mine plan for LW W3-W4 has been developed based upon the following factors:

- Risk assessments for both natural environmental features and built infrastructure;
- Exploration drilling;
- Geological model and resource recovery parameters;
- Mining parameters;
- Economic feasibility parameters;
- Environment investigation and assessment, particularly in consideration for impacts associated with mining directly under 3rd Order or greater streams;
- Technical mining impact parameters, such as impacts of subsidence; and
- Consultation with the relevant Government authorities.

The mine layout and mining method provides an extraction layout that maximises the efficient use and management of resources through maximising resource utilisation.

There are no significant environmental impacts anticipated, given the mine plan avoidance of sensitive areas and the ability for ongoing adaptive management, which will preclude longwall mining within the Extraction Plan Study Area.

There are no significant subsidence impacts anticipated to surface infrastructure that cannot be mitigated prior to mining that will preclude longwall mining within the Extraction Plan Study Area.

The subsidence monitoring program forming part of the Extraction Plan summaries the overall monitoring of mining impacts on both the natural environment and built infrastructure, with management actions and controls detailed within the relevant key component plans and infrastructure management plans.

Using the proposed longwall mining method, the ROM recovery yield from the Bulli Coal Seam in is estimated to be 69% for LW W3 and 74% for LW W4. The total amount of ROM coal anticipated to be extracted from LW W3-W4 is approximately 2.562 million tonnes.

Tahmoor Coal considers that the mine layout of LW W3-W4 provides the most efficient resource recovery given the environmental and surface infrastructure constraints to mining.

10 Review and Improvement

This section describes the key elements of implementation relevant to the management of coal resource recovery. A description of general reporting requirements, reviews and key responsibilities that are applicable to extraction of LW W3-W4 are discussed in the Extraction Plan Main Document.

10.1 Reporting Requirements

Generic reporting requirements for the LW W3-W4 Extraction Plan are discussed in **Section 6.1** of the Extraction Plan Main Document. There are no reporting requirements specific to the management of coal resource recovery identified for the extraction of LW W3-W4.

10.2 Review and Auditing

Generic review and auditing requirements for the LW W3-W4 Extraction Plan are discussed in **Section 6.2** of the Extraction Plan Main Document. There are no review or auditing requirements specific to the management of coal resource recovery identified for the extraction of LW W3-W4.

10.3 Roles and Responsibilities

Generic roles and responsibilities applicable for the implementation of the LW W3-W4 Extraction Plan are discussed in **Section 6.3** of the Extraction Plan Main Document. There are no roles and responsibilities specific to the implementation of coal resource recovery management measures identified for the extraction of LW W3-W4.

11 Document Information

This section provides a compiled list of references, related documents, terms, and abbreviations used in this document. In addition, this section provides the change information for this document.

11.1 References

Department of Planning and Environment (DPE) (2015), Guidelines for the Preparation of Extraction Plans V5.

Glencore (2014), Tahmoor Colliery Development and Extraction of Longwalls 31 to 37 – Subsidence management Plan Application.

Kembla Coal and Coke (1993), Tahmoor North Coal Project, an Extension of Current Operations, Environmental Impact Statement, prepared for Novacoal Australia.

Mine Subsidence Engineering Consultants (2021), Tahmoor Coal – Longwalls W3 and W4, Subsidence Predictions and Impact Assessments for Natural and Built Features due to the Extraction of the Proposed Longwalls W3 and W4 in Support of the Extraction Plan Application. Prepared for Tahmoor Coal, March 2021, document MSEC1112.

Olsen Environmental Consulting (1998), Tahmoor North Underground Extension, Underground Coal Mining to Extend Life of Tahmoor Mine, Environmental Impact Statement, prepared for Austral Coal.

Palaris (2019), Tahmoor Coal Mine – Resource and Reserve Statement.

11.2 Glossary of Terms

The Extraction Plan Main Document provides a compiles Glossary of Terms in **Section 8.3**.

11.3 Abbreviations

Abbreviations used in this document are provided below in **Table 11-1**.

Table 11-1 Abbreviations

Abbreviation	Definition
CMRR	Coal Mine Roof Rating
CRRP	Coal Resource Recovery Plan
CSG	Coal Seam Gas
DPE	NSW Department of Planning and Environment (former) Now known as NSW Department of Planning, Industry and Environment (DPIE)
DPIE	NSW Department of Planning, Industry and Environment
JORC	Joint Ore Reserves Committee
km	Kilometre/s
LW	Longwall
LW W1	Longwall West 1

Abbreviation	Definition
LW W1-W2	Longwalls West 1 to West 2
LW W2	Longwall West 2
LW W3	Longwall West 3
LW W3-W4	Longwalls West 3 to West 4
LW W4	Longwall West 4
m	Metre/s
MG	Main Gate
Mining Act	NSW *Mining Act 1992*
Mining SEPP	*State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*
mm	Millimetre/s
ML	Mining Lease
ROM	Run of Mine
SMP Application	Subsidence Management Plan Application
T	Tonnes
Tahmoor Coal	Tahmoor Coal Pty Ltd
Tahmoor Mine	Tahmoor Coal Mine
TG	Tailgate

11.4 Change Information

Table 11-2 provides the details of document history of this Extraction Plan.

Table 11-2 Document History

Version	Date Reviewed	Reviewed By	Change Summary
1.0	May 2021	Zina Ainsworth, David Corbett, Jason Prestwidge, Malcolm Waterfall	New document