YANCOAL
兖煤澳大利亚有限公司

STRATFORDCOAL
Part of the Yancoal Australia Group

STRATFORD MINING COMPLEX
Mining Operations Plan and Rehabilitation Management Plan
1 January 2021 – 31 December 2023

STRATFORD MINING COMPLEX

MINING OPERATIONS PLAN
AND
REHABILITATION MANAGEMENT PLAN

1 JANUARY 2021 TO 31 DECEMBER 2023

Section/Page/ Annexure	Revision	Amendment/Addition	Distribution	Approval Date
All	Version 1 (01072783)	Original	Distributed for Consultation: DPIE, DPIE-Water, DPIE-BCD and Mid-Coast Council. Submitted for Approval: Resources Regulator.	Submitted: 20 January 2021
All, where relevant	Version 2 (01088492)	Updated to address Resources Regulator and DPIE review comments.	Submitted for Approval: Resources Regulator.	TBC

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Project No. YAN-20-31
Document No. 01088492

Name of Mine:	STRATFORD MINING COMPLEX
MOP Commencement Date:	1 January 2021
MOP Completion Date:	31 December 2023
Mining Authorisations (Lease/Licence No)	ML 1360, ML 1409, ML 1447, ML 1521, ML 1528 & ML 1538, ML 1577, ML 1733, ML 1787 and MLA 1
Name of Authorisation/Authorisation Holders:	Gloucester Coal Ltd/CIM Stratford Pty Ltd/ Stratford Coal Pty Ltd/ CIM Resources Ltd/ EXCEL Mining Pty Ltd/ICA Coal Pty Ltd
Name of Mine Operator (if different):	Stratford Coal Pty Ltd

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Title of Representative(s) of the Authorisation Holder(s):

Operations Manager

Signature of Representative(s) of the Authorisation Holder(s):

Date:
20 January 2021 (Version 1).
18 June 2021 (Version 2)
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SUMMARY OF TABLES, FIGURES AND PLANS

A summary of the relevant tables and plans required by the New South Wales Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* is provided below.

ESG3 Requirement	Section of MOP	Table Reference	Plan Reference	Source
Material Production Schedule during the MOP Term	Section 2.3.4	Table 3	N/A	SCPL MOP Guidelines
Domain Selection	Section 5.1	Table 6	Plans 2 and 3A-3C	SCPL MOP Guidelines
Rehabilitation Phases	Section 5.3	Table 7	Plans 3A-3C	Spatial Data MOP Guidelines
Performance Indicators and Completion/ Relinquishment Criteria	Section 6	Table 9	N/A	In consideration of MOP Guidelines and Stratford Mining Complex Rehabilitation Management Plan requirements
Proposed Disturbance and Rehabilitation Activities during the MOP Term	Section 7.2	Table 10	Plans 3A-3C	Spatial Data MOP Guidelines
Summary of Rehabilitation Areas during the MOP Term	Section 7.3	Table 11	Plans 3A-3C	Spatial Data MOP Guidelines
Plans	Section 12	N/A	All Plans	In consideration of MOP Guidelines and GIS Software

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1 INTRODUCTION

The Stratford Mining Complex (SMC) is located approximately 100 kilometres (km) north of Newcastle, New South Wales (NSW) (Plan 1A). Stratford Coal Pty Ltd (SCPL), a wholly owned subsidiary of Yancoal Australia Limited (Yancoal), owns and operates the SMC.

Development of the SMC is approved under Development Consent (SSD-4966) and occurs within Mining Leases (MLs) 1577, ML 1528, ML 1360, ML1409, ML 1447, ML 1538, ML 1521, ML 1733 and ML 1787 (Plan 1C). Other key approvals, licences and permits for the SMC are described in Section 1.4.

This Mining Operations Plan and Rehabilitation Management Plan (MOP/RMP) for the SMC has been prepared by SCPL in accordance with the requirements of the SMC ML conditions, Development Consent (SSD-4966) conditions and the *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* (Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy [DTIRIS-DRE], 2013) (the MOP Guidelines).

This MOP/RMP replaces the existing SMC MOP/RMP (for the period 1 March 2018 to 1 March 2021 [including its approved Amendments A and B]) and describes the proposed operational mining and rehabilitation activities for the SMC for the period 1 January 2021 to 31 December 2023 (the MOP/RMP term).

1.1 HISTORY OF OPERATIONS

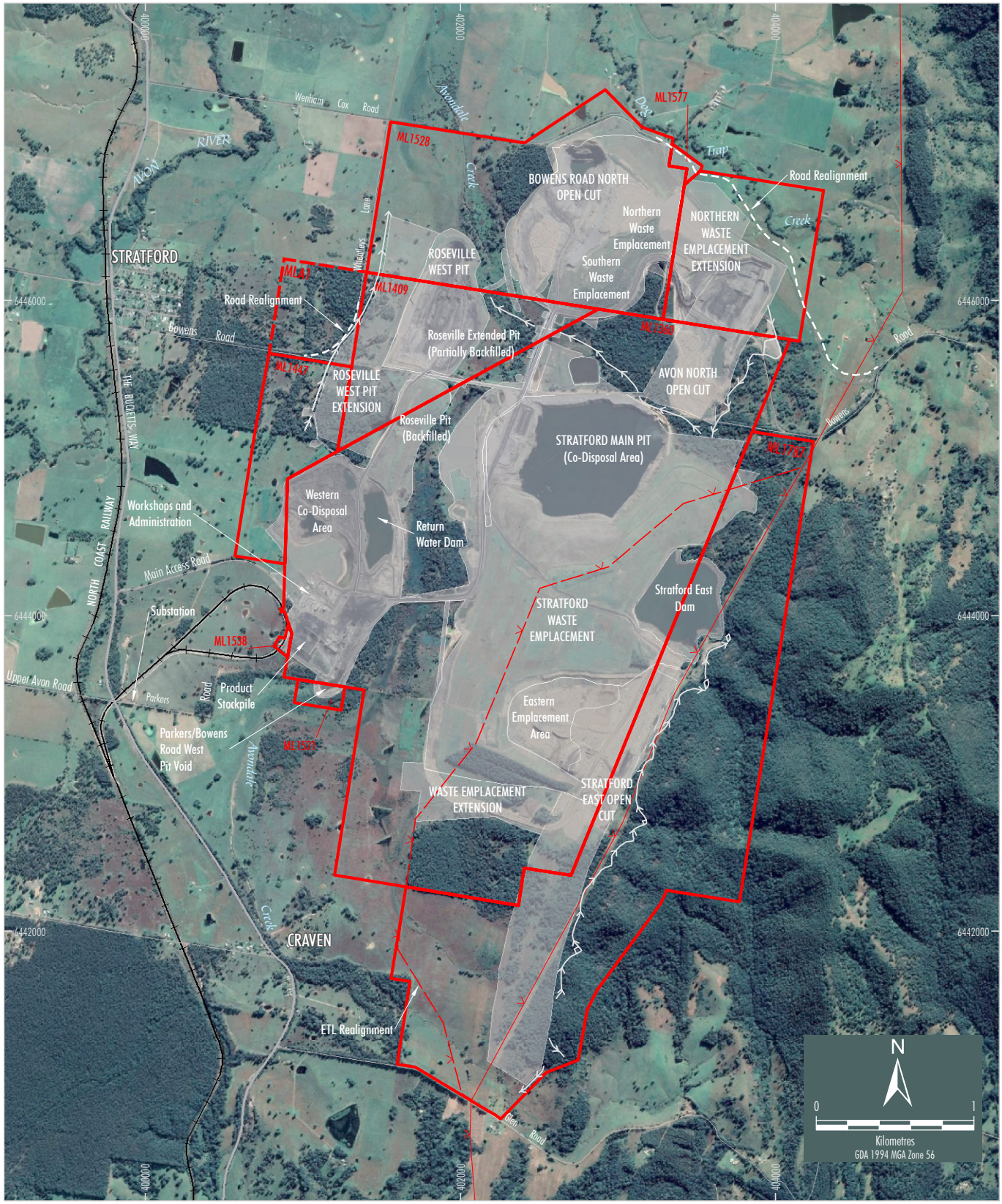
Production commenced at the Stratford Coal Mine in June 1995 with the first coal railed in July 1995, following a six month construction program. Run-of-mine (ROM) coal at the SMC has been sourced from a number of open cut mining areas including the (Figure 1):

- Stratford Main Pit;
- Roseville Pit (now backfilled);
- Roseville Extended Pit (now partially backfilled);
- Roseville West Pit;
- Parkers/Bowens Road West Pit (now backfilled);
- Bowens Road North Open Cut (BRNOC);
- Avon North Open Cut; and
- Stratford East Open Cut.

ROM coal from Yancoal's Duralie Coal Mine (DCM), which is located approximately 20 km south of the SMC, is also railed to the SMC for processing.

The handling and processing of both SMC and DCM ROM coal occurs at the SMC Coal Handling and Preparation Plant (CHPP) (Figure 1). CHPP rejects are pumped as a slurry via a pipeline to the Stratford Main Pit. CHPP rejects have also historically been placed in the Western Co-disposal Area (Figure 1) and backfilled into mine voids (i.e. Parkers/Bowens Road West Pit and Roseville Pit).

On 29 May 2015, the NSW Planning Assessment Commission approved the Stratford Extension Project (SEP). The SEP provides for the continuation of mining and processing at the SMC for an additional 11 years (until 31 December 2025).



YAN-20-31 SMOP 21-24_205A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Electricity Transmission Line
- Approximate Extent of Existing/Approved Surface Development
- Conceptual Up-Catchment Diversion

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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STRATFORD MINING COMPLEX MOP/RMP

Stratford Mining Complex General Arrangement

* Stratford Main Pit is used as both a Water Management Area and CHPP Rejects Material Management Area

Figure 1

SMC Development Consent (SSD-4966) has been modified on one occasion. SSD 49-66 MOD 2 was granted on 13 January 2020 under section 4.55(1A) of the NSW *Environmental Planning and Assessment Act, 1979* (EP&A Act) for the MidCoast Council Water Access Modification, to permit water stored at the SMC to be made available to the MidCoast Council (as a public authority) for the benefit of local services and other potential public purpose water needs. The SMC Development Consent (SSD-4966) was also amended on 14 January 2021 to correct some administrative errors.

1.2 PURPOSE AND SCOPE OF THIS MOP/RMP

This MOP/RMP has been prepared in accordance with conditions of the SMC MLs (relevant to the preparation of a MOP) and addresses the requirements for the SMC Rehabilitation Management Plan prescribed by Condition 55 of Schedule 3 of Development Consent (SSD-4966). These requirements are outlined in Table 2 in Section 1.3 below, along with where they are addressed in this MOP/RMP.

Other conditions of Development Consent (SSD-4966) relevant to rehabilitation (i.e. Conditions 53 and 54 of Schedule 3 of Development Consent [SSD-4966]) are also addressed in this MOP/RMP.

As described in Section 1, this MOP/RMP describes the proposed operational mining activities and rehabilitation activities for the SMC for the period from 1 January 2021 to 31 December 2023.

To inform this MOP/RMP, a rehabilitation and mine closure risk assessment was undertaken on 27 October 2020. The outcomes from the risk assessment are incorporated into this MOP/RMP. The SMC's Mine Closure Planning Program (Section 10 of this MOP/RMP) has also been updated to include additional detail regarding the technical assessments and/or studies and activities that will be implemented to inform and plan for mine closure.

MOP/RMP Structure

In accordance with the MOP Guidelines (DTIRIS-DRE, 2013), this MOP/RMP is structured as follows:

Section 1	Provides details of SMC history; SMC current consents, authorisations and licences; the scope of this MOP/RMP and its requirements; land use and land ownership; and outlines the consultation undertaken relevant to this MOP/RMP.
Section 2	Provides details of the proposed mining activities during the MOP/RMP term.
Section 3	Outlines key environmental risks and risks specific to rehabilitation.
Section 4	Describes the SMC's post-mining land use and rehabilitation objectives.
Section 5	Presents the SMC rehabilitation domains, objectives and phases.
Section 6	Presents performance indicators and completion criteria relevant to the rehabilitation domains.
Section 7	Describes rehabilitation activities to be implemented during the MOP/RMP term.
Section 8	Describes rehabilitation monitoring and research.
Section 9	Outlines intervention and adaptive management measures to be implemented relevant to identified rehabilitation risks.
Section 10	Describes the SMC Mine Closure Planning Program, which describes the technical and/or environmental assessments that will be undertaken to inform final rehabilitation planning and closure of the SMC.
Section 11	Provides the reporting mechanisms relevant to implementation of this MOP/RMP.
Section 12	Lists the MOP Plans.

Section 13 Outlines the protocol for reviewing and revising the MOP/RMP and the personnel responsible for monitoring, reviewing and implementing the MOP/RMP.

Section 14 Lists the references cited in this MOP/RMP.

1.3 MOP/RMP REQUIREMENTS

Table 1 details the relevant conditions of the SMC MLs and Development Consent (SSD-4966) which set out the requirements for this MOP/RMP, and provides the section where each condition has been addressed. Development Consent (SSD-4966) also includes detailed rehabilitation objectives for the SMC final landform and requirements relating to post-mining land use. These objectives are outlined in Section 4.

Table 1
MOP/RMP Requirements

Condition	Requirement	Section Addressed
MLs 1787, 1733, Condition 3(b)	**Mining Operations Plan and Annual Rehabilitation Report** 1) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which:	Sections 4 and 5
	i. identifies areas that will be disturbed;	Section 2.3 and Plans 3A – 3C
	ii. details the staging of specific mining operations, mining purposes and prospecting;	Section 2.3 and Plans 3A – 3C
	iii. identifies how the mine will be managed and rehabilitated to achieve the post mining land use;	Sections 5 to 8
	iv. identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment;	Sections 2, 3, 8 and 9
	v. reflect the conditions of approval under: • the *Environmental Planning and Assessment Act 1979*; • the *Protection of the Environment Operations Act 1997*; and • any other approvals relevant to the development including the conditions of this mining lease.	Sections 1.4 and 4.1
MLs 1787, 1733, Condition 3(c)	2) The MOP must be prepared in accordance with the *ESG3: Mining Operations Plan (MOP) Guidelines September 2013* published on the Department's website at: www.resourcesandenergy.nsw.gov.au/miners-and-explorers/rules-andforms/pgf/environmental-guidelines.	Section 1
MLs 1447, 1521, 1528, 1538 and 1577 Conditions 2 (2) & (4)	**Mining Operations Plan (MOP)** 2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.	Section 1
	4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:	Section 2.3 and Plans 3A-3C
	a) area(s) proposed to be disturbed under the Plan;	Section 2.3 and Plans 3A-3C
	b) mining and rehabilitation method(s) to be used and their sequence;	Section 2.3 and Sections 5 and 7
	c) areas to be used for disposal of tailings/waste;	Section 2.3.6
	d) existing and proposed surface infrastructure;	Section 2.2

Table 1 (continued)
MOP/RMP Requirements

Condition	Requirement	Section Addressed
MLs 1447, 1521, 1528, 1538 and 1577 Conditions 2 (2) & (4) (continued)	e) progressive rehabilitation schedules;	Section 7 and Plans 3A-3C
	f) areas of particular environmental sensitivity;	Section 3
	g) water management systems (including erosion and sediment controls);	Sections 2.3.9, 3.3.3, 5.2.2 and 5.2.3
	h) proposed resource recovery; and	Section 2.3.4
	i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and postmining land use/vegetation.	Sections 4 to 6
Development Consent SSD-4966 Schedule 3 Condition 55	**Rehabilitation Management Plan** The Applicant shall prepare and implement a Rehabilitation Management Plan to the satisfaction of the Resources Regulator. This plan must:	This MOP/RMP
	a) be prepared in consultation with the Department, DPIE Water, BCD and GSC;	Section 1.6
	b) be submitted to the Resources Regulator for approval at least 3 months prior to commencement of mining operations in the new mining areas; unless the Resources Regulator agrees otherwise;	Section 1.6
	c) be prepared in accordance with any relevant DRG guideline;	Section 1
	d) describe how rehabilitation of the site would be integrated with the implementation of the biodiversity offset strategy;	Sections 1.7 and 10.10
	e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);	Sections 6 and 9
	f) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform and final land use;	Sections 4, 5, 6, 7 and 10
	g) include interim rehabilitation where necessary to minimise the area exposed for dust generation;	Section 2.3.10
	h) include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures and progress against the detailed performance and completion criteria; and	Sections 8, 11 and 13
	i) build to the maximum extent practicable on the other management plans required under this consent. *Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the rehabilitated site*.	Sections 3 and 10

1.4 CURRENT CONSENTS, AUTHORISATIONS AND LICENCES

The date of grant and duration of Development Consent (SSD-4966) and other key authorisations and licences issued by government agencies relevant to the SMC are provided in Table 2 below.

Table 2
Key Consents, Leases, Licences and Permits

Instrument	Relevant Authority	Date of Grant	Duration of Approval
Development Consent (SSD-4966)	Department of Planning, Industry and Environment (DPIE)	29/05/2015	The Applicant may carry out mining operations on the site until 31 December 2025.
ML1528	Resources Regulator	20/1/2003	21 years.
ML1447	Resources Regulator	1/4/1999	21 years. Renewal Pending.

Table 2 (continued)
Key Consents, Leases, Licences and Permits

Instrument	Relevant Authority	Date of Grant	Duration of Approval
ML1409	Resources Regulator	7/1/1997	21 years from renewal on 07/01/2018.
ML1577	Resources Regulator	1/3/2006	21 years.
ML1360	Resources Regulator	22/12/1994	21 years from renewal on 21/12/2015.
ML1538	Resources Regulator	25/6/2003	21 years.
ML1521	Resources Regulator	24/9/2002	21 years.
ML 1733	Resources Regulator	8/4/2016	21 years.
ML 1787	Resources Regulator	05/06/19	21 years
Environment Protection Licence (EPL) 5161	NSW Environment Protection Authority (EPA)	9/1/2001	Until the licence is surrendered, suspended or revoked. The licence is subject to review every three years.
Exploration Authorisation (AUTH) 311	Resources Regulator	14/10/2013	28 November 2017. Renewal lodged 27/11/2017 and is currently pending.
AUTH 315	Resources Regulator	14/10/2013	28 November 2017. Renewal lodged 27/11/2017 and is currently pending.
Monitoring and test bore licences	DPIE-Water	Various	Various.
WAL 41534	DPIE-Water	18/04/2018	Perpetuity
WAL 41535	DPIE-Water	14/12/2017	Perpetuity
WAL 41536	DPIE-Water	14/12/2017	Perpetuity
WAL 41537	DPIE-Water	22/01/2018	Perpetuity
WAL 41538	DPIE-Water	22/01/2018	Perpetuity

In accordance with the MOP Guidelines, Development Consent (SSD-4966) for the SMC is provided in Attachment 1. The SMC is a **Level 1** mine as defined in the MOP Guidelines.

1.5 LAND OWNERSHIP AND LAND USE

The SMC is owned and operated by SCPL. With the exception of existing road reserves, the existing MLs exist wholly within land owned by Yancoal (i.e. freehold land) (Plan 1C). Dwellings within the MLs are not occupied.

The SMC is located within the MidCoast Local Government Area.

Historic and current land use in the vicinity of the SMC is dominated by agricultural production (primarily grazing for beef production), mining and remnant vegetation generally located along ridgelines and watercourses, and in isolated patches within the cleared landscape.

A number of reserved areas are located in the general vicinity of the SMC including the Glen Nature Reserve (located approximately 2 km to the south-east), Barrington Tops National Park located to the west and south-west, and the Avon River State Forest located to the west.

Settlements located in the vicinity of the SMC site include the villages of Stratford and Craven (Plan 1C).

1.6 STAKEHOLDER CONSULTATION

This MOP/RMP has been developed in accordance with the MOP Guidelines and in consultation with the Resources Regulator.

As required by Condition 55(a), Schedule 3 of Development Consent (SSD-4966), this MOP/RMP was provided to the NSW Department of Planning, Industry and Environment (DPIE) – Planning and Assessment Division, DPIE – Biodiversity & Conservation Division (BCD), DPIE – Water and the MidCoast Council (MCC) for consultation, prior to submission to the NSW Resources Regulator for approval. In addition to these required consultee agencies, SCPL also provided this MOP/RMP to the NSW Environment Protection Authority (EPA) and to the SMC's Community Consultative Committee (CCC) for consultation.

No comments on this MOP/RMP were received from the DPIE – BCD, MCC, EPA and SMC CCC. Review comments provided by the DPIE Planning and Assessment Division were primarily administrative in nature. SCPL responded directly to the DPIE and this MOP/RMP has been updated where relevant to address the DPIE's comments. A request for additional information from the Resources Regulator was received in February 2021. The additional information requests were largely focussed on mine closure planning program aspects of the MOP/RMP. SCPL responded directly to the Resources Regulator and this MOP/RMP has been updated where relevant to incorporate the relevant additional information.

Ongoing consultation with the community and relevant stakeholders occurs via the SMC's CCC, the SMC website, and SMC community hotline and response protocol.

1.7 RELATIONSHIP OF THE MOP/RMP TO OTHER MANAGEMENT PLANS

SMC Biodiversity Management Plan

A portion of the mine rehabilitation (350 hectares [ha] of native vegetation) will be established to form part of the SMC Biodiversity Offset Strategy in accordance with Condition 33, Schedule 3 of Development Consent SSD-4966. Details regarding mine site rehabilitation planning and management are provided in this MOP/RMP (and in future MOP/RMPs). Management of SMC Biodiversity Offset Areas and Biodiversity Enhancement Areas is described in the SMC Biodiversity Management Plan (BMP). As described in the BMP, Biodiversity Enhancement Areas (Plan 4) have been established through the SMC to provide a linkage of natural habitat (wildlife corridors) with the native vegetation rehabilitation areas.

2 PROPOSED MINING ACTIVITIES

2.1 PROJECT DESCRIPTION

As per the SMC Development Consent (SSD-4966), mining operations at the SMC are approved to take place until the end of 2025. “Mining operations” includes the removal of overburden and extraction, processing, handling, storage and transportation of coal carried out on the site.

Development Consent (SSD-4966) then continues to be in force until SCPL rehabilitates the site in accordance with the conditions of the Development Consent.

During the MOP/RMP term, activities at the SMC would involve:

- continued processing of SMC and DCM ROM coal at the SMC CHPP;
- continued reclaim of historical CHPP rejects from the Western Co-disposal Area for re-processing;
- cessation of mining of the BRNOC and commencement of backfilling and rehabilitation;
- continued mining within the Avon North Open Cut;
- continued mining within the Stratford East Open Cut;
- continued mining within the Roseville West Pit;
- disposing of CHPP rejects in the Stratford Main Pit; and
- railing of product coal to the Port of Newcastle.

A MOP amendment would be prepared prior to mining within the Roseville West Pit Extension.

A detailed description of the proposed mining activities associated with future activities at the SMC is provided in Section 2 of the SEP Environmental Impact Statement (EIS) and available on the Stratford Coal website.

2.2 ASSET REGISTER

In accordance with the MOP Guidelines, an Asset Register is provided in Table 2 which lists the major assets relevant to each SMC rehabilitation domain at the commencement of the MOP/RMP and the proposed decommissioning activities for the listed assets.

Table 2
Major Asset Register

Primary Rehabilitation Domain	Approximate Size (hectare [ha])[1]	Major Assets	Relevant Secondary Domains	Proposed Decommissioning Activities
Domain 1 – Infrastructure Area	113	• rail loop and rail loading / unloading infrastructure; • CHPP; • workshop; • fuel farm and bays; • tyre fitting and storage; • explosives magazine; • car park; • offices, crib huts and bathhouses; • topsoil stockpiles; and • registered exploration boreholes.	• pasture area; • woodland/open forest; and • final void/water storage.	No decommissioning of the Infrastructure Area is proposed during this MOP/RMP term.

Table 2 (Continued)
Major Asset Register

Primary Rehabilitation Domain	Approximate Size (hectare [ha])[1]	Major Assets	Relevant Secondary Domains	Proposed Decommissioning Activities
Domain 2 – Water Management Area	33	• Stratford East Dam; • up-catchment diversions; • return water dam; • Parkers/Bowens Road West Pit; and • temporary water management infrastructure (e.g. sediment control dams).	• pasture area; • woodland/open forest; and • permanent water management infrastructure.	No decommissioning of water management structures is proposed during this MOP/RMP term.
Domain 3 – Waste Emplacements	391	• centre pivot irrigator located on the Stratford waste emplacement; and • TransGrid electricity transmission line (ETL) across the Stratford waste emplacement.	• pasture area; • woodland/open forest; and • final void/water storage.	The decommissioning of the Waste Emplacements will be described in subsequent MOP/RMPs. The centre pivot will remain in operation during this MOP/RMP term.
Domain 4 – CHPP Reject Material Management Area	97	• Stratford main pit; • Western Co-disposal Area[2]; and • CHPP rejects pipeline.	• pasture area; • woodland/open forest; and • final void/water storage.	CHPP reject material would continue to be deposited in the Stratford Main Pit. Water management of the Stratford Main Pit would occur with reticulation to either the return water dam or BRNOC. CHPP rejects in the Western Co-disposal Area would be recovered and re-processed in the CHPP. The decommissioning of CHPP reject management infrastructure will be described in subsequent MOPs.
Domain 5 – Open Cut Pits	91	• Roseville West Pit; • BRNOC; • Avon North Open Cut; • Stratford East Open Cut; and • pump systems and associated pipeline.	• final void/water storage; • pasture area; and • woodland/open forest.	Stratford Main Pit, Roseville West and BRNOC would be used as water storages during the MOP/RMP term. The decommissioning of the open cut pits will be described in subsequent MOPs.

ha = hectares.

1 Based on the maximum disturbance at the commencement of the MOP/RMP term.

2 The Western Co-disposal Area is no longer used for CHPP reject disposal. Recovery of CHPP rejects from the Western Co-disposal Area for re-processing is undertaken.

2.3 ACTIVITIES OVER THE MOP/RMP TERM

This section provides details of all operational activities relevant to the MLs proposed during the MOP/RMP term including:

- exploration (Section 2.3.1);
- construction/land preparation works (Section 2.3.2);
- mining operations (Section 2.3.3);
- material production schedule during the MOP/RMP term (Section 2.3.4);
- waste rock management (Section 2.3.5);
- CHPP rejects management (Section 2.3.6);
- waste management (Section 2.3.7);
- decommissioning and demolition activities (Section 2.3.8);
- water management (Section 2.3.9);
- progressive rehabilitation and completion (Section 2.3.10); and
- rehabilitation resources management (Section 2.3.11).

The approved general arrangement of the SMC is shown on Figure 1.

2.3.1 Exploration

Mine exploration activities would continue within the MLs, AUTH 311, AUTH 315 and Exploration Licence (EL) 6904 (Plan 1A). These activities would occur within, and external to, the open cut footprints and would be used to investigate aspects such as geological features, seam structure and coal/overburden characteristics as input to detailed mine planning and feasibility studies. During the MOP/RMP term exploration activities will focus on the Stratford East Open Cut area within ML 1787.

Exploration activities within the Authorisation/Exploration Lease areas would require a Review of Environmental Factors (REF) prior to any works being undertaken.

2.3.2 Construction Activities

Existing infrastructure and supporting services at the SMC will continue to be used during the MOP/RMP term. Additional infrastructure and construction/development activities which are required to support the SEP (including modifications and alterations to existing infrastructure) will continue to be planned for development and construction during the MOP/RMP term. Supporting services and infrastructure proposed during the MOP/RMP term include those listed below:

- noise management infrastructure upgrades and haul road bunding;
- haul road and culvert over Avondale Creek linking BRNOC and Roseville West Pit;
- water management infrastructure upgrades; and
- realignment of the 132kV power line.

Construction/development activities would generally be restricted to daylight hours (i.e. 7.00 am to 6.00 pm) up to seven days a week as per commitments within the EIS.

Some minor upgrades may be required within the MOP/RMP term to the existing infrastructure and supporting services, including car park extensions, offices, bathhouse and muster areas, warehouse, fuel bays, tyre storage and workshop extensions (e.g. tyre fitting bays). These upgrades would be located within the existing Infrastructure Area footprint as indicated within the SEP EIS.

There would be no demolition of mine infrastructure required during this MOP/RMP term except for buildings requiring upgrades or extensions.

Noise Management, Future Infrastructure and Haul Road Bunding

Upgrades/replacement of infrastructure and equipment for noise attenuation purposes will be required during the MOP/RMP term in addition to what was previously in place for the BRNOC and Stratford Consents. Future works, as proposed within the SEP, will require progressive improvement to noise management infrastructure, including:

- replacement of conveyor drives and idlers with lower noise equivalents during the course of this MOP/RMP term;
- installation of acoustic bunding beside key haul roads; and
- continued sound power level testing of equipment and necessary adjustments.

Haul Road and Culvert over Avondale Creek

During Year 1 of the MOP/RMP term, a haul road and culvert will be constructed over Avondale Creek to link the BRNOC and Roseville West Pit areas (Plans 3A to 3C), within the approved area of surface development (Figure 1), consistent with approved SEP activities.

132kV Power Line Relocation

The extent of the Stratford East Open Cut will require, during this MOP/RMP term, the relocation or elevation of a section of the existing 132 kV power line, and its associated easement, owned and operated by TransGrid.

The relocations of the 132 kV power line will be undertaken in consultation with TransGrid.

RFS Fire Trail Realignment

The extent of the Stratford East Open Cut and Stratford Waste Emplacement would require realignment of an existing RFS fire trail, which provides access from Parkers Road to a ridge line east of the Project.

Access would be retained via the 132 kV power line easement either from Wenham Cox Road or Glen Road. Access across the Stratford Waste Emplacement will be maintained throughout the life of the Project.

Realignment of the fire trail will be undertaken in consultation with the Stratford and Craven RFS, Transgrid and local landholders.

2.3.3 Mining Operations

BRNOC

The BRNOC is an existing mining area located north-west of the Stratford Main Pit (Figure 1). Mining of the BRNOC pit will be completed during 2021. Progressive backfilling of the BRNOC has commenced and will continue during this MOP/RMP term. By the end of the MOP/RMP term, the BRNOC is anticipated to be completely backfilled, reprofiled to its final landform shape, with revegetation established across the northern extent of the landform (Plans 3A, 3B and 3C).

Access to the BRNOC will continue to be via an existing haul road north of the Stratford Main Pit.

Avon North Open Cut

The Avon North Open Cut is an existing mining area located north-east of the Stratford Main Pit (Figure 1). Approximately 4.3 Mt of ROM coal will be mined from the Avon North Open Cut over the life of the pit, targeting the Avon, Marker 2, Glenview, Triple Coal and Rombo groups of seams. Mining of the Avon North Open Cut Pit will continue to progress throughout the MOP/RMP term (Plans 3A, 3B and 3C).

Access to the Avon North Open Cut will be via the existing haul road east of the BRNOC Pit to the toe of the Northern Waste Emplacement Extension.

Once mining operations in the Avon North Open Cut are completed, the void will be used as a contained water storage and ultimately for co-disposal of CHPP rejects (if required) once the Stratford Main Pit co-disposal Area void is filled.

Roseville West Pit

The Roseville West Pit is an existing mining area located within ML 1409 and ML1528 (Figure 1). Mining in the existing footprint of the Roseville West Pit will continue throughout the MOP/RMP term. Backfilling the northern extent of the Roseville West Pit with waste will commence during the MOP/RMP term (Plans 3B and 3C).

Access to the Roseville West Pit will continue to be via the existing haul roads to the south-east. A new haul road access will also be constructed between the BRNOC and Roseville West Pit (Figure 1 and Plans 3A to 3C). This haul road will cross Avondale Creek and will involve construction of a new culvert.

There will be no progress into the Roseville West Pit Extension area during this MOP/RMP term.

Stratford East Open Cut

The Stratford East Open Cut pit is located within ML 1360 and ML 1787 (Figure 1). Approximately 9.6 Mt of ROM coal would be mined from the Stratford East Open Cut over the life of the pit, targeting the Cheer-up and Clareval Seams.

During the MOP/RMP term, mining of the Stratford East Open Cut will be continued with development extending south up to the approved extent of the pit (Plans 3A, 3B and 3C). Backfilling of the northern extent of the Stratford East Open Cut will also commence during the MOP/RMP term, with the northern most extent shaped to its final landform and revegetation established by the end of the MOP/RMP term.

Access to the Stratford East Open Cut would continue to be via a haul road constructed along the southern and western toe of the Stratford Waste Emplacement as shown in Plans 3A, 3B, and 3C.

Once mining operations in the Stratford East Open Cut are complete, the void will be partially backfilled with waste. A void will remain at the southern end of the open cut and would be a permanent contained water storage. The catchment area of the Stratford East Open Cut will be minimised with provision of permanent perimeter bunds, up catchment diversions and/or bunds/embankment walls.

Western Co-Disposal Area

The Western Co-disposal Area is no longer used for the disposal of CHPP rejects. The extent of the Western Co-disposal Area is contained by perimeter bunding and diversion drains.

Recovery of historical CHPP rejects from the Western Co-disposal Area will continue to occur during the MOP/RMP term (refer Table 3). Following the complete removal of all historical CHPP rejects, the landform will be progressively profiled to be free-draining, prior to being revegetated to pasture and scattered endemic woodland/open forest trees. Progressive rehabilitation will occur during the MOP/RMP term as shown on Plans 3A, 3B and 3C.

The existing rehabilitation at the western extent of the area will continue to be maintained during the MOP/RMP term (Plans 3A, 3B and 3C).

Any remaining historical CHPP reject material in the Western Co-disposal Area would be encapsulated with a suitably well-drained layer of material to act as a capillary breaking layer between the reject material and the overlying cover. The landform will then be profiled to be free-draining, prior to being revegetated to pasture and scattered endemic woodland/open forest trees.

Stratford Main Pit

Mining of the Stratford Main Pit has been completed. The Stratford Main Pit will continue to be used as a CHPP rejects material disposal area, water storage and waste emplacement area during the MOP/RMP term including receiving and transfer of water as outlined in the EIS and relevant management plans.

2.3.4 Material Production Schedule During MOP/RMP Term

An indicative mine schedule for the MOP/RMP term is provided in Table 3. The combined coal processing and production rates for the SMC and DCM are also provided in Table 3.

2.3.5 Waste Rock Management

Waste rock will be mined from the Roseville West, Avon North and Stratford East Open Cuts during this MOP/RMP term and will be used to backfill the BRNOC and the northern extents of both the Roseville West Open Cut and Stratford East Open Cut and will be placed in the Eastern Emplacement Area (Plans 3A, 3B and 3C).

No waste rock will be mined from the Stratford Main Pit during this MOP/RMP term.

As outlined in Section 3.3.1, waste rock material extracted from the Stratford East Open Cut is expected to be PAF, with some potentially acid-forming-low capacity and NAF materials also present. Extracted PAF material will be placed in a constructed PAF waste cell within the Eastern Emplacement Area during the MOP/RMP term, or within the Stratford Main Pit below the predicted final water table recovery level. In accordance with Condition O6.14 of SMC's EPL 5161, SCPL has submitted the out-of-pit waste rock emplacement PAF cell design to the EPA for approval. PAF material management procedures are described in Section 3.3.1.

Table 3
Indicative Coal and Material Production Schedule

Year	Stripped Topsoil (m^3)*	Overburden (Mbcm)	ROM Coal (Mtpa)				CHPP Rejects (Mtpa)	Product Coal for Rail (Mtpa)
			SMC	DCM	Western Co-Disposal Area Coal Recovery	Total ROM^		
Year 1 (1 January 2021 – 31 December 2021)	15,200	7.5	1.4	0.3	0.1	1.8	0.7	1.1
Year 2 (1 January 2022 – 31 December 2022)	13,900	5.6	1.1	0	0.1	1.2	0.5	0.7
Year 3 (1 January 2023 – 31 December 2023)	0	5.3	1.3	0	0.1	1.4	0.6	0.8
Total	**29,100**	**18.4**	**3.8**	**0.3**	**0.3**	**4.4**	**1.8**	**2.6**

* Assumed topsoil stripping depth average of 100 millimetres (mm) based on site knowledge.

^ Combined ROM coal mined by SMC, DCM and Western Co-disposal Area coal recovery.

m^3 = cubic metres

Mbcm = million cubic metres.

Mtpa = Million tonnes per annum.

The status of rehabilitation of the SMC Waste Emplacements at the commencement of the MOP/RMP term is described in Section 7.1.

A summary of the approved out-of-pit mine waste rock emplacements for each of the approved open cut mining areas are discussed further below:

- **Avon North Open Cut –** BRNOC Pit, Roseville West Pit and Stratford Waste Emplacement (including Stratford Main Pit).
- **Stratford East Open Cut –** Stratford Waste Emplacement Extension (including Stratford Main Pit) and Stratford East Open Cut.
- **Roseville West Pit–** Stratford Waste Emplacement (including Stratford Main Pit) and Roseville West Pit (as described in Section 2.3.3, no mining of the Roseville West Pit Extension will occur during this MOP/RMP term).

The maximum elevation of the Stratford Waste Emplacement at closure would be 196 m Australian Height Datum (AHD). The status of rehabilitation of the Stratford Waste Emplacement at the commencement of the MOP/RMP term is described in Section 7.1. Once the Avon North Open Cut void is available for use as water storage, waste rock from the Roseville West Pit Extension will be used to backfill the Stratford Main Pit void (not scheduled during this MOP/RMP term).

The Northern Waste Emplacement will be extended with waste rock from the Avon North Open Cut until it reaches an approximate maximum elevation of 165 m AHD. Waste rock from the Avon North Open Cut will also be placed in the BRNOC and Stratford Main Pit/Stratford Waste Emplacement during this MOP/RMP term. The status of rehabilitation of the Northern Waste Emplacement at the commencement of the MOP/RMP term is described in Section 7.1.

2.3.6 CHPP Rejects Management

The disposal of CHPP rejects at the SMC will continue to be managed in accordance with the Life of Mine Rejects Disposal Plan.

The Stratford Main Pit will continue to be used for co-disposal of CHPP rejects at the SMC until the existing storage capacity is exhausted (beyond this MOP/RMP term).

The MOP/RMP term includes the continuation of the recovery of CHPP rejects from the Western Co-disposal Area and processing activities at the CHPP. Activities will remain within existing areas of disturbance.

2.3.7 Waste Management

Key waste streams (apart from waste rock and CHPP rejects) that would be generated during the MOP/RMP term comprise:

- recyclable and non-recyclable general wastes;
- sewage and wastewater; and
- other wastes from mining and workshop activities (e.g. used tyres, scrap metal and waste hydrocarbons and oil filters).

General waste minimisation principles (i.e. reduce, re-use and recycle) will continue to be applied at the SMC to minimise the quantity of wastes that require off-site disposal.

All general domestic waste (e.g. general solid [putrescibles] waste and general solid [non-putrescible] waste as defined in *Waste Classification Guidelines Part 1: Classifying Waste* [NSW Environment Protection Authority, 2014]) and general recyclable products will continue to be collected by an appropriately licensed contractor. SCPL will maintain a register of regulated waste collected by the licensed waste contractor.

Waste tyres will continue to be stockpiled and disposed in the backfilled sections of pit voids. Tyres will be placed in discrete lots and buried with a minimum cover of 5 m, and avoid other combustible material. Records of buried locations and depths will continue to be recorded during the MOP/RMP term.

Exploration waste and other waste will be disposed of in pit voids.

Scrap metal at the workshops will continue to be collected by a scrap metal merchant for recycling.

Waste hydrocarbons and oil filters are currently collected, stored and removed by licensed contractors.

The current collection and storage methods (including containment of waste oil/grease tanks/drums within a separate bunded area at the workshop) will continue for the MOP/RMP term, with removal of waste hydrocarbons and oil filters by licensed contractors.

Soil and waste rock contaminated with hydrocarbons will be treated in bioremediation areas or disposed of offsite by a licenced contractor.

Sewage treatment at the SMC comprises:

- a 'Biotreat' tank system (including primary settlement and aeration) located at the site office;
- a septic tank system located at the training building near the site office;
- an active aeration system located at the bath-house complex near the site office;
- a primary treatment and aeration system located at the CHPP; and
- a septic tank system and transpiration trench located at the rail load-out bin.

Treated/grey water from the sewage treatment systems near the site office are sprayed onto grassed areas adjacent to the buildings. Treated water from the sewage treatment system located at the CHPP is sprayed on vegetated areas south of the CHPP.

The existing sewage treatment facilities (with upgrades as required) and treated/grey water spray areas will continue to be operated in a manner to the satisfaction of the MCC and in accordance with the *Environmental Guidelines: Use of Effluent by Irrigation* (NSW Department of Environment and Conservation, 2004).

2.3.8 Decommissioning and Demolition Activities

No decommissioning and/or demolition activities are proposed during this MOP/RMP term. As described in Section 2.3.2, a section of the existing 132kV power line south of the Stratford East Open Cut will require relocation or elevation during this MOP/RMP term.

2.3.9 Water Management

The existing water management system and reticulation options will be conducted in accordance with the SMC Water Management Plan (WMP). The WMP includes a Site Water Balance that is reviewed on an annual basis.

Up-catchment Runoff Control

The SMC water management system will control waters generated from surface development areas while minimising the capture of surface water runoff by diverting up-catchment runoff around such areas. The water management system will include a combination of permanent structures (that will continue to operate post closure) and temporary structures (that will only be required until the completion of rehabilitation works [e.g. sediment control structures]).

Existing water management structures and bunds will remain in place during the MOP/RMP term.

As the Stratford East Open Cut mining area progresses further south (Plans 3A to 3C) an additional eastern diversion would be constructed to divert up-catchment runoff (from the foothills to the east) to the south, reporting to the headwaters of Avondale Creek.

The design of these up-catchment diversion structures is detailed in the Surface Water Management Plan (SWMP). Up-catchment diversions are required to be stable in the long-term and would be designed to convey 1:100 Annual Recurrence Interval intensity rainfall events.

Construction and rehabilitation of these structures would incorporate appropriate channel cross-section designs, low longitudinal gradients (e.g. 0.5%) and channel lining (e.g. grass or rockfill) to limit erosion potential and facilitate their long-term stability. The diversion structures would be designed in consultation with the NSW DPIE-Water.

Contained Water Storages

Contained water storages for the SMC will include the existing Stratford East Dam, Stratford Main Pit, Return Water Dam, Parkers/Bowens Road West Pit and BRNOC (prior to backfilling) and Roseville West Pit (prior to backfilling).

The Water Management Areas at the SMC during the MOP/RMP term are shown on Plans 3A to 3C.

Sedimentation Control

Sedimentation control for the SEP will be implemented generally consistent with the current approach undertaken at the SMC. Disturbed Area Dams and Sediment Dams will be used on-site as described in the WMP. These dams are included within the SMC Infrastructure Area domain.

Silt fences (or other sedimentation control measures) will be erected downslope of construction areas, including the Avondale Creek haul road and culvert construction area, and downslope of other disturbed areas (e.g. topsoil stockpiles before grass cover establishment). Controls are detailed in relevant management plans including the WMP available on the Stratford Coal website.

2.3.10 Progressive Rehabilitation and Completion

Previously rehabilitated areas (e.g. Stratford Waste Emplacement, areas of the BRNOC Northern and Southern Waste Emplacements and backfilled Roseville Pit) that are not proposed for disturbance during this MOP/RMP term will be maintained. Disturbance within these areas is approved under the Development Consent (SSD-4966) and will be described in future MOP/RMP revisions for SEP activities proposed.

Progressive rehabilitation during the MOP/RMP term will be undertaken as shown on Plans 3A to 3C and as described in Sections 5 and 7.

2.3.11 Rehabilitation Resources Management

General soil resource management practices would include the stripping and stockpiling of soil resources for use in rehabilitation. The objectives of soil resource management for the SMC are to:

- identify and quantify potential soil resources for rehabilitation;
- optimise the recovery of useable soil reserves during soil stripping operations; and
- manage soil reserves so as not to degrade the resource when stockpiled.

Topsoil will be stripped in advance of mining operations in the Stratford East Open Cut during the MOP/RMP term. Topsoil stripping would not be required for mining operations in the Avon North Open Cut and Roseville West Pit as mining activities will only occur within existing disturbance areas.

Topsoil management measures include:

- progressive stripping of approved disturbance areas to minimise the incremental disturbance;
- avoiding topsoil stripping during unsuitable weather conditions; and
- direct placement of topsoil on rehabilitation areas where practicable in preference to stockpiling.

Topsoil stripping depths for the site are determined on a case-by-case basis by a competent person, considering site conditions (e.g. soil type and salinity), to ensure all topsoil resources are recovered during clearing activities. Notwithstanding, topsoil stripping depths average approximately 100 - 150 millimetres (mm) across the site (SCPL, 2012b).

Topsoil stockpile locations are shown on Plans 3A – 3C. As shown, stockpiles are located directly to the north and west of the Stratford Waste Emplacement, and directly to the north-west of the Avon North Open Cut and west of the Western Co-Disposal Area (Plan 3A – 3C).

Existing topsoil stockpiles will be managed to maintain long-term soil viability. The long-term management of topsoil stockpiles is described in Section 3.3.4.

The proposed topsoil stripping and application schedule is shown in Plans 3A – 3C. Topsoil stripping is undertaken in advance of mining activities. Progressive rehabilitation areas over the MOP/RMP term (including areas scheduled for Growth Medium Development) are shown on Plans 3A - 3C. These Plans inform the topsoil application schedule over the MOP/RMP term.

3 ENVIRONMENTAL ISSUES MANAGEMENT

3.1 ENVIRONMENTAL RISK ASSESSMENT

The SMC EIS included an Environmental Risk Assessment (ERA) which identified environmental and rehabilitation risks relevant to the SEP (Safe Production Solutions Pty Ltd, 2012). The ERA was prepared in accordance with the Australian Standard/New Zealand Standard (AS/NZS) ISO 31000:2009 *Risk Management – Principles and Guidelines*.

An ERA workshop was conducted on 19 January 2012 to identify key issues for the SEP. The following issues were assigned a risk greater than low:

- Potential groundwater related impacts (e.g. baseflow loss) on Dog Trap Creek, Avondale Creek and associated alluvium.
- Potential for intrusive noise and sleep disturbance impacts on some receivers including dwellings, schools, a church and recreational areas resulting from SEP operations.
- Noise amenity and sleep disturbance impacts on nearby receivers from SEP road and rail operations during daytime, evening and night-time.
- Increased emissions of PM_{10}/$PM_{2.5}$/Total Suspended Particulates (TSP)/dust deposition from the SEP resulting in the potential for an increase of predicted impact (health and amenity) at residential receivers.

The relevant mitigation and management measures for these impacts are described in the SMC's environmental management plans where relevant (Section 3.2).

An SEP ERA workshop also identified the following issues relevant to rehabilitation/closure and were assigned a low risk ranking:

- Potential for failure of revegetation and/or habitat enhancement on post-mine landforms.
- Geotechnical issues related to the Roseville West Pit Extension (where excavating through reject material).
- Long-term stability and rehabilitation of CHPP rejects deposited in the co-disposal areas.

A review of the 2012 ERA findings was undertaken in July 2017. The review found that the previous ERA findings remain valid and that no changes were required to the above.

A Rehabilitation and Mine Closure Risk Assessment (C K Consultants [CKC], 2020) for the SMC was undertaken on 27 October 2020 to identify and assess the potential risks associated with achieving successful rehabilitation of the SMC. This risk assessment updates the SMC Environmental Risk Register for ongoing progressive rehabilitation and provides guidance for the Mine Closure Planning Program (Section 10). The risk assessment was undertaken in accordance with the AS/NZS ISO 31000:2018 *Risk Management Guidelines* and Yancoal's Risk Assessment Matrix and was attended by a range of SMC and Yancoal personnel responsible for SMC mine planning and other relevant SMC consultants. A copy of the Rehabilitation & Mine Closure Risk Assessment (CKC, 2020) is provided in Appendix A of this MOP/RMP.

Key potential risk issues relevant to SMC rehabilitation identified from the 2020 risk assessment (CKC, 2020) include (Appendix A):

- Rehabilitation of Main Pit rejects emplacement area to final landform and final land use is complex and likely to take a longer timeframe than planned or insufficient material to achieving backfilling/ final landform.

- Potential for offsite impacts from water discharge from final voids.
- Surface water run-off causes detrimental effects on aquatic ecology.
- Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval.
- Public safety risk of access to/ interaction with final voids.
- Unplanned release of mine water during rehabilitation/ operations.
- Poor quality runoff from rehabilitated areas.
- Failure to achieve rehabilitation completion criteria causes delay to relinquishment.
- Final landform water management infrastructure does not provide for long term stability.
- Geotechnical instability of rehabilitated waste emplacements and final void.

For each of the key rehabilitation risks identified, existing or proposed controls were identified as well as any additional risk reduction strategies or actions required to adequately control the risk (i.e. reduce the risk level to as As Low As Reasonably Practicable [ALARP]).

Key actions identified in the risk reduction strategies relevant to mine closure have been incorporated into the Mine Closure Planning Program outlined in Section 10. The findings of the 2020 Risk Assessment summarised above have informed the technical and environmental assessments required by the Mine Closure Planning Program outlined in Section 10. The rehabilitation trigger, action, response plan (TARP) (Section 9) has also been updated where relevant to include any key controls/actions identified in the risk assessment.

3.2 ENVIRONMENTAL RISK MANAGEMENT

A comprehensive environmental management system has been established at the SMC. This includes implementation of environmental management commitments contained within a number of management plans, programs, studies, strategies and protocols, which have been prepared in accordance with relevant approval conditions (and approved in all cases by regulatory agencies).

In addition to this MOP/RMP, the following environmental management plans and other documents have been prepared to guide environmental management on-site at the SMC:

- Environmental Management Strategy;
- Noise Management Plan (NMP);
- Blast Management Plan (BLMP);
- Air Quality Management Plan (AQMP);
- WMP (including Site Water Balance [SWB], Surface Water Management Plan [SWMP] and Groundwater Management Plan [GWMP]);
- Squirrel Glider Management Plan;
- Biodiversity Management Plan (BMP); and
- Heritage Management Plan (HMP).

These plans are progressively updated with the latest version being available on the SMC website (http://www.stratfordcoal.com.au).

During the MOP/RMP term, the SMC environmental management plans will be reviewed and revised as necessary, in consultation with the relevant regulatory authorities. The status of revision of SMC management plans will be reported in the Annual Review.

3.3 SPECIFIC RISKS RELATING TO REHABILITATION

3.3.1 Geology

Description of Mine Geology

The coal resource at the SMC is located within the Permian aged Gloucester Basin in NSW.

The SMC is located in the central eastern flank of the north-south trending synclinal structure of the Gloucester Basin. In this area, a thick sequence of Carboniferous volcanics is overlain by late Permian sedimentary strata including coal seams. The Permian succession is divided into the following three groups (oldest to youngest):

- Stroud Volcanics;
- Dewrang Group; and
- Gloucester Coal Measures.

The target coal seams at the SMC are located within the Craven and Avon Subgroups of the Gloucester Coal Measures and within the Dewrang Group, including (Figure 2):

- Marker [M7] Seams;
- Bindaboo Seams;
- Deards Seams;
- Cloverdale Seams;
- Roseville Seams;
- Bowens Road Seams;
- Avon Seams;
- Glenview Seams;
- Marker 2 Seams;
- Triple Coal Seams;
- Cheer-up Seams;
- Clareval Seams; and
- Rombo Coal Seams.

The Cloverdale, Roseville, Marker, Bowens Road and Avon Seams have been previously mined at the SMC. Coal seams in the SMC area are generally of constant thicknesses except to the east where thrust faulting has thickened and repeated strata, which is further complicated by the steeply dipping syncline structure. A description of the local geology and geological features (including faulting) in the vicinity of the SMC is provided in the SEP Groundwater Assessment (Heritage Computing, 2012).

<table>
<tr><th>BASIN</th><th>PERIOD</th><th>GROUP</th><th>SUB-GROUP</th><th>FORMATION</th><th>COAL SEAMS</th></tr>
<tr><td rowspan="11">GLOUCESTER</td><td rowspan="11">PERMIAN</td><td rowspan="7">GLOUCESTER COAL MEASURES</td><td rowspan="5">CRAVEN</td><td>Crowthers Road</td><td>[Conglomerate]</td></tr>
<tr><td>Woods Road (Leloma)</td><td>Linden, Marker (M6,M7 [2]), Bindaboo [1,2], Deards [1,2]</td></tr>
<tr><td>Bucketts Way (Jilleon)</td><td>Cloverdale [1,2], Roseville [1,2] Marker (M3, M8, M1) [1]</td></tr>
<tr><td>Wards River</td><td>[Conglomerate]</td></tr>
<tr><td>Wenham</td><td>Bowens Road [1,2], Bowens Road Lower [1]</td></tr>
<tr><td colspan="2">SPELDON FORMATION</td><td></td></tr>
<tr><td rowspan="2">AVON</td><td>Dog Trap Creek</td><td>Glenview, Marker 2</td></tr>
<tr><td>Waukivory Creek</td><td>Avon [1,2], Triple [1], Rombo, Glen Road, Valley View, Parkers Road</td></tr>
<tr><td colspan="2" rowspan="3">DEWRANG GROUP</td><td>Mammy Johnsons</td><td>Mammy Johnsons</td></tr>
<tr><td>Weismantel</td><td>Weismantel</td></tr>
<tr><td>Duralie Road</td><td>Cheer-up [2], Clareval [2]</td></tr>
<tr><td colspan="3">ALUM MOUNTAIN VOLCANICS</td></tr>
</table>

[1] Coal reserves previously mined at the Stratford Mining Complex
[2] Coal reserves to be mined by the SEP

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Source: Tamplin Resources (2010), Stratford Coal (1994) and SCPL (2012)

STRATFORDCOAL
Part of the Yancoal Australia Group

STRATFORD MINING COMPLEX MOP/RMP

Stratigraphic Units at the Stratford Mining Complex

Figure 2

Environmental Geochemistry

An assessment of the geochemical characteristics of the waste rock material associated with the development of the SEP is provided in the SEP Geochemistry Assessment (Environmental Geochemistry International, 2012) and available on the Stratford Coal website. A summary of the assessment is provided below.

Waste rock materials generated from the BRNOC would generally be expected to be non-acid forming (NAF), similar to waste rock material generated from future access into the Roseville West Pit Extension, which is also expected to be NAF.

Based on the acid base accounting test work, the Avon North Open Cut would generally be expected to be NAF. A small quantity of overburden immediately adjacent to some of the coal seams would however, be potentially acid forming (PAF).

In general waste rock material generated from the Stratford East Open Cut is expected to be PAF, with some potentially acid forming – low capacity (PAF-LC) and NAF materials also present.

PAF Material Management Procedures

PAF material at the SMC is managed in accordance with the SWMP (Section 7.2).

The targeted coal seams in the Stratford East Open Cut are equivalent to those mined at the DCM. Consistent with the PAF material management procedures adopted at the DCM, waste rock material from the Stratford East Open Cut will be segregated and selectively handled and then placed in either in-pit (below the predicted final water table recovery level) or out-of-pit waste rock emplacements (PAF waste cells).

For in-pit waste rock emplacement, PAF waste rock material will be placed below the predicted final water table recovery level. For the out-of-pit PAF cells, PAF waste rock material will be encapsulated within constructed containment cells and capped with a low permeability layer. The in-pit or out-of-pit engineered PAF waste cells will be constructed in accordance with designs prepared by a suitably qualified person. The design for the Eastern Emplacement Area PAF waste cell has been prepared by ATC Williams Pty Ltd and was submitted to the EPA for approval in February 2020, with additional information requested by the EPA provided in October 2020.

During operations, limestone would be placed on the open pit floor, interim waste rock in-pit and out-of-pit waste rock emplacement lifts/faces where PAF material is present in accordance with the Life of Mine Rejects Disposal Plan and the WMP, to minimise the release of acid rock drainage products.

Additional geochemical characterisation and investigation will be undertaken over the life of the SMC, including waste rock/roof rock PAF/NAF distribution.

The 2020 rehabilitation and mine closure risk assessment identified the following potential risk issues relevant to PAF material management: '*less than adequate rehabilitation of PAF waste emplacements causing acid mine drainage (AMD) contamination of surface and groundwater*' and '*less than adequate allowance for PAF capping materials*'. Existing and/or planned control measures (consistent with that described in this Section and in the SEP EIS) were identified to reduce the risk level to ALARP.

Consistent with the outcomes of the risk assessment, during the MOP/RMP term SCPL will develop a PAF material handling and management procedure for the SMC and update the SMC WMP to include design details for the Eastern Emplacement Area PAF cell, as well as PAF material handling and management procedures and monitoring that would be undertaken to enable identification of potential impacts.

3.3.2 Spontaneous Combustion

Spontaneous combustion at the SMC is uncommon. Two spontaneous combustion incidents have occurred historically in the Stratford Main Pit and were associated with the Glenview Seam being exposed in the final highwall or endwall. Two other more recent incidents occurred on separate occasions in small areas (less than 5 m x 5 m) within product stockpiles.

The 2020 rehabilitation and mine closure risk assessment (Section 3.1) identified the following potential risk issues relevant to spontaneous combustion: '*less than adequate rehabilitation of in-situ and exposed coal seams causing spontaneous combustion or AMD contamination of groundwater*' and '*spontaneous combustion of carbonaceous material in final landform'*. Existing and/or planned control measures (consistent with that described in this Section and in the SEP EIS) were identified to reduce the risk level to ALARP.

The management and mitigation measures in the SMC Spontaneous Combustion Management Procedure will be implemented during the MOP/RMP term to reduce the potential for, or impacts from, spontaneous combustion events.

3.3.3 Erosion and Sediment Control

Water Management

The existing water management system at the SMC, as described in the WMP is based on the management of five separate water types, namely:

- clean water from up-catchment diversions/runoff (Section 2.3.9);
- mine water sourced from open cut mining operations and preferentially used for coal processing, dust suppression and irrigation (during times of water surplus) (Section 2.3.9);
- sediment-laden water within runoff from areas disturbed by SMC activities;
- runoff from rehabilitated or partially rehabilitated areas; and
- sewage including treated/grey water (Section 2.3.7).

Sediment Control

The existing SMC currently uses sediment dams to contain runoff from waste emplacements, haul roads, backfilled pits and along the rail siding.

Sedimentation control for the SEP will be implemented generally consistent with the approach undertaken at the SMC. For clarity, distinction is made between the two types of site sediment control structures that have been assessed and included as part of the SEP water management system as follows:

- disturbed area dams; and
- sediment dams.

Disturbed Area Dams

In addition to existing contained water storages, disturbed area dams would contain runoff from active waste rock emplacements or other areas disturbed by mining activities and runoff from haul roads or the CHPP area. Disturbed area dams will be sized in accordance with *Managing Urban Stormwater Soils and Construction Volume 2E Mines and quarries* (DECC, 2008b), with pumped transfer of accumulated water back to contained water storages.

Sediment Dams

Sediment dams would contain runoff from topsoiled/partially rehabilitated mine areas that have been shaped to final profiles, covered with topsoil and seeded. The sediment dams will allow for gravity settling of sediment prior to release off-site.

Sediment dams will be sized to capture runoff from a 90th percentile rainfall event with a duration of five days in accordance with *Managing Urban Stormwater Soils and Construction Volume 2E Mines and quarries* (DECC, 2008b). The capacity of the sediment dams will be regularly monitored and works will be conducted as required to maintain the design capacity of the sediment dams.

Sediment dams will be maintained until such time as vegetation successfully establishes on topsoiled areas and where runoff has similar water quality characteristics to areas that are undisturbed by mining activities.

Outlet structures from sediment dams will also be designed in consideration of the *Guidelines for Outlet Structures* (NSW Office of Water, 2010).

Erosion and sediment issues discussed at the 2012 ERA workshop included potential long-term sediment/contaminant migration to downstream waterways and consequent impact on downstream water users and ecology. This risk was considered to be low.

The 2020 rehabilitation and mine closure risk assessment also identified the following potential risk issues relevant to water management and sediment control: '*poor quality runoff from rehabilitated areas*', 'su*rface water runoff causes detrimental effects on aquatic ecology resulting in fish kill and prosecution*', '*unplanned release of mine water during rehabilitation/operations*', '*long-term contamination from sediment accumulation in water storages*', '*surface water contamination from surface water infrastructure that has not been properly decommissioned*' and '*erosion of final landforms, compromising establishment of vegetation and water quality*'. Existing and/or planned control measures (consistent with that described in this MOP/RMP and in the SEP EIS) were identified to reduce the risk level to ALARP.

Water Management Plan

Water management on-site will be undertaken in accordance with the WMP and commitments as outlined within the SEP EIS.

3.3.4 Soil Type(s) and Suitability

The physical and chemical properties of the soils in the SMC area indicate that with the implementation of appropriate management measures and with suitable amelioration, soils in the SMC disturbance areas would be a suitable rehabilitation medium to establish pasture for grazing post-mining (SCPL, 2012a).

Long-term soil stockpiles will be managed to maintain long-term soil viability by the following key management practices:

- Topsoil stockpiles will be limited in height to a maximum of 3 m.
- Soil stockpiles will be constructed to minimise erosion, encourage drainage, and promote revegetation.
- Stockpiles will be sown with a stabilising cover crop once established.
- Where additions such as lime, gypsum or fertiliser are needed to improve the condition of stripped soil, they will be applied to the soil stockpiles as a component of soil stockpiling activities.

A site topsoil balance is undertaken annually. Annual reporting of the site soil balance and rehabilitation performance is provided in the Annual Review.

The 2020 rehabilitation and mine closure risk assessment identified the following potential risk issues relevant to soil management and soil suitability for rehabilitation: '*soil not suitable to support intended rehabilitated land use requiring re-approval for final land use*', '*less than adequate recovery of suitable soil volumes and characteristics to carry out rehabilitation*' and '*less than adequate soil depth and/or quality to support intended land use, requiring rework*'. Existing and/or planned control measures (consistent with that described in this MOP/RMP and in the SEP EIS) were identified to reduce the risk level to ALARP.

3.3.5 Flora

Vegetation Clearance, Threatened Species and Seed Collection

A Vegetation Clearance Protocol has been developed for the SMC and is described in the BMP. The Vegetation Clearance Protocol would be implemented for the clearing activities associated with the Stratford East Open Cut disturbance areas during the MOP/RMP term.

During the habitat assessment phase of the Vegetation Clearance Protocol, trees within the proposed Stratford East Open Cut disturbance areas may be checked for their provision of seed to be utilised in the rehabilitation program, followed by the collection of seed during felling activities. Seed collection activities may also be undertaken during the MOP/RMP term within the SEP offset areas or SCPL-owned lands for use in plant propagation programs to provide tube stock for revegetation activities. The seed collected (type and quantity) would be reported in the Annual Review.

Seed collection activities will be undertaken in accordance with the BMP.

Threatened Species

No threatened ecological communities listed under the *NSW Biodiversity Conservation Act, 2016* (BC Act) or Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) have been recorded within the SEP area (FloraSearch, 2012). The *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* threatened ecological community was identified by Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now the Department of Agriculture, Water and the Environment [DAWE]) as potentially occurring, however, it does not occur in the SEP area or surrounds.

FloraSearch and Ecobiological undertook a literature and database review in addition to targeted surveys to identify threatened flora species listed under the BC Act or EPBC Act which could potentially occur within the SEP area.

No threatened flora species have been recorded in the SEP area or immediate surrounds (FloraSearch, 2012). No threatened flora populations listed under the BC Act or EPBC Act are relevant to the SEP (FloraSearch, 2012).

Management measures relevant to flora species will be undertaken in accordance with the BMP and any updates.

The former Department of Environment and Energy (now DAWE) granted EPBC Approval 2011/6176 for the SEP on 29 January 2016. SCPL prepared the approved BMP to reflect EPBC Approval 2011/6176 and the requirements of Development Consent (SSD-4966).

Weed Management

Weed management measures at the SMC during the MOP/RMP term will include:

- minimisation of seed transport from the site during construction and operation through the use of the SMC vehicle wash bay;
- identification of weeds via site inspections and communication with landholders and regulatory authorities, as well as follow up inspections to ensure success;
- mechanical removal of identified weeds and/or the application of approved herbicides in authorised areas; and
- specific control of declared weeds.

Appropriately qualified persons will be engaged to undertake weed control. Follow-up site inspections will occur to determine the effectiveness of weed control. Weed management and monitoring results will be reported in the Annual Review.

Revegetation

Revegetation will be undertaken in accordance with the details as outlined in this MOP/RMP.

The 2020 rehabilitation and mine closure risk assessment identified the following potential risk issue relevant to revegetation: '*failure to achieve target vegetation community results in delayed relinquishment*'. Existing and/or planned control measures (consistent with that described in this MOP/RMP and in the SEP EIS) were identified to reduce the risk level to ALARP.

3.3.6 Fauna

Threatened Species

A total of 28 species of the fauna recorded at the SMC or surrounds are listed as threatened species under either the *Biodiversity Conservation Act, 2016* Act or EPBC Act (AMBS, 2012). This includes 15 species of birds and 13 species of mammals. These species are outlined in the BMP.

Threatened Fauna and Migratory Species under the Commonwealth EPBC Act

The New Holland Mouse is listed as Vulnerable under the EPBC Act and is the only threatened species listed under the EPBC Act to have been recorded in the additional surface development area. The New Holland Mouse is not listed as a threatened species under the BC Act. The Grey-headed Flying-fox and Long-nosed Potoroo are also listed as threatened under the EPBC Act and have been recorded in the vicinity of the SEP (AMBS, 2012).

Eleven migratory bird species listed under the EPBC Act have been recorded within the SMC or surrounds. These include the: Fork-tailed Swift, Rainbow Bee-eater, Great Egret, Cattle Egret, Satin Flycatcher, Rufous Fantail, Black-faced Monarch, Spectacled Monarch, Double-banded Plover, Latham's Snipe and White-bellied Sea-eagle (AMBS, 2012).

Habitat Management

Timing Land Clearance to Minimise Harm of Fauna

Where practicable, clearance of habitat trees will occur during late summer or early autumn to minimise impacts to a large range of fauna breeding during spring and summer, and fauna which will hibernate during winter (e.g. microbats).

If clearance of habitat trees is required outside of this time period, then suitably qualified personnel will assess the habitat to be disturbed and determine the appropriate vegetation clearance procedures (refer to BMP). Clearance of derived native grassland or non-habitat trees or shrubs will occur at any time of year.

Salvage and Relocation of Logs, Vegetative Material and Rocks

Habitat features (e.g. trunks, logs, large rocks, branches, small stumps and roots) are salvaged during vegetation clearance activities and stockpiled for relocation to nearby areas (i.e. rehabilitation areas, biodiversity enhancement areas or biodiversity offset areas). When relocated, these features are likely to provide habitat resources for a range of invertebrate and ground dwelling fauna.

A description of the material salvaged and relocated will be reported in the Annual Review.

Salvage and Relocation of Tree Hollows

Some tree hollows salvaged during vegetation clearance activities will be selectively chosen for placement in areas where habitat enhancement is required. These features may be securely attached to suitable trees or placed on the ground. Tree hollows placed in trees will be monitored according to the nest box program.

Nest Box Program

Nest boxes will continue to be installed during the MOP/RMP to provide habitat opportunities for arboreal fauna in the short to medium-term in accordance with Condition 38(g), Schedule 3 of Development Consent (SSD-4966).

Once installed, the nest boxes will be monitored by suitably qualified personnel to observe fauna usage and the monitoring results will be reported in the Annual Review.

The nest box program is described in detail in the BMP.

Progressive Rehabilitation

Rehabilitation will be undertaken progressively across the site, in line with objectives of Development Consent (SSD-4966), and will also account for interim rehabilitation strategies as specified in Condition 54, Schedule 3 of Development Consent (SSD-4966).

3.3.7 Other Risks

Overburden Characterisation

The geochemical procedures relevant to waste rock are discussed in Section 3.3.1.

Slopes and Slope Management

The design of the outer batters of the waste emplacements would be consistent with the constructed Stratford, Northern and Southern Waste Emplacements.

Air Quality

Air quality management and monitoring at the SMC will be conducted in accordance with the AQMP. The existing SMC dust monitoring network currently consists of five high volume air sampler and seven dust deposition gauges.

The AQMP prescribes SCPL's air quality monitoring program requirements in accordance with the SEP Development Consent and EPLs. Air quality monitoring results are documented in the Annual Review and data is made available on the Stratford Coal website.

Surface Water

The SWMP describes the operational water management system and provisions for review of the site water balance, erosion and sediment control measures, surface water and groundwater monitoring and management.

Water quality data from surface water quality monitoring points at the SMC are documented in the Annual Review and data is made available on the Stratford Coal website.

Groundwater

The GWMP describes the SMC groundwater monitoring program and groundwater management measures (including investigation trigger levels). Groundwater quality monitoring results are documented in the Annual Review and data is made available on the Stratford Coal website.

Greenhouse Gases

SCPL reports annual greenhouse gas emissions and energy consumption from the SMC to the Federal government in accordance with the *National Greenhouse and Energy Reporting Act, 2007* requirements.

Blasting

Potential impacts associated with blasting at the existing SMC are monitored and managed in accordance with the BLMP. Blast monitoring (ground vibration and overpressure) for every blast is conducted at five locations surrounding the SMC.

Blast monitoring results are documented in the Annual Review and data is made available on the Stratford Coal website.

Noise

Noise management and monitoring at the SMC is conducted in accordance with the NMP. The noise monitoring program includes operator-attended monitoring at locations representative of privately-owned dwelling locations surrounding the SMC, real-time monitoring, an on-site Automatic Weather Station and temperature inversion measurements.

Noise monitoring results are documented in the Annual Review and data is made available on the Stratford Coal website.

Visual and Lighting

Progressive rehabilitation will be undertaken in order to reduce the contrast between the SMC landforms and the surrounding environment.

The biodiversity offset strategy for the SMC includes measures such as revegetation of cleared areas. The tree plantings/revegetation will progressively limit potential views of the SMC from some viewpoint locations (e.g. Glen Road).

SCPL will implement management and mitigation measures to minimise visual and lighting impacts in accordance with Development Consent (SSD-4966).

Cultural Heritage

The HMP sets out the salvage, excavation, monitoring and management measures for archaeological sites and other Aboriginal objects located at the SMC, in accordance with the existing permits and consents. The HMP details the management of registered sites and other aboriginal objects within the SMC area.

Contaminated Land

During the mine closure phase, after the completion of final rehabilitation works, a land contamination assessment will be conducted (refer Section 10.9).

Issues expected to be addressed by this assessment will include, but not be limited to, decontamination of areas such as those impacted by carbonaceous material (e.g. coal spillage, coal storage), by hydrocarbon spillage (e.g. workshops, fuel storage areas) or by sedimentation (e.g. dams which have directly received pit water).

Bushfire

Management measures relevant to bushfire hazards include details on operational arrangement, on-site fire protection, hazard management and the implementation of fuel management strategies.

Bushfire management measures undertaken to date/proposed to continue to be undertaken include:

- members of the Gloucester Bushfire Management Committee (GBFMC) and relevant government agencies have inspected the mine site on a number of occasions;
- access arrangements onto and through the mine site for local bushfire brigade officers to fight bushfires have been made;
- a number of old fire trails up onto the ridge on the eastern side of the mine site have been cleared and re-opened;
- SCPL has given an undertaking to GBFMC members that water cart(s) will be made available for bushfire fighting purposes where suitable access for this machinery is available;
- SCPL routinely (as required) undertakes hazard reduction burns, in consultation with the local bushfire brigade; and
- fuel loads on cleared pasture areas on the mine site that are removed from mining operations are reduced by cattle agistment and/or periodic slashing.

4 POST-MINING LAND USE

4.1 REGULATORY REQUIREMENTS

Development Consent Conditions

Condition 53 of Schedule 3 of Development Consent (SSD-4966) specifies the SMC post-mining land use and rehabilitation objectives which are reproduced in Table 4.

Table 4
Relevant Post-Mining Land Use and Rehabilitation Development Consent Conditions

Feature	Objective
Mine site (as a whole)	*Safe, stable and non-polluting* *Constructed landforms drain to the natural environment* *Minimise visual impact of final landforms as far as is reasonable and feasible and be sympathetic to the original Gloucester valley landform*
Final voids	*Minimise the size and depth of final voids so far as is reasonable and feasible* *Minimise the drainage catchment of final voids so far as is reasonable and feasible* *Minimise high wall instability risk so far as is reasonable and feasible* *The size and depth of final voids must be designed having regard to their function as long-term groundwater sinks, to maximise groundwater flows across back-filled pits to the void and to not be a source of saline groundwater for aquifers and streams* *Designed and constructed to ensure adequate freeboard to ensure no spillage under any foreseeable conditions* *Minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood*
Surface infrastructure	*To be decommissioned and removed, unless the Deputy Secretary, Resources and Energy agrees otherwise*
Agricultural land	*Establish a minimum of 300 hectares of land with Class 4 agricultural suitability*
Other land	*Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprising:* • *a wildlife corridor (shown as Biodiversity Enhancement Area in the figure in Appendix 8);* • *local native plant species; and* • *a landform consistent with the surrounding environment*
Stratford and Glen heritage railway corridors	*Road and transmission alignments to avoid heritage railway corridors* *Rehabilitation activities to avoid or minimise impacts*
Community	*Ensure public safety, with an emphasis on final voids* *Minimise the adverse socio-economic effects associated with mine closure*

The Development Consent (SSD-4966) conditions relating to the "Final Voids" and "Surface Infrastructure" (Table 4) are domain specific, while all other features relate to all Rehabilitation Domains.

Condition 55 of the Development Consent (SSD-4966) specifies the Rehabilitation Management Plan (RMP) requirements (reproduced below):

Rehabilitation Management Plan

55. The Applicant shall prepare and implement a Rehabilitation Management Plan to the satisfaction of the Resources Regulator. This plan must:

a) be prepared in consultation with the Department, DPIE Water, BCD, and GSC;

b) be submitted to the Resources Regulator for approval at least 3 months prior to the commencement of mining operations in the new mining areas, unless the Resources Regulator agrees otherwise;

c) be prepared in accordance with any relevant DRG guideline;

d) describe how the rehabilitation of the site would be integrated with the implementation of the biodiversity offset strategy;

e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);

f) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform and final land use;

g) include interim rehabilitation where necessary to minimise the area exposed for dust generation;

h) include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures and progress against the detailed performance and completion criteria; and

i) build to the maximum extent practicable on the other management plans required under this consent.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the rehabilitated mine site.

Mining Lease Conditions

Rehabilitation requirements are prescribed in the conditions of ML 1577, ML 1528, ML 1360, ML 1447, ML 1409, ML 1538, ML 1521, ML 1733 and ML 1787. The relevant conditions for each ML are reproduced in Attachment 2.

4.2 POST-MINING LAND USE GOAL

The mine closure goal for the SMC is to achieve relinquishment to the satisfaction of the relevant Minister(s), meeting relevant ML and Development Consent conditions.

Table 5 describes the general rehabilitation and mine closure goals for the SMC. Plan 4 shows the proposed post-mining land use for each rehabilitation domain.

Table 5
General Rehabilitation and Mine Closure Goals for the Stratford Mining Complex

Short to Medium-term	Long-term
• Restrict clearing to the minimum disturbance areas required and recover vegetation and fauna habitat resources (e.g. trees, hollows) during clearing activities for re-use in rehabilitation areas. • Minimise the time soil is stored in temporary stockpiles before being re-used, and where practicable use stripped soil directly for rehabilitation. • Progressively rehabilitate disturbance areas as they become available. • Reshape completed backfilled open cut areas and waste rock emplacements progressively to their final landform shape, so that revegetation is staged. • Sow cover crops on completed operational disturbance areas and final profile mine landforms as soon as possible after completing earthworks and placement of topsoil, to minimise the potential for soil erosion. • Establish endemic woodland/open forest species and/or pasture in the rehabilitation areas in accordance with the SMC rehabilitation goals.	• Create stable mine landforms that are non-polluting and integrate with the adjoining ridgeline to the east and existing waste rock emplacements. • Construct final mine landforms that drain in a stable manner to Avondale Creek, Dog Trap Creek and their associated tributaries. • Revegetate mine landforms to include endemic woodland/open forest species. • Revegetate mine landforms to include agricultural land (e.g. Class 4 lands under the Agricultural Suitability classification system). • Backfill the Stratford Main Pit and BRNOC as part of the SMC. Incorporate three final voids at the cessation of the SMC (Stratford East Open Cut, Avon North Open Cut and Roseville West Pit Extension). • Enhance the habitat values and biodiversity values of the SMC area (including endemic woodland/open forest areas) at relinquishment of the mining leases. • Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora and fauna values with unmined control sites of remnant vegetation.

Key features of the final SMC landform include (Plan 4):

- final voids located in the Stratford East Open Cut, Avon North Open Cut and Roseville West Pit Extension (depending on the extent of backfilling in the Stratford Main Pit, a final void may also remain for water storage subject to approval by the DPIE and Resources Regulator);
- elevated mine landforms associated with the Stratford Waste Emplacement and Northern Waste Emplacement that are broadly integrated with the surrounding landforms;
- landforms at grade or only slightly elevated above pre-mining topography associated with areas of the backfilled open cut pits, the rehabilitated infrastructure area and Western Co-disposal Area; and
- permanent Stratford East Dam water storage structure and various water management structures to direct the flow of water from the mine landforms to Avondale Creek, Dog Trap Creek and their associated tributaries.

The post-mining land uses at the SMC will include:

- revegetated mine landforms including endemic woodland/open forest species; and
- revegetated mine landforms to include agricultural land (e.g. Class 4 lands under the Agricultural Suitability classification system).

Rehabilitation of mined lands would be considered suitable when the nominated standards and/or completion criteria for land use, landform stability, revegetation, and beneficial use have been met, or if the relevant Minister(s) otherwise accepts the rehabilitation status.

4.3 REHABILITATION OBJECTIVES

Rehabilitation objectives for the SMC are prescribed in Condition 53 of Schedule 3 of the Development Consent (SSD-4966) (Section 4.1 and Attachment 1).

5 REHABILITATION PLANNING AND MANAGEMENT

5.1 DOMAIN SELECTION

Consistent with contemporary rehabilitation guidelines and rehabilitation planning best practice, conceptual rehabilitation domains have been developed for the SMC. Based on the MOP Guidelines (DTIRIS-DRE, 2013), Table 6 outlines the primary and secondary domains together with the codes that have been allocated for each domain.

Table 6
Coding for Primary (Operational) and Secondary (Post-Mining Land Use) Domains

Code	Primary Domains (Operational)	Code	Secondary Domains (Post-Mining Land Use)
1	Infrastructure Area	A	Pasture/Scattered Trees
2	Water Management Area	B	Woodland/Open Forest
3	Waste Emplacement	C	Permanent Water Management Area
4	CHPP Reject Material Management Area	D	Final Void/Water Storage
5	Open Cut Pit	E	Biodiversity Enhancement Area/ Biodiversity Offset Area
6	Biodiversity Enhancement Area/ Biodiversity Offset Area		

In summary, the following conceptual rehabilitation domains have been developed for the SMC in accordance with the MOP Guidelines as shown on Plan 4:

- Domain 1A – Infrastructure Area – Pasture/Scattered Trees;
- Domain 1B – Infrastructure Area – Woodland/Open Forest;
- Domain 2A – Water Management Area – Pasture/Scattered Trees;
- Domain 2B – Water Management Area – Woodland/Open Forest;
- Domain 2C – Permanent Water Management Area;
- Domain 3A – Waste Emplacement – Pasture/Scattered Trees;
- Domain 3B – Waste Emplacement – Woodland/Open Forest;
- Domain 4A – CHPP Reject Material Management Area – Pasture/Scattered Trees;
- Domain 4B – CHPP Reject Material Management Area – Woodland/Open Forest;
- Domain 5B – Open Cut Pit – Woodland/Open Forest;
- Domain 5D – Open Cut Pit – Final Void/Water Storage; and
- Domain 6E – Biodiversity Enhancement Area/Biodiversity Offset Area.

5.2 DOMAIN REHABILITATION OBJECTIVES

Rehabilitation objectives have been developed for each domain based on relevant Development Consent (SSD-4966) and ML conditions (except for the Biodiversity Enhancement Areas and Biodiversity Offset Areas).

The overall rehabilitation objectives and domain rehabilitation objectives for the SMC have been prepared in consultation with relevant regulatory authorities (including the Resources Regulator, DPIE, DPIE-BCD, DPIE-Water and MCC) and key stakeholders including surrounding landholders and the CCC, as part of the SEP approval process and as part of approval of the previous MOP/RMP (prepared following approval of the SEP).

5.2.1 Domain 1A/1B – Infrastructure Areas (Pasture/Scattered Trees or Woodland/Open Forest)

The infrastructure areas at the SMC would comprise (Figure 1):

- administration areas, muster areas and bathhouses;
- CHPP area and workshop;
- rail loading/unloading infrastructure; and
- internal haul roads.

SMC infrastructure would be removed and the sites deep-ripped and seeded as required. Some concrete hardstands, site access roads and water management structures may be retained for alternate post-mining uses (where agreed in consultation with the relevant landholders).

CHPP Area and Workshop

Post-operations, the key rehabilitation objectives for the infrastructure areas are to (SCPL, 2012b):

- Decommission and remove all infrastructure, unless otherwise agreed by the determining authority (e.g. decommissioning of the rail loop).
- If there are any contaminated soils associated with the site workshops or contaminated sediments in the return water dam, these will be identified and remediated in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997*.
- Profile the domain to a free-draining landform, with runoff reporting to Avondale Creek.
- Revegetate the domain to pasture with scattered native endemic trees (Domain 1A) or woodland/open forest (Domain 1B). Following rehabilitation, the majority of the domain will be suitable for grazing (e.g. Class 4 lands under the Agricultural Suitability classification system) (i.e. Domain 1A will be dominant).

If at the time of mine closure, the determining authority requires the decommissioning of the rail loop, SCPL will rehabilitate this area as follows:

- Removal of line and signalling infrastructure.
- Identify any contaminated soils associated in the rail loop area and remediate in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997*.
- Profile to a free-draining landform.
- Revegetate the area to pasture with scattered native endemic trees.

Haul Roads

At the completion of mining the SMC haul roads will be decommissioned, reprofiled or removed where required, topsoiled and revegetated with woodland and open forest unless otherwise agreed by the determining authority (e.g. retained for agricultural use).

5.2.2 Domain 2A/2B – Water Management Area (Pasture/Scattered Trees or Woodland/Open Forest)

The temporary water management areas at the SMC that will be decommissioned and rehabilitated include (Figure 1):

- Return Water Dam;
- Parkers/Bowens Road West Pit Void; and
- other water management structures and sediment control dams.

Return Water Dam

Decommissioning and rehabilitation of the Return Water Dam which adjoins the Western Co-disposal Area would involve dewatering the dam, reshaping, or removal where required of dam walls. The area would then be topsoiled and revegetated with pasture and scattered endemic trees (i.e. Domain 2A).

Parkers/Bowens Road West Pit Void

Rehabilitation of the Parkers/Bowens Road West Pit Void would involve backfilling the void to approximately pre-mining surface level and revegetation with pasture and scattered endemic trees (i.e. Domain 2A) (i.e. consistent with surrounding infrastructure area).

Other Water Management Structures and Sediment Control Dams

Sediment dams downstream of the waste rock emplacements will be maintained until the revegetated surface is stable and the runoff water quality is suitable for release off-site. Runoff water quality criteria is included in the SMC WMP.

Water management structures and sediment control dams would either be retained as farm water management structures or decommissioned and rehabilitated.

Temporary diversion drains would be decommissioned and rehabilitated.

5.2.3 Domain 2C – Permanent Water Management Area

The permanent water management structures for the SMC would comprise (Figure 1):

- Stratford East Dam;
- up-catchment diversions associated with final void catchments; and
- other water management structures (where agreed in consultation with the relevant authority).

The rehabilitation objective for the permanent water management structures is to create stable systems.

Stratford East Dam

Post-mining, the Stratford East Dam will be retained for future agricultural use, use by a public authority and/or environmental benefit.

Up-catchment Diversions

A number of up-catchment diversions associated with the catchments reporting to the final voids will be permanent structures that would remain post-mining (e.g. the up-catchment diversions for the Stratford Waste Emplacement that reports to the Stratford East Final Void and the Avon North up-catchment diversion).

Other Water Management Structures

A number of permanent drop-down structures will be retained post-mining where required (e.g. on the batters of waste rock emplacements).

The drop structures will be designed so that they are stable in the long-term. The design and construction of the drop structures will incorporate lining with coarse durable rockfill (or some other form of stable revetment) and appropriate energy dissipation (Gilbert & Associates, 2012).

5.2.4 Domain 3A/3B – Waste Emplacement (Pasture/Scattered Trees or Woodland/Open Forest)

The waste emplacements at the SMC comprise (Figure 1):

- Northern Waste Emplacement;
- Stratford Waste Emplacement (including the backfilled Eastern Emplacement Area and backfilled sections of the Stratford East Open Cut);
- Roseville Pit Waste Emplacement (including the backfilled sections of Roseville West Pit); and
- the BRNOC Northern & Southern Waste Emplacement (including the backfilled BRNOC).

In general, rehabilitation of the waste emplacements involves reshaping of the waste material to maximise stability and reduce erosion, spreading of soil substrates where required, revegetation and ongoing monitoring and management.

The majority of the upper surface of the Stratford Waste Emplacement (and associated western embankment) will be rehabilitated to include pasture with selective establishment of endemic trees and shrubs (i.e. Domain 3A) as shown on Plan 4.

Some of the outer batters of the Stratford Waste Emplacement batters will be revegetated using endemic woodland/open forest species (i.e. Domain 3B) as shown on Plan 4.

The BRNOC Northern and Southern Waste Emplacements will be revegetated with endemic woodland/open forest trees and shrubs (Domain 3B).

The Roseville Pit has been backfilled and will be revegetated with endemic woodland/open forest and shrubs (Domain 3B).

Final landform cross sections are shown on Plans 5A to 5F. The relevant stratigraphic units at the SMC are shown on Figure 2.

5.2.5 Domain 4A/4B – CHPP Reject Material Management Area (Pasture/Scattered Trees or Woodland/Open Forest)

The Western Co-disposal Area is no longer used for CHPP reject disposal. CHPP reject disposal areas at the SMC include the Stratford Main Pit and the future Avon North Open Cut void (i.e. following completion of mining as required).

Western Co-disposal Area

As described in the approved SEP EIS, approximately 1.3 Mt of CHPP rejects will be reclaimed from the Western Co-Disposal Area to recover thermal coal products. Following the removal of historical CHPP rejects, the landform will be progressively profiled to be free-draining, prior to being revegetated to pasture with scattered endemic woodland/open forest trees (consistent with other general infrastructure disturbance areas [Domain 1A]) (Section 5.2.1).

Any remaining historical CHPP reject material in the Western Co-disposal Area would be encapsulated with a suitably well-drained layer of material to act as a capillary breaking layer between the reject material and the overlying cover. The capping layer will be of approximately 0.9 m thickness, comprising approximately 0.6 m of compacted clay overlain by approximately 0.3 m of topsoil. The landform will then be profiled to be free-draining, prior to being revegetated to pasture and scattered endemic woodland/open forest trees.

Stratford Main Pit

Rehabilitation concepts for the Stratford Main Pit include profiling the backfilled pit to a free-draining landform, capping the reject material and topsoiling for revegetation with endemic woodland/open forest species. A *Stratford Main Pit Rehabilitation Strategy* has been prepared by Xenith Consulting Pty Ltd [Xenith], 2019) which provides details of the proposed methodology for progressive reject disposal, water transfer and overburden emplacement for the Stratford Main Pit, as well as details of the surficial rehabilitation strategy (i.e. capping design). A copy of the *Stratford Main Pit Rehabilitation Strategy* (Xenith, 2019) is provided in Appendix B.

Depending on the extent of backfilling in the Stratford Main Pit, SCPL may seek the DPIE's and Resources Regulator's approval for the Stratford Main Pit to remain partially as a final void for water and rejects storage.

5.2.6 Domain 5B/5D – Open Cut Pit (Final Void or Woodland/Open Forest)

At the completion of mining, the SMC final landform will include partially backfilled final voids located at the Roseville West Pit Extension, Avon North Open Cut and Stratford East Open Cut (Figure 1).

The rehabilitation objectives for these final voids are to:

- Minimise the catchment area of the final voids.
- Ensure the final voids are stable and non-polluting.
- Leave the void surrounds safe (for humans and stray stock).

The partially backfilled Roseville West Pit Extension will be revegetated using endemic woodland/open forest species (i.e. Domain 5B) (Plan 4).

At the completion of mining, the Roseville West Pit final void will be surrounded by woodland/open forest (Plan 4).

Void access restrictions (i.e. perimeter bunding and/or fencing) would be installed around the final voids where appropriate to ensure safety and the exclusion of stock.

Final landform cross sections are shown on Plans 5A to 5E.

5.2.7 Domain 6E – Biodiversity Enhancement Area/Biodiversity Offset Area

The Biodiversity Offset Strategy for the SMC is summarised in Table 5 of Condition 33, Schedule 3 of Development Consent SSD-4966 and involves conserving areas of land (outside the MLs) with existing conservation values (Biodiversity Offset Areas) and enhancing/actively managing areas of land within the SMC mining leases to provide linkages of existing native vegetation to the SMC rehabilitation areas (Biodiversity Enhancement Areas). Condition 33 also requires a portion of mine rehabilitation (350 ha of native vegetation) to form part of the Biodiversity Offset Strategy. The SMC Biodiversity Offset strategy is described in detail in the SMC BMP.

5.3 REHABILITATION PHASES

A summary of the rehabilitation phases proposed for completion at the end of the MOP/RMP term is provided in Table 7.

Table 7
Summary of Rehabilitation Phases Proposed for Completion at the End of the MOP/RMP Term

Rehabilitation Phase	Domain				
	Infrastructure Area (1A/1B)	Water Management Area (2A/2B/2C)	Waste Emplacement (3A/3B)	CHPP Reject Material Management Area (4A/4D)	Open Cut Pit (Final Void) (5B/D)
Active Mining Area	✓	✓	✓	✓	✓
Decommissioning	×	×	×	×	×
Landform Establishment	×	×	✓	×	×
Growth Medium Development	×	×	×	×	×
Ecosystem and Land Use Establishment	×	×	✓[1]	✓	×
Ecosystem and Land Use Sustainability	×	×	✓[1]	×	×
Relinquished Lands	×	×	×	×	×

[1] As described in Section 7.2 and shown on Plans 3A, 3B and 3C rehabilitation has occurred on Stratford, BRNOC Northern and BRNOC Southern Waste Emplacements.

Plans 3A, 3B and 3C show the status of the rehabilitation areas (according to the rehabilitation phase) at the end of Years 1, 2 and 3 of the MOP/RMP term.

The proposed rehabilitation activities during the MOP/RMP term are described in Section 7.2.

6 PERFORMANCE INDICATORS AND COMPLETION CRITERIA

The key completion criteria for the SMC (Table 8) are designed to address rehabilitation objectives (Table 4) and incorporate outcomes from the assessment of woodland and pasture rehabilitation. Rehabilitation will need to achieve a standard which satisfies the Resources Regulator that SCPL has met rehabilitation undertakings provided in the MOP/RMP and rehabilitation bonds can be released.

Table 8
Key Completion Criteria

Component	Key Completion Criteria
Final Landforms	• Safe, stable, adequately drained post-mining landforms consistent with the surrounding landscape as evidenced by comparative photography, water quality monitoring and geotechnical surveys. • Geomorphic stability of drainage features comparable to existing natural drainage features as evidenced by cross-section and long-section surveys and monitoring of erosion. • Successful integration of infrastructure retained (subject to approval) from mining activities.
Final Voids	• Surface water inflows to the final voids minimised through appropriate land forming as evidenced by revision of the water balance based on final as-built mine landforms. • Final voids profiled for long-term stability as evidenced by geotechnical surveys of highwalls and endwalls. • Perimeter bunding formed and security fencing installed.
Rehabilitation and Revegetation Areas	• Woodland/riparian areas on trajectory towards criteria, as indicated in annual rehabilitation reviews, towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity) equivalent to reference sites.
Grazing Areas	• Approximately 300 ha of grazing lands will be re-established with a combination of pastures and scattered endemic trees (e.g. Class 4 Agricultural Suitability classification).

A summary of the rehabilitation objectives, performance indicators and completion criteria relevant to each rehabilitation domain is provided in Table 9. Plan 4 shows the relevant primary and secondary domains.

Once SCPL can demonstrate that the completion criteria presented in Table 9 has been met, SCPL will seek confirmation that the rehabilitation achieved on site is to the satisfaction of the Resources Regulator.

Table 9
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Decommissioning							
Domain 1A/1B – Infrastructure Area							
The site is safe and free of hazardous materials.	Undertake consultation to confirm any alternative use for retained infrastructure (i.e. rail loop) post-mining.	Consultation complete. Decision made regarding post-mining use of retained infrastructure.	N/A	SEP EIS. Mine Closure Planning Program (Section 10.8).	No	N/A	Not commenced
	Presence of relevant remaining infrastructure (as agreed via consultation).	Complete removal of relevant infrastructure (as agreed via consultation).	Detailed Asset Register of Retained Infrastructure (Section 10.8)		No	N/A	Not commenced
		Retained infrastructure has been inspected by suitably qualified person and verification assessment concludes the infrastructure is safe, stable and non-polluting.	Retained infrastructure verification assessment (Section 10.8)	Mine Closure Planning Program (Section 10.8).	No	N/A	Not commenced
Identify any contaminated soils associated within the infrastructure areas and rail loop and remediate in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997.*	Levels of contaminated soils identified.	No contaminated soils present.	Land contamination assessment (Section 10.9)	SEP EIS. Mine Closure Planning Program (Section 10.9).	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Decommissioning (continued)							
Domain 2A/2B – Water Management Area (Backfilled)							
Water management infrastructure (i.e. pump and pipeline systems) will be dismantled and removed from site and either sold or transferred to another Yancoal site.	Undertake consultation to confirm any alternative use for water management infrastructure post-mining.	Consultation complete. Decision made regarding post-mining use of retained infrastructure.	Detailed Asset Register of Retained Infrastructure (Section 10.8)	SEP EIS. Mine Closure Planning Program (Sections 10.4 and 10.8). WMP.	No	N/A	Not commenced
	Presence of remaining relevant water management infrastructure (as agreed via consultation).	Complete removal of relevant infrastructure (as agreed via consultation).	Water Infrastructure Decommissioning Strategy (Section 10.4.2)		No	N/A	Not commenced
Return Water Dam will be dewatered and water disposed either in one of the final voids or transferred off-site for disposal at relevant facility.	Return Water Dam water level.	Dewatering of Return Water Dam complete.		SEP EIS. WMP.	No	N/A	Not commenced
Any contaminated sediments in the Return Water Dam will be identified and remediated in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997.*	Levels of contaminated soils identified.	No contaminated soils present.	Water Infrastructure Decommissioning Strategy (Section 10.4.2) Land contamination assessment (Section 10.9)	SEP EIS. SWMP. Mine Closure Planning Program (Sections 10.4 and 10.9).	No	N/A	Not commenced
Domain 2C – Permanent Water Management Area							
Permanent water management areas/structures (i.e. permanent diversions, drains and water storages) are stable and safe.	The assessed stability of permanent water management structures.	Internal stability inspections during the mine closure phase conclude that the permanent water management structures are stable and safe.	Erosion and sediment control monitoring (Section 8.3). Operational stability inspection sign-off by SMC Operations Manager	SEP EIS. Rehab & Mine Closure Risk Ass'mt (Section 3.1).	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Decommissioning (continued)							
Domain 3A/3B – Waste Emplacement							
No spontaneous combustion present in waste emplacements.	Presence of spontaneous combustion.	No areas of spontaneous combustion identified.	Spontaneous combustion monitoring (Section 8.3).	Spontaneous Combustion Management Procedure.	No	N/A	Commenced
No indication of material acid generation in areas of waste emplacement cells containing PAF material.	pH levels recorded in surrounding groundwater/surface water.	Monitoring results show no unusual pH levels recorded in surrounding surface/groundwater.	Groundwater and surface water monitoring (Section 8.3).	SEP EIS, Stratford Coal Mine Life of Mine Rejects Disposal Plan and WMP.	No	N/A	Commenced
Waste Emplacement design non-polluting.	PAF Emplacement.	Engineered PAF waste cells constructed in accordance with designs prepared by a suitably qualified expert and capped with a low permeability layer.	Sign-off of approved design. Survey of as-built waste emplacements and PAF cells.	SEP EIS and WMP. Mine Closure Planning Program (Section 10.2).	No	N/A	Commenced
Domain 4A/4B – CHPP Reject Material Management Area							
All infrastructure associated with the CHPP will be removed and either sold or transferred to another Yancoal site.	Presence of CHPP infrastructure.	Complete removal of infrastructure.	Infrastructure Removal Strategy (Section 10.8).	SEP EIS. Mine Closure Planning Program (Section 10.8).	No	N/A	Not commenced
Domain 5B – Open Cut Pit (Backfilled)							
Once reject material disposal in relevant open cut pits is complete and dewatering is complete, remove all associated infrastructure (e.g. pump and pipeline systems).	Presence of infrastructure.	Complete removal of infrastructure.	Infrastructure Removal Strategy (Section 10.8)	SEP EIS and Stratford Coal Mine Life of Mine Rejects Disposal Plan.	No	N/A	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Decommissioning (continued)							
Final landform design non-polluting.	PAF Emplacement.	PAF waste rock material placed below the predicted final water table recovery level.	Sign-off of approved design. Survey of as-built waste emplacements and PAF cells and capping system (Section 10.2).	SEP EIS and WMP. Rehab & Mine Closure Risk Ass'mt (Section 3.1). Mine Closure Planning Program (Section 10.2).	No	N/A	Commenced
Domain 5D – Open Cut Pit (Final Void/Water Storage)							
Cease dewatering open cut pits and remove all associated infrastructure.	Presence of infrastructure.	Complete removal of infrastructure.	Infrastructure Removal Strategy (Section 10.8).	Existing SMC commitments. Mine Closure Planning Program (Section 10.8).	No	N/A	Commenced
No indication of material acid generation in Roseville West Pit, Stratford East Pit and Avon North.	pH levels in Roseville West Pit, Stratford East Pit and Avon North Pit.	Monitoring results show no unusual pH levels recorded in Roseville West Pit, Stratford East Pit and Avon North Pit.	Surface water monitoring (Section 8.3).	SEP EIS, Stratford Coal Mine Life of Mine Rejects Disposal Plan and WMP.	No	N/A	Commenced
Rehabilitation Phase – Landform Establishment							
Domain 1A/1B/2A/2B – Infrastructure Area							
Re-shape Return Water Dam embankments and infrastructure areas and profile the domains to a free-draining landform, with runoff reporting to Avondale Creek.	No adverse water build-up/spill overs in the Return Water Dam rehabilitation area or infrastructure areas.	Landform is free draining.	Visual monitoring and topographic survey. Retained Water Infrastructure (Section 10.4.3).	SEP EIS. Mine Closure Planning Program (Section 10.4.3).	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Landform Establishment (continued)							
Domain 2C – Permanent Water Management Area							
The rehabilitation objective for the permanent water management structures is to create stable systems.	Stability of permanent water management structures.	Internal stability inspections during the mine closure phase conclude that the permanent water management areas assessed as structurally stable.	Erosion and sediment control monitoring (Section 8.3). Operational stability inspection sign-off by SMC Operations Manager.	WMP. Rehab & Mine Closure Risk Ass'mt (Section 3.1).	No	Table 12	Commenced
	Hydraulic design for permanent drains and diversions.	Up-catchment diversions constructed in accordance with approved design, in consultation with DPIE-Water. Diversions constructed with low longitudinal gradients (e.g. 0.5%). Diversions designed to convey 1:100 ARI rainfall event.	Sign-off of approved design and survey of as-built design.	SEP EIS. WMP.	No	Table 12	Commenced.
Domain 3A/3B – Waste Emplacement							
Minimise long-term erosion and significant tunnel erosion on waste emplacements.	Presence of active erosion. Presence of large rocks.	No large rocks present on waste emplacement slopes. No active tunnel erosion present prior to growth medium development.	Visual monitoring. Erosion and sediment control monitoring (Section 8.3)	SEP EIS. WMP. Rehabilitation monitoring (Section 8.1).	No	Table 12	Commenced
Landform consistent with natural surrounding area.	Elevation of landform.	Waste emplacements constructed in accordance with approved design.	Topographic survey.	SEP EIS.	No	N/A	Commenced
Domain 4A/4B – CHPP Reject Material Management Area							
Capping layer placed over areas of the Western Co-Disposal Area where CHPP reject material remains in-situ (i.e. has not been reclaimed).	Capping layer installed over relevant areas of the Western Co-Disposal Area.	Capping layer installed as per capping design.	Sign-off by SMC Operations Manager that capping installed as per design.	SEP EIS. Stratford Coal Mine Life of Mine Rejects Disposal Plan.	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Landform Establishment (continued)							
Create stable landform at the Western Co-disposal Area and the backfilled Stratford Main Pit.	Presence of active erosion.	Limited erosion present prior to growth medium development.	Erosion and sediment control monitoring (Section 8.3). Rehabilitation monitoring (Section 8.1).	Stratford Coal Mine Life of Mine Rejects Disposal Plan. This MOP/RMP.	No	Table 12	Commenced
Domain 5A/5B – Open Cut Pit (Backfilled)							
Detailed materials balance completed to inform open cut pit backfilling requirements.	Detailed materials balance commenced.	Detailed materials balance completed.	Sign off by Mine Closure Planning Team.	Rehab & Mine Closure Risk Assessment (Section 3.1). Mine Closure Planning Program (Section 10.7).	No	Table 12	Not commenced.
Create stable landform and minimise long-term erosion of the backfilled pits.	Presence of active erosion.	Limited erosion present prior to growth medium development.	Erosion and sediment control monitoring (Section 8.3). Rehabilitation monitoring (Section 8.1).	SEP EIS. This MOP/RMP.	No	Table 12	Commenced
Domain 5D – Open Cut Pit (Final Void/Water Storage)							
Leave the void surrounds safe (for humans and stray stock) – high walls stable.	Ongoing internal geotechnical assessments of open cut voids conducted.	Ongoing internal geotechnical assessment reports conclude low risk of highwall failure.	Ongoing internal geotechnical assessment sign-off by SMC Operations Manager.	Existing SMC commitments. Rehab & Mine Closure Risk Ass'mt (Section 3.1).	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Landform Establishment (continued)							
Domain 5D – Open Cut Pit (Final Void/Water Storage) (continued)							
Confine each final void waterbody.	Overflows from final void water bodies.	Ongoing internal geotechnical assessments of final voids conclude voids are stable and safe, and post-closure water monitoring program indicates no overflows from voids.	Ongoing internal geotechnical assessment sign-off by SMC Operations Manager. Final void water balance and surface water monitoring (Section 10.13).	SEP EIS and WMP. Rehab & Mine Closure Risk Ass'mt (Section 3.1). Mine Closure Planning Program (Section 10.13).	No	Table 12	Not commenced
Restrict access.	Presence of bunding, fencing and/or signage around perimeter of final voids.	Bunding, fencing and/or signage installed and access restricted.	Sign-off by SMC Operations Manager (or delegate) that bunding, fencing and/or signage installed.	SEP EIS. Rehab & Mine Closure Risk Ass'mt (Section 3.1). Mine Closure Planning Program (Section 10.3.1).	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Growth Media Development							
Domain 1A/1B – Infrastructure Area							
Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).	Topsoil depth.	Approximately 100 millimetres (mm) to 150 mm topsoil.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	SEP EIS. This MOP/RMP.	No	Table 12	Not commenced
Domain 2A/2B – Water Management Area (Backfilled)							
Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).	Topsoil depth.	Approximately 100 mm to 150 mm topsoil.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	SEP EIS. This MOP/RMP.	No	Table 12	Not commenced
Domain 2C – Permanent Water Management Area							
Growth medium established on relevant areas of permanent water management structures (i.e. on embankments of retained dams).	Topsoil depth.	Approximately 100 mm to 150 mm topsoil.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	SEP EIS. This MOP/RMP.	No	Table 12	Commenced
Domain 3A/3B – Waste Emplacement							
Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).	Topsoil depth.	Approximately 100 mm to 150 mm topsoil.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	SEP EIS. This MOP/RMP.	No	Table 12	Commenced
Growth medium is structurally stable to minimise long-term erosion potential).	Soil fertility test conducted to determine requirement for soil treatments (e.g. lime, gypsum, fertiliser).	Growth medium stable and prepared for planting.	Soil chemistry analysis.	Existing SMC commitment.	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Growth Media Development (continued)							
Domain 3A/3B – Waste Emplacement (continued)							
Slopes contour ripped to minimise erosion potential. Other measures implemented as necessary to control erosion.	Monitoring of erosion incidence.	Slopes contour ripped and low incidence of erosion on waste emplacement slopes.	Erosion and sediment control monitoring (Section 8.3). Rehabilitation monitoring (Section 8.1).	Existing SMC commitment.	No	Table 12	Commenced
Domain 4A/4B – CHPP Reject Material Management Area							
Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).	Topsoil depth.	Approximately 100 mm to 150 mm topsoil.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	Stratford Coal Mine Life of Mine Rejects Disposal Plan. Existing SMC commitment.	No	Table 12	Commenced
Domain 5A/5B – Open Cut Pit (Backfilled)							
Growth medium developed to sustain proposed post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).	Topsoil depth.	Approximately 100 mm to 150 mm topsoil.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	Existing SMC commitment.	No	Table 12	Commenced
Domain 5D – Open Cut Pit (Final Void/Water Storage)							
Perimeter bunds would be revegetated with endemic woodland species upon completion of construction.	Topsoil depth.	Approximately 100 mm to 150 mm topsoil placed on perimeter bunds to support revegetation.	Visual monitoring and supervision of topsoil spreading. Sign-off by SMC Operations Manager.	Existing SMC commitments.	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification /Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Establishment							
All Secondary Domain A Areas (Pasture/Scattered Trees)							
Develop completion criteria for the Pasture/Scattered Trees Secondary Domain (Domain A areas) that reflect the characteristics of Class 4 lands under the agricultural suitability classification system.	Develop completion criteria set for Secondary Domain A areas.	Develop completion criteria set for Secondary Domain A areas.	Sign off by Mine Closure Planning Team.	Rehab & Mine Closure Risk Ass'mt (Section 3.1). Mine Closure Planning Program (Section 10.5).	No	N/A	Not commenced.
Domain 1A – Infrastructure Area (Pasture/Scattered Trees)							
Revegetate to pasture, with scattered endemic trees via seed and/or tubestock (if required).	Landscape Function Analysis (LFA) Soil surface assessment indices. Agricultural Suitability Assessment.	Suitable LFA reference site selected. LFA results indicate that the pasture is developing similar characteristics to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycle indices by a suitably qualified person. Results from Agricultural Suitability Assessment undertaken by a suitably qualified person indicate that pasture/scattered trees rehabilitation area is on a trajectory towards Class 4 agricultural suitability land completion criteria.	Ecosystem Function Analysis (EFA) (Section 8.1 and Attachment 3). Agricultural Rehabilitation Monitoring (Section 8.2).	Existing SMC commitment. This MOP/RMP.	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification /Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Establishment (continued)							
Domain 1B – Infrastructure Area (Woodland/Open Forest)							
The domain would be revegetated to woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Suitable EFA reference site selected. EFA results indicate that the vegetation is maturing and developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration, nutrient cycling indices and vegetation dynamics and habitat complexity results by a suitably qualified person.	EFA (Section 8.1 and Attachment 3).	Existing SMC commitment. This MOP/RMP.	No	Table 12	Not commenced
Domain 2A – Water Management Area (Backfilled) (Pasture/Scattered Trees)							
The domain would be revegetated to pasture, with scattered endemic woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. Agricultural Suitability Assessment.	Suitable EFA reference site selected. LFA results indicate that the pasture is developing similar characteristics to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Results from Agricultural Suitability Assessment undertaken by a suitably qualified person indicate that pasture/scattered trees rehabilitation area is on a trajectory towards Class 4 agricultural suitability land completion criteria.	EFA (Section 8.1 and Attachment 3). Agricultural Rehabilitation Monitoring (Section 8.2).	Existing SMC commitment. This MOP/RMP.	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification /Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Establishment (continued)							
Domain 2B – Water Management Area (Backfilled) (Woodland/Open Forest)							
The domain would be revegetated to woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Suitable EFA reference site selected. EFA results indicate that the vegetation is maturing and developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration, nutrient cycling indices and vegetation dynamics and habitat complexity results by a suitably qualified person.	EFA (Section 8.1 and Attachment 3).	Existing SMC commitment. This MOP/RMP.	No	Table 12	Not commenced
Domain 2C – Permanent Water Management Area							
Permanent water management structures are operating effectively.	Internal geotechnical assessment.	During operations and mine closure phases, internal operational inspections confirm that permanent water management structures are stable and operating effectively.	Operational inspection sign-off by SMC Operations Manager.	WMP. Rehab & Mine Closure Risk Ass'mt (Section 3.1).	No	Table 12	Commenced
The Stratford East Dam would be retained for future agricultural use. Some sediment control dams may be retained as farm dams where agreed in consultation with relevant regulatory agencies and landholders.	Undertake consultation with relevant local landholders and regulatory agencies regarding long-term use of Stratford East Dam.	Arrangements confirmed for long-term use of retained Stratford East Dam and any other dam retained for future agricultural use.	Ongoing consultation. Mine Closure Planning Team sign-off of Detailed Asset Register for Retained Infrastructure (Section 10.8) and Stratford East Dam Review (Section 10.4.3).	Existing SMC commitments and WMP. Mine Closure Planning Program (Section 10.4.3 and 10.8).	No	N/A	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Establishment (continued)							
Domain 3A – Waste Emplacement (Pasture/Scattered Trees)							
Waste emplacement areas would be revegetated with pasture, with scattered endemic trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. Agricultural Suitability Assessment	Suitable LFA reference site selected. LFA results indicate that the pasture is developing similar characteristics to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Results from Agricultural Suitability Assessment undertaken by a suitably qualified person indicate that pasture/scattered trees rehabilitation area is on a trajectory towards Class 4 agricultural suitability land completion criteria.	EFA (Section 8.1 and Attachment 3). Agricultural Rehabilitation Monitoring (Section 8.2).	SEP EIS. Existing SMC commitments. This MOP/RMP.	No	Table 12	Commenced
Domain 3B – Waste Emplacement (Woodland/Open Forest)							
Waste emplacement areas would be revegetated woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Suitable EFA reference site selected. EFA results indicate that the vegetation is maturing and developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration, nutrient cycling indices and vegetation dynamics and habitat complexity results by a suitably qualified person.	EFA (Section 8.1 and Attachment 3).	SEP EIS. Existing SMC commitments. This MOP/RMP.	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Establishment (continued)							
Domain 4A – CHPP Reject Material Management Area (Pasture/Scattered Trees)							
CHPP rejects material management areas would be revegetated with pasture, with scattered endemic trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. Agricultural Suitability Assessment	Suitable LFA reference site selected. LFA results indicate that the pasture is developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Results from Agricultural Suitability Assessment undertaken by a suitably qualified person indicate that pasture/scattered trees rehabilitation area is on a trajectory towards Class 4 agricultural suitability land completion criteria.	EFA (Section 8.1 and Attachment 3). Agricultural Rehabilitation Monitoring (Section 8.2).	Existing SMC commitments. This MOP/RMP.	No	Table 12	Not commenced
Domain 4B – CHPP Reject Material Management Area (Woodland/Open Forest)							
CHPP rejects material management areas would be revegetated with woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Suitable EFA reference site selected. EFA results indicate that the vegetation is maturing and developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration, nutrient cycling and vegetation dynamics and habitat complexity results by a suitably qualified person.	EFA (Section 8.1 and Attachment 3).	Existing SMC commitments. This MOP/RMP.	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Establishment (continued)							
Domain 5A – Open Cut Pit (Backfilled) (Pasture/Scattered Trees)							
Backfilled open cut pits would be revegetated with pasture, with scattered endemic woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. Agricultural Suitability Assessment	Suitable LFA reference site selected. LFA results indicate that the pasture is developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Results from Agricultural Suitability Assessment undertaken by a suitably qualified person indicate that pasture/scattered trees rehabilitation area is on a trajectory towards Class 4 agricultural suitability land completion criteria.	EFA (Section 8.1 and Attachment 3). Agricultural Rehabilitation Monitoring (Section 8.2).	SEP EIS. Existing SMC commitments. This MOP/RMP.	No	Table 12	Not commenced
Domain 5B – Open Cut Pit (Backfilled) (Woodland/Open Forest)							
Backfilled open cut pits would be revegetated with woodland/open forest trees via seed and/or tubestock (if required).	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat complexity results.	Suitable EFA reference site selected. EFA results indicate that the vegetation is maturing and developing characteristics similar to that found in the relevant reference site based on measurement of stability, infiltration, nutrient cycling indices and vegetation dynamics and habitat complexity results by a suitably qualified person.	EFA (Section 8.1 and Attachment 3).	SEP EIS. Existing SMC commitments. This MOP/RMP.	No	Table 12	Not commenced
Domain 5D – Open Cut Pit (Final Void/Water Storage)							
Safe, stable and non-polluting.	Internal geotechnical assessment.	During operational and mine closure phases, internal geotechnical assessments confirm that final voids are safe, stable and non-polluting.	SMC Operations Manager sign-off of internal geotechnical assessments.	SEP EIS and WMP. Rehab & Mine Closure Risk Ass'mt (Section 3.1).	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Sustainability							
Domain 1A – Infrastructure Area (Pasture/Scattered Trees)							
Areas of pasture, with scattered endemic trees, are suitable for grazing.	LFA Soil surface assessment indices. Agricultural Suitability Assessment	LFA results indicate the Domain 1A areas are, or are on a trajectory towards, self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Rehabilitation area is suitable for grazing use (e.g. Class 4 lands under the agricultural suitability classification system) as determined by Agricultural Suitability Assessment undertaken by suitably qualified person.	EFA (Section 8.1 and Attachment 3). Agricultural Suitability Assessment (Section 10.12)	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.12).	No	Table 12	Not commenced
Domain 1B – Infrastructure Area (Woodland/Open Forest)							
Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Native Ecosystems Rehabilitation Assessment concludes that EFA results indicate woodland/open forest areas are, or are on a trajectory towards, self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity, vegetation structure) equivalent to unmined control sites of remnant vegetation.	EFA (Section 8.1 and Attachment 3). Rehabilitation Assessment – Native Ecosystems (Section 10.11).	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.11).	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Sustainability (continued)							
Domain 2A – Water Management Area (Backfilled) (Pasture/Scattered Trees)							
Areas of pasture, with scattered endemic trees, are suitable for grazing.	LFA Soil surface assessment indices. Agricultural Suitability Assessment	LFA results indicate the Domain 2A areas are, or are on a trajectory towards, self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified expert. Rehabilitation area is suitable for grazing use (e.g. Class 4 lands under the agricultural suitability classification system) as determined by Agricultural Suitability Assessment undertaken by suitably qualified person.	EFA (Section 8.1 and Attachment 3). Agricultural Suitability Assessment (Section 10.12)	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.12).	No	Table 12	Not commenced
Domain 2B – Water Management Area (Backfilled) (Woodland/Open Forest)							
Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.	LFA Soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Native Ecosystems Rehabilitation Assessment concludes that EFA results indicate woodland/open forest areas are, or are on a trajectory towards, self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity, vegetation structure) equivalent to unmined control sites of remnant vegetation.	EFA (Section 8.1 and Attachment 3). Rehabilitation Assessment – Native Ecosystems (Section 10.11).	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.11).	No	Table 12	Not commenced
Domain 2C – Permanent Water Management Area							
Safe, stable and non-polluting.	Regulatory (e.g. NSW Resources Regulator) assessment at mine closure.	At mine closure, relevant regulatory agencies (e.g. NSW Resources Regulator) confirm that permanent water management structures are safe, stable and non-polluting as informed by conclusion of Stability Assessment of retained water management structures.	Water quality monitoring (Section 8.3). Stability Assessment (Sections 10.2.1 and 10.4.3).	WMP. Rehab & Mine Closure risk Ass'mt (Section 3.1). Mine Closure Planning Program (Sections 10.2.1 & 10.4.3).	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Sustainability (continued)							
Domain 3A – Waste Emplacement (Pasture/Scattered Trees)							
Areas of pasture, with scattered endemic trees, are suitable for grazing.	LFA soil surface assessment indices. Agricultural Suitability Assessment.	LFA results indicate the Domain 3A areas are, or are on a trajectory towards, self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Rehabilitation area is suitable for grazing use (e.g. Class 4 lands under the agricultural suitability classification system) as determined by Agricultural Suitability Assessment undertaken by suitably qualified person.	EFA (Section 8.1 and Attachment 3). Agricultural Suitability Assessment (Section 10.12)	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.12).	No	Table 12	Commenced
Domain 3B – Waste Emplacement (Woodland/Open Forest)							
Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.	LFA soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Native Ecosystems Rehabilitation Assessment concludes that EFA results indicate woodland/open forest areas are, or are on a trajectory towards, self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity, vegetation structure) equivalent to unmined control sites of remnant vegetation.	EFA (Section 8.1 and Attachment 3). Rehabilitation Assessment – Native Ecosystems (Section 10.11)	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.11).	No	Table 12	Commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Sustainability (continued)							
Domain 4A – CHPP Reject Material Management Area (Pasture/Scattered Trees)							
Areas of pasture, with scattered endemic trees, are suitable for grazing.	LFA soil surface assessment indices. Agricultural Suitability Assessment.	LFA results indicate the Domain 4A areas are, or are on a trajectory towards, self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Rehabilitation area is suitable for grazing use (e.g. Class 4 lands under the agricultural suitability classification system) as determined by Agricultural Suitability Assessment undertaken by suitably qualified person.	EFA (Section 8.1 and Attachment 3). Agricultural Suitability Assessment (Section 10.12).	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.12).	No	Table 12	Not commenced
Domain 4B – CHPP Reject Material Management Area (Woodland/Open Forest)							
Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.	LFA soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Native Ecosystems Rehabilitation Assessment concludes that EFA results indicate that woodland/open forest areas are, or are on a trajectory towards, self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity, vegetation structure) equivalent to unmined control sites of remnant vegetation.	EFA (Section 8.1 and Attachment 3). Rehabilitation Assessment – Native Ecosystems (Section 10.11)	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.11).	No	Table 12	Not commenced
Domains 4A & 4B – CHPP Reject Material Management Area							
CHPP reject material capping layer adequate to support post-mining vegetation communities (e.g. pasture and scattered trees or woodland/open forest).	LFA soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results. Agricultural Suitability Assessment.	For areas where CHPP reject material remains in-situ and a capping layer has been installed overlying the reject material, Native Ecosystems Rehabilitation Assessment and Agricultural Suitability Assessment conclude EFA and LFA results indicate that the rehabilitation area is capable of supporting final land uses of grazing or areas woodland/open forest.	EFA and LFA (Section 8.1 and Attachment 3). Agricultural Suitability Assessment & Native Ecosystems Rehabilitation Assessment (Sections 10.11 & 10.12).	Mine Closure Planning Program (Sections 10.11 and 10.12). Rehabilitation & Mine Closure Risk Assessment (Appendix A).	No	Table 12	Not commenced

Table 9 (Continued)
Summary of Rehabilitation Objectives, Performance Indicators and Completion Criteria

Objective	Performance Indicator	Completion Criteria	Monitoring Method	Justification/ Source	Complete	Link to TARP	Progress at Start of MOP/RMP
Rehabilitation Phase – Ecosystem and Land Use Sustainability (continued)							
Domain 5A – Open Cut Pit (Backfilled) (Pasture/Scattered Trees)							
Areas of pasture, with scattered endemic woodland/open forest trees, are suitable for grazing.	LFA soil surface assessment indices. Agricultural Suitability Assessment.	LFA results indicate the Domain 5A areas are, or are on a trajectory towards, self-sustaining ecosystems based on measurement of stability, infiltration and nutrient cycling indices by a suitably qualified person. Rehabilitation area is suitable for grazing use (e.g. Class 4 lands under the agricultural suitability classification system) as determined by Agricultural Suitability Assessment undertaken by suitably qualified person.	EFA (Section 8.1 and Attachment 3). Agricultural Suitability Assessment (Section 10.12)	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.12).	No	Table 12	Not commenced
Domain 5B – Open Cut Pit (Backfilled) (Woodland/Open Forest)							
Woodland/open forest areas are self-sustaining and on a path towards obtaining comparable flora values with unmined control sites of remnant vegetation.	LFA soil surface assessment indices. EFA Vegetation Dynamics results. EFA Habitat Complexity results.	Native Ecosystems Rehabilitation Assessment concludes that EFA results indicate woodland/open forest areas are, or are on a trajectory towards, self-sustaining ecosystem and/or measures of ecosystem function (e.g. vegetation cover, landform stability, species diversity) equivalent to unmined control sites of remnant vegetation.	EFA (Section 8.1 and Attachment 3). Rehabilitation Assessment – Native Ecosystems (Section 10.11).	Existing SMC commitments. SEP EIS. Mine Closure Planning Program (Section 10.11).	No	N/A	Not commenced
Domain 5D – Open Cut Pit (Final Void/Water Storage)							
Safe, stable and non-polluting.	Regulatory assessment at mine closure.	At mine closure, relevant regulatory agencies (e.g. NSW Resources Regulator) confirm that final voids are safe, stable and non-polluting as informed by conclusion of Geotechnical Assessment of final voids.	Water quality monitoring (Section 8.3). Geotechnical Assessment (Section 10.2.1).	Existing SMC commitments. SEP EIS. Rehab & Mine Closure Risk Ass'mt (Section 3.1). Mine Closure Planning Program (Section 10.2.1).	No	N/A	Not commenced

7 REHABILITATION IMPLEMENTATION

7.1 STATUS AT MOP/RMP COMMENCEMENT

SCPL has successfully undertaken rehabilitation activities at the SMC since 1996. Approximately 264 ha of land at the SMC has been rehabilitated (i.e. shaped, covered with topsoil and revegetated). Sections of the following landforms are currently under rehabilitation (Plans 3A, 3B and 3C):

- Stratford Waste Emplacement;
- BRNOC Northern & Southern Waste Emplacements;
- Roseville Pit;
- Roseville West Pit; and
- Western Co-Disposal Area.

The following sections detail the current rehabilitation status and the rehabilitation methods which have been implemented successfully and will continue to be implemented at the SMC.

7.1.1 Infrastructure Area

The infrastructure areas are currently active.

The existing infrastructure and services will continue to be utilised throughout the life of the SMC.

7.1.2 Waste Emplacement Areas (including previously active open cut pits)

7.1.2.1 Existing Rehabilitation Methods

Rehabilitation works of the Waste Emplacement at the SMC have been effectively completed. Areas of endemic woodland shrubs and trees have been successfully established across slopes and batters of the Waste Emplacements, with pasture established on the Stratford Waste Emplacement and Western Co-disposal Area. Plates 1 to 12 provide examples of the progression of rehabilitation phases and successful rehabilitation undertaken at the SMC.

A selection of cover vegetation has been used for rehabilitation at the SMC. Seed mixes will continue to be reviewed to ensure any improvements can be incorporated, including pertinent recommendations from EFA monitoring.

Pasture seed mixes have been typically used at a rate of between 20 and 40 kilograms per ha and have included:

- Shirohie Millet;
- Saia Oats;
- Vic Perennial Ryegrass;
- Haifa White Clover;
- Rhodes Grass;
- Seaton Park Sub Clover;
- Kikuyu; and
- Paspalum.

The native tree and shrub seed mixes for the woodland and forest rehabilitation areas generally includes a selection of the framework species for the representative vegetation communities as shown on Plan 1B. Species pallets are provided in the BMP. The target vegetation communities are representative of the pre-mining vegetation communities or the surrounding vegetation communities and are based on the vegetation mapping undertaken for the EIS 2012.

7.1.2.2 Stratford Waste Emplacement

Rehabilitation works on the top and outer batters of the Stratford Waste Emplacement have been effectively completed (Plate 1). However, activities undertaken during the term of this MOP/RMP include additional disturbance to waste emplacement and rehabilitation areas including, sections of the existing Stratford Waste Emplacement. Disturbance in these areas is approved under the Development Consent (SDD-4966) and will be rehabilitated in accordance with Section 7.2.

The Stratford Waste Emplacement has been constructed with an overall outer batter slope of between 1V:4H to 1V:6H. Following the development of drainage structures, the waste rock has been covered with 100 to 200 mm of topsoil. Following topsoil placement, site preparation works have involved either chisel ploughing or deep-ripping along contours, depending on the vegetation type to be established.

The Stratford Waste Emplacement has been progressively revegetated with a pasture cover crop. Endemic woodland shrubs and trees have been established on ridgelines and other selected areas. Portions of the rehabilitated emplacement are grazed by cattle and irrigated.

Plates 1 to 6 provide examples of the successful rehabilitation undertaken at the Stratford Waste Emplacement.

7.1.2.3 BRNOC Waste Emplacement

Rehabilitation of the BRNOC out-of-pit Northern and Southern Waste Emplacements has been undertaken progressively since the commencement of mining operations in 2003. Rehabilitation to date has focused on re-contouring the waste emplacements to batter slopes of 1V:4H, pasture treatment on topsoiled areas of the Northern Waste Emplacement and establishment of endemic woodland shrubs and trees. A topsoil depth of approximately 100 mm was used on the Northern and Southern Waste Emplacements.

Plates 7 to 10 provide examples of the successful rehabilitation undertaken at the BRNOC.

7.1.2.4 Roseville Pit

The Roseville Pit was an open cut void that was temporarily used for the co-disposal of CHPP rejects and water storage prior to being capped with mine waste rock and topsoiled to a depth of approximately 200 mm. Native woodland and pasture species have been established on the backfilled Roseville Pit (Figure 1 and Plan 2).

7.1.2.5 Roseville Extended Pit

The Roseville Extended Pit has been substantially backfilled (Figure 1 and Plan 2). The Roseville Extended Pit will continue to be used for waste emplacement and therefore rehabilitation has been undertaken in some areas of the pit up to the Ecosystem and Land Use Establishment (Plan 3A).

7.1.2.6 Stratford Main Pit

Portions of the Stratford Main Pit have been backfilled with waste rock and outer batters also seeded via aerial seeding methods as a temporary measure. The Stratford Main Pit will continue to be used for waste emplacement, co-disposal of CHPP rejects and as a water storage and transfer point.

7.1.3 Open Cut/Void Areas

The Roseville West Pit, Avon North Open Cut and Stratford East Open Cut pits are currently active and will remain active during the MOP/RMP term.

7.2 PROPOSED REHABILITATION ACTIVITIES DURING THE MOP/RMP TERM

Rehabilitation activities are proposed in the BRNOC, Western Co-disposal Area Dam, the Northern Waste Emplacement and the Northern Waste Emplacement Extension, Roseville West Pit and Stratford East Open Cut (northern extent) and the Stratford Waste Emplacement, including the Eastern Emplacement Area.

In accordance with the MOP Guidelines, Table 10 provides a summary of disturbance and rehabilitation progression during the MOP term.

A summary of the status of rehabilitation for each Domain over the MOP/RMP term is described in Sections 7.2.1 to 7.2.5.

Plate 1: Stratford Waste Emplacement Looking West

Plate 2: Stratford Waste Emplacement - Rehabilitated Agricultural Areas

YAN-20-31 SMOP 21-24_003A

Plate 3: Pasture on Stratford Waste Emplacement Area

Plate 4: Pasture on Stratford Waste Emplacement Area overlooking Eastern Emplacement Area

YAN-20-31 SMOP 21-24_004A

Plate 5: Woodland Rehabilitation on Stratford Waste Emplacement

Plate 6: Woodland Rehabilitation on Stratford Waste Emplacement

YAN-20-31 SMOP 21-24_005A

Plate 7: BRNOC Southern Emplacement Rehabilitation

Plate 8: BRNOC Northern Emplacement Rehabilitation

YAN-20-31 SMOP 21-24_006A

Plate 9: Rehabilitation (Pasture) East of BRNOC

Plate 10: Woodland Rehabilitation on BRNOC Northern Emplacement Area

YAN-20-31 SMOP 21-24_007A

Table 10
Disturbance and Rehabilitation Progression During the MOP/RMP Term

Year	Total Disturbance Area (ha)[1]	Incremental Rehabilitation Area (ha)	Cumulative Rehabilitation Area (ha)[2]	Comments/Explanation
At start of MOP/RMP term (1 January 2021)	460	NA	264	Refer to Section 7.1.
Year 1 1 January 2021 – 31 December 2021	445	15	279	**Disturbance** • New disturbance areas associated with Stratford East Open Cut, including areas previously rehabilitated on Northern Waste Emplacement, Western Co-Disposal Area and northern extent of the Stratford East Open Cut. **Rehabilitation (during Year 1)** • New areas of rehabilitation in the north of the Northern Waste Emplacement Extension and east of the Roseville West Pit. • Identification of opportunistic temporary rehabilitation areas will continue. • Areas of existing rehabilitation are expected to progress during Year 1 of the MOP/RMP term as described in Sections 7.2.1 to 7.2.5.
Year 2 1 January 2022 – 31 December 2022	416	45	324	**Disturbance** • New disturbance areas associated with Stratford East Open Cut. **Rehabilitation (during Year 2)** • New areas of rehabilitation proposed in the northern extent of BRNOC and Roseville West Pit (i.e. backfilling the northern extents of both pits), areas immediately north-west and south of the Stratford Main Pit and an area in the northern extent of the Stratford East Open Cut. • Identification of opportunistic temporary rehabilitation areas will continue. • Areas of existing rehabilitation are expected to progress during Year 2 of the MOP/RMP term as described in Sections 7.2.1 to 7.2.5.
Year 3 1 January 2023 – 31 December 2023 (End of MOP term)	397	32	356	**Disturbance** • No new areas of disturbance are planned for Year 3 of the MOP/RMP term. **Rehabilitation (during Year 3)** • New areas of rehabilitation proposed in the central and southern extent of the BRNOC (completion of backfilling of BRNOC expected to be completed during Year 3) and in the northern extent of Roseville West Pit. The northern extent of the Stratford East Open Cut will continue to be backfilled during Year 3. • Identification of opportunistic temporary rehabilitation areas will continue. • Areas of existing rehabilitation are expected to progress during Year 3 of the MOP/RMP term as described in Sections 7.2.1 to 7.2.5.

[1] Total disturbance area includes areas of land which are within the Active and Decommissioning phases. Total disturbance area reflects sum of primary domains less area of rehabilitation.

[2] Total Rehabilitation Area includes areas of land which are within the Landform Establishment and Growth Medium Development, Ecosystem and Land Use Establishment, and Ecosystem and Land Use Sustainability phases.

Note: The rehabilitation and disturbance area boundaries reflect actual development or rehabilitation extent based on new (2020) aerial imagery and therefore may differ from the forecasted areas for the end of the MOP/RMP term in the previous 2018-2021 SMC MOP/RMP.

7.2.1 Domain 1 – Infrastructure Area

Rehabilitation activities relevant to the infrastructure areas are not proposed to commence during the MOP/RMP term.

During the decommissioning phase of the SMC, the priority will be to dismantle fixed equipment and infrastructure for removal from site and re-use at another location or recycling. Non-salvageable/non-recyclable and non-contaminated infrastructure will be disposed of at suitable off-site disposal areas (or on-site subject to relevant approvals being obtained). Once all the equipment and infrastructure components have been removed from an area it will be deep-ripped, topsoiled and seeded with species relevant to the rehabilitation domain (i.e. either pasture and scattered tree species, or woodland/open forest species).

Some concrete hardstands, administration and ablution buildings, site access roads, sheds, buildings and sediment dams may be retained for alternate post-mining uses subject to agreement with the Resources Regulator, other relevant regulatory agencies and the ultimate landholder. Electricity transmission infrastructure will be retained for future use by landholders unless it is no longer required, in which case it will be decommissioned and removed.

It is anticipated that some of the internal roads will be retained for use by landholders following the cessation of mining, although this will be subject to consultation with relevant landholders during closure planning.

7.2.2 Domain 2 – Water Management Area

No rehabilitation activities of water management structures will occur during the MOP/RMP term.

7.2.3 Domain 3 – Waste Emplacement

The BRNOC Northern Waste Emplacement is expected to progress from the Ecosystem and Land Use Establishment phase to the Ecosystem and Land Use Sustainability phase during the MOP/RMP term. The visual bund constructed at the northern extent of the BRNOC will progress from the Landform Establishment phase to Ecosystem and Land Use Establishment phase during the MOP/RMP term.

During Years 2 and 3, rehabilitation will commence on northern backfilled extent of the Stratford East Open Cut (Plans 3B and 3C). The area of the Stratford Waste Emplacement immediately south of the Strafford Main Pit will progress from the Ecosystem and Land Use Establishment phase to the Ecosystem and Land Use Sustainability phase during the MOP/RMP term.

7.2.4 Domain 4 – CHPP Rejects Material Management Area

The Western Co-disposal Area will continue to be active during the MOP/RMP term with an approximate 14 ha area to the west of the Western Co-disposal Area scheduled to remain as Ecosystem and Land Use Establishment during the MOP/RMP term. In Year 3 of the MOP/RMP term rehabilitation of the remainder of the Western Co-disposal Area will commence, with the majority of the landform anticipated to be at the Landform Establishment by the end of Year 3.

7.2.5 Domain 5 – Open Cut

Backfilling of the BRNOC and Roseville West Pit with waste material from the Avon North Open Cut will progress during the MOP/RMP term (Plans 3A to 3C). By the end of the MOP/RMP term both the BRNOC and the Roseville West Pit are anticipated to be completely backfilled, with the northern extent of the BRNOC to include rehabilitation at the Ecosystem and Land Use Establishment phase.

7.3 SUMMARY OF REHABILITATION AREAS DURING THE MOP/RMP TERM

In accordance with the MOP Guidelines, a summary of the progression of rehabilitation within each domain (according to the rehabilitation phase) is provided in Table 11.

Plans 3A, 3B and 3C provide a conceptual view of the status of rehabilitation at the SMC (according to rehabilitation phase) and progression during the MOP/RMP term. Additional temporary rehabilitation and seeding opportunities that become available will also be undertaken where required.

Table 11
Summary of Domains, Rehabilitation Phases and Areas at Commencement and Completion of MOP/RMP Term

Primary Domain	Rehabilitation Phase	Approximate Area (ha) at Start of MOP/RMP Term	Approximate Area (ha) at End of MOP/RMP Term
Infrastructure Area (1)	Active	111	111
	Decommissioning	0	0
	Landform Establishment	0	0
	Growth Medium Development	0	0
	Ecosystem Establishment – Pasture/Scattered Trees	2	2
	Ecosystem Establishment – Woodland/Open Forest	0	0
	Ecosystem Sustainability – Pasture/Scattered Trees	0	0
	Ecosystem Sustainability – Woodland/Open Forest	0	0
	Relinquished Lands	0	0
	Total	**113**	**113**
Water Management Area (2)	Active	33	33
	Decommissioning	0	0
	Landform Establishment	0	0
	Growth Medium Development	0	0
	Ecosystem Establishment - Pasture/Scattered Trees	0	0
	Ecosystem Establishment – Woodland/Open Forest	0	0
	Ecosystem Sustainability – Pasture/Scattered Trees	0	0
	Ecosystem Sustainability – Woodland/Open Forest	0	0
	Relinquished Lands	0	0
	Total (including Permanent Water Management Area)	**33**	**33**
Permanent Water Management Area (2C)		**25**	**25**

Table 11
Summary of Domains, Rehabilitation Phases and Areas at Commencement and Completion of MOP/RMP Term

Primary Domain	Rehabilitation Phase	Approximate Area (ha) at Start of MOP/RMP Term	Approximate Area (ha) at End of MOP/RMP Term
Waste Emplacement (3)	Active	143	97
	Decommissioning	0	0
	Landform Establishment	32	32
	Growth Medium Development	0	0
	Ecosystem Establishment – Pasture/Scattered Trees	0	34
	Ecosystem Establishment – Woodland/Open Forest	13	72
	Ecosystem Sustainability – Pasture/Scattered Trees	136	136
	Ecosystem Sustainability – Woodland/Open Forest	67	67
	Relinquished Lands	0	0
	Total	**391**	**438**
CHPP Reject Material Disposal Area (4)	Active	85	85
	Decommissioning	0	0
	Landform Establishment	5	0
	Growth Medium Development	0	0
	Ecosystem Establishment – Pasture/Scattered Trees	7	12
	Ecosystem Establishment – Woodland/Open Forest	0	0
	Ecosystem Sustainability – Pasture/Scattered Trees	0	0
	Ecosystem Sustainability – Woodland/Open Forest	0	0
	Relinquished Lands	0	0
	Total	**97**	**97**
Open Cut Pit (5)	Active	91	72
	Decommissioning	0	0
	Landform Establishment	0	0
	Growth Medium Development	0	0
	Ecosystem Establishment – Pasture/Scattered Trees	0	0
	Ecosystem Establishment – Woodland/Open Forest	0	0
	Ecosystem Sustainability – Pasture/Scattered Trees	0	0
	Ecosystem Sustainability – Woodland/Open Forest	0	0
	Relinquished Lands	0	0
	Total	**91**	**72**

Note: The rehabilitation phase and domain area boundaries reflect actual development or rehabilitation extent based on new (2020) aerial imagery and therefore may differ from the forecasted areas for the end of the MOP/RMP term in the previous 2018-2021 SMC MOP/RMP.

7.4 RELINQUISHMENT PHASE ACHIEVED DURING THE MOP/RMP TERM

No lands are proposed for relinquishment during the MOP/RMP term.

8 REHABILITATION MONITORING AND RESEARCH

8.1 NATIVE REHABILITATION MONITORING AND ECOSYSTEM FUNCTION ANALYSIS

Rehabilitation is monitored on a regular basis to ensure vegetation is establishing in the rehabilitation areas and to determine the need for any maintenance and/or contingency measures (e.g. supplementary plantings, weed or erosion control). The monitoring also aims to demonstrate the effectiveness of the rehabilitation techniques and track the progression towards achieving the performance and completion criteria.

Visual Monitoring

The visual monitoring includes:

- monitoring of soil erosion status and the effectiveness of erosion control methods;
- observing drains to determine whether substantial silting of inverts and/or any localised failure of the drain embankment has occurred;
- assessing germination success and vegetation establishment (diversity and abundance);
- usage of habitat enhancement features;
- evaluating the behaviour of placed topsoil;
- evaluating threats posed to rehabilitated areas posed by weed infestation and feral animals; and
- opportunistic fauna observations.

The visual monitoring provides an early identification of areas requiring remedial planting or other maintenance works to maintain rehabilitation progress. Annual surveys of select revegetation areas will be undertaken by an appropriately qualified and experienced person to review the success of rehabilitation and identify any additional measures required to achieve ongoing rehabilitation success.

Regular feral animal and weed control is undertaken over the entire SMC area (including the rehabilitation areas) and will continue as further areas transition into rehabilitation.

Ecosystem Function Analysis

In-depth monitoring and assessment of the quality and ecological value of woodland rehabilitation will be required prior to lease relinquishment. This assessment will be conducted using the Ecosystem Function Analysis (EFA) methodology. EFA aims to measure the progression of rehabilitation towards self-sustaining ecosystems. EFA has been incorporated into the overall SMC annual rehabilitation monitoring program to provide an assessment of landscape functionality.

The EFA is comprised of the following components:

- LFA;
- vegetation dynamics; and
- habitat complexity.

A description of the EFA monitoring methodology, including each of the above components, is provided in Attachment 3. of this MOP/RMP

EFA Analogue Transects have been established in proximal areas to represent the varying landscapes (i.e. slopes and aspects) and target communities planned for each rehabilitation area.

During December 2013, Greening Australia (2014) established a total of 30 fixed EFA Revegetation monitoring transects across a range of current rehabilitation areas at the SMC. Since 2013, LFA and revegetation monitoring has been undertaken annually at these sites.

As rehabilitation progresses, further EFA Revegetation Transects will be established in each of the rehabilitation domain areas. The location of each transect will be determined on the basis of representative slope, aspect and target vegetation community in consultation with a suitably qualified specialist.

The representativeness of the EFA transects are reviewed during each monitoring round to confirm that transects continue to accurately represent the status of rehabilitation across each of the rehabilitation domains.

The results of LFA, vegetation dynamics and habitat complexity monitoring (i.e. EFA) are used at the SMC to monitor progress towards rehabilitation completion and to determine a trajectory towards self-sustaining ecosystems.

SCPL will continue to engage a suitably qualified contractor to undertake annual LFA and vegetation structure monitoring at the SMC during the MOP/RMP term.

A detailed monitoring report is prepared annually that includes a summary of previous monitoring results, results of the current year's monitoring and any planned remedial works, if required. The monitoring results are summarised in the SMC's Annual Review which is made available on the Stratford Coal website.

8.2 AGRICULTURAL REHABILITATION MONITORING

Rehabilitation monitoring has commenced for the rehabilitation areas proposed as Secondary Domain A (post-mining land-use) – pasture and scattered trees. The areas of the SMC final landform targeted for future agricultural pursuits will be rehabilitated with pasture species (and scattered tree species) (e.g. areas of the Waste Emplacement and former infrastructure areas [Plan 4] and are proposed for Class 4 agricultural suitability. Class 4 Agricultural Suitability is defined as (NSW Agriculture, 2002):

> *Land suitable for grazing but not for cultivation. Agriculture is based on native pastures and improved pastures established using minimum tillage techniques. Production may be seasonally high but the overall production level is low as a result of major environmental constraints.*

Monitoring of pasture and scattered tree rehabilitation areas will involve monitoring of LFA indices, including stability, infiltration and nutrient cycling indices. Completion criteria for these areas will be assessed by undertaking an assessment of the Agricultural Suitability class by a suitably qualified specialist or agronomist. Completion criteria that reflect Class 4 agricultural suitability land will be developed as part of the refined rehabilitation objectives, performance indicators and completion criteria set to be developed by SCPL by 31 December 2022 (Section 10.5).

8.3 OTHER REHABILITATION MONITORING

Surface Water Monitoring

The surface water management system and monitoring program is described in the WMP.

SCPL monitors surface water quality by sampling from ten monitoring locations in and surrounding the mine site. These locations comprise both streams and water storage structures. Surface water is sampled and analysed on a monthly and event basis, or following a sediment dam spill. Collected waters are analysed for a suite of physical and chemical parameters and the results are reported in the Annual Review, along with a comparison to a number of performance indicators and measures. Surface water monitoring is also undertaken at a number of the water storages at the SMC.

SCPL will continue to monitor the water quality of contained water storages (i.e. pH and solute concentrations) during the life of the SMC as part of the existing surface water monitoring program. If in the event acid rock drainage is identified through the surface water monitoring program, specific acid rock drainage controls will be implemented.

This surface water monitoring will continue over the MOP/RMP term to confirm that rehabilitated areas are progressing satisfactorily to a final landform which is non-polluting and not adversely affecting off-site water quality.

Groundwater Monitoring

A Groundwater Management Plan (as part of the WMP) has been prepared to control potential impacts on local and regional groundwater resources and includes and a monitoring program to validate and review the groundwater model predictions.

Groundwater monitoring is undertaken at a suite of monitoring bores located in and around the SMC area as described in the WMP. Monitoring is undertaken on a monthly, quarterly, six monthly or annual basis depending upon the parameter being measured. The groundwater monitoring network includes bores in close proximity to the BRNOC, Roseville West Pit and Stratford Main Pits. As mining progresses within the Avon North Open Cut Pit and the Stratford East Open Cut Pit, additional groundwater monitoring piezometers will be installed during the MOP/RMP term. Monitoring results are reported in the Annual Review along with a comparison to relevant performance indicators.

A site water balance review is undertaken on an annual basis to monitor the status of inflows (including groundwater inflows to open pits), storage and consumption of final voids. The site water balance review is used to optimise water management performance and enables corrective actions to be implemented, if required. The results of the water balance reviews are reported in the Annual Review.

Groundwater monitoring on the mine site (including within/surrounding the final voids) will continue during the MOP/RMP term to confirm that rehabilitation areas are progressing appropriately towards free draining and non-polluting landforms and to determine whether further remediation work is necessary.

Erosion and Sediment Control Monitoring

All sediment dams are monitored on a minimum quarterly basis or following receipt of sufficient rain whereby such dams have the potential to spill. Maintenance activities are undertaken on sediment dams as required. Sediment dams are cleaned out when the storage volume is reduced by sediment deposition (i.e. when 30% of storage volume is lost to sediment build up) and inspected after major rainfall events. All overflows and controlled discharges from sediment dams are sampled and analysed.

Areas under rehabilitation are stabilised by structural controls such as bench drains and contour banks (as required), to break up effective slope length exposed to erosion.

All rehabilitation areas are assessed regularly via visual monitoring of soil erosion status and the effectiveness of erosion control methods (Section 8.1). The visual monitoring identifies any areas of active erosion occurring in the rehabilitation areas and remedial works are undertaken where required.

Fauna Monitoring

Fauna usage of the native woodland/forest rehabilitation areas will be documented over time. Fauna surveys will be conducted every three years to assess the success of the rehabilitation areas in providing habitat for a range of vertebrate fauna.

Spontaneous Combustion Monitoring

The SMC Spontaneous Combustion Management Procedure includes details of identifying signs of self-heating and the management measures to be used to treat, remove and remediate affected areas.

Spontaneous combustion monitoring would also continue during the SMC decommissioning phase and would be undertaken in relevant domains to identify materials with the potential to spontaneously combust. Following identification, SCPL will commission the removal of the material by suitably qualified personnel prior to further rehabilitation proceeding.

9 INTERVENTION AND ADAPTIVE MANAGEMENT

9.1 THREATS TO REHABILITATION

SCPL has successfully undertaken rehabilitation activities at the SMC since 1996 (Section 7.1) with the results of rehabilitation monitoring continuing to inform the effectiveness of rehabilitation methods and requirements for contingency measures.

The 2012 ERA (SP Solutions, 2012) and the 2020 Rehabilitation Risk Assessment (CKC, 2020) (Section 3.1) identified potential issues and risks associated with rehabilitation and mine closure at the SMC. These risks/threats to rehabilitation are outlined in the rehabilitation trigger, action, response plan in Table 12 (Section 9.2) along with actions that will be undertaken to mitigate these risks.

Emerging threats to rehabilitation success will be identified through the ongoing monitoring programs described in Section 8.

9.2 TRIGGER ACTION RESPONSE PLAN

A trigger, action, response plan (TARP) (Table 12) has been developed based on identified threats to rehabilitation at the SMC.

Table 12
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domains 1A/1B, 2A/2B, 3A/3B, 4A, 5B	Severe drought results in loss of vegetation and failure of rehabilitation area.	Rehabilitation monitoring indicates revegetation species failure as a result of drought conditions.	• Species selection consistent with species native to area that are drought-tolerant. • Monitoring of rehabilitation following any prolonged dry periods and watering and/or replanting of seeds as necessary.	• Successful implementation of action/response at the SMC.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
	Flooding results in loss of vegetation and failure of rehabilitation area.	Rehabilitation monitoring indicates significant erosion in rehabilitation area as a result of flooding and loss of revegetation.	• Design final landforms (e.g. slopes) and drainage structures to minimise impacts from heavy rainfall/flooding based on Site Water Balance and Site Flood Model. • Design review and verification process. • Survey control. • Monitoring of rehabilitation areas following any major rainfall event and re-stablisation of any landforms and/or replanting of seeds as necessary.	• WMP. • 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Successful implementation of action/response at the SMC.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
	Fire results in loss of vegetation and failure of rehabilitation area.	Occurrence of bushfire in rehabilitation area results in loss of revegetation.	• Species selection consistent with species native to area that are fire-tolerant. • Implementation of fire prevention measures in rehabilitation area and surrounds.	• Successful implementation of action/response at the SMC.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
	Exploration activities results in loss of vegetation and failure of rehabilitation area.	Rehabilitation monitoring indicates revegetation is damaged resulting in failure of rehabilitation area.	• Implement relevant impact avoidance measures in accordance with approval or Review of Environmental Factors (REF). • Monitoring of rehabilitation areas following exploration and replanting of seeds as necessary.	• Exploration activity approval or REF. • Successful implementation of action/response at the SMC.	Visual inspection of remediated area following exploration activities.	Reporting in Annual Review.

Table 12 (Continued)
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domains 1A, 2A, 3A and 4A	Erosion on steep slopes (e.g. outer batters of waste emplacements) due to overgrazing of pasture or damage from stock.	Rehabilitation monitoring indicates active erosion on outer batters.	• Exclude stock and remediate eroded area. • Rest remediated area from continuous grazing to improve long-term stability of the area.	• Greening Australia's (2014) Monitoring of Landscape Function and Vegetation Structure of Rehabilitation Areas at the SMC. • Successful implementation of action/response at the SMC.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
	Continuous grazing on areas revegetated with pasture results in low density, depth and cover of pasture grass, increasing erosion potential (particularly on steep batters of waste emplacement areas or other landforms).	Rehabilitation monitoring indicates active erosion and poor revegetation cover.	• Modify grazing regime to include rest periods.	• Greening Australia's (2014) Monitoring of Landscape Function and Vegetation Structure of Rehabilitation Areas at the SMC. • Successful implementation of action/response at the SMC.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
Domains 1B, 2B, 3B and 5B	Dense cover of exotic grasses (i.e. Kikuyu) in un-grazed woodland areas results in suppression of native grasses.	Rehabilitation monitoring indicates low species diversity and dominance of exotic grasses.	• Discontinue use of Kikuyu/remove from seed mix. • Increase number of native grass species in seed mix. • Re-seed relevant areas with native grass species (i.e. *Themeda australis*).	• Greening Australia's (2014) Monitoring of Landscape Function and Vegetation Structure of Rehabilitation Areas at the SMC.	Regular visual inspection of rehabilitation areas and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
Domains 1A/1B, 2A/2B, 3A/3B, 4A, 5B	Direct-seeding of Eucalypt species is an ineffective method to achieve long-term development of resilient Eucalypt trees.	Rehabilitation monitoring indicates poor/slow growth and development of Eucalypt trees.	• Revegetation methods to include both direct-seeding and planting of tubestock (particularly for Eucalypt tree species).	• Greening Australia's (2014) Monitoring of Landscape Function and Vegetation Structure of Rehabilitation Areas at the SMC.	Regular visual inspection of rehabilitation area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.

Table 12 (Continued)
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domains 1A/1B, 2A/2B, 3A/3B, 4A, 5B	Species diversity and/or density in rehabilitation areas does not correspond with reference site(s).	During ecosystem establishment and sustainability phase, monitoring indicates that species diversity and/or density in some areas does not correspond with reference site(s).	• Conduct additional plantings or further actions following planting such as application of fertiliser or watering of rehabilitation areas. • Obtain expert opinions if required.	• Greening Australia's (2014) Monitoring of Landscape Function and Vegetation Structure of Rehabilitation Areas at the SMC.	Regular visual inspection of rehabilitation area and ongoing rehabilitation monitoring using LFA methodology.	Reporting in Annual Review.
Domains 4A, 5B	Instability of rehabilitated CHPP reject disposal areas.	Geological drilling/testing indicates instability of rehabilitated profiled landform.	• Excavate CHPP rejects and dispose of in a pit void. • Replace with stable material (e.g. waste rock).	• ERA.	Visual inspections and geological drilling/testing.	Reporting in Annual Review.
Domains 4A/4B	Compromised CHPP reject material capping layer.	Rehabilitation monitoring results indicate potential failure of capping layer over CHPP reject material disposal areas within Western Co-Disposal Area or within waste emplacement PAF cell.	• Conduct investigation, in consultation with suitably qualified person, to determine scale of affected area and likelihood for affected rehabilitation area to rectify without intervention or requirement for excavation of area to replace capping layer. • If recommended by investigation, excavate affected area, replace capping layer as per design and rehabilitate as per Domain 4A/4B rehabilitation objectives.	• To ensure rehabilitation completion criteria are met.	Verification capping layer installed as designed. Rehabilitation monitoring.	Reporting in Annual Review
Domain 5B and 5D	Geotechnical issues relating to the Rehabilitation of the Roseville Pit Extension where excavating through CHPP reject material in the backfilled Roseville Pit.	Geological drilling/testing indicates instability of pit walls.	• Cut back pit wall to reduce wall angle and improve stability.	• ERA.	Visual inspections and geological drilling/testing.	Reporting in Annual Review.
Domain 5B	Insufficient material available to backfill Stratford Main Pit resulting in change to final landform to a water-filled final void.	SMC mine planning team identifies less than adequate (LTA) waste rock material available to achieve completely backfilled landform.	• Conduct operations in accordance with approved SMC Life of Mine Reject Disposal Plan and SMC Stratford Main Pit Rehabilitation Strategy. • Develop a detailed closure plan for the Stratford Main Pit which includes materials balance analysis. • Review potential approval pathways for modifying the Stratford Main Pit final landform and final land use. • Annual material balance.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Ongoing SMC mine planning meetings and continual review of SMC materials production balances and schedule.	Resources Regulator consultation

Table 12 (Continued)
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain 5B	Potential for offsite impacts from water discharge from final voids.	• Too great catchment area reporting to final void. • Inaccurate final void modelling • Inaccurate Final void assumptions • Climatic changes	• Conceptual final void design. Final voids modelled as groundwater sink with zero discharge (equilibrium below spill level) in EIS. • Site water balance and post-mining final void water balance. • Post-mining final landform drainage design review. • Flood model. • Site Groundwater model (including review of site groundwater model as part of mine closure planning program).	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Post-mine monitoring program including monitoring of final void water level.	Reporting in Annual Review.
Domains 1 to 4	Surface water run-off causes detrimental effects on aquatic ecology.	• LTA AMD management. • LTA design of water management structures. • LTA management or decommissioning of irrigation area run-off. • Seepage from waste emplacements into creeks. • Reduction in catchment run-off. • Runoff from rehabilitated areas. • Runoff from area of contaminated land.	• PAF model. • Development of PAF material handling and management procedure, and detailed PAF cell and capping designs prepared by suitably qualified person/s. • Geochemical assessment carried out as part of EIS. • Mine surveying and tracking of waste materials. • Water Management Plan including; site water balance, SWMP, Irrigation Management Plan. • On-going geochemical testing of waste materials. • Water management Infrastructure design, monitoring and reporting. • Mine plans, dig plans and dump plans include PAF controls. • Water quality monitoring and aquatic ecology monitoring. • Contaminated land assessment post-closure.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Operational SWMP monitoring program and post-mine monitoring program. Rehabilitation monitoring program.	Reporting in Annual Review.

Table 12 (Continued)
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domains 1 to 4	Unplanned release of mine water during rehabilitation/ operations.	• Current WMP water management practices on site are LTA for rehabilitation stage of operations. • LTA surface and ground water controls for rehabilitation stage of operations. • Uncontrolled spill from Mine Water Storage Dams. • Unexpected structural failure of dam, flood bunds. • Unplanned removal of water management infrastructure, e.g. minor levee or bund. • Failure to correctly identify where run-off from rehab areas could occur and where they could report to.	• SMC Water Management Plan procedures and monitoring. • Dedicated resources on site. • Current water infrastructure in place. • Site water balance. • Ground disturbance and clearing procedure. • Mine Planning procedures.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1).	Operational SWMP monitoring program and post-mine monitoring program.	Reporting in Annual Review.
Domains 1 to 4	Poor quality runoff from rehabilitated areas.	• Current water management practices on site are LTA for rehabilitation stage of operations. • LTA surface and ground water controls for rehabilitation stage of operations. • Vegetation not adequately established. • LTA landform and drainage structure design. • LTA erosion controls. • LTA PAF cell design/ capping.	• Established WMP trigger level criteria. • Dedicated resources on site. • Current water infrastructure in place. • Site water balance. • Existing MOP/RMP. • Landform, drainage and erosion control design by suitably competent person (including review of final landform drainage design as part of mine closure planning program). • Development of PAF material handling and management procedure, and detailed PAF cell and capping designs prepared by suitably qualified person/s. • Demonstrated rehab areas success. • Mine inspection program for sediment dams, drains, erosion controls etc.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	WMP monitoring program and post-mine monitoring program. Rehabilitation monitoring program.	Reporting in Annual Review.

Table 12 (Continued)
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
All	Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval.	• Failure to carry out rehabilitation in accordance with final land use. • LTA final landform design.	• MOP & RMP clearly identifies final land use goals, linked to DA consent requirements. • Yancoal Project Governance System. • Rehabilitation monitoring and reporting. • Mine closure planning team to manage and assess rehabilitation implementation.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Rehabilitation monitoring program and post-mine monitoring program.	Reporting in Annual Review.
All	Failure to achieve rehabilitation completion criteria causes delay to relinquishment.	• Reinstatement of flora and fauna habitat LTA. • LTA implementation of rehabilitation controls. • Rehabilitated landform doesn't sustain intended final land use. • Climatic conditions. • Fire damage.	• MOP performance and completion criteria. • MOP monitoring and reporting requirements. • Previous site rehabilitation and experience. • Biodiversity MP, including bushfire management controls. • MOP rehabilitation procedures are scientifically based. • Analogue monitoring sites established. • Selection of appropriate land uses for climatic conditions. • Mine closure planning team to manage and assess rehabilitation implementation. • Rehabilitation assessment during closure phase.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Rehabilitation monitoring program and post-mine monitoring program.	Reporting in Annual Review.
Domain 2C	Final landform water management infrastructure does not provide for long term stability.	• LTA design of water infrastructure. • LTA modelling of water infrastructure requirements. • LTA construction of water infrastructure requirements. • Changed climate conditions.	• Site flood model. • Site water balance. • Approved conceptual final landform design which incorporates water infrastructure. • Design approach to minimise drainage structures on rehabilitated slopes. • Review of final landform drainage design as part of mine closure planning program. • Design review and verification process. • Survey control.	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Rehabilitation and WMP monitoring programs and post-mine monitoring program.	Reporting in Annual Review.

Table 12 (Continued)
Rehabilitation Trigger Action Response Plan

Domain	Threat to Rehabilitation Success	Trigger	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domains 2A/2B and Domains 5B/5D	Geotechnical instability of rehabilitated waste emplacements and final void.	• Steepness of final highwalls, endwalls, batters and waste emplacements. • Undetermined water impacts on wall stability and submerged rehabilitated waste emplacements. • Uncontrolled erosion. • Do not have final landform design or void design. • Water displaced from void by failure.	• Operational geotechnical assessments. • Conceptual final landform design. • Post-mining water balance model and final void water balance model. • Complete detailed final landform design and final void design. • Carry out a geotechnical assessment of the final void design including water filled void at interim stages. • Final landform stability assessment (Section 10.2.1).	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Rehabilitation and WMP monitoring programs and post-mine monitoring program.	Reporting in Annual Review.
Domain 5D	Public safety risk of access to/ interaction with final voids.	• Uncontrolled access to final void. • LTA security measures, barriers and bunding. • Final pit wall angle unsafe.	• MOP includes provision and maintenance of perimeter fencing, signage and bunding. • Post-closure monitoring and maintenance (Section 10.13).	• 2020 rehabilitation and mine closure risk assessment (Section 3.1). • Mine closure planning program (Section 10).	Review of adequacy of final void perimeter fencing, signage and bunding.	Reporting in Annual Review.

10 MINE CLOSURE PLANNING PROGRAM

A Mine Closure Planning Program has been developed for the SMC which outlines the technical and environmental assessments and other works required to inform final rehabilitation planning and closure of the SMC. The technical assessments identified in the Mine Closure Planning Program include the risk mitigation measures and risk reduction strategies identified in the 2012 ERA and in the 2020 Rehabilitation and Mine Closure Risk Assessment (Section 3.1). The planning program is designed to inform the preparation of a detailed Mine Closure Plan, which will be prepared in future MOP/RMP terms prior to mine closure.

Many of the assessments/studies included in the Mine Closure Planning Program will commence during the MOP/RMP term (Table 13), and will continue to be developed in the next and subsequent MOP/RMP terms.

The Mine Closure Planning Program components and target schedule for each component is provided in Table 13. A more detailed description of the mine closure components is provided in the following sub-sections.

Table 13
Mine Closure Planning Program Components and Target Schedule

Aspect	Assessment/Study/Design Work Component	Target Completion Date	MOP/RMP Section
Mine Closure Planning	• Appoint a Mine Closure Planning Team to manage and implement the Mine Closure Planning Program.	Year 1 of this MOP/RMP term	Section 10.1
Approval relinquishment	• Mine Closure Planning Team to review timing and process of relinquishing approvals following mine closure (e.g. EPL, Development Consent and MLs).	Commence during this MOP/RMP term	Section 10.6
Final Landform (and Final Void) Design	• Prepare detailed design of the SMC final landform including detailed designs for the SMC final voids and detailed drainage design.	30 June 2022	Sections 10.2 and 10.3
Water Management	• Review the final landform drainage design to ensure comparable drainage density to local natural landforms.	30 June 2022	Section 10.2
	• Prepare a strategy for decommissioning of dams not required in final landform and strategy for retained dams, including an assessment of the dam catchments and harvestable rights and dam approval requirements.	Commence during this MOP/RMP term, and complete by end 2024	Section 10.4
Final void water balance and water quality	• Review/update the SMC final void water balances to reflect the detailed final void designs; to verify predicted final void inflows and outflows; and to verify predicted water level equilibriums and water qualities for each void. • Review/update the site groundwater model to ensure the model is consistent with the final landform design and to verify predicted groundwater inflows to final voids. • Review the medium to long term water quality predictions of the final voids against available monitoring data to determine the need for additional/alternate management.	Commence during this MOP/RMP term, and complete by end 2024	Section 10.3
Refinement of Rehabilitation Performance Indicators and Completion Criteria	• Develop a refined Rehabilitation Performance Indicators and Completion Criteria set that reflects the detailed design for the SMC final landform and detailed Asset Register (relevant to the infrastructure to be retained in the final landform [Section 10.8]).	31 December 2022	10.5

Table 13 (Continued)
Mine Closure Planning Program Components and Target Schedule

Aspect	Assessment/Study/Design Work Component	Target Completion Date	MOP/RMP Section
Final Landform Design Verification	• Following completion of final landform rehabilitation works, undertake a Stability Assessment of all drainage features, water management areas and rehabilitated waste emplacements to identify any works required to ensure long-term stability of the final landform. • Following completion of final void rehabilitation works, undertake a Geotechnical Assessment of the final voids to ensure the final voids are safe, stable & non-polluting.	Pre-closure (Outside this MOP/RMP term)	Section 10.2.1
Rehabilitation Resources	• Undertake an annual material balance for required rehabilitation materials (e.g. growth media, inert capping materials, and suitable rock for water management structures).	Annually/ ongoing	Section 10.7
Infrastructure	• Identify all non-active infrastructure which is not required for the remainder of processing activities. • Undertake infrastructure decommissioning/demolition assessment including consultation to confirm any alternative use for retained infrastructure (i.e. rail loop, haul roads, access tracks and dams) post-mining. • Complete detailed Asset Register and a targeted Rehabilitation Objectives, Performance Indicator and Completion Criteria set for all infrastructure to be retained in the final landform.	30 June 2022	Section 10.8
Contaminated land	• Undertake a contaminated lands assessment focusing on infrastructure areas to identify any remediation.	Pre-closure (Outside this MOP/RMP term)	Section 10.9
Biodiversity Offset Integration	• Undertake an assessment of the SMC Biodiversity Offset Areas and Biodiversity Enhancement Areas to confirm completion of the Biodiversity Offset Strategy completion criteria and integration with the SMC rehabilitation.	Pre-closure (Outside this MOP/RMP term)	Section 10.10
Rehabilitation Assessment – Native Ecosystems	• Undertake an assessment of achievement of the SMC rehabilitation completion criteria detailed in Section 6 of this MOP/RMP, including an ecological assessment of SMC native woodland/forest rehabilitation areas.	Progressive and Pre-closure (Outside this MOP/RMP term)	Section 10.11
Agricultural Land – Suitability Assessment	• Following completion of final landform rehabilitation works, undertake an agricultural land suitability assessment of the rehabilitated agricultural lands.	Pre-closure (Outside this MOP/RMP term)	Section 10.12
Post-closure Monitoring and Maintenance	• Identify post-closure environmental monitoring requirements. • Identify post-closure maintenance requirements such as priority weed & feral animal control, exclusion or control of grazing animals, control of public access, fire management and maintenance of safety signage/fencing.	During this MOP/RMP term	Section 10.13
Environmental Management Plans Revision	• Following cessation of mining operations, review and update as required, existing environmental management plans (including monitoring programs) for the rehabilitation and post-closure phase.	After cessation of mining operations (Outside this MOP/RMP term)	Section 10.14

Table 13 (Continued)
Mine Closure Planning Program Components and Target Schedule

Aspect	Assessment/Study/Design Work Component	Target Completion Date	MOP/RMP Section
Human Resources Strategy	• Commence preparation of a human resources strategy to identify opportunities to stage the release of employees and to support redeployment where appropriate.	End of this MOP/RMP term	Section 10.15
Community Engagement Strategy	• Commence preparation of a community management strategy to minimise any adverse socio-economic effects of mine closure.	End of this MOP/RMP term	Section 10.16
Stakeholder Engagement	• Identify relevant stakeholders for engagement/consultation during the mine closure planning process. • Communicate with the SMC CCC regarding the process for stakeholder engagement during mine closure.	Next MOP/RMP term	Section 10.17

10.1 MINE CLOSURE PLANNING TEAM

In accordance with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), a Mine Closure Planning Team for the SMC will be appointed during Year 1 of this MOP/RMP term that includes suitably qualified and experienced personnel to implement the Mine Closure Planning Program and guide and manage the mine closure process.

10.2 FINAL LANDFORM DESIGN

The rehabilitation objectives for the SMC final landform requires the final landform designs to be safe, stable and non-polluting; drain to the natural environment; and to be sympathetic to the original Gloucester valley landform (Section 4.3). Additionally, the final landform designs are required to sustain the intended post-mining land use for the SMC final landform. The conceptual final landform design for the SMC was developed as part of the approved SEP and is shown on Plan 4.

In accordance with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), a refined/detailed final landform design will be developed for the SMC, and will include detailed designs for each of the SMC final voids (i.e. the Roseville West, Avon North and Stratford East final voids) (Section 10.3), and a detailed drainage design for the final landform which includes drainage density comparable to local natural landforms. The detailed design will consider long-term settlement, stability (Section 10.2.1), water balance modelling (Sections 10.3.2 and 10.4.1) and surface water erosion issues (Sections 10.2.1 and 10.4.3).

The final landform designs prepared by 30 June 2022 will also include PAF cell and Western Co-Disposal Area capping system design information. As described in Section 5.2.5, approximately 1.3 Mt of CHPP reject material is proposed to be reclaimed to recover thermal coal products from the Western Co-Disposal Area. For the areas of the Western Co-Disposal Area where CHPP reject material has not been recovered, a capping layer will be placed over the reject material (refer Section 5.2.5).

10.2.1 Final Landform Design Verification

In accordance with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), following the completion of final landform rehabilitation works (during the post-closure phase), a Stability Assessment will be undertaken of all drainage features, water management areas and rehabilitated waste emplacements to verify the long-term stability of the final landform, and a Geotechnical Assessment of the final voids will be undertaken to verify the long-term stability of final void walls.

10.3 FINAL VOIDS

10.3.1 Detailed Final Void Designs

As part of the refinement of final landform design, and in accordance with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), refined/detailed designs for each SMC final void will be prepared. Consistent with the rehabilitation objectives for the final voids (Section 4.3), the final voids will be designed to:

- minimise the size and depth of the final voids as far as is reasonable and feasible;
- function as groundwater sinks;
- include constructed diversion bunds/drains around the void perimeter to divert surface water runoff away from the voids in order to minimise the drainage catchment for each void;
- minimise highwall instability as far as is reasonable and feasible;
- maintain adequate freeboard so that the voids do not spill under any simulated conditions;
- minimise the risk of flood interaction for all flood events up to and including the Probable Maximum Flood; and
- include bunding, fencing and/or signage around perimeter of final voids for public safety.

As described in Section 10.2.1 above, a Geotechnical Assessment of the final voids will be undertaken to verify the long-term stability of final void walls.

10.3.2 Final Void Water Balance

A final void water balance was prepared for each void for the SEP EIS (Gilbert & Associates, 2012).

Once the detailed final void designs have been completed, a review or if necessary a re-calibration, of the final void water balances will be undertaken to verify the predicted long-term final void equilibrium water levels and water quality as presented in the SEP EIS, consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A).

The final void water balance review/re-calibration would:

- be informed by the site groundwater model which reflects the detailed final landform (and final void) designs to verify the predicted groundwater inflows to the final voids;
- review of the drainage catchments to each final void based on the detailed final landform design to verify the predicted surface water inflows to the final voids;
- consider contemporary operational monitoring data (including open cut pit/void inflow rates and water quality data); and

- consider contemporary climate data, including contemporary rainfall runoff and evapotranspiration estimates.

10.3.3 Final Void Water Quality

As part of the final void water balances, and consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), a review of the medium to long term water quality predictions for the final voids would be undertaken and would consider contemporary operational monitoring data (and void inflow data collected following the cessation of mining) to verify that the predictions from the SEP EIS remain valid.

10.4 WATER MANAGEMENT

10.4.1 Site Water Balance

A site water balance has been prepared for the SEP EIS by a suitably qualified and experienced person (Gilbert & Associates, 2012). A revised post-mining site water balance will be undertaken to reflect the refined final landform and final void designs, including all surface water inflows and outflows, consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A).

10.4.2 Water Infrastructure Decommissioning Strategy

All water management infrastructure including sediment dams, Disturbed Area Dams (including the Return Water Dam) and temporary diversion drains not required in the final landform will be decommissioned and rehabilitated in accordance with the rehabilitation objectives for the Water Management domain and Infrastructure Area domain. Consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), a strategy will be developed to guide the decommissioning of the relevant dams and is anticipated to include:

- a register/list of the dams to be decommissioned and removed;
- proposed staging or scheduling for decommissioning;
- procedures for decommissioning, including details of where the dam water will be transferred to, where sediments will be disposed of (i.e. within a final void, or at a licensed off-site facility) and embankment re-profiling requirements; and
- rehabilitation requirements (including revegetation species).

10.4.3 Retained Water Infrastructure

The Stratford East Dam will be retained in the final landform. A review will be undertaken, by a suitably qualified and experienced person, of the future approval requirements for the Stratford East Dam which would include an assessment of the dam's catchment and harvestable rights, and potential future uses for either agriculture, use by a public authority or environmental benefit.

Sediment dams will only remain pending long-term acceptable water quality and may be kept for stock water if suitable.

Irrigation infrastructure owned by SCPL will be retained following an assessment to identify whether beneficial to support the agricultural production land use activities associated with the rehabilitated agricultural lands.

Other retained water infrastructure would include the permanent up-catchment diversion structures surrounding the SMC final landforms and final voids required to direct up-catchment runoff to surrounding receiving creeks and tributaries, and final landform drainage structures (e.g. drop structures) required to facilitate drainage to the natural environment.

All retained water infrastructure will ultimately be determined in consultation with the regulatory authorities and the community, and will consider future local and regional water infrastructure needs.

Retained infrastructure will be inspected by a suitably qualified person and a verification assessment undertaken to confirm that the infrastructure is safe and stable.

10.5 REFINEMENT OF REHABILITATION PERFORMANCE INDICATORS AND COMPLETION CRITERIA

By 31 December 2022, SCPL will refine the rehabilitation objectives, performance indicators and completion criteria, in Table 9 in Section 6, of this MOP/RMP, to reflect the detailed final landform designs (Sections 10.2, 10.3 and 10.4) and to reflect the detailed Asset Register for Retained Infrastructure (Section 10.8). The refined rehabilitation objectives, performance indicators and completion criteria set will also include completion criteria for Secondary Domain A areas that are rehabilitated to pasture/scattered trees and are proposed for Class 4 agricultural suitability lands.

10.6 APPROVALS AND MINING LEASE RELINQUISHMENT REVIEW

During the MOP/RMP term the Mine Closure Planning Team would commence a review of the timing and process for relinquishing/surrendering SMC approvals following mine closure (e.g. EPL, Development Consent and MLs), consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A). The timing for relinquishment/surrendering each approval instrument will be informed by the conditions or requirements associated with each instrument, and the likely consultation requirements involved.

10.7 REHABILITATION RESOURCES

As described in Section 3.3.4, a site topsoil balance is maintained at the SMC which is updated annually to ensure adequate resources are available for rehabilitation of disturbed areas. As at December 2019, an estimated 360,079 cubic metres of topsoil was held in various stockpiles at the SMC. This would provide for rehabilitation of approximately 360 hectares to the nominal topsoil depth of 100 mm. The current area of disturbance which will require topsoil (i.e. not including final void areas or permanent water bodies) is approximately 363 hectares. Existing topsoil resources combined with the topsoil resources to be stripped during the MOP/RMP term would provide sufficient topsoil resources to rehabilitate SMC disturbed areas.

Topsoil stripping will be conducted during the MOP/RMP term associated with development of the Stratford East Open Cut. Soil resources will either be directly placed on available rehabilitation areas or placed within dedicated soil stockpiles. The site topsoil balance will be updated once soil stripping and placement activities are complete.

During the MOP/RMP term, and consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), the SMC's topsoil balance will be augmented to incorporate estimates of other materials required to complete rehabilitation of the SMC. The rehabilitation materials balance will include:

- balances of available topsoil and subsoil resources, inert capping material (i.e. NAF material) resources for the relevant areas of the Western Co-Disposal Area and any PAF cells, and suitable waste rock for construction of long-term water management structures;
- details of volumes of these materials required for rehabilitation of the SMC final landform; and
- details of the sources of these materials.

Characterisation (i.e. geochemical and soil testwork) will be undertaken to confirm that the capping materials are NAF and are suitable for use.

10.8 INFRASTRUCTURE DECOMMISSIONING AND DEMOLITION SCHEDULING

Detailed Asset Register of Retained Infrastructure

Section 7.2.1 of this MOP/RMP provides an overview of the infrastructure anticipated to be removed from the SMC and proposed rehabilitation objectives for the former infrastructure areas. The removal of infrastructure is not planned during this MOP/RMP term.

To inform the infrastructure to be retained in the final landform and the infrastructure required to be decommissioned, by 30 June 2022, a detailed Asset Register will be prepared which will include:

- details of the infrastructure to be retained or decommissioned;
- the purpose/justification for retained infrastructure;
- a description of the preliminary scope for the regulatory processes required for retention;
- details of the final land use for the infrastructure to be retained;
- details of the documentation that will validate the final condition/land use of the retained infrastructure (e.g. report completed by a suitably qualified person that validates that the infrastructure is safe, stable and non-polluting); and
- details of how SCPL has reduced the SMC disturbance footprint (e.g. road widths reduced).

As part of preparation of the detailed Asset Register, consultation with relevant regulatory authorities and key stakeholders will be undertaken to obtain in-principle support for the infrastructure proposed to be retained. However, ultimately, SCPL will require agreement from the ultimate landholder and the determining authority regarding the infrastructure to be retained in the final landform. It is anticipated that this process will be ongoing throughout the post-closure phase.

Infrastructure that may be retained to support the post-mining uses, subject to outcomes of consultation with the determining authority and relevant stakeholders (Section 7.2.1), includes:

- Some concrete hardstands, administration and ablution buildings, site access roads, sheds, buildings and sediment dams.
- Electricity transmission infrastructure, which may be retained for future use by the relevant electricity services provider, unless during consultation it is determined it is no longer required, in which case it will be decommissioned and removed from site.
- The rail loop, which may also be retained for future use if agreed with relevant regulatory authorities and if appropriate approvals are obtained. Alternately, if the determining authority requires decommissioning of the rail loop, it will be decommissioned.

An inspection of the infrastructure retained in the final landform will be undertaken by a suitably qualified person and a verification assessment completed to confirm that the infrastructure is safe, stable and non-polluting.

As described in Section 10.5, a detailed Rehabilitation Objectives, Performance Indicator and Completion Criteria set for the retained infrastructure will be prepared by 31 December 2022.

Anticipated Infrastructure Removal Strategy and Timing

Once mining operations have ceased, infrastructure and equipment not required to support final rehabilitation activities (i.e. landform bulk shaping and soil placement) and ongoing monitoring and maintenance works, will be progressively decommissioned and removed from site. If at this stage, agreement has been obtained from the determining authority for the retention of some infrastructure, this infrastructure would also be decommissioned and removed.

Scheduling of infrastructure removal will be undertaken on a campaign basis to minimise disruptions to road networks. Oversize heavy vehicle transport of infrastructure/equipment will be undertaken in accordance with relevant permits and load declarations obtained in accordance with *Additional Access Conditions – Oversize and overmass heavy vehicles and loads* (Roads and Maritime Services, 2017) (or its current equivalent at the time of the event) and any other licences and escorts as required by regulatory authorities. Any relevant permits and transport requirements will be obtained in consultation with the RMS and relevant local councils at the time.

Heavy vehicle scheduling will, where possible, consider and occur outside of peak periods associated with general movement of vehicles (e.g. morning and afternoon peak traffic times) to minimise disruptions to the road networks along the transport route.

10.9 CONTAMINATED LAND ASSESSMENT

A contaminated land assessment will be undertaken once mining operations have ceased and key infrastructure removed, during the mine closure or post-closure phase. The assessment will focus on the decontamination of areas impacted by carbonaceous material (e.g. coal spillage, coal storage) (including the rail lop area), hydrocarbon spillage (e.g. workshops, fuel storage areas) or sedimentation (e.g. dams which have directly received pit water).

The contaminated land assessment will be undertaken in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997* and in consideration of relevant guidelines, including the *Managing Land Contamination Planning Guidelines SEPP 55–Remediation of Land* (Department of Urban Affairs and Planning and EPA, 1998), *Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011) and the *National Environment Protection (Assessment of Site Contamination) Measure* (National Environment Protection Council, 2013).

Any potential contamination areas will be remediated as recommended in the assessment report, which is expected to involve excavation of the contaminated materials and disposal at an off-site licensed facility or on-site subject to relevant approvals being obtained. Rehabilitation will not be undertaken until the area is assessed as free of contamination. Rehabilitation of the area would be undertaken in accordance with the rehabilitation objectives for the Infrastructure Area Domain (i.e. revegetated to woodland/open forest or pasture/scattered trees), or domain applicable to the area.

10.10 BIODIVERSITY OFFSET INTEGRATION

Condition 33, Schedule 3 of the Development Consent SSD-4966 requires a portion of the mine rehabilitation (350 ha of native vegetation) to form part of the Biodiversity Offset Strategy. Additionally and as described in the SMC's BMP, Biodiversity Enhancement Areas (Plan 4) have been established through the SMC to provide a linkage of natural habitat (wildlife corridors) with the native woodland/forest rehabilitation areas.

Completion criteria have been developed for the SMC's Biodiversity Offset Strategy and are detailed in the SMC's BMP. During the pre-closure phase, an assessment will be undertaken to confirm that the Biodiversity Offset Strategy completion criteria have been met.

An Annual Biodiversity Report reviews the effectiveness of measures in the BMP and tracks progress of the Offset Areas against the performance indicators and completion criteria. The Annual Biodiversity Report is incorporated within the SMC Annual Review and is made available on SMC's website. The Biodiversity Report will continue to be prepared annually, or at an alternate frequency as agreed with the DPIE, until the assessment outlined above confirms the Biodiversity Offset Strategy completion criteria have been met.

10.11 REHABILITATION ASSESSMENT – NATIVE ECOSYSTEMS

Following the completion of rehabilitation activities and during the pre-closure phase, a rehabilitation assessment will be undertaken to confirm that the rehabilitation completion criteria detailed in Section 6 of this MOP/RMP have been met. The assessment would include an ecological assessment of the revegetation areas (including the woodland/forest areas and the pasture/scattered tree areas) and would be conducted by a suitably qualified ecologist.

An Annual Rehabilitation Report is prepared by SCPL and tracks progress of the SMC rehabilitation areas against the rehabilitation performance indicators and completion criteria (Section 6). The Annual Rehabilitation Report is incorporated within the SMC Annual Review and is made available on SMC's website. The Rehabilitation Report will continue to be prepared annually, or at an alternate frequency as agreed with the DPIE, until the rehabilitation assessment outlined above confirms that the rehabilitation completion criteria have been met.

10.12 AGRICULTURAL SUITABILITY ASSESSMENT

Following the completion of rehabilitation activities during the mine closure phase, an assessment of the rehabilitated agricultural areas will be undertaken to confirm the areas comprise Class 4 agricultural suitability land and are suitable for grazing use. The Agricultural Suitability Assessment would be conducted by a suitably qualified agronomist.

10.13 POST-CLOSURE MONITORING AND MAINTENANCE PROGRAM

The mine closure phase will commence once all mining activities at the SMC have ceased, all relevant infrastructure required to be removed has been decommissioned and removed and once all final landform rehabilitation works (e.g. bulk shaping, soil placement and revegetation activities) have been completed. The post-closure monitoring and maintenance phase is relevant to the period after the completion of all works needed to implement closure of the SMC, as described above, up until relinquishment of the SMC.

Post-Closure Monitoring

SCPL currently conducts numerous environmental monitoring programs at the SMC in accordance with the SMC's Development Consent, EPL and environmental management plan requirements, including air quality, noise, blasting, surface water, groundwater, rehabilitation and offset area monitoring programs.

Some of these monitoring programs will continue during the post-closure phase (e.g. surface water and groundwater monitoring, rehabilitation monitoring), however, some programs will become redundant and will cease (e.g. blast monitoring) or will be gradually refined once coal extraction and landform bulk shaping and soil placement rehabilitation works have ceased (e.g. noise and air quality monitoring).

Consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A), a Post-closure Monitoring and Maintenance Requirements Strategy will be developed and will inform the revisions required to the SMC environmental management plans and monitoring programs for the post-closure phase (Section 10.13). SCPL will refine its environmental management plans and monitoring programs in consultation with the relevant government agencies during the mine closure phase (Section 10.14).

It is anticipated that the surface water and groundwater monitoring program will be progressively refined during the post-closure period to focus on runoff areas from the major mine landforms and groundwater aquifers potentially impacted by the SMC.

Rehabilitation performance monitoring will continue throughout the post-closure phase and results from the rehabilitation monitoring program will be used to confirm that the rehabilitation completion criteria have been met (Sections 10.11 and 10.12).

Similarly, monitoring of regeneration and revegetation performance in the Biodiversity Offset Areas will continue during the post-closure phase and results from the offset monitoring program will be used to confirm that the offset area completion criteria have been met (Section 10.10).

Amendments to the monitoring programs during the post- closure phase will be reflected in the relevant environmental management plan revisions (Section 10.14). It is expected that the residual monitoring programs will be undertaken for approximately ten years following mine closure.

Post-Closure Maintenance

Results from the post-closure monitoring programs will be used to inform the post-closure maintenance requirements (e.g. the requirement for erosion control, supplementary rehabilitation plantings or offset area revegetation plantings, additional weed and pest control activities). It is expected that any maintenance requirements will be undertaken on a campaign / as required basis.

Post-closure maintenance activities will continue until the SMC's statutory rehabilitation objectives (Section 4.3) and rehabilitation completion criteria (Section 6) have been met and confirmation has been received from the relevant authority.

10.14 ENVIRONMENTAL MANAGEMENT PLANS

As described in Section 3.2, SCPL implements a number of environmental management plans and strategies in accordance with the Development Consent conditions to guide environmental management on-site:

- EMS;
- NMP;
- BLMP;
- AQMP;
- WMP (including SWB, SWMP and GWMP);
- Squirrel Glider Management Plan;
- BMP;
- HMP; and
- this MOP/RMP.

Similar to the post-closure monitoring programs during the mine closure and post-closure phases, it is expected that a number of these management plans will become redundant to reflect the cessation of coal extraction and associated earthworks such as waste emplacement construction (e.g. the BLMP, NMP, HMP) or require revisions to reflect the refined scope of the monitoring programs (e.g. WMP).

Revision and removal of these plans will be undertaken in consultation with the relevant regulatory agencies required under Development Consent SSD-4966.

10.15 HUMAN RESOURCES STRATEGY

It is anticipated that the SMC workforce would be progressively refined/contracted commensurate with the change in scale of activities at the SMC, i.e. after the cessation of coal extraction, after the cessation of processing, and after the completion of site decommissioning works and landform bulk shaping and rehabilitation activities.

Preparation of a human resources strategy will commence during the MOP/RMP term which will identify opportunities to stage the release of employees and to support redeployment where appropriate, consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A).

10.16 COMMUNITY MANAGEMENT STRATEGY

Cessation of mining operations at the SMC is expected to result in a contraction in regional economic activity. However, the magnitude of regional economic impacts at the end of the SMC life depends on a number of interrelated factors, including the proposed movements of workers and their families, alternative development and employment opportunities and the economic structure and trends in the regional economy at the time.

By the end of this MOP/RMP term, a community management strategy will be developed which will include measures to minimise adverse socio-economic effects associated with closure of the SMC consistent with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment (Section 3.1 and Appendix A).

Upon the completion of mining operations at the SMC, the contributions to the GSC and GLC (now the Mid-Coast Council) required under Schedule 2, Condition 17 of Development Consent SSD_4966 will cease. The annual contributions to the Mid-Coast Council for road maintenance of The Bucketts Way and Wenham Cox Road, required under Schedule 3, Conditions 46 and 47 of Development Consent SSD_4966, will also cease. Ongoing consultation will be undertaken with the Mid-Coast Council prior to during the SMC mine closure phase.

10.17 STAKEHOLDER ENGAGEMENT/CONSULTATION – MINE CLOSURE

Proposed rehabilitation and post-mining land use concepts have been continuously developed throughout the SMC approval process, in consultation with relevant government agencies and key stakeholders, including the SMC's CCC.

This MOP/RMP details the final rehabilitation and post-mining land use goals for the SMC and will be provided to the following government agencies and key stakeholders for comment, and will be subject to approval by the Resources Regulator, as required by Condition 55, Schedule 3, of Development Consent SSD_4966:

- DPIE (Planning and Assessment Division);
- DPIE BCD;
- DPIE-Water; and
- Mid-Coast Council (formerly the GSC).

Results of consultation undertaken with the abovementioned stakeholders will be incorporated into this MOP/RMP where relevant.

SCPL will continue to consult with relevant government agencies and the community throughout the mine life and during mine closure.

Community Consultative Committee

The SMC's CCC was established in 2003 in accordance with Schedule 5, Condition 5 of Development Consent SSD_4966 and operates under the guidance of the DPIE. Meetings are held quarterly and provide a forum for open discussion between the community, SCPL, the Mid-Coast Council, and other stakeholders on issues relating to the mine's operations, environmental performance and community engagement.

The CCC for the SMC is currently comprised of:

- an independent Chairperson;
- five local community representatives;
- two local government representatives (Mid-Coast Council); and
- two SCPL representatives.

The CCC conducts meetings either on-site or at a location in the local community. The CCC undertakes regular inspections, reviews environmental and audit reports and discusses any concerns, incidents or complaints that may have been registered. The CCC members are an active conduit between local communities and the SMC. Minutes are taken from each meeting and published on the SMC's website.

Items of discussion at these meetings include (but are not limited to) mine progress, rehabilitation activities, environmental monitoring reporting, complaints and any environmental assessments undertaken. Outcomes from CCC meetings and community liaison activities are documented annually in the Annual Review.

The CCC will continue to be consulted regarding mine closure process, objectives and concepts.

Aboriginal Groups

Consultation with Aboriginal groups about the SMC has been extensive and involved various methods including advertisements, meetings, correspondence and archaeological survey attendance prior to the commencement of, and during, the operation of the SMC.

Numerous groups have been consulted about the SMC to date, including:

- Forster Local Aboriginal Land Council;
- Gloucester Worimi First People;
- Karuah Local Aboriginal Land Council;
- Maaiangal Group, Worimi Nation;
- Mookibakh Traditional Owners Inc.; and
- Doo-wa-kee Cultural & Heritage Surveys.

These groups will continue to be consulted during the mine closure phase.

11 REPORTING

Annual Review

In accordance with Condition 4, Schedule 5 of Development Consent SSD-4966, SCPL will prepare an Annual Review prior to the end of March each year (or other timing as may be agreed with the Secretary of the DPIE) to review the environmental performance of the SMC. The Annual Review will report on SCPL's compliance with all conditions of Development Consent SSD-4966, SMC's MLs and other relevant environmental approvals and licences.

In addition to addressing the requirements of Condition 4, Schedule 5 of Development Consent SSD-4966, the Annual Review will include:

- a description of rehabilitation activities undertaken during the reporting period and the forecasted rehabilitation activities proposed for the next reporting period;
- a summary of rehabilitation monitoring results and any observations of the effectiveness of the rehabilitation practices and measures;
- a review of the rehabilitation monitoring results against the rehabilitation performance indicators and completion criteria; and
- an update on the mine closure planning process.

In accordance with Condition 11, Schedule 5 of Development Consent SSD-4966, the Annual Review will be made publicly available on the Stratford Coal website (www.stratfordcoal.com.au).

Independent Environmental Audit

In accordance with Condition 9, Schedule 5 of Development Consent SSD-4966, an Independent Environmental Audit of the SMC will be conducted by a suitably qualified, experienced and independent team of experts (including experts in noise, blasting, air quality, ecology, and any other fields specified by the Secretary) whose appointment has been endorsed by the Secretary.

As required by Condition 9, Schedule 5 of Development Consent SSD-4966, the Independent Environmental Audit will:

- assess the environmental performance of the SMC and whether SCPL is complying with the requirements of Development Consent SSD-4966, and any other relevant environmental approvals;
- review the adequacy of any approved strategy, plan or program required by the SMC environmental approvals; and
- if necessary, recommend measures or actions to improve the environmental performance of the SMC.

A copy of the Independent Environmental Audit, and SCPL's response to the recommendations in the audit, will be submitted to the Secretary of the DPIE in accordance with Condition 10, Schedule 5 of Development Consent SSD-4966, and be made publicly available on the Stratford Coal website, in accordance with Condition 11, Schedule 5 of Development Consent SSD-4966.

Details of the SMC's reporting requirements and audit processes are provided in the SMC's Environmental Management Strategy, which is also provided on SMC's website.

Website and Community Hotline

SCPL's website provides updates on assessments and approvals relevant to the SMC and provides access to relevant environment and community information.

SCPL has established a dedicated community hotline (via phone 1300 658 239) that is available 24 hours, seven days a week for community members who have enquiries or who wish to lodge complaints in relation to SCPL's activities at the SMC.

A summary of complaints is documented in the Annual Review and available on the SCPL website.

Non-Compliances with Statutory Requirements

Compliance with all approvals, plans and procedures will be the responsibility of all personnel (staff and contractors) employed on or in association with the SMC.

The Environmental & Community Superintendent will have oversight of inspections, internal audits and initiate directions identifying any remediation/rectification work required, and areas of actual or potential non-compliance.

The Annual Review will include any reported non-compliances with SMC's statutory requirements set within the approvals, lease, licences and plans.

Incidents

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment, and/or breaches or exceeds the limits or performance measures/criteria in the Development Consent SSD-4966 or EPL.

The reporting of incidents will be conducted in accordance with Condition 7 of Schedule 5 of Development Consent SSD-4966 and in accordance with the EPL. SCPL will notify the DPIE and EPA at the earliest opportunity, and any other relevant agencies of any incident at the SMC that has caused, or threatens to cause, material harm to the environment. Within 7 days of the date of the incident, SCPL will provide the DPIE and any relevant agencies with a detailed report on the incident (as requested), and such further reports as may be requested.

12 PLANS

The following plans relevant to this MOP/RMP have been prepared in consideration of the Plan requirements in the MOP Guidelines:

- Plan 1A – Regional Location;
- Plan 1B – Pre-MOP Environment – Natural Environment;
- Plan 1C – Pre-MOP Environment – Built Environment;
- Plan 2 – Rehabilitation Domains at Commencement of MOP/RMP Term;
- Plan 3A – Mining and Rehabilitation – Indicative General Arrangement Year 1 (1 January 2021 – 31 December 2021);
- Plan 3B – Mining and Rehabilitation – Indicative General Arrangement Year 2 (1 January 2022 – 31 December 2022);
- Plan 3C – Mining and Rehabilitation – Indicative General Arrangement Year 3 (1 January 2023 – 31 December 2023);
- Plan 4 – Conceptual Final Landform and Rehabilitation Domains;
- Plan 5A – Cross Section Location;
- Plan 5B – Conceptual Cross Section of the Rehabilitated Project Mine Landform;
- Plan 5C – Roseville West Pit Cross Sections;
- Plan 5D – Bowens Road North Open Cut Cross Sections;
- Plan 5E – Avon North Open Cut Cross Sections; and
- Plan 5F – Stratford East Open Cut Cross Sections.

These plans are attached to this MOP/RMP.

13 REVIEW AND IMPLEMENTATION OF THE MOP/RMP

13.1 REVIEW OF THE MOP/RMP

In accordance with Condition 5, Schedule 5 of Development Consent SSD-4966, this MOP/RMP will be reviewed (to the satisfaction of the Secretary) within three months of the submission of:

- an Annual Review (Condition 4, Schedule 5 of Development Consent SSD-4966);
- an incident report (Condition 7, Schedule 5 of Development Consent SSD-4966);
- an Independent Environmental Audit (Condition 9, Schedule 5 of Development Consent SSD-4966); or
- any modification to the conditions of Development Consent SSD-4966 (unless the conditions require otherwise).

The reviews will be undertaken to ensure the MOP/RMP is updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of SMC.

Where a review leads to revisions in the MOP/RMP then, within 4 weeks of the review, the revised MOP/RMP will be submitted for the approval of the Resources Regulator.

The revision status of this MOP/RMP is indicated on the title page of each copy.

The rehabilitation principles and targets described in this MOP/RMP will continue to be tracked via SCPL's internal review and tracking systems and the reporting and auditing mechanisms described in Section 11. Any proposed changes to the MOP/RMP that would potentially require an amendment to this MOP/RMP would be discussed with the Resources Regulator in accordance with the MOP Guidelines.

The results of environmental performance monitoring undertaken during the MOP/RMP term will contribute to refining future MOPs/RMPs.

13.2 IMPLEMENTATION

A general overview of the responsibility of SCPL personnel in regard to the monitoring, review and implementation of this MOP/RMP is provided in Table 14 below.

Table 14
Site Environmental and Mining Management Relevant to Implementation of this MOP/RMP

Environmental Management Team Member(s)	Role and Responsibility
Operations Manager	• Provide adequate resourcing to support site environmental management. • Provide strategic direction. • Overall site management responsibility. • Responsible for management of mining contractors and SCPL staff.
Superintendent – Mine Planning	• Responsible for, review and implementation of planning and engineering aspects of MOP/RMP. • Annual internal auditing and reporting (Annual Review). • Responsible for the performance of activities undertaken within the mining area.

Table 14 (continued)
Site Environmental and Mining Management Relevant to Implementation of this MOP/RMP

Environmental Management Team Member(s)	Role and Responsibility
Superintendent – Environment and Community	• Responsible for monitoring, review and implementation of environmental aspects of MOP/RMP. • Environmental related approvals and planning. • Management of the implementation and compliance with Environmental Management Plan, approvals, licensing and permits. • Responsible for site environmental monitoring. • Annual internal auditing and reporting (Annual Review). • Progressive rehabilitation planning, development and reporting. • External government and stakeholder consultation. • Responsible for community enquiry and initiatives management.
General Staff and Contractors	• All general staff members trained in environmental procedures and protocols as part of the induction process and regular site meetings. • All general staff members responsible for immediately reporting environmental incidents. • All general staff members responsible for undertaking works in an environmentally sound manner and in accordance with MOP/RMP, Environmental Management Plan, and site commitments.

14 REFERENCES AND GLOSSARY

14.1 REFERENCES

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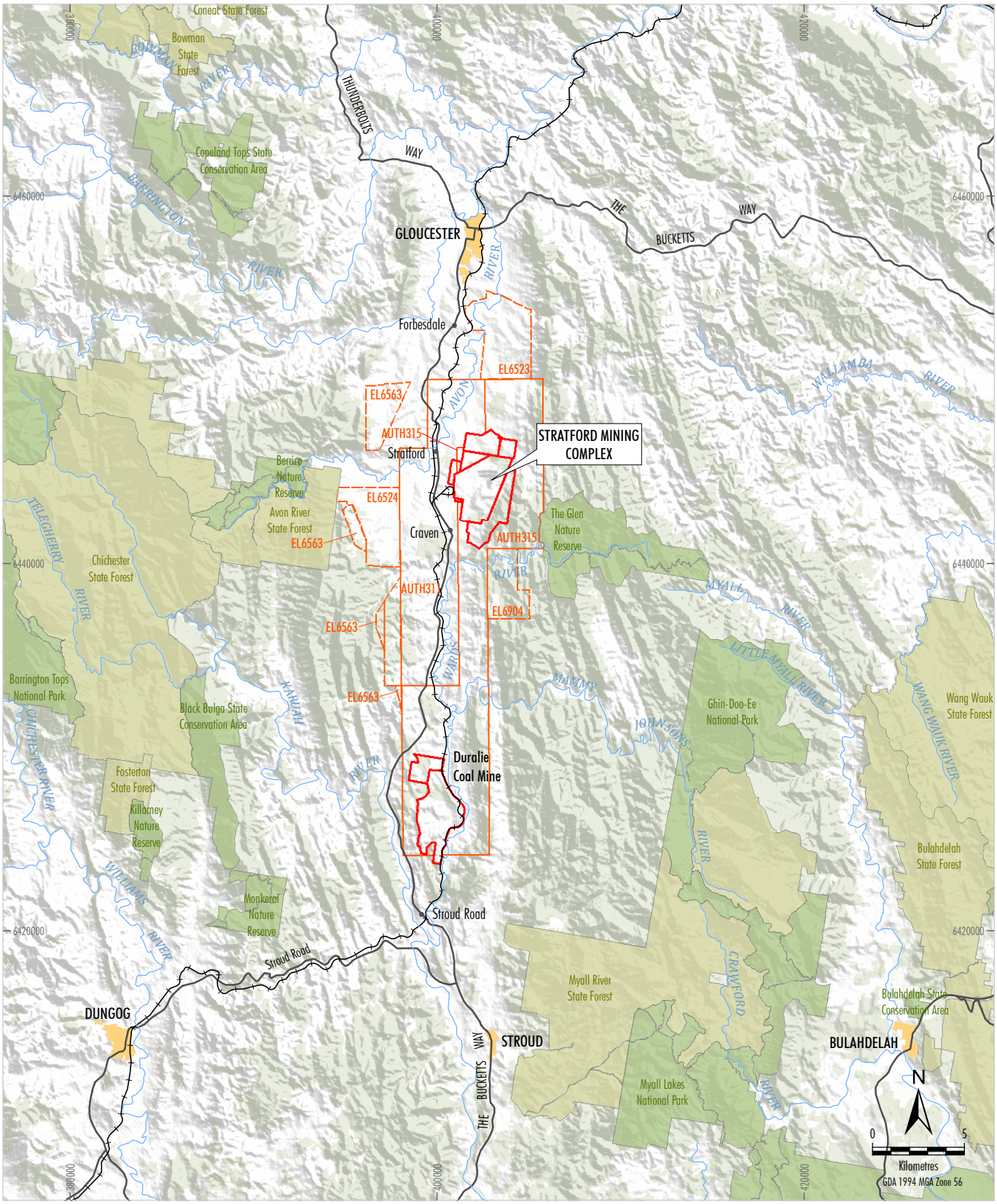
14.2 GLOSSARY

AHD	Australian Height Datum
AMBS	Australian Museum Business Services Pty Ltd
AS/NZS	Australian Standard/New Zealand Standard
AUTH	Authorisation (Exploration)
AQMP	Air Quality Management Plan
BC Act	NSW *Biodiversity Conservation Act 2016*
BCD	Biodiversity and Conservation Division within the DPIE
BLMP	Blast Management Plan
BMP	Biodiversity Management Plan
BRNOC	Bowens Road North Open Cut
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DAWE	Commonwealth Department of Agriculture, Water and Environment
DCM	Duralie Coal Mine
DECC	Department of Environment and Climate Change (now BCD)
DEE	Commonwealth Department of Environment and Energy (now DAWE)
DPIE	Department of Planning, Industry and Environment
DPIE-Water	NSW Water Group within the Department of Planning, Industry and Environment
DRG	Department of Resources and Geoscience (now NSW Resources Regulator)
DTIRIS-DRE	Department of Trade and Investment, Regional Infrastructure and Services – Division of Resources and Energy (now NSW Resources Regulator)
EFA	ecosystem function analysis
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority

EPBC Act	Commonwealth *Environment Protection and Conservation Act 1999*
EPL	Environment Protection Licence
ERA	Environmental Risk Assessment
GBFMP	Gloucester Bushfire Management Committee
GLC	Gloucester Lakes Council (now now the MidCoast Council)
GSC	Gloucester Shire Council (now the MidCoast Council)
GWMP	Groundwater Management Plan
HMP	Heritage Management Plan
km	kilometre
Kv	kilovolt
LFA	landscape function analysis
m	metres
mm	millimetre
m^3	cubic metres
Mbcm	million cubic metres
MCC	MidCoast Council
ML	Mining Lease
MOP/RMP	Mining Operations Plan and Rehabilitation Management Plan
Mtpa	million tonnes per annum
NAF	non-acid forming
NMP	Noise Management Plan
OEH	Office of Environment and Heritage (now BCD)
PAF	potentially acid forming
PAF-LC	potentially acid forming – low capacity
ROM	Run-of-Mine
SCPL	Stratford Coal Pty Ltd
SEP	Stratford Extension Project
SMC	Stratford Mining Complex

SSD	State Significant Development
SWB	Site Water Balance
SWMP	Surface Water Management Plan
TARP	Trigger Action Response Plan
WMP	Water Management Plan

PLANS



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LEGEND

- Mining Lease Boundary
- Exploration Licence Boundary
- Authorisation Boundary
- NSW State Forest
- National Park, Nature Reserve or State Conservation Area

Source: Geoscience Australia (2006);
NSW Department of Planning & Environment (2017)

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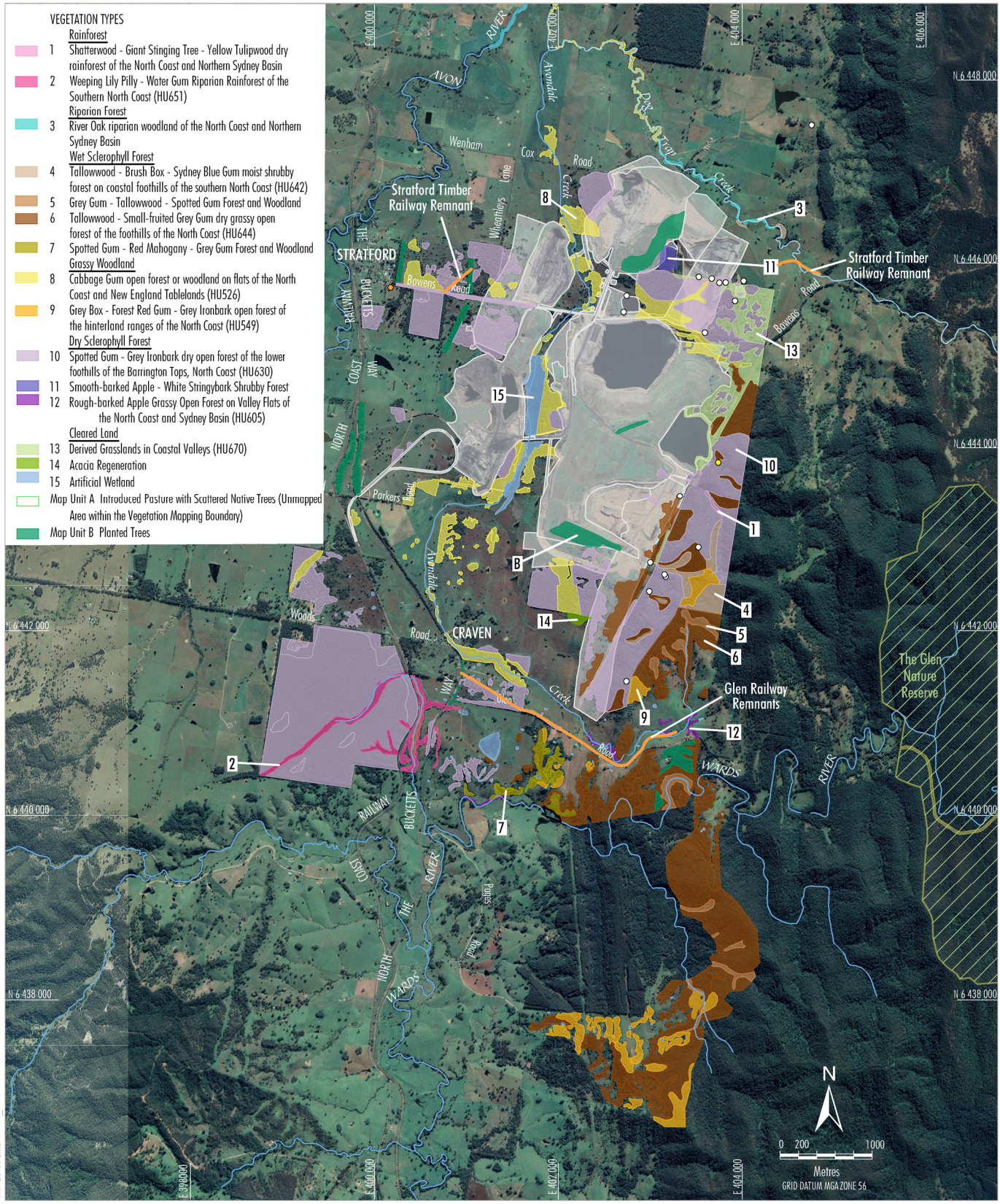
STRATFORD MINING COMPLEX MOP/RMP

Regional Location

PLAN 1A



YAN-20-31 SWO 21-24_101A

LEGEND

Approximate Extent of Existing/Approved Surface Development

Aboriginal Heritage

- Aboriginal Heritage Site
- Potential Aboriginal Heritage Site

Non-Aboriginal Heritage

- Local Significance Heritage Item

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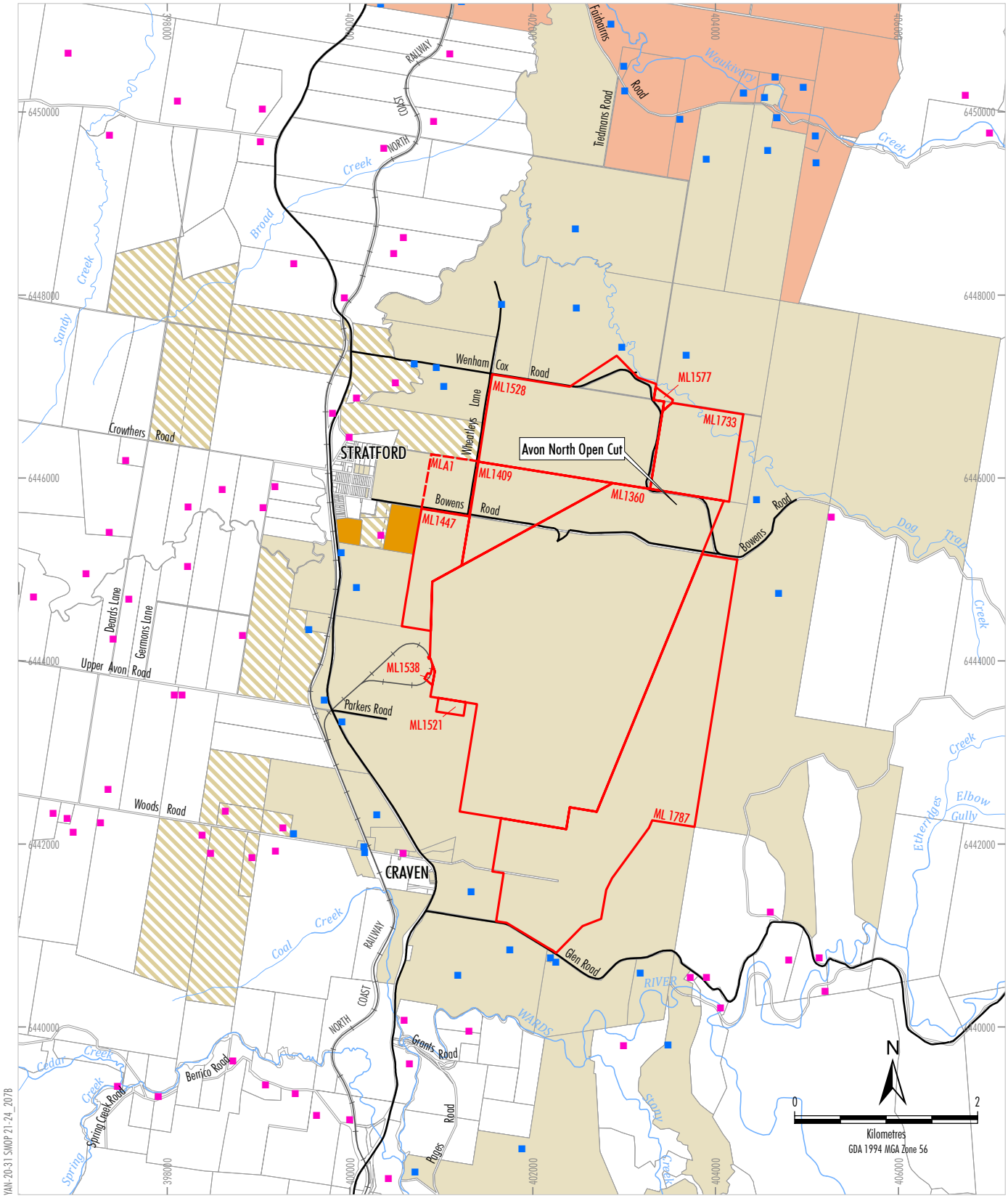
STRATFORD MINING COMPLEX MOP/RMP

Pre-MOP Environment-
Natural Environment

Source: Australian Museum Business Services (2011) ; FloraSearch (2011); SCPL (2012); DFS-LPI (2012) ; DPI C&L [CLD] (2012) Orthophoto - SCPL (flown July 2011); Google Earth CNES/Airbus (2020)

PLAN 1B



YAN-20-31 SMOP 21-24_207B

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Yancoal Owned Land
- GRL Owned Land or Under Option
- Private Landholders - Yancoal Agreement
- Crown Land
- Privately Owned Dwelling
- Resource Company Owned Dwelling

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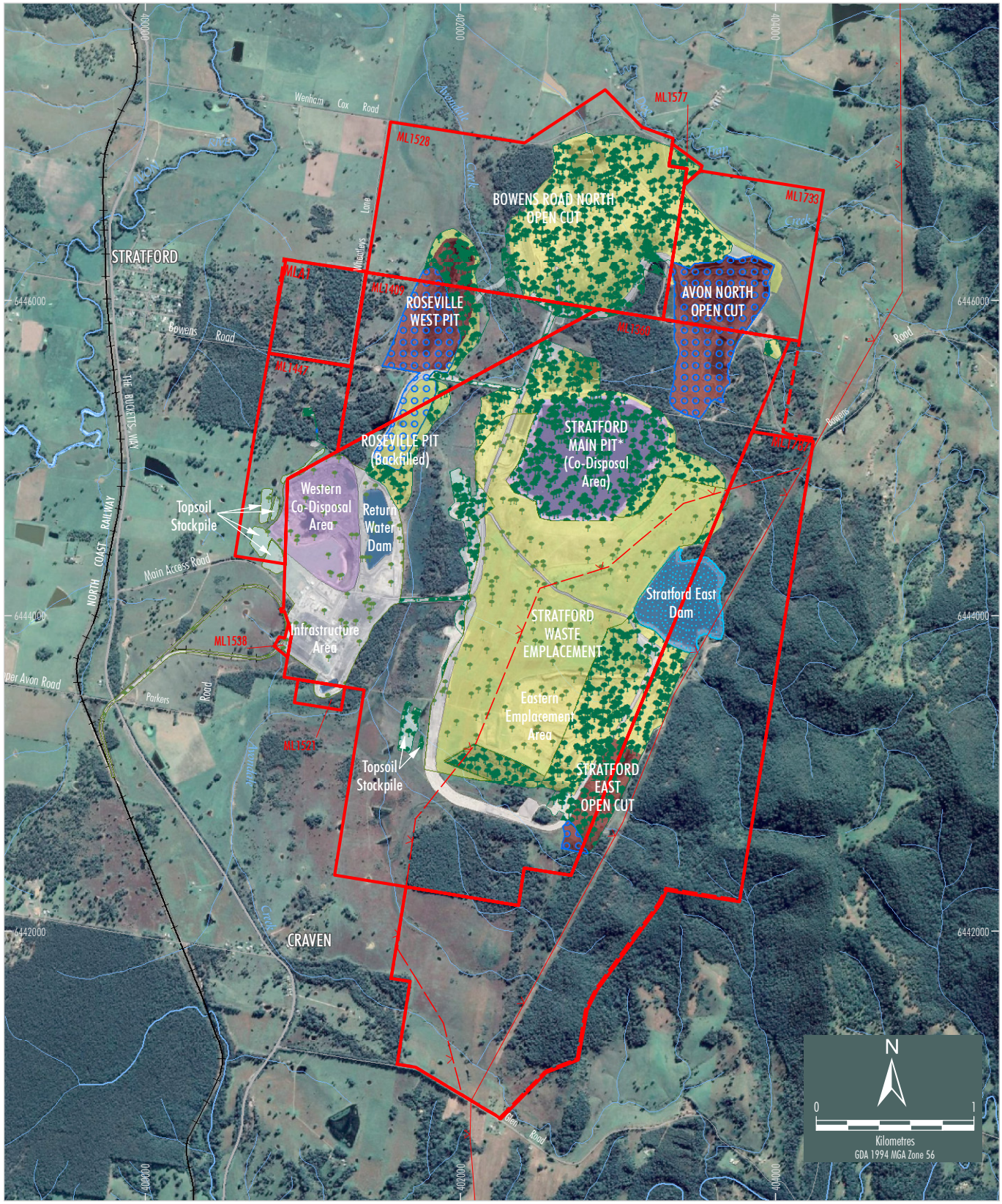
STRATFORD MINING COMPLEX MOP/RMP

Pre-MOP Environment -
Built Environment

Source: Orthophoto - Yancoal (July 2014); LPI (2016); NSW Department of Planning & Environment (2017)

PLAN 1C



YAN-20-31 SMOP 21-24_208A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Electricity Transmission Line

Relevant Primary Domains

- Infrastructure Area (1)
- Water Management Area (2)
- Waste Emplacement (3)
- CHPP Rejects Material Management (4)
- Open Cut Pit (5)

* Stratford Main Pit is used as both a Water Management Area and CHPP Rejects Material Management Area

Relevant Secondary Domains

- Pasture/Scattered Tress (A)
- Woodland/Open Forest (B)
- Permanent Water Management Area (C)
- Final Void/Water Storage (D)

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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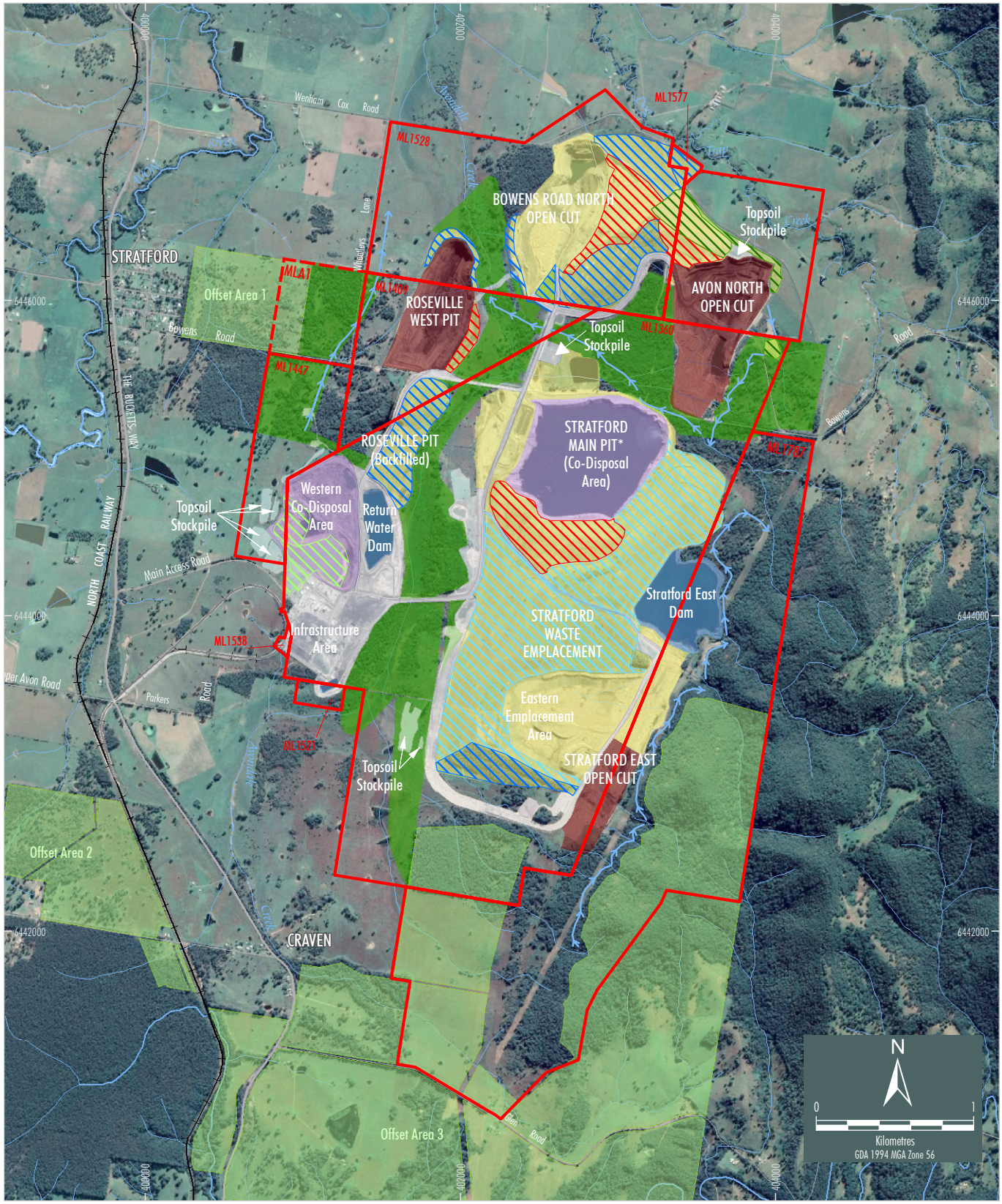
STRATFORD MINING COMPLEX MOP/RMP

Rehabilitation Domains at Commencement of MOP/RMP

PLAN 2



YAN-20-31 SMOP 21-24_201A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Electricity Transmission Line
- Surface Contour (5 m interval)
- Up-catchment Diversion

Relevant Primary Domain

- Infrastructure Area (1)
- Water Management Area (2)
- Waste Emplacement (3)
- CHPP Rejects Material Management (4)
- Open Cut Pit (5)
- Biodiversity Enhancement Area/ Biodiversity Offset Area (6)

Rehabilitation Phase

- Landform Establishment
- Ecosystem and Land Use Establishment - Pasture/Scattered Trees
- Ecosystem and Land Use Establishment - Woodland/Open Forest
- Ecosystem and Land Use Sustainability - Pasture/Scattered Trees
- Ecosystem and Land Use Sustainability - Woodland/Open Forest

* Stratford Main Pit is used as both a Water Management Area and CHPP Rejects Material Management Area

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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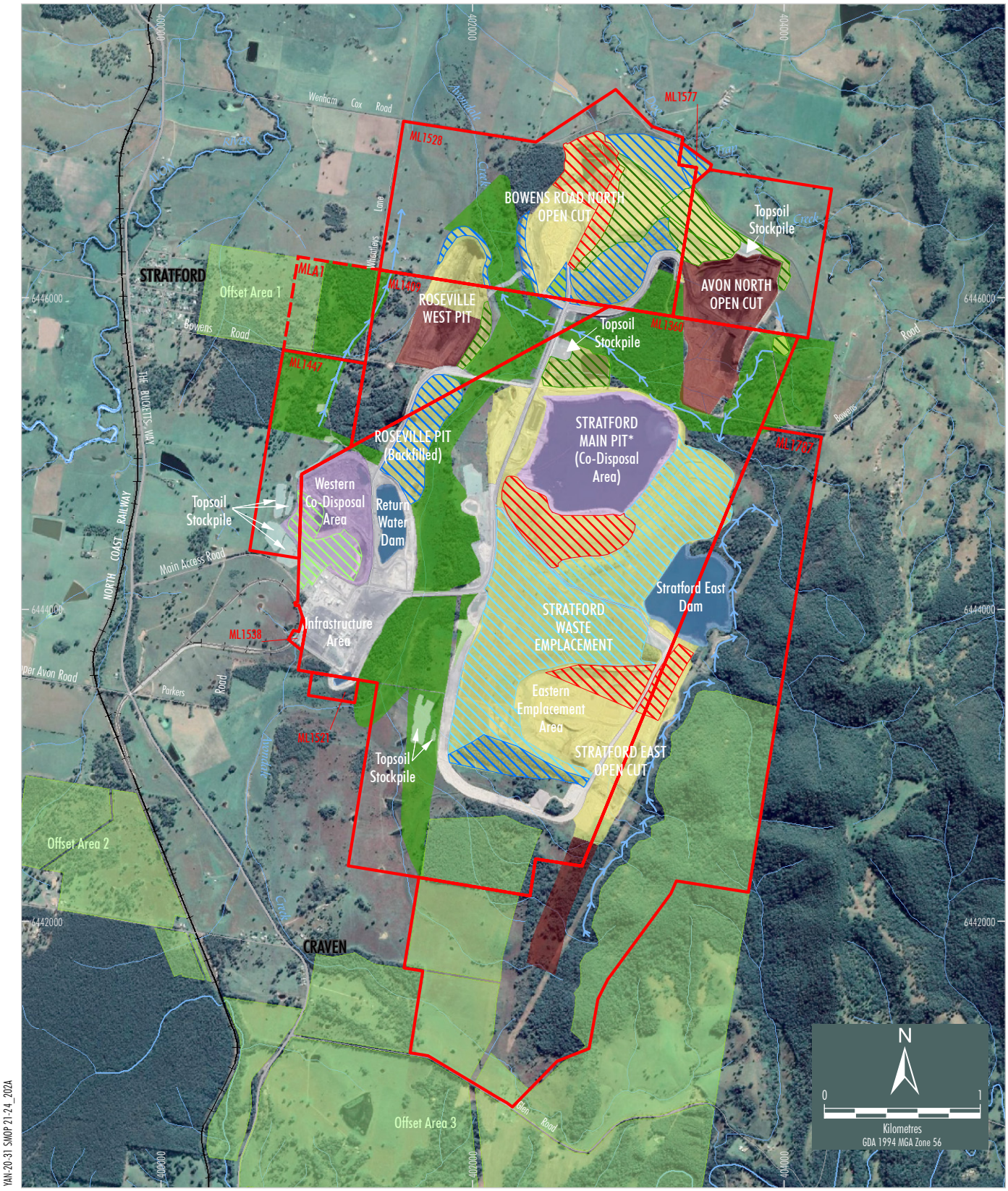
STRATFORD MINING COMPLEX MOP/RMP

Mining and Rehabilitation Indicative General Arrangement Year 1 (1 Jan 2021 - 31 Dec 2021)

PLAN 3A



YAN-20-31 SMOP 21-24_202A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Electricity Transmission Line
- Surface Contour (5 m interval)
- Up-catchment Diversion

Relevant Primary Domain

- Infrastructure Area (1)
- Water Management Area (2)
- Waste Emplacement (3)
- CHPP Rejects Material Management (4)
- Open Cut Pit (5)
- Biodiversity Enhancement Area/ Biodiversity Offset Area (6)

Rehabilitation Phase

- Landform Establishment
- Ecosystem and Land Use Establishment - Pasture/Scattered Trees
- Ecosystem and Land Use Establishment - Woodland/Open Forest
- Ecosystem and Land Use Sustainability - Pasture/Scattered Trees
- Ecosystem and Land Use Sustainability - Woodland/Open Forest

* Stratford Main Pit is used as both a Water Management Area and CHPP Rejects Material Management Area

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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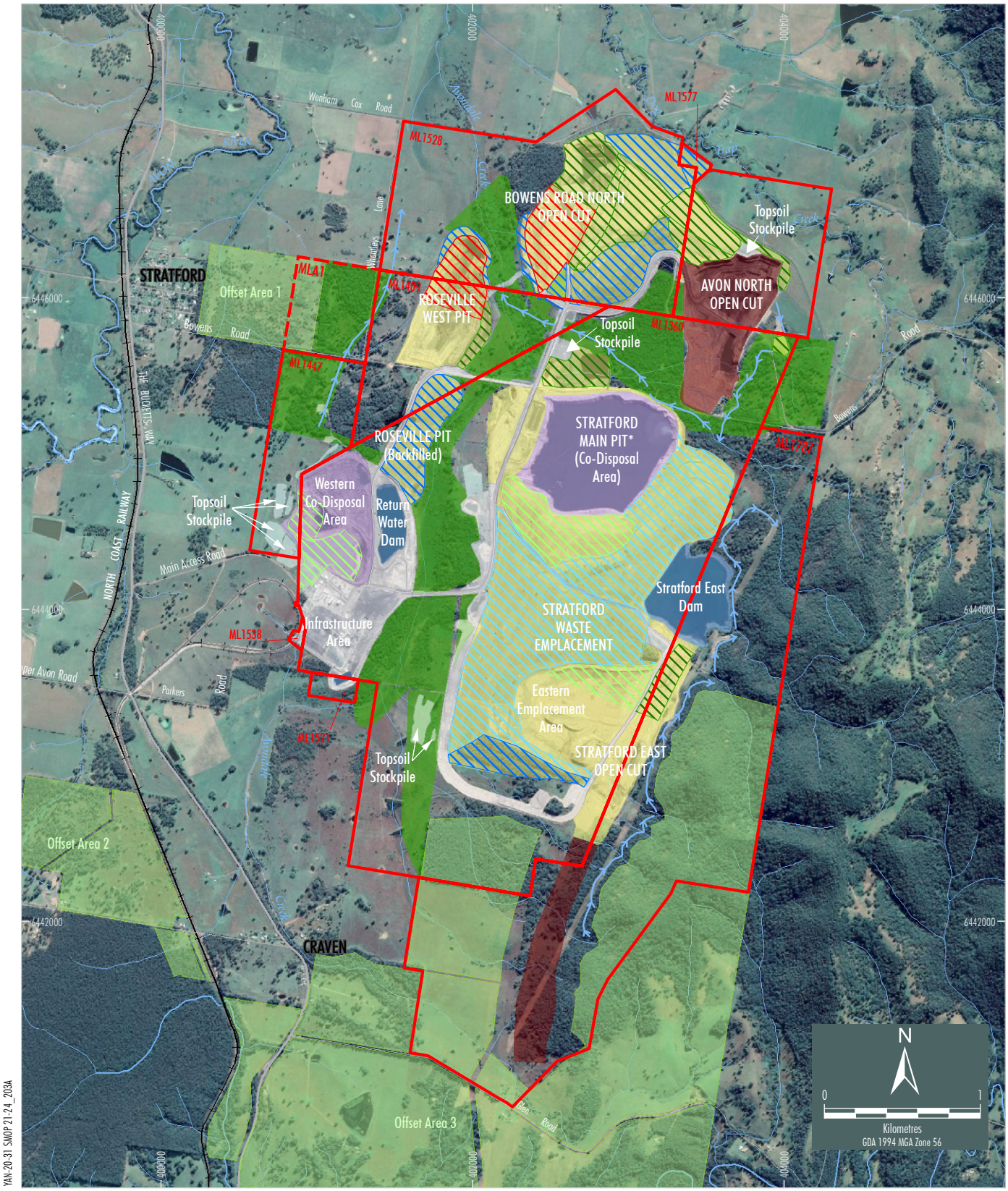
STRATFORD MINING COMPLEX MOP/RMP

Mining and Rehabilitation Indicative General Arrangement Year 2 (1 Jan 2022 - 31 Dec 2022)

PLAN 3B



YAN-20-31 SMOP 21-24_203A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Electricity Transmission Line
- Surface Contour (5 m interval)
- Up-catchment Diversion

Relevant Primary Domain

- Infrastructure Area (1)
- Water Management Area (2)
- Waste Emplacement (3)
- CHPP Rejects Material Management (4)
- Open Cut Pit (5)
- Biodiversity Enhancement Area/ Biodiversity Offset Area (6)

Rehabilitation Phase

- Landform Establishment
- Ecosystem and Land Use Establishment - Pasture/Scattered Trees
- Ecosystem and Land Use Establishment - Woodland/Open Forest
- Ecosystem and Land Use Sustainability - Pasture/Scattered Trees
- Ecosystem and Land Use Sustainability - Woodland/Open Forest

* Stratford Main Pit is used as both a Water Management Area and CHPP Rejects Material Management Area

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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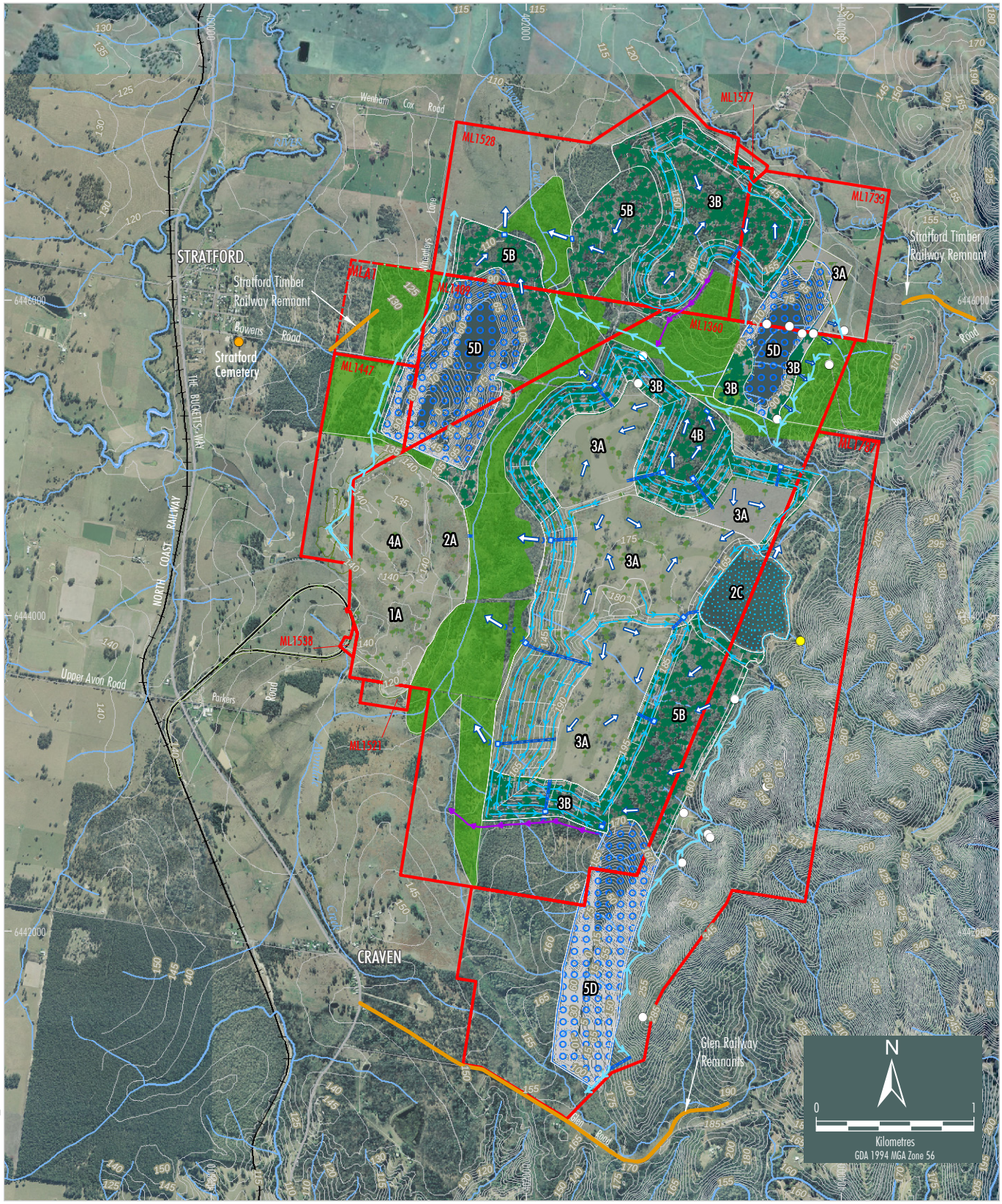
STRATFORD MINING COMPLEX MOP/RMP

Mining and Rehabilitation Indicative General Arrangement Year 3 (1 Jan 2023 - 31 Dec 2023)

PLAN 3C



YAN-20-31 SMOP 21-24_209A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Post-Mining Landform Outline
- Post-Mining Landform Contour (2 m interval)
- Biodiversity Enhancement Area

Relevant Primary Domains

- Infrastructure Area (1)
- Water Management Area (2)
- Waste Emplacement (3)
- CHPP Rejects Material Management (4)
- Open Cut Pit (5)

Relevant Secondary Domains

- Pasture/Scattered Tress (A)
- Woodland/Open Forest (B)
- Permanent Water Management Area (C)
- Final Void/Water Storage (D)
- Up-catchment Diversion
- Berm Drain
- Stabilised Drainage Channel
- Drop Structure
- Stilling Basin and Flow Spreader
- Direction of Water Flow

Aboriginal Heritage

- Aboriginal Heritage Site
- Potential Aboriginal Heritage Site

Non-Aboriginal Heritage

- Local Significance Heritage Site

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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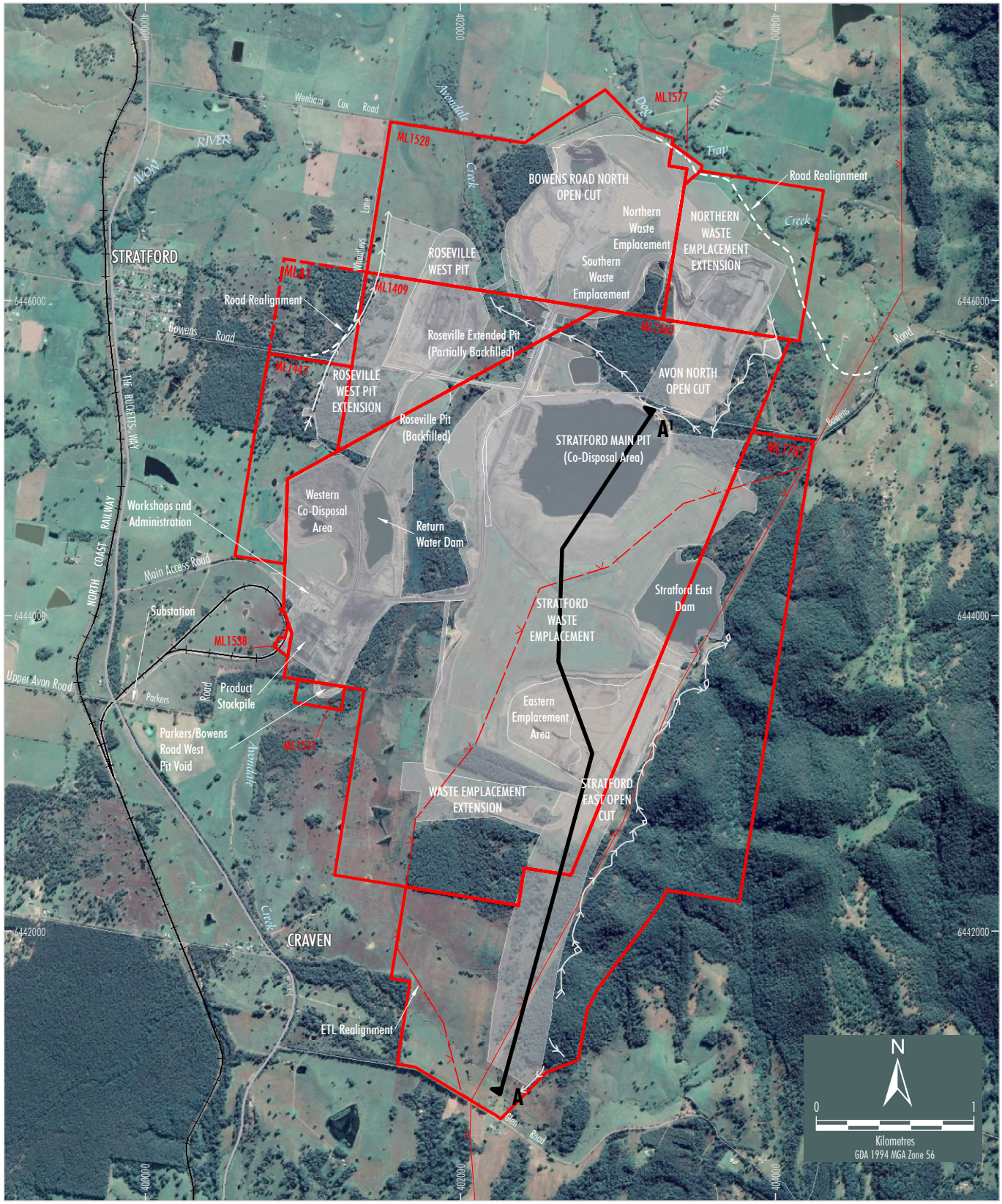
STRATFORD MINING COMPLEX MOP/RMP

Conceptual Final Landform and Rehabilitation Domains

PLAN 4



YAN-20-31 SMOP 21-24_210A

LEGEND

- Mining Lease Boundary
- Mining Lease Application Boundary
- Electricity Transmission Line
- Approximate Extent of Existing/Approved Surface Development
- Conceptual Up-Catchment Diversion

Source: Orthophoto - Google Earth CNES/Airbus (2020); NSW Department of Planning & Environment (2017)

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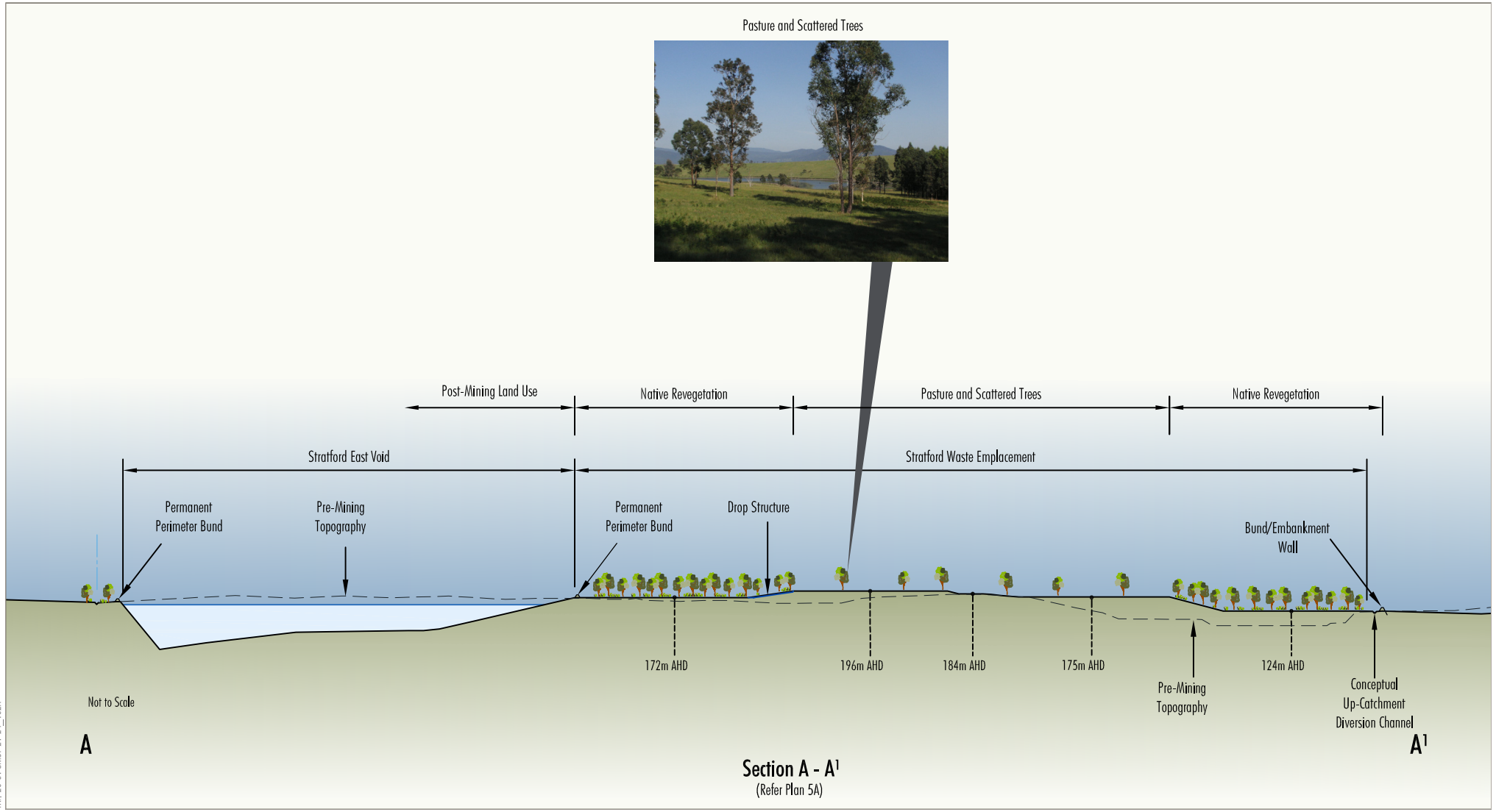
STRATFORD MINING COMPLEX MOP/RMP

Cross Section Location

* Stratford Main Pit is used as both a Water Management Area and CHPP Rejects Material Management Area

Figure 5A



Section A - A1
(Refer Plan 5A)

YAN-20-31 SMOP 21-24_102A

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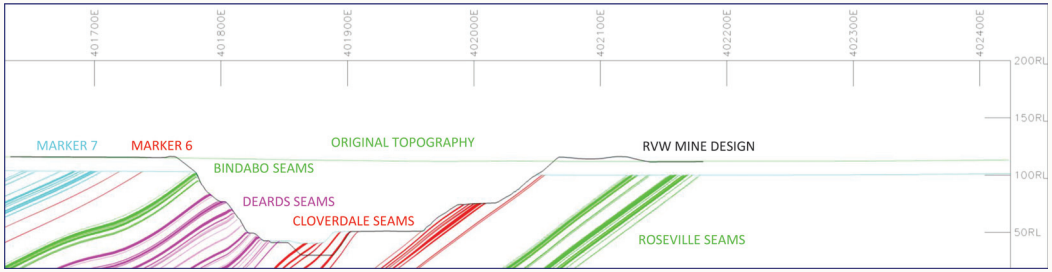
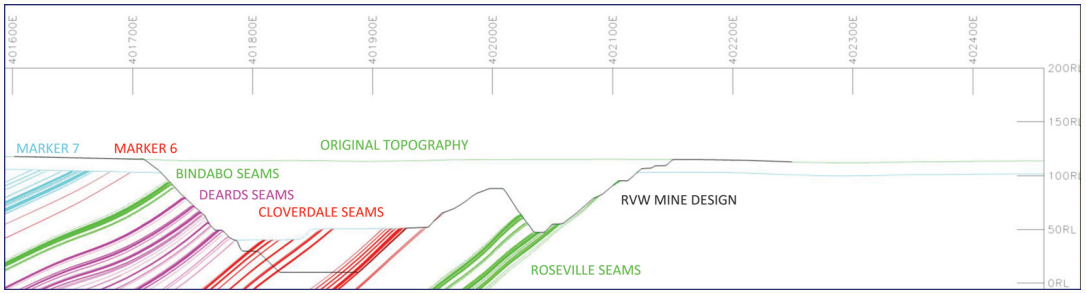
STRATFORD MINING COMPLEX MOP/RMP

Conceptual Cross Section of the Rehabilitated Project Mine Lanform

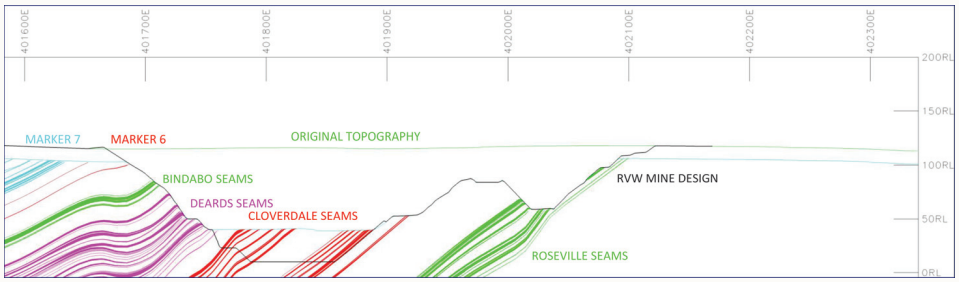
PLAN 5B



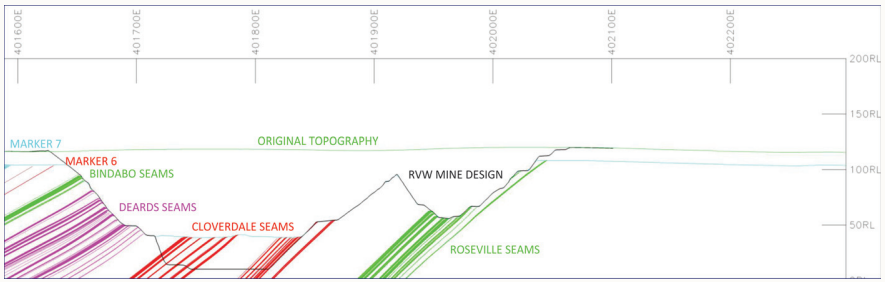
SECTION RVW_XS221



SECTION RVW_XS1



SECTION RVW_XS29



SECTION RVW_XS28

YAN-20-31 SMOP 21-24_008A

Source: Stratford Coal (2019)

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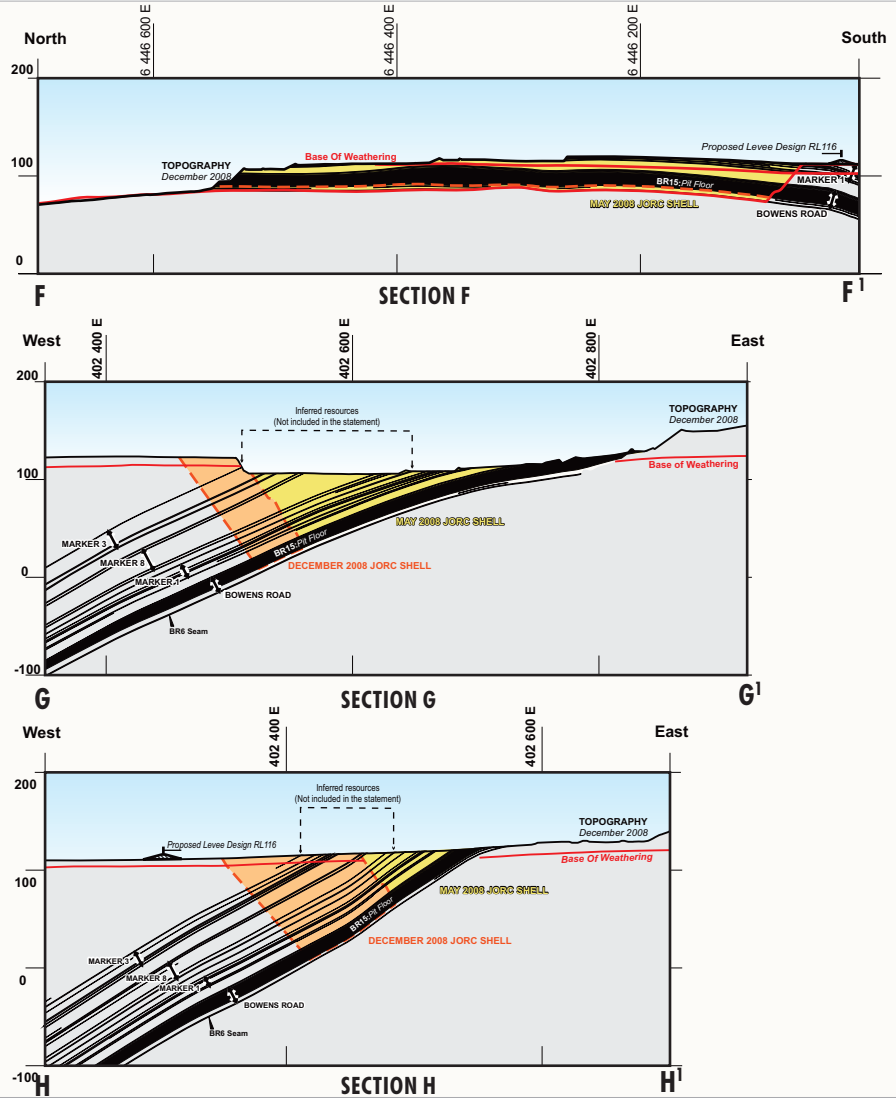
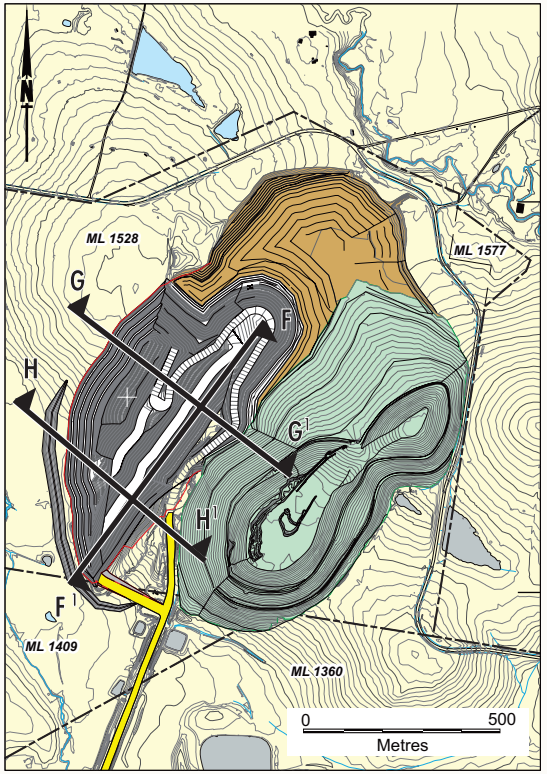
STRATFORD MINING COMPLEX MOP/RMP

Roseville West Pit
Cross Sections

PLAN 5C





PLAN

YAN-20-31 SMOP 21-24_009A

Source: Stratford Coal (2010)

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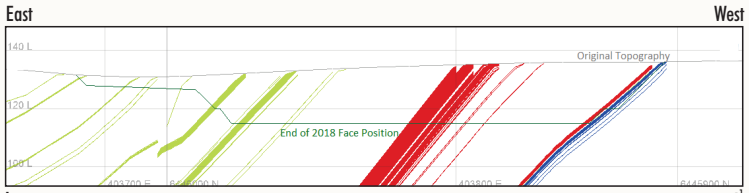
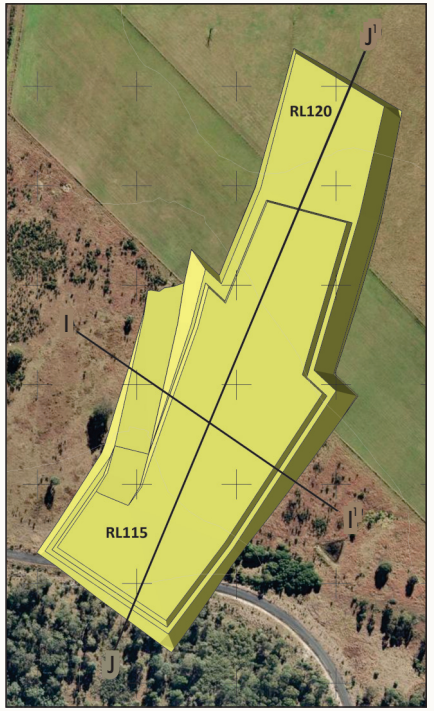
STRATFORD MINING COMPLEX

Bowens Road North Open Cut
Cross Sections

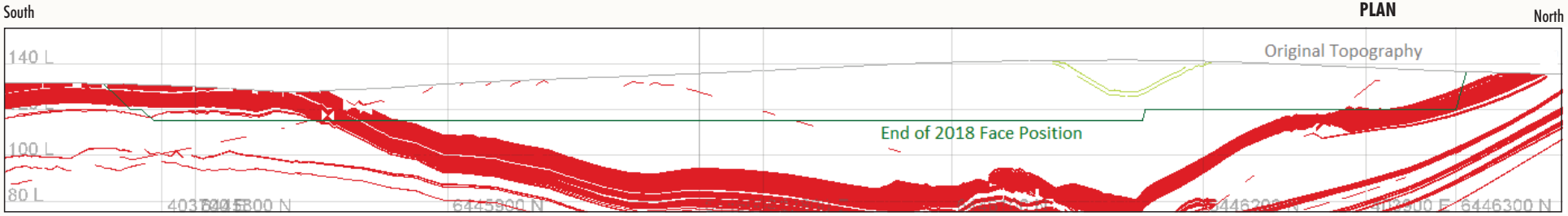
PLAN 5D



SECTION I



PLAN



SECTION J

Source: Yancoal (2018)

YAN-20-31 SMOP 21-24_010A

STRATFORDCOAL
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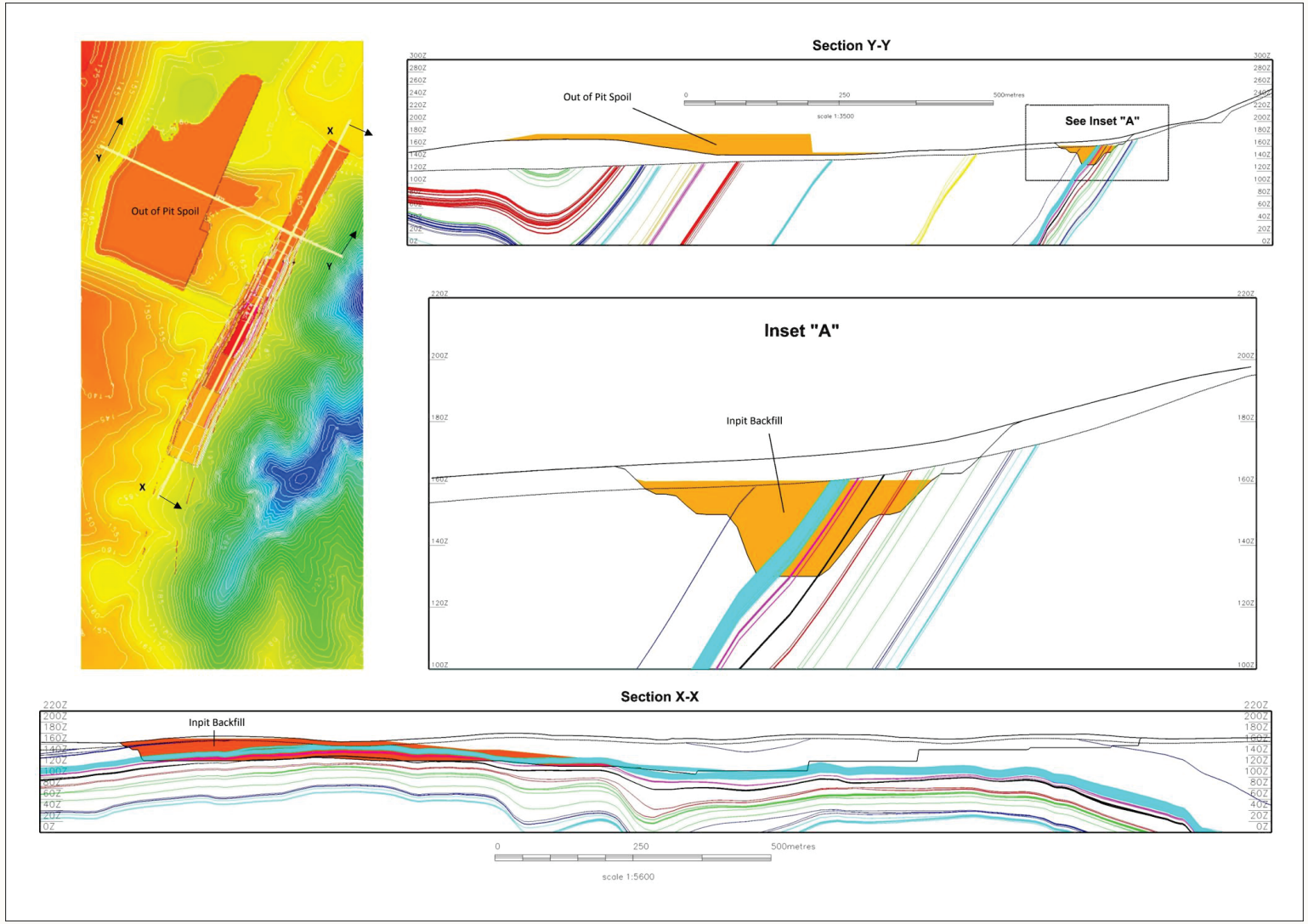
STRATFORD EXTENSION PROJECT MOP

Avon North Open Cut
Cross Sections

PLAN 5E



YAN-20-31 SMOP 21-24_011A

Source: Yancoal (2018)

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STRATFORD MINING COMPLEX MOP/RMP

Stratford East Open Cut
Cross Sections

PLAN 5F

ATTACHMENT 1

STRATFORD MINING COMPLEX DEVELOPMENT CONSENT (SSD-4966)

Development Consent

Section 89E of the *Environmental Planning & Assessment Act 1979*

As delegate of the Minister for Planning, the Planning Assessment Commission of NSW approves the development application referred to in Schedule 1, subject to the conditions in Schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

Member of the Commission **Member of the Commission**

Sydney 2015

SCHEDULE 1

Application Number:	SSD-4966
Applicant:	Stratford Coal Pty Ltd
Consent Authority:	Minister for Planning
Land:	See Appendix 1
Development:	Stratford Extension Project

14 January 2021 Mod 2 Red Type

TABLE OF CONTENTS

DEFINITIONS

Annual review	The review required by condition 4 of Schedule 5
Applicant	Stratford Coal Pty Ltd, or any other person entitled to benefit from this consent
BCA	Building Code of Australia
BCD	Biodiversity Conservation Division, within the Department
Blast misfire	The failure of one or more holes in a blast pattern to initiate
BOS	Biodiversity offset strategy described in the EIS, required by condition 34 of Schedule 3 of this consent and depicted conceptually in Figure 1 in Appendix 8
Bowens Road North Offset	The offset strategy described in Section 3.1 of the environmental assessment titled Bowens Road North Open Cut June 2010 Modification, and depicted generally in Figure 2 of Appendix 8
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
Conditions of this consent	Conditions contained in Schedules 2 to 5 inclusive
CPI	Australian Bureau of Statistics Consumer Price Index
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
Department	Department of Planning, Industry and Environment
Development	The development described in the EIS
DPIE Water	Water Group within the Department
DRG	The Division of Resources and Geosciences, within the Department
EEC	Endangered ecological community, as defined under the TSC Act
EIS	• Environmental Impact Statement titled *Stratford Extension Project Environmental Impact Statement,* dated November 2012, and associated response to submissions titled *Stratford Extension Project Environmental Impact Statement Responses to Submissions,* dated May 2013; and • Modification Report titled *Stratford Coal Mine (SSD 4966) – MCC Water Access Modification* dated 19 December 2019
EPA	Environment Protection Authority, or its successor
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence issued under the POEO Act
Evening	The period from 6pm to 10pm
Feasible	Feasible relates to engineering considerations and what is practical to build or implement
GLC	Great Lakes Council (now known as Mid-Coast Council following its merger with Gloucester Shire Council)
GSC	Gloucester Shire Council (now known as Mid-Coast Council following its merger with Great Lakes Council)
Heritage item	An item as defined under the *Heritage Act 1977* and/or an Aboriginal Object or Aboriginal Place as defined under the *National Parks and Wildlife Act 1974*
Incident	A set of circumstances that: • causes or threatens to cause material harm to the environment; and/or • breaches or exceeds the limits or performance measures/criteria in this consent
Land	As defined in the EP&A Act, except for where the term is used in the noise and air quality conditions in Schedules 3 and 4 of this consent where it is defined to mean the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this consent
Material harm to the environment	Actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial
Mine water	Water that accumulates within, or drains from, active mining areas, emplacements, stockpiles, tailings dams and infrastructure areas (synonymous with 'dirty water')
Mining operations	Includes the removal, transportation and emplacement of overburden and extraction, processing, handling and storage and transportation of coal carried out on the site
Minor	Not very large, important or serious
Mitigation	Activities associated with reducing the impacts of the development

Negligible	Small and unimportant, such as to be not worth considering
Negotiated agreement	An agreement involving the negotiation of a package of mitigation and/or compensatory benefits for landowners of affected land. The agreement is negotiated between the applicant and the landowner.
New mining areas	The areas shown on Figure 1 of Appendix 3 as Roseville West Pit Extension, Northern Waste Emplacement Extension, Avon North Open Cut, Stratford East Open Cut and Waste Emplacement Extension
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
POEO Act	*Protection of the Environment Operations Act 1997*
Privately-owned land	Land that is not owned by a public agency or a mining or petroleum company (or its subsidiary)
Public infrastructure	Linear and related infrastructure and the like that provides services to the general public, such as roads, railways, water supply, drainage, sewerage, gas supply, electricity, telephone, telecommunications, etc
Reasonable	Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, costs versus benefits provided, and the nature and extent of potential improvements
Rehabilitation	The treatment or management of land disturbed by the development for the purpose of establishing a safe, stable and non-polluting environment
Remediation	Activities associated with partially or fully repairing or rehabilitating the impacts of the development or controlling the environmental consequences of this impact
ROM coal	Run-of-mine coal, including coal recovered from the Western Co-disposal Area
Secretary	Secretary of the Department, or any person authorised to act on their behalf
Site	All land to which the development application applies as listed in Appendix 1 and shown in Appendix 2
TSC Act	*Threatened Species Conservation Act 1995*

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT

1. In addition to meeting the specific performance criteria established under this consent, the Applicant shall implement all reasonable and feasible measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the development.

TERMS OF CONSENT

2. The Applicant shall carry out the development generally in accordance with the:
   (a) EIS;
   (b) statement of commitments; and
   (c) conditions of this consent.

   Notes:
   - *The general layout of the development is shown in Appendix 3.*
   - *The Applicant's statement of commitments is shown in Appendix 9.*

3. If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this consent shall prevail to the extent of any inconsistency.

4. The Applicant shall comply with any reasonable requirement/s of the Secretary arising from the Department's assessment of:
   (a) any strategies, plans, programs, reviews, audits, reports or correspondence that are submitted in accordance with this consent; and
   (b) the implementation of any actions or measures contained in these documents.

LIMITS ON CONSENT

Mining Operations

5. The Applicant may carry out mining operations on the site until 31 December 2025.

   Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of the Secretary and the Resources Regulator. Consequently, this consent will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Coal Extraction

6. The Applicant shall not extract more than 2.6 million tonnes of ROM coal from the site in any calendar year.

Coal Processing

7. The Applicant shall not process on site more than 5.6 million tonnes of ROM coal in any calendar year.

Coal Transport

8. The Applicant shall ensure that:
   (a) all product coal is transported from the site by rail;
   (b) no more than an average of 2.5 laden trains leave the site each day over any calendar year;
   (c) no more than 6 laden trains leave the site in any 24-hour period; and
   (d) no more than 2 laden trains leave the site during any night.

   Note: This condition does not apply to movements of the Duralie shuttle train.

SURRENDER OF EXISTING DEVELOPMENT CONSENTS

9. Prior to the end of December 2015, or as otherwise agreed by the Secretary, the Applicant shall surrender all existing development consents for the site in accordance with section 104A of the EP&A Act.

   Note: This requirement does not extend to the surrender of construction and occupation certificates for existing and proposed building works under Part 4A of the EP&A Act. Surrender of a consent should not be understood as implying that works legally constructed under a valid consent can no longer be legally maintained or used.

10. Prior to the surrender of existing development consents, the conditions of this consent shall prevail to the extent of any inconsistency with the conditions of these consents.

STRUCTURAL ADEQUACY

11. The Applicant shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:

- *Under Part 4A of the EP&A Act, the Applicant is required to obtain construction and occupation certificates for the proposed building works; and*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the development.*

DEMOLITION

12. The Applicant shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures,* or its latest version.

PROTECTION OF PUBLIC INFRASTRUCTURE

13. Unless the Applicant and the applicable authority agree otherwise, the Applicant shall:
    (a) repair, or pay the full costs associated with repairing, any public infrastructure that is damaged by the development; and
    (b) relocate, or pay the full costs associated with relocating, any public infrastructure that needs to be relocated as a result of the development.

Note: This condition does not apply to damage to roads caused as a result of general road usage.

OPERATION OF PLANT AND EQUIPMENT

14. The Applicant shall ensure that all plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

STAGED SUBMISSION OF STRATEGIES, PLANS OR PROGRAMS

15. With the approval of the Secretary, the Applicant may submit any strategy, plan or program required by this consent on a progressive basis.

Notes:

- *While any strategy, plan or program may be submitted on a progressive basis, the Applicant will need to ensure that the existing operations on site are covered by suitable strategies, plans or programs at all times.*
- *If the submission of any strategy, plan or program is to be staged, then the relevant strategy, plan or program must clearly describe the specific stage to which the strategy, plan or program applies, the relationship of this stage to any future stages, and the trigger for updating the strategy, plan or program.*

16. Until they are replaced by an equivalent strategy, plan or program approved under this consent, the Applicant shall implement the existing strategies, plans or programs for the site that have been approved under existing development consents.

COMMUNITY ENHANCEMENT

17. From 31 March 2015 until mining operations under this consent cease on the site, unless the Secretary agrees otherwise, the Applicant shall pay to GSC a total of $550 a year for each full-time equivalent employee/contractor on the site. This payment is for the provision of infrastructure and services generated by the development. It is also to be indexed in accordance with the CPI for the December quarter of the previous year (except for the initial payment).

Note: The number of full-time equivalent employees/contractors is to be calculated for the first time in March 2015, and then recalculated in March each year prior to the next payment.

18. The Applicant's obligations to make payments to GSC under condition 15 of Schedule 2 of DA 23-98/99 shall cease on 31 March 2015, unless the Secretary agrees otherwise.

GLOUCESTER GAS PROJECT

19. The Applicant shall use its best endeavours to co-operate with the proponent of the Gloucester Gas Project, with the aim of maximising the outcomes of both developments with respect to:
    - resource recovery;
    - operational efficiencies;
    - biodiversity conservation; and
    - rehabilitation,

    to the satisfaction of the Secretary.

    Note: See also the Applicant's Statement of Commitments (Appendix 9).

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from an owner of the land listed in Table 1, the Applicant shall acquire the land in accordance with the procedures in conditions 5-6 of Schedule 4.

Table 1: Land subject to acquisition upon request

Property ID	
40/51/Cr1 – L. Blanch	42 – D. Blanch
Cr7 – Pryce-Jones	Cr 2 – Boorer

Note: To interpret the location referred to in Table 1 see the applicable figure in Appendix 5.

However, the obligation to acquire a property does not apply if the Applicant has a negotiated agreement with the owner/s of the relevant land that sets aside acquisition under the terms of this consent, and the Applicant has advised the Department in writing of the terms of this agreement.

ADDITIONAL MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Tables 1 and 2, the Applicant shall implement additional noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at the residence in consultation with the owner. These measures must be reasonable and feasible and directed towards reducing the noise impacts of the development on the residence.

If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional noise mitigation upon request

Property ID	***Property ID***
31(1) – Isaac	60 – Healy / Greenwood
44 – Cross / Jane	36 – Wallace
37 – Worth	29 – Ward
15(3) – Falla	

Note: To interpret the locations referred to in Table 2 see the applicable figure in Appendix 5.

However, the obligation to implement noise mitigation measures does not apply if the Applicant has a negotiated agreement with the owner/s of the relevant residence or land that sets aside noise mitigation measures under the terms of this consent, and the Applicant has advised the Department in writing of the terms of this agreement.

NOISE

Hours of Operation

3. The Applicant shall comply with the operating hours in Table 3.

Table 3: Operating hours

Activity	***Operating Hours***
• Open cut mining operations in the Bowens Road North and Roseville West Extension pits • Recovery and transport of CHPP rejects for re-processing • Construction of the noise mitigation bunds on the western side of the Avon North, Roseville West Extension and Stratford East pits	7 am to 6 pm, 7 days per week
• Open cut mining operations in the Avon North and Stratford East pits • Coal processing, loading and dispatch of product coal trains	24 hours a day, 7 days per

• Maintenance activities	week
• Water truck access to the Bowens Road Water Fill Point	7 am to 6 pm, Monday to Saturday

Noise Criteria

4. The Applicant shall ensure that the noise generated by the development does not exceed the criteria in Table 4 at any residence on privately-owned land.

Table 4: Noise criteria dB(A)

Land	***Day*** $L_{Aeq(15\ min)}$	***Evening*** $L_{Aeq(15\ min)}$	***Night*** $L_{Aeq(15\ min)}$	***Night*** $L_{A1\ (1\ min)}$
40/51/Cr1 – L. Blanch	43	43	43	50
Cr7 – Pryce-Jones	43	43	43	49
42 – D. Blanch	42	42	42	50
Cr 2 – Boorer	41	41	41	49
31(1) – Isaac	40	40	40	48
36 – Wallace	39	39	39	47
44 – Cross / Jane				
60 – Healy / Greenwood	39	39	39	45
37 – Worth	38	38	38	46
29 – Ward	38	38	37	45
23 – Bagnall	37	37	37	45
31(2) – Isaac				
296 – Watson				
297 – Bosma				
298 – Yates	36	36	36	45
15(3) – Falla	39	35	35	45
15(2) – Falla	36	35	35	45
Stratford Village	37	36	35	45
All other privately-owned residences	35	35	35	45

- *To interpret the locations referred to in Table 4 see the applicable figure(s) in Appendix 5.*
- *Stratford village is shown on the figure(s) in Appendix 5.*

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy*. Appendix 6 sets out the meteorological conditions under which these criteria apply and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has a negotiated agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

5. The Applicant shall:
   (a) implement best management practice to minimise the construction, operational, road and rail noise of the development;

(b) operate a comprehensive noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day-to-day planning of mining operations, and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this consent;
(c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 6);
(d) only use locomotives and rolling stock that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL (No. 3142);
(e) co-ordinate noise management on site with the noise management of the Gloucester Gas Project to minimise cumulative noise impacts; and
(f) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent,

to the satisfaction of the Secretary.

Noise Management Plan

6. The Applicant shall prepare and implement a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
   (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval prior to 31 December 2015, unless otherwise agreed by the Secretary;
   (b) describe the measures that would be implemented to ensure:
      - compliance with the noise criteria and operating conditions of this consent; and
      - the noise impacts of the project are minimised during meteorological conditions when the noise limits of this consent do not apply;
   (c) describe the proposed noise management system in detail;
   (d) include a monitoring program that:
      - includes monitoring of inversion strength at an appropriate sampling rate to determine compliance with noise limits;
      - provides for the biennial validation of the noise model for the project.
      - evaluates and reports on:
         - the effectiveness of the on-site noise management system;
         - compliance against the noise criteria in this consent; and
         - compliance with the noise operating conditions;
      - includes a program to calibrate and validate real-time noise monitoring results with attended monitoring results over time (so the real-time noise monitoring program can be used as a better indicator of compliance with the noise criteria and as a trigger for further attended monitoring); and
      - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

Night-time Noise

7. Within 2 years of the commencement of night-time mining operations, and every 2 years thereafter, the Applicant shall engage an independent acoustic expert to undertake a review of compliance with the relevant conditions of consent for night-time operations, to the satisfaction of the Secretary.

   Should any review report show that night-time mining operations have been/are non-compliant, the Applicant must modify its operations and conduct another independent review with 30 days.

   If this second review demonstrates compliance, the Applicant may continue its modified night-time mining operations. If not, the Applicant must immediately cease night-time mining operations.

   Night-time mining operations may only restart if the Secretary is satisfied that the proposed operations would be compliant with the relevant conditions of consent.

Record of Noise Limit Exemptions

8. The Applicant shall record and make available on its website:
   (a) when the real-time monitoring and management system detects any potential exceedance of the noise limits;
   (b) when exemptions from noise limits due to meteorological conditions apply;
   (c) the specific reasonable and feasible measures that were taken when either (a) or (b) apply; and
   (d) facilitate the regular review of this information by the CCC,

   to the satisfaction of the Secretary.

BLASTING

Blasting Criteria

9. The Applicant shall ensure that blasting on site does not cause any exceedence of the criteria in Table 5.

Table 5: Blasting criteria

Location	***Airblast overpressure (dB(Lin Peak))***	***Ground vibration (mm/s)***	***Allowable exceedence***
Residence on privately-owned land	120	10	0%
	115	5	5% of the total number of blasts over a period of 12 months
All public infrastructure	-	50 *(or a limit determined by the structural design methodology in AS 2187.2-2006, or its latest version, or other alternative limit for public infrastructure, to the satisfaction of the Secretary)*	0%

However, these criteria do not apply if the Applicant has a written agreement with the relevant owner to exceed these criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Blasting Hours

10. The Applicant shall only carry out blasting on site between 9 am and 5 pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of the Secretary.

Blasting Frequency

11. The Applicant may carry out a maximum of:
    (a) 1 blast per day on site; and
    (b) 3 blasts per week, averaged over a calendar year.

    This condition does not apply to blasts required to ensure the safety of the mine or its workers.

    Note: For the purposes of this condition a blast refers to a single blast event, which may involve a number of individual blasts fired in quick succession in a discrete area of the mine.

Property Inspections

12. If the Applicant receives a written request from the owner of any privately-owned land within 2 kilometres of any approved open cut pit on site for a property inspection to establish the baseline condition of any buildings and/or structures on his/her land, or to have a previous property inspection report updated, then within 2 months of receiving this request the Applicant shall:
    (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to:
        - establish the baseline condition of any buildings and/or structures on the land, or update the previous property inspection report; and
        - identify any measures that should be implemented to minimise the potential blasting impacts of the development on these buildings and/or structures; and
    (b) give the landowner a copy of the new or updated property inspection report.

    If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Secretary for resolution.

Property Investigations

13. If any owner of privately-owned land claims that the buildings and/or structures on his/her land have been damaged as a result of blasting on site, then within 2 months of receiving this claim in writing from the landowner, the Applicant shall:
    (a) commission a suitably qualified, experienced and independent person, whose appointment is acceptable to both parties, to investigate the claim; and
    (b) give the landowner a copy of the property investigation report.

    If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Applicant shall repair the damages to the satisfaction of the Secretary.

    If there is a dispute over the selection of the suitably qualified, experienced and independent person, or the Applicant or landowner disagrees with the findings of the independent property investigation, either party may refer the matter to the Secretary for resolution.

Operating Conditions

14. The Applicant shall:
    (a) implement best management practice to:
        - protect the safety of people and livestock in the surrounding area;
        - protect public infrastructure and private property in the surrounding area from any damage; and
        - minimise the dust and fume emissions of any blasting;
    (b) ensure that blasting on the site does not damage Aboriginal cultural heritage site CTS-1;
    (c) minimise the frequency and duration of any required road closures; and
    (d) operate a suitable system to enable the public to get up-to-date information on the proposed blasting Schedule on site,

    to the satisfaction of the Secretary.

15. The Applicant shall not undertake blasting within 500 metres of:
    (a) any public road; or
    (b) any land outside of the site not owned by the Applicant,

    unless the Applicant has:
        - demonstrated to the satisfaction of the Secretary that the blasting can be carried out closer to the road or land without compromising the safety of people or livestock, or damaging buildings and/or structures; and
        - updated the Blast Management Plan to include the specific measures that would be implemented while blasting is being carried out within 500 metres of the land or road; or
        - a written agreement with the landowner or GSC (in the case of any public road) to allow blasting to be carried out closer to the land or road, and the Applicant has advised the Department in writing of the terms of this agreement.

Blast Management Plan

16. The Applicant shall prepare and implement a Blast Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the EPA and submitted to the Secretary for approval at least 3 months prior to the commencement of mining operations in the new mining areas, unless otherwise agreed by the Secretary;
    (b) describe the measures that would be implemented to ensure compliance with the blasting criteria and operating conditions of this consent;
    (c) propose and justify any alternative ground vibration limits for public infrastructure in the vicinity of the site (if relevant);
    (d) include a monitoring program for evaluating and reporting on compliance with the blasting criteria and operating conditions; and
    (e) include a specific blast fume management protocol to demonstrate how emissions will be minimised including risk management strategies if blast fumes are generated.

AIR QUALITY

Odour

17. The Applicant shall ensure that no offensive odours, as defined under the POEO Act, are emitted from the site.

Air Quality Criteria

18. The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 6 at any residence on privately-owned land.

Note:
"Reasonable and feasible avoidance measures" includes, but is not limited to, the operational requirements in conditions 23 and 24 to develop and implement a real-time air quality management system that ensures operational responses to the risks of exceedance of the criteria.

Table 6: Air quality criteria

Pollutant	***Averaging Period***	***Criterion***	
Particulate matter < 10 µm (PM_{10})	Annual	[a,d] 30 µg/m^3	
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3	
Total suspended particulates (TSP)	Annual	[a,d] 90 µg/m^3	
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a,d] 4 g/m^2/month

Notes to Table 6:
a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).
[b] Incremental impact (ie increase in concentrations due to the development alone, with zero allowable exceedances of the criteria over the life of the development.
[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

Mitigation Measures

19. If the development causes an exceedance of the air quality criteria in Table 6, the Applicant shall, upon receiving a written request for air quality mitigation measures from the landowner, undertake air quality mitigation measures directed towards reducing the potential human health and amenity impacts of the development at a residence. These measures may include (for example):
    (a) air conditioning, including heating;
    (b) insulation;
    (c) first flush water systems;
    (d) installation and regular replacement of water filters;
    (e) cleaning of rainwater tanks;
    (f) clothes dryers; and
    (g) regular cleaning or any residence and its related amenities, such as barbeque areas and swimming pools.

    If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Mine-owned Land

20. The Applicant shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria in Table 6 at any occupied residence on mine-owned land unless:
    (a) the tenant and landowner (if the residence is owned by another mining or petroleum company) has been notified of any health risks associated with such exceedances in accordance with the notification requirements under Schedule 4 of this consent;
    (b) the tenant of any land owned by the Applicant can terminate their tenancy agreement without penalty at any time, subject to giving reasonable notice;
    (c) air mitigation measures such as those listed in condition 19 are installed at the residence, if requested by the tenant or landowner (if the residence is owned by another mining or petroleum company);
    (d) air quality monitoring is regularly undertaken to inform the tenant or landowner (where owned by another mining or petroleum company) of the actual particulate emissions at the residence; and

(e) data from this monitoring is presented to the tenant or landowner in an appropriate format for a medical practitioner to assist the tenant and/or landowner (where owned by another mining or petroleum company) in making informed decisions on health risks associated with occupying the property,

to the satisfaction of the Secretary.

Air Quality Acquisition Criteria

21. If particulate matter emissions generated by the development exceed the criteria, or contribute to an exceedance of the cumulative criteria, in Table 7 at any residence on privately-owned land, or on more than 25% of any privately owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls, then upon receiving a written request for acquisition from the landowner the Applicant shall acquire the land in accordance with the procedures in conditions 5-6 of Schedule 4.

Table 7: Air quality land acquisition criteria

Pollutant	***Averaging Period***	***Criterion***	
Particulate matter < 10 µm (PM_{10})	Annual	[a,d] 30 µg/m^3	
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3	
Total suspended particulates (TSP)	Annual	[a,d] 90 µg/m^3	
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a,d] 4 g/m^2/month

Notes to Table 7:
a Cumulative impact (ie increase in concentrations due to the development plus background concentrations due to all other sources).
[b] Incremental impact (ie increase in concentrations due to the development alone, with up to 5 allowable exceedances of the criteria over the life of the development.
[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

Operating Conditions

22. The Applicant shall:
    (a) implement best practice management to minimise the off-site odour, fume and dust emissions of the development;
    (b) implement all reasonable and feasible measure to minimise the release of greenhouse gas emissions from the site;
    (c) minimise the surface disturbance of the site;
    (d) minimise any visible off-site air pollution generated by the development;
    (e) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting, predictive and real-time air dispersion modelling and real-time air quality monitoring data to guide the day-to-day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures (such as relocate, modify and/or suspend) to ensure compliance with the relevant conditions of this consent; and
    (f) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 6 and 7 above),

    to the satisfaction of the Secretary.

Air Quality Management Plan

23. The Applicant shall prepare and implement an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the EPA, and submitted to the Secretary for approval prior to 31 December 2015, unless otherwise agreed by the Secretary;
    (b) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;
    (c) describe the proposed air quality management system; and
    (d) include an air quality monitoring program that:

- uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the development against the air quality criteria in this consent;
- adequately supports the proactive and reactive air quality management system;
- evaluates and reports on:
  - the effectiveness of the air quality management system; and
  - compliance with the air quality operating conditions; and
- defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.

METEOROLOGICAL MONITORING

24. For the life of the development, the Applicant shall ensure that there is a meteorological station in the vicinity of the site that:
    (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline and the *NSW Industrial Noise Policy*; and
    (b) is capable of continuous real-time measurement of temperature lapse rate data that are able to be transformed accurately and repeatably, and no more favourably, to those that would be obtained by the use of a 60 m tower,
    to the satisfaction of the EPA.

SOIL AND WATER

Water Supply

25. The Applicant shall ensure that it has sufficient water for all stages of the development, and if necessary, adjust the scale of operations on site to match its available water supply.

    Note: Under the Water Act 1912 and/or the Water Management Act 2000, the Applicant is required to obtain the necessary water licences for the development.

Compensatory Water Supply

26. The Applicant shall provide a compensatory water supply to the owner of any privately-owned land whose water supply is adversely and directly impacted (other than a negligible impact) as a result of the development, in consultation with DPIE Water, and to the satisfaction of the Secretary.

    The compensatory water supply measures must provide an alternative long-term supply of water that is equivalent to the loss attributed to the development. Equivalent water supply should be provided (at least on an interim basis) within 24 hours of the loss being identified.

    If the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

    If the Applicant is unable to provide an alternative long-term supply of water, then the Applicant shall provide alternative compensation to the satisfaction of the Secretary.

Water Pollution

27. Unless an EPL authorises otherwise, the Applicant shall comply with Section 120 of the POEO Act.

Irrigation

28. The Applicant shall only carry out irrigation on parts of the site that drain directly to mine water storages, and in accordance with the relevant requirements of an approved Water Management Plan.

Avondale and Dog Trap Creeks

29. The Applicant shall not carry out any mining operations within 40 metres of Avondale or Dog Trap Creeks, with the exception of the construction and/or use of the proposed and existing haul road crossings of Avondale Creek shown in the figure(s) in Appendix 3.

30. The Applicant shall improve the riparian habitat along Avondale Creek to the satisfaction of the Secretary. These improvements must be made within the area of the proposed Biodiversity Enhancement Area (see Appendix 8) and include the re-establishment of flora species characteristic of the Cabbage Gum open forest vegetation community.

Offsite Water Transfer

30A. The Applicant may allow a public authority to collect and transport water offsite by road:
a) where this water is intended for use for a public purpose; and
b) up to a maximum rate of 25 road registered water trucks per day.

Notes:
- *The transport and use of water by the public authority may be subject to separate regulatory requirements, including processes under Part 5 of the EP&A Act, and relevant controls, restrictions and/or exemptions under the POEO Act.*
- *This condition does not restrict or affect water that may be taken under the provisions of the Rural Fires Act 1997."*

Water Management Performance Measures

31. The Applicant shall comply with the performance measures in Table 8 to the satisfaction of the Secretary.

Table 8: Water Management Performance Measures

Feature	***Performance Measure***
Water Management – General	• Minimise the use of clean water on site • Maximise as far as reasonable and feasible the separation of clean and dirty water within the site
Construction and operation of linear infrastructure	• Design, install and maintain erosion and sediment controls generally in accordance with the series *Managing Urban Stormwater: Soils and Construction including Volume 1, Volume 2A – Installation of Services and Volume 2C – Unsealed Roads* • Design, install and maintain infrastructure within 40 m of watercourses generally in accordance with the *Guidelines for Controlled Activities on Waterfront Land (July 2012), or its latest version* • Design, install and maintain creek crossings generally in accordance with the *Policy and Guidelines for Fish Friendly Waterway Crossings (NSW Fisheries 2003)* and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings (NSW Fisheries 2003), or their latest versions*
Mine Sediment Dams	• Design, install and maintain the dams generally in accordance with the series *Managing Urban Stormwater: Soils and Construction – Volume 1* and *Volume 2E – Mines and Quarries*
Clean Water Diversion and Storage Infrastructure	• Maximise as far as reasonable and feasible the diversion of clean water around disturbed areas on site • Design, install and maintain the clean water system to capture and convey the 1 in 100 year ARI flood
Stream diversion of tributary of Avondale Creek	• Design, install and maintain the tributary diversion to convey the modelled peak water flows for its altered catchment • Establish and maintain geomorphic stability of the diversion channel using appropriate revegetation and stabilisation techniques • Demonstrate that the channel is appropriately vegetated and stabilised prior to the release of flows into the diversion channel • Control water flows entering the diversion channel by the construction of a stormwater detention basin
Mine Water Storages and out-of-pit emplacement of potentially acid-forming materials	• No discharges to surface waters • Adequate freeboard to minimise the risk of discharge to surface waters
In-pit emplacement of CHPP rejects and potentially acid forming materials	• Emplacement, and/or encapsulation and/or capping to prevent or minimise the migration of pollutants beyond the pit shell or seepage from out-of-pit emplacement areas • Emplacement of CHPP rejects below the predicted post-mining groundwater level • Adequate freeboard within the pit to minimise the risk of discharge to surface waters
Chemical and petroleum storage	• Chemical and hydrocarbon products to be stored in bunded areas in accordance with relevant Australian Standards
Aquatic and riparian ecosystem, in the Avon River and its tributaries, particularly	• Develop site-specific in-stream water quality objectives in accordance with ANZECC 2000 and *Using the ANZECC Guidelines and Water Quality Objectives in NSW* (DECC 2006),

Feature	*Performance Measure*
Avondale and Dog Trap Creeks	or their latest versions

Water Management Plan

32. The Applicant shall prepare and implement a Water Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with the EPA and DPIE Water, by suitably qualified and experienced person/s whose appointment has been approved by the Secretary;
    (b) be submitted to the Secretary for approval prior to 31 December 2015, unless otherwise agreed by the Secretary; and
    (c) in addition to the standard requirements for management plans (see condition 3 of Schedule 5), include a:
        (i) Site Water Balance, that:
            - includes details of:
                - sources and security of water supply, including details of Water Access Licences held, and contingency supply for future reporting periods;
                - water use and management on site;
                - any off-site water discharges; and
                - reporting procedures, including the preparation of a site water balance for each calendar year; and
            - investigates and implements all reasonable and feasible measures to minimise water use on site;
        (ii) Surface Water Management Plan, that includes:
            - detailed baseline data on water flows and quality in the watercourses that could potentially be affected by the development;
            - a detailed description of the water management system, including the:
                - clean water diversion systems;
                - erosion and sediment controls (mine water system); and
                - mine water management systems, including irrigation areas;
            - detailed plans, including design objectives and performance criteria for:
                - design and management of final voids;
                - design and management for the emplacement of coal reject materials and potential acid-forming or sulfate-generating materials;
                - management of sodic and dispersible soils;
                - diversion of the key tributary of Avondale Creek;
                - reinstatement of drainage lines on the rehabilitated areas of the site; and
                - control of any potential water pollution from the rehabilitated areas of the site;
            - performance criteria for the following, including trigger levels for investigating any associated potentially adverse impacts:
                - mine water management system;
                - downstream surface water quality;
                - downstream flooding impacts, and
                - stream and riparian vegetation health for the Avon River and its tributaries, including Avondale and Dog Trap Creeks;
            - a program to monitor and report on:
                - effectiveness of the mine water management system;
                - effectiveness of the stream diversion for the key tributary of Avondale Creek;
                - surface water flows (with a focus on base flow and low flows) and quality in the watercourses potentially affected by the development; and
                - downstream flooding impacts;
            - reporting procedures for the results of the monitoring program; and
            - a plan to respond to any exceedences of the performance criteria, and repair, mitigate and/or offset any adverse surface water impacts of the development;
        (iii) Groundwater Management Plan that includes:
            - detailed baseline data of groundwater levels, yield and quality in the region that could be affected by the development, including licensed privately-owned groundwater bores and a detailed survey/Schedule of groundwater dependent ecosystems;
            - groundwater assessment criteria including trigger levels for investigating any potentially adverse groundwater impacts;
            - a program to monitor and report on:
                - groundwater inflows to the open cut pits;
                - the seepage/leachate from water storages, emplacements and final voids;
                - background changes in groundwater yield/quality against mine-induced changes; and
                - impacts of the development on:

- regional and local (including alluvial) aquifers;
- groundwater supply of potentially affected landowners; and
- groundwater dependent ecosystems and riparian vegetation;

- a program to validate the groundwater model for the development, including an independent review of the model every 3 years, and comparison of monitoring results with modelled predictions; and
- a plan to respond to any exceedences of the performance criteria; and

(iv) protocol that has been prepared in consultation with the owners of nearby resource developments, including the Gloucester Gas Project, to:

- minimise and manage the cumulative water quality and quantity impacts of these developments;
- review opportunities for water sharing/water transfers between these developments;
- co-ordinate water quality monitoring programs as far as practicable;
- undertake joint investigations/studies in relation to complaints/exceedences of trigger levels where cumulative impacts are considered likely; and
- co-ordinate modelling programs for validation, re-calibration and re-running of the groundwater and surface water models using approved mine and gas production operation plans.

Note: The protocol can be developed in stages and will need to be subject to ongoing review, dependent upon the determination of, and commencement of, other mining developments in the area.

BIODIVERSITY

Biodiversity Offset Strategy

33. The Applicant shall implement the biodiversity offset strategy described in the EIS, summarised in Table 9 and shown conceptually in Figure 1 in Appendix 8, to the satisfaction of the Secretary.

Table 9: Summary of the biodiversity offset strategy

Area	***Offset Type***	***Minimum Size (ha)***
Biodiversity Offset Area, including Offset Areas 1, 2, 3 and 4	Existing vegetation to be enhanced and additional vegetation to be established.	935 Includes 490 ha of existing native vegetation.
Biodiversity Enhancement Area	Existing vegetation to be enhanced and additional vegetation to be established, including Cabbage Gum open forest within the Avondale Creek riparian area.	240
Rehabilitation Area	Native woodland vegetation communities to be re-established.	350

Note: For the purposes of this consent the vegetation community referred to in the EIS as Cabbage Gum open forest on flats of the North Coast or New England Tablelands is considered equivalent to Subtropical Coastal Rainforest of the NSW North Coast Bioregion EEC under the TSC Act.

Enhancement of Biodiversity Offset Strategy

34. At least 3 months prior to the commencement of mining operations in the new mining areas, the Applicant shall notify the owner of Property 44 (Cross / Jane) that they may request the Applicant to acquire their property. Upon receiving a written request from the owner to acquire their property, the Applicant shall acquire this property in accordance with conditions 5 and 6 of Schedule 4.

Should the Applicant acquire Property 44, then the property, exclusive of the residence and its immediate surrounds, shall be added to the Biodiversity Offset Strategy for the development described in condition 34 above, and managed in accordance with the requirements applicable to this Strategy.

Should the Applicant not acquire Property 44 in accordance with this condition, then the Applicant shall use its best endeavours to enter into an agreement with the owner that conserves, enhances and provides long-term security for the native vegetation on the property. This agreement must require that the vegetation on this property is managed in accordance with the Biodiversity Management Plan in condition 40.

Cabbage Gum Open Forest

35. The Applicant shall ensure the establishment of vegetation in the Biodiversity Offset Area and Biodiversity Enhancement Area includes the establishment of flora species characteristic of the Cabbage Gum Open Forest community as described in the note below Table 9.

Long Term Security of Offset

36. Prior to 30 June 2016, unless the Secretary agrees otherwise, the Applicant shall make suitable arrangements to protect the Biodiversity Offset Area in perpetuity to the satisfaction of the Secretary.

Note: For the purposes of this consent suitable arrangements may include a biobanking agreement or the use of Public Positive Covenants in combination with Restrictions In Use of Land on the land titles of the Offset lands. Other arrangements such as dedication of land under the National Parks and Wildlife Act 1974, Trust Agreements under the Nature Conservation Trust Act 2001 or a Property Vegetation Plan registered on title under the Native Vegetation Act 2003 would be considered for their suitability by the Secretary.

Habitat for Threatened Fauna Species

37. The Applicant shall ensure that the Biodiversity Offset Area and Biodiversity Enhancement Area provides suitable habitat for all the threatened fauna species recorded in the surface development area, namely the:
    - Glossy-black Cockatoo;
    - Speckled Warbler;
    - Grey-crowned Babbler (eastern subspecies);
    - Varied Sittella;
    - Brush-tailed Phascogale;
    - Squirrel Glider;
    - Long-nosed Potoroo; and
    - New Holland Mouse.

Squirrel Glider Management Plan

38. The Applicant shall prepare and implement a Squirrel Glider Management Plan to the satisfaction of the Secretary. This Plan must be prepared in consultation with BCD and approved by the Secretary prior to any clearing within 500 metres of a Squirrel Glider colony and shall include:
    (a) measures to establish the home range of each colony;
    (b) a census of suitable tree hollows in home ranges and offset areas suitable for Squirrel Gliders;
    (c) establishing the food resources utilised by each colony;
    (d) measures to enhance food resources utilised by Squirrel Gliders, particularly for Offset Area 1;
    (e) a vegetation clearing protocol to protect individual Squirrel Gliders;
    (f) relocation of trees containing suitable tree hollows;
    (g) installation of suitable nest boxes at a ratio of least 3:1 for each suitable hollow destroyed by the development and their long term management;
    (h) measures to assess the rate of tree hollow development within the Offset Areas;
    (i) implementation of Yancoal's proposed Glider crossings of haul roads with the establishment of suitable vegetation adjacent to each crossing;
    (j) implementation of Yancoal's proposals to enhance vegetation, particularly in Offset Area 3, to create recruitment and dispersal pathways for Squirrel Gliders; and
    (k) installation of Gliders crossings of The Bucketts Way and Main Northern Railway, should Yancoal acquire Property 44, unless their installation is prevented by the relevant transport authority.

Biodiversity Management Plan

39. The Applicant shall prepare and implement a Biodiversity Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared in consultation with BCD, and be submitted to the Secretary for approval prior to 31 December 2015;
    (b) describe the short, medium, and long-term measures that would be implemented to:
        - manage the remnant vegetation and habitat on the site; and
        - implement the biodiversity offset strategy;
    (c) include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy, and triggering remedial action (if necessary);
    (d) include a detailed description of the measures that would be implemented over the next 3 years for:
        - enhancing the quality of existing vegetation and fauna habitat;
        - establishing native vegetation and fauna habitat in the Biodiversity Offset Area, Biodiversity Enhancement Area and Rehabilitation Area through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features (where necessary);
        - enhancing the landscaping of the site and along public roads to minimise visual and lighting impacts, particularly along Glen Road;
        - protecting vegetation and soil outside approved disturbance area;

- maximising the salvage of resources within the approved disturbance area – including vegetative and soil – for beneficial reuse in the biodiversity offset strategy;
- collecting and propagating seed;
- minimising the impacts to fauna on site, including undertaking pre-clearance surveys;
- managing any potential conflicts between the proposed restoration works in the Biodiversity Offset Area and any Aboriginal heritage values (both cultural and archaeological);
- managing salinity;
- controlling weeds and feral pests;
- controlling erosion;
- managing grazing and agriculture;
- controlling access; and
- managing bushfire risk;

(e) include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;

(f) identify the potential risks to the successful implementation of the biodiversity offset strategy, and include a description of the contingency measures that would be implemented to mitigate against these risks; and

(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan need to be substantially integrated for achieving biodiversity objectives for the rehabilitated mine-site.

Conservation Bond

40. By the end of June 2016, unless the Secretary agrees otherwise, the Applicant shall lodge a Conservation Bond with the Department to ensure that the Biodiversity Offset Strategy is implemented in accordance with the performance and completion criteria of the Biodiversity Management Plan.

The sum of the bond shall be determined by:

(a) calculating the full cost of implementing the Biodiversity Offset Strategy (other than land acquisition costs); and

(b) employing a suitably qualified quantity surveyor to verify the calculated costs.

If the Offset Strategy is completed generally in accordance with the completion criteria in the Biodiversity Management Plan to the satisfaction of the Secretary, the Secretary will release the bond.

If the offset strategy is not completed generally in accordance with the completion criteria in the Biodiversity Management Plan, the Secretary will call in all, or part of, the conservation bond, and arrange for the satisfactory completion of the relevant works.

Notes:

- *Alternative funding arrangements for long-term management of the biodiversity offset strategy, such as provision of capital and management funding as agreed by BCD as part of a Biobanking Agreement or transfer to conservation reserve estate can be used to reduce the liability of the conservation and biodiversity bond.*
- *The sum of the bond may be reviewed in conjunction with any revision to the biodiversity offset strategy.*

Bowens Road North Open Cut Offset Strategy

41. The Applicant shall implement the Bowens Road North Offset Strategy, as described in the modification application Bowens Road North Mod 4 and accompanying Environmental Assessment titled *Bowens Road North Open Cut June 2010 Modification*, in conjunction with the biodiversity offset strategy for the Duralie Extension Project, and comply with the relevant requirements for the implementation of this strategy in the Duralie Extension project approval (see MP 08_0203).

Note: The lands to which the Bowens Road North Offset Strategy applies are shown conceptually in Figure 2 of Appendix 8 and are located about 20 km south of the Stratford Mine and contiguous with more extensive lands of the Duralie Mine Offset Strategy.

HERITAGE

Protection of Aboriginal Sites

42. The Applicant shall ensure that the development does not cause any direct or indirect impact on identified Aboriginal sites located outside the approved disturbance area of the development on the site.

Heritage Management Plan

43. The Applicant shall prepare and implement a Heritage Management Plan for the development to the satisfaction of the Secretary. This plan must:
    (a) be prepared by suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;
    (b) be prepared in consultation with BCD and local Aboriginal stakeholders (in relation to the management of Aboriginal heritage values);
    (c) be submitted to the Secretary for approval prior to 31 December 2015, unless the Secretary agrees otherwise;
    (d) include the following:
        - a detailed archaeological salvage program for Aboriginal sites/objects within the approved disturbance area, including methodology and procedures/protocols for:
            - staged salvage, based on anticipated mine planning (sites OS-3, OS-4, OS-5, IF-1, IF-2, IF-3, IF-4 shown on the figure in Appendix 7);
            - salvage of scarred trees (sites ST-2; ST-4 shown on the figure in Appendix 7);
            - monitoring of topsoil stripping during construction associated with the Wenham Cox / Bowens Road realignment in the vicinity of Dog Trap Creek;
            - site assessment and reporting;
            - protection, storage, management and long-term protection of salvaged Aboriginal objects; and
            - addressing relevant statutory requirements under the *National Parks and Wildlife Act 1974*; and
        - a description of the measures that would be implemented for:
            - protecting, monitoring and managing Aboriginal sites outside the approved disturbance area (including sites OS-1, OS-2, ST-1, ST-3, IF-5, PAD-1, PAD-2, CTS-1 shown on the figure in Appendix 7);
            - maintaining and managing reasonable access for Aboriginal stakeholders to cultural heritage items on site and in the Biodiversity Offset Area;
            - managing the discovery of any human remains or previously unidentified Aboriginal objects on site, including (in the case of human remains) stop work provisions and notification protocols;
            - ongoing consultation with local Aboriginal stakeholders in the conservation and management of Aboriginal cultural heritage both on-site and in the Biodiversity Offset Area; and
            - ensuring any workers on site receive suitable heritage inductions prior to carrying out any activities which may disturb Aboriginal sites, and that suitable records are kept of these inductions.

TRANSPORT

Road Realignments

44. The Applicant shall construct the proposed realignment of:
    (a) Bowens Road to Wenham Cox Road to the east of the Avon North pit; and
    (b) Wheatleys Lane and Bowens Road to the west of the Roseville West pit extension,
    to the satisfaction of GSC.

Intersection Upgrades

45. Prior to 31 December 2015, unless the Secretary agrees otherwise, the Applicant shall:
    (a) improve the warning signage, re-paint line markings and install raised reflective markers at the intersection of the Stratford Mine Access Road and The Bucketts Way; and
    (b) upgrade/repair road drainage on the southwestern corner of the intersection of Wenham Cox Road and Wheatleys Lane to ensure it does not pose an unacceptable safety risk to traffic,
    to the satisfaction of GSC.

Road Maintenance – The Bucketts Way

46. From the commencement of mining operations in the new mining areas until their cessation, unless otherwise agreed by the Secretary, the Applicant shall pay GSC and GLC annual contributions for the maintenance and resealing of The Bucketts Way in accordance with the terms in Appendix 4.

Road Maintenance – Wenham Cox Road

47. From the commencement of mining operations in the new mining areas until their cessation, unless otherwise agreed by the Secretary, the Applicant shall pay GSC annual contributions for the maintenance of Wenham Cox Road. The contribution shall be based on the proportion of all heavy vehicles using this road

due to the Applicant's mining operations and exploration activities, or a figure of $5000 per annum (2014 dollars, subject to annual indexation in accordance with the CPI), as the Applicant decides. Any dispute about this condition shall be referred to the Secretary for resolution.

Transport Monitoring

48. The Applicant shall monitor and report on:
    (a) the amount of coal transported from the site; and
    (b) the date and time of each train movement to and from the site;
    to the satisfaction of the Secretary.

49. Prior to 31 December 2015, the Applicant shall submit a detailed Transport Monitoring Program for the development, which has been prepared in consultation with GSC and GLC, to the Secretary for approval. This Program shall monitor heavy vehicle movements to and from the mine and on The Bucketts Way to the north and south of the mine and require these data to be reported directly to the Applicant, GSC and GLC.

VISUAL

Operating Conditions

50. The Applicant shall:
    (a) implement all reasonable and feasible measures to minimise the visual and off-site lighting impacts of the development;
    (b) ensure no fixed outdoor lights shine above the horizontal;
    (c) ensure no in-pit mobile lighting rigs shine above the pit wall and other mobile lighting rigs do not shine above the horizontal;
    (d) ensure that all external lighting associated with the development complies with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting* or its latest version;
    (e) provide for the establishment and monitoring of trees and shrubs:
        - along the Glen Road; and
        - at other areas identified as necessary for the maintenance of satisfactory visual amenity; and
    (f) ensure that the visual appearance of all buildings, structures, facilities or works (including paint colours and specifications) is aimed at blending as far as possible with the surrounding landscape,
    to the satisfaction of the Secretary**.**

BUSHFIRE MANAGEMENT

51. The Applicant shall:
    (a) ensure that the development is suitably equipped to respond to any fires on site; and
    (b) assist the Rural Fire Service, emergency services and National Parks and Wildlife Service as much as possible if there is a fire in the surrounding area.

WASTE

52. The Applicant shall:
    (a) implement all reasonable and feasible measures to minimise the waste (including coal reject) generated by the development;
    (b) ensure that the waste generated by the development is appropriately stored, handled and disposed of; and
    (c) monitor and report on the effectiveness of waste minimisation and management measures in the Annual Review.

REHABILITATION

Rehabilitation Objectives

53. The Applicant shall rehabilitate the site to the satisfaction of the Resources Regulator. This rehabilitation must be generally consistent with the proposed Rehabilitation Strategy described in the EIS (and depicted conceptually in Appendix 8) and comply with the objectives in Table 10.

Table 10: Rehabilitation objectives

Feature	***Objective***
Mine site (as a whole)	Safe, stable and non-polluting Constructed landforms drain to the natural environment Minimise visual impact of final landforms as far as is

Feature	*Objective*
	reasonable and feasible and be sympathetic to the original Gloucester valley landform
Final voids	Minimise the size and depth of final voids so far as is reasonable and feasible Minimise the drainage catchment of final voids so far as is reasonable and feasible Minimise high wall instability risk so far as is reasonable and feasible The size and depth of final voids must be designed having regard to their function as long-term groundwater sinks, to maximise groundwater flows across back-filled pits to the void and to not be a source of saline groundwater for aquifers and streams Designed and constructed to ensure adequate freeboard to ensure no spillage under any foreseeable conditions Minimise risk of flood interaction for all flood events up to and including the Probable Maximum Flood
Surface infrastructure	To be decommissioned and removed, unless the Deputy Secretary, Resources and Energy agrees otherwise
Agricultural land	Establish a minimum of 300 hectares of land with Class 4 agricultural suitability
Other land	Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprising: • a wildlife corridor (shown as Biodiversity Enhancement Area in the figure in Appendix 8); • local native plant species; and • a landform consistent with the surrounding environment
Stratford and Glen heritage railway corridors	Road and transmission alignments to avoid heritage railway corridors Rehabilitation activities to avoid or minimise impacts
Community	Ensure public safety, with an emphasis on final voids Minimise the adverse socio-economic effects associated with mine closure

Progressive Rehabilitation

54. The Applicant shall progressively rehabilitate the site, including the Western Co-disposal Area, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim rehabilitation strategies must be employed where areas prone to dust generation are not subject to active mining operations but cannot yet be permanently rehabilitated.

    Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.

Rehabilitation Management Plan

55. The Applicant shall prepare and implement a Rehabilitation Management Plan to the satisfaction of the Resources Regulator. This plan must:
    (a) be prepared in consultation with the Department, DPIE Water, BCD, and GSC;
    (b) be submitted to the Resources Regulator for approval at least 3 months prior to the commencement of mining operations in the new mining areas; unless the Resources Regulator agrees otherwise;
    (c) be prepared in accordance with any relevant DRG guideline;
    (d) describe how the rehabilitation of the site would be integrated with the implementation of the biodiversity offset strategy;
    (e) include detailed performance and completion criteria for evaluating the performance of the rehabilitation of the site, and triggering remedial action (if necessary);

(f) describe the measures that would be implemented to ensure compliance with the relevant conditions of this consent, and address all aspects of rehabilitation including mine closure, final landform and final land use;
(g) include interim rehabilitation where necessary to minimise the area exposed for dust generation;
(h) include a program to monitor, independently audit and report on the effectiveness of the rehabilitation measures and progress against the detailed performance and completion criteria; and
(i) build to the maximum extent practicable on the other management plans required under this consent.

Note: The Biodiversity Management Plan and Rehabilitation Management Plan require substantial integration to achieve biodiversity objectives for the rehabilitated mine site.

SCHEDULE 4
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS/TENANTS

1. Within 1 month of the date of this consent, unless the Secretary agrees otherwise, the Applicant shall:
   (a) notify in writing the owners of:
      - the land listed in Table 1 of Schedule 3 that they have the right to require the Applicant to acquire their land at any stage during the development;
      - any residence listed in condition 2 of Schedule 3, including those on the land listed in Table 1 of Schedule 3, that they have the right to request the Applicant for additional noise mitigation measures to be installed at their residence at any stage during the development; and
      - any privately-owned land within 2 kilometres of the approved open cut mining pit/s that they are entitled to ask for an inspection to establish the baseline condition of any buildings or structures on their land, or to have a previous property inspection report updated;
   (b) notify the tenants of any mine-owned land of their rights under this consent; and
   (c) send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the owners and/or existing tenants of any land (including mine-owned land) where the predictions in the EIS identify that dust emissions generated by the development are likely to be greater than the relevant air quality criteria in Schedule 3 at any time during the life of the development.

2. Prior to entering into any tenancy agreement for any land owned by the Applicant that is predicted to experience exceedances of the recommended dust and/or noise criteria, or for any of the land listed in Table 1 that is subsequently purchased by the Applicant, the Applicant shall:
   (a) advise the prospective tenants of the potential health and amenity impacts associated with living on the land, and give them a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time); and
   (b) advise the prospective tenants of the rights they would have under this consent,
   to the satisfaction of the Secretary.

3. As soon as practicable after obtaining monitoring results showing:
   (a) an exceedance of any relevant criteria in Schedule 3, the Applicant shall notify affected landowners in writing of the exceedance, and provide regular monitoring results to each affected landowner until the development is again complying with the relevant criteria; and
   (b) an exceedance of the relevant air quality criteria in Schedule 3, the Applicant shall send a copy of the NSW Health fact sheet entitled "Mine Dust and You" (as may be updated from time to time) to the affected landowners and/or existing tenants of the land (including the tenants of any mine-owned land).

INDEPENDENT REVIEW

4. If an owner of privately-owned land considers the development to be exceeding the criteria in Schedule 3, then he/she may ask the Secretary in writing for an independent review of the impacts of the development on his/her land.

   If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision, the Applicant shall:
   (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Secretary, to:
      - consult with the landowner to determine his/her concerns;
      - conduct monitoring to determine whether the development is complying with the relevant impact assessment criteria in Schedule 3; and
      - if the development is not complying with these criteria then:
         - determine if more than one mine or development is responsible for the exceedance, and if so the relative share of each mine or development regarding the impact on the land; and
         - identify the measures that could be implemented to ensure compliance with the relevant criteria; and
   (b) give the Secretary and landowner a copy of the independent review.

   Should noise monitoring undertaken under this condition, and/or regular noise compliance monitoring at a residence, indicate that the development is responsible for sustained exceedances of the noise criteria in Table 4 of Schedule 3 (defined as 3 or more exceedances within a 2 year period) then the Applicant must offer the landowner additional noise mitigation measures in accordance with, condition 2 of Schedule 3.

LAND ACQUISITION

5. Within 3 months of receiving a written request from a landowner with acquisition rights, the Applicant shall make a binding written offer to the landowner based on:
   (a) the current market value of the landowner's interest in the land at the date of this written request, as if the land was unaffected by the development, having regard to the:
      - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
      - presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of additional noise and/or air quality mitigation measures under Schedule 3;
   (b) the reasonable costs associated with:
      - relocating within the Gloucester or Great Lakes local government area, or to any other local government area determined by the Secretary; and
      - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is to be acquired; and
   (c) reasonable compensation for any disturbance caused by the land acquisition process.

   However, if at the end of this period, the Applicant and landowner cannot agree on the acquisition price of the land and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.

   Upon receiving such a request, the Secretary will request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to:
   - consider submissions from both parties;
   - determine a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above;
   - prepare a detailed report setting out the reasons for any determination; and
   - provide a copy of the report to both parties.

   Within 14 days of receiving the independent valuer's report, the Applicant shall make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.

   However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Secretary for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Secretary will determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above, the independent valuer's report, the detailed report of the party that disputes the independent valuer's determination and any other relevant submissions.

   Within 14 days of this determination, the Applicant shall make a binding written offer to the landowner to purchase the land at a price not less than the Secretary's determination.

   If the landowner refuses to accept the Applicant's binding written offer under this condition within 6 months of the offer being made, then the Applicant's obligations to acquire the land shall cease, unless the Secretary determines otherwise.

6. The Applicant shall pay all reasonable costs associated with the land acquisition process described in condition 5 above, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at the Office of the Registrar-General.

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT, REPORTING AND AUDITING

ENVIRONMENTAL MANAGEMENT

Environmental Management Strategy

1. The Applicant shall prepare and implement an Environmental Management Strategy for the development to the satisfaction of the Secretary. This strategy must:
   (a) be submitted to the Secretary for approval at least 3 months prior to the commencement of mining operations in the new mining areas, unless the Secretary agrees otherwise;
   (b) provide the strategic framework for environmental management of the development;
   (c) identify the statutory approvals that apply to the development;
   (d) describe the role, responsibility, authority and accountability of all key personnel involved in the environmental management of the development;
   (e) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the operation and environmental performance of the mining complex;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise;
      - respond to any non-compliance;
      - respond to emergencies; and
   (f) include:
      - copies of any strategies, plans and programs approved under the conditions of this consent; and
      - a clear plan depicting all the monitoring to be carried out in relation to the development.

Adaptive Management

2. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 3. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.

   Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:
   (a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;
   (b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
   (c) implement remediation measures as directed by the Secretary,
   to the satisfaction of the Secretary.

Management Plan Requirements

3. The Applicant shall ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:
   (a) detailed baseline data;
   (b) a description of:
      - the relevant statutory requirements (including any relevant approval, licence or lease conditions);
      - any relevant limits or performance measures/criteria;
      - the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;
   (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;
   (d) a program to monitor and report on the:
      - impacts and environmental performance of the development;
      - effectiveness of any management measures (see c above);
   (e) a contingency plan to manage any unpredicted impacts and their consequences;
   (f) a program to investigate and implement ways to improve the environmental performance of the development over time;
   (g) a protocol for managing and reporting any:
      - incidents;
      - complaints;
      - non-compliances with statutory requirements; and
      - exceedances of the impact assessment criteria and/or performance criteria; and
   (h) a protocol for periodic review of the plan.

Annual Review

4. By the end of March each year, or other timing as may be agreed by the Secretary, the Applicant shall review the environmental performance of the development to the satisfaction of the Secretary. This review must:
   (a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
   (b) include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, which includes a comparison of these results against the:
      - the relevant statutory requirements, limits or performance measures/criteria;
      - the monitoring results of previous years; and
      - the relevant predictions in the EIS;
   (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
   (d) identify any trends in the monitoring data over the life of the development;
   (e) identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the next year to improve the environmental performance of the development.

Revision of Strategies, Plans and Programs

5. Within 3 months of:
   (a) the submission of an annual review under Condition 4 above;
   (b) the submission of an incident report under Condition 7 below;
   (c) the submission of an audit report under Condition 9 below; or
   (d) any modification to the conditions of this consent, (unless the conditions require otherwise),

   the Applicant shall review the strategies, plans, and programs required under this consent, to the satisfaction of the Secretary. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

   Note: The purpose of this condition is to ensure that strategies, plans and programs are regularly updated to incorporate any measures recommended to improve environmental performance of the development.

Community Consultative Committee

6. The Applicant shall operate a Community Consultative Committee (CCC) for the development to the satisfaction of the Secretary. This CCC must be operated in general accordance with the *Guidelines for Establishing and Operating Community Consultative Committees for Mining Projects* (Department of Planning, 2007, or its latest version).

   Notes:
   - *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Applicant complies with this consent; and*
   - *The CCC should be comprised of an independent chair and appropriate representation from the Applicant, GSC, recognised environmental groups and the local community to the satisfaction of the Secretary.*

REPORTING

Incident Reporting

7. The Applicant shall notify, at the earliest opportunity, the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment. For any other incident associated with the development, the Applicant shall notify the Secretary and any other relevant agencies as soon as practicable after the Applicant becomes aware of the incident. Within 7 days of the date of the incident, the Applicant shall provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.

Regular Reporting

8. The Applicant shall provide regular reporting on the environmental performance of the development on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent.

INDEPENDENT ENVIRONMENTAL AUDIT

Independent Environmental Audit

9. Prior to 31 December 2015, and every 3 years thereafter, unless the Secretary directs otherwise, the Applicant shall commission and pay the full cost of an Independent Environmental Audit of the development. This audit must:
   (a) be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the development and assess whether it is complying with the requirements in this consent, and any other relevant approvals, relevant EPL/s and/or Mining Lease/s (including any assessment, plan or program required under these approvals);
   (d) review the adequacy of any approved strategy, plan or program required under the abovementioned approvals; and
   (e) recommend measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under these approvals.

   Note: This audit team must be led by a suitably qualified auditor, and include experts in noise, blasting, air quality, ecology, and any other fields specified by the Secretary.

10. Within 3 months of commissioning this audit, or as otherwise agreed by the Secretary, the Applicant shall submit a copy of the audit report to the Secretary, together with its response to any recommendations contained in the audit report.

ACCESS TO INFORMATION

11. The Applicant shall:
   (a) make the following information publicly available on its website:
      - the EIS;
      - all current statutory approvals for the development;
      - approved strategies, plans or programs required under the conditions of this consent;
      - a comprehensive summary of the monitoring results of the development, which have been reported in accordance with the various plans and programs approved under the conditions of this consent;
      - a complaints register, which is to be updated on a monthly basis;
      - minutes of CCC meetings;
      - the last five annual reviews;
      - any independent environmental audit, and the Applicant's response to the recommendations in any audit;
      - any other matter required by the Secretary; and
   (b) keep this information up to date,

   to the satisfaction of the Secretary.

APPENDIX 1
SCHEDULE OF LAND

Tenure Type	Lot Number	Deposited Plan Number
Freehold	59	979859
Freehold	1	241780
Freehold	74	979859
Freehold	2	241780
Freehold	1	997092
Freehold	1	531023
Freehold	20	1164626
Freehold	71	979859
Freehold	58	979859
Freehold	56A	979859
Freehold	56B	979859
Freehold	56C	979859
Freehold	56D	979859
Freehold	56E	979859
Freehold	1	861278
Freehold	57	979859
Freehold	72	979859
Freehold	54	979859
Freehold	B	116316
Freehold	75	979859
Freehold	3	1062249
Freehold	73	979859
Freehold	1	194827
Freehold	52	979859
Freehold	70	979859
Freehold	293	137520
Freehold	69	979859
Freehold	11	1139127
Freehold	12	1139127
Freehold	1	194827
Freehold	4	1062249
Freehold	A	116326
Freehold	66	1008585
Freehold	1	116325
Freehold	79	979859
Freehold	772	826955
Freehold	1	778861
Freehold	2	778861
Freehold	64	979859
Freehold	Part of 45	979859
Freehold	Part of 8	1139127
Freehold	Part of 9	1139127
Freehold	Part of 10	1139127
Freehold	Part of 63	1093998
Freehold	Part of 62	1093998
Freehold (Private subdivision road reserves or owned by Gloucester Shire Council)	Road located within and between the above parcels of land	N/A

APPENDIX 2
DEVELOPMENT SITE

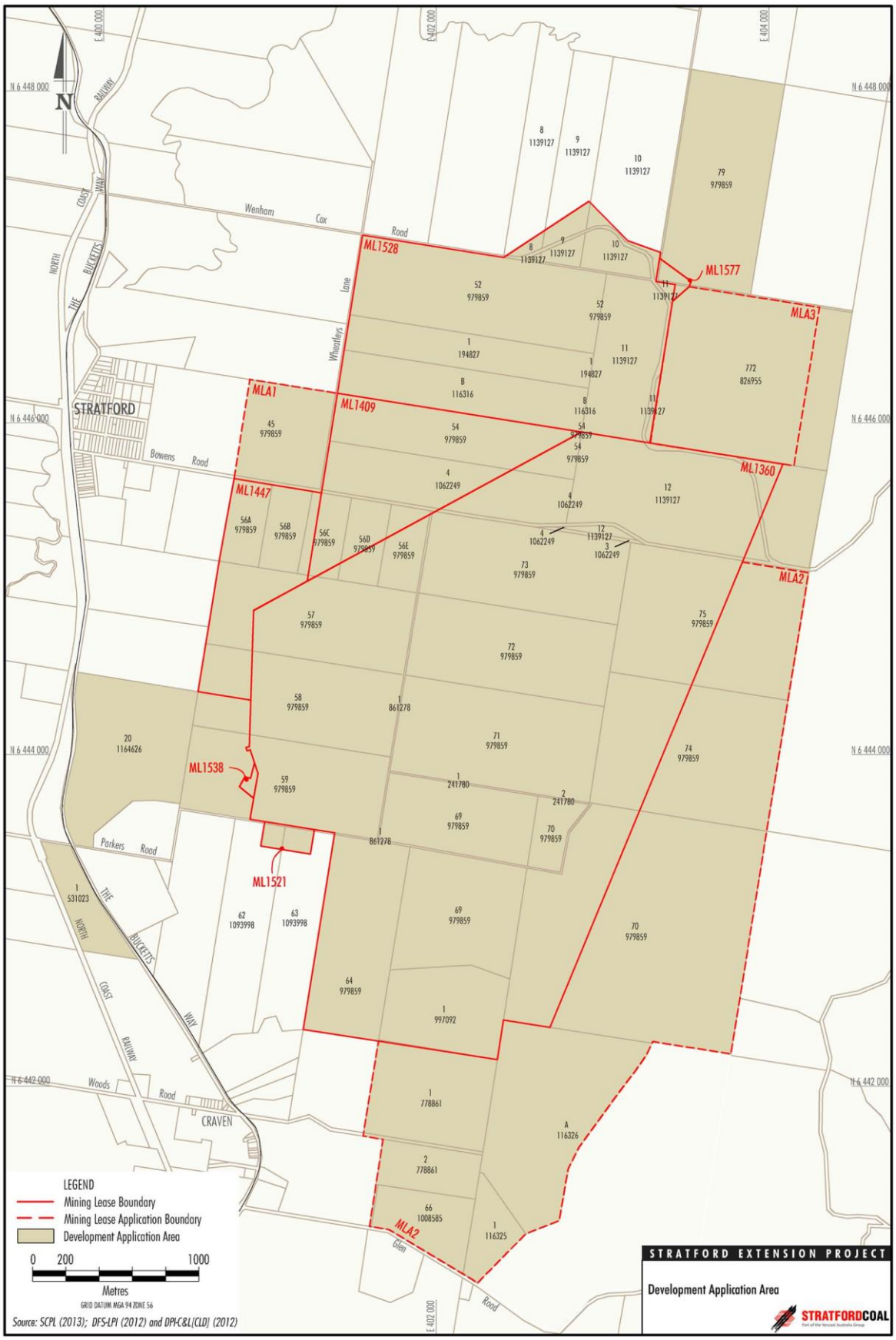


Figure 1: *Stratford Extension Project – Development Site*

APPENDIX 3
DEVELOPMENT LAYOUT

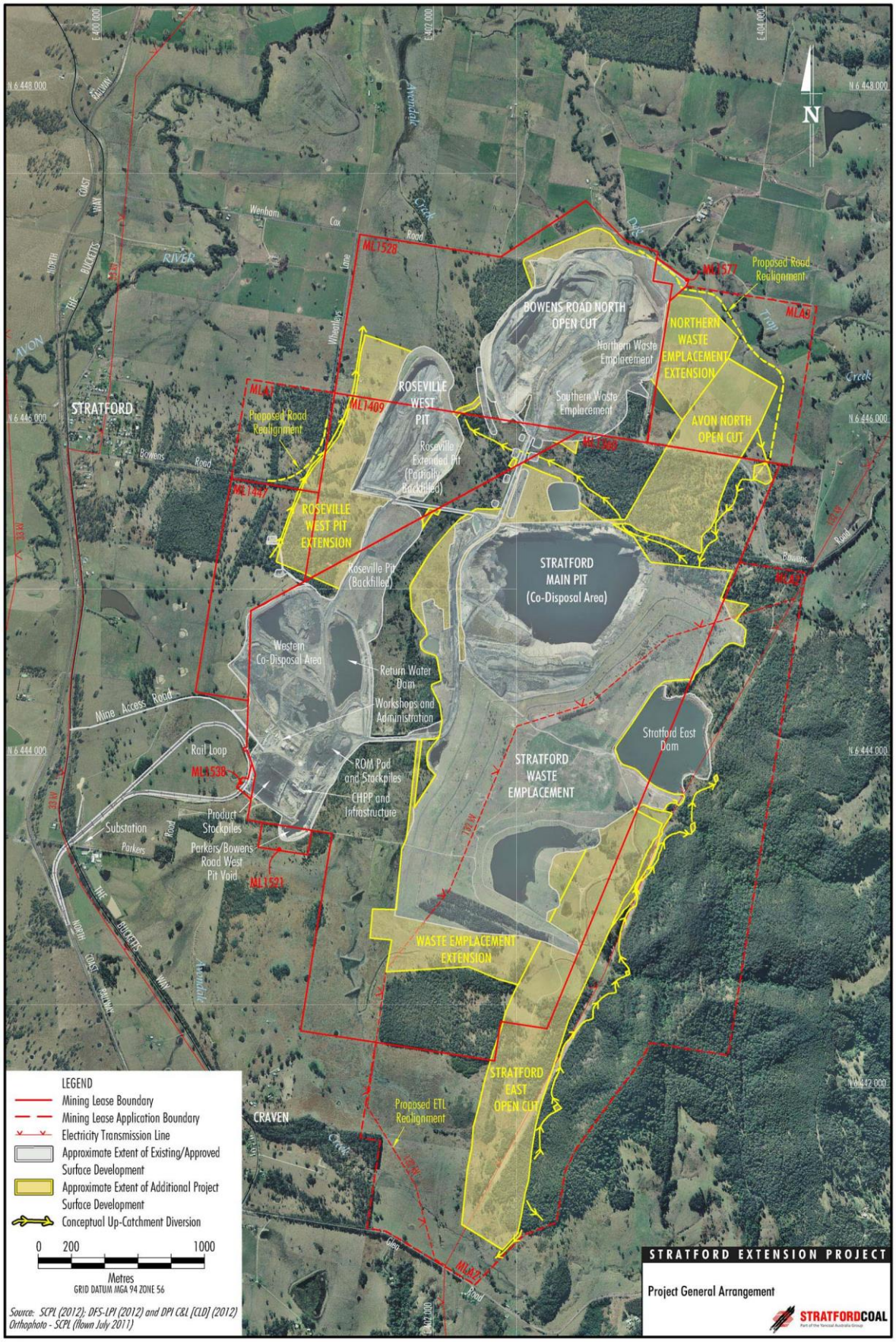


Figure 1: *General layout of the Stratford Extension Project*

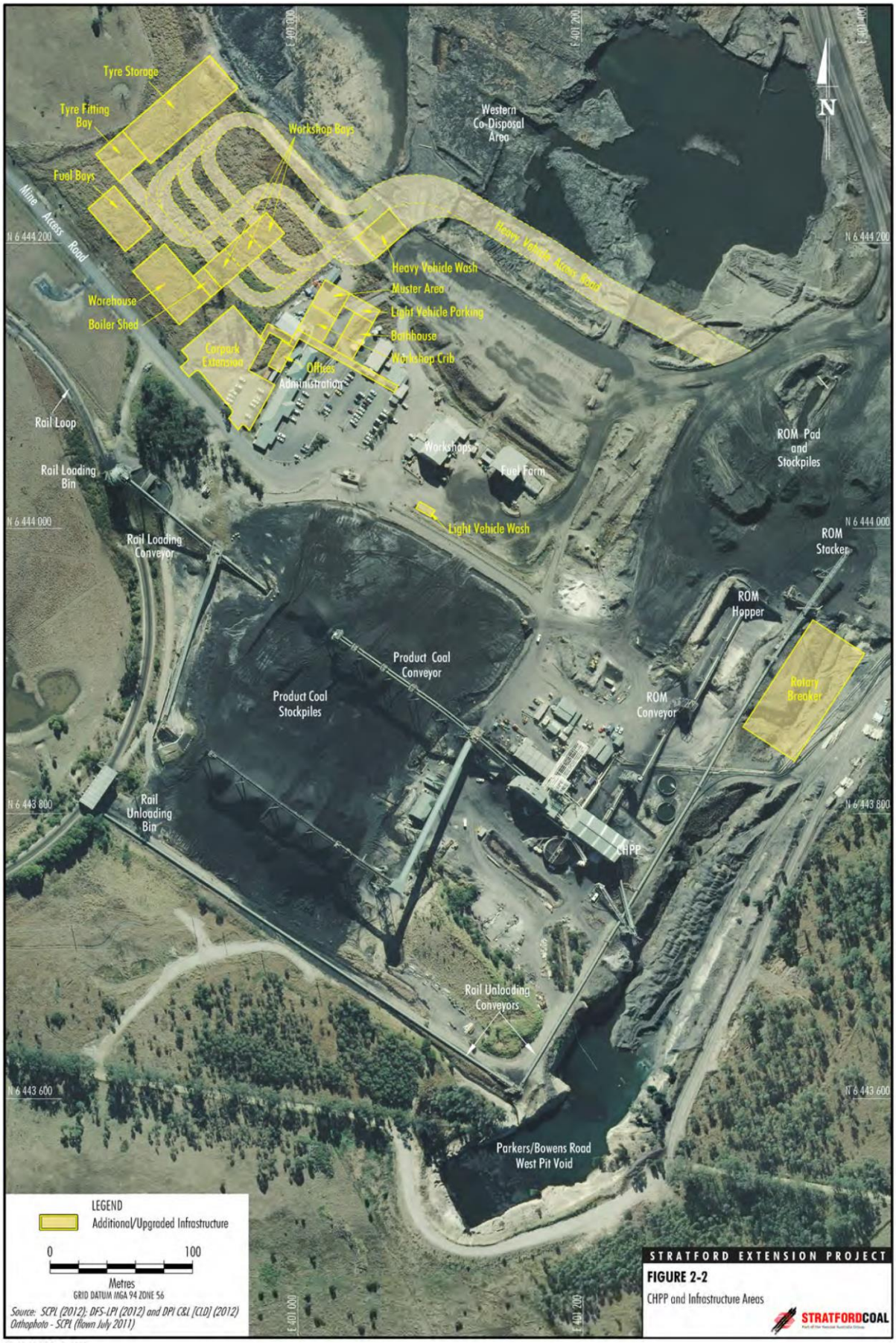


Figure 2: *General layout of infrastructure areas*

APPENDIX 4
MAINTENANCE AND RESEALING CONTRIBUTIONS FOR THE BUCKETTS WAY

The Applicant shall pay GSC and GLC annual contributions towards the maintenance and resealing of The Bucketts Way in accordance with the formulae in this appendix, with the first annual payment payable within 12 months of the date of commencement of mining operations under this consent, and additional payments on each following anniversary of the first payment, until the cessation of mining operations on the site under this consent. Each payment is to be calculated as follows:

Gloucester Shire Council:

The payment for the 19.25 km section of The Bucketts Way from the shire boundary with GLC to the town of Gloucester is based on total road maintenance contributions to GLC in the Duralie Coal Mine project approval converted to a per kilometre rate for this 19.25 km section.

The Duralie approval provides for a payment of $64,626.74 (in 2014) for the impacts of mine-generated heavy vehicle traffic over the 55 km length of The Bucketts Way within Great Lakes Shire. For 2014, this equates to a contribution of $1,175.03 / km.

Applying this rate within Gloucester Shire, the contribution base (2014 dollars) is:

19.25 km x $1,175.03 = $22,619.32.

The dollar values in this formula are subject to annual indexation in accordance with the CPI.

Great Lakes Council:

As GLC receives contributions to the upkeep of The Bucketts Way that is based on existing heavy vehicle traffic related to the Duralie Coal mine, GLC sought a contribution for road impacts based on the increase in heavy vehicle traffic caused by the Stratford Extension Project (6 additional truck movements within a total of 36 predicted truck movements generated from both Stratford and Duralie mines).

The contribution base (2014 dollars) is $64,626.74 x 6 /36 = $10,771.12

The dollar values in this formula are subject to annual indexation in accordance with the CPI.

APPENDIX 5
LAND OWNERSHIP

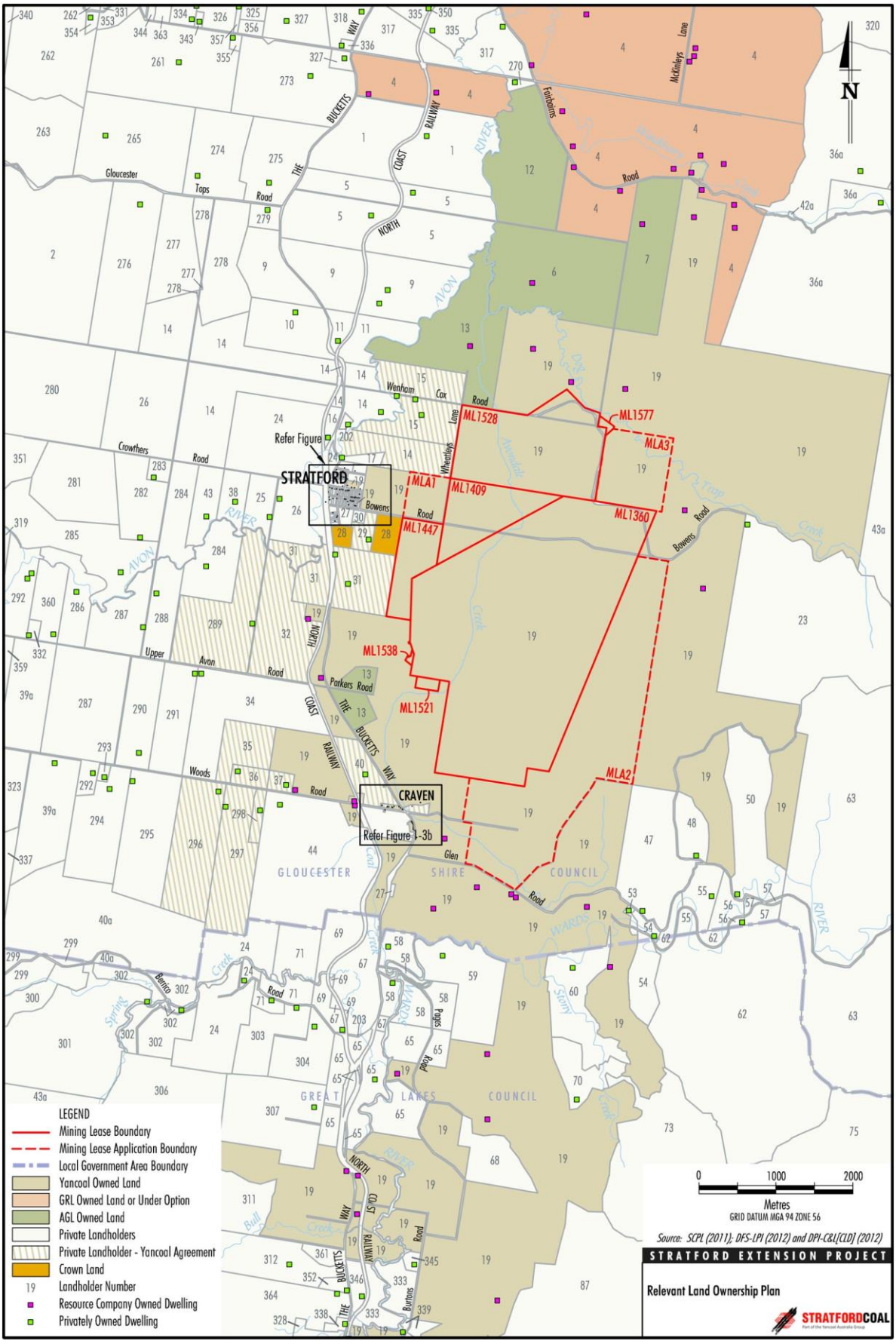


Figure 1a: *Land ownership for Stratford Extension Project and surrounds*

Figure 1b: *Land ownership for Stratford and Craven village areas*

Figure 1c: *Property owners for Figures 1a and 1b*

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 4 in Schedule 3 are to apply to a receiver under all meteorological conditions except under:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) temperature inversion conditions between 1.5°C and 3°C/100 m and wind speed greater than 2 m/s at 10 m above ground level; or
   (c) temperature inversion conditions greater than 3°C/100 m.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station required under condition 25 of Schedule 3.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times in each calendar year (ie at least once in every calendar month), unless the Secretary directs otherwise.

5. Unless the Secretary agrees otherwise, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment;
   (c) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration; and
   (d) the use of an appropriate modifying factor for low frequency noise to be applied during compliance testing at any individual residence if low frequency noise is present (in accordance with the INP) and before comparison with the specified noise levels in the consent.

APPENDIX 7
ABORIGINAL CULTURAL HERITAGE SITES

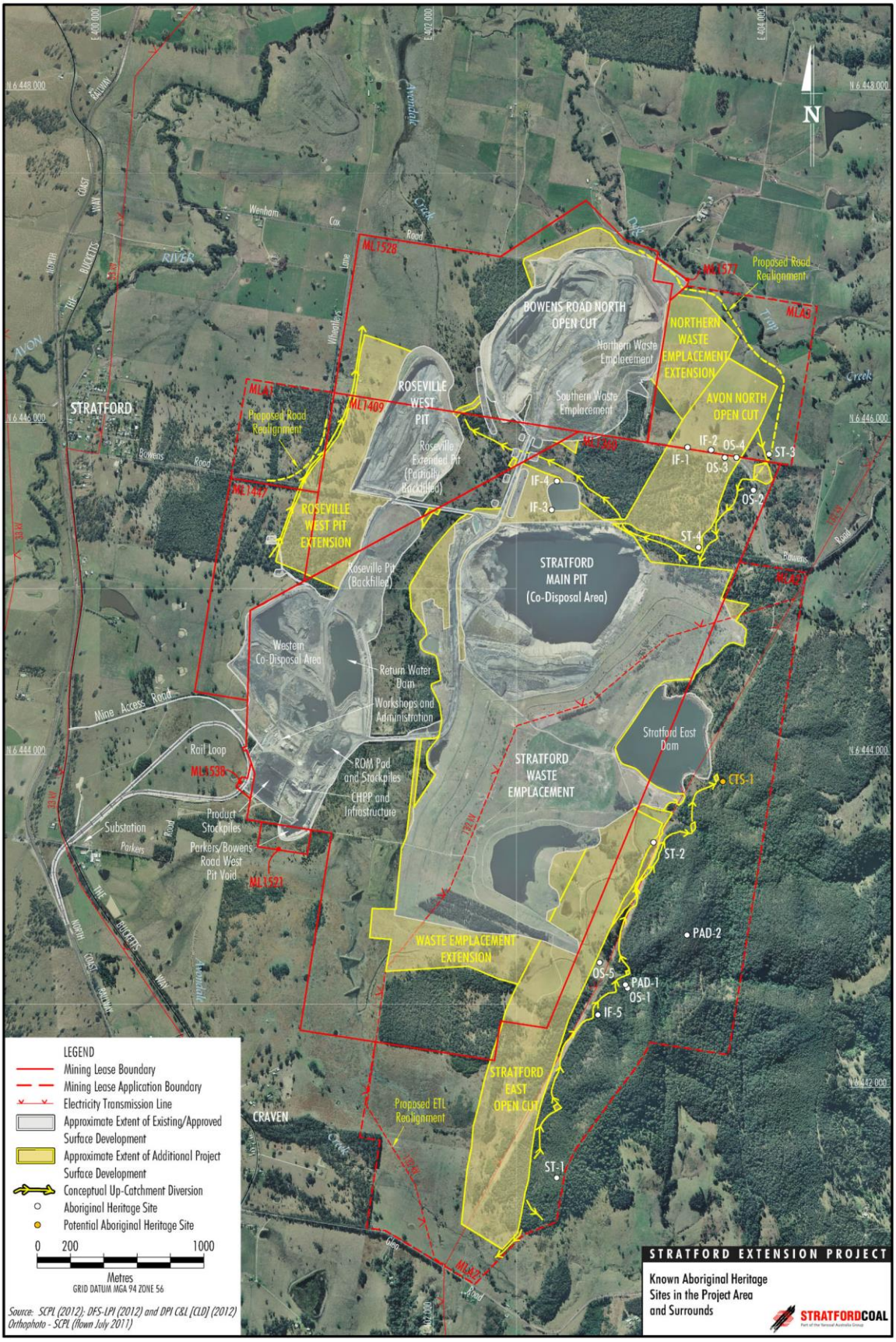


Figure 1: *Location of Aboriginal cultural heritage sites*

APPENDIX 8
STRATFORD BIODIVERSITY OFFSET AREAS

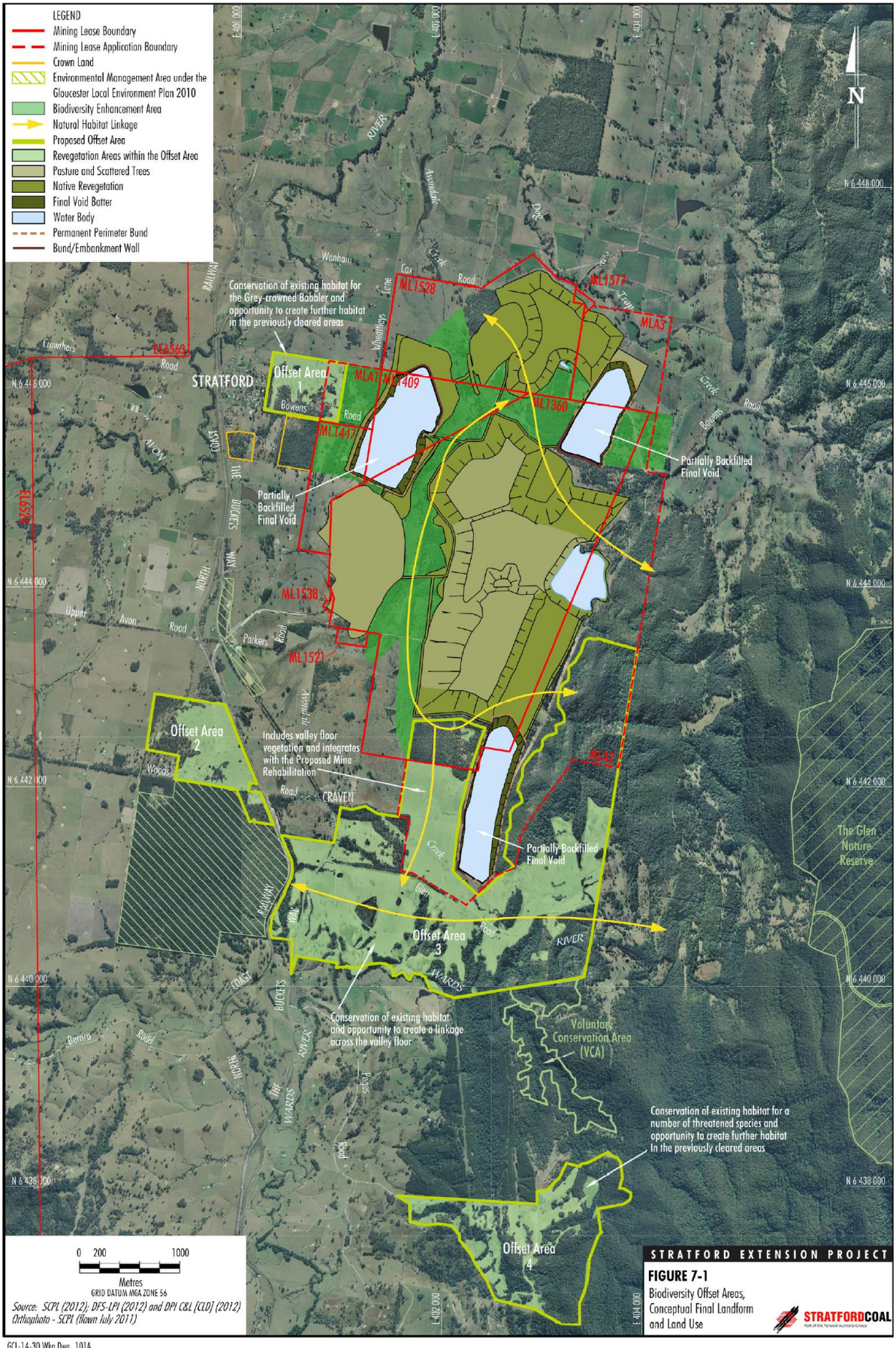


Figure 1: *Location of Stratford Biodiversity Offset Areas*

BOWENS ROAD NORTH OFFSET AREA

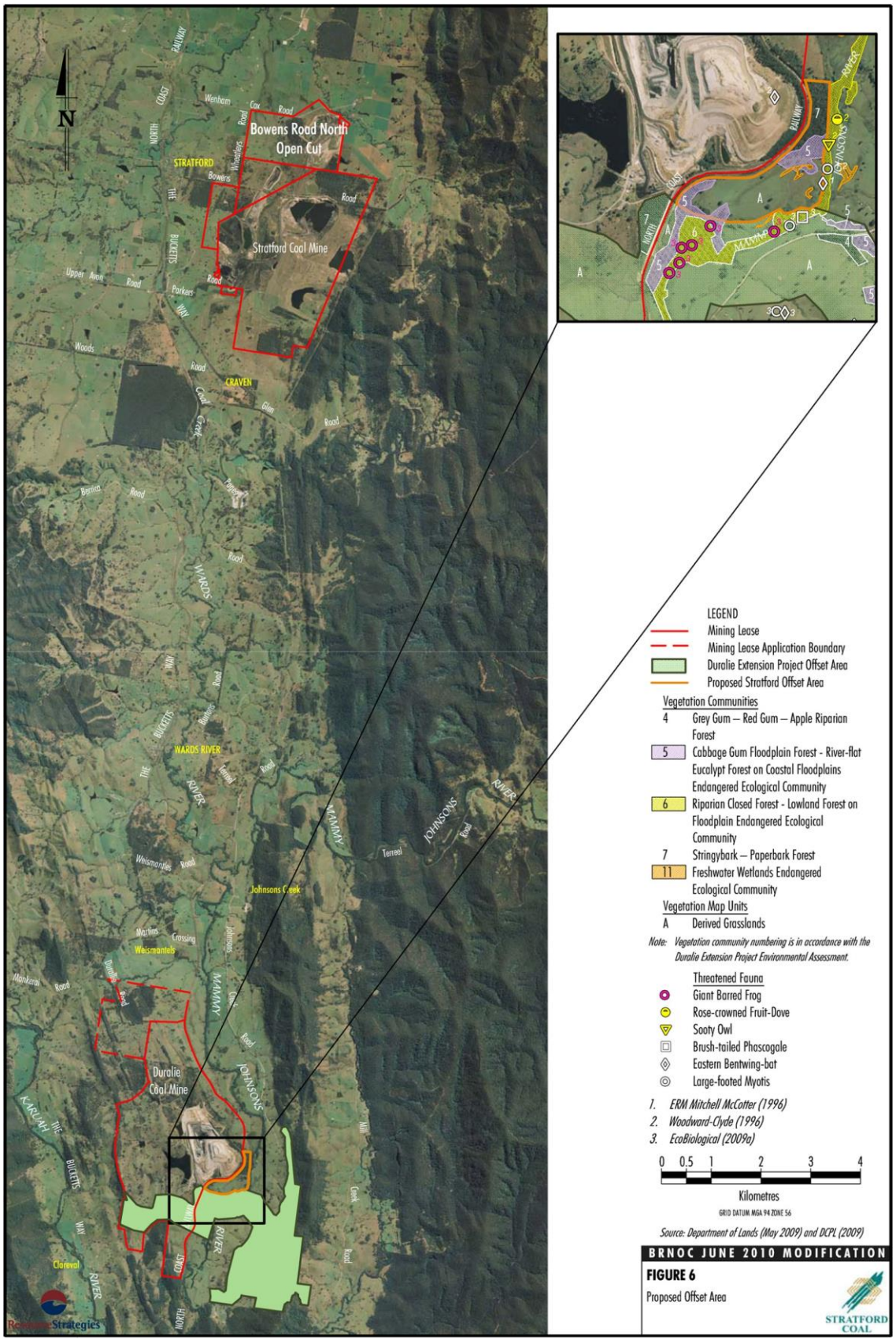


Figure 2: *Location of Bowens Road North Open Cut Offset Area (near Duralie mine)*

APPENDIX 9
STATEMENT OF COMMITMENTS

AGL Energy Limited (AGL)'s approved Gloucester Gas Project overlays and is adjacent to Stratford Coal Pty Ltd (SCPL)'s existing Stratford Mining Complex and proposed Stratford Extension Project. SCPL and AGL are in the process of negotiating terms of a cooperation agreement which would describe the manner in which these projects interact. SCPL's statement of commitments (SOC) in relation to the interaction of the Stratford Extension Project and Gloucester Gas Project are described hereunder.

SOC1:

SCPL will make every reasonable attempt, and be able to demonstrate its attempts, to enter into a cooperation agreement with the holder(s) of any overlapping petroleum title(s) within the Stratford Extension Project area prior to the grant of **MLA 1** and **MLA 2** as shown on Figure 1. The cooperation agreement will address but not be limited to issues such as:

- access arrangements;
- operation interaction procedures;
- dispute resolution;
- information exchange;
- well location;
- timing of drilling;
- potential resource interaction conflicts; and
- rehabilitation issues.

SOC2:

SCPL will make every reasonable attempt to ensure that the conservation agreements (or other mechanism under which the Stratford Extension Project Biodiversity Offsets are secured) authorise the location and operation of AGL's proposed wells CR24, CR26, CR27 and ST55 within the Stratford Extension Project Biodiversity Offsets properties as shown on Figure 1 (following).

SOC3a:

Upon receiving a written request from the owner of property 44 (Cross/Jane), SCPL will acquire property 44 or enter into a compensation agreement to the satisfaction of the owner, unless the owner of property 44 agrees otherwise. Within 1 month of the date of Development Consent, SCPL will notify the owner of property 44 that they may request SCPL acquire their property.

Should the owner elect to sell property 44, land acquisition will be based on the requirements of Schedule 4, condition 5 of the Development Consent.

Should the owner elect to sell property 44, it will be included in the biodiversity offset for the Project (i.e. it will be secured in perpetuity for conservation purposes).

SOC3b:

At the commencement of evening or night-time mining operations in the Stratford East Open Cut, upon receiving a written request from the owner of property 60 (Greenwood /Healy), SCPL will acquire property 60 or enter into a compensation agreement to the satisfaction of the owner, unless the owner of property 60 agrees otherwise.

At least 1 month prior to the commencement of evening or night-time mining operations in the Stratford East Open Cut, SCPL will notify the owner of property 60 that they may request SCPL acquire their property.

Should the owner elect to sell property 60, land acquisition will be based on the requirements of Schedule 4, Condition 5 of the Development Consent.

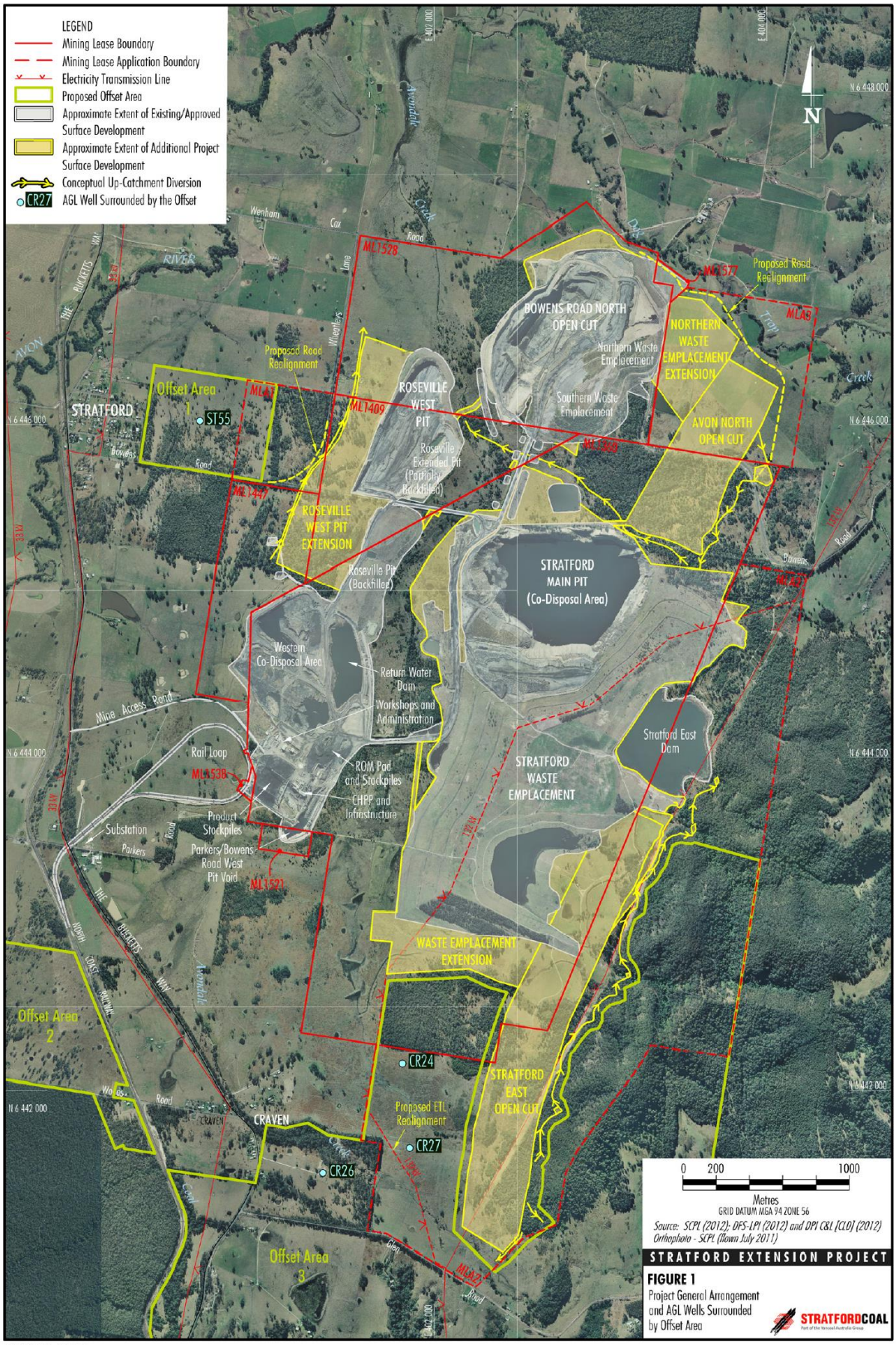


Figure 1: *Project General Arrangement and AGL Wells Surrounded by Offset Area*

ATTACHMENT 2

RELEVANT MINING LEASE CONDITION EXTRACTS

MINING LEASE

MINING ACT 1992

NO. 1360 (ACT 1992)

DATED
A.D. 19 21st DECEMBER 1994

THE MINISTER FOR MINES OF
THE STATE OF NEW SOUTH WALES
TO

CIM RESOURCES LTD
EXCEL MINING PTY LTD
ICA COAL PTY LTD

RECORDED in the Department of Mineral Resources at Sydney, this 22nd day of DECEMBER A.D. 1994, at the hour of 2 'clock in the AFTERnoon.

Director-General

DAMS AND ESCAPE OF WATER

8. [21]

Settling dams or other dams constructed or to be constructed on the subject area shall be constructed, maintained and sealed to the satisfaction of the Inspector.

9. [22]

The lease holder shall provide and maintain efficient means to prevent contaminated waters discharging or escaping from the subject area onto surrounding areas .

DUST AND CONVEYOR SYSTEMS

10.[23]
The lease holder shall take such precautions as are necessary to abate any dust nuisance.

11.[24]

The lease holder shall carry out regular inspections of above-ground conveyor systems and shall promptly remove any spillages.

MANAGEMENT AND REHABILITATION OF LANDS (GENERAL)

12.[27]

The lease holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof or the Minister and subject to such conditions as the Minister may stipulate.

13. [28]

The lease holder shall observe any instruction given or which may be given by the Minister with a view to minimising or preventing public inconvenience or damage to public or private property.

14. [29]

Subject to any specific condition of this authority providing for rehabilitation of any particular part of the subject area affected by mining or activities associated therewith, the lease holder shall;

(a) shape and revegetate to the satisfaction of the Minister, any part of the subject area that may, in the opinion of the Minister have been damaged or deleteriously affected by mining operations and ensure such areas are permanently stabilised, and,

(b) reinstate and make safe, including sealing and/or fencing, any excavation within the subject area.

15. [30]

If required to do so by the Minister and within such time as may be stipulated by the Minister the lease holder shall carry out to the satisfaction of the Minister surveys of structures, buildings and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.

16. [31]

(a) The lease holder shall each year once operations have commenced, submit for the Minister's approval an "Annual Environmental Management Report" relating to the operations of the lease holder on the subject area.

(b) The date by which the Report must be submitted will be determined by the Minister after consulting with the lease holder.

(c) The Report shall comprise:

(i) a plan showing short, medium and long term mining plans;

(ii) a rehabilitation report (in respect of open cut operations) and/or a surface environmental management report (in respect of underground operations);

(iii) a review of performance in terms of Environment Protection Authority and Department of Water Resources licence and approval conditions (related to the Clean Air Act 1961, the Clean Waters Act 1970, the Noise Control Act 1975, the Environmentally Hazardous Chemical Act 1985, the Pollution Control Act 1970 and the Water Act 1912) applicable to the subject area;

(iv) a review of performance in terms of Development Consent conditions for the subject area;

(v) a listing of any variations obtained to approvals applicable to the subject area during the previous year.

(d) The Minister may, by notice in writing, direct the lease holder to undertake any operations or remedial actions in such manner and within such period as may be specified in that notice so as to ensure that operations on the subject area conform to the requirements of relevant statutory approvals or licences.

(e) The lease holder shall conduct operations on the subject area in accordance with an "open cut application" approved by the Minister and any conditions contained in the Minister's approval of that application. Where the lease holder is of the opinion that the approved operations should be amended the lease holder shall submit an amendment for the Minister's approval.

17.[32]

If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by the lease holder.

18. [33]

Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.

19. [34]

If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.

20. [35]

The lease holder shall maintain the subject area in a clean and tidy condition at all times.

21. [36]

The lease holder shall take all precautions against causing outbreak of fire on the subject area.

Mining Lease No. 1407

N.S.W. STAMP DUTY
CL No. 221815 MINERAL MINING LEASE
1991 — 1992 — 1993-94-95-96-97

D.J. Campbell 8.1.97

MINING LEASE

MINING ACT 1992

NO. 1409

DATED 7th JANUARY A.D. 1997

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

STRATFORD COAL PTY LTD
ACN 064 016 164

RECORDED in the Department of Mineral Resources at Sydney, this 9th day of JANUARY A.D. 1997, at the hour of 1 o'clock in the ~~After~~ noon.

for Director-General

COPY

DUMPS

15 The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the dumping, depositing or removal of material extracted as well as the stabilisation and revegetation of any dumps of coal, minerals, mine residues, tailings or overburden situated on the subject area or the associated colliery holding.

16 The lease holder shall comply with any direction given or which may be given by the Minister regarding the spraying of coal dumps on the subject area.

DUST

17 The lease holder shall take such precautions as are necessary to abate any dust nuisance.

NAGEMENT AND REHABILITATION OF LANDS (GENERAL)

18 The lease holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof or the Minister and subject to such conditions as the Minister may stipulate.

19 The lease holder shall observe any instruction given or which may be given by the Minister with a view to minimising or preventing public inconvenience or damage to public or private property.

20 If required to do so by the Minister and within such time as may be stipulated by the Minister the lease holder shall carry out to the satisfaction of the Minister surveys of structures, buildings and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.

21

(a) The lease holder shall each year once operations have commenced, submit for the Minister's approval an "Annual Environmental Management Report" relating to the operations of the lease holder on the subject area.

(b) The date by which the Report must be submitted will be determined by the Minister after consulting with the lease holder.

(c) The Report shall comprise:

(i) a plan showing short, medium and long term mining plans;

(ii) a rehabilitation report (in respect of open cut operations) and/or a surface environmental management report (in respect of underground operations);

(iii) a review of performance in terms of Environment Protection Authority and Department of Water Resources licence and approval conditions (related to the Clean Air Act 1961, the Clean Waters Act 1970, the Noise Control Act 1975, the Environmentally Hazardous Chemical Act 1985, the Pollution Control Act 1970 and the Water Act 1912) applicable to the subject area;

(iv) a review of performance in terms of Development Consent conditions for the subject area;

(v) a listing of any variations obtained to approvals applicable to the subject area during the previous year.

(d) The Minister may, by notice in writing, direct the lease holder to undertake any operations or remedial actions in such manner and within such period as may be specified in that notice so as to ensure that operations on the subject area conform to the requirements of relevant statutory approvals or licences.

(e) The lease holder shall conduct operations on the subject area in accordance with an "open cut application" approved by the Minister and any conditions contained in the Minister's approval of that application. Where the lease holder is of the opinion that the approved operations should be amended the lease holder shall submit an amendment for the Minister's approval.

22 If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.

23 Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.

If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.

25 The lease holder shall take all precautions against causing outbreak of fire on the subject area.

BLASTING

26 The lease holder shall monitor noise and vibration and institute controls, generally in accordance with the recommendations of Australian Standard AS-2187-1993 and ANZEC Guidelines.

N.S.W. STAMP DUTY
CL No. 1846988 COAL MINING LEASE
1997 ... 1998 ... 1999 6.4.99

MINING LEASE

MINING ACT 1992

NO. 1447

DATED 1st APRIL A.D. 1999

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

STRATFORD COAL PTY LTD
A.C.N. 064 016 164

RECORDED in the Department of Mineral
Resources at Sydney, this
6th day of April
A.D. 1999, at the hour of
10 o'clock in the fore noon.

J. Beattie
....
for Director General

SCHEDULE OF CONDITIONS OF AUTHORITY - 1998
(COAL)

MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP)

Mining Operations Plan (MOP)

2 (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:-

(a) ongoing mining operations and environmental management; and

(b) ongoing monitoring of the project.

(2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.

(3) A Plan must be lodged with the Director-General:-

(a) prior to the commencement of operations;

(b) subsequently as appropriate prior to the expiry of any current Plan; and

(c) in accordance with any direction issued by the Director-General.

(4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-

(a) area(s) proposed to be disturbed under the Plan;

(b) mining and rehabilitation method(s) to be used and their sequence;

(c) areas to be used for disposal of tailings/waste;

(d) existing and proposed surface infrastructure;

(e) progressive rehabilitation schedules;

(f) areas of particular environmental sensitivity;

(g) water management systems (including erosion and sediment controls);

(h) proposed resource recovery; and

(i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation

(5) The Plan when lodged will be reviewed by the Department of Mineral Resources.

(6) The Director-General may within two (2) months of the lodgement of a Plan, require modification and relodgement.

(7) If a requirement in accordance with clause (6) is not issued within two months of the lodgement of a Plan, lease holder may proceed with implementation of the Plan submitted subject to the lodgement of the required security deposit within the specified time.

(8) During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in (5) - (7) above.

3 Annual Environmental Management Report (AEMR)

(1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General.

(2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:-

(a) the accepted Mining Operations Plan;

(b) development consent requirements and conditions;

(c) Environment Protection Authority and Department of Land and Water Conservation licences and approvals;

(d) any other statutory environmental requirements;

(e) details of any variations to environmental approvals applicable to the lease area. and

(f) where relevant, progress towards final rehabilitation objectives.

(3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice.

MINING LEASE

MINING ACT 1992

NO. 1521

DATED 24 SEPT A.D. 2002

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

Gloucester Coal Ltd
A.C.N. 008 881 712
and
CIM Stratford Pty Ltd
A.C.N. 070 387 914

RECORDED in the Department of Mineral Resources at Sydney, this 24 day of SEPTEMBER A.D. 2002, at the hour of 3 o'clock in the afternoon.

.....
for Director General

SCHEDULE OF CONDITIONS OF AUTHORITY (COAL) (1999)

EXTRACTION OF COAL

1 The lease holder shall extract as large a percentage of the coal in the subject area as is practicable consistent with the provisions of the Coal Mines Regulations Act 1982 and the Regulations thereunder and shall comply with any direction given or which may be given in this regard by the Minister.

MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP)

MINING OPERATIONS PLAN (MOP)

2 (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:-

(a) ongoing mining operations and environmental management; and

(b) ongoing monitoring of the project.

(2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgment.

(3) A Plan must be lodged with the Director-General:-

(a) prior to the commencement of operations;

(b) subsequently as appropriate prior to the expiry of any current Plan; and

(c) in accordance with any direction issued by the Director-General.

(4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-

(a) area(s) proposed to be disturbed under the Plan;

(b) mining and rehabilitation method(s) to be used and their sequence;

(c) areas to be used for disposal of tailings/waste;

(d) existing and proposed surface infrastructure;

(e) progressive rehabilitation schedules;

(f) areas of particular environmental sensitivity;

(g) water management systems (including erosion and sediment controls);

(h) proposed resource recovery; and

(i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation

(5) The Plan when lodged will be reviewed by the Department of Mineral Resources.

(6) The Director-General may within two (2) months of the lodgement of a Plan, require modification and relodgement.

(7) If a requirement in accordance with clause (6) is not issued within two months of the lodgement of a Plan, lease holder may proceed with implementation of the Plan submitted subject to the lodgement of the required security deposit within the specified time.

(8) During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) - (7) above.

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT (AEMR)

3 (1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General.

(2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:-

(a) the accepted Mining Operations Plan;

(b) development consent requirements and conditions;

(c) Environment Protection Authority and Department of Land and Water Conservation licences and approvals;

(d) any other statutory environmental requirements;

(e) details of any variations to environmental approvals applicable to the lease area. and

(f) where relevant, progress towards final rehabilitation objectives.

(3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice.

N.S.W. STAMP DUTY
Cl. No. 1946958 COAL MINING LEASE
2003 2004 2005

MINING LEASE

MINING ACT 1992

NO. 1528

DATED 20 January A.D. 2003

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

Gloucester Coal Ltd
ACN. 008 881 712
And
CIM Stratford Pty Ltd
ACN. 070 387 914
And
ICA Coal Pty Limited
ACN 066 784 558

RECORDED in the Department of Mineral Resources at Sydney, this thirty-first day of January, A.D. 2003, at the hour of eleven o'clock in the forenoon.

.....
for Director General

SCHEDULE OF
CONDITIONS OF AUTHORITY 1999 (COAL)

EXTRACTION OF COAL

1 The lease holder shall extract as large a percentage of the coal in the subject area as is practicable consistent with the provisions of the Coal Mines Regulations Act 1982 and the Regulations thereunder and shall comply with any direction given or which may be given in this regard by the Minister.

MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP)

MINING OPERATIONS PLAN (MOP)

2 (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:-

(a) ongoing mining operations and environmental management; and

(b) ongoing monitoring of the project.

(2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgment.

(3) A Plan must be lodged with the Director-General:-

(a) prior to the commencement of operations;

(b) subsequently as appropriate prior to the expiry of any current Plan; and

(c) in accordance with any direction issued by the Director-General.

(4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-

(a) area(s) proposed to be disturbed under the Plan;

(b) mining and rehabilitation method(s) to be used and their sequence;

(c) areas to be used for disposal of tailings/waste;

(d) existing and proposed surface infrastructure;

(e) progressive rehabilitation schedules;

(f) areas of particular environmental sensitivity;

(g) water management systems (including erosion and sediment controls);

(h) proposed resource recovery; and

(i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation

(5) The Plan when lodged will be reviewed by the Department of Mineral Resources.

(6) The Director-General may within two (2) months of the lodgement of a Plan, require modification and relodgement.

(7) If a requirement in accordance with clause (6) is not issued within two months of the lodgement of a Plan, lease holder may proceed with implementation of the Plan submitted subject to the lodgement of the required security deposit within the specified time.

(8) During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) - (7) above.

ANNUAL ENVIRONMENTAL MANAGEMENT REPORT (AEMR)

3 (1) Within 12 months of the commencement of mining operations and thereafter annually or, at such other times as may be allowed by the Director-General, the lease holder must lodge an Annual Environmental Management Report (AEMR) with the Director-General.

(2) The AEMR must be prepared in accordance with the Director-General's guidelines current at the time of reporting and contain a review and forecast of performance for the preceding and ensuing twelve months in terms of:-

(a) the accepted Mining Operations Plan;

(b) development consent requirements and conditions;

(c) Environment Protection Authority and Department of Land and Water Conservation licences and approvals;

(d) any other statutory environmental requirements;

(e) details of any variations to environmental approvals applicable to the lease area. and

(f) where relevant, progress towards final rehabilitation objectives.

(3) After considering an AEMR the Director-General may, by notice in writing, direct the lease holder to undertake operations, remedial actions or supplementary studies in the manner and within the period specified in the notice to ensure that operations on the lease area are conducted in accordance with sound mining and environmental practice.

MINING LEASE

MINING ACT 1992

NO. 1538

DATED 25 JUNE A.D. 2003

THE MINISTER FOR MINERAL RESOURCES
OF THE STATE
OF NEW SOUTH WALES
TO

Gloucester Coal Ltd
A.C.N. 008 881 712

CIM Stratford Pty Ltd
A.C.N. 070 387 914

ICA Coal Pty Ltd
A.C.N. 066 784 558

RECORDED in the Department of Mineral Resources at Sydney, this 1st day of July A.D. 2003, at the hour of 10 o'clock in the [illegible] noon.

.....
for Director General

SCHEDULE OF
CONDITIONS OF AUTHORITY (COAL) (1999)

MINING, REHABILITATION, ENVIRONMENTAL MANAGEMENT PROCESS (MREMP)
MINING OPERATIONS PLAN (MOP)

2 (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:-

(a) ongoing mining operations and environmental management; and

(b) ongoing monitoring of the project.

(2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgment.

(3) A Plan must be lodged with the Director-General:-

(a) prior to the commencement of operations;

(b) subsequently as appropriate prior to the expiry of any current Plan; and

(c) in accordance with any direction issued by the Director-General.

(4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-

(a) area(s) proposed to be disturbed under the Plan;

(b) mining and rehabilitation method(s) to be used and their sequence;

(c) areas to be used for disposal of tailings/waste;

(d) existing and proposed surface infrastructure;

(e) progressive rehabilitation schedules;

(f) areas of particular environmental sensitivity;

(g) water management systems (including erosion and sediment controls);

(h) proposed resource recovery; and

(i) where the mine will cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining landuse/vegetation

(5) The Plan when lodged will be reviewed by the Department of Mineral Resources.

DUMPS

15 The lease holder shall comply with any direction, given or which may be given by the Inspector regarding the dumping, depositing or removal of material extracted as well as the stabilisation and revegetation of any dumps of coal, minerals, mine residues, tailings or overburden situated on the subject area or the associated colliery holding.

DUST

17 The lease holder shall take such precautions as are necessary to abate any dust nuisance.

MANAGEMENT AND REHABILITATION OF LANDS (GENERAL)

18 The lease holder shall not interfere in any way with any fences on or adjacent to the subject area unless with the prior written approval of the owner thereof or the Minister and subject to such conditions as the Minister may stipulate.

19 The lease holder shall observe any instruction given or which may be given by the Minister with a view to minimising or preventing public inconvenience or damage to public or private property.

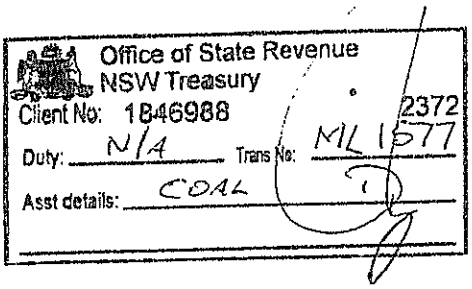
20 If required to do so by the Minister and within such time as may be stipulated by the Minister the lease holder shall carry out to the satisfaction of the Minister surveys of structures, buildings and pipelines on adjacent landholdings to determine the effect of operations on any such structures, buildings and pipelines.

21 If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister any lands within the subject area which may have been disturbed by the lease holder.

22 Upon completion of operations on the surface of the subject area or upon the expiry or sooner determination of this authority or any renewal thereof, the lease holder shall remove from such surface such buildings, machinery, plant, equipment, constructions and works as may be directed by the Minister and such surface shall be rehabilitated and left in a clean, tidy and safe condition to the satisfaction of the Minister.

23 If so directed by the Minister the lease holder shall rehabilitate to the satisfaction of the Minister and within such time as may be allowed by the Minister any lands within the subject area which may have been disturbed by mining or prospecting operations whether such operations were or were not carried out by the lease holder.

24 The lease holder shall take all precautions against causing outbreak of fire on the subject area.



MINING LEASE

MINING ACT 1992

NO **1577**

DATED **01 March 2006**

THE MINISTER FOR MINERAL RESOURCES

OF THE STATE

OF NEW SOUTH WALES

TO

GLOUCESTER COAL LTD
ACN 008 881 712
and
CIM STRATFORD PTY LTD
ACN 070 387 914

CONDITIONS OF AUTHORITY (ML) (2004)

Notice to Landholders

1. Within a period of three months from the date of grant/renewal of this lease or within such further time as the Minister may allow, the lease holder must serve on each landholder of the land a notice in writing indicating that this lease has been granted/renewed and whether the lease includes the surface. An adequate plan and description of the lease area must accompany the notice.

   If there are ten or more landholders affected, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this lease has been granted/renewed; state whether the lease includes the surface and must contain an adequate plan and description of the lease area.

Mining, Rehabilitation, Environmental Management Process (MREMP)

Mining Operations Plan (MOP)

2. (1) Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The Plan together with environmental conditions of development consent and other approvals will form the basis for:-

   (a) ongoing mining operations and environmental management; and

   (b) ongoing monitoring of the project.

   (2) The Plan must be prepared in accordance with the Director-General's guidelines current at the time of lodgement.

   (3) A Plan must be lodged with the Director-General:-

   (a) prior to the commencement of mining operations (including mining purposes);

   (b) subsequently as appropriate prior to the expiry of any current Plan; and

   (c) in accordance with any direction issued by the Director-General.

   (4) The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify:-

   (a) area(s) proposed to be disturbed under the Plan;

   (b) mining and rehabilitation method(s) to be used and their sequence;

   (c) areas to be used for disposal of tailings/waste;

   (d) existing and proposed surface infrastructure;

   (e) existing flora and fauna on the site;

   (f) progressive rehabilitation schedules;

MINING LEASE

MINING ACT 1992

NO 1787

DATED 05 JUNE 2019

THE MINISTER FOR REGIONAL
NEW SOUTH WALES, INDUSTRY
AND TRADE

OF THE STATE

OF NEW SOUTH WALES

TO

CIM Stratford Pty Ltd
ACN 070 387 914

and

Gloucester Coal Ltd
ACN 008 881 712

MINING LEASE CONDITIONS 2013

1. Notice to Landholders

(a) Within a period of three months from the date of grant/renewal of this mining lease, the lease holder must serve on each landholder a notice in writing indicating that this mining lease has been granted/renewed and whether the lease includes the surface. A plan identifying each landholder and individual land parcel subject to the lease area, and a description of the lease area must accompany the notice.

(b) If there are ten or more landholders, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this mining lease has been granted/renewed; state whether the lease includes the surface and must contain a plan and description of the lease area. If a notice is made under condition 1(b), compliance with condition 1(a) is not required.

2. Rehabilitation

Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.

3. Mining Operations Plan and Annual Rehabilitation Report

(a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting.

(b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which:

(i) identifies areas that will be disturbed;

(ii) details the staging of specific mining operations, mining purposes and prospecting;

(iii) identifies how the mine will be managed and rehabilitated to achieve the post mining land use;

(iv) identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and

(v) reflects the conditions of approval under:

- the *Environmental Planning and Assessment Act 1979;*
- the *Protection of the Environment Operations Act 1997;* and

- any other approvals relevant to the development including the conditions of this mining lease.

(c) The MOP must be prepared in accordance with the *ESG3: Mining Operations Plan (MOP) Guidelines September 2013* published on the Department's website at www.resourcesandenergy.nsw.gov.au/miners-and-explorers/rules-and-forms/pgf/environmental-guidelines

(d) The lease holder may apply to the Minister to amend an approved MOP at any time.

(e) It is not a breach of this condition if:

(i) the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the *Environmental Planning and Assessment Act 1979*, the *Protection of the Environment Operations Act 1997,* the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* or the *Work Health and Safety Act 2011*; and *Work Health and Safety Regulation 2011*

(ii) the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out.

(f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must:

(i) provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP;

(ii) be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and

(iii) be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resourcesandenergy.nsw.gov.au/miners-and-explorers/rules-and-forms/pgf/environmental-guidelines

Note: The Rehabilitation Report replaces the Annual Environmental Management Report.

4. Non-Compliance Reporting

(a) The lease holder must notify the Department upon becoming aware of any breaches of the conditions of this mining lease or breaches of the Mining Act or Regulations;

(b) Notifications under condition 4(a) must be provided in the form specified on the Department's website within seven (7) days of the mining lease holder becoming aware of the breach.

MINING LEASE

MINING ACT 1992

NO 1733

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8 APRIL 2016

THE MINISTER FOR INDUSTRY
RESOURCES AND ENERGY

OF THE STATE

OF NEW SOUTH WALES

TO

CIM STRATFORD PTY LTD
ACN 070 387 914
AND
GLOUCESTER COAL LTD
ACN 008 881 712

MINING LEASE CONDITIONS 2013

1. Notice to Landholders

(a) Within a period of three months from the date of grant/renewal of this mining lease, the lease holder must serve on each landholder a notice in writing indicating that this mining lease has been granted/renewed and whether the lease includes the surface. A plan identifying each landholder and individual land parcel subject to the lease area, and a description of the lease area must accompany the notice.

(b) If there are ten or more landholders, the lease holder may serve the notice by publication in a newspaper circulating in the region where the lease area is situated. The notice must indicate that this mining lease has been granted/renewed; state whether the lease includes the surface and must contain a plan and description of the lease area. If a notice is made under condition 1(b), compliance with condition 1(a) is not required.

2. Rehabilitation

Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.

3. Mining Operations Plan and Annual Rehabilitation Report

(a) The lease holder must comply with an approved Mining Operations Plan (MOP) in carrying out any significant surface disturbing activities, including mining operations, mining purposes and prospecting. The lease holder must apply to the Minister for approval of a MOP. An approved MOP must be in place prior to commencing any significant surface disturbing activities, including mining operations, mining purposes and prospecting.

(b) The MOP must identify the post mining land use and set out a detailed rehabilitation strategy which:

(i) identifies areas that will be disturbed;

(ii) details the staging of specific mining operations, mining purposes and prospecting;

(iii) identifies how the mine will be managed and rehabilitated to achieve the post mining land use;

(iv) identifies how mining operations, mining purposes and prospecting will be carried out in order to prevent and or minimise harm to the environment; and

(v) reflects the conditions of approval under:

- the *Environmental Planning and Assessment Act 1979;*
- the *Protection of the Environment Operations Act 1997;* and

- any other approvals relevant to the development including the conditions of this mining lease.

(c) The MOP must be prepared in accordance with the *ESG3: Mining Operations Plan (MOP) Guidelines September 2013* published on the Department's website at www.resources.nsw.gov.au/environment

(d) The lease holder may apply to the Minister to amend an approved MOP at any time.

(e) It is not a breach of this condition if:

(i) the operations which, but for this condition 3(e) would be a breach of condition 3(a), were necessary to comply with a lawful order or direction given under the *Environmental Planning and Assessment Act 1979*, the *Protection of the Environment Operations Act 1997,* the *Mine Health and Safety Act 2004 / Coal Mine Health and Safety Act 2002* and *Mine Health and Safety Regulation 2007 / Coal Mine Health and Safety Regulation 2006* or the *Work Health and Safety Act 2011*; and

(ii) the Minister had been notified in writing of the terms of the order or direction prior to the operations constituting the breach being carried out.

(f) The lease holder must prepare a Rehabilitation Report to the satisfaction of the Minister. The report must:

(i) provide a detailed review of the progress of rehabilitation against the performance measures and criteria established in the approved MOP;

(ii) be submitted annually on the grant anniversary date (or at such other times as agreed by the Minister); and

(iii) be prepared in accordance with any relevant annual reporting guidelines published on the Department's website at www.resources.nsw.gov.au/environment.

Note: The Rehabilitation Report replaces the Annual Environmental Management Report.

4. Compliance Report

(a) The lease holder must submit a Compliance Report to the satisfaction of the Minister. The report must be prepared in accordance with any relevant guidelines or requirements published by the Minister for compliance reporting.

(b) The Compliance Report must include:

(i) the extent to which the conditions of this mining lease or any provisions of the Act or the regulations applicable to activities under this mining lease, have or have not been complied with;

(ii) particulars of any non-compliance with any such conditions or provisions,

(iii) the reasons for any such non-compliance;

ATTACHMENT 3

SUMMARY OF EFA METHODOLOGY

Summary of EFA Methodology

The EFA monitoring methodology is a monitoring procedure that can be used to determine how well an ecosystem works as a biophysical system. The methodology is described in detail in *Assessing Rehabilitation Success Version 1.1* (Tongway, 2001), *Landscape Function Analysis: Procedures for Monitoring and Assessing Landscapes with Special Reference to Minesites and Rangelands Version 3.1* (Tongway and Hindley, 2004), *Landscape Function Analysis Field Procedures* (Tongway, 2008) and *Restoring Disturbed Landscapes: Putting Principles into Practice* (Tongway and Ludwig, 2011).

EFA comprises three components*:*

- Landscape Function Analysis;
- Vegetation Dynamics; and
- Habitat Complexity.

A summary of the EFA components derived from the references is provided below.

Landscape Function Analysis

Landscape Function Analysis (LFA) is a monitoring procedure that uses quickly determined field indicators to assess the functional status of a landscape. LFA provides a quantitative tool for management and monitoring a landscape. Data recorded as part of LFA monitoring are based on landscape processes and focus on the dynamics of resource mobilisation, transport, deposition, utilisation and soil condition.

The first step of LFA is to characterise the “landscape organisation” of each transect by identifying the “patch” and “interpatch” zones along each transect. A “patch” is an area (on the ground) which collects or restricts the flow of resources (e.g. water, topsoil or organic matter) and an “interpatch” area (also on the ground) generally loses resources. Typical patches include areas of vegetative ground cover, fallen logs or debris and troughs (in the case of an area that has been recently ripped). Typical interpatches include areas of bare soil and banks (areas of raised ground such as those found in areas recently ripped).

Once the patches and interpatches along a transect have been identified and measured, various parameters are assessed within each of the patches and interpatch zones identified along the transect. These parameters are referred to as soil surface indicators and include:

- rainsplash protection (assesses of the degree to which physical surface cover and projected plant cover ameliorate the effect of raindrops impacting the soil surface);
- perennial vegetation cover (estimates the basal cover of perennial grass and/or the density of canopy cover of trees and shrubs to infer root biomass);
- litter (assesses the amount, origin and degree of litter decomposition);
- cryptogam cover (assesses the cover of cryptogams visible on the soil surface as an indicator of soil surface stability and of nitrogen fixation);
- crust condition (assesses the degree of surface crust brokenness and therefore the availability of loose soil material for erosion);
- soil erosion type and severity (assesses the type and severity of recent or current soil erosion);
- deposited materials (assesses the nature and amount of alluvium recently deposited);
- soil surface roughness (assesses the ability of the soil surface to capture and retain mobile resources such as water, seeds, topsoil and organic matter at fine scale);

- surface dry coherence (assesses the ease with which the soil can be physically disturbed to release material suitable for removal by wind or water);
- soil slake test (assesses the stability of natural soil fragments when rapidly wetted); and
- soil surface texture (assesses the texture class of surface soil as it effects infiltration [e.g. sands have high infiltration whereas clays have slower infiltration]).

Each of the above soil surface indicators is assigned to a class in accordance with the LFA field manual (Tongway, 2008). Values for each soil surface indicator are entered into a database (CSIRO, 2005 in CSIRO, 2011) where set algorithms generate the three LFA indices, *viz.* stability, infiltration and nutrient cycling, which together define soil productive potential. Table 1 indicates which of the above soil surface indicators are incorporated into the set algorithms to generate each of the three LFA indices.

Table 1
Landscape Function Index Contribution

Soil Surface Indicator		LFA Indices		
		Stability	Infiltration	Nutrient Cycling
Rainsplash Protection		•		
Perennial Vegetation Cover			•	•
Litter Cover	Amount	•		
	Origin and Decomposition		•	•
Cryptogam Cover		•		•
Crust Condition		•		
Erosion Type and Severity		•		
Deposited Materials		•		
Soil Surface Roughness			•	•
Surface Dry Coherence		•	•	
Slake Test		•	•	
Soil Texture			•	

After Tongway and Hindley (2004).

The output values for each of the LFA indices range from 1 to 100 and are compared against LFA index values obtained empirically from an appropriate Analogue Transect[1]. This comparison, when undertaken over multiple monitoring rounds, allows the progression of rehabilitation LFA index values towards analogue LFA index values to be tracked and a trend determined.

Once the rehabilitation area LFA values have both: (a) reached the point half-way between the values for the initial rehabilitation monitoring round and the analogue values (i.e. the point of inflection on a symmetrical sigmoidal curve); and (b) are also on a stable and steady upward trend, the landscape functioning of the rehabilitation area represented by the transect is considered to be on a trajectory towards self-sustaining (Tongway and Hindley, 2004).

The LFA results are assessed in consideration of, and in association with, the Vegetation Dynamics and Habitat Complexity results to determine if the rehabilitation is on a trajectory towards a self-sustaining ecosystem.

[1] Analogue transects are selected to represent the target ecosystem for rehabilitation areas (i.e. a self-sustaining ecosystem).

Vegetation Dynamics

Vegetation Dynamics monitoring provides a quantitative assessment of canopy cover cross sectional area and height of canopy.

Vegetation Dynamics is typically measured using the wandering quarter technique or point-centred-quarter technique (Tongway and Hindley, 2004). The wandering quarter technique records information on the different structural layers present along each transect (i.e. groundcover, shrubs and trees) using a plotless, distance measuring procedure. The wandering quarter technique includes (for each structural layer present) the following general steps:

- From the start (i.e. upslope end) of the transect and using its compass bearing, record the distance to base of the nearest plant which is within a 90 degree arc centred on the compass bearing.
- Record the species, total height of plant, height to canopy, canopy dimensions (width and breadth) and canopy density.
- From that plant (and within a 90 degree arc centred on the same compass bearing as the transect) find and record the same measurements of the next plant.
- Continue to do this until at least 25 plants are recorded (to allow robust statistical analysis) or the end of the transect is reached. If practical, more lines parallel to the original can be utilised to record the required 25 plants should insufficient plants be present on the first line. The same plant should not be measured twice even on adjacent lines.
- Repeat the above for each structural layer (i.e. groundcover, shrubs and trees) present along each transect.

The above information is entered into a database (CSIRO, 2005) where set algorithms generate Vegetation Dynamics values, including the number of plants per hectare, canopy cover cross sectional area and canopy volume. These values can be used to demonstrate that various characteristics of a natural vegetation structure is developing, including: groundcover which assists to stabilise the soil surface and capture resources; and development of a tree and shrub layer which contribute to litter accumulation and nutrient cycling processes.

The Vegetation Dynamics results are assessed in consideration of and in association with the LFA and Habitat Complexity results to determine if the rehabilitation is on a trajectory towards a self-sustaining ecosystem.

Habitat Complexity

The Habitat Complexity component of EFA assesses the extent to which habitat resources (i.e. shelter and foraging resources) for vertebrate fauna are developing. Habitat Complexity measures habitat quality and availability and is assessed on the basis of the following five features:

- tree canopy (% cover);
- shrub canopy (% cover);
- groundcover (% cover);
- fallen logs, rocks and litter; and
- water availability.

Each feature is assessed on a standardised scale of 0 to 3 and the scores of the five features are summed to give an overall Habitat Complexity index (Tongway and Hindley, 2004.). A summary of the standardised scale for each of the five features is presented in Table 2.

Table 2
Summary of Scales for Individual Habitat Complexity Features

Structure	Score			
	0	**1**	**2**	**3**
Tree canopy (% cover)	0	<30	30-70	>70
Shrub canopy (% cover)	0	<30	30-70	>70
Groundcover	Sparse <0.5 m	Sparse <0.5 m	Dense >0.5 m	Dense >0.5 m
Logs, rocks, litter, etc. (% cover)	0	<30	30-70	>70
Water availability	dry	moist	permanent water adjacent	water-logged

After Tongway and Hindley, 2004.

The change in the overall Habitat Complexity index over time is used to assist in demonstrating the development of available habitat resources. The Habitat Complexity results are assessed in consideration of and in association with the LFA and Vegetation Dynamics results to determine if the rehabilitation is on a trajectory towards a self-sustaining ecosystem.

APPENDIX A

STRATFORD MINING COMPLEX
REHABILITATION & MINE CLOSURE RISK ASSESSMENT
(CK CONSULTANTS PTY LTD, 2020)

CK Consultants Pty. Ltd.

ABN: 99 111 079 522
Email: admin@ckcpl.com.au
Mobile: 0417 025 265

Yancoal Australia Limited

Stratford Coal Pty. Ltd.

Stratford Mining Complex

Rehabilitation & Mine Closure Risk Assessment

CK20-016 - Final Report, 16th November, 2020

Client:
Mr John Cullen – Operations Manager, Stratford Coal – Yancoal Australia
Mr Michael Plain – Environment & Community Superintendent, Stratford Coal – Yancoal Australia.

Author:
Mr Chris Allanson – Principal Consultant - CK Consultants Pty. Limited.

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File	Version	Prepared By	Reviewed By	Date
20201105 CK20-016 Yancoal Stratford MOP Enviro RA Draft Rpt	Draft	C. Allanson	M. Plain, M. Robinson, A. Lau	5th November 2020
20201116 CK20-016 Yancoal Stratford Rehabilitation & Closure RA Rpt	Final	C. Allanson	-	16 November 2020

1. Executive Summary

In October 2020, CK Consultants Pty. Limited (CKCPL) facilitated a risk assessment of the Stratford Mining Complex rehabilitation and closure risks to inform an update to the Stratford Mining Complex Mining Operations Plan & Rehabilitation Management Plan (MOP).

The risk assessment was a facilitated work-group session held on site and via video conference on Tuesday 27th October 2020 and included contributions from various people who have involvement with mine planning and operational compliance with Stratford's approvals, environment and community obligations.

The purpose of the risk assessment was to review and update the environmental risk register that underpins the MOP, incorporating consideration of on-going environmental control and rehabilitation of the site, mine closure planning and to identify site specific issues, constraints or characteristics requiring specific management to ensure that stated rehabilitation objectives can be achieved.

The reader should refer to Section 3 of this report for details regarding the context of the risk assessment, including the scope, assumptions and limitations.

The risk assessment conforms to the Australian, New Zealand and International Standard for risk management AS/NZS ISO 31000:2018 and risk rating was in accordance with the Stratford Coal Risk Management Standard STC-HST-22412 Risk Assessment Matrix (see Appendix D). Final risk definition and risk rating was on a consensus basis and there were nil non-consensus matters raised during the risk assessment.

The risk assessment identified forty-two (42) risk issues relating to operational environmental control, rehabilitation and mine closure planning. Of these, one (1, 2%) risk was rated as *EXTREME* and seventeen (17, 40%) were rated as *HIGH*. A summary of the *EXTREME* and *HIGH* risks follows:

Risk Level	Risk Issue	Aspect	Loss Type	Risk Reduction Strategy/ Actions
EXTREME	**Rehabilitation of Main Pit rejects emplacement area to final landform and final land use is complex and likely to take a longer timeframe than planned or insufficient material to achieving backfilling/ final landform.**	Final land use concepts and landform design and establishment	Financial	• Develop a detailed plan for closure of the Stratford Main Pit rejects emplacement area, including assessment of material balance and characteristics.
HIGH	**Stratford funding and/or resourcing of personnel inadequate to undertake planning and implementation of mine rehabilitation and closure**	Rehabilitation & Closure Schedule	Reputation	• Review rehabilitation and closure aspects during annual LOM process • Review rehabilitation and closure aspects during annual budgeting process
	Inadequate capability to plan for and carry out mine rehabilitation and closure resulting in rework delays and reputational damage	Rehabilitation & Closure Schedule	Financial	• Identify and appoint Mine Closure Planning Team and personnel
	Potential for offsite impacts from water discharge from final voids	Surface & groundwater management	Environment	• Develop detailed final void design • Review and verify post-mining final void water balance • Develop final void long term water quality model • Review and verify the post-mining groundwater model.

Risk Level	Risk Issue	Aspect	Loss Type	Risk Reduction Strategy/ Actions
	Surface water run-off causes detrimental effects on aquatic ecology resulting in fish kill and prosecution	Mine operations environmental risks & potential legacy issues	Environment	• Review site water balance for post-mining phase • Review post-mining water monitoring program • Review Water Management Plan for closure
	Inability to carry out adequate closure planning and implementation	Rehabilitation & Closure Schedule	Reputation	• Develop Mine closure planning program in MOP. • Identify and appoint Mine Closure Planning Team
	Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval	Final land use concepts and landform design and establishment	Financial	• Review adequacy of rehabilitation monitoring to verify that final land use requirements are being met for agricultural land.
	Public safety risk of access to/ interaction with final voids	Final Voids and Rejects storage facility management	Safety	• Evaluate measures for the long-term provision of security of final voids, including consideration of wall slope and set back distance • Carry out geotechnical assessment of final voids
	Unplanned release of mine water during rehabilitation/ operations	Mine operations environmental risks & potential legacy issues	Environment	• Review site induction requirements to specify that water management infrastructure cannot be altered without specific authorisation
	Poor quality runoff from rehabilitated areas	Mine operations environmental risks & potential legacy issues	Environment	• Review and update WMP regarding water run-off controls for rehabilitation phase of operations.
	Failure to achieve rehabilitation completion criteria causes delay to relinquishment	Mine operations environmental risks & potential legacy issues	Financial	• Review adequacy of rehabilitation monitoring to verify that final land use requirements and completion criteria are being met.
	Final landform water management infrastructure does not provide for long term stability	Final land use concepts and landform design and establishment	Financial	• Develop and finalise designs for long term water management infrastructure • Review post-mining site water balance • Carry out verification of long-term water management infrastructure • Carry out verification of the final landform design
	Geotechnical instability of rehabilitated waste emplacements and final void resulting in environmental impact	Final land use concepts and landform design and establishment	Environment	• Complete detailed final landform design and final void design. • Carry out a geotechnical assessment of the final void design including water filled void at interim stages.
	Delay in relinquishment of licenses and consent conditions	Licencing & Approvals	Financial	• Assess strategy to relinquish approvals and licenses
	Less Than Adequate allowance for site decommissioning, demolition/ removal	Mine decommissioning (infrastructure, water infrastructure, etc.)	Financial	• Carry out a detailed decommissioning and demolition study

Risk Level	Risk Issue	Aspect	Loss Type	Risk Reduction Strategy/ Actions
	Negative socio-economic impact of closure on local community	Post Closure	Reputation	• Identify all relevant stakeholders and dependencies for closure phase • Develop a closure socio-economic impact minimisation strategy
	Negative socio-economic impact of closure on workforce	Post Closure	Reputation	• Develop and implement a Human Resources (HR) strategy for mine closure
	Failure to identify and respond to issues in a timely manner leads to non-compliance or environmental harm	Post Closure - Monitoring and Maintenance	Environment	• Identify and develop a post closure monitoring and maintenance requirements strategy • Carry out a review of all existing environmental management plans for post closure phase

Table 1-1 – Extreme & High Risk & Action Summary

Greater detail is provided in the body of the report and a summary of actions (in risk order) is provided in Appendix A. Appendices B and C provide the full details of the Stratford Mine Closure Risk Assessment in assessment and risk rated order respectively.

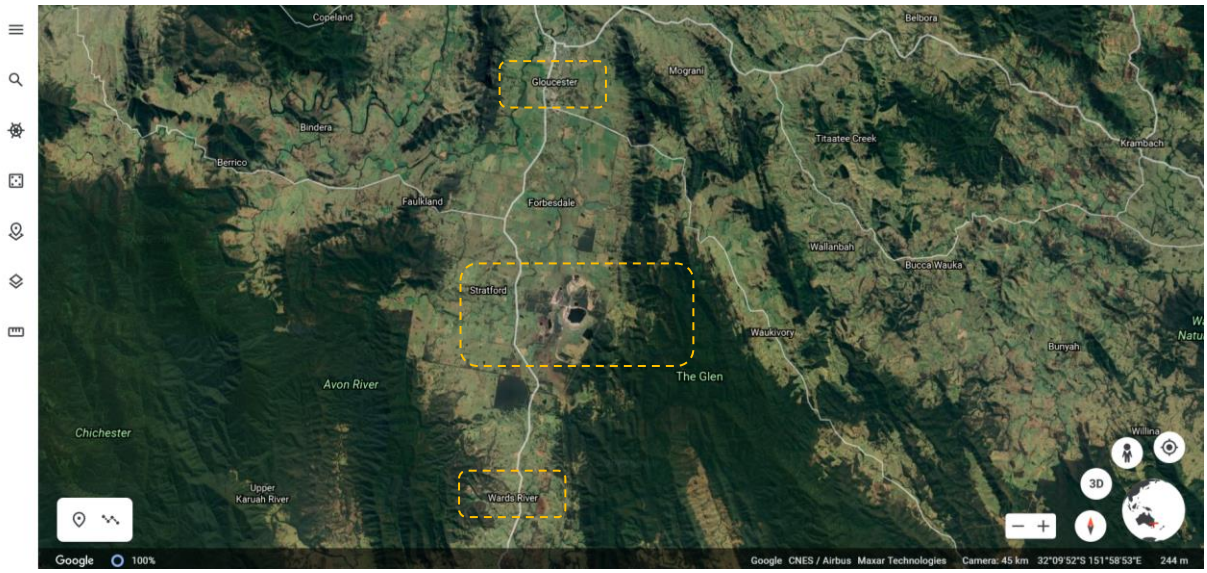
2. Introduction

In October 2020, CK Consultants Pty. Limited (CKCPL) was engaged by Mr Michael Plain, Environment & Community Superintendent for Stratford Coal Pty. Ltd., (Stratford, the Client) to facilitate and record a risk assessment of the Stratford Mining Complex rehabilitation and closure risks to inform an update to the Stratford Mining Complex Mining Operations Plan & Rehabilitation Management Plan (MOP).

The risk assessment was a facilitated work-group session held on site and via video conference on Tuesday 27th October 2020 and included contributions from various people who have involvement with mine planning and operational compliance with Stratford's approvals, environment and community obligations. This report details the method used, findings and the recommendations resulting from the risk assessment.

3. Context

The Stratford Mining Complex is located in the Gloucester Basin, approximately 95km north of Newcastle NSW. The mine exists in a rural setting, with the main mine access on The Bucketts Way, approximately 13km south of the township of Gloucester, approximately 5km to the north of the village of Craven and 12km north of Wards River.



Google Earth image

Figure 3-1 – Stratford Location

Google Earth image

Figure 3-2 – Stratford Mining Complex

The Stratford Mining Complex is positioned amongst rural land, with the Berrico Nature Reserve approximately 10km to the west and The Glen Nature Reserve approximately 3km to the east.

The MOP is a tool used by the NSW Resources Regulator (RR) to monitor the progress of mining and rehabilitation activities across the life of a mine. It fulfils the function of describing rehabilitation commitments and activities to be carried out during the approved timeframe of the MOP as well as defining rehabilitation criteria for the intended final land use post mine closure. The activities described in the MOP also inform the quantum of the rehabilitation bond required to be held by the RR in the event of a default against the committed rehabilitation commitments.

An approved MOP must be in place prior to commencing any significant surface disturbing activities associated with the approved mine development, including mining operations, mining purposes and prospecting, and relates only to the activities within the mining lease (i.e. it does not authorise prospecting activities within any associated exploration licence areas). A valid MOP must be in place at all times for the life of the operation, including the final rehabilitation phase post mine closure.

The Stratford Coal Mine commenced operations in mid-1995 and included three mining areas (Stratford Main Pit, Roseville West Pit and the Bowens Road North Pit). Mining of the Stratford Main Pit ceased in 2003, the Roseville West Pit concluded in October 2013 and the Bowens Road North Pit concluded in 2014. In 2014, Stratford Mining Complex was placed on 'care and maintenance', with site activity limited to tailings reprocessing of the Western Co-disposal (Codam) washery reject area (co-disposal area) and washing Run-of Mine (ROM) coal from Yancoal's Duralie Coal Mine (located approximately 20 km south of the Stratford Mining Complex). Re-processing of the Codam material continued for approximately 18 months.

Coal processed at the Stratford Mining Complex is sold into the export semi-soft coking coal and thermal markets.

The Stratford Extension Project was granted State and Federal approval in 2015 and this project commenced in April 2018. Mining operations in the Bowens Road North Pit resumed in mid-2018. Mining has been carried out generally along-strike using selective mining processes with excavators and trucks.

Stratford Mining Complex disturbed areas include:

- Mining areas:
    - The Stratford Main Pit,
    - Roseville Pit (backfilled), Roseville West Pit (partly backfilled) and Roseville West Pit Extension,
    - Bowens Road North Pit,
    - Avon North Open Cut,
    - Stratford East Open Cut,
    - Stratford Emplacement Area, substantially rehabilitated and waste emplacement extension,
    - Northern waste extension,
- Mine Infrastructure areas:
    - Administration, bath house and workshop,
    - ROM pad, CHPP and product stockpiles,
    - Rail loop,
    - Western Co-disposal Area,
    - Water management infrastructure and dams.

A summary of Stratford Mining Complex key development, environmental and water approvals and licences follows.

Instrument	Granted	Term
Development Consent SSD-4966	29 May 2015	Until 31 December 2025
ML1528	20 January 2003	21 years
ML1447	1 April 1999	21 years
ML1409	9 January 1997	21 years
ML1577	1 March 2006	21 years
ML1360	22 December 1994	21 years from renewal date on 21 December 2005
ML1538	25 June 2003	21 years
ML1521	24 September 2002	21 years
ML1733	8 April 2016	21 years
ML1787	5 June 2019	21 years
Environmental Protection License (EPL5161)	9 January 2001	Until surrendered or revoked. Reviewed each 3 years
Exploration Authorisation (AUTH) 311	14 October 2013	28 November 2017
AUTH 315	14 October 2013	28 November 2017
Monitoring & test bore licenses	Various	Various
Water Access License (WAL) 19536	2 February 2011	Title for allocation from Regulated River Source
WAL 19514	6 November 2014	Title for allocation from Regulated River Source
WAL 41534	18 April 2018	Perpetuity
WAL 41535	14 December 2017	Perpetuity
WAL 41536	14 December 2017	Perpetuity
WAL 41537	22 January 2018	Perpetuity
WAL 41538	22 January 2018	Perpetuity

Table 3-1 – Stratford Mining Complex Consents. Leases and Licences

Figure 3-3 – General Layout of Stratford Mining Complex

Sourced from; Stratford Mining Complex Mining Operations and Rehabilitation Management Plan

3.1 Purpose

The purpose of the risk assessment was to review and update the environmental risk register that underpins the MOP, incorporating consideration of on-going environmental control and rehabilitation of the site, mine closure planning and to identify site specific issues, constraints or characteristics requiring specific management to ensure that stated rehabilitation objectives can be achieved.

The risk assessment findings will be incorporated into an updated MOP for the Stratford Mining Complex which documents the long-term rehabilitation and mine closure principles for the site.

3.2 Scope

The scope of the risk assessment was designed to consider current and future mine impacts, including post closure. The scope included the following aspects of mine operations, rehabilitation and closure:

- Mine operations environmental risks & potential legacy issues
- Rehabilitation & Closure Schedule
- Final land use concepts and landform design and establishment
- Rehabilitation & Closure Criteria
- Stakeholder & Community Consultation
- Licencing & Approvals
- Mine decommissioning (infrastructure, water infrastructure, etc.)
- Materials & soils management
- Rehabilitation & Revegetation
- Surface & groundwater management
- Final Voids and Rejects storage facility management
- Biodiversity Offset Integration
- Post Closure.

Greater detail is provided in Section 4.2, which includes all considerations discussed during the risk assessment.

3.3 Objectives

The objective of the risk assessment was to objectively challenge the current activities and planning regarding environmental controls, rehabilitation and for mine closure. In order to achieve a valid risk assessment, the following approach was taken:

- Involvement of parties who have relevant operating and technical knowledge and expertise and involvement with mine planning, operations and compliance with Stratford Mining Complex approvals, environment and community obligations. The risk assessment was facilitated and recorded by a qualified and experienced Mining Engineer and Coal Mine Manager, with operating and risk assessment experience with this topic.
- Prior to the risk assessment workshop, the facilitator reviewed the current MOP document and the Regulator's guidance regarding environmental compliance and liaised with the Client to develop the scope of assessment and discussion list.

- The risk assessment conforms to the principles of the Australian, New Zealand and International Standard for risk management AS/NZS ISO 31000:2018 and risk rating is in accordance with the Stratford Coal Risk Management Standard STC-HST-22412 Risk Assessment Matrix. Final risk definition and risk rating was on a consensus basis and there were nil non-consensus matters raised during the risk assessment.
- The risk assessment seeks to conform to requirements set out in Section 3.2 and Explanatory Note 2 (e) of *ESG3: Mining Operations Plan (MOP) Guidelines, September 2013* relating to risk assessments.
- This report records the risk assessment and the final version of this report will have been reviewed by the Client as a suitably complete and accurate record.

3.4 Assumptions & Limitations

Unless specifically stated in the risk assessment, the following assumptions and limitations apply to the risk assessment:

- The risk assessment is based on the remaining life of mine plan, which is based on the inferred economics for continuing mining until completion and is ultimately subject to the prevailing economic and political climate at the time. Therefore, the actual extent of mining in the identified areas may vary and so the scheduling of rehabilitation and mine closure may also vary.
- The risk assessment is based on the current requirements and obligations imposed on the mining operation and these may change over the remaining operational life of the mine and post closure.

3.5 Definitions

Risk assessment definitions are in line with the Stratford Coal Risk Management Standard STC-HST-22412.

Causes	The underlying pre-condition events or circumstances which must be present to cause exposure to the risk issue
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or foregone opportunity. There may be a range of possible outcomes associated with an event. Consequence type the most severe consequence type used during risk rating
Event	Occurrence or change of a particular set of circumstances
Hazard	A source of potential harm
Hierarchy of Controls	Establishes a preferred order of risk control
Likelihood	Chance of something happening. Presented as a qualitative description of chance
LTA	Less than adequate
MRC	Maximum reasonable consequence
Planned / Existing Controls	Controls that are implemented and/ or there is commitment to at the time of the risk assessment. Controls should reflect the nature of the identified risk causes. Control measures maintain and/or modify risk
Risk/ Risk Issue	Effect of uncertainty on objectives
Risk Analysis	Comprehends the nature of risk and its characteristics including where appropriate, the level of risk
Risk Assessment	The overall process of risk identification, risk analysis and risk evaluation.

Risk Evaluation	Supports decisions. It involves comparing the results of the risk analysis with the established risk criteria to determine where additional action is required
Risk Identification	To find, recognise and describe risks that might help or prevent an organisation achieving its objectives.
Risk Level	The categorisation of the risk issue for management action, in accordance with the Yancoal/Stratford Coal Operations Risk Matrix
Risk Management	Coordinated activities to direct and control an organisation with regard to risk
Residual Risk Rating	Risk rating in consideration of the effectiveness and efficiency of existing controls. This relies on expert opinion of the risk assessment participants of how well the existing controls would control the risk. The numerical value and descriptor applied to a risk determined from the risk matrix, by reading the junction of Consequence column and Likelihood row
Risk Source	Element which alone or in combination has the potential to give rise to risk.
Risk Treatment	To select and implement options for addressing risk. Controls recommended by the risk assessment team to reduce the level of risk
Stakeholder (interested party)	Is a person or organisation that can affect, be affected by, or perceive themselves to be affected by a decision or activity.
Worker	A Stratford Coal Worker and a Contractor Worker.

4. Risk Assessment Process

The risk assessment was facilitated by a facilitator having formal mining qualifications and operational coal mining experience, including coal mine manager.

Prior to the risk assessment the Facilitator carried out research to develop a suitable scope of assessment and discussion list (see Table 4-2), which included:

- Stratford Mining Complex currently approved Mining Operations Plan and Rehabilitation Management Plan document.
- The Resources Regulator's draft *Guideline 1: Rehabilitation Risk Assessment* and draft *Guideline 3: Rehabilitation Controls*, provided on the website.
- The Resources Regulator's guidance on environmental compliance, particularly the information relating to Targeted Assessment Program (TAP) provided on the website.

The risk assessment was conducted as a facilitated elicitation workshop involving people with relevant operating and technical knowledge and expertise and involvement with mine planning, operations and compliance with Stratford's approvals, environment and community obligations. This is a very powerful technique that taps into the knowledge and expertise of the site. Risk ratings are based on participant expert judgement and consensus of the effectiveness and efficiency of existing and planned controls.

The Facilitator's role was to provide guidance in the risk assessment process, encourage discussion and challenge in a non-threatening manner so as to properly define and assess the risk issues.

Risks were recorded in a spreadsheet which records the information in sufficient detail to define the risks, potential causes and controls to allow risk rating and highlight the most severe risks. Risk reduction strategies/ actions were developed where applicable.

4.1 Participants

The participants were organised by Stratford prior to the time of the workshop. The list of participants is provided in Table 4-1 and an attendance sign-off sheet is provided in Appendix E.

Name	Position	Company/ Site	Qualifications & Experience	27/10/2020
Michael Plain	Environment & Community Superintendent	Stratford Coal	BLWSc Hon Class 1 11 years' mining environment & community	✓
Michael Moore	Manager - Environmental Standards	Yancoal	BSc(Hons), MEM, MSc 28 years' resource sector, including 8 years' resource exploration, 7 years' government resource policy & project assessment, 3 years' environmental consulting, 10 years environmental management & approvals	✓
Nathan Vaughan	Mine Planning Superintendent	Stratford Coal	Mine Surveyor 10 years	✓
Andrew Lau	Mine Closure Manager	Yancoal	BE (Mining) 19 years' OC coal, 7 years' site Technical Services lead (incl Environmental)	✓
Margot Robinson	Environment Manager – Senior Technical Specialist	Resource Strategies	B Business (International Business); Graduate Diploma (Environmental Management) 12 years' experience in environmental management & project approvals in the resource industry	✓
Thomas Kirkwood	Environment & Community Co-ordinator	Stratford Coal	BSc 5 years' environment & community	✓
Carly McCormack	Environment & Community Superintendent	Austar Coal Mine & Northern Rhondda Colliery	B Env Sc, Grad Cert Env Studies 5 years' UG mining, 17 years' environmental consulting	✓
Alan Andrews	Manager - Property	Yancoal	BE (Civil/Structural) 15 years' mine related property acquisitions, rural & residential property management	✓
Chris Allanson	Facilitator, Principal Consultant	CK Consultants	BE (Mining), MBA, NSW Coal Mine Manager 20 years' UG coal mining operations, 20yrs' risk management	✓

Table 4-1 – Participants

4.2 Discussion List

Aspect	##	Consideration
1. Mine operations environmental risks & potential legacy issues	1.01	Surface water
	1.02	Ground water
	1.03	Noise & blasting
	1.04	Geology - waste rock and insitu coal geochemistry
	1.05	Soils management
	1.06	Spontaneous combustion
	1.07	Visual amenity
	1.08	Terrestrial flora & fauna
	1.09	Aquatic ecology
	1.10	Air quality
	1.11	Non aboriginal heritage
	1.12	Aboriginal heritage
2. Rehabilitation & Closure Schedule	2.01	Site capability & competency
	2.02	Resources & funding
	2.03	Monitoring & inspection
	2.04	Completion commitments
3. Final land use concepts and landform design and establishment	3.01	Identified final use and rehabilitation domains
	3.02	Final landform design and construction incorporation with surrounding landforms (macro & micro-relief) and visual amenity
	3.03	Water management integrated into the final landform
	3.04	Reject emplacement areas and tailings dams to support final land use
	3.05	Final voids, highwalls and low walls stability
	3.06	Integration of rehabilitation into mine planning systems
4. Rehabilitation & Closure Criteria	4.01	Establishing rehabilitation objectives
	4.02	Establishing performance and completion criteria
5. Stakeholder & Community Consultation	5.01	General
6. Licencing & Approvals	6.01	Approvals relinquishment requirements and schedule
7. Mine decommissioning (infrastructure, water infrastructure, etc.)	7.01	Removal, demolition and or dismantling of buildings and infrastructure
	7.02	Structural works associated with making safe those buildings and infrastructure to be retained as part of the final land use, including heritage management
	7.03	Decommissioning, removal and/or augmentation of the mine water management infrastructure
	7.04	Sealing rehabilitation and relinquishment of exploration boreholes

	7.05	Identification and remediation of hazardous areas and removal of hazardous items
	7.06	Off-site water usage post closure
8. Materials & soils management	8.01	Salvage of soil resources for rehabilitation
	8.02	Management of soil and materials inventories (e.g. inert capping material, etc) for final land and rehabilitation, including consideration of geochemical and geotechnical properties required for rehabilitation
	8.03	Integration of rehabilitation into mine planning systems
9. Rehabilitation & Revegetation	9.01	Growth medium development & revegetation objectives for sustainable rehabilitation and final land use outcomes
	9.02	Techniques & measures
	9.03	Rehabilitation planting materials - seed and tube stock
	9.04	Site capability
10. Surface & groundwater management	10.01	Detailed design of final landforms, including geomorphological and hydraulic modelling
	10.02	Techniques and measures to achieve the final land use
	10.03	Final void, water balance, water quality, potential pollution impacts, geotechnical stability & public safety
	10.04	Future water licensing requirements for water retained within the final void(s)
	10.05	Monitoring and inspection requirements
11. Final Voids and Rejects storage facility management	11.01	Potentially Acid Forming (PAF)/Non-Acid Forming (NAF) handling and long-term storage
	11.02	Rejects handling and long-term storage
	11.03	Final void design
	11.04	Water management and water quality
	11.05	Security measures
12. Biodiversity Offset Integration	12.01	Stratford biodiversity offset area and biodiversity conservation area commitments
13. Post Closure	13.01	Socio-Economic Impacts
	13.02	Human Resources
	13.03	Monitoring and Maintenance
	13.04	Relinquishment

Table 4-2 - Discussion List

4.3 Risk Evaluation

Risk rating was carried out on a residual risk basis, i.e. in consideration of the effectiveness and efficiency of the existing / planned control measures. The risk assessment considers that planned controls include those controls that have a firm commitment or are in the process of implementation.

Whilst worst case consequence scenarios were discussed and recorded (Maximum Reasonable Consequence -MRC), the worst-case consequence was not necessarily the consequence severity chosen for risk rating. The risk assessment team used their expert judgement to determine the effectiveness of control measures and to choose the most appropriate consequence severity for risk rating. Likelihood was selected based on the chosen consequence severity.

4.4 Risk Reduction Strategy

Following risk rating, risk reduction strategies were discussed and agreed actions recorded.

5. Findings

5.1 Summary of Risk Distributions

Forty-two (42) risk issues were identified and rated in the risk assessment. Tables 5-1, 5-2 & 5-3 and Chart 5-1, 5-2 & 5-3 provide summaries of the distribution of risk, consequence and type from the risk assessment.

Risk Level	No.	%
Extreme	1	2%
High	17	40%
Medium	13	31%
Low	11	26%
Total	**42**	**100%**

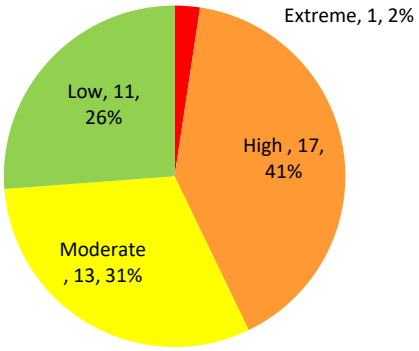


Table 5-1 & Chart 5-1 – Distribution – All Risks

Consequence Level	No.	%
Catastrophic - 5	-	0%
Major - 4	8	19%
Moderate - 3	16	38%
Minor - 2	17	40%
Insignificant - 1	1	2%
Total	**42**	**100%**

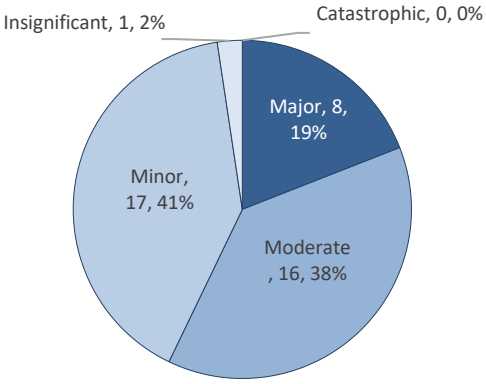


Table 5-2 & Chart 5-2 – Distribution - Consequence

Risk Type	No.	%
Financial	24	57%
Environmental Impact	9	22%
Reputation Impact	8	19%
Harm to People	1	2%
Total	**42**	**100%**

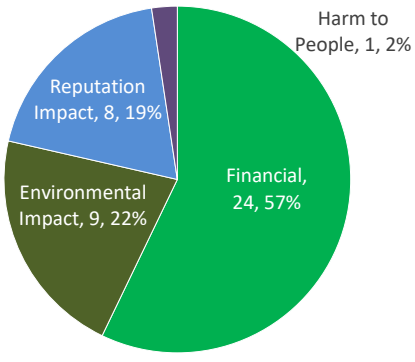


Table 5-3 & Chart 5-3 – Distribution – Risk Type

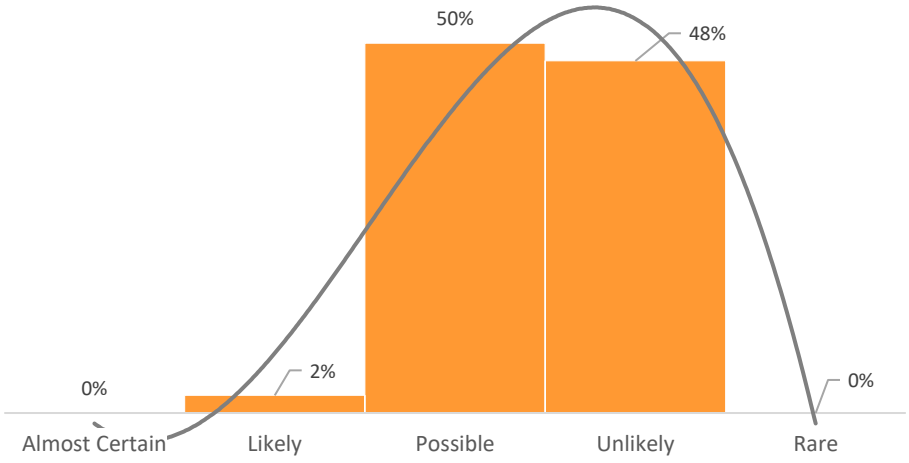


Chart 5-4 – Likelihood Distribution

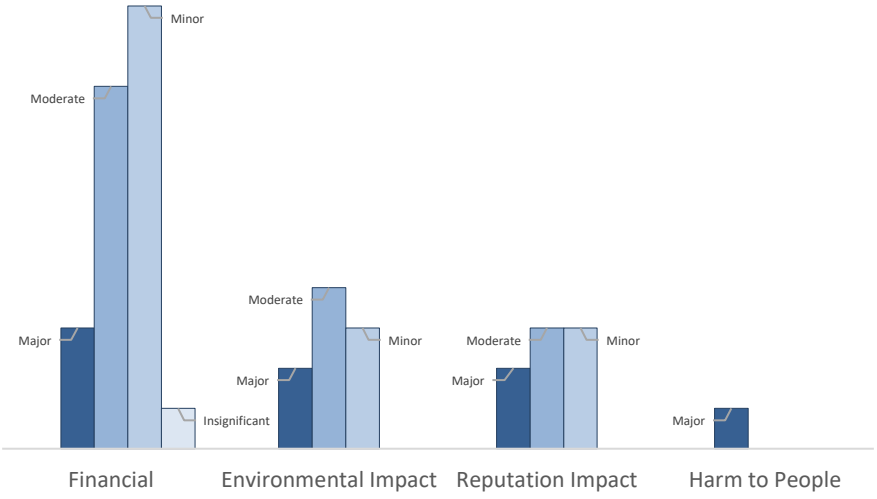


Chart 5-5 – Consequence by Risk Type

5.2 Most Severe Risks

The single most severe (*EXTREME*) risk was:

- Rehabilitation of Main Pit rejects emplacement area to final landform and final land use is complex and likely to take a longer timeframe than planned or insufficient material to achieving backfilling/ final landform, Ref 3.04.01. This risk was rated as having a *Likely* Financial impact of $20m to $100M.

The seventeen (17) *HIGH* risks are listed below:

- Rated with *Major* consequence:
    - Surface water run-off causes detrimental effects on aquatic ecology resulting in fish kill and prosecution, Environmental Impact, 1.09.01
    - Inability to carry out adequate closure planning and implementation, Reputation Impact, 2.01.01
    - Stratford funding and/or resourcing of personnel inadequate to undertake planning and implementation of mine rehabilitation and closure, Reputation Impact, 2.02.01

  - Inadequate capability to plan for and carry out mine rehabilitation and closure resulting in rework delays and reputational damage, Financial Impact, 2.02.02
  - Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval, Financial Impact, 3.01.01
  - Potential for offsite impacts from water discharge from final voids, Environmental Impact, 10.03.01
  - Public safety risk of access to/ interaction with final voids, HS, 11.05.01
- Rated with *Moderate* consequence:
  - Unplanned release of mine water during rehabilitation/ operations, Environmental Impact, 1.01.01
  - Poor quality runoff from rehabilitated areas, Environmental Impact, 1.01.02
  - Failure to achieve rehabilitation completion criteria causes delay to relinquishment, Financial Impact, 1.08.01
  - Final landform water management infrastructure does not provide for long term stability, Financial Impact, 3.03.01
  - Geotechnical instability of rehabilitated waste emplacements and final void resulting in environmental impact, 3.05.01
  - Delay in relinquishment of licenses and consent conditions, Financial Impact, 6.01.01
  - Less Than Adequate (LTA) allowance for site decommissioning, demolition/ removal, Financial Impact, 7.01.01
  - Negative socio-economic impact of closure on local community, Reputation Impact, 13.01.01
  - Negative socio-economic impact of closure on workforce, Reputation Impact, 13.02.01
  - Failure to identify and respond to issues in a timely manner leads to non-compliance or environmental harm, Environmental Impact, 13.03.01

5.3 Risk Reduction Actions

Where appropriate, additional controls and actions have been identified in Appendix A and full details are provided in Appendices B and C.

6. Non-Consensus Matters

No non-consensus matters arose during the risk assessment.

7. Statement of Conformance & Sign-off

To verify this risk assessment complies with statutory requirements and recommended guidance, in accordance with the Stratford Coal Risk Management Standard STC-HST-22412, the following checklist and sign-off must be completed and signed-off by site management.

Section A - Report Checklist

1.	Is there a description of the operation or equipment being assessed?	☐
2.	Is there a summary of the strategic, corporate and risk management context?	☐
3.	Is there a list of the people involved in the risk identification step, together with their organisational roles and experience relevant to the risk assessment topic?	☐
4.	Is there an adequately detailed outline of the approach used to identify the risks?	☐
5.	Is there an outline of the method used for assessing the likelihood and consequences of the risks?	☐
6.	Are there two lists of identified risks, ranked by: a) risk magnitude, and b) consequence magnitude	☐
7.	Is there discussion of the basis for defining either the safety standard to be achieved, or the level of risk management expenditure?	☐
8.	Is there a list of the main actions to be taken to reduce risks and to manage risks?	☐
9.	Have responsibilities for implementing additional controls / further actions have been allocated?	☐
10.	Is there a timetable for implementing main actions entered in Intelex?	☐
11.	The Report specifies a requirement for an audit after completion of all implementation stages?	☐

Section B – Review & Sign-off

I, Michael Plain, Environment and Community Superintendent for Stratford Coal hereby state that I have reviewed this risk assessment and have found conformance with the requirements:

ISO31,000:2018 Risk management guidelines	☐
MDG1010: Minerals industry safety and health risk management guideline, January 2011	☐
Section 3.2 and Explanatory Note 2 e); ESG3: Mining Operations Plan (MOP) Guidelines, September 2013 relating to conduct of risk assessments	☐
STC-HST-22412 Stratford Coal Risk Management Standard, Version 4, 15/11/2019	☐
Approved actions have been entered into Intelex	☐

Name:	Michael Plain
Position:	Environment & Community Superintendent
Signature:	

Date:	

B-2 – Statutory Acceptance & Sign-off

Acceptance of this risk assessment as contributing to compliance with the following prescribed requirements.	John Cullen, Operations Manager
Mining Lease Conditions	☐
Section 3.2 and Explanatory Note 2 (e); ESG3: Mining Operations Plan (MOP) Guidelines, September 2013 relating to conduct of risk assessments	☐

Name:	John Cullen
Position:	Operations Manager Stratford Mining Complex
Signature:	
Date:	

Appendix A

Yancoal Australia Limited – Stratford Coal Pty Ltd

Rehabilitation and Mine Closure Risk Assessment

Summary of Actions (Risk Order), 27th October, 2020

Action #	Action Item		Ref, Aspect - Consideration Risk Issue, Risk Level Loss Type Cause/s
1.1	Develop a detailed plan for closure of the Stratford Main Pit rejects emplacement area, including assessment of material balance and characteristics.		3.04.01, Final land use concepts and landform design and establishment - Reject emplacement areas and tailings dams to support final land use **Rehabilitation of Main Pit rejects emplacement area to final landform and final land use is complex and likely to take a longer timeframe than planned or insufficient material to achieving backfilling/final landform.** EXTREME Financial risk, caused by: 1. Rejects dewatering requirements to enable capping and rehabilitation 2. LTA backfill and capping material available to provide a free draining surface 3. Reject density unsuitable for capping
2.1	Review rehabilitation and closure aspects during annual LOM process		2.02.01, Rehabilitation & Closure Schedule - Resources & funding **Stratford funding and/or resourcing of personnel inadequate to undertake planning and implementation of mine rehabilitation and closure** HIGH Reputational risk, caused by: 1. Sustained significant group financial loss 2. Corporate imposed temporary budgetary constraints 3. Corporate imposed temporary restriction on backfilling vacant site roles where relevant site personnel leave
2.2	Review rehabilitation and closure aspects during annual budgeting process		
3.1	Identify and appoint Mine Closure Planning Team and personnel		2.02.02, Rehabilitation & Closure Schedule - Resources & funding **Inadequate capability to plan for and carry out mine rehabilitation and closure resulting in rework delays and reputational damage** HIGH Financial risk, caused by: 1. LTA experience and numbers within current incumbents and externally available to carry out planning and/ or work 2. Planning and completion time frames
4.1	Develop detailed final void design		10.03.01, Surface & groundwater management - Final void, water balance, water quality, potential pollution impacts, geotechnical stability & public safety **Potential for offsite impacts from water discharge from final voids** HIGH Environmental risk, caused by: 1. Too great catchment area reporting to final void 2. Inaccurate final void modelling 3. Inaccurate Final void assumptions 4. Climatic changes
4.2	Review and verify post-mining final void water balance		
4.3	Develop final void long term water quality model		
4.4	Review and verify the post-mining groundwater model.		
5.1	Review site water balance for post-mining phase		1.09.01, Mine operations environmental risks & potential legacy issues - Aquatic ecology **Surface water run-off causes detrimental effects on aquatic ecology resulting in fish kill and prosecution** HIGH Environmental risk, caused by: 1. LTA AMD management 2. LTA management or decommissioning of irrigation area run-off 3. Seepage from waste emplacements into creeks 4. Reduction in catchment run-off 5. Runoff from rehabilitated areas
5.2	Review post-mining water monitoring program		
5.3	Review Water Management Plan for closure		
6.1	Develop Mine closure planning program in MOP.		2.01.01, Rehabilitation & Closure Schedule - Site capability & competency **Inability to carry out adequate closure planning and implementation** HIGH Reputational risk, caused by: 1. LTA suitably competent people 2. Complexity of closure planning requirements
6.2	Identify and appoint Mine Closure Planning Team		

Action #	Action Item		Ref, Aspect - Consideration Risk Issue, Risk Level Loss Type Cause/s
7.1	Review adequacy of rehabilitation monitoring to verify that final land use requirements are being met for agricultural land.		3.01.01, Final land use concepts and landform design and establishment - Identified final use and rehabilitation domains **Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval** HIGH Financial risk, caused by: 1. Failure to clearly articulate final land use 2. Failure to carry out rehabilitation in accordance with final land use 3. LTA final landform design
8.1	Evaluate measures for the long-term provision of security of final voids, including consideration of wall slope and set back distance		11.05.01, Final Voids and Rejects storage facility management - Security measures **Public safety risk of access to/ interaction with final voids** HIGH Safety risk, caused by: 1. Uncontrolled access to final void 2. LTA security measures, barriers and bunding 3. Final pit wall angle unsafe
8.2	Carry out geotechnical assessment of final voids		
9.1	Review site induction requirements to specify that water management infrastructure cannot be altered without specific authorisation		1.01.01, Mine operations environmental risks & potential legacy issues - Surface water **Unplanned release of mine water during rehabilitation/ operations** HIGH Environmental risk, caused by: 1. Current water management practices on-site are less than adequate (LTA) for rehabilitation stage of operations 2. LTA surface and ground water controls for rehabilitation stage of operations 3. Uncontrolled spill from Mine Water Storage Dams 4. Unexpected structural failure of dam, flood bunds 5. Unplanned removal of water management infrastructure, e.g. minor levee or bund 6. Failure to correctly identify where run-off from rehab areas could occur and where they could report to
10.1	Review and update WMP regarding water run-off controls for rehab phase of operations.		1.01.02, Mine operations environmental risks & potential legacy issues - Surface water **Poor quality runoff from rehabilitated areas** HIGH Environmental risk, caused by: 1. Current water management practices on-site are LTA for rehabilitation stage of operations 2. LTA surface and ground water controls for rehabilitation stage of operations 3. Vegetation not adequately established 4. LTA landform and drainage structure design 5. LTA PAF cell design/ capping
11.1	Develop and finalise designs for long term water management infrastructure		3.03.01, Final land use concepts and landform design and establishment - Water management integrated into the final landform **Final landform water management infrastructure does not provide for long term stability** HIGH Financial risk, caused by: 1. LTA design of water infrastructure 2. LTA modelling of water infrastructure requirements 3. LTA construction of water infrastructure requirements 4. Changed climate conditions
11.2	Review post-mining site water balance		
11.3	Carry out verification of long-term water management infrastructure		
11.4	Carry out verification of the final landform design		

Action #	Action Item		Ref, Aspect - Consideration Risk Issue, Risk Level Loss Type Cause/s
12.1	Complete detailed final landform design and final void design.		3.05.01, Final land use concepts and landform design and establishment - Final voids, highwalls and low walls stability Geotechnical instability of rehabilitated waste emplacements and final void resulting in environmental impact HIGH Environmental risk, caused by: 1. Steepness of final highwalls, endwalls, batters and waste emplacements 2. Undetermined water impacts on wall stability and submerged rehabilitated waste emplacements 3. Uncontrolled erosion 4. Do not have final landform design or void design 5. Water displaced from void by failure
12.2	Carry out a geotechnical assessment of the final void design including water filled void at interim stages.		
13.1	Assess strategy to relinquish approvals and licenses		6.01.01, Licencing & Approvals - Approvals relinquishment requirements and schedule Delay in relinquishment of licenses and consent conditions HIGH Financial risk, caused by: 1. Changing expectations, new legislation 2. Failure to meet conditions/ closure criteria
14.1	Carry out a detailed decommissioning and demolition study		7.01.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Removal, demolition and or dismantling of buildings and infrastructure LTA allowance for site decommissioning, demolition/ removal HIGH Financial risk, caused by: 1. No detailed estimate
15.1	Identify all relevant stakeholders and dependencies for closure phase		13.01.01, Post Closure - Socio-Economic Impacts Negative socio-economic impact of closure on local community HIGH Reputational risk, caused by: 1. LTA assessment of local community dependency on Stratford Coal Mine
15.2	Develop a closure socio-economic impact minimisation strategy		
16.1	Develop and implement a HR strategy for mine closure		13.02.01, Post Closure - Human Resources Negative socio-economic impact of closure on workforce HIGH Reputational risk, caused by: 1. LTA assessment of manning requirements during rehabilitation and closure and job dependency strategy
17.1	Identify and develop a post closure monitoring and maintenance requirements strategy		13.03.01, Post Closure - Monitoring and Maintenance Failure to identify and respond to issues in a timely manner leads to non-compliance or environmental harm HIGH Environmental risk, caused by: 1. LTA provision for closure monitoring and maintenance 2. LTA reporting system post-mining
17.2	Carry out a review of all existing environmental management plans for post closure phase		
18.1	Develop and implement a PAF management strategy/procedure, including PAF cell design and management		1.02.01, Mine operations environmental risks & potential legacy issues - Ground water AMD impacts to groundwater impacting ability to relinquish the site unless rehandled MEDIUM Financial risk, caused by: 1. LTA handling and storage of potentially acid forming material (PAF) 2. LTA handling and storage of CHPP rejects

Action #	Action Item		Ref, Aspect - Consideration Risk Issue, Risk Level Loss Type Cause/s
19.1	Install additional F-series monitoring borehole network		1.02.02, Mine operations environmental risks & potential legacy issues - Ground water **Seepage from mine water storage dams and final voids enters ground water, requiring remediation/ limitation of connectivity** MEDIUM Financial risk, caused by: 1. LTA dam design 2. LTA dam construction 3. LTA final void modelling
19.2	Undertake review and verification of groundwater model post closure		
20.1	Develop and implement PAF management and handling strategy/procedure.		1.04.01, Mine operations environmental risks & potential legacy issues - Geology - waste rock and insitu coal geochemistry **LTA rehabilitation of PAF waste emplacements causing acid mine drainage (AMD) contamination of surface and ground water** MEDIUM Financial risk, caused by: 1. Incorrect modelling and mapping of PAF materials 2. Incorrect placement within waste emplacements 3. Insufficient capping placed or encapsulation of PAF material 4. LTA final void water balance modelling and ground water modelling
20.2	Develop and implement process to verify PAF waste emplacements during operations.		
21.1	Review long term management of Aboriginal Heritage sites		1.12.01, Mine operations environmental risks & potential legacy issues - Aboriginal heritage **Rehabilitation activities disturb aboriginal heritage site** MEDIUM Reputational risk, caused by: 1. Rehabilitation activities outside previously approved disturbed areas 2. LTA delineation of heritage sites 3. Previously unidentified heritage sites adjacent to current disturbed area
22.1	Develop and complete detailed final landform plan for all disturbed/active mining areas.		3.02.01, Final land use concepts and landform design and establishment - Final landform design and construction incorporation with surrounding landforms (macro & micro-relief) and visual amenity **Final landform design inconsistent with natural surrounding area/design constraints resulting in rework** MEDIUM Financial risk, caused by: 1. LTA final landform design and planning 2. Landform not constructed in accordance with design
22.2	Carry out verification of the final landform design adequacy.		
23.1	Include future monitoring requirements of exposed coal seams for spontaneous combustion in Closure Plan		1.04.02, Mine operations environmental risks & potential legacy issues - Geology - waste rock and insitu coal geochemistry **LTA rehabilitation of insitu and exposed coal seams causing spontaneous combustion or AMD contamination of ground water** MEDIUM Financial risk, caused by: 1. LTA final void water balance modelling and ground water modelling 2. Incorrect treatment of exposed coal seams 3. Incorrect final void landform design 4. Seams exposed in end wall of Stratford East and Avon North Pits 5. Loose coal
24.1	Develop a Mine Closure Consultation Strategy		5.01.01, Stakeholder & Community Consultation - General **Rehabilitation and closure does not meet public expectations** MEDIUM Reputational risk, caused by: 1. LTA Consultation with authorities regarding future use of land and water assets 2. LTA consultation with local community/stakeholders

Action #	Action Item		Ref, Aspect - Consideration Risk Issue, Risk Level Loss Type Cause/s
25.1	Carry out a review of water infrastructure to be decommissioned or retained		7.03.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Decommissioning, removal and/or augmentation of the mine water management infrastructure Long term contamination from sediment accumulation in water storages MEDIUM Financial risk, caused by: 1. LTA identification and treatment/ removal of contaminated materials 2. Rehabilitation fails to meet completion criteria
26.1	Carry out a review of water infrastructure to be decommissioned or retained		7.03.02, Mine decommissioning (infrastructure, water infrastructure, etc.) - Decommissioning, removal and/or augmentation of the mine water management infrastructure Surface water contamination from surface water infrastructure that has not been properly decommissioned MEDIUM Financial risk, caused by: 1. LTA identification and treatment/ removal of contaminated materials 2. LTA surface water model for rehabilitated site 3. Rehabilitation fails to meet completion criteria
27.1	Review relinquishment requirements for exploration sites		7.04.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Sealing rehabilitation and relinquishment of exploration boreholes LTA allowance for sealing, rehabilitation and relinquishment of boreholes MEDIUM Financial risk, caused by: 1. Number of potentially unsealed and unrehabilitated boreholes 2. Incomplete statutory reporting
27.2	Review number of boreholes that need to be rehabilitated		
28.1	Carry out contaminated land assessments		7.05.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Identification and remediation of hazardous areas and removal of hazardous items Long term environmental legacy issues from contaminated sites MEDIUM Financial risk, caused by: 1. LTA identification and treatment/ removal of contaminated materials e.g. around bulk fuel storage, ROM pad, load-out facilities
28.2	Develop a register to identify all assets and potentially contaminated areas and hazardous substances		
29.1	Identify water licensing requirements for closure phase to support proposed post-mining land use.		10.04.01, Surface & groundwater management - Future water licensing requirements for water retained within the final void(s) Inadequate water licensing for intended future water use MEDIUM Environmental risk, caused by: 1. LTA identification of intended water use 2. LTA identification of future water licensing requirements 3. LTA understanding of the changeover requirements of the water licenses
30.1	Review Noise Management Plan and monitoring requirements for closure.		1.03.01, Mine operations environmental risks & potential legacy issues - Noise & blasting Noise impacts exceed receivers' predictions LOW Environmental risk, caused by: 1. Noise impacts exceed criteria
31.1	Review MOP/Rehabilitation Management Plan to include process of verification of PAF waste emplacement and capping placement to design.		1.06.01, Mine operations environmental risks & potential legacy issues - Spontaneous combustion Spontaneous combustion of carbonaceous material in final landform LOW Financial risk, caused by: 1. LTA placement or capping 2. Slumping/cracking of capped emplacement areas allowing oxygen ingress

Action #	Action Item		Ref, Aspect - Consideration Risk Issue, Risk Level Loss Type Cause/s
32.1	Investigate implementation of covenants over vegetated lands for visual screening post closure.		1.07.01, Mine operations environmental risks & potential legacy issues - Visual amenity **Visual impacts e.g. The Bucketts Way and nearby receivers** LOW Reputational risk, caused by: 1. Rehabilitation does not achieve approved final landform requirements or expectations 2. Unsuccessful rehabilitation creates exposed faces, highwalls, low walls 3. LTA screening of long-term final voids 4. Adjacent land use change
33.1	Review site induction, training and awareness regarding dust management for contractors coming on site.		1.10.01, Mine operations environmental risks & potential legacy issues - Air quality **Dust emissions during rehabilitation exceed criteria at nearby receivers in accordance with predictions** LOW Environmental risk, caused by: 1. Inadequate control of rehabilitation activities, including bulk shaping and topsoil handling 2. Climatic conditions
33.2	Review Air Quality Management Plan for closure phase		
34.1	Develop and implement PAF Management Strategy/Procedure		1.10.02, Mine operations environmental risks & potential legacy issues - Air quality **Odours emitted from site from heatings** LOW Reputational risk, caused by: 1. LTA PAF management and capping at Stratford East generates odours
35.1	Continue to review rehabilitation soil/capping resource requirements annually.		8.01.01, Materials & soils management - Salvage of soil resources for rehabilitation **LTA recovery of suitable soil volumes and characteristics to carry out rehabilitation** LOW Financial risk, caused by: 1. LTA systems for management of topsoil
36.1	Carry out a study to identify any infrastructure to be retained for future land use and scope of remediation work		7.02.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Structural works associated with making safe those buildings and infrastructure to be retained as part of the final land use, including heritage management **LTA allowance for making site infrastructure fit for future use** LOW Financial risk, caused by: 1. No detailed estimate or asset transfer value
37.1	Complete detailed final landform design and final void design.		3.05.02, Final land use concepts and landform design and establishment - Final voids, highwalls and low walls stability **Erosion of final landforms, compromising establishment of vegetation and water quality** **See 1.01.02, 1.08.01, 1.09.01** 1. LTA design of drainage from landforms/ waste emplacement slopes
37.2	Undertake a geotechnical review of the stability of final landforms.		

Appendix B

Yancoal Australia Limited – Stratford Coal Pty Ltd

Stratford Mining Complex
Rehabilitation and Mine Closure Risk Assessment

Risk Table (Assessment Order), 27th October, 2020

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.01.01, Mine operations environmental risks & potential legacy issues - Surface water	Unplanned release of mine water during rehabilitation/ operations	1. Current water management practices on-site are less than adequate (LTA) for rehabilitation stage of operations 2. LTA surface and ground water controls for rehabilitation stage of operations 3. Uncontrolled spill from Mine Water Storage Dams, 4. Unexpected structural failure of dam, flood bunds 5. Unplanned removal of water management infrastructure, e.g. minor levee or bund 6. Failure to correctly identify where run-off from rehab areas could occur and where they could report to	1. Water Management Plan 2. Dedicated resources on site 3. Current water infrastructure in place 4. Site water balance 5. Ground disturbance and clearing procedure 6. Mine Planning procedures	L3 E	E	3	C	13	H	1. Review site induction requirements to specify that water management infrastructure cannot be altered without specific authorisation

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.01.02, Mine operations environmental risks & potential legacy issues - Surface water	Poor quality runoff from rehabilitated areas	1. Current water management practices on-site are LTA for rehabilitation stage of operations 2. LTA surface and ground water controls for rehabilitation stage of operations 3. Vegetation not adequately established 4. LTA landform and drainage structure design 5. LTA PAF cell design/ capping	1. Water management plan (WMP); rehabilitation runoff criteria 2. Dedicated resources on site 3. Current water infrastructure in place 4. Site water balance 5. Existing MOP and Rehabilitation MP 6. Landform and drainage design by suitably competent person 7. Demonstrated rehab areas success 8. Mine inspection program for sed dams, drains etc.	L3 E	E	3	C	13	H	1. Review and update WMP regarding water run-off controls for rehab phase of operations.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.02.01, Mine operations environmental risks & potential legacy issues - Ground water	Acid mine drainage (AMD) impacts to groundwater impacting ability to relinquish the site unless rehandled	1. LTA handling and storage of potentially acid forming material (PAF) 2. LTA handling and storage of CHPP rejects	1. Geochemistry assessment 2. LOM reject disposal plan 3. WMP, includes surface & ground water 4. PAF cell designs by competent person 5. PAF model for mining operation 6. Long term storage below ground water level and water in voids will operate as groundwater sinks 7. Stratford waste has not included PAF to date (except Stratford East Area) 8. Geological model identifies PAF material 9. Mining model considers management of PAF	L3 F	F	3	D	9	M	1. Develop and implement a PAF management strategy/procedure, including PAF cell design and management
1.02.02, Mine operations environmental risks & potential legacy issues - Ground water	Seepage from mine water storage dams and final voids enters ground water, requiring remediation/ limitation of connectivity	1. LTA dam design 2. LTA dam construction 3. LTA final void modelling	1. Current WMP addresses monitoring for seepage 2. Existing ground water model includes post-mining groundwater recovery	L3 F	F	3	D	9	M	1. Install additional F-series monitoring borehole network 2. Undertake review and verification of groundwater model post closure.
1.03.01, Mine operations environmental risks & potential legacy issues - Noise & blasting	Noise impacts exceed receivers' predictions	1. Noise impacts exceed criteria	1. Blast Management Plan 2. Noise Management Plan 3. Blasting not planned during rehabilitation and closure phase 4. Noise emissions are predicted to be lower during rehab and closure, compared to operational phase.	L2 E	E	2	D	5	L	1. Review Noise Management Plan and monitoring requirements for closure.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.04.01, Mine operations environmental risks & potential legacy issues - Geology - waste rock and insitu coal geochemistry	LTA rehabilitation of PAF waste emplacements causing AMD contamination of surface and ground water	1. Incorrect modelling and mapping of PAF materials 2. Incorrect placement within waste emplacements 3. Insufficient capping placed or encapsulation of PAF material 4. LTA final void water balance modelling and ground water modelling	1. PAF model 2. Geochemical assessment carried out as part of EIS 3. Mine surveying and tracking of waste materials 4. On-going geochemical testing of waste materials 5. Mine plans, dig plans and dump plans include PAF controls 6. PAF rehandle material estimates considered in final landform design 7. PAF cell designs by competent person 8. PAF model for mining operation	L3 F	F	3	D	9	M	1. Develop and implement PAF management and handling strategy/procedure. 2. Develop and implement process to verify PAF waste emplacements during operations.
1.04.02, Mine operations environmental risks & potential legacy issues - Geology - waste rock and insitu coal geochemistry	LTA rehabilitation of insitu and exposed coal seams causing spontaneous combustion or AMD contamination of ground water	1. LTA final void water balance modelling and ground water modelling 2. Incorrect treatment of exposed coal seams 3. Incorrect final void landform design 4. Seams exposed in end wall of Stratford East and Avon North Pits 5. Loose coal	1. Conceptual final void design 2. Final void water balance 3. Long term final void water quality model 4. Removal of loose or blasted coal 5. On-going monitoring	L2 F	F	2	C	8	M	1. Include future monitoring requirements of exposed coal seams for spontaneous combustion in Closure Plan

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.05.01, Mine operations environmental risks & potential legacy issues - Soils management	Soil not suitable to support intended rehabilitated land use requiring re-approval for final land use	1. LTA knowledge of soil properties 2. Inappropriate selection of final land use	1. EIS includes soil and agricultural assessments, soil mapping and land use suitability categories 2. Rehabilitation monitoring program includes soil testing 3. Demonstrated success with the selected land use (grazing) 4. MOP includes final land use goals and completion criteria	L2 F	F	2	D	5	L	-
1.06.01, Mine operations environmental risks & potential legacy issues - Spontaneous combustion	Spontaneous combustion of carbonaceous material in final landform	1. LTA placement or capping 2. Slumping/cracking of capped emplacement areas allowing oxygen ingress	1. Spontaneous Combustion MP 2. LOM Reject Disposal Plan 3. Rejects placed in old voids and in cells within voids 4. Rehabilitated areas inspections	L2 F	F	2	D	5	L	1. Review MOP/Rehabilitation Management Plan to include process of verification of PAF waste emplacement and capping placement to design.
1.07.01, Mine operations environmental risks & potential legacy issues - Visual amenity	Visual impacts e.g. The Bucketts Way and nearby receivers	1. Rehabilitation does not achieve approved final landform requirements or expectations 2. Unsuccessful rehabilitation creates exposed faces, highwalls, low walls 3. LTA screening of long-term final voids 4. Adjacent land use change	1. Final landform design considers visual amenity 2. Previous rehabilitation and experience 3. Vegetated screens along Wenham Cox Road and Glen Road and The Bucketts Way	L2 R	R	2	D	5	L	1. Investigate implementation of covenants over vegetated lands for visual screening post closure.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.08.01, Mine operations environmental risks & potential legacy issues - Terrestrial flora & fauna	Failure to achieve rehabilitation completion criteria causes delay to relinquishment	1. Disturbance outside approved clearance limits and rehabilitation areas 2. Reinstatement of flora and fauna habitat less than adequate 3. LTA implementation of controls 4. Rehabilitated landform doesn't sustain intended final land use 5. Climatic conditions 6. Fire damage	1. Clearing has been completed within existing approved disturbed area 2. MOP performance and completion criteria 3. Clearance procedure and permit 4. MOP monitoring and reporting requirements 5. Previous site rehabilitation and experience 6. Biodiversity MP, including bushfire management controls 7. MOP rehabilitation procedures are scientifically based 8. Off-site analogue monitoring points for flora and fauna 9. Selection of appropriate land uses for climatic conditions	L3 F	F	3	C	13	H	Review adequacy of rehabilitation monitoring to verify that final land use requirements and completion criteria are being met.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.09.01, Mine operations environmental risks & potential legacy issues - Aquatic ecology	Surface water run-off causes detrimental effects on aquatic ecology resulting in fish kill and prosecution	1. LTA AMD management 2. LTA management or decommissioning of irrigation area run-off 3. Seepage from waste emplacements into creeks 4. Reduction in catchment run-off 5. Runoff from rehabilitated areas	1. PAF model 2. Geochemical assessment carried out as part of EIS 3. Mine surveying and tracking of waste materials 4. Water Management Plan including; site water balance, Irrigation Management Plan 5. On-going geochemical testing of waste materials 6. Water management Infrastructure, monitoring and reporting 7. Mine plans, dig plans and dump plans include PAF controls 8. Water quality monitoring and aquatic ecology monitoring	L4 E	E	4	D	14	H	1. Review site water balance for post-mining phase 2. Review post-mining water monitoring program 3. Review Water Management Plan for closure
1.10.01, Mine operations environmental risks & potential legacy issues - Air quality	Dust emissions during rehabilitation exceed criteria at nearby receivers in accordance with predictions	1. Inadequate control of rehabilitation activities, including bulk shaping and topsoil handling 2. Climatic conditions	1. Air Quality Management Plan 2. Dust control systems and infrastructure in place 3. Air quality monitoring network 4. Rehab methodologies include consideration for; air quality impacts and rainfall, timing of planting	L2 E	E	2	D	5	L	1. Review site induction, training and awareness regarding dust management for contractors coming on site. 2. Review Air Quality Management Plan for closure phase

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.10.02, Mine operations environmental risks & potential legacy issues - Air quality	Odours emitted from site from heatings	1. LTA PAF management and capping at Stratford East generates odours	1. Mine Planning procedures 2. Ability to implement compensation agreements 3. History of managing PAF materials with heating and odours at Duralie.	L2 R	R	2	D	5	L	1. Develop and implement PAF Management Strategy/Procedure
1.11.01, Mine operations environmental risks & potential legacy issues - Non aboriginal heritage	Nil risk identified within mining lease area.									
1.12.01, Mine operations environmental risks & potential legacy issues - Aboriginal heritage	Rehabilitation activities disturb aboriginal heritage site	1. Rehabilitation activities outside previously approved disturbed areas 2. LTA delineation of heritage sites 3. Previously unidentified heritage sites adjacent to current disturbed area	1. Aboriginal cultural heritage assessment 2. Heritage Management Plan 3. Clearance Procedure and Permit 4. Heritage Site Salvage Program 5. Heritage site delineation and monitoring	L3 R	R	3	D	9	M	1. Review long term management of Aboriginal Heritage sites
2.01.01, Rehabilitation & Closure Schedule - Site capability & competency	Inability to carry out adequate closure planning and implementation	1. LTA suitably competent people 2. Complexity of closure planning requirements	1. Experience with transition between mine sites (consultation) 2. Prescribed closure outcomes and established closure criteria in approval documents and MOP 3. Established and demonstrated rehabilitation 4. Yancoal Mine Closure Standard 5. Current site capability	L4 R	R	4	D	14	H	1. Develop Mine closure planning program in MOP. 2. Identify and appoint Mine Closure Planning Team

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
2.02.01, Rehabilitation & Closure Schedule - Resources & funding	Stratford funding and/or resourcing of personnel inadequate to undertake planning and implementation of mine rehabilitation and closure	1. Sustained significant group financial loss 2. Corporate imposed temporary budgetary constraints 3. Corporate imposed temporary restriction on backfilling vacant site roles where relevant site personnel leave	1. Rehabilitation Cost Estimate (RCE) approved by Resources Regulator and bond lodged. 2. Managed under Yancoal group. 3. Maintaining Yancoal's reputation with key stakeholders (critical for maintaining/securing approvals at other Yancoal operations) 4. Corporate instigated LOM process 5. Corporate instigated annual budgeting process 6. Yancoal E&C policy 7. Yancoal mine closure standard	L4 R	R	4	C	18	H	1. Review during annual LOM process 2. Review during annual budgeting process
2.02.02, Rehabilitation & Closure Schedule - Resources & funding	Inadequate capability to plan for and carry out mine rehabilitation and closure resulting in rework delays and reputational damage	1. LTA experience and numbers within current incumbents and externally available to carry out planning and/ or work 2. Planning and completion time frames	1. Yancoal Mine Closure Standard - forms closure team 2. Ability to engage external resources with suitable site knowledge and mine closure planning experience 3. Existing workforce and equipment	L4 R	F	4	C	18	H	1. Identify and appoint Mine Closure Planning Team and personnel
3.01.01, Final land use concepts and landform design and establishment - Identified final use and rehabilitation domains	Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval	1. Failure to clearly articulate final land use 2. Failure to carry out rehabilitation in accordance with final land use 3. LTA final landform design	1. MOP & RMP clearly identifies final land use goals, linked to DA consent requirements. 2. Yancoal Project Governance System 3. Monitoring and reporting	L4 F	F	4	D	14	H	1. Review adequacy of rehabilitation monitoring to verify that final land use requirements are being met for agricultural land.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
3.02.01, Final land use concepts and landform design and establishment - Final landform design and construction incorporation with surrounding landforms (macro & micro-relief) and visual amenity	Final landform design inconsistent with natural surrounding area/design constraints resulting in rework	1. LTA final landform design and planning 2. Landform not constructed in accordance with design	1. Conceptual final landform drafted by external specialist in consultation with Stratford Mine Planning Team 2. Conceptual landform design incorporates erosion control and drainage design 3. MOP includes criteria for final landform design 4. Detailed final landform designs prepared by Stratford Mine Planning Team 5. Survey control 6. Final landform design is generally in accordance with approved conceptual landform design	L3 F	F	3	D	9	M	1. Develop and complete detailed final landform plan for all disturbed/active mining areas. 2. Carry out verification of the final landform design adequacy.
3.03.01, Final land use concepts and landform design and establishment - Water management integrated into the final landform	Final landform water management infrastructure does not provide for long term stability	1. LTA design of water infrastructure 2. LTA modelling of water infrastructure requirements 3. LTA construction of water infrastructure requirements 4. Changed climate conditions	1. Site flood model 2. Site water balance 3. Approved conceptual final landform design which incorporates water infrastructure 4. Design approach to minimise drainage structures on rehabilitated slopes 5. Design review and verification process 6. Survey control	L3 F	F	3	C	13	H	1. Develop and finalise designs for long term water management infrastructure 2. Review post-mining site water balance 3. Carry out verification of long-term water management infrastructure 4. Carry out verification of the final landform design

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
3.04.01, Final land use concepts and landform design and establishment - Reject emplacement areas and tailings dams to support final land use	Rehabilitation of Main Pit rejects emplacement area to final landform and final land use is complex and likely to take a longer timeframe than planned or insufficient material to achieving backfilling/final landform	1. Rejects dewatering requirements to enable capping and rehabilitation 2. LTA backfill and capping material available to provide a free draining surface 3. Reject density unsuitable for capping	1. LOM Reject Disposal Plan 2. MOP RMP, which includes final land use 3. Stratford Main Pit Rehabilitation Strategy	L4 F	F	4	B	21	Ex	1. Develop a detailed plan for closure of the Stratford Main Pit rejects emplacement area, including assessment of material balance and characteristics.
3.05.01, Final land use concepts and landform design and establishment - Final voids, highwalls and low walls stability	Geotechnical instability of rehabilitated waste emplacements and final void resulting in environmental impact	1. Steepness of final highwalls, endwalls, batters and waste emplacements 2. Undetermined water impacts on wall stability and submerged rehabilitated waste emplacements 3. Uncontrolled erosion 4. Do not have final landform design or void design 5. Water displaced from void by failure	1. Operational geotechnical assessments 2. Conceptual final landform design 3. Post-mining water balance model and final void water balance model.	L3 E	E	3	C	13	H	1. Complete detailed final landform design and final void design. 2. Carry out a geotechnical assessment of the final void design including water filled void at interim stages.
3.05.02, Final land use concepts and landform design and establishment - Final voids, highwalls and low walls stability	Erosion of final landforms, compromising establishment of vegetation and water quality See 1.01.02, 1.08.01, 1.09.01	1. LTA design of drainage from landforms/ waste emplacement slopes	1. Conceptual final landform design 2. Demonstrated previous rehabilitation experience 3. Water Management Plan							1. Complete detailed final landform design and final void design. 2. Undertake a geotechnical review of the stability of final landforms.
3.06.01, Final land use concepts and landform design and establishment - Integration of rehabilitation into mine planning systems	Discussed Nil additional risks recorded		1. Mine Planning Procedure 2. LOM process 3. Annual mining schedule and budget 4. Weekly planning meetings and presentations.							

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
4.01.01, Rehabilitation & Closure Criteria - Establishing rehabilitation objectives	Discussed Nil additional risks recorded		1. Rehabilitation objectives specified in approval conditions and MOP.							
4.02.01, Rehabilitation & Closure Criteria - Establishing performance and completion criteria	Discussed Nil additional risks recorded		1. Rehabilitation performance and completion criteria specified in approval conditions and MOP.							
5.01.01, Stakeholder & Community Consultation - General	Rehabilitation and closure does not meet public expectations	1. LTA Consultation with authorities regarding future use of land and water assets 2. LTA consultation with local community/stakeholders	1. Compliance with consultation requirements in MOP 2. Stratford Extension Project EIS involved consultation.	L2 R	R	2	C	8	M	1. Develop a Mine Closure Consultation Strategy
6.01.01, Licencing & Approvals - Approvals relinquishment requirements and schedule	Delay in relinquishment of licenses and consent conditions	1. Changing expectations, new legislation 2. Failure to meet conditions/ closure criteria	1. Environmental Management System 2.. Mine Planning System	L3 F	F	3	C	13	H	1. Assess strategy to relinquish approvals and licenses
7.01.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Removal, demolition and or dismantling of buildings and infrastructure	LTA allowance for site decommissioning, demolition/ removal	1. No detailed estimate	1. Yancoal provision cost for demolition based on RCE process	L3 F	F	3	C	13	H	1. Carry out a detailed decommissioning and demolition study that includes estimated costs
7.02.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Structural works associated with making safe those buildings and infrastructure to be retained as part of the final land use, including heritage management	LTA allowance for making site infrastructure fit for future use	1. No detailed estimate or asset transfer value	1. Yancoal provision cost for demolition based on RCE process	L1 F	F	1	C	4	L	1. Carry out a study to identify any infrastructure to be retained for future land use and scope of remediation work

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
7.03.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Decommissioning, removal and/or augmentation of the mine water management infrastructure	Long term contamination from sediment accumulation in water storages	1. LTA identification and treatment/ removal of contaminated materials 2. Rehabilitation fails to meet completion criteria	1. Water Management Plan 2. Water quality sampling records 3. Site Water Balance 4. RCE allowance for decontamination of water storages 5. MOP identifies surface water infrastructure to be retained or decommissioned	L2 F	F	2	C	8	M	1. Carry out a review of water infrastructure to be decommissioned or retained
7.03.02, Mine decommissioning (infrastructure, water infrastructure, etc.) - Decommissioning, removal and/or augmentation of the mine water management infrastructure	Surface water contamination from surface water infrastructure that has not been properly decommissioned	1. LTA identification and treatment/ removal of contaminated materials 2. LTA surface water model for rehabilitated site 3. Rehabilitation fails to meet completion criteria	1. Water Management Plan 2. MOP identifies surface water infrastructure to be retained or decommissioned 3. Site Water Balance 4. RCE allowance for decommissioning of water storages	L2 F	F	2	C	8	M	1. Carry out a review of water infrastructure to be decommissioned or retained
7.04.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Sealing rehabilitation and relinquishment of exploration boreholes	LTA allowance for sealing, rehabilitation and relinquishment of boreholes	1. Number of potentially unsealed and unrehabilitated boreholes 2. Incomplete statutory reporting	Nil underground workings on site 1. Yancoal Exploration Standard 2. Borehole database 3. Exploration lease RCE	L2 F	F	2	C	8	M	1. Review relinquishment requirements for exploration sites 2. Review number of boreholes that need to be rehabilitated
7.05.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Identification and remediation of hazardous areas and removal of hazardous items	Long term environmental legacy issues from contaminated sites	1. LTA identification and treatment/ removal of contaminated materials e.g. around bulk fuel storage, ROM pad, load-out facilities	1. Waste Management Plan 2. Asbestos assessment carried out on mine owned property, register and MP	L2 F	F	2	C	8	M	1. Carry out contaminated land assessments 2. Develop a register to identify all assets and potentially contaminated areas and hazardous substances

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
7.06.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Off-site water usage post closure	See 13.01.01									
8.01.01, Materials & soils management - Salvage of soil resources for rehabilitation	LTA recovery of suitable soil volumes and characteristics to carry out rehabilitation	1. LTA systems for management of topsoil	1. Top soil stocktake, updated annually 2. EIS Soil assessment, including soil characterisation and suitability 3. Topsoil management included in MOP and in Clearing Plan 4. Ongoing soil testing as part of rehab program	L2 F	F	2	D	5	L	1. Continue to review rehabilitation soil/capping resource requirements annually.
8.02.01, Materials & soils management - Management of soil and materials inventories (e.g. inert capping material, etc) for final land and rehabilitation, including consideration of geochemical and geotechnical properties required for rehabilitation	LTA allowance for PAF capping materials	1. LTA systems for management of capping material	1. Mine planning process 2. Geochemical assessment of capping material 3. Clay striped and stockpiled for construction of PAF cell 4. PAF cell design 5. Topsoil stocktake	L2 F	F	2	D	5	L	-
8.03.01, Materials & soils management - Integration of rehabilitation into mine planning systems	See 8.02.01									

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
9.01.01, Rehabilitation & Revegetation - Growth medium development & revegetation objectives for sustainable rehabilitation and final land use outcomes	LTA soil depth and/ or quality to support intended land use, requiring rework	1. LTA establishment of soil profile 2. Contaminated topsoil 3. LTA soil testing	1. Survey control 2. Rehabilitation (topsoil stripping and management) methodologies included in MOP RMP 3. Demonstrated rehabilitation success 4. Topsoil balance 5. Competent and trained operators 6. Supervision	L2 F	F	2	D	5	L	-
9.02.01, Rehabilitation & Revegetation - Techniques & measures	Discussed Nil additional risks recorded									
9.03.01, Rehabilitation & Revegetation - Rehabilitation planting materials - seed and tube stock	Failure to achieve target vegetation community results in delayed	1. Poor quality seed/ mix 2. LTA availability of required species 3. Poor tube stock 4. LTA treatment and planting techniques 5. LTA availability of seed volume	1. Species mix templates in MOP RMP and Biodiversity MP 2. Rehabilitation and planting methodologies in MOP RMP 3. Identified suppliers of native seed and tube stock 4. Seed collection where possible	L2 F	F	2	D	5	L	-
9.04.01, Rehabilitation & Revegetation - Site capability	Discussed, Nil additional risks recorded See 2.02.02									
10.01.01, Surface & groundwater management - Detailed design of final landforms, including geomorphological and hydraulic modelling	Nil additional risks identified, See 3.03.01									

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
10.02.01, Surface & groundwater management - Techniques and measures to achieve the final land use	Discussed, nil additional risks identified See 3.02.01, 3.03.01, 3.05.01, 3.05.02, 1.04.01									
10.03.01, Surface & groundwater management - Final void, water balance, water quality, potential pollution impacts, geotechnical stability & public safety	Potential for offsite impacts from water discharge from final voids	1. Too great catchment area reporting to final void. 2. Inaccurate final void modelling 3. Inaccurate Final void assumptions 4. Climatic changes	1. Conceptual final void design. Final voids modelled as ground water sink with zero discharge (equilibrium below spill level) in EIS 2. Site water balance and post-mining final void water balance 3. Flood model 4. Ground water model 5. Conceptual final void water balance	L4 E	E	4	C	18	H	1. Develop detailed final void design 2. Review and verify post-mining final void water balance 3. Develop final void long term water quality model 4. Review and verify the post-mining groundwater model.
10.04.01, Surface & groundwater management - Future water licensing requirements for water retained within the final void(s)	Inadequate water licensing for intended future water use	1. LTA identification of intended water use 2. LTA identification of future water licensing requirements 3. LTA understanding of the changeover requirements of the water licenses	1. Current water licensing for operational phase	L2 E	E	2	C	8	M	1. Identify water licensing requirements for closure phase to support proposed post-mining land use.
10.05.01, Surface & groundwater management - Monitoring and inspection requirements	See 13.03.01									
11.01.01, Final Voids and Rejects storage facility management - PAF/NAF handling and long-term storage	Nil additional risks identified See 1.04.01 & 3.04.01									

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
11.02.01, Final Voids and Rejects storage facility management - Rejects handling and long-term storage	See 3.03.01 & 3.04.01									
11.03.01, Final Voids and Rejects storage facility management - Final void design	Nil additional risks identified, see 3.05.01									
11.04.01, Final Voids and Rejects storage facility management - Water management and water quality	Nil additional risks identified, see 1.01.02 & 1.02.01									
11.05.01, Final Voids and Rejects storage facility management - Security measures	Public safety risk of access to/ interaction with final voids	1. Uncontrolled access to final void 2. LTA security measures, barriers and bunding 3. Final pit wall angle unsafe	1. MOP includes provision and maintenance of perimeter fencing, signage and bunding	L4 HS	HS	4	D	14	H	1. Evaluate measures for the long-term provision of security of final voids, including consideration of wall slope and set back distance 2. Carry out geotechnical assessment of final voids
12.01.01, Biodiversity Offset Integration - Stratford biodiversity offset area and biodiversity conservation area commitments	Failure to achieve biodiversity targets and commitments inhibits ability to relinquish biodiversity offset area (BOA) ~1200Ha	1. Inability to integrate rehabilitation with undisturbed land and wildlife corridors 2. Human interference 3. Impacts on native ecosystems by introduced species 4. Bushfire and other natural disaster impacts 5. Incorrect rehabilitation planning, e.g. not linked to adjoining vegetation community 6. Inadequate revegetation and habitat enhancement	1. Biodiversity Management Plan (BMP) 2. MOP & Rehabilitation Management Plan (RMP) 3. Demonstrated previous biodiversity offset revegetation 4. BMP & RMP monitoring verifies on track for achieving completion criteria 5. Biodiversity offset cost estimate and conservation bond separate to the RCE provision.	L3 F	F	3	D	9	M	-

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
13.01.01, Post Closure - Socio-Economic Impacts	Negative socio-economic impact of closure on local community	1. LTA assessment of local community dependency on Stratford Coal Mine	1. Reporting of total FTE's and employee demographic in Annual Reviews	L3 R	R	3	C	13	H	1. Identify all relevant stakeholders and dependencies for closure phase 2. Develop a closure socio-economic impact minimisation strategy
13.02.01, Post Closure - Human Resources	Negative socio-economic impact of closure on workforce	1. LTA assessment of manning requirements during rehabilitation and closure and job dependency strategy	1. Mine communications 2. Existing EA 3. Experience with mine site transfer	L3 R	R	3	C	13	H	1. Develop and implement a HR strategy for mine closure
13.03.01, Post Closure - Monitoring and Maintenance	Failure to identify and respond to issues in a timely manner leads to non-compliance or environmental harm	1. LTA provision for closure monitoring and maintenance 2. LTA reporting system post-mining	1. Yancoal EMS 2. Stratford Coal Environmental Management System - monitoring and maintenance requirements during operational phase	L3 E	E	3	C	13	H	1. Identify and develop a post closure monitoring and maintenance requirements strategy 2. Carry out a review of all existing environmental management plans for post closure phase
13.04.01, Post Closure - Relinquishment	Nil additional risks identified. See 6.01.01									

Appendix C

Yancoal Australia Limited – Stratford Coal Pty Ltd

Stratford Mining Complex
Rehabilitation and Mine Closure Risk Assessment

Risk Table (Risk Order), 27th October, 2020

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
3.04.01, Final land use concepts and landform design and establishment - Reject emplacement areas and tailings dams to support final land use	Rehabilitation of Main Pit rejects emplacement area to final landform and final land use is complex and likely to take a longer timeframe than planned or insufficient material to achieving backfilling/final landform	1. Rejects dewatering requirements to enable capping and rehabilitation 2. LTA backfill and capping material available to provide a free draining surface 3. Reject density unsuitable for capping	1. LOM Reject Disposal Plan 2. MOP RMP, which includes final land use 3. Stratford Main Pit Rehabilitation Strategy	L4 F	F	4	B	21	Ex	1. Develop a detailed plan for closure of the Stratford Main Pit rejects emplacement area, including assessment of material balance and characteristics.
2.02.01, Rehabilitation & Closure Schedule - Resources & funding	Stratford funding and/or resourcing of personnel inadequate to undertake planning and implementation of mine rehabilitation and closure	1. Sustained significant group financial loss 2. Corporate imposed temporary budgetary constraints 3. Corporate imposed temporary restriction on backfilling vacant site roles where relevant site personnel leave	1. Rehabilitation Cost Estimate (RCE) approved by Resources Regulator and bond lodged. 2. Managed under Yancoal group. 3. Maintaining Yancoal's reputation with key stakeholders (critical for maintaining/securing approvals at other Yancoal operations) 4. Corporate instigated LOM process 5. Corporate instigated annual budgeting process 6. Yancoal E&C policy 7. Yancoal mine closure standard	L4 R	R	4	C	18	H	1. Review during annual LOM process 2. Review during annual budgeting process

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
2.02.02, Rehabilitation & Closure Schedule - Resources & funding	Inadequate capability to plan for and carry out mine rehabilitation and closure resulting in rework delays and reputational damage	1. LTA experience and numbers within current incumbents and externally available to carry out planning and/ or work 2. Planning and completion time frames	1. Yancoal Mine Closure Standard - forms closure team 2. Ability to engage external resources with suitable site knowledge and mine closure planning experience 3. Existing workforce and equipment	L4 R	F	4	C	18	H	1. Identify and appoint Mine Closure Planning Team and personnel
10.03.01, Surface & groundwater management - Final void, water balance, water quality, potential pollution impacts, geotechnical stability & public safety	Potential for offsite impacts from water discharge from final voids	1. Too great catchment area reporting to final void. 2. Inaccurate final void modelling 3. Inaccurate Final void assumptions 4. Climatic changes	1. Conceptual final void design. Final voids modelled as ground water sink with zero discharge (equilibrium below spill level) in EIS 2. Site water balance and post-mining final void water balance 3. Flood model 4. Ground water model 5. Conceptual final void water balance	L4 E	E	4	C	18	H	1. Develop detailed final void design 2. Review and verify post-mining final void water balance 3. Develop final void long term water quality model 4. Review and verify the post-mining groundwater model.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.09.01, Mine operations environmental risks & potential legacy issues - Aquatic ecology	Surface water run-off causes detrimental effects on aquatic ecology resulting in fish kill and prosecution	1. LTA AMD management 2. LTA management or decommissioning of irrigation area run-off 3. Seepage from waste emplacements into creeks 4. Reduction in catchment run-off 5. Runoff from rehabilitated areas	1. PAF model 2. Geochemical assessment carried out as part of EIS 3. Mine surveying and tracking of waste materials 4. Water Management Plan including; site water balance, Irrigation Management Plan 5. On-going geochemical testing of waste materials 6. Water management Infrastructure, monitoring and reporting 7. Mine plans, dig plans and dump plans include PAF controls 8. Water quality monitoring and aquatic ecology monitoring	L4 E	E	4	D	14	H	1. Review site water balance for post-mining phase 2. Review post-mining water monitoring program 3. Review Water Management Plan for closure
2.01.01, Rehabilitation & Closure Schedule - Site capability & competency	Inability to carry out adequate closure planning and implementation	1. LTA suitably competent people 2. Complexity of closure planning requirements	1. Experience with transition between mine sites (consultation) 2. Prescribed closure outcomes and established closure criteria in approval documents and MOP 3. Established and demonstrated rehabilitation 4. Yancoal Mine Closure Standard 5. Current site capability	L4 R	R	4	D	14	H	1. Develop Mine closure planning program in MOP. 2. Identify and appoint Mine Closure Planning Team

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
3.01.01, Final land use concepts and landform design and establishment - Identified final use and rehabilitation domains	Rehabilitation is incompatible or unable to achieve proposed final land use, requiring rework or re-approval	1. Failure to clearly articulate final land use 2. Failure to carry out rehabilitation in accordance with final land use 3. LTA final landform design	1. MOP & RMP clearly identifies final land use goals, linked to DA consent requirements. 2. Yancoal Project Governance System 3. Monitoring and reporting	L4 F	F	4	D	14	H	1. Review adequacy of rehabilitation monitoring to verify that final land use requirements are being met for agricultural land.
11.05.01, Final Voids and Rejects storage facility management - Security measures	Public safety risk of access to/ interaction with final voids	1. Uncontrolled access to final void 2. LTA security measures, barriers and bunding 3. Final pit wall angle unsafe	1. MOP includes provision and maintenance of perimeter fencing, signage and bunding	L4 HS	HS	4	D	14	H	1. Evaluate measures for the long-term provision of security of final voids, including consideration of wall slope and set back distance 2. Carry out geotechnical assessment of final voids
1.01.01, Mine operations environmental risks & potential legacy issues - Surface water	Unplanned release of mine water during rehabilitation/ operations	1. Current water management practices on-site are less than adequate (LTA) for rehabilitation stage of operations 2. LTA surface and ground water controls for rehabilitation stage of operations 3. Uncontrolled spill from Mine Water Storage Dams, 4. Unexpected structural failure of dam, flood bunds 5. Unplanned removal of water management infrastructure, e.g. minor levee or bund 6. Failure to correctly identify where run-off from rehab areas could occur and where they could report to	1. Water Management Plan 2. Dedicated resources on site 3. Current water infrastructure in place 4. Site water balance 5. Ground disturbance and clearing procedure 6. Mine Planning procedures	L3 E	E	3	C	13	H	1. Review site induction requirements to specify that water management infrastructure cannot be altered without specific authorisation

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.01.02, Mine operations environmental risks & potential legacy issues - Surface water	Poor quality runoff from rehabilitated areas	1. Current water management practices on-site are LTA for rehabilitation stage of operations 2. LTA surface and ground water controls for rehabilitation stage of operations 3. Vegetation not adequately established 4. LTA landform and drainage structure design 5. LTA PAF cell design/ capping	1. Water management plan (WMP); rehabilitation runoff criteria 2. Dedicated resources on site 3. Current water infrastructure in place 4. Site water balance 5. Existing MOP and Rehabilitation MP 6. Landform and drainage design by suitably competent person 7. Demonstrated rehab areas success 8. Mine inspection program for sed dams, drains etc.	L3 E	E	3	C	13	H	1. Review and update WMP regarding water run-off controls for rehab phase of operations.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.08.01, Mine operations environmental risks & potential legacy issues - Terrestrial flora & fauna	Failure to achieve rehabilitation completion criteria causes delay to relinquishment	1. Disturbance outside approved clearance limits and rehabilitation areas 2. Reinstatement of flora and fauna habitat less than adequate 3. LTA implementation of controls 4. Rehabilitated landform doesn't sustain intended final land use 5. Climatic conditions 6. Fire damage	1. Clearing has been completed within existing approved disturbed area 2. MOP performance and completion criteria 3. Clearance procedure and permit 4. MOP monitoring and reporting requirements 5. Previous site rehabilitation and experience 6. Biodiversity MP, including bushfire management controls 7. MOP rehabilitation procedures are scientifically based 8. Off-site analogue monitoring points for flora and fauna 9. Selection of appropriate land uses for climatic conditions	L3 F	F	3	C	13	H	Review adequacy of rehabilitation monitoring to verify that final land use requirements and completion criteria are being met.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
3.03.01, Final land use concepts and landform design and establishment - Water management integrated into the final landform	Final landform water management infrastructure does not provide for long term stability	1. LTA design of water infrastructure 2. LTA modelling of water infrastructure requirements 3. LTA construction of water infrastructure requirements 4. Changed climate conditions	1. Site flood model 2. Site water balance 3. Approved conceptual final landform design which incorporates water infrastructure 4. Design approach to minimise drainage structures on rehabilitated slopes 5. Design review and verification process 6. Survey control	L3 F	F	3	C	13	H	1. Develop and finalise designs for long term water management infrastructure 2. Review post-mining site water balance 3. Carry out verification of long-term water management infrastructure 4. Carry out verification of the final landform design
3.05.01, Final land use concepts and landform design and establishment - Final voids, highwalls and low walls stability	Geotechnical instability of rehabilitated waste emplacements and final void resulting in environmental impact	1. Steepness of final highwalls, endwalls, batters and waste emplacements 2. Undetermined water impacts on wall stability and submerged rehabilitated waste emplacements 3. Uncontrolled erosion 4. Do not have final landform design or void design 5. Water displaced from void by failure	1. Operational geotechnical assessments 2. Conceptual final landform design 3. Post-mining water balance model and final void water balance model.	L3 E	E	3	C	13	H	1. Complete detailed final landform design and final void design. 2. Carry out a geotechnical assessment of the final void design including water filled void at interim stages.
6.01.01, Licencing & Approvals - Approvals relinquishment requirements and schedule	Delay in relinquishment of licenses and consent conditions	1. Changing expectations, new legislation 2. Failure to meet conditions/ closure criteria	1. Environmental Management System 2.. Mine Planning System	L3 F	F	3	C	13	H	1. Assess strategy to relinquish approvals and licenses
7.01.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Removal, demolition and or dismantling of buildings and infrastructure	LTA allowance for site decommissioning, demolition/ removal	1. No detailed estimate	1. Yancoal provision cost for demolition based on RCE process	L3 F	F	3	C	13	H	1. Carry out a detailed decommissioning and demolition study

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
13.01.01, Post Closure - Socio-Economic Impacts	Negative socio-economic impact of closure on local community	1. LTA assessment of local community dependency on Stratford Coal Mine	1. Reporting of total FTE's and employee demographic in Annual Reviews	L3 R	R	3	C	13	H	1. Identify all relevant stakeholders and dependencies for closure phase 2. Develop a closure socio-economic impact minimisation strategy
13.02.01, Post Closure - Human Resources	Negative socio-economic impact of closure on workforce	1. LTA assessment of manning requirements during rehabilitation and closure and job dependency strategy	1. Mine communications 2. Existing EA 3. Experience with mine site transfer	L3 R	R	3	C	13	H	1. Develop and implement a HR strategy for mine closure
13.03.01, Post Closure - Monitoring and Maintenance	Failure to identify and respond to issues in a timely manner leads to non-compliance or environmental harm	1. LTA provision for closure monitoring and maintenance 2. LTA reporting system post-mining	1. Yancoal EMS 2. Stratford Coal Environmental Management System - monitoring and maintenance requirements during operational phase	L3 E	E	3	C	13	H	1. Identify and develop a post closure monitoring and maintenance requirements strategy 2. Carry out a review of all existing environmental management plans for post closure phase

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.02.01, Mine operations environmental risks & potential legacy issues - Ground water	AMD impacts to groundwater impacting ability to relinquish the site unless rehandled	1. LTA handling and storage of potentially acid forming material (PAF) 2. LTA handling and storage of CHPP rejects	1. Geochemistry assessment 2. LOM reject disposal plan 3. WMP, includes surface & ground water 4. PAF cell designs by competent person 5. PAF model for mining operation 6. Long term storage below ground water level and water in voids will operate as groundwater sinks 7. Stratford waste has not included PAF to date (except Stratford East Area) 8. Geological model identifies PAF material 9. Mining model considers management of PAF	L3 F	F	3	D	9	M	1. Develop and implement a PAF management strategy/procedure, including PAF cell design and management
1.02.02, Mine operations environmental risks & potential legacy issues - Ground water	Seepage from mine water storage dams and final voids enters ground water, requiring remediation/ limitation of connectivity	1. LTA dam design 2. LTA dam construction 3. LTA final void modelling	1. Current WMP addresses monitoring for seepage 2. Existing ground water model includes post-mining groundwater recovery	L3 F	F	3	D	9	M	1. Install additional F-series monitoring borehole network 2. Undertake review and verification of groundwater model post closure.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.04.01, Mine operations environmental risks & potential legacy issues - Geology - waste rock and insitu coal geochemistry	LTA rehabilitation of PAF waste emplacements causing acid mine drainage (AMD) contamination of surface and ground water	1. Incorrect modelling and mapping of PAF materials 2. Incorrect placement within waste emplacements 3. Insufficient capping placed or encapsulation of PAF material 4. LTA final void water balance modelling and ground water modelling	1. PAF model 2. Geochemical assessment carried out as part of EIS 3. Mine surveying and tracking of waste materials 4. On-going geochemical testing of waste materials 5. Mine plans, dig plans and dump plans include PAF controls 6. PAF rehandle material estimates considered in final landform design 7. PAF cell designs by competent person 8. PAF model for mining operation	L3 F	F	3	D	9	M	1. Develop and implement PAF management and handling strategy/procedure. 2. Develop and implement process to verify PAF waste emplacements during operations.
1.12.01, Mine operations environmental risks & potential legacy issues - Aboriginal heritage	Rehabilitation activities disturb aboriginal heritage site	1. Rehabilitation activities outside previously approved disturbed areas 2. LTA delineation of heritage sites 3. Previously unidentified heritage sites adjacent to current disturbed area	1. Aboriginal cultural heritage assessment 2. Heritage Management Plan 3. Clearance Procedure and Permit 4. Heritage Site Salvage Program 5. Heritage site delineation and monitoring	L3 R	R	3	D	9	M	1. Review long term management of Aboriginal Heritage sites

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
3.02.01, Final land use concepts and landform design and establishment - Final landform design and construction incorporation with surrounding landforms (macro & micro-relief) and visual amenity	Final landform design inconsistent with natural surrounding area/design constraints resulting in rework	1. LTA final landform design and planning 2. Landform not constructed in accordance with design	1. Conceptual final landform drafted by external specialist in consultation with Stratford Mine Planning Team 2. Conceptual landform design incorporates erosion control and drainage design 3. MOP includes criteria for final landform design 4. Detailed final landform designs prepared by Stratford Mine Planning Team 5. Survey control 6. Final landform design is generally in accordance with approved conceptual landform design	L3 F	F	3	D	9	M	1. Develop and complete detailed final landform plan for all disturbed/active mining areas. 2. Carry out verification of the final landform design adequacy.
12.01.01, Biodiversity Offset Integration - Stratford biodiversity offset area and biodiversity conservation area commitments	Failure to achieve biodiversity targets and commitments inhibits ability to relinquish biodiversity offset area (BOA) ~1200Ha	1. Inability to integrate rehabilitation with undisturbed land and wildlife corridors 2. Human interference 3. Impacts on native ecosystems by introduced species 4. Bushfire and other natural disaster impacts 5. Incorrect rehabilitation planning, e.g. not linked to adjoining vegetation community 6. Inadequate revegetation and habitat enhancement	1. Biodiversity Management Plan (BMP) 2. MOP & Rehabilitation Management Plan (RMP) 3. Demonstrated previous biodiversity offset revegetation 4. BMP & RMP monitoring verifies on track for achieving completion criteria 5. Biodiversity offset cost estimate and conservation bond separate to the RCE provision.	L3 F	F	3	D	9	M	-

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.04.02, Mine operations environmental risks & potential legacy issues - Geology - waste rock and insitu coal geochemistry	LTA rehabilitation of insitu and exposed coal seams causing spontaneous combustion or AMD contamination of ground water	1. LTA final void water balance modelling and ground water modelling 2. Incorrect treatment of exposed coal seams 3. Incorrect final void landform design 4. Seams exposed in end wall of Stratford East and Avon North Pits 5. Loose coal	1. Conceptual final void design 2. Final void water balance 3. Long term final void water quality model 4. Removal of loose or blasted coal 5. On-going monitoring	L2 F	F	2	C	8	M	1. Include future monitoring requirements of exposed coal seams for spontaneous combustion in Closure Plan
5.01.01, Stakeholder & Community Consultation - General	Rehabilitation and closure does not meet public expectations	1. LTA Consultation with authorities regarding future use of land and water assets 2. LTA consultation with local community/stakeholders	1. Compliance with consultation requirements in MOP 2. Stratford Extension Project EIS involved consultation.	L2 R	R	2	C	8	M	1. Develop a Mine Closure Consultation Strategy
7.03.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Decommissioning, removal and/or augmentation of the mine water management infrastructure	Long term contamination from sediment accumulation in water storages	1. LTA identification and treatment/ removal of contaminated materials 2. Rehabilitation fails to meet completion criteria	1. Water Management Plan 2. Water quality sampling records 3. Site Water Balance 4. RCE allowance for decontamination of water storages 5. MOP identifies surface water infrastructure to be retained or decommissioned	L2 F	F	2	C	8	M	1. Carry out a review of water infrastructure to be decommissioned or retained

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
7.03.02, Mine decommissioning (infrastructure, water infrastructure, etc.) - Decommissioning, removal and/or augmentation of the mine water management infrastructure	Surface water contamination from surface water infrastructure that has not been properly decommissioned	1. LTA identification and treatment/ removal of contaminated materials 2. LTA surface water model for rehabilitated site 3. Rehabilitation fails to meet completion criteria	1. Water Management Plan 2. MOP identifies surface water infrastructure to be retained or decommissioned 3. Site Water Balance 4. RCE allowance for decommissioning of water storages	L2 F	F	2	C	8	M	1. Carry out a review of water infrastructure to be decommissioned or retained
7.04.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Sealing rehabilitation and relinquishment of exploration boreholes	LTA allowance for sealing, rehabilitation and relinquishment of boreholes	1. Number of potentially unsealed and unrehabilitated boreholes 2. Incomplete statutory reporting	Nil underground workings on site 1. Yancoal Exploration Standard 2. Borehole database 3. Exploration lease RCE	L2 F	F	2	C	8	M	1. Review relinquishment requirements for exploration sites 2. Review number of boreholes that need to be rehabilitated
7.05.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Identification and remediation of hazardous areas and removal of hazardous items	Long term environmental legacy issues from contaminated sites	1. LTA identification and treatment/ removal of contaminated materials e.g. around bulk fuel storage, ROM pad, load-out facilities	1. Waste Management Plan 2. Asbestos assessment carried out on mine owned property, register and MP	L2 F	F	2	C	8	M	1. Carry out contaminated land assessments 2. Develop a register to identify all assets and potentially contaminated areas and hazardous substances
10.04.01, Surface & groundwater management - Future water licensing requirements for water retained within the final void(s)	Inadequate water licensing for intended future water use	1. LTA identification of intended water use 2. LTA identification of future water licensing requirements 3. LTA understanding of the changeover requirements of the water licenses	1. Current water licensing for operational phase	L2 E	E	2	C	8	M	1. Identify water licensing requirements for closure phase to support proposed post-mining land use.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.03.01, Mine operations environmental risks & potential legacy issues - Noise & blasting	Noise impacts exceed receivers' predictions	1. Noise impacts exceed criteria	1. Blast Management Plan 2. Noise Management Plan 3. Blasting not planned during rehabilitation and closure phase 4. Noise emissions are predicted to be lower during rehab and closure, compared to operational phase.	L2 E	E	2	D	5	L	1. Review Noise Management Plan and monitoring requirements for closure.
1.05.01, Mine operations environmental risks & potential legacy issues - Soils management	Soil not suitable to support intended rehabilitated land use requiring re-approval for final land use	1. LTA knowledge of soil properties 2. Inappropriate selection of final land use (specific in NSW)	1. EIS includes soil and agricultural assessments, soil mapping and land use suitability categories 2. Rehabilitation monitoring program includes soil testing 3. Demonstrated success with the selected land use (grazing) 4. MOP includes final land use goals and completion criteria	L2 F	F	2	D	5	L	-
1.06.01, Mine operations environmental risks & potential legacy issues - Spontaneous combustion	Spontaneous combustion of carbonaceous material in final landform	1. LTA placement or capping 2. Slumping/cracking of capped emplacement areas allowing oxygen ingress	1. Spontaneous Combustion MP 2. LOM Reject Disposal Plan 3. Rejects placed in old voids and in cells within voids 4. Rehabilitated areas inspections	L2 F	F	2	D	5	L	1. Review MOP/Rehabilitation Management Plan to include process of verification of PAF waste emplacement and capping placement to design.

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
1.07.01, Mine operations environmental risks & potential legacy issues - Visual amenity	Visual impacts e.g. The Bucketts Way and nearby receivers	1. Rehabilitation does not achieve approved final landform requirements or expectations 2. Unsuccessful rehabilitation creates exposed faces, highwalls, low walls 3. LTA screening of long-term final voids 4. Adjacent land use change	1. Final landform design considers visual amenity 2. Previous rehabilitation and experience 3. Vegetated screens along Wenham Cox Road and Glen Road and The Bucketts Way	L2 R	R	2	D	5	L	1. Investigate implementation of covenants over vegetated lands for visual screening post closure.
1.10.01, Mine operations environmental risks & potential legacy issues - Air quality	Dust emissions during rehabilitation exceed criteria at nearby receivers in accordance with predictions	1. Inadequate control of rehabilitation activities, including bulk shaping and topsoil handling 2. Climatic conditions	1. Air Quality Management Plan 2. Dust control systems and infrastructure in place 3. Air quality monitoring network 4. Rehab methodologies include consideration for; air quality impacts and rainfall, timing of planting	L2 E	E	2	D	5	L	1. Review site induction, training and awareness regarding dust management for contractors coming on site. 2. Review Air Quality Management Plan for closure phase
1.10.02, Mine operations environmental risks & potential legacy issues - Air quality	Odours emitted from site from heatings	1. LTA PAF management and capping at Stratford East generates odours	1. Mine Planning procedures 2. Ability to implement compensation agreements 3. History of managing PAF materials with heating and odours at Duralie.	L2 R	R	2	D	5	L	1. Develop and implement PAF Management Strategy/Procedure

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
8.01.01, Materials & soils management - Salvage of soil resources for rehabilitation	LTA recovery of suitable soil volumes and characteristics to carry out rehabilitation	1. LTA systems for management of topsoil	1. Top soil stocktake, updated annually 2. EIS Soil assessment, including soil characterisation and suitability 3. Topsoil management included in MOP and in Clearing Plan 4. Ongoing soil testing as part of rehab program	L2 F	F	2	D	5	L	1. Continue to review rehabilitation soil/capping resource requirements annually.
8.02.01, Materials & soils management - Management of soil and materials inventories (e.g. inert capping material, etc) for final land and rehabilitation, including consideration of geochemical and geotechnical properties required for rehabilitation	LTA allowance for PAF capping materials	1. LTA systems for management of capping material	1. Mine planning process 2. Geochemical assessment of capping material 3. Clay striped and stockpiled for construction of PAF cell 4. PAF cell design 5. Topsoil stocktake	L2 F	F	2	D	5	L	-
9.01.01, Rehabilitation & Revegetation - Growth medium development & revegetation objectives for sustainable rehabilitation and final land use outcomes	LTA soil depth and/ or quality to support intended land use, requiring rework	1. LTA establishment of soil profile 2. Contaminated topsoil 3. LTA soil testing	1. Survey control 2. Rehabilitation (topsoil stripping and management) methodologies included in MOP RMP 3. Demonstrated rehabilitation success 4. Topsoil balance 5. Competent and trained operators 6. Supervision	L2 F	F	2	D	5	L	-

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
9.03.01, Rehabilitation & Revegetation - Rehabilitation planting materials - seed and tube stock	Failure to achieve target vegetation community results in delayed	1. Poor quality seed/ mix 2. LTA availability of required species 3. Poor tube stock 4. LTA treatment and planting techniques 5. LTA availability of seed volume	1. Species mix templates in MOP RMP and Biodiversity MP 2. Rehabilitation and planting methodologies in MOP RMP 3. Identified suppliers of native seed and tube stock 4. Seed collection where possible	L2 F	F	2	D	5	L	-
7.02.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Structural works associated with making safe those buildings and infrastructure to be retained as part of the final land use, including heritage management	LTA allowance for making site infrastructure fit for future use	1. No detailed estimate or asset transfer value	1. Yancoal provision cost for demolition based on RCE process	L1 F	F	1	C	4	L	1. Carry out a study to identify any infrastructure to be retained for future land use and scope of remediation work
1.11.01, Mine operations environmental risks & potential legacy issues - Non aboriginal heritage	Nil risk identified within mining lease area.									
3.05.02, Final land use concepts and landform design and establishment - Final voids, highwalls and low walls stability	Erosion of final landforms, compromising establishment of vegetation and water quality See 1.01.02, 1.08.01, 1.09.01	1. LTA design of drainage from landforms/ waste emplacement slopes	1. Conceptual final landform design 2. Demonstrated previous rehabilitation experience 3. Water Management Plan							1. Complete detailed final landform design and final void design. 2. Undertake a geotechnical review of the stability of final landforms.
3.06.01, Final land use concepts and landform design and establishment - Integration of rehabilitation into mine planning systems	Discussed Nil additional risks recorded									

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
4.01.01, Rehabilitation & Closure Criteria - Establishing rehabilitation objectives	Discussed Nil additional risks recorded		1. Rehabilitation objectives specified in approval conditions and MOP.							
4.02.01, Rehabilitation & Closure Criteria - Establishing performance and completion criteria	Discussed Nil additional risks recorded		1. Rehabilitation performance and completion criteria specified in approval conditions and MOP.							
7.06.01, Mine decommissioning (infrastructure, water infrastructure, etc.) - Off-site water usage post closure	See 13.01.01									
8.03.01, Materials & soils management - Integration of rehabilitation into mine planning systems	See 8.02.01									
9.02.01, Rehabilitation & Revegetation - Techniques & measures	Discussed Nil additional risks recorded									
9.04.01, Rehabilitation & Revegetation - Site capability	Discussed, Nil additional risks recorded See 2.02.02									
10.01.01, Surface & groundwater management - Detailed design of final landforms, including geomorphological and hydraulic modelling	Nil additional risks identified, see 3.03.01									
10.02.01, Surface & groundwater management - Techniques and measures to achieve the final land use	Discussed, nil additional risks identified See 3.02.01, 3.03.01, 3.05.01, 3.05.02, 1.04.01									

Ref, Aspect - Consideration	Risk Issue	Cause/s	Planned/ Existing Controls	MRC	Loss Type	Consequence	Likelihood	Risk Rank	Risk Level	Risk Reduction Strategy/ Actions
10.05.01, Surface & groundwater management - Monitoring and inspection requirements	See 13.03.01									
11.01.01, Final Voids and Rejects storage facility management - PAF/NAF handling and long-term storage	Nil additional risks identified See 1.04.01 & 3.04.01									
11.02.01, Final Voids and Rejects storage facility management - Rejects handling and long-term storage	See 3.03.01 & 3.04.01									
11.03.01, Final Voids and Rejects storage facility management - Final void design	Nil additional risks identified, see 3.05.01									
11.04.01, Final Voids and Rejects storage facility management - Water management and water quality	Nil additional risks identified, see 1.01.02 & 1.02.01									
13.04.01, Post Closure - Relinquishment	Nil additional risks identified. See 6.01.01									

Appendix D

Yancoal Australia Limited

Risk Assessment Matrix

Loss Type	Consequence				
	1 Insignificant	2 Minor	3 Moderate	4 Major	5 Catastrophic
(P) Harm to People	**Slight injury or health effects** – report only (RO) or first aid injury (FAI)	**Minor injury or health effects** – medical treatment injury (MTI) or restricted work injury (RWI)	**Serious bodily injury or health effects** – lost time injury (LTI)	**Single fatality**	**Multiple fatalities**
(E) Environmental Impact	**Environmental nuisance** – trivial or negligible, short term impact to area of low significance, minimal or no physical remediation required No regulation. Cost < $1K	**Minor environmental harm** – short term impact to area of limited local significance, limited physical remediation Reportable Breach /Minor Non-Compliance, potential warning notice, other notices (infringement / prosecution) unlikely. Costs $1K - $10K	**Serious environmental harm** – impact to Environment, physical remediation, potential or actual community health impacts or pollution or contamination Infringement Notice but Prosecution unlikely Costs $10K - $100K	**Major environmental harm** – long term reversible impact, health statistics in community alter as a result of this incident or pollution or contamination Prosecution Costs $100K - $1M	**Extreme environmental harm** – irreversible impacts on environmental values of extreme & widespread areas, or those of national conservation significance, community fatalities or pollution or contamination Prosecution, License revoked Costs > $1M
(O) Asset Damage and Other Consequential Losses	**Slight damage** < $1M, or < 1-day disruption to operation	**Minor damage** $1M - $5M, or < 1-week disruption to operation	**Local damage** $5M - $20M, or < 1-month disruption to operation	**Major damage** $20M -$100M or, < 6 months disruption to operation	**Extreme damage** > $100M, or > 6 months, substantial or total loss of operation
(R) Impact on Reputation	**Slight impact** – Public awareness may exist but no public concern Isolated compliance failure – no brand damage	**Limited impact** –Some local public concern Intervention of regulating authority – minimal brand damage	**Considerable impact** -Regional public concern Major compliance failure involving fines – medium brand damage	**National impact** –National public concern Temporary withdrawal of license to operate – significant brand damage	**International impact** - International public attention Loss of shareholder confidence – irreparable brand damage

Likelihood	Likelihood Guide	Level of Risk				
A (Almost Certain)	Likely that the unwanted event could occur several times per year at this location	**11 (M)**	**16 (H)**	**20 (H)**	**23 (E)**	**25 (E)**
B (Likely)	Likely that the unwanted event could occur several times per year in the Australian mining industry; or could happen annually	**7 (M)**	**12 (M)**	**17 (H)**	**21 (E)**	**24 (E)**
C (Possible)	The unwanted event could well have occurred in the Australian mining industry at some time in the past 10 years	**4 (L)**	**8 (M)**	**13 (H)**	**18 (H)**	**22 (E)**
D (Unlikely)	The unwanted event has happened in the Australian mining industry at some time; or could happen in 50 years	**2 (L)**	**5 (L)**	**9 (M)**	**14 (H)**	**19 (H)**
E (Rare)	The unwanted event has never been known to occur in the Australian mining industry; or is highly unlikely that it could ever occur	**1 (L)**	**3 (L)**	**6 (M)**	**10 (M)**	**15 (H)**

Risk Rating	Risk Level	Risk Management	Reporting Timeframe	Investigation if Incident Occurs	Action Development Timeframe
21 - 25	**(E) Extreme**	Stop operations or don't proceed with activity (Make Safe). Immediate intervention required from Senior Management.	COO - Immediately. If unable, within 2 hrs. Notify alternative immediately e.g. MD	External facilitated investigation	Within 24 hrs w/ copy "entered" for COO monitoring of status.
13 - 20	**(H) High**	Imperative to eliminate or reduce risk by introduction of controls. Do not proceed with activity until reviewed by Senior Management.	COO - within 24 hrs	Internal / external facilitator	Within 7 days. Higher risks should also be available for COO status monitoring.
6 - 12	**(M) Moderate**	Corrective action to be determined. Do not proceed without authorisation from Supervisor.	GM - within 24 hrs	Detailed investigation including hard controls	Within 14 days
1 - 5	**(L) Low**	Safe to continue activity once risk is minimised.	Manager - within 24 hrs	Consider further actions	Within 60 days.

Appendix E

Risk Assessment Workshop Signed Attendance Sheet

Yancoal Australia

Stratford Coal Mine - Mine Operations and Rehabilitation Management Plan Environmental Risk Assessment

Name (Sign below)	Position	Company/ Site	Qualifications & Experinece	27/10/2020
Michael Plain	Environment & Community Superintendent	Stratford Coal	BLWSc, 11 years Mining E&C	✓
Michael Moore VIA VIDEO CONFERENCE		Yancoal		✓
Nathan Vaughan	Mine Planning Supt	Yancoal	Nominated Mine Surveyor 10yrs	✓
Andrew Lau VIA VIDEO CONFERENCE		Yancoal		✓
Margot Robinson VIA VIDEO CONFERENCE		Resource Strategies		✓
Jamie Gleeson		Resource Strategies		—
Megan Dawson		Yancoal		—
Thomas Kirkwood	Environment & Community Coord	Yancoal	BSc E&C 5yrs	✓
Carly McCormack VIA VIDEO CONFERENCE		Yancoal		✓
Alan Andrews VIA VIDEO CONFERENCE		Yancoal		✓
Chris Allanson	Facilitator, Principal Consultant	CK Consultants	BE (Mining), MBA, NSW Coal Mine Manager 20yrs' UG coal mining operations, 20yrs' risk management	✓

APPENDIX B

STRATFORD MAIN PIT REHABILITATION STRATEGY (XENITH CONSULTING PTY LTD, 2019)

Xenith

Yancoal

Stratford Main Pit Rehabilitation Strategy

12 APRIL 2019

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DOCUMENT ISSUE APPROVAL

Project & Document No:	Date:
Stratford Main Pit Rehabilitation Strategy R1.docm	17/04/2019
Title	**Revision No:**
Stratford Main Pit Rehabilitation Strategy	R1
Client:	**Status:**
Yancoal – Stratford Mine	Final

	Name	Position	Signature	Date
Prepared by:	John Cawte	Project Manager		11/04/2019
Reviewed by:	Dave Lennard	Project Reviewer		12/04/2019
Approved by:	John Cawte	Project Manager		17/04/2019

DISTRIBUTION

Organisation	Attention	No of hard copies	No of electronic copies	Actioned
Yancoal - SMC	Michael Plain	Nil	1	John Cawte

To be initialled and dated by the person who actions the issue of the documents.

1 EXECUTIVE SUMMARY

1.1 Introduction

Stratford Coal Pty Ltd (SCPL), a wholly owned subsidiary of Yancoal Australia Limited (Yancoal), owns the Stratford Coal Mine (SCM), which is located approximately 100 kilometres (km) north of Newcastle, New South Wales (NSW).

The Development Consent SSD-4966 for the Stratford Extension Project (SEP) was granted on 29 May 2015 and involves the extension and continuation of mine operations at the SMC, including (among other things):

- mining of up to 2.6 million tonnes of ROM coal per annum;
- progressive backfilling of mine voids with waste rock behind the advancing open cut mining operations;
- stockpiling and loading of product coal to trains for transport on the North Coast Railway to Newcastle;
- disposal of CHPP rejects via pipeline to the existing co-disposal area in the Stratford Main Pit and, later in the mine life, the Avon North Open Cut void;
- continued use of existing water storages/dams; and
- rehabilitation of the site.

The first Life of Mine Rejects Disposal Plan (RDP) was contained in the *Stratford Coal Mine Environmental Impact Statement* (SCPL, 1994) and the RDP was revised in 1998, 2003, 2009 and 2016.

An unannounced inspection of the SMC was conducted on 31 May 2018 by the NSW Resources Regulator (within the DP&E) and based on the outcomes required:

> *...CIM Stratford Pty Ltd to develop a strategy to assess the proposed rehabilitation methodology for the reject emplacement facility considering factors such as anticipated material densities and moisture content of the emplaced materials, and the approved post mining land use for the facility. ...*

Cognisant of the above NSW Resources Regulator inspection outcomes, this report has been prepared with a focus on Stratford Main Pit, primarily to:

- Describe the strategy to continue the use of Stratford Main Pit for the disposal of rejects, storage of pit water and the dumping of overburden waste;
- Facilitate efficient, low cost disposal and management of reject both during the operational and the closure (rehabilitation) stages of Main Pit; and
- Describe the Stratford Main Pit rehabilitation methodology and final landform development including backfilling and capping.

1.2 Mine Production

An indicative coal and reject material production schedule for the period where Stratford Main Pit is the reject disposal area (to end of 2026) is provided in Table 1.1. Following the completion of mining in the Avon North Open Cut in 2026, the void would be used as a new co-disposal area for the SEP and the Stratford Main Pit would be rehabilitated.

Table 1.1 – SMC Production

Calendar Year		2019	2020	2021	2022	2023	2024	2025	2026
OB Dump Material Available	Mbcm	4.8	6.7	6.5	6.6	6.5	6.1	5.4	5.7
Coal Mined (incl DCM)	Mt	1.3	1.2	1.1	1.0	1.2	1.0	1.0	1.1
Product Coal	Mt	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.7
Reject	Mt	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5

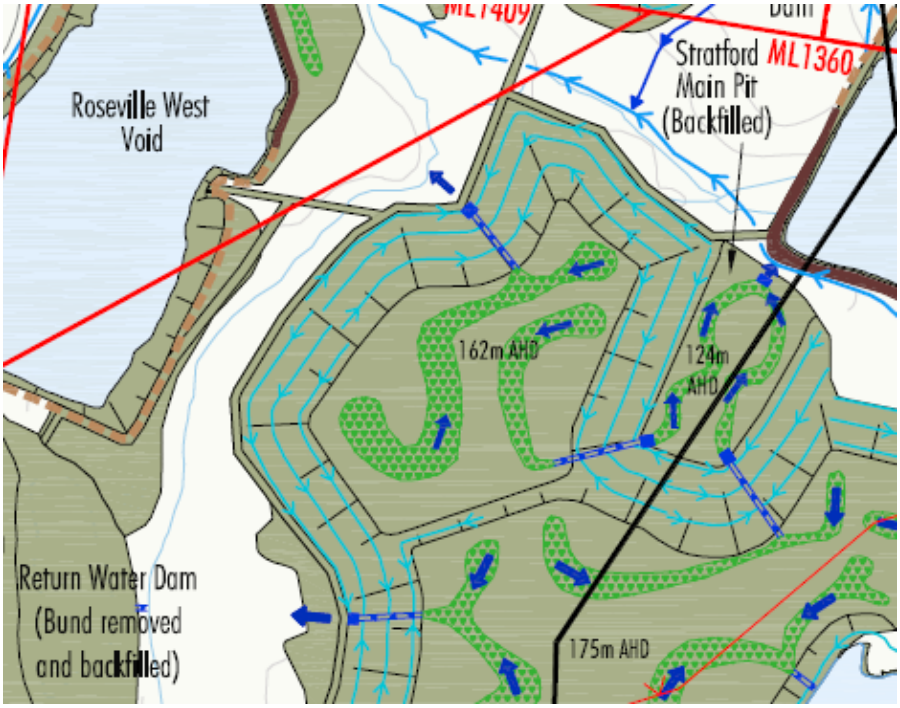
1.3 Stratford Main Pit Reject Disposal Plan

All reject (coarse and fine) is pumped to the Stratford Main Pit as a slurry. A proportion of the total rejects stream has previously been classified as PAF-HC. As such, a principal requirement for placement of co-disposal reject under the previously approved RDP has been for a combination of sub-aqueous and sub-aerial deposition with limestone treatment and progressive inundation.

1.4 Stratford Main Pit Final Landform

A key aspect to the post-mining rehabilitation of the SEP area would comprise a combination of grazing and nature conservation (woodland/open forest) land use areas, established on the reshaped final landform. Figure 5.3 shows the final landform as a closer view of the Stratford Main Pit area extracted from the Stratford Extension Project Environmental Impact Statement (EIS, 2012) Section 5 Rehabilaition Strategy. The Stratford Main Pit is backfilled to a maximum 162m AHD for the western portion of the pit and 124m AHD for the eastern portion. Stratford Main Pit landform is shaped and has various water management structures to direct the flow of water from the mine landform to Avondale Creek. No final void remains in Stratford Main Pit final landform.

Figure 1.1 – Stratford Main Pit Final Landform



1.5 Stratford Main Pit Rehabilitation Strategy

Stratford Main Pit will continue to be the main reject co-disposal area and primary water storage for SMC until 2026. Additionally, Stratford Main Pit will be an overburden (OB) dump for the adjacent pits. Until this time, the overburden reporting to Stratford Main Pit will be restricted to ensure that there is sufficient co-disposal and water storage capacity.

Following the completion of mining in the Avon North Open Cut in 2026, the void would be used as a new co-disposal area for the SEP and water storage with co-disposal ceasing in Stratford Main Pit. All remaining stored water in Stratford Main Pit will be transferred to Avon North Open Cut.

The rejects dispoal in Stratford Main Pit will primarily be progressed from the south west and central south areas via sub-aqueous deposition and sub-aerial deposition which has the pit floor sloping away primarily to the east. Below the northern wall of the pit, the depths from the crest to the pit floor (co-disposed reject and tailings) range from approximately 15m to 70m based on January 2019 surveys.

A method has been devised to safely dump OB into Stratford Main Pit which still contains water and is actively depositing co-disposed rejects. This same method will be able to be used to continue to dump OB into the pit once the co-disposal of rejects and tailings has ceased in Stratford Main Pit, and the OB material then be used to cover the rejects and tailings.

The OB dumping strategy will incorporate the installation of a mobile apron feeder with a 10m cenitlevered gantry (gantry feeder). The gantry feeder will be deployed initially to the north of the Stratford Main Pit where it will overhang the crest of the north wall by 10m. It is designed for Cat 785 Rear dump trucks to dump directly onto the gantry feeder or dozers push onto it, whereby it conveys the OB out 10m and deposits it in the pit. This allows a waste dump to be constructed to the same level as the gantry feeder without any equipment on the first 10m of the dump.

Once the first pass has been completed and the starting area has settled, the gantry feeder can be relocated to the start and on top of the dump which then allows the second pass to be constructed. This keeps mobile equipment approximately 10m from the crest.

A geotechnical assessment has shown that these arrangements enable a suitable Factor of Safety (FoS) to support this strategy. Risk assessments are to be carried out during more detailed studies to ascertain the acceptability of slope stability modelling outcomes where the FoS is < 1.2.

Figure 1.2 to Figure 1.7 show the progressive backfilling of the Stratford Main Pit which accounts for the co-disposed rejects, the stored water and the OB material dumped in place.

Figure 1.2 – Stratford Main Pit - Start

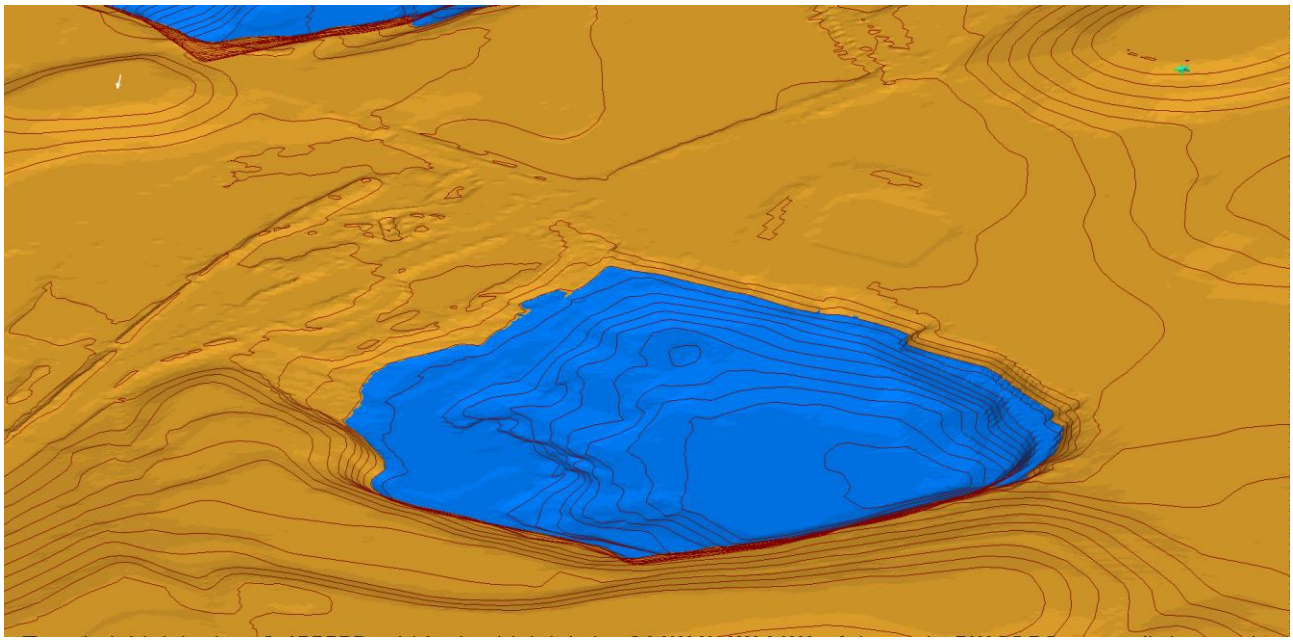


Figure 1.3 - Stratford Main Pit - 2019

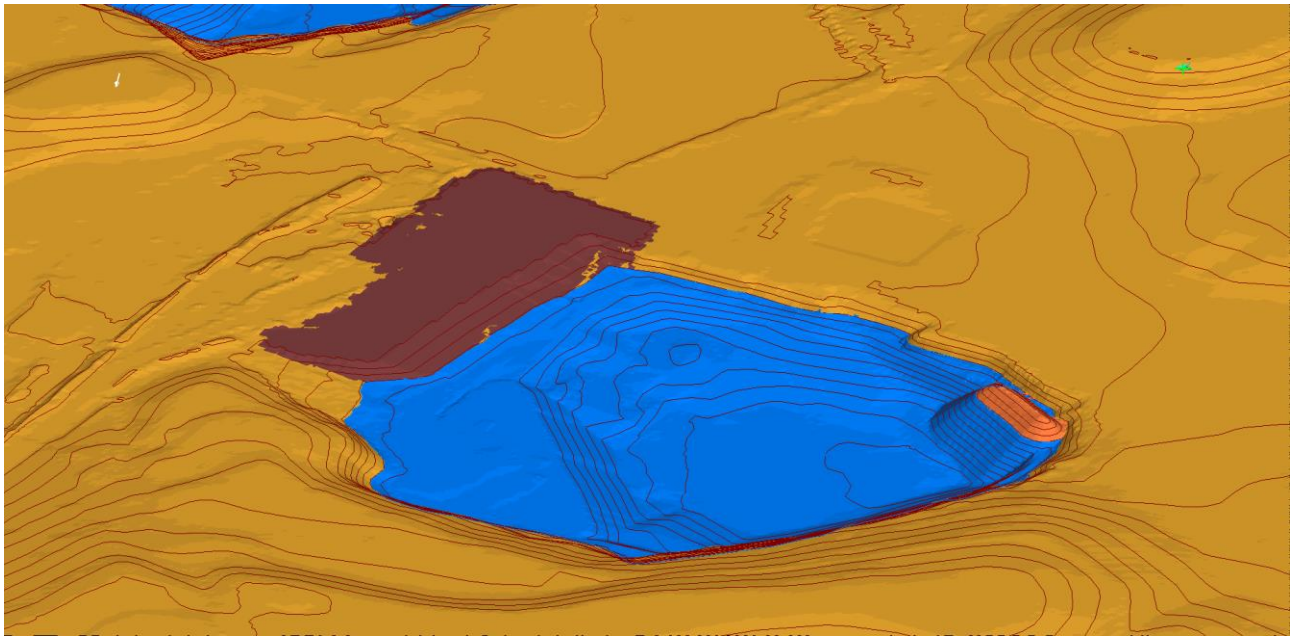


Figure 1.4 - Stratford Main Pit - 2021

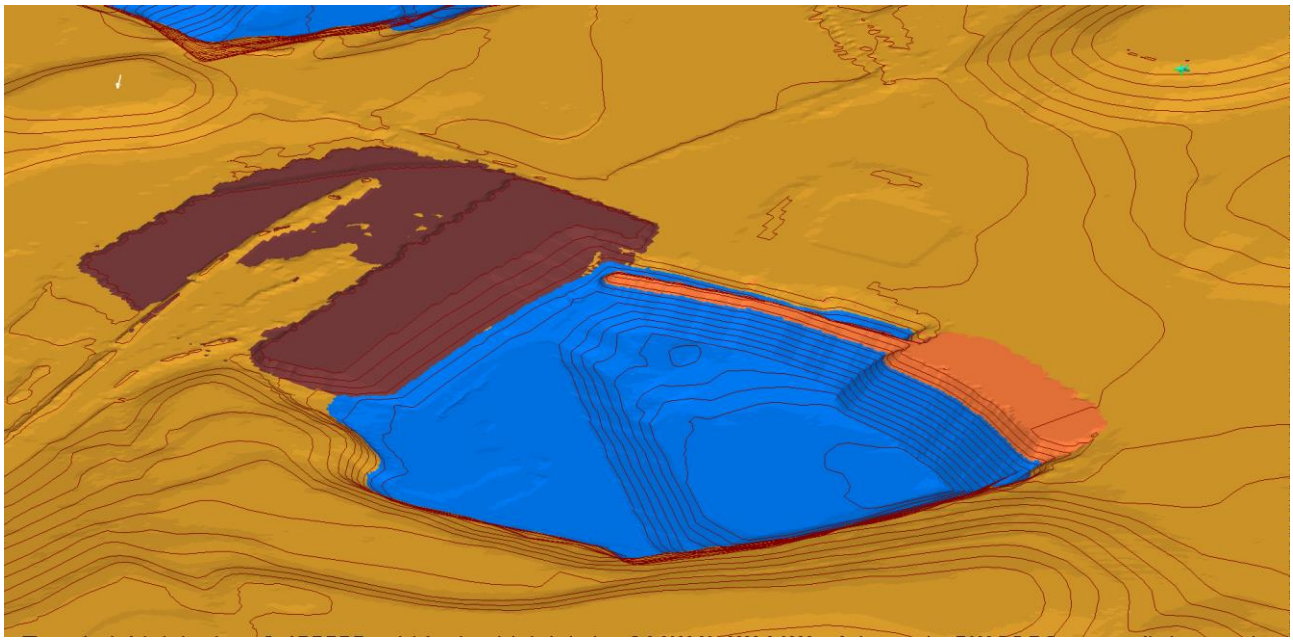


Figure 1.5 - Stratford Main Pit - 2024

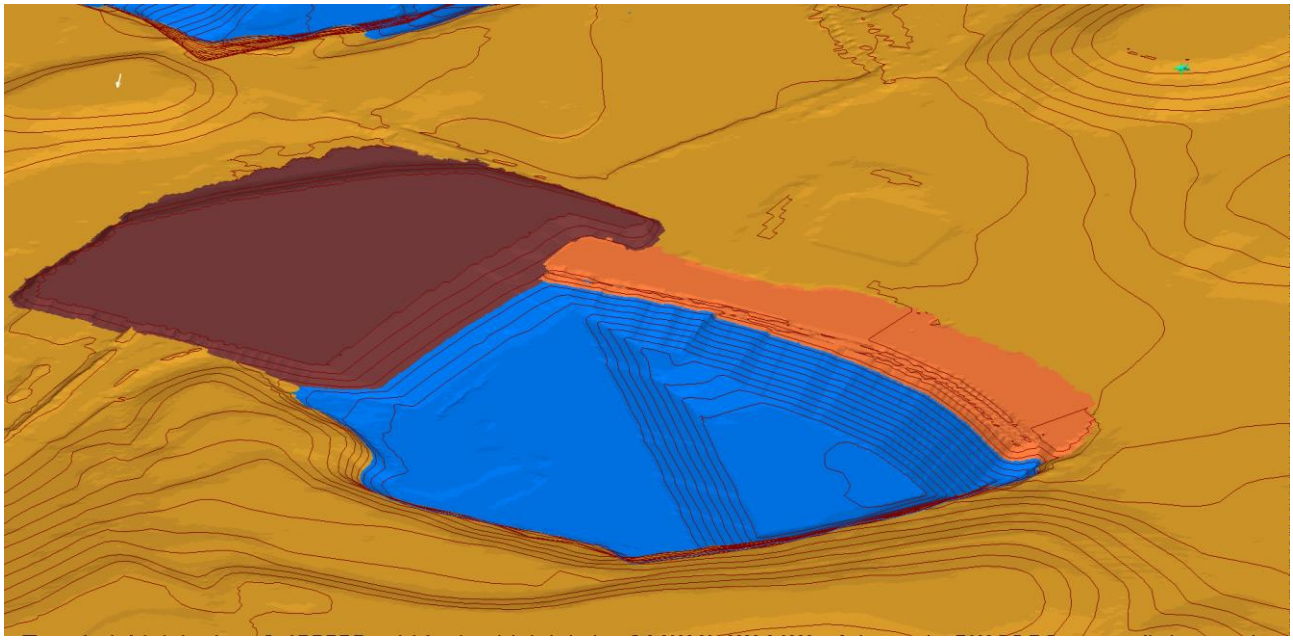


Figure 1.6 - Stratford Main Pit - 2028

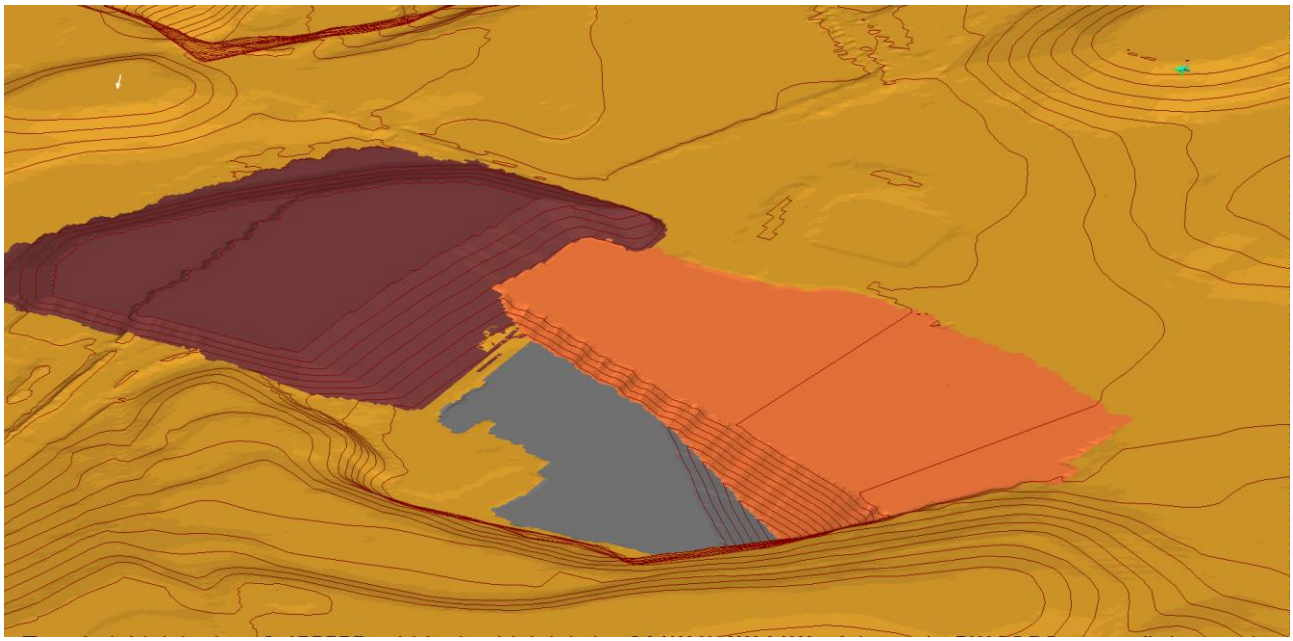
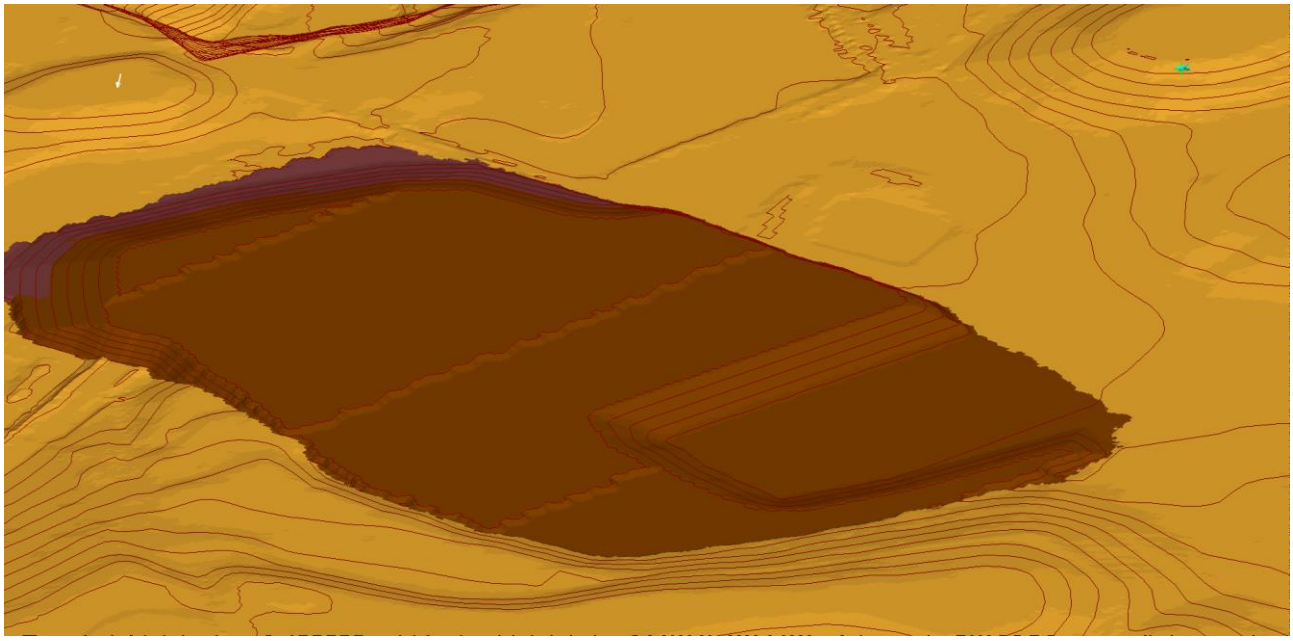
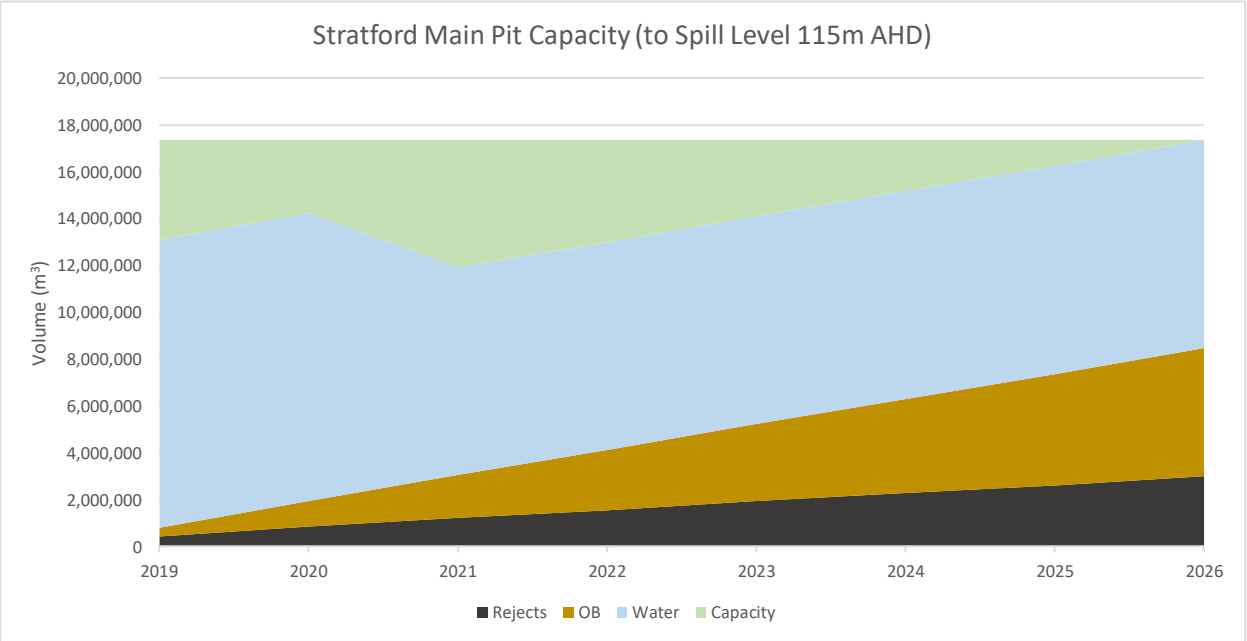


Figure 1.7 - Stratford Main Pit – 2036 – Final Landform



Based on the Stratford Main Pit Capacity as at the start of 2019, the amount of overburden is limited in order to ensure sufficient room for rejects and tailings placement and stored water. Figure 1.8 demonstrates the capacity levels within Stratford Main Pit to the end of 2026, at which time the co-disposed rejects and tailings are redirected to the newly completed Avon North Open Cut. The dip in stored water in 2021 is due to 3.4GL of water being transferred to Roseville West Open Cut, as it finishes mining operations in 2020. The stored water can also commence being transferred to Avon North Open Cut. This releases the remaining capacity of Stratford Main Pit to OB dump and capping the co disposed tailings with inert OB and clays, then continuing with the topsoil placement and revegetation.

Figure 1.8 – Stratford Main Pit Capacity



The monitoring and assessment of the Startford Main Pit will continue to be in accordance with the RDP.

1.6 Recommendations

To improve or confirm some aspects of this report, a number of recommendations are put forward. These recommendations are:

- Risk assessments are to be carried out during more detailed studies to ascertain the acceptability of slope stability modelling outcomes where the FoS is < 1.2. It is possible that a lower FoS could be acceptable where strict operational controls are in place to mitigate the risks.
- Further testing and analysis of the co-disposed rejects / tailings is undertaken to better understand the material properties and distribution across the void. This would include both laboratory and in-situ field testing (where possible).
- Further study is undertaken to improve the FoS based upon changes to the geometry of the dumping arrangements and operational approach.
- Undertake a more detailed investigation of the cantilevered apron feeder, engaging with the supplier to firm up the designs and site requirements.
- The site water balance is updated to ensure that the strategy appropriately accounts for all the variables with respect site water.

2 INTRODUCTION

2.1 Stratford Mining Complex

Stratford Coal Pty Ltd (SCPL), a wholly owned subsidiary of Yancoal Australia Limited (Yancoal), owns the Stratford Coal Mine (SCM), which is located approximately 100 kilometres (km) north of Newcastle, New South Wales (NSW) (Figure 2.1). SCPL also owns the Bowens Road North Open Cut (BRNOC), located to the immediate north of the SCM. The SCM and BRNOC are collectively referred to as the Stratford Mining Complex (SMC). Yancoal also owns the Duralie Coal Mine (DCM), which is located approximately 20 km south of the SMC. Run-of-mine (ROM) coal from the DCM is transported by rail to the SMC for processing and subsequent export.

Since 1995, the SMC has involved open cut mining and processing of coal from the Stratford Main Pit and several smaller satellite pits (Bowens Road West, Roseville, Roseville Extension, Roseville West and Bowens Road North pits), within the Stratford Mining Leases at the Stratford Coal Handling and Preparation Plant (CHPP). Coal production at the DCM commenced in March 2003 with ROM coal being railed to the Stratford CHPP for processing. The SMC and DCM product coals are railed to the port of Newcastle for export. The rejects streams produced from the Stratford CHPP are handled collectively and comprises fine and coarse reject. The reject is pumped as a slurry (at approximately 45% solids concentration by weight) to the Stratford Main Pit for disposal.

Mining activities approved under the SCM Development Consent and the BRNOC Development Consent were suspended in mid-2014, however, processing of ROM coal from the DCM and the export of product coals has continued under the SCM Development Consent.

The Development Consent SSD-4966 for the Stratford Extension Project (SEP) was granted on 29 May 2015 and involves the extension and continuation of mine operations at the SMC, including (among other things):

- mining of up to 2.6 million tonnes of ROM coal per annum;
- continuation of mining in the BRNOC; and the extension of mining into three new open cut mining areas:
  - Avon North Open Cut;
  - Stratford East Open Cut; and
  - Roseville West Pit Extension.
- progressive backfilling of mine voids with waste rock behind the advancing open cut mining operations;
- continued and expanded placement of waste rock in the Stratford Waste Emplacement and Northern Waste Emplacement;
- coal processing at the existing coal handling and preparation plant (CHPP);
- stockpiling and loading of product coal to trains for transport on the North Coast Railway to Newcastle;
- disposal of CHPP rejects via pipeline to the existing co-disposal area in the Stratford Main Pit and, later in the mine life, the Avon North Open Cut void;
- continued use of existing water storages/dams and progressive development of additional sediment dams, pumps, pipelines, irrigation infrastructure, and other water management equipment and structures;

- other associated minor infrastructure, plant, equipment and activities and minor modifications to the existing structure, plant and equipment, and activities; and
- rehabilitation of the site.

The general arrangement of the approved SMC is provided in Figure 2.2.

Figure 2.1 – Regional Location

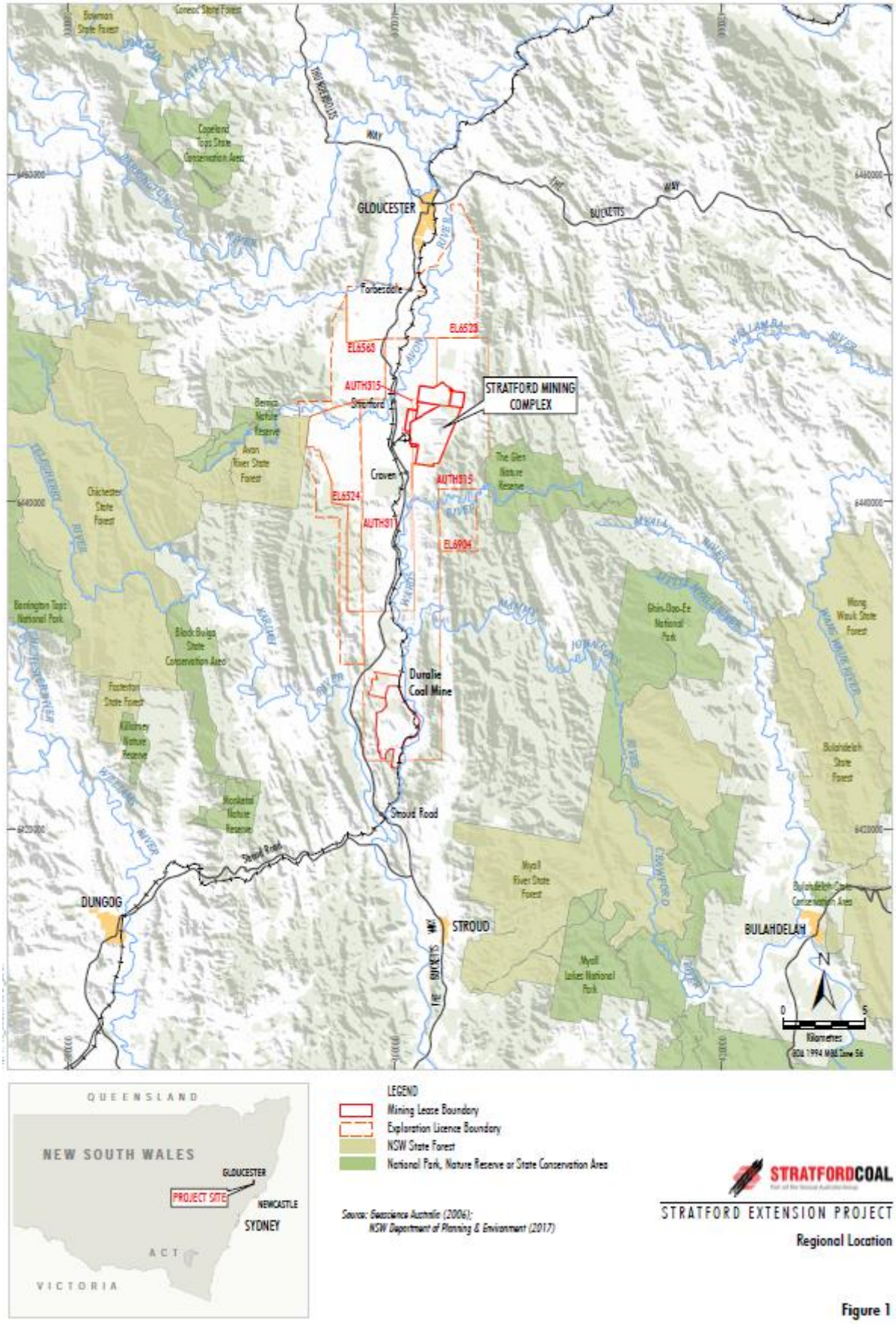
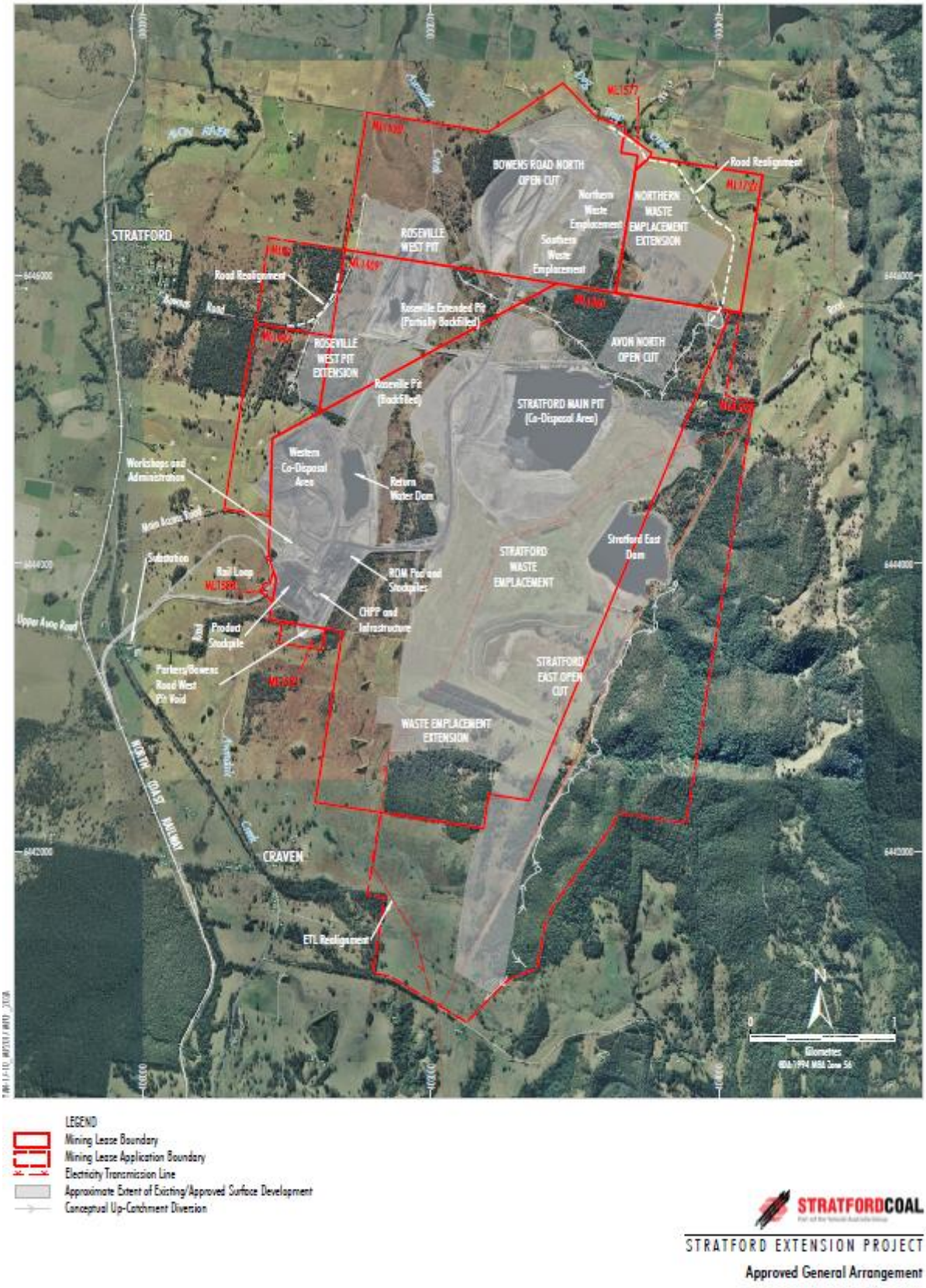


Figure 2.2 – Approved General Arrangement



Source: Orthophoto - Yancoal (July 2014); LPI (2016); NSW Department of Planning & Environment (2017)

Figure 2

2.2 Purpose and Scope

The first Life of Mine Rejects Disposal Plan (RDP) was contained in the *Stratford Coal Mine Environmental Impact Statement* (SCPL, 1994). Following grant of the SCM Development Consent (former DA 23-98/99[1]), including the condition to "*dispose of rejects generated by the processing of coal on site in general accordance with the approved SMC Life of Mine Reject Disposal Plan*", the RDP was revised in 1998, 2003, 2009 and 2016.

An unannounced inspection of the SMC was conducted on 31 May 2018 by the NSW Resources Regulator (within the DP&E) and based on the outcomes required:

> *...CIM Stratford Pty Ltd to develop a strategy to assess the proposed rehabilitation methodology for the reject emplacement facility considering factors such as anticipated material densities and moisture content of the emplaced materials, and the approved post mining land use for the facility. ...*

Cognisant of the above NSW Resources Regulator inspection outcomes, this report has been prepared with a focus on Stratford Main Pit to:

- Describe the strategy to continue the use of Stratford Main Pit for the disposal of rejects, storage of pit water and the dumping of overburden waste,
- Estimate the remaining life of the Stratford Main Pit as a secure containment facility for reject disposal, including allowance for storage of supernatant water with a low risk of spill.
- Describe the rehabilitation strategy for the Stratford Main Pit once it reaches its reject disposal capacity consistent with the MOP (including consideration of factors such as material densities and moisture contents, and the approved post-mining land use).
- Facilitate control of water movement to and from the active reject disposal areas (Main Pit) such that there is a low risk of surface and groundwater contamination either during the active mine life or post rehabilitation and lease relinquishment.
- Facilitate efficient, low cost disposal and management of reject both during the operational and the closure (rehabilitation) stages of Main Pit.
- Facilitate reject disposal operations at Main Pit that are in compliance with the regulatory guidelines and Development Consent conditions.
- Provide for monitoring of reject disposal and associated water management system performance to establish ongoing compliance with the objectives of the RDP specifically for Stratford Main Pit and to enable ready deployment of corrective measures if required to maintain compliance.

[1] DA 23-98-99 was surrendered, effective 11 April 2018, in accordance with Condition 9, Schedule 2 of Development Consent SSD-4966.

2.3 Structure of this Report

The remainder of this report is structured as follows:

Section 3: Provides the anticipated rejects production schedule for Stratford Main Pit at the SMC.

Section 4: Describes the rejects disposal methodology and disposal schedule for the Stratford Main Pit.

Section 5: Describes the Stratford Final Landform with a specific focus on Stratford Main Pit.

Section 6: Describes the rehabilitation strategy for the Stratford Main Pit which includes its rejects disposal areas.

Section 7: Provides details of the Stratford Main Pit monitoring and assessment program.

Section 8: Lists the references cited in this report.

3 MINE PRODUCTION

3.1 SMC Production Strategy

An indicative coal and reject material production schedule for the period where Stratford Main Pit is the reject disposal area (to end of 2026) is provided in Table 3.1.

Table 3.1 – SMC Production

Calendar Year		2019	2020	2021	2022	2023	2024	2025	2026
OB Dump Material Available	Mbcm	4.8	6.7	6.5	6.6	6.5	6.1	5.4	5.7
Coal Mined (incl DCM)	Mt	1.3	1.2	1.1	1.0	1.2	1.0	1.0	1.1
Product Coal	Mt	0.8	0.7	0.7	0.6	0.7	0.6	0.6	0.7
Reject	Mt	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5

During this period, it is anticipated that approximately 3.6 Mt of CHPP rejects (total) would be produced and require management at the SMC. The Stratford Main Pit will continue to be used for co-disposal of CHPP rejects at the SMC until 2026. Following the completion of mining in the Avon North Open Cut, the void would be used as a new co-disposal area for the SEP. The existing slurry pipeline from the CHPP would be extended to the new co-disposal area when available.

4 STRATFORD MAIN PIT REJECT DISPOSAL PLAN

4.1 Overview of SMC RDP

The RDP is based on on-going pumped co-disposal of reject within the Stratford Main Pit void. Reject disposal within the Stratford Main Pit commenced operation in May 2003. Since that time approximately 19.4 Mt of reject material has been deposited in the Stratford Main Pit (to the beginning of April 2018). The rejects survey in the Stratford Main Pit as at January 2019 is shown in Figure 4.1 and Figure 4.2.

The EGi (2010; 2012) geochemical assessment reports concluded that implementation of appropriate management measures would be required to manage potential ARD impacts associated with the existing and proposed co-disposed CHPP rejects. However, the Stratford Main Pit water quality monitoring confirms that current management measures have successfully controlled pH from deposited CHPP rejects and maintained a circa neutral pH in the Stratford Main Pit. As a result, the existing CHPP reject management measures outlined in the previously approved Life of Mine Rejects Disposal Plan (SCPL, 2009) were considered by EGi (2012) to be suitable for the SEP.

Rejects at the SMC have been previously characterised as being PAF, therefore measures to manage rejects are in place. Rejects management measures include placement into the Stratford Main Pit where they are progressively inundated with water to prevent significant pyrite oxidation and acid generation in the long term, with monitoring of water quality undertaken during operations and provision for lime (calcium hydroxide - $Ca[OH]_2$) dosing and limestone (calcium carbonate - $CaCO_3$) treatment as required. These measures will continue for the SEP.

4.2 Stratford Main Pit Reject Disposal Plan

All reject (coarse and fine) is pumped to the Stratford Main Pit as a slurry. DCM reject, which forms a proportion of the total rejects stream, has previously been classified as PAF-HC. As such, a principal requirement for placement of co-disposal reject under the previously approved RDP has been for a combination of sub-aqueous and sub-aerial deposition with limestone treatment and progressive inundation.

This methodology, as described in the previously approved RDP (SCPL, 2009) has successfully controlled the formation of acid conditions in the Stratford Main Pit, with recorded pH in water samples not falling below 6.3 since 2003. Recorded pH of reject beach samples has generally been near neutral with since 2003 with only occasional lower readings.

Pumped co-disposal reject is disposed of via a reject delivery pipeline located along the pit access road and directed towards the low point within the pit void. Sub-aqueous beaching of co-disposal reject deposited directly into water is undertaken wherever practical and safe. This is achieved by “floating” the delivery line into the disposal area from the land-based take off point at the southern end of the pit. Discharge occurs from a stationary deposition location. As a result, submerged beach slopes estimated at between 5% and 15% are formed. Deposition at any one location continues until the beach rises to within 0.5 m of the water surface.
At this time the deposition location is moved.

The original sub-aqueous deposition had resulted in a low density tailings deposit that was likely to consolidate extremely slowly, if at all, given its deposition beneath the water level in the void. In accordance with the previously approved RDP (SCPL, 2009), SCPL commenced a combined approach of sub-aerial and sub-aqueous deposition of reject, to facilitate a higher density reject deposit.

The sub-aerial deposition will be facilitated by the relocation of the reject discharge point to the southern end of the pit, however previously this has been located on the western side of the pit. The discharge point will be alternated from the south western corner around to the central southern side to form a beach from the south-western side of the Stratford Main Pit sloping to the south-eastern side (Figure 4.1 and Figure 4.2). Water recovery will be undertaken from the south-western side of the pit. Following this, reject deposition will also occur west to east from the south with water recovery from the south-west of the Stratford Main Pit.

Control of acid generation in the sub-aerially deposited reject will be facilitated by incorporating limestone into the reject stream, establishing reject beaches 2 m to 3 m above water level such that they are significantly inundated with rising pit waters within 6-12 months, dosing the reject beach surface with lime at appropriate rates, and alternating the discharge point so that deposited reject beaches are essentially not exposed for more than 1 year.

Figure 4.1 – Bathymetric Survey Conducted January 2019

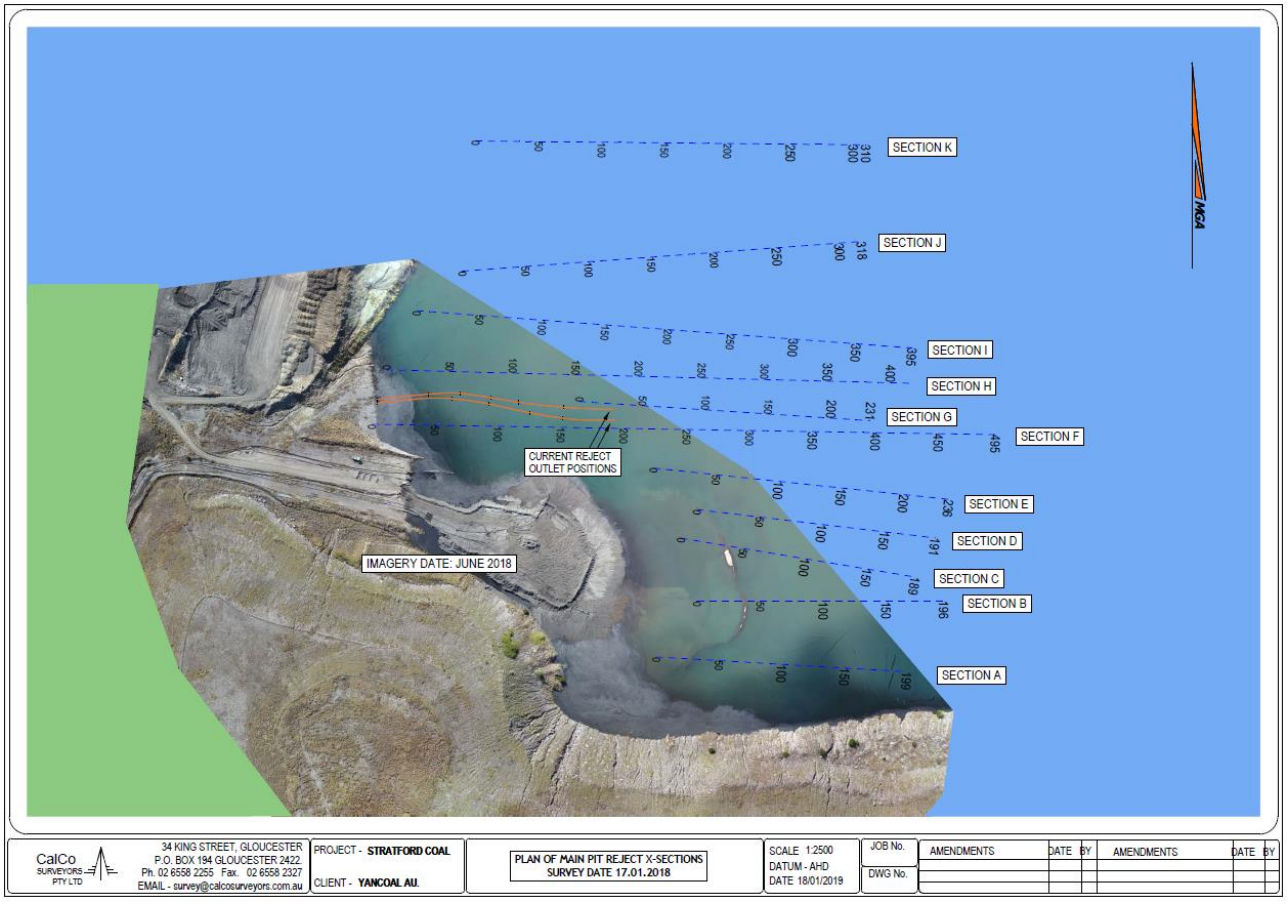
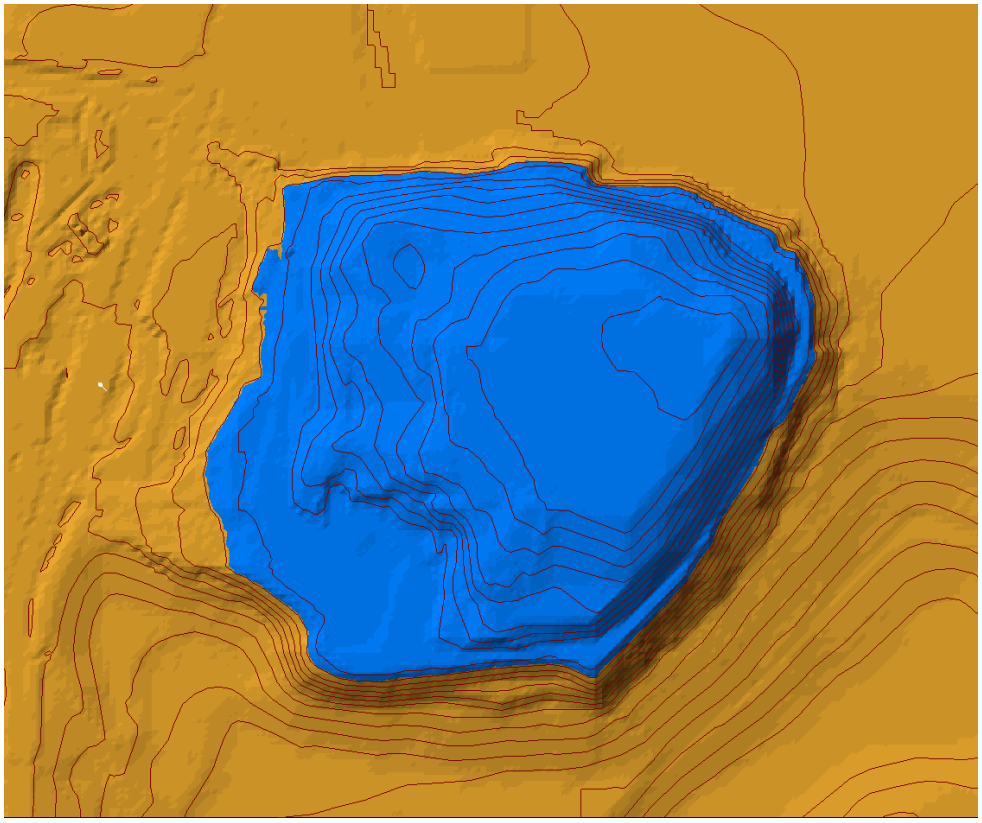


Figure 4.2 – Merged Bathymetric Survey



EGi has advised that application of <4 mm size limestone at a rate of 80 t $CaCO_3$/hectare incorporated into the top 300 mm to 500 mm of exposed surface reject should provide sufficient control of ARD from exposed materials until they are inundated. Limestone will be incorporated into the top surface of the surface reject via surface broadcasting/spreading and ripping with appropriate equipment.

In addition, limestone (<4 mm size) will be introduced to the CHPP reject stream at a rate of approximately 5 kg/t (based on a neutralising value of >90%) when DCM coal is being processed. Limestone analysis will be conducted on a regular basis to test sizing and neutralising value. The rate at which limestone is introduced may be reviewed based on results from monitoring (refer Section 7).

Limestone will be introduced into the CHPP with DCM coal at the plant feed. The method for introducing lime will comprise a front end loader feeding lime into the CHPP hopper. The average rate of lime that will be introduced is 1.5 kg/t of ROM coal as DCM coal has a yield of approximately 70%. Lime will pass through the CHPP and go into the reject stream at 5 kg/t before being deposited in the Stratford Main Pit. Alternative methods of introducing lime to the reject stream may be used.

Guidelines on limestone addition rates for co-disposed reject and tailings placed in the Stratford Main Pit are presented in detail within Attachment A of the RDP.

On-going monthly monitoring of Stratford Main Pit water quality (refer Section 7) will continue and will provide feedback on the adequacy of lime dosing.

All activities required under the proposed reject disposal methodology will be subject to risk assessment including the compilation of specific Safe Work Method Statements for key tasks.

It is proposed for reject to be placed in the Stratford Main Pit lower than the estimated pre-mine groundwater level, estimated to be equal to the level of the adjacent Avondale Creek at approximately RL 114 m AHD, in order to maintain reject saturation and limit the potential for long term reject oxidation.

5 STRATFORD FINAL LANDFORM – STRATFORD MAIN PIT

5.1 Overview of the Stratford Final Landform

Post-mining the SEP area would comprise a combination of grazing and nature conservation (woodland/open forest) land use areas. Figure 5.1 illustrates the SEP conceptual final landform extracted from the Stratford Extension Project Environmental Impact Statement (EIS, 2012) Section 5 Rehabilaition Strategy.

Key features of the final landform include:

- final voids located in the Stratford East Open Cut, Avon North Open Cut and Roseville West Pit Extension;
- elevated mine landforms associated with the Stratford Waste Emplacement and Northern Waste Emplacement that are broadly integrated with the surrounding landforms;
- landforms at grade or only slightly elevated above pre-mining topography associated with areas of the backfilled open cut pits, the rehabilitated infrastructure area and western co-disposal area; and
- permanent Stratford East Dam water storage structure and various water management structures to direct the flow of water from the mine landforms to Avondale Creek, Dog Trap Creek, and their associated tributaries. Figure 5.2 provides a cross-section illustrating the final Project landforms, Including two of the three final voids.

Figure 5.1 – Stratford Final Landform

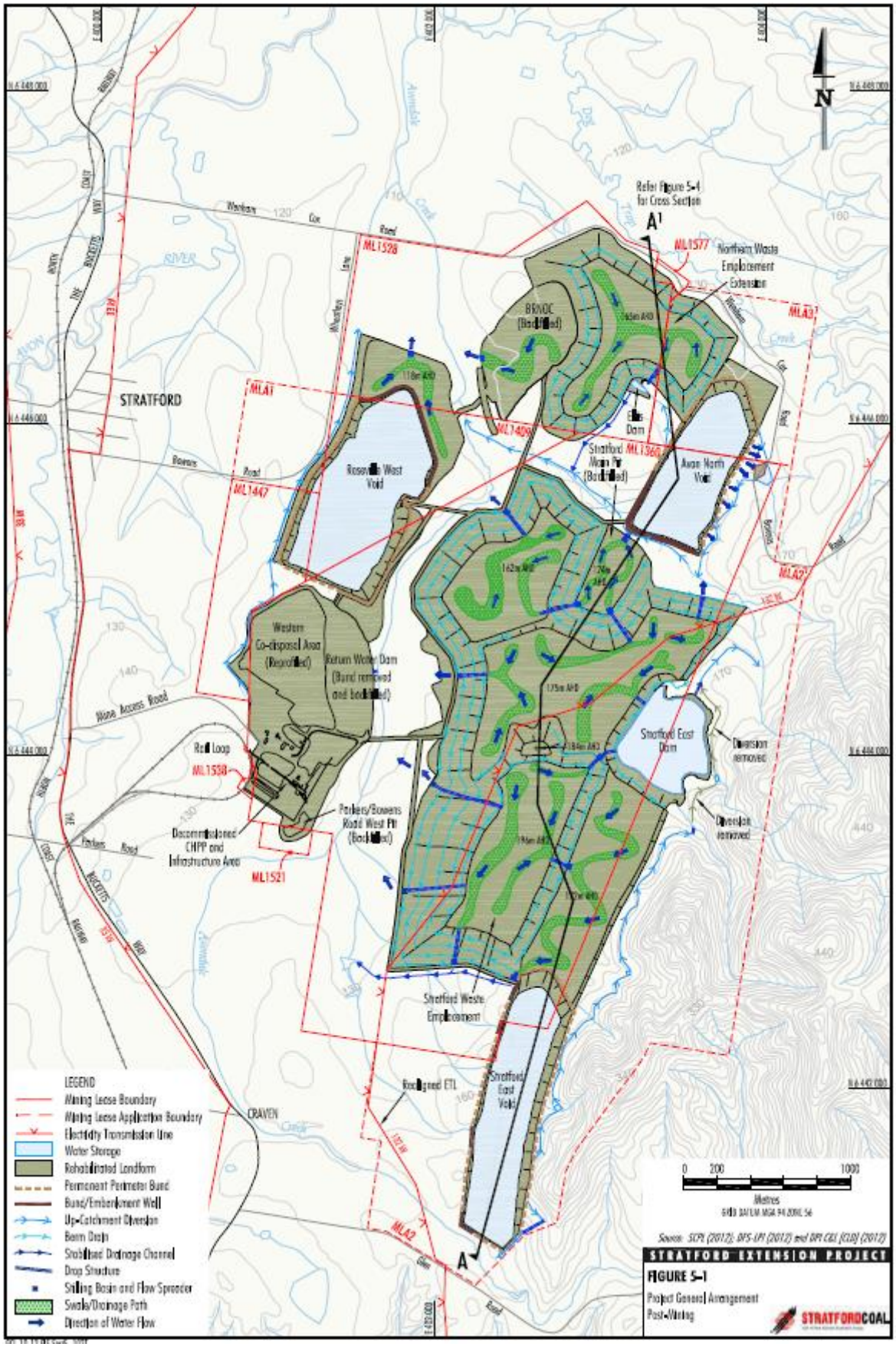
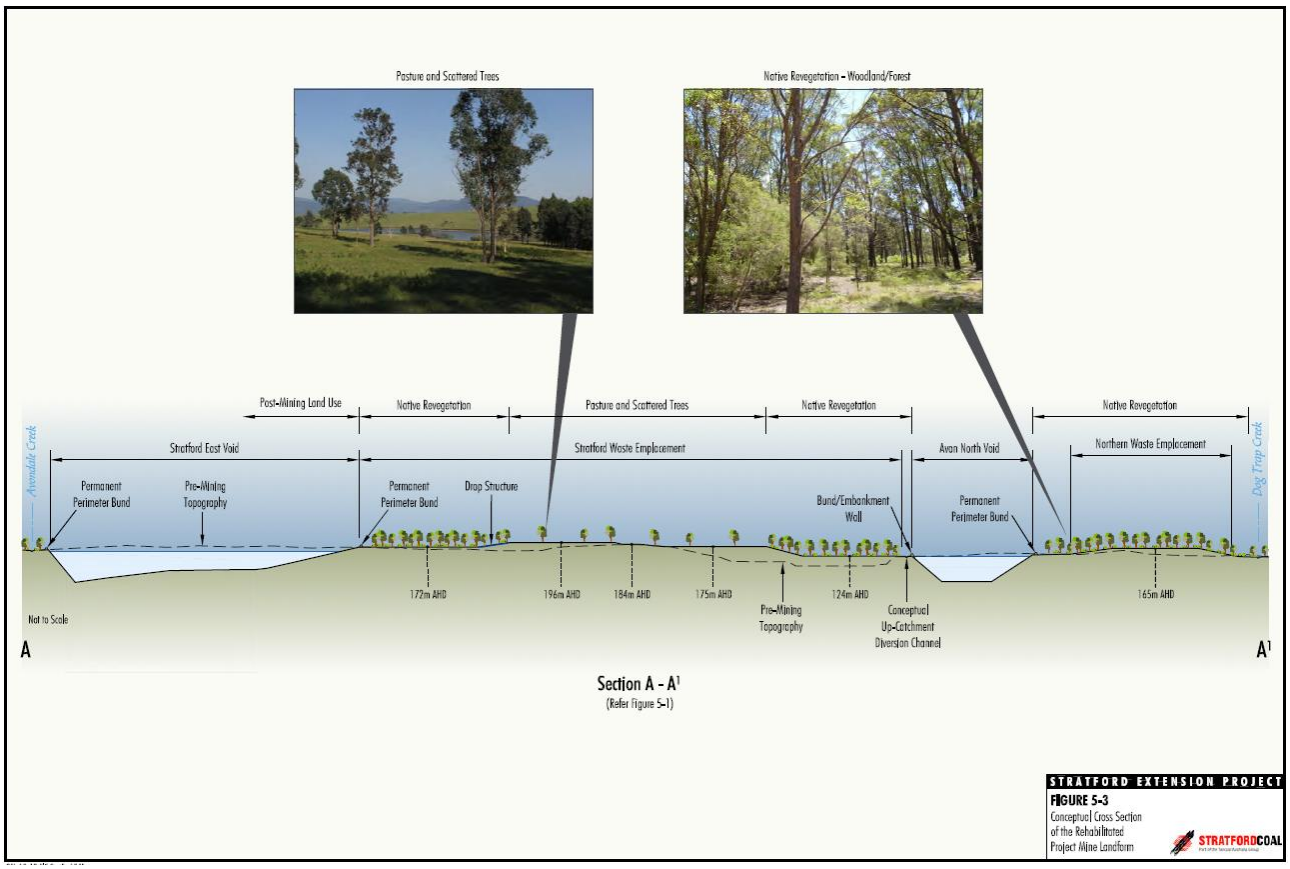


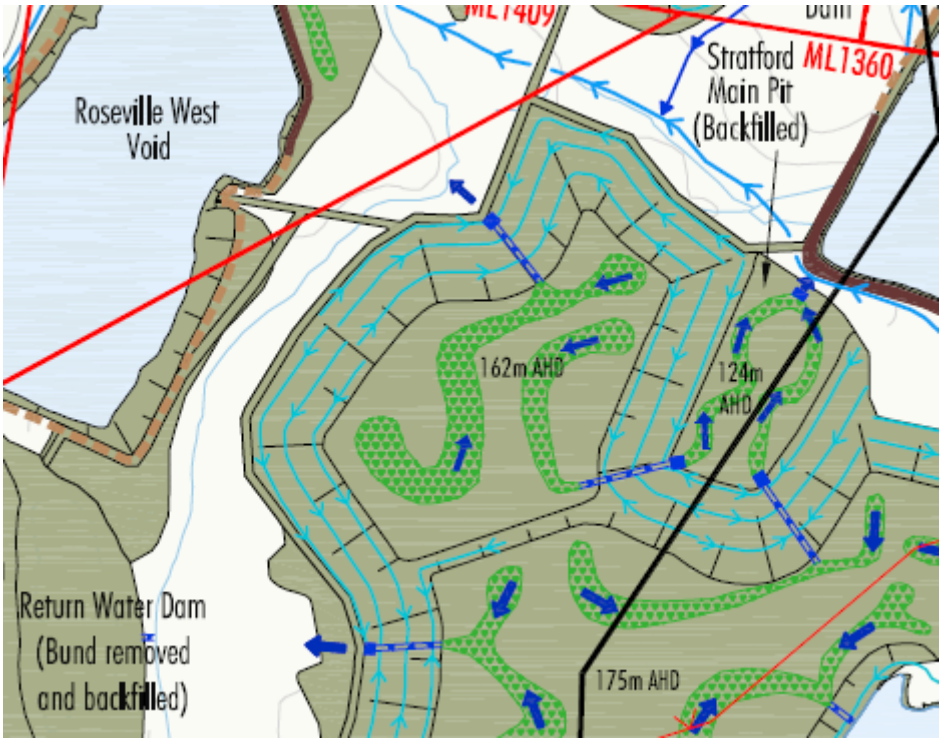
Figure 5.2 – Final Landform Section



5.2 Stratford Main Pit Final Landform

Figure 5.3 shows the final landform as a closer view of the Stratford Main Pit area. The Stratford Main Pit is backfilled to 162m AHD for the western portion of the pit and 124m AHD for the eastern portion. Stratford Main Pit landform is shaped and has various water management structures to direct the flow of water from the mine landform to Avondale Creek. No final void remains in Stratford Main Pit.

Figure 5.3 – Stratford Main Pit Final Landform



6 STRATFORD MAIN PIT REHABILITATION STRATEGY

6.1 Overview of SMC Reject Disposal Areas Rehabilitation Strategy

Rehabilitation of the CHPP reject disposal areas will be undertaken generally in accordance with the SMC Mining Operations Plan & Rehabilitation Management Plan (MOP). Performance and completion criteria for the rehabilitated reject disposal areas are described in the MOP in accordance with Condition 55, Schedule 3 of NSW Development Consent SSD-4966 (refer Section 6, and the detailed plans provided, in SCPL's MOP).

Capping and rehabilitation of the completed co-disposal areas will be undertaken to prevent or minimise the migration of pollutants beyond the pit shell or seepage from out-of-pit emplacement areas.

6.2 Stratford Main Pit Rehabilitation Strategy

The Stratford Main Pit will be backfilled with inert overburden materials to a minimum depth of 2 m, sourced from on-going mining operations of other open cuts at the SMC. A clay layer of 1 m to 1.5 m would be added to the inert material (if required), followed by a 150 mm to 200mm topsoil layer, the addition of lime and gypsum as required and revegetation with trees, shrubs and grasses. Backfilling will occur to between 5 m and 10 m above pre-mining surface levels, to allow for minor settling which may occur due to the significant depth of deposited reject in the Stratford Main Pit. A gradually sloping (less than 10-12^{o}) final surface profile will be provided. Stable drainage lines will be incorporated into the final landform design.

6.2.1 Overburden Dump and Reject Strategy

Stratford Main Pit will continue to be the reject co-disposal area and primary water storage for SMC until 2026. Additionally, Stratford Main Pit will be an overburden dump for the adjacent pits. Until this time, the overburden reporting to Stratford Main Pit will be restricted to ensure that there is sufficient co-disposal and water storage capacity.

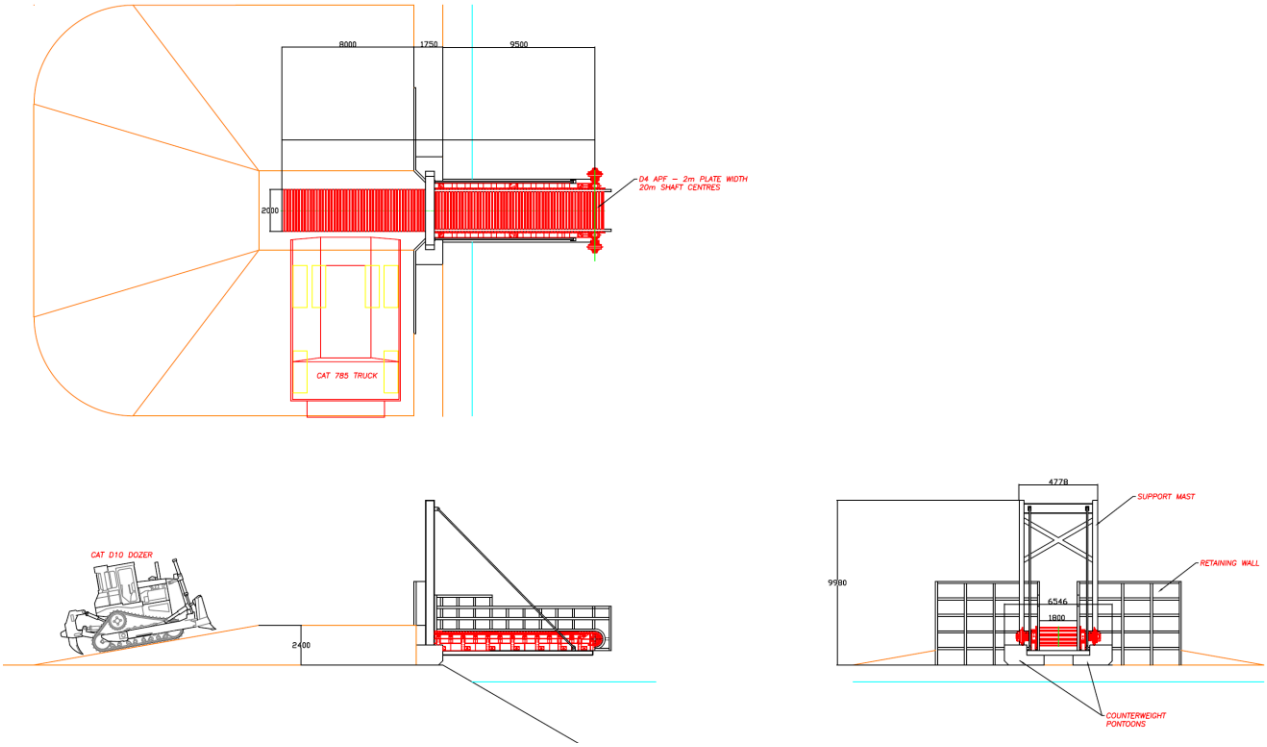
Following the completion of mining in the Avon North Open Cut in 2026, the void would be used as a new co-disposal area for the SEP and water storage with co-disposal ceasing in Stratford Main Pit. All remaining stored water in Stratford Main Pit will be transferred to Avon North Open Cut.

As described in Section 4.2, the rejects dispoal will primarily be progressed from the south west and central south areas of the Stratford Main Pit via sub-aqueous deposition and sub-aerial deposition. This has the pit floor sloping away primarily to the east as it is combined with historical reject deposition and overburden dumping from the west. Below the northern wall of the pit, the depths from the crest to the pit floor (co-disposed reject and tailings) range from approximately 15m to 70m based on the January 2019 survey.

A method has been devised to safely dump overburden into Stratford Main Pit which still contains water and is actively depositing co-disposed tailings. This same method will be able to be used to continue to dump overburden into the pit once the co-disposal of rejects and tailings has ceased in Stratford Main Pit, and the Overburden material then be used to cover the rejects and tailings.

The overburden (OB) dumping strategy will incorporate the installation of a mobile apron feeder with a 10m cenitlevered gantry (gantry feeder). Refer to Figure 6.1. The gantry feeder will be deployed initially to the north of the Stratford Main Pit where it will overhang the crest of the north wall by 10m. It is designed for Cat 785 Rear dump trucks to dump directly onto the gantry feeder or dozers push onto it, whereby it conveys the OB out 10m and deposits it in the pit. This allows a waste dump to be constructed to the same level as the gantry feeder without any equipment on the first 10m of the dump. The gantry feeder can be dragged along to the side to enable the dump to be extended along the crest.

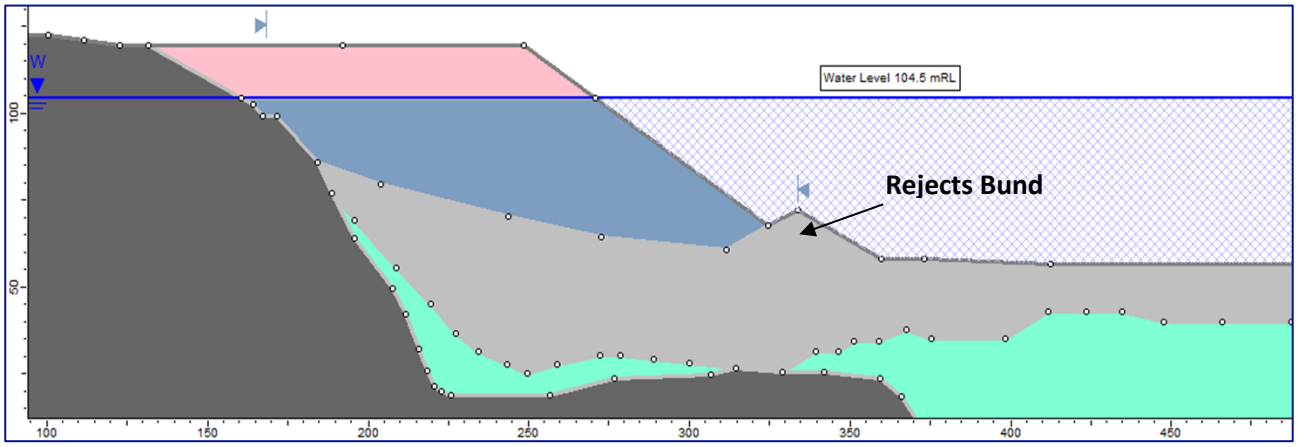
Figure 6.1 – Cantilever Apron Feeder (Gantry Feeder)



Once the first pass has been completed and the starting area has settled, the gantry feeder can be relocated to the start and on top of the dump which then allows the second pass to be constructed. This keeps mobile equipment approximately 10m from the crest.

To provide additional support to the OB dump and to improve the geotechnical factor of safety (FoS), a pit floor bund can be created at an appropriate height and strategically placed, such that it has a buttressing affect for the toe of the OB dump. This is shown in Figure 6.2. This bund can be placed via the sub-aqueous dumping of the co-disposed rejects. This requires the extending of the co-disposal pipe and the accurate location of the outlet of the pipe combined with the relocation of the pipe to extend the bund.

Figure 6.2 – OB Dump with Rejects Buttress



A geotechnical assessment has shown that these arrangements enable a suitable FoS to support this strategy. Risk assessments are to be carried out during more detailed studies to ascertain the acceptability of slope stability modelling outcomes where the FoS is < 1.2. It is possible that a lower FoS could be acceptable where strict operational controls are in place to mitigate the risks. It is recommended that further testing and analysis is required to better understand the material properties of the co-disposed tailings and distribution across the void. This would include both laboratory and in-situ field testing (where possible).

Once the dump from the north has extended sufficiently, a western OB dump can be extended to toe into and ultimately join the northen dump. This will provide stability to the western dump.

Figure 6.3 to Figure 6.14 show the progressive backfilling of the Stratford Main Pit which accounts for the co-disposed rejects, the stored water and the OB material dumped in place.

Figure 6.3 – Stratford Main Pit - Start

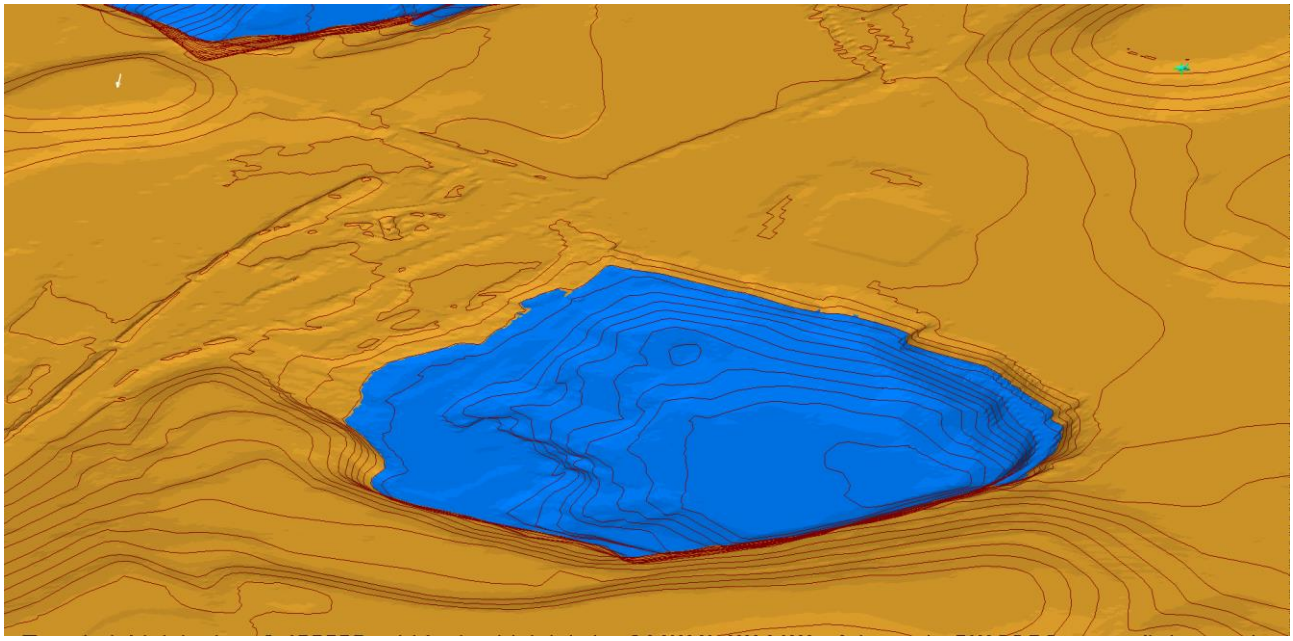


Figure 6.4 - Stratford Main Pit - 2019

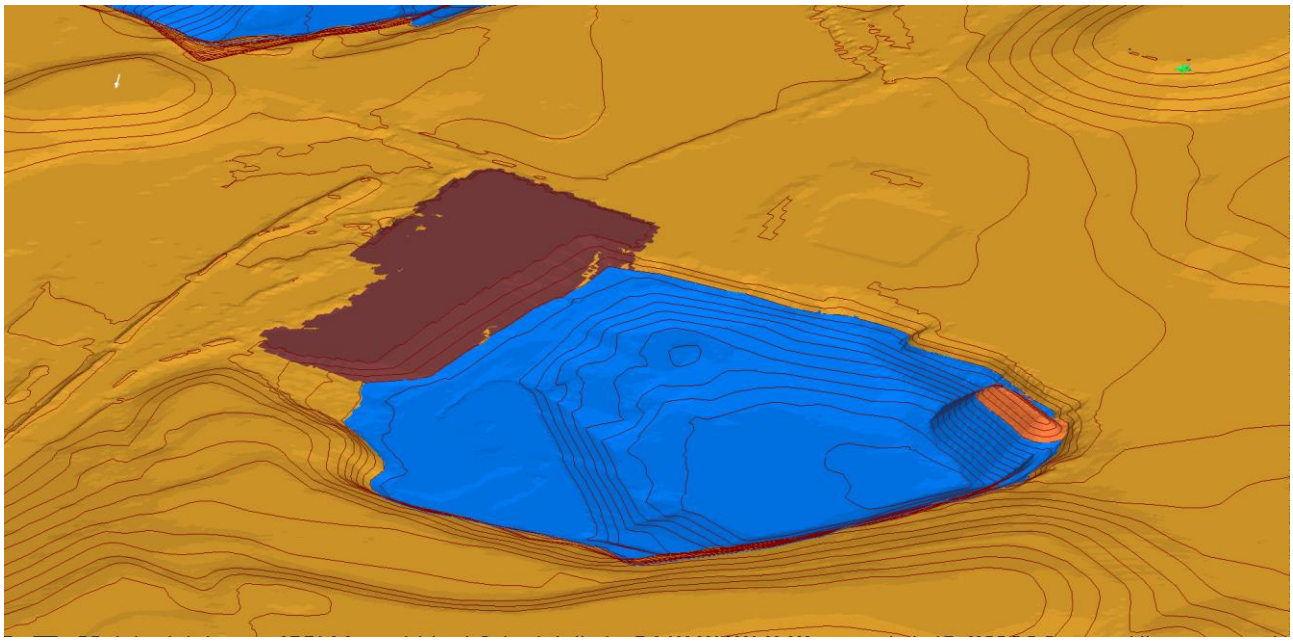


Figure 6.5 - Stratford Main Pit - 2020

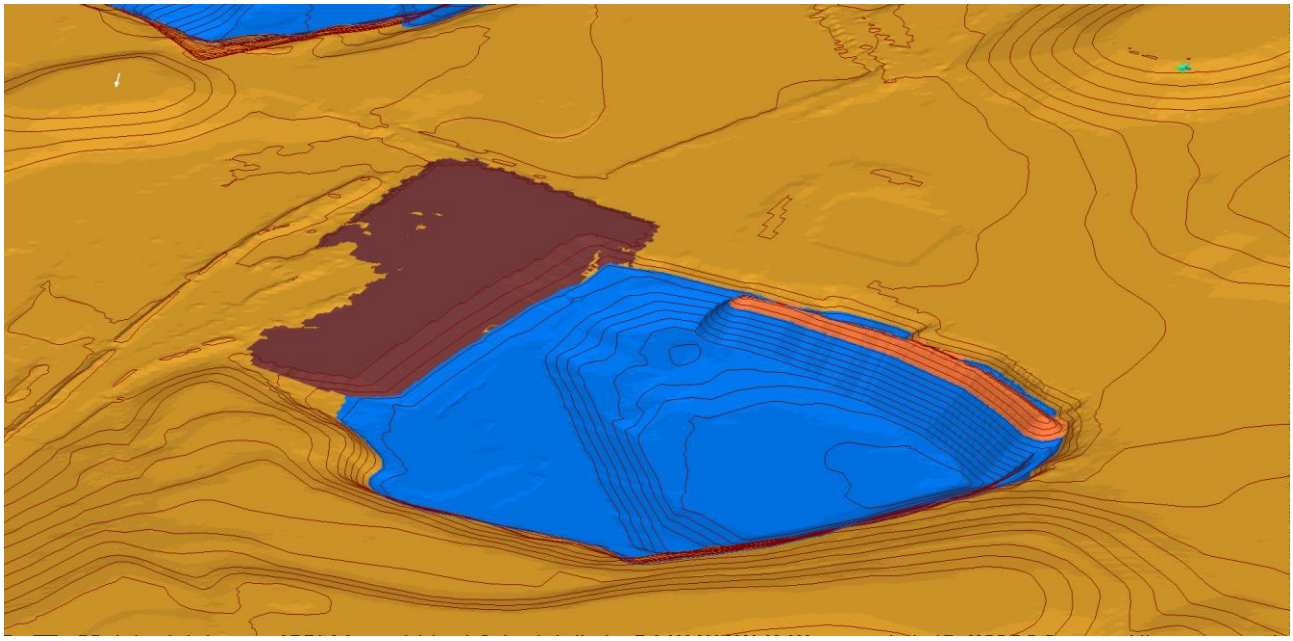


Figure 6.6 - Stratford Main Pit - 2021

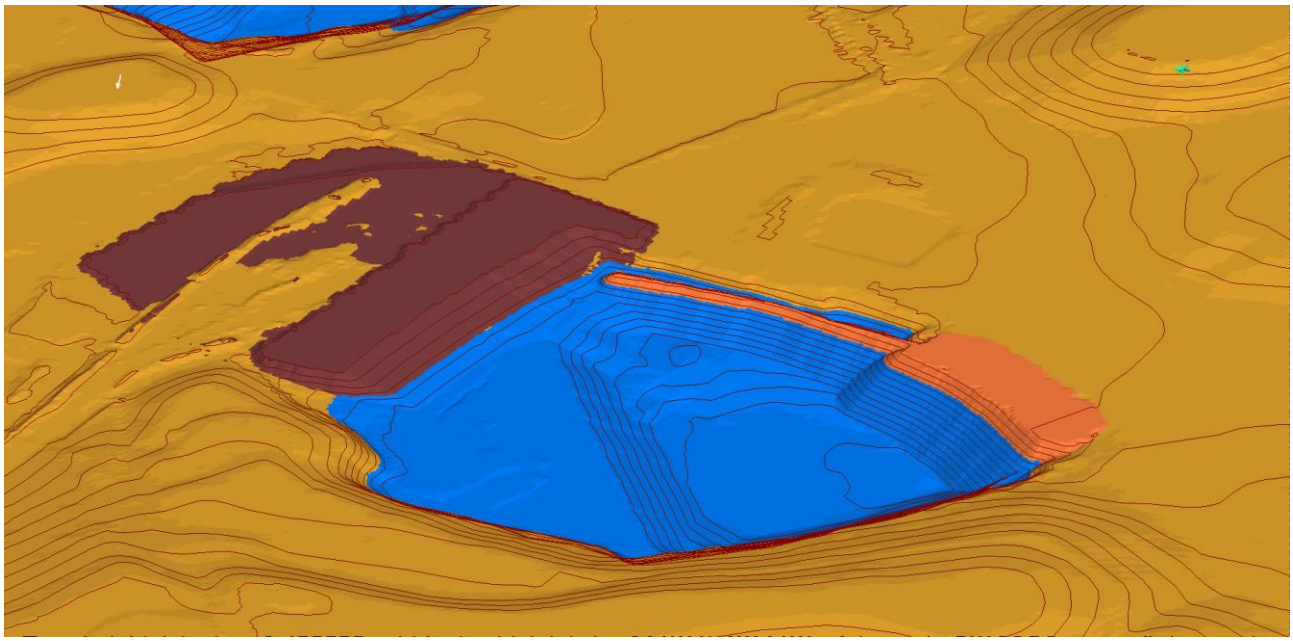


Figure 6.7 - Stratford Main Pit - 2022

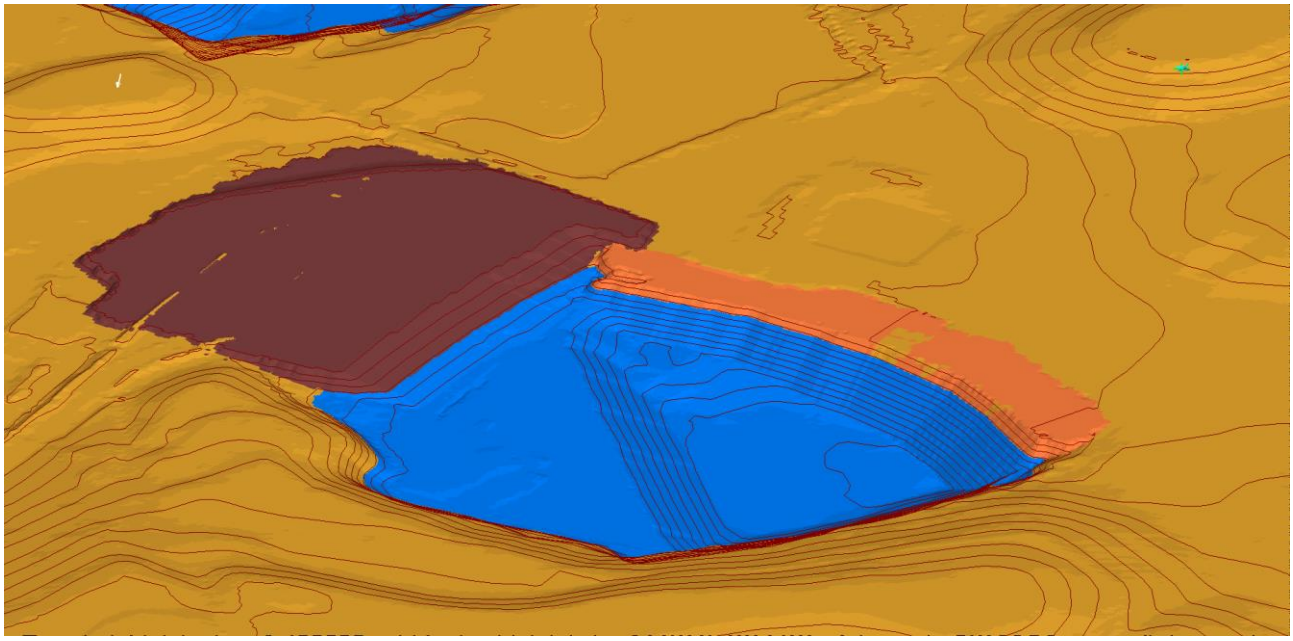


Figure 6.8 - Stratford Main Pit - 2023

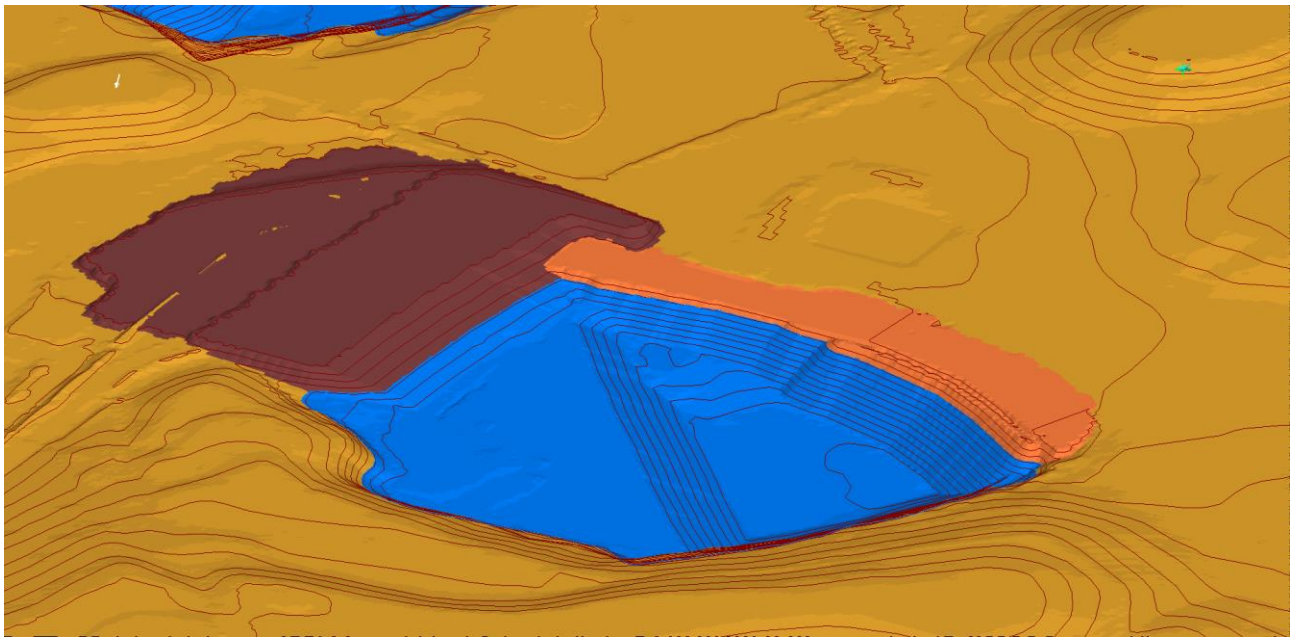


Figure 6.9 - Stratford Main Pit - 2024

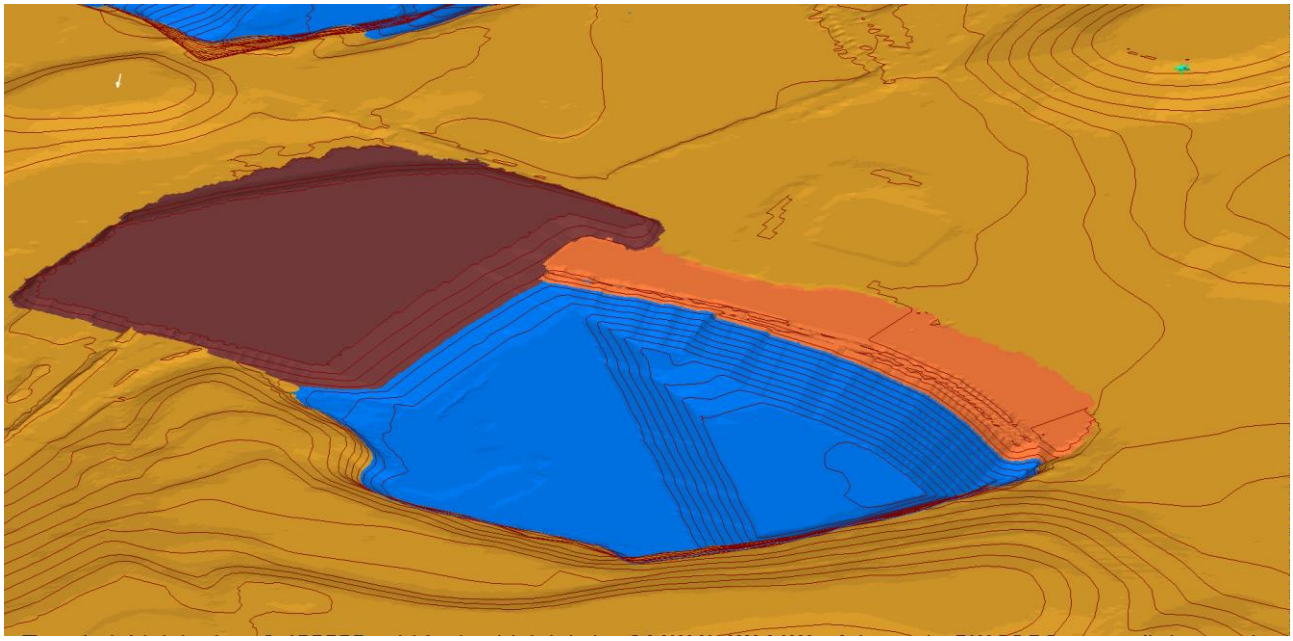


Figure 6.10 - Stratford Main Pit - 2025

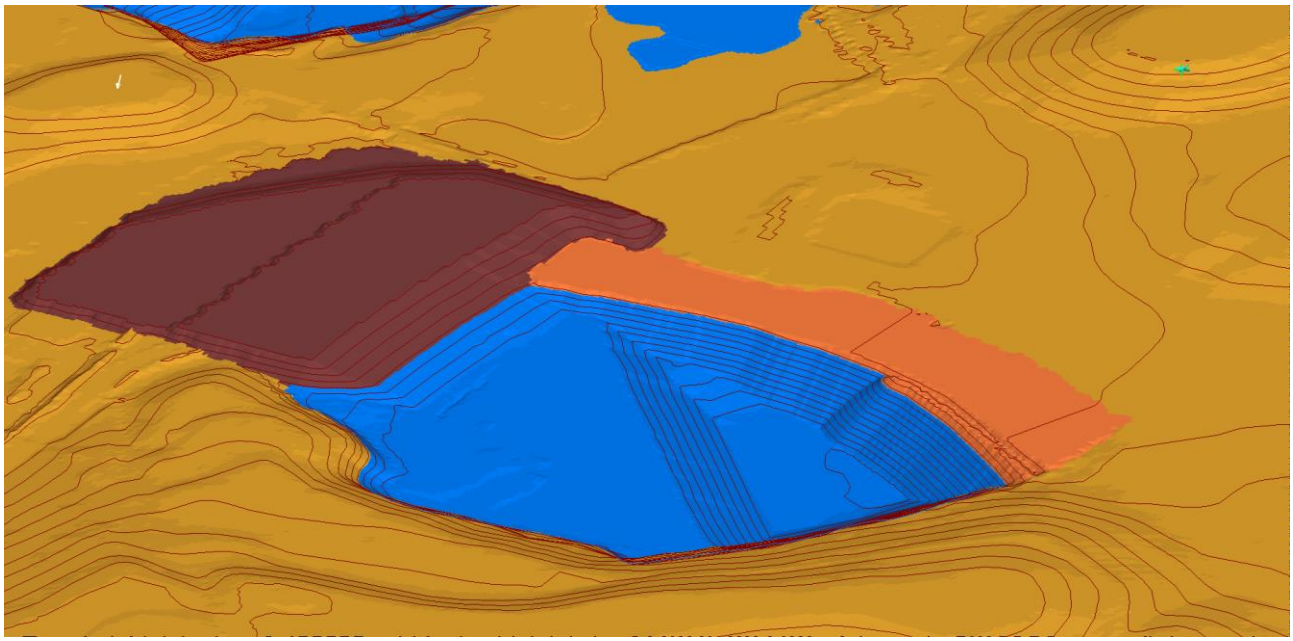


Figure 6.11 - Stratford Main Pit - 2026

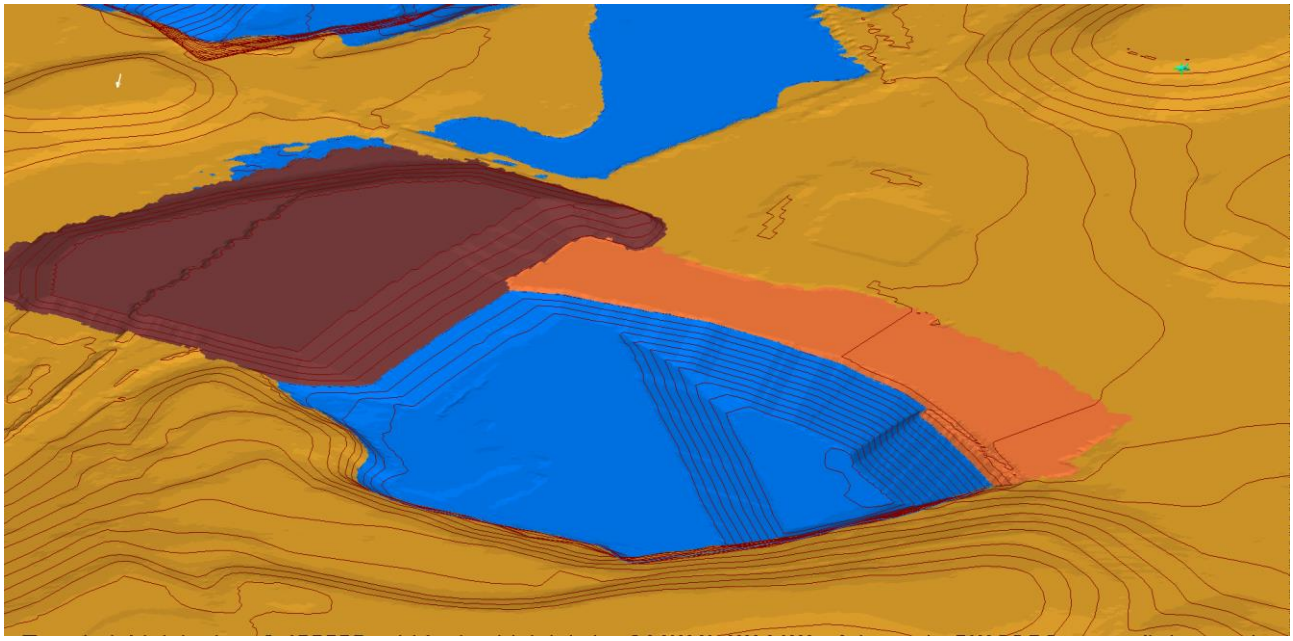


Figure 6.12 - Stratford Main Pit - 2028

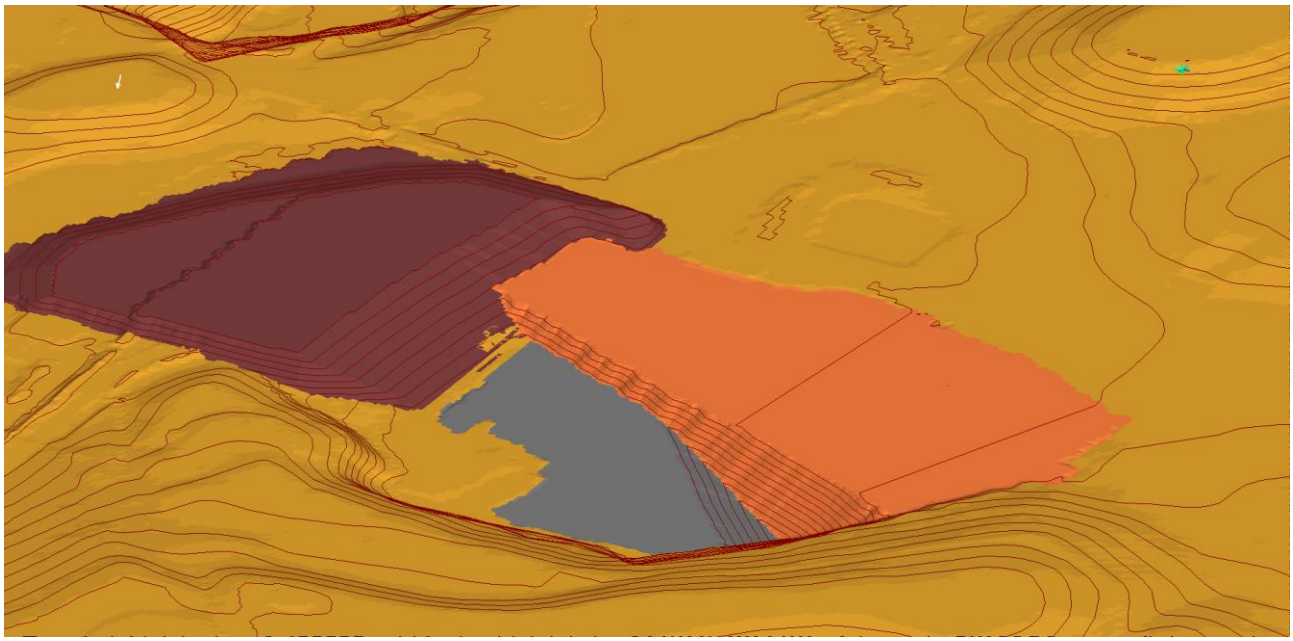


Figure 6.13 - Stratford Main Pit - 2031

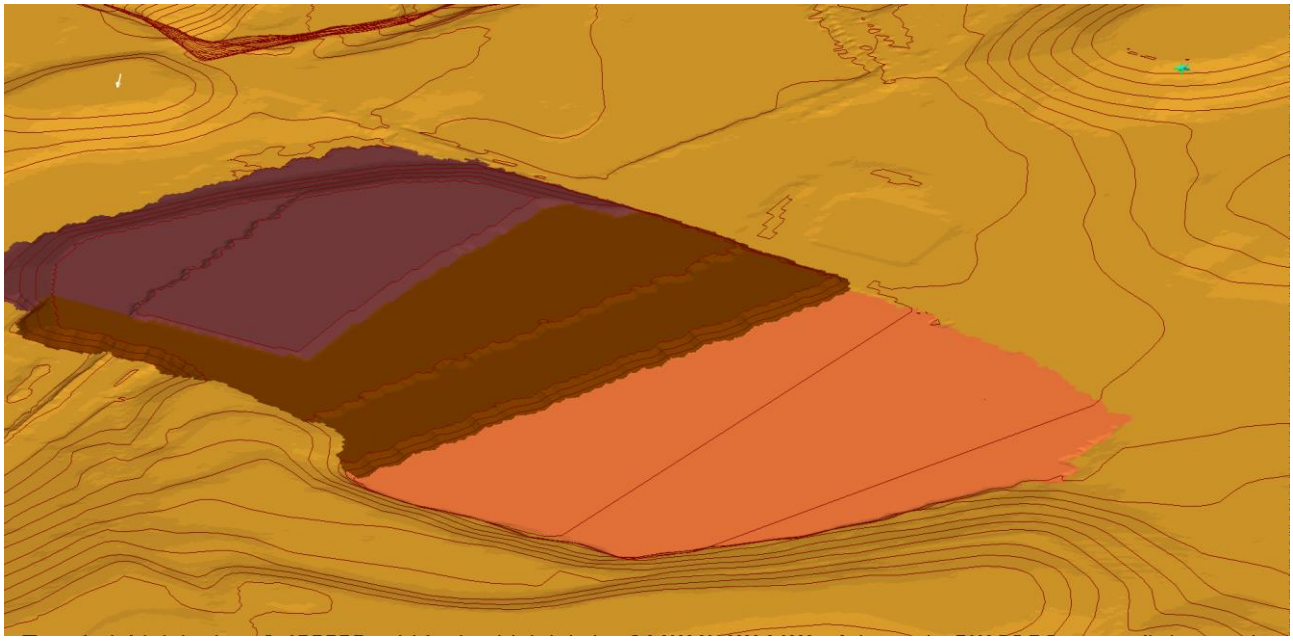
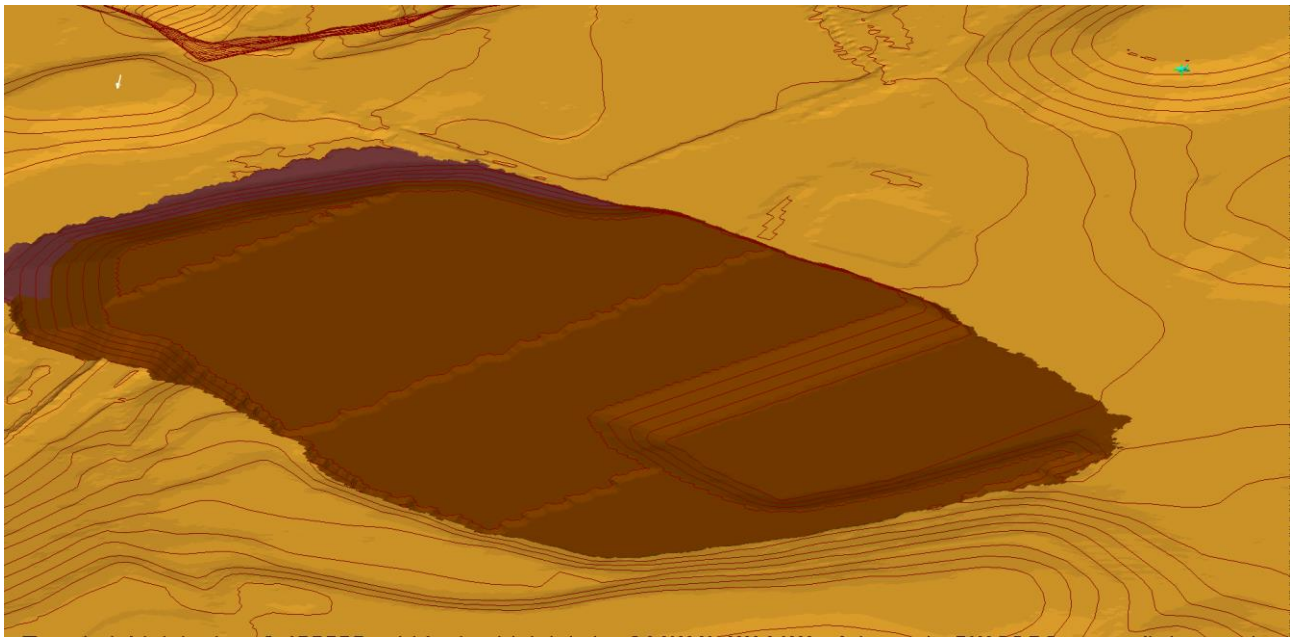
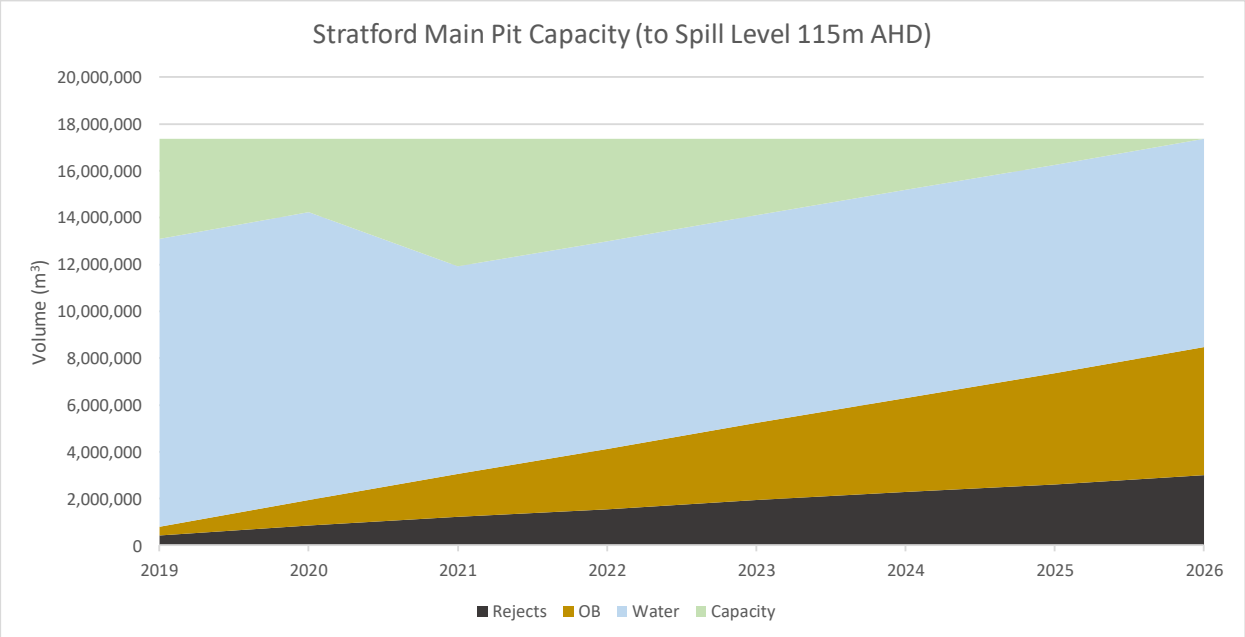


Figure 6.14 - Stratford Main Pit – 2036 – Final Landform



Based on the Stratford Main Pit Capacity as at the start of 2019, the amount of overburden is limited in order to ensure sufficient room for rejects and tailings placement and stored water. Figure 6.15 demonstrates the capacity levels within Stratford Main Pit to the end of 2026, at which time the co-disposed rejects and tailings are redirected to the newly completed Avon North Open Cut. The dip in stored water in 2021 is due to 3.4GL of water being transferred to Roseville West Open Cut, as it finishes mining operations in 2020. The stored water can also commence being transferred to Avon North Open Cut. This releases the remaining capacity of Stratford Main Pit to OB dump and capping the co disposed tailings as described in Section 6.2 and continuing with the topsoil placement and revegetation.

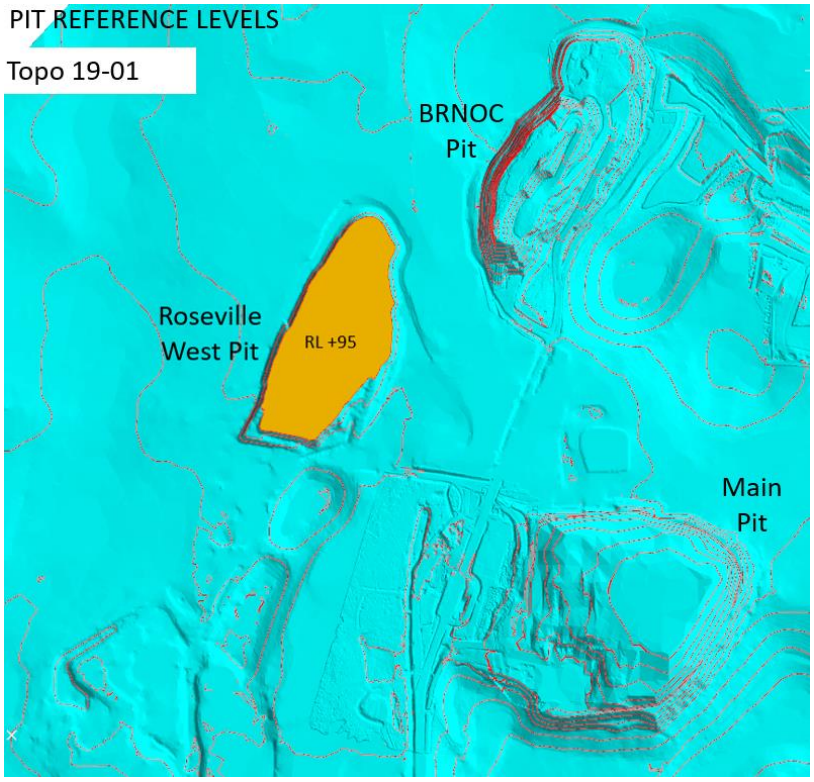
Figure 6.15 – Stratford Main Pit Capacity



6.2.2 Water Management Strategy

Stratford Main Pit is currently the Primary water storage facility for SMC and will continue to be until Avon North Open Cut is completed in 2026 and water can be transferred there. As mentioned in the previous section, 3.4GL will be transferred from Stratford Main Pit to Roseville West after mining is completed there in 2020. The 3.4 GL represents filling this pit to 75m AHD. There is an additional 3.4GL capacity in Roseville West which would take the water level to 95m AHD as shown in Figure 6.16 which still provides more than 3GL freeboard in this pit. While Stratford Main Pit has been represented as reaching capacity by the end of 2026, there is sufficient spare capacity in Roseville West to manage significant inflows. It is recommended, however, that the site water balance is updated to ensure this appropriately represents the proposed waste and rejects schedules and accurately predicts the available water storage capacity and potential spill risk over the life of the operations. The preferred option is for direct transfer of stored water from the Stratford Main Pit to Avon North Pit and the other storage options (i.e. Roseville West Pit and Stratford East Dam) would only be used as a contingency if required.

Figure 6.16 – Roseville West Capacity



7 MONTORING AND ASSESSMENT – MAIN PIT

7.1 Main Pit Monitoring and Assessment

The performance of the reject and water management system is monitored to confirm compliance with the reject disposal and water management plans. Environmental water quality monitoring is also conducted to check for possible effects of mining and processing activities on surface and groundwater. The following monitoring program as described in the RDP is in place for reject material disposal in the Stratford Main Pit (Table 7.1).

Table 7.1 – Reject Monitoring Program

Parameter	Location	Frequency
Rainfall	Mine site office	Daily
Reject solids	CHPP	Monthly totals
Reject solids (pH field testing)	Stratford Main Pit – Reject beach	Monthly
Water level	Stratford Main Pit	Monthly
Reject deposit level (bathymetric survey)	Stratford Main Pit reject area	Six-Monthly
Pumping volumes (inflow and outflow)	Transfer pumps	Monthly totals
Pit water quality (pH, EC, Alkalinity)	Stratford Main Pit	Monthly
Monitoring bores water level and quality	Around Stratford Main Pit (refer to the Groundwater Management Plan)	Quarterly
Receiving surface drainage water quality (pH, EC)	Avondale Creek upstream and downstream of mine (refer to Surface Water Management Plan)	Monthly/Event (>25 mm / 24 hour)

A trigger action response program (TARP) will be used in conjunction with the reject monitoring program. Key components of the TARP are outlined in Table 7.2 below.

Table 7.2 – Reject Monitoring Trigger Action Response Program

Monitoring Trigger	Action	Response
Rainfall Events >100mm	Inspect Stratford Main Pit clean water diversions. Inspect pit water level.	Undertake remedial works if required. Relocate depositional points if required.
Water level increase in Stratford Main Pit greater than modelled	Review weather data, pumping/mine waste inputs, and reject density data.	Revise Stratford Main Pit fill model as required.
Reject density significantly differs from predicted 1.2 t/m^3	Correlate with CHPP data. Confirm survey data.	Revise depositional methodology. Revise Stratford Main Pit fill model as required.
Persistent downward trend in water quality results or reject results over three month period	Investigate source/cause of water quality decline. The investigation would seek to assess presence and extent of any acid generation from exposed reject and quality profile in void water column. Appropriate remedial measures would be implemented based on findings of these investigations.	If source is found to be exposed reject revert to sub-aqueous disposal within safety limitations. Otherwise adopt alternative recommended actions (refer below).

Historical water quality data recorded for the Stratford Main Pit is used as a baseline of comparison for future monitoring with the objective of maintaining existing water quality over the period of the RDP. Monitoring results including comparisons against baseline values will be presented in the Annual Review.

Water volume data is assessed using the water balance simulation model as a basis and reviewed/reported in the Annual Review. In the event that the review indicates likely final water volumes in the Stratford Main Pit of a magnitude that could compromise rehabilitation, a revision of the reject disposal schedule would be undertaken and a revision to the RDP prepared.

In the event that monitoring and implementation of the TARP indicates that additional management measures are required (i.e. as a result of a persistent downward trend in water quality results), the following measures will be investigated and where appropriate will be implemented (EGi, 2010):

- increasing limestone dosage amounts;
- increasing blending depth;
- optimising limestone incorporation methods;
- decreasing limestone size fraction;
- increasing frequency of lime application; and

- use of more direct effort in control of convection/advection (such as compaction).

In addition, the disposal of a greater proportion of CHPP rejects sub-aqueously will also be considered as a contingency measure.

8 RECOMMENDATIONS

To improve or confirm some aspects of this report, a number of recommendations are put forward. These recommendations are:

- Risk assessments are to be carried out during more detailed studies to ascertain the acceptability of slope stability modelling outcomes where the FoS is < 1.2. It is possible that a lower FoS could be acceptable where strict operational controls are in place to mitigate the risks.
- Further testing and analysis of the co-disposed rejects / tailings is undertaken to better understand the material properties and distribution across the void. This would include both laboratory and in-situ field testing (where possible).
- Further study is undertaken to improve the FoS based upon changes to the geometry of the dumping arrangements and operational approach.
- Undertake a more detailed investigation of the cantilevered apron feeder, engaging with the supplier to firm up the designs and site requirements.
- The site water balance is updated to ensure that the strategy appropriately accounts for all the variables with respect site water.

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