CENTENNIAL

Powerline Management Plan
Longwalls 30 to 31

Mandalong Mine

MEMS-EP-9000-PLMP-9054

June 2021

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DOCUMENT CONTROL

DOCUMENT DETAILS	Name:	Powerline Management Plan LW30-31
	Author:	Phil Enright
	Number:	MEMS-EP-9000-PLMP-9054
	Revision No.:	1
	Document Status	Final

APPROVAL DETAILS

Revision No.	Date Sent	Details of Approval	Approved By	Approval Date
0	19/03/2021	Draft for Ausgrid review	Phil Enright Mining Approvals Coordinator	19/03/2021
1	22/03/2021	Final	Phil Enright Mining Approvals Coordinator	24/03/2021
1	25/06/2021	Final	Phil Enright Mining Approvals Coordinator	25/06/2021

CIRCULATION DETAILS

Name	Department	Circulation Date
Mr Tony Daley Network Services - Design and Planning Portfolio - Newcastle	Ausgrid	19/03/2021 (Rev.0) 24/03/2021 (Rev.1)
Director Resources Assessments	Department of Planning, Industry and Environment – Resource Assessments	24/03/2021 (Rev.1)
Director Resources Assessments	Department of Planning, Industry and Environment – Resource Assessments	25/06/2021 (Rev.2)

1 BACKGROUND

1.1 Introduction

Mandalong Mine is an existing underground longwall coal mine located on the western side of Lake Macquarie near Morisset, approximately 35 km southwest of Newcastle. Centennial Mandalong Pty Ltd is the operator of the mine and is a wholly owned subsidiary of Centennial Coal Company Pty Limited.

Development Consent for Mandalong Mine (SSD-5144) was approved on 12 October 2015 and permits extraction of 6.5 million tonnes of run-of-mine (ROM) coal per calendar year until 31 December 2040.

An Extraction Plan is required to be developed and approved prior to undertaking secondary extraction. The Extraction Plan is prepared for Longwall panels 30-31 (LW30-31), describes the applicable regulatory framework, mine planning, management and monitoring measures to be implemented to protect all surface/subsurface natural and built features in addition to administering public safety measures associated with secondary extraction.

This Powerline Management Plan (in support of the LW30-31 Extraction Plan) has been developed in accordance with the current requirements of Condition 6, Schedule 4 of SSD-5144 for the extraction of LW30-31, and in accordance with Mining Leases (ML1722 and ML1744) requirements issued under the Mining Act 1992 to extract longwall panels within the West Wallarah Seam.

The Extraction Plan and Powerline Management Plan have been prepared generally in accordance with the Department of Planning & Environment, *Draft Guidelines for the Preparation of Extraction Plans V5* (2015) and the Department of Industry – Resources Regulator *Managing Risks of Subsidence Guide: WHS (Mines and Petroleum Sites) Legislation* (2017).

The area applicable to this extraction plan is defined in detail in **Section 3.1**

1.2 Project Description

The Extraction Plan area comprises a surface area of approximately 209 hectares. Across the Extraction Plan area, the ground surface elevation ranges from 40 m to 240 m. Due to the elevated topography, alluvium is limited in this area. The depth of cover above the West Wallarah Seam in this area ranges from approximately 285 m to 500 m.

The existing surface environment of the Extraction Plan area includes watercourses, native bushland, steep slopes and archaeological heritage items.

There are nine private properties, one property owned by Central Coast Council, one owned by Centennial Coal and one Crown Land lot. A small area of Olney State Forest is located at the southern extent of the Extraction Plan Area. Of the nine privately owned properties, four dwellings will be affected by subsidence. Local roads, power lines, telecommunication networks and other associated infrastructure are also included in the area of potential subsidence influence. This infrastructure is managed by the Built Features Management Plan and supporting individual infrastructure management plans developed for Public Roads (Crown), Telstra Communications and Ausgrid Powerlines.

2 Purpose

The purpose of the Powerline Management Plan is to provide the management strategies, controls and monitoring programs to be implemented for the management of potential subsidence impacts on Ausgrid 11kV powerlines servicing a limited number of rural residential properties affected by the extraction of LW30 and LW31.

3 Scope

3.1 Extraction Plan Area

The Powerline Management Plan applies to the management of risks relating to the development of subsidence from the extraction of LW30 and LW31, located within Centennial Mandalong Mining Leases (ML1722 and ML1744) and Development Consent SDD-5144. The Extraction Plan Area is defined by the minimum of a 26.5^{o} angle of draw or 20mm limit of subsidence at the Upper 95% Confidence Limits from the extents of proposed extraction of LW30-31(**Figure 1**).

3.2 Ausgrid Powerlines

There are 14 timber 11kV power poles near or above LW30-31. The poles are approximately 15m high and support the conductors on timber cross members with ceramic insulators. The power supply network located within the Extraction Plan Area is under the care and control of Ausgrid. The powerline network location and mine workings are shown in **Figure 1**.

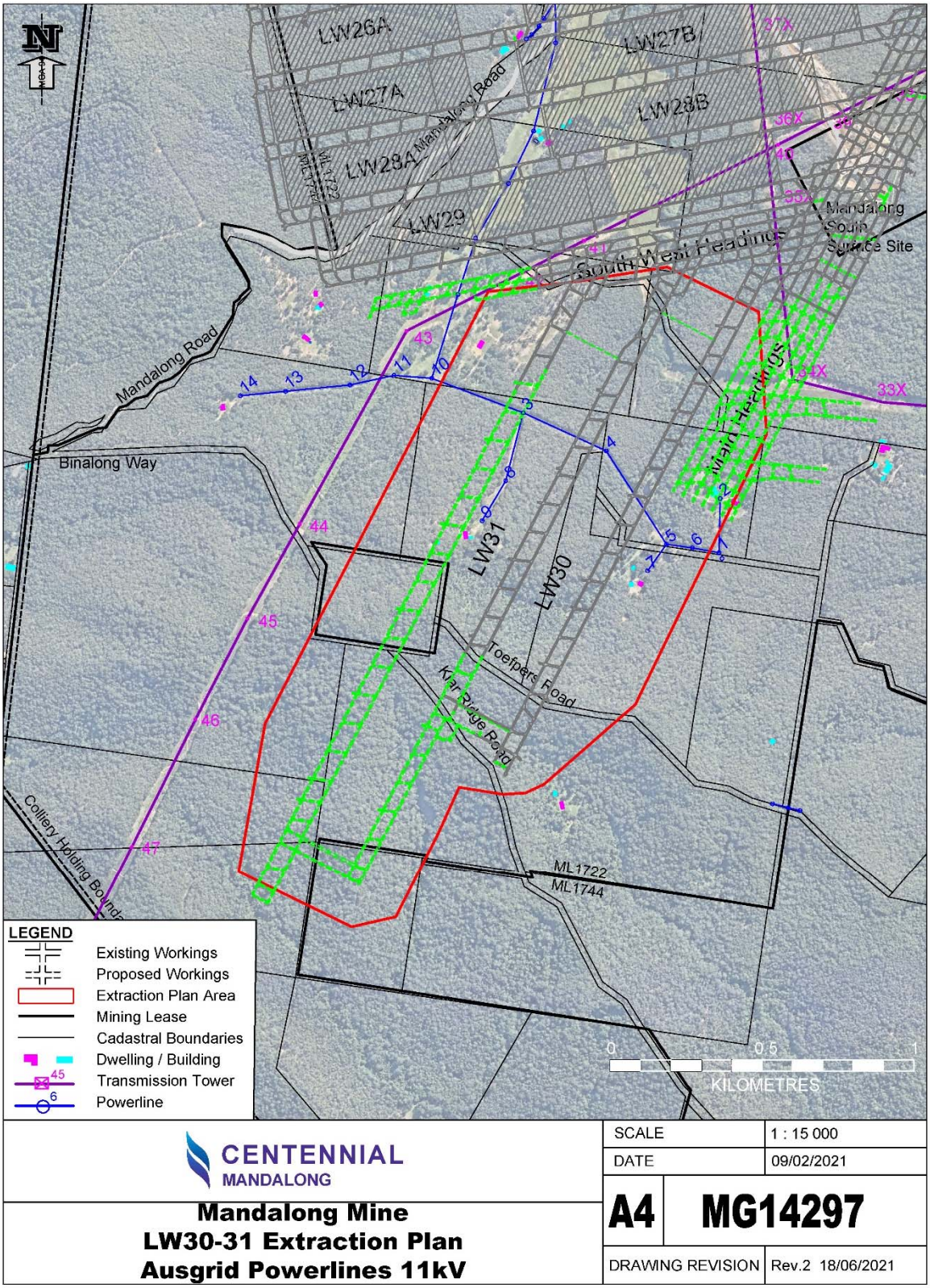

Figure 1 – Ausgrid Powerline Network and Mine Workings within Extraction Plan Area

4 Consultation and Plan Development

The Powerline Management Plan has been prepared and developed in consultation with Ausgrid as required by Development Consent SSD-5144. A summary of the consultation for the Powerline Line Management Plan is presented in **Table 1** and copy of the correspondence included in **Appendix 4**.

Mandalong Mine has successfully extracted 29 longwalls beneath the Ausgrid powerline network since the commencement of longwall mining in 2005. There have been seven previous revisions of the Powerline Management Plan. Each revision has been conducted in consultation with Ausgrid in preparation for each mining application (Extraction Plan).

The process for consultation, communication and the provision of information pertaining to this management plan will be managed according to Centennial Mandalong's **HSMC-SC-Information and Communications Arrangements** and **HSMS-SE-6592-Consultation Arrangements**.

Table 1 – Overview of Stakeholders Consulted Specifically for the Management Plan

Stakeholder	Date	Consultation Type and Summary of Aspects/Issues	Section Addressed
Ausgrid	11/05/2020	Centennial provided email to Ausgrid providing information regarding the proposed re-orientation of LW30-34. Subsidence predictions for power poles provided from DgS report no. MAN-001_11_28.04.20	Section 4 Appendix 4
Ausgrid	11/05/2020	Email and phone call received from Ausgrid to clarify the approvals process and development of Powerline Management Plan for the Extraction Plan, similar to previous management plan for LW25-31.	Section 4 Appendix 4
Ausgrid	28/10/2020	Centennial provided Ausgrid with update on Extraction Plan LW30-33. Provided Plan MG14221 and extract from DgS report MAN-005-1 subsidence assessment for power poles.	Section 4 Appendix 4
Ausgrid	16/11/2020	Phone call from Centennial to Ausgrid to discuss Powerline Management Plan.	Section 4
Ausgrid	19/11/2020	Phone call from Ausgrid to advise that a 'Short Form Contract' was required to model subsidence predictions to determine appropriate mitigation measures. Discussed time need to prepare complete any mitigation works and mine schedule. Expected mining beneath powerlines over LW30 around August 2021.	Section 4
Ausgrid	10/12/2020	AusGrid provided Short Form Contact to carry out subsidence impact to existing network and design mitigation measures.	Section 4 Appendix 4
Centennial	11/12/2020	Centennial signed Short Form Contract and raised purchase order to conduct subsidence impact modelling and mitigation measures.	Section 4 Appendix 4
Ausgrid	4/02/2021	Ausgrid confirmed that the modelling assessment had been completed. An estimate of the cost to carry out the minor changes to the network was being prepared. A short form contract for the works would be provided to Centennial in the following weeks.	Section 4 Appendix 4
Ausgrid	22/02/2021	Centennial provided additional subsidence information and electronic copy of the mine plan for assessment of powerline mitigation works.	Section 4 Appendix 4

Stakeholder	Date	Consultation Type and Summary of Aspects/Issues	Section Addressed
Ausgrid	19/03/2021	Centennial provided draft Powerline Management Plan for Ausgrid to review.	Section 4 Appendix 4
Ausgrid	22/03/2021	**T Daley provided email confirming that Ausgrid is satisfied that the Powerline Management Plan LW30-31 has management in place to ensure Ausgrid infrastructure is protected from the impacts of subsidence.**	Section 4 Appendix 4
Ausgrid	24/03/2021	T Daley provided plan detailing design works for subsidence mitigation on the powerline. A Short Form Contract was provided for Centennial to compensate Ausgrid to complete the mitigation works.	Section 4 Appendix 4

5 Regulatory Requirements

Centennial Mandalong operations are conducted in accordance with the relevant legislation and requirements of statutory authorities. Legislative and regulatory requirements are generally recognised through the imposition of conditions on the development consent, licences, mining approvals and Work, Health and Safety legislation.

5.1 Development Consent

Development Consent SSD-5144 provides a number of conditions relating to the preparation of the Built Features Management Plans. These conditions are summarised in **Table 2** below, together with the notation of the section of this document in which each matter is addressed.

Table 2 - Development Consent Conditions SSD-5144

Condition	Development Consent Condition	Section Addressed
Schedule 4 Condition 4	**Performance Measures – Built Features** The Applicant must ensure that the development does not cause any exceedances of the performance measures in Table 7, to the satisfaction of the Secretary.	Section 6 and Table 6
Schedule 4 Condition 5	**Performance Measures** Any dispute between the Applicant and the owner of any built feature over the interpretation, application or implementation of the performance measures in Table 7 is to be settled by the Secretary, following consultation with RR. Any decision by the Secretary shall be final and not subject to further dispute resolution under this consent.	Section 6
Schedule 4 Condition 6 (g)	**Extraction Plan** (g) include a Built Features Management Plan, which has been prepared in consultation with RR and the owners of affected built features, to manage the potential subsidence impacts and/or environmental consequences of the proposed second workings, and which: • addresses in appropriate detail all items of key public infrastructure (with particular consideration to tension/angle/suspension towers on transmission lines), and other public infrastructure; • has been prepared following appropriate consultation with the owner/s of potentially affected feature/s; • recommends appropriate remedial measures and includes commitments to mitigate, repair, replace or compensate all predicted impacts on potentially affected built features in a timely manner; and • in the case of all key public infrastructure, and other public infrastructure except roads, trails and associated structures, reports external auditing for compliance with ISO 31000 (or alternative standard agreed with the infrastructure owner), and provides for annual auditing of compliance and effectiveness during extraction which may impact the infrastructure;	Extraction Plan LW30-31 Built Features Management Plan LW30-31 Public Roads Management Plan LW30-31 Section 4 Section 7 Section 9
Schedule 4 Condition 6 (o)	(o) Trigger Action Response Plan addressing all features in Tables 6 and 7 which contain:	Section 12 and Appendix 1

Condition	Development Consent Condition	Section Addressed
	• appropriate triggers to warn of the development of an increasing risk of exceedance of any performance measures; • specific actions to respond to high risk exceedance of any performance measure to ensure that the measure is not exceeded; and • an assessment of remediation measures that may be required if exceedances occur and the capacity to implement the measures;	
Schedule 4 Condition 6 (p)	(p) include a Contingency Plan that expressly provides for: • adaptive management where monitoring indicates that there has been an exceedance of any performance measure in Tables 6 and 7, or where any such exceedance appears likely; and an assessment of the remediation measures that may be required if exceedances occur and the capacity to implement the measures;	Section 12 and Appendix 1
Statement of Commitments	**Subsidence Monitoring and Management** As part of the development of each Extraction Plan, Centennial Mandalong will update the Public Safety Management Plan and Built Features Management Plans in consultation with the relevant infrastructure owners.	This Plan Build Features Management Plan

5.2 Mining Leases

The Extraction Plan Area for LW30-31 is associated with two approved mining leases held by Centennial Mandalong: ML1722 and ML1744. Error! Reference source not found. summaries the relevant conditions relating to the Extraction Plan for LW30-31 and preparation of the Powerline Management Plan.

Table 3 – Summary of ML1722 and ML1744 conditions relating to Built Features

	Mining Lease No. 1722 and 1744	Section Addressed
ML1722 and ML1744 Condition 6	**Extraction Plan** (a) In this condition: (i) approved Extraction Plan means a plan, being: A. an extraction plan or subsidence management plan approved in accordance with the conditions of a relevant development consent and provided to the Secretary; or B. a subsidence management plan relating to the mining operations subject to this lease: I. submitted to the Secretary on or before 31 December 2014; and II. approved by the Secretary. (ii) relevant development consent means a development consent or project approval issued under the Environmental Planning & Assessment Act 1979 relating to the mining operations subject to this lease. (b) The lease holder must not undertake any underground mining operations that may cause subsidence except in accordance with an approved Extraction Plan. (a) The lease holder must ensure that the approved Extraction Plan provides for the effective management of risks associated with any subsidence resulting from mining operations carried out under this lease. (b) The lease holder must notify the Secretary within 48 hours of any: (i) incident caused by subsidence which has a potential to expose any person to health and safety risks; (ii) significant deviation from the predicted nature, magnitude, distribution, timing and duration of subsidence effects, and of the potential impacts and consequences of those deviations on built features and the health and safety of any person; or (iii) significant failure or malfunction of a monitoring device or risk control measure set out in the approved Extraction Plan addressing: A. built features; B. public safety; or C. subsidence monitoring.	Extraction Plan LW30-31 Built Features Management Plan LW30-31 Public Roads Management Plan LW30-31 Public Safety Management Plan LW30-31 Subsidence Monitoring Program LW30-31

5.3 Work Health and Safety Legislation

Mandalong Mine has developed a Safety Management System framework (MS-1001) that integrates plans, policies and procedures that enables a systematic approach to establishing and maintaining effective systems to manage health and safety consistent with WHS legislation and AS/NZS 4804:2001.

The following Work, Health and Safety (WHS) requirements have been considered for the Extraction Plan principally within the context of subsidence related risks to public safety, including to private property and public infrastructure and in reference to *Managing Risks of Subsidence Guide: WHS (Mines and Petroleum Sites) Legislation* (NSW Department of Industry - Resources Regulator, 2017)

Work Health and Safety legislation relating to the management of risk to health and safety from mine subsidence is addressed in **Table 4**.

Table 4 - Summary of WHS Legislation Relating to Mine Subsidence

Work Health and Safety Legislation Clause	Requirement	Section Addressed
WHS Regulation 2017 Clause 34	**Duty to identify hazards** A duty holder, in managing risks to health and safety, must identify reasonably foreseeable hazards that could give rise to risks to health and safety.	Section 7 Section 8 Extraction Plan Appendix 4 -Risk Assessments
WHS Regulation 2011 Clause 35	**Managing risks to health and safety** A duty holder, in managing risks to health and safety, must: (a) eliminate risks to health and safety so far as is reasonably practicable, and (b) if it is not reasonably practicable to eliminate risks to health and safety, minimise those risks so far as is reasonably practicable.	Section 6.1 Section 7 Section 9 Section 11
WHS Regulation 2017 Clause 36	**Hierarchy of control measures** (1) This clause applies if it is not reasonably practicable for a duty holder to eliminate risks to health and safety. (2) A duty holder, in minimising risks to health and safety, must implement risk control measures in accordance with this clause. (3) The duty holder must minimise risks, so far as is reasonably practicable, by doing 1 or more of the following: (a) substituting (wholly or partly) the hazard giving rise to the risk with something that gives rise to a lesser risk, (b) isolating the hazard from any person exposed to it, (c) implementing engineering controls. (4) If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by implementing administrative controls. (5) If a risk then remains, the duty holder must minimise the remaining risk, so far as is reasonably practicable, by ensuring the provision and use of suitable personal protective equipment. **Note.** A combination of the controls set out in this clause may be used to minimise risks, so far as is reasonably practicable, if a single control is not sufficient for the purpose.	Section 6.1 Section 7 Section 9 MS-1001
WHS Regulation 2017 Clause 37	**Maintenance of control measures** A duty holder who implements a control measure to eliminate or minimise risks to health and safety must ensure that the control measure is, and is maintained so that it remains, effective, including by ensuring that the control measure is and remains: (a) fit for purpose, and (b) suitable for the nature and duration of the work, and (c) installed, set up and used correctly.	Section 9 Section 10 Volume 3 of LW30-31 EP

Work Health and Safety Legislation Clause	Requirement	Section Addressed
WHS Regulation 2017 Clause 38	**Review of control measures** (1) A duty holder must review and as necessary revise control measures implemented under this Regulation so as to maintain, so far as is reasonably practicable, a work environment that is without risks to health or safety. (2) Without limiting subclause (1), the duty holder must review and as necessary revise a control measure in the following circumstances: (a) the control measure does not control the risk it was implemented to control so far as is reasonably practicable, (b) before a change at the workplace that is likely to give rise to a new or different risk to health or safety that the measure may not effectively control, (c) a new relevant hazard or risk is identified, (d) the results of consultation by the duty holder under the Act or this Regulation indicate that a review is necessary, (e) a health and safety representative requests a review under subclause (4). (3) Without limiting subclause (2) (b), a change at the workplace includes: (a) a change to the workplace itself or any aspect of the work environment, or (b) a change to a system of work, a process or a procedure. (4) A health and safety representative for workers at a workplace may request a review of a control measure if the representative reasonably believes that: (a) a circumstance referred to in subclause (2) (a), (b), (c) or (d) affects or may affect the health and safety of a member of the work group represented by the health and safety representative, and (b) the duty holder has not adequately reviewed the control measure in response to the circumstance.	Section 11 Section 15 Extraction Plan Appendix 4 -Risk Assessments
WHS Regulation (Mines and Petroleum Sites) 2014 Clause 9	**Management of risks to health and safety** (cl 617 model WHS Regs) (1) A person conducting a business or undertaking at a mine must manage risks to health and safety associated with mining operations at the mine in accordance with Part 3.1 of the WHS Regulations. (2) A person conducting a business or undertaking at a mine must ensure that a risk assessment is conducted in accordance with this clause by a person who is competent to conduct the particular risk assessment having regard to the nature of the hazard. (3) In conducting a risk assessment, the person must have regard to: (a) the nature of the hazard, and (b) the likelihood of the hazard affecting the health or safety of a person, and (c) the severity of the potential health and safety consequences. (4) Nothing in subclause (3) limits the operation of any other requirement to conduct a risk assessment under this Regulation. (5) A person conducting a business or undertaking at a mine (who is the mine operator of the mine or who is a contractor) must keep a record of the following: (a) each risk assessment conducted under this clause and the name and competency of the person who conducted the risk assessment, (b) the control measures implemented to eliminate or minimise any risk that was identified through any such risk assessment. (6) A person conducting a business or undertaking at a mine is not required to keep a record of a risk assessment if: (a) the risk assessment is one that an individual worker is required to carry out before commencing a particular task, and (b) the person keeps a record of risk assessments that addresses the overall activity being undertaken (of which the task forms a part) such as risk assessments carried out in relation to the development of the safety management system for the mine or for a principal mining hazard management plan. (7) The record kept under subclause (5): (a) if kept by a mine operator—forms part of the safety management system of the mine and the records of the mine, or	Section 7 MS-1001

Work Health and Safety Legislation Clause	Requirement	Section Addressed
	(b) if kept by a contractor who has prepared a contractor health and safety management plan—forms part of the plan.	
WHS Regulation (Mines and Petroleum Sites) 2014 Clause 10	**Review of control measures** (cl 618 model WHS Regs) (1) A person conducting a business or undertaking at a mine must review and as necessary revise control measures implemented under clause 9 in the following circumstances: (a) an audit of the effectiveness of the safety management system for the mine indicates a deficiency in a control measure, (b) a worker is moved from a hazard or assigned to different work in response to a recommendation contained in a health monitoring report provided under Part 3, (c) an incident referred to in clause 128 occurs, (d) any other incident occurs that is required to be notified to the regulator under the WHS laws. (2) The mine operator of a mine must ensure that a control measure that is the subject of a request by a health and safety representative under clause 38 (4) of the WHS Regulations is reviewed and as necessary revised, whether the request is made to the mine operator or notified to the mine operator under subclause (3) by another person conducting a business or undertaking at the mine. (3) A person conducting a business or undertaking at the mine who is not the mine operator of the mine must immediately notify the mine operator of a request made to the person under clause 38 (4) of the WHS Regulations. (4) A health and safety representative for workers at the mine may request a review of a control measure under clause 38 (4) of the WHS Regulations as if the circumstances referred to in subclause (1) were included as a circumstance in clause 38 (4) (a) of the WHS Regulations.	Section 11 Section 15 MS-1001 Section 14
WHS Regulation (Mines and Petroleum Sites) 2014 Clause 23 Identification of principal mining hazard management plan	(1) The mine operator of a mine must identify all principal mining hazards associated with mining operations at the mine. (2) The mine operator must conduct, in relation to each principal mining hazard identified, a risk assessment that involves a comprehensive and systematic investigation and analysis of all aspects of risk to health and safety associated with the principal mining hazard. (3) The mine operator, in conducting a risk assessment under subclause (2), must: (a) use investigation and analysis methods that are appropriate to the principal mining hazard being considered, and (b) consider the principal mining hazard individually and also cumulatively with other hazards at the mine.	Centennial Risk Management System – consistent with AS/NZS ISO 31000:2009 Risk Assessments in Appendix 4 Extraction Plan Subsidence WHS No. 1001025001 Built Features LW30-31 No. 1001284061 PSMPs LW30-31 No. 1001285007 Environment LW30-31 No. 1001284063
WHS Regulation (Mines and Petroleum Sites) 2014 Clause 24	(1) The mine operator of a mine must consider the following when preparing a principal mining hazard management plan for a principal mining hazard at the mine in accordance with this clause and Schedule 1. (2) A principal mining hazard management plan must: (a) provide for the management of all aspects of risk control in relation to the principal mining hazard, and	Extraction Plan LW30-31 and Public Safety Management Plan and

Work Health and Safety Legislation Clause	Requirement	Section Addressed
Preparation of principal mining hazard management plan	(b) so far as is reasonably practicable, be set out and expressed in a way that is readily understandable by persons who use it.. (3) A principal mining hazard management plan must: (a) describe the nature of the principal mining hazard to which the plan relates, and (b) describe how the principal mining hazard relates to other hazards associated with mining operations at the mine, and (c) describe the analysis methods used in identifying the principal mining hazard to which the plan relates, and (d) include a record of the most recent risk assessment conducted in relation to the principal mining hazard, and (e) describe the investigation and analysis methods used in determining the control measures to be implemented, and (f) describe all control measures to be implemented to manage risks to health and safety associated with the principal mining hazard, and (g) describe the arrangements in place for providing the information, training and instruction required by clause 39 of the WHS Regulations in relation to the principal mining hazard, and (h) refer to any design principles, engineering standards and technical standards relied on for control measures for the principal mining hazard, and (i) set out the reasons for adopting or rejecting each control measure considered. (4) The mine operator of a mine must consider the following when preparing a principal mining hazard management plan for a principal mining hazard at the mine: (a) the matters set out in Schedule 1 in respect of the principal mining hazard, and (b) any other matter relevant to managing the risks associated with the principal mining hazard at the mine.	Powerline Management Plan
WHS Regulation (Mines and Petroleum Sites) 2014 Clause 67 Subsidence	(1) In complying with clause 9, the mine operator of an underground coal mine must manage risks to health and safety associated with subsidence at the mine. (2) Without limiting subclause (1), the mine operator must ensure that: (a) so far as is reasonably practicable, the rate, method, layout, schedule and sequence of mining operations do not put the health and safety of any person at risk from subsidence, and (b) monitoring of subsidence is conducted, including monitoring of its effects on relevant surface and subsurface features, and (c) any investigation of subsidence and any interpretation of subsidence information is carried out only by a competent person, and (d) all subsidence monitoring data is provided to the regulator in the form and at the times required by the regulator, and (e) so far as is reasonably practicable, procedures are implemented for the effective consultation, co-operation and co-ordination of action with respect to subsidence between the mine operator and relevant persons conducting any business or undertaking that is, or is likely to be, affected by subsidence	Section 6.1 Extraction Plan Appendix 4 - Risk Assessments Section 9 Section 10 Section 13 Section 14 TARPs
WHS Regulation (Mines and Petroleum Sites) 2014 Clause 128 Duty to notify regulator of certain incidents	1) The operator of a mine or petroleum site must take all reasonable steps to ensure that the regulator is notified in accordance with this clause after becoming aware of an incident (other than a notifiable incident) arising out of the carrying out of mining operations or petroleum operations at the mine or petroleum site, but only if the incident: (a) results in illness or injury that requires medical treatment within the meaning of clause 13 of Schedule 9, or (b) is a high potential incident. (5) In this clause:	Appendix 1 TARPs Section 14 Public Safety Management Plan and

Work Health and Safety Legislation Clause	Requirement	Section Addressed
	high potential incident means any of the following: (m) any indication from monitoring data of the development of subsidence which may result in any incident referred to in clause 179 (a) (xvi) - a failure of ground, or of slope stability control measures, or 179 (a) (xvii) - rock falls, instability of cliffs, steep slopes or natural dams, occurrence of sinkholes, development of surface cracking or deformations or release of gas at the surface, due to subsidence.	Land Management Plan
WHS Regulation (Mines and Petroleum Sites) 2014 Schedule 1 Subsidence Clause 3C Principal hazard management plans – additional matters to be considered	**Subsidence** The following matters must be considered in developing the control measures to manage the risks of subsidence: (a) the characteristics of all relevant surface and subsurface features, (b) the characteristics of all relevant geological, hydrogeological, hydrological, geotechnical, topographic and climatic conditions, including any conditions that may cause elevated or abnormal subsidence or the formation of sinkholes, (c) the characteristics of any previously excavated or abandoned workings that may interact with any proposed or existing mine workings, (d) the existence, distribution, geometry and stability of significant voids, standing pillars or remnants within any old pillar workings that may interact with any proposed or existing mine workings, (e) the predicted and actual nature, magnitude, distribution, timing and duration of subsidence, (f) the rate, method, layout, schedule and sequence of mining operations.	Extraction Plan - Appendix 1 (Ditton Geotechnical Services, 2021) Extraction Plan and Volume 3 (Component Plans)
WHS Regulation (Mines and Petroleum Sites) 2014 Schedule 3 Clause 16 High Risk Activities	**Secondary extraction or pillar extraction, splitting or reduction** (1) The following are identified as high-risk activities: (a) secondary extraction by longwall mining, shortwall mining or miniwall mining, (b) pillar extraction, (c) pillar splitting, (d) pillar reduction. (2) The waiting period for any such activity is 3 months. (3) The information and documents that must be provided in relation to any such activity are as follows: (a) details of the authoritative sources used in determining that the proposed method of work can be done safely, (b) engineering plans showing the manner and sequence of extraction, endorsed by the individual nominated to exercise the statutory function of mining engineering manager at the mine, (c) information about the land above or in the vicinity of the proposed activity including land use and details of who owns or occupies any land that may be affected by subsidence, (d) in the case of a pillar extraction, details of the procedures for the recovery of buried and immobile mining plant in or around a goaf, (e) details of how the risks to the health and safety of workers and other persons from subsidence caused by the activity will be managed.	Extraction Plan LW30-31 High Risk Activity Notification for LW30-31

5.4 Extraction Plan Guidelines

The Extraction Plan and Powerline Management Plan have been prepared generally in accordance with the Department of Planning & Environment, *Draft Guidelines for the Preparation of Extraction Plans V5* (2015). **Table 5** provides a summary of the guidelines requirements for key component plans together with the notation of the section of this document in which each matter is addressed.

Table 5 - Extraction Plan Guideline Requirements for Key Component Plans

Extraction Plan Guideline Requirement – Key Component Plans	Section Addressed
An overview of all landscape features, heritage sites, environmental values, built features or other values to be managed under the component plan	Section 1 Section 3
Setting out all performance measures included in the development consent relevant to the features or values to be managed under the component plan	Section 6
Setting out clear objectives to ensure the delivery of the performance measures and all other relevant statutory requirements (including relevant safety legislation)	Section 6 Section 6.1
Proposing performance indicators to establish compliance with these performance measures and statutory requirements;	Section 6 TARPS
Describe the landscape features, heritage sites and environmental values to be managed under the component plan, and their significance. It should be noted that a full description of such features, sites and values would commonly have been provided and considered in a recent environmental impact assessment. Consequently, this section can be relatively brief, and focus on the presentation of appropriate figures and/or graphical plans;	Section 8
Describe all currently-predicted subsidence impacts and environmental consequences relevant to the features, sites and values to be managed under the component plan;	Section 8
Describe all measures planned to remediate these impacts and/or consequences, including any measures proposed to ensure that impacts and/or consequences comply with performance measures and/or the Applicant's commitments;	Section 9 Section 10.2 TARPS in Appendix 1
Describe the existing baseline monitoring network and the current baseline monitoring results, including pre-subsidence photographic surveys of key landscape features and key heritage sites which may be subject to significant subsidence impacts (such as significant watercourses, swamps and Aboriginal heritage sites);	Section 10.1
Fully describing the proposed monitoring of subsidence impacts and environmental consequences;	Section 10.2
Describe the proposed monitoring of the success of remediation measures following implementation;	Section 10.2
Describe adaptive management proposed to avoid repetition of unpredicted subsidence impacts and/or environmental consequences;	Section 11 TARPS in Appendix 1
Describe contingency plans proposed to prevent, mitigate or remediate subsidence impacts and/or environmental consequences which substantially exceed predictions or which exceed performance measures;	Section 11 Section 12 TARPS in Appendix 1
Listing responsibilities for implementation of the plan; and	Section 13
An attached Trigger, Action, Response Plan (effectively a tabular summary of most of the above).	Appendix 1

6 Performance Measures and Indicators

6.1 Mine Design

Mandalong Mine is designed to provide reduced levels of subsidence by using sub-critical longwall panels (180m to 200m) combined with 43m to 53m wide chain pillars that utilise the bridging effect of the overlying massive conglomerate and sandstone strata. This design is proven and provides subsidence impacts below safe, serviceable and repairable (SSR) criteria for dwellings and also minimises the impacts to the flood plain, natural features and the built features managed by this plan.

6.2 Subsidence Prediction

Subsidence predictions and potential impacts from the extraction of LW30-31 on surface and subsurface features present within the Extraction Plan Area has been prepared by Ditton Geotechnical Services (2021) based on the following methodology:

(i) The development of a geotechnical model of the overburden and immediate roof-pillar-floor system using available borehole log and testing data.

(ii) Prediction of maximum subsidence effect parameters for the proposed longwalls.

(iii) Review of Mandalong Mine's subsidence data and impacts associated with LWs 1 - 27.

(iv) Prediction of first and final subsidence effect profiles and final contours and assessment of the potential impacts to existing and proposed features or developments.

(v) Prediction of post-mining surface levels.

(vi) Potential surface cracking widths and their general location.

(vii) Prediction of sub-surface heights of continuous and discontinuous fracturing above the proposed longwall panels.

(viii) Potential ponding depth locations.

(ix) Potential surface gradient changes and erosion / slope stability impacts.

(x) Valley Closure and Uplift potential along watercourses.

(xi) Far-field horizontal displacements and strains.

(xii) Predicted impacts and management strategies required for the environment, developments and Aboriginal and European Heritage sites.

Two empirically based prediction models (**ACARP, 2003** and **SDPS®**) have been used to generate subsidence profiles and contours above the proposed longwall panels after mining is complete. **Surfer 8®** software has then been used to generate subsidence, tilt, horizontal displacement, and strain contours above the panels from the **SDPS®** output files.
The subsidence predictions models used in this study are summarised below:

- **ACARP, 2003** - An empirical model that was originally developed for predicting maximum single and multiple longwall panel subsidence, tilt, curvature and strain in the Newcastle Coalfield. The model database included measured subsidence parameters and overburden geology data, which have been back analysed to predict the subsidence reduction potential (SRP) of massive lithology in terms of 'Low', 'Moderate' and 'High' SRP categories.

  The model database also includes chain pillar subsidence, inflexion point distance, goaf edge subsidence and angle of draw prediction models, which allow subsidence profiles to be generated

for any number of panels and a range of appropriate confidence limits. The Upper 95% Confidence Limit (U95%CL) has been adopted in this study for predictions of the Credible Worst-Case values.

The model has been updated by Ditton Geotechnical Services (DgS) since 2007 to allow the original **ACARP, 2003** model to be applied to other Australian Coalfields and improve its robustness over a greater range of mining geometries and geologies.

- **SDPS®, 2007** - A US developed (Virginia Polytechnical Institute) influence function model for subsidence predictions above longwalls or pillar extraction panels. The model requires calibration to measured subsidence profiles to reliably predict the subsidence and differential subsidence profiles required to assess impacts on surface features.

  The model also includes a database of percentage of hard rock (i.e. massive sandstone / conglomerate) that effectively reduces subsidence above super-critical and sub-critical panels due to either bridging or bulking of collapsed material. This is consistent with the **ACARP, 2003** models prediction methodology.

Pre-feasibility studies of appropriate panel widths and set-back distances required to minimise or limit surface impacts to manageable levels have been undertaken by Centennial Mandalong and DgS prior to the preparation of the predictions. The outcomes of the preliminary analysis have resulted in the mining geometry and layout adopted.

Based on regression analysis techniques, curves of 'best fit' have been used to estimate Mean and Credible Worst-Case (Upper 95% Confidence Limits) for the subsidence effects due to the proposed longwalls. The curves are based on measured subsidence data in the NSW Coalfields and key mining geometry parameters (refer **ACARP, 2003**). The Mandalong mining experience to-date has also been reviewed against the database (LW1-27).

The prediction method allows specialist consultants to assess the potential range of impacts to a given feature in a probabilistic manner. Impact Management Plans and strategies can then be developed that allows appropriate Trigger Action Responses and mine planning adjustments or mitigation measures necessary to deliver satisfactory outcomes to stakeholders.

6.3 Performance Measures

As outlined in **Section 6.1**, the primary objective of the mine design is to prevent any significant mine induced risk to built features by providing low levels of subsidence, that allows built features including private dwellings to remain safe, serviceable and repairable.

The Powerline Management Plan aims to ensure the performance measures for power lines and power poles in SSD-5144 Schedule 4 Condition 4 Table 7 are not exceeded. The performance measures are shown in **Table 6**.

Table 6 - Subsidence Impact Performance Measures SSD-5144

Key Public Infrastructure	
M1 Motorway	Always safe and serviceable.
Main Northern Railway	
330 kV power supply infrastructure	Damage that does not affect safety or serviceability must be fully repairable, and must be fully repaired.
Other Built Infrastructure	
Power lines and power poles	Always safe.
Telecommunications infrastructure	Serviceability should be maintained wherever practicable.
Privately-owned residences	
Local Roads	Loss of serviceability must be fully compensated.
Other built features and improvements, (including access roads, farm dams, swimming pools, tracks and fences)	Damage must be fully repairable, and must be fully repaired or else replaced or fully compensated.
Public Safety	
Public Safety	Negligible additional risk.

Notes:

- *Key public infrastructure is shown in Figure 2 of Appendix 2 and in Figure 1 of Appendix 5*
- *Other built infrastructure is shown in Figure 1 of Appendix 5.*
- *The Applicant will be required to define more detailed performance indicators for each of these performance measures in the Built Features Management Plan, Property Subsidence Management Plans and Public Safety Management Plan (see condition 6 below).*
- *Measurement and/or monitoring of compliance with performance measures and performance indicators is to be undertaken using generally accepted methods that are appropriate to the environment and circumstances in which the feature or characteristic is located. These methods are to be fully described in the relevant management plans. In the event of a dispute over the appropriateness of proposed methods, the Secretary will be the final arbiter.*
- *Requirements regarding safety or serviceability do not preclude preventative or mitigatory actions being taken prior to or during mining in order to achieve or maintain these outcomes.*
- *Requirements under this condition may be met by measures undertaken in accordance with the Mine Subsidence Compensation Act 1961.*

6.4 Performance Indicators

To establish compliance with the performance measured outlined in **Section 6.3**, Centennial Mandalong has established a subsidence and environmental monitoring program developed in consultation with the built feature owners and RR. Trigger Action Response Plans (TARPs) have also been established and provided in **Appendix 1**. These documents establish the appropriate subsidence monitoring, parameters and associated trigger levels to demonstrate that subsidence performance satisfies the Subsidence Performance Measures set in **Table 6** and infrastructure requirements.

The Performance Indicators have been established for each built feature. The TARPS provide the trigger values as outlined in **Table 7**.

Table 7 – Performance Indicators

Performance Indicator	Tigger	Action / Response
Level 1 Low	Operations within prediction and approved impact.	Continued operations and monitoring as normal.
Level 2 Medium	Operations within approved impacts but exceed or potentially exceed predictions.	Review and investigation processes are engaged, with adaptive management as required.
Level 3 High	Operations exceed approved impact. *The approved Performance Measures of Development Consent SSD-5144 and other relevant approvals.*	Adaptive Management fully engaged

7 Risk Management

Centennial Mandalong has adopted the Stature Risk Assessment Program which was developed to ensure consistency in all risk assessments across the Centennial Coal operations. The Stature Risk Assessment Program sets out a consequences table and risk ranking matrix for managing identified risks consistent with AS/NZS ISO 31000:2009.

All operational processes undertaken at the Centennial Mandalong operations are subject to the risk assessment process prior to implementation. The process for risk and change management is undertaken according to the methodology and tools contained within **HSMS-SE-1024-Risk Management Arrangements and HSMS-SE-1082- Change Management System**.

Centennial Mandalong completed a WRAC Risk Assessment (No. 1001284061) for Built Features affected by subsidence from the secondary extraction of LW30-31, including powerlines. A full copy of the risk assessment is included within the Extraction Plan LW30-31 Appendix 4.

7.1 Identified Risks

Mandalong Mine has well established Infrastructure Management Plans, which have been developed and refined since the commencement of longwall mining in 2005. Potential hazards to public safety and the Ausgrid power supply network from the impact of mine subsidence can include:

- Potential for damage to poles, cross arms, insulators and conductors;
- Potential for tilting poles, increased/decreased conductor tension;
- Potential for reduced conductor ground clearance; and
- Potential for interruption of power supply to customers.

The risk assessment team also considered the tolerance of Mandalong Road to subsidence impact. Two case studies were modelled:

1. Maximum subsidence prediction (mean); and
2. Credible Worst-Case (Upper 95% Confident Limits).

This enabled a form of sensitivity analysis of the subsidence predictions to be made as outlined in **Table 8**.

Table 8 – Subsidence Sensitivities

Prediction	Cause
Maximum Predicted Subsidence (Mean)	Expected geotechnical conditions
Maximum Predicted Subsidence (Credible Worst-Case, U95% CL)	Geotechnical conditions worse than anticipated

7.2 Risk Assessment Outcome

A risk ranking (low, moderate, significant, high or extreme) was assigned to each risk/hazard. The risk ranking for Ausgrid powerlines was assessed as **Low** at the maximum predicted subsidence.

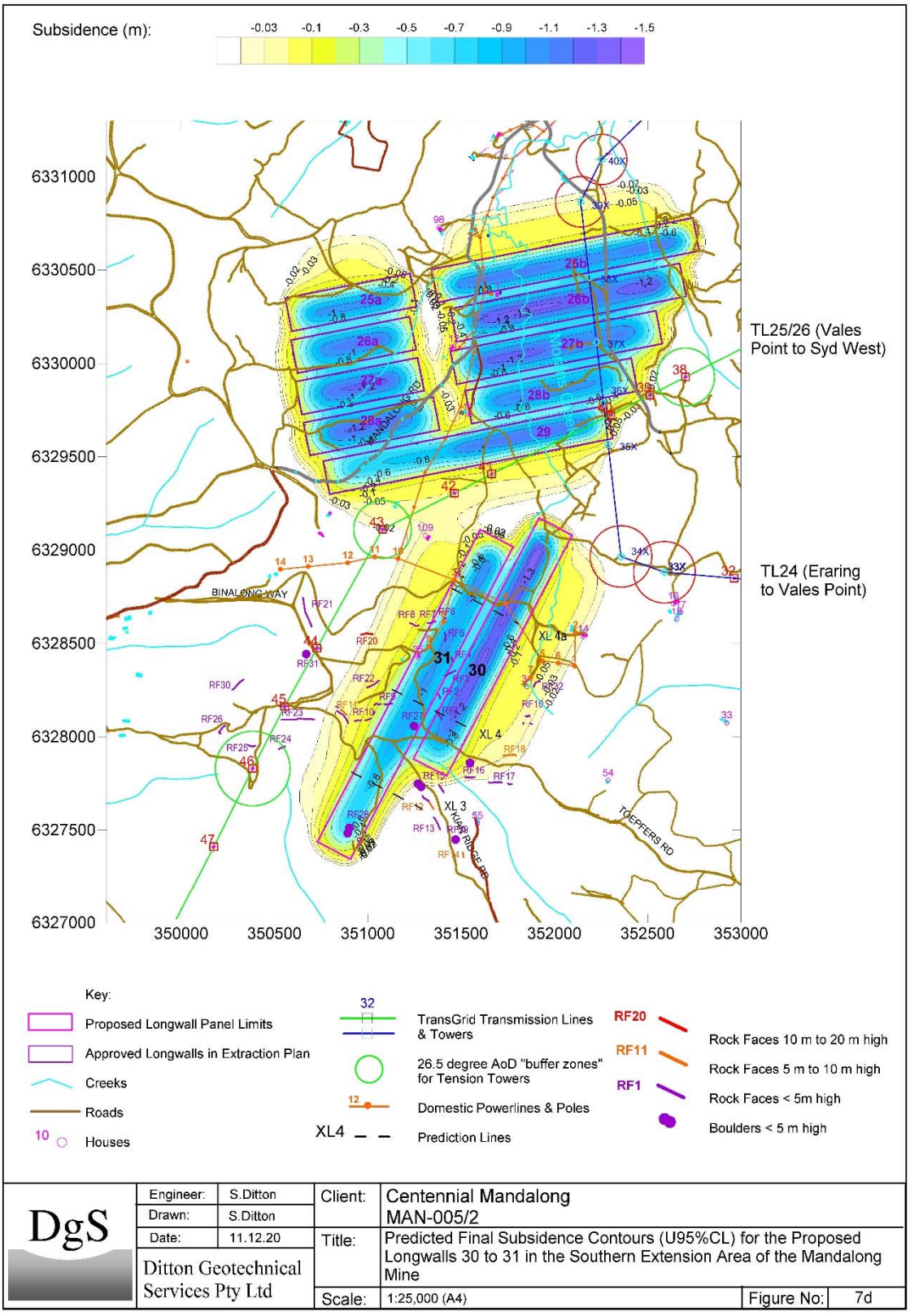

Figure 2 – Maximum Predicted Vertical Subsidence, Powerlines and Mine Plan

8 Powerlines and Predicted Impacts

8.1 Ausgrid Powerlines

Ausgrid is responsible for the care and maintenance of the 11kV power supply network within Mandalong. Mandalong Mine has been mining beneath Ausgrid powerlines since the commencement of longwall mining in 2005 and during the extraction of the 29 previous longwall panels. The Powerline Management Plan has been developed and reviewed for each of the previous nine Extraction Plan areas. Similarly, this Powerline Management Plan (MEMS-EP-9000-PLMP-9054) has been reviewed for LW30-31 Extraction Plan and developed in consultation with Ausgrid, based on the Ditton Geotechnical Services (2021) subsidence predictions which are consistent with previous mining.

Table 9 provides the maximum subsidence predictions at the Worst-Case (Upper 95% Confidence Limits) for the Ausgrid power poles located over LW30-33.

Table 9 – Worst-Case Final Subsidence Predictions for Ausgrid Power Poles over LW30-33

Pole No.	Easting (m)	Northing (m)	Final Subsidence (m)	Final Tilt (mm/m)	Final Ground Strain+ (mm/m)	Pole Base Displacement (mm)	Pole Movement Direction (o)
Proposed LW30 to 31 Effects (Extraction Plan)							
1 (MG-77016)	352108	6328379	0.00	0.2	0.1	4	296
2 (MG-77017)	352112	6328558	0.03	0.9	0.1	17	297
3 (MG-77014)	351463	6328840	**0.20**	**6.8**	3.2	**136**	280
4 (MG-77015)	351737	6328714	**1.20**	**11.3**	-5.5	**226**	118
5 (MG-77008)	351935	6328407	0.06	0.7	-0.2	13	295
6 (MG-77006)	352021	6328395	0.03	0.9	0.1	18	298
7 (MG-77007)	351873	6328319	**0.06**	0.3	0.0	5	324
8 (MG-71001)	351406	6328616	**0.55**	**10.6**	**-0.5**	**212**	122
9 (MG-71002)	351328	6328484	**0.47**	**9.0**	**0.5**	**180**	172
10 (MG-77013)	351162	6328954	**0.02**	**0.0**	***0.5***	***20***	**120**
11 (MG-77002)	351037	6328964	**0.00**	**0.0**	***0.5***	***20***	**120**
12 (MG-77003)	350892	6328932	**0.00**	**0.0**	***0.5***	***20***	**120**
13 (MG-77004)	350680	6328911	**0.00**	**0.0**	**0.0**	**0**	**-**
14 (MG-77005)	350531	6328896	**0.00**	**0.0**	**0.0**	**0**	**-**
Proposed LW30 to 33 Effects (Mod 9)							
1 (MG-77016)	352108	6328379	0.00	0.2	0.1	4	296
2 (MG-77017)	352112	6328558	0.03	0.9	0.1	17	297
3 (MG-77014)	351463	6328840	0.69	8.2	3.1	164	280
4 (MG-77015)	351737	6328714	1.18	10.9	-5.5	218	118
5 (MG-77008)	351935	6328407	0.08	0.7	-0.2	13	295
6 (MG-77006)	352021	6328395	0.03	0.9	0.1	18	298
7 (MG-77007)	351873	6328319	0.07	0.3	0.0	5	324
8 (MG-71001)	351406	6328616	1.07	4.9	-1.0	97	122
9 (MG-71002)	351328	6328484	1.18	2.4	-0.5	48	172
10 (MG-77013)	351162	6328954	0.07	0.5	0.8	10	180
11 (MG-77002)	351037	6328964	0.05	0.5	0.1	11	149
12 (MG-77003)	350892	6328932	0.01	0.1	0.1	3	144
13 (MG-77004)	350680	6328911	0.03	0.6	0.1	11	253
14 (MG-77005)	350531	6328896	0.01	0.2	0.1	5	203

+ - Tensile and compressive phases may occur during subsidence development. **Bold** - predictions different to Mod 9.
italics - far-field displacements & strains

8.1.1 Predicted Impacts

There has been no interruption or loss of serviceability from subsidence on any powerline infrastructure during the extraction of the previous 29 longwall panels due to the low levels of vertical subsidence, tilt and strain.

The predicted Final U95%CL subsidence for the poles range between 0.0 m and 1.20 m with tilts ranging from 0 mm/m to 11 mm/m and strains from -5.5 mm/m (compressive) and 3.1 mm/m (tensile). Horizontal displacement of the pole bases is estimated to range from 5 mm to 226 mm after mining is complete.

Slightly lower subsidence effects were assessed at some pole locations in the Mod 9 Report and is due to the difference in the number of longwalls and chain pillar compression effects. The conductors between the poles may experience lengthening and/or shortening due to the pole tilts which may result in conductor clearance losses. It is considered very unlikely that the poles will be impacted by surface strains due to the absence of cracking observed to-date.

9 Management Measures

The management measures are:

- Ausgrid has completed modelling of subsidence effects on the powerline network;
- Ausgrid has identified mitigation works are required to be completed prior to power poles being impacted by subsidence;
- Ausgrid will conduct the mitigation works prior to subsidence affecting the powerline network (typical works include installing rollers, replacing cross-arms, replacement poles and removing stays);
- Centennial to record the pre and post condition of Ausgrid power poles using Centennial's 3D scanning theodolite (Trimble SX10);
- Centennial to provide Ausgrid with the pre and post 3D scanning results for evaluation;
- Centennial to monitor subsidence line Crossline 24 and Crossline 25 and conduct visual inspections of the affected section of the powerline; and
- Centennial to conduct weekly inspections powerlines when the infrastructure is within the Active Longwall Subsidence Zone.

The subsidence monitoring program is detailed in **Section 10.2**.

10 Monitoring Program

The Mandalong Mine Subsidence Monitoring Program consists of conventional subsidence monitoring, visual inspections and aerial LIDAR surveys, developed in order to:

- Demonstrate mine development and extraction is undertaken as per approved designs;
- Provide information to demonstrate statutory compliance and obligations are satisfied;
- Targeted monitoring of sensitive surface and built features;
- Meet stakeholder monitoring requirements to minimise impact to infrastructure;
- Provide appropriate and timely subsidence information to assess against triggers established in the TARPs.
- To provide data for future monitoring systems for ongoing mining within Mandalong mining leases.

The Subsidence Monitoring Program is scheduled in the Centennial Compliance Database. The compliance database allows for surveys, inspections and notifications to be scheduled on either time or productions schedule (longwall face position). The required actions are assigned to the relevant role to ensure the subsidence monitoring program is achieved.

10.1 Baseline Monitoring

10.1.1 Detail Aerial Mapping

An aerial LIDAR survey was undertaken in April 2020, providing the pre-mining landform for the Extraction Plan area and post mining landform for Longwalls 1 to 25. The LIDAR surveys provide surface mapping with a vertical accuracy of 0.15m. Aerial LIDAR surveys of the whole mining area are conducted approximately every three years.

10.1.2 Conventional Subsidence Monitoring

Centennial Mandalong has a well-established conventional subsidence line monitoring program, with currently over 80km of crosslines and centrelines established over the whole mining area. The monitoring lines typically consist of buried star pickets within cast iron covers, nominally spaced at 10m intervals.

Within the Extraction Plan area, three crosslines will be established:

- Crossline 23 Centennial property over LW28-30;
- Crossline 24 Located along Toepfers Road and Kiar Ridge Fire Trail over LW30-33; and
- Crossline 25 Located along a private access road over LW31.

The proposed location of the monitoring lines is shown in **Figure 3**.

10.1.3 3D Scanning of Power poles

Centennial Mandalong will conduct 3D scanning of the power poles prior to the poles being affected by subsidence from LW30-31. High precision scanning and survey/subsidence data will be provided using Centennial's Trimble SX10 Scanning Total Station. The monitoring will record the pre mining condition of power poles. All scanning and results will be provided to Ausgrid.

10.1.4 Ausgrid LIDAR Information

Ausgrid LIDAR information obtained in 2017 and overhead network modelling software provides the pre-mining condition of the powerline network.

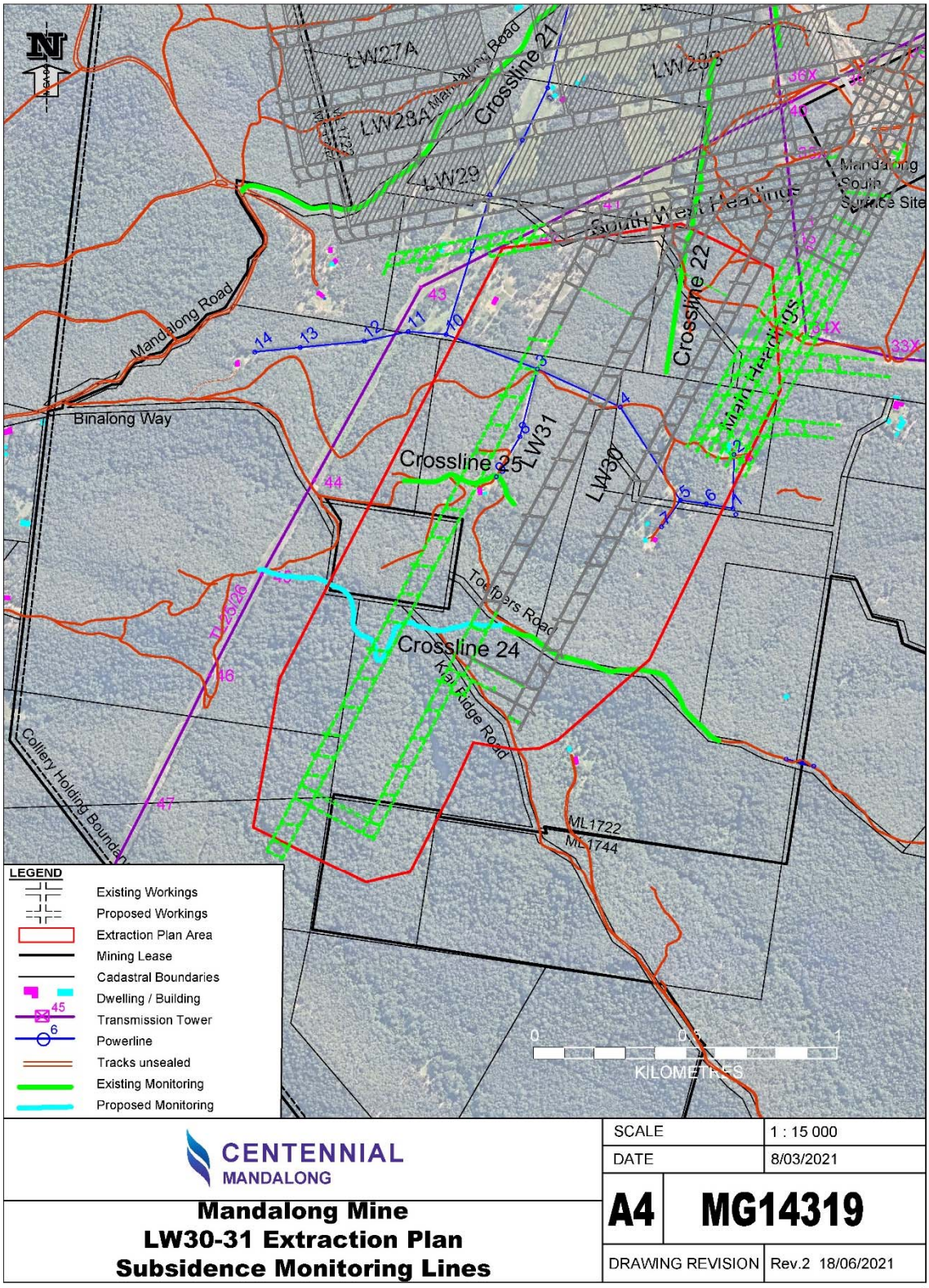

Figure 3 – Proposed Subsidence Monitoring Lines for LW30-31

10.2 Subsidence Monitoring

10.2.1 Subsidence Monitoring Zones

Mandalong Mine has developed three subsidence monitoring zones to accommodate the development of subsidence from the narrow longwall panels and the bridging effect of the overlying massive strata that provides the reduced levels of subsidence. Unique to Mandalong Mine and as a result of the bridging massive strata, subsidence develops later than in typical longwall operations, with the majority of subsidence realised after the longwall face has retreated approximately 500m.

Additional subsidence also develops over the longwall panel following the extraction of the next adjacent longwall panel. This is due to the compression of the intervening chain pillar and strata. The additional subsidence contributed is typically in the order of 0.30m and is dependent on the geotechnical conditions and the depth of cover. Tilts and strains typically remain unchanged and may be reduced as a result of the decreased vertical subsidence differential between the maingate chain pillar and the centre of the longwall panel. In areas with higher depth of cover over 300m some additional minor settlement may occur following the extraction of the adjacent two to three longwall panels.

Accordingly, with 29 longwall panels now completed, Mandalong has developed three subsidence monitoring zones which define required monitoring activities in actively subsiding and stable areas of the mine as follows below. Full details of proposed monitoring activities within each zone are described within the Subsidence Monitoring Program for each Extraction Plan progressively approved by the mine.

10.2.1.1 Active Subsidence Zone for Visual Monitoring

The “Active Subsidence Zone” for visual monitoring inspections is defined as:

- 100m in advance of the current longwall face position; and
- the following 500m of longwall extraction (i.e. 500m behind the face position).

10.2.1.2 Active Longwall Zone for Crossline Monitoring

The “Active Longwall Subsidence Zone” includes the nominated crosslines for the current longwall panel and the three previous longwall panels.

10.2.1.3 Stable Longwall Subsidence Zone for Crossline Monitoring

The “Stable Longwall Subsidence Zone” represents the stable non-subsiding areas beyond the three previous longwall panels, defined as being from the start of the nominated crosslines up to the Active Longwall Subsidence Zone.

10.2.2 Crossline Monitoring

Subsidence monitoring on Crossline 24 and Crossline 25 will be conducted following the completion of each longwall panel.

Weekly visual inspections will be conducted when private access roads and the adjacent powerlines are located within the active subsidence zone of each longwall. Monthly monitoring will continue for the following six months or when the next longwall mines beneath the access roads and powerlines. The results of the visual inspections will be recorded on the subsidence inspection checklist sheet and filed.

10.2.3 3D Scanning of Power Poles

Centennial Mandalong will conduct 3D scanning of the power poles prior to the poles being affected by subsidence from LW30-31. High precision scanning and survey/subsidence data will be provided using Centennial's Trimble SX10 Scanning Total Station. The monitoring will record the pre and post mining condition of power poles for Ausgrid to assess if further mitigation or remediation works are necessary.

10.2.4 Ausgrid LIDAR Information

Ausgrid will conduct LIDAR monitoring using the overhead modelling software to analysis the impact of subsidence on the powerline network upon completion of works.

Table 10 – Ausgrid Powerlines and Access Road Subsidence Monitoring Summary

Feature	Location	Monitoring Method	Parameter	Monitoring Frequency and Duration
Crown Roads Public Roads Management Plan **Private Access Roads** PSMP **Telstra Communications Network** Communications Management Plan **Ausgrid Powerlines** Powerline Management Plan	**Crown Roads** Toefpers Rd Kiar Ridge Rd **Private Access Roads** Private properties **Powerline easements** 11kV powerline	**Crossline 23** Star posts on Centennial property at 10m spacing **Crossline 24 and Crossline 25** Star posts adjacent to road at 10m spacing	Vertical subsidence, tilt and strain.	Baseline Prior to mining LW30 and LW31. Post Mining 2 months after mining LW30 and LW31. Stable Zone 2 yearly.
		Visual Inspection	Presence of mine-induced damage: • surface tensile cracking in pavement • surface compressive shearing in pavement • surface cracking in fill embankments • erosion of local slope stability for fill embankment if cracking occurs • cracking to culverts and under-road pipes • road drainage Risk to public safety Powerline –tilting pole, damage cross arms, insulators; change in conductor sag/tension; ground clearance. Communications - inspection of aerial cables, poles, pits, cables, joints and conduits.	Active Zone Weekly visual inspection while road, communications and adjacent powerlines are within the current LW active subsidence zone. Post Mining Monthly visual inspection for the following six months or until the commencement of weekly inspections for the next longwall panel.
		3D Scanning Trimble SX10 Scanning Total Station of each pole affected by subsidence.	3D scan of power pole, High resolution photograph of pole, Vertical subsidence at pole Tilt of pole, Change in distance between poles.	Baseline Prior to mining impacting poles from the extraction of LW30 and 31. Post Mining

Feature	Location	Monitoring Method	Parameter	Monitoring Frequency and Duration
				2 months after mining LW30 and LW31.
		Ausgrid	Overhead powerline modelling using LIDAR data.	Baseline Prior to mining LW30 and 31 2017 LIDAR information. Post mining After the completion of mining LW31.

11 Adaptive Management

In addition to the conservative sub-critical longwall panel design specifically to provide reduced levels of subsidence and impact, Centennial Mandalong developed an adaptive management approach designed to avoid repetition of any unpredicted subsidence and or environmental consequences. This system involves the monitoring and evaluation of impacts to powerlines against the performance indicators defined in **Section 6.4** and contingency plan (TARP) in the event that a performance indicator is exceeded.

11.1 Measures to be Implemented to Remediate Impacts

Ausgrid will conduct post-mining inspections and modelling to determine if subsidence remediation works are required.

12 Contingency Plans

Trigger Action Response Plans (TARP) have been developed using performance indicators for the Ausgrid powerlines. In the event that subsidence monitoring and or visual inspections identify that a performance indicator has been exceeded, Centennial Mandalong will implement the contingency measures as detailed in the TARP in **Appendix 1**.

13 Roles and Responsibilities

The responsibility for implementation, monitoring and review of the Powerline Management Plan lies with the Mining Approvals Coordinator. The roles and responsibilities for the Powerline Management Plan are outline in **Table 11**.

Table 11 – Roles and Responsibilities

Position	Responsibility
Mine Manager	• Authorisation of the Powerline Management Plan • Ensuring that sufficient resources are available to implement this plan.
Mining Approvals Coordinator	Implementation, monitoring and review of this plan, including: • Ensure that the Subsidence Monitoring Program, required inspections, mining notifications are scheduled into the Centennial Compliance Database prior to the commencement of each longwall panel. • Ensuring subsidence monitoring and inspections are conducted at the required schedule and persons conducting monitoring/inspections are trained in the requirements of this plan. • Consulting with the landowners, infrastructure owners and relevant government departments including Ausgrid, DPIE, RR and SA NSW. • Review and assess the subsidence monitoring results against the performance measures. • Notification of any exceedance of performance indicators in accordance with the TARPs and management plan. • Coordinating any remedial work as required. • Preparation and submission of formal reporting requirements outlined in this plan. • Review and audit of the Powerline Management Plan.
Subsidence Surveyor	• Establishment of subsidence monitoring in accordance with the Subsidence Monitoring Program. • Ensure all subsidence surveys are conducted in accordance with the approved Subsidence Monitoring Program. • Review and assess subsidence monitoring results. • Notify the Mining Approvals Coordinator of any identified public safety issues. • Provide the monitoring results to the Mining Approvals Coordinator, Ditton Geotechnical Services, RR, Ausgrid and SA NSW. • Provide Ausgrid with pre and post mining 3D scanning results.
Survey Department	• When required, conduct inspections within the applicable subsidence zone to the standard required, using the subsidence inspection checklist. • Promptly notify the Mining Approvals Coordinator of any issue identified during a subsidence inspection.
Ausgrid	• Conduct modelling using overhead line design software after completion of mining. • Provide the Mining Approvals Coordinator with modelling results and any proposed mitigation or remediation.

14 Reporting

Reporting will be completed in accordance with the draft *Guidelines for the Preparation of Extraction Plans* (NSW Department of Planning & Environment, 2015), as summarised in **Table 12**.

Table 12 - Reporting Requirements

Report	Trigger	Requirements	Stakeholders
Incident Reporting	Any occasion or incident in accordance with consent condition, WHS Regulations or TARP.	In accordance with requirements of: • Development Consent Schedule 6 Condition 10; or • WHS Regulation (Mines and Petroleum Sites) Clause 128; or • TARP.	RR DPIE Ausgrid Ditton Geotechnical Services SA NSW CCC
Bi-Monthly Subsidence Impact Reporting	If a new impact is identified, compile after monthly subsidence.	Distinguish impact: • within predictions; • those which exceed predictions but remain within performance measures and/or performance indicators; and • those which exceed performance measures and/or performance indicators. Report to include: • full description; • location identification using aerial photos with longwall layout superimposed; • photos of the impact; and • preliminary characterisation of the impact in accordance with the relevant TARP(s).	
Annual Review	Annual Report required under development consent SSD-5144.	Report to include: • reports of impacts and environmental monitoring results; • monitoring results; and • summary of subsidence impacts.	RR DPIE MEG CCC Ausgrid
Community Consultative Committee (CCC)	CCC meetings are typically held three times per year.	Subsidence and environmental performance is included as an agenda item at each meeting.	CCC
Mining Notifications	One month prior to mining beneath the powerlines.	Scheduled date that the powerlines will be affected by subsidence and within the Active Subsidence Zone.	Ausgrid

15 Audit and Review

Audit and review procedures are outlined in Centennial Mandalong's Safety Management System that comply with the NSW Work Health and Safety (Mines and Petroleum Sites) Regulations. These procedures are utilised to manage audit and review functions of the Built Features Management Plan. Refer Document **HSMS-SE-1028- System Evaluation**.

15.1 Audit

The requirements of the Powerline Management Plan are to be audited annually for compliance and effectiveness during the extraction of LW30-31.

Any non-conformances or deficiencies found during the audit are to be brought to the attention of the System Coordinator so that corrective actions can be outlined. These corrective actions are to be allocated and carried out accordance with **HSMS-SE-1029 - Corrective Action Procedure**.

15.2 Review

The Powerlines Management Plan will be reviewed every three years or in the event that one of the following occurs:

- Stakeholders raise issues that necessitates a review;
- Where unpredicted impacts or consequences have required implementation of contingency actions under this plan;
- Monitoring, incident or audit processes demonstrate a review is required;
- Where triggered by a TARP;
- With each new Extraction Plan;
- Where triggered by circumstances in either Clause 10 or Clause 128 of WHS (Mines and Petroleum Sites) Regulation or Clause 38 WHS Regulation; and
- Change in mine design or layout.

16 Document Control

An integrated Document Control Procedure is incorporated into Centennial Mandalong's Safety Management System.

Documents, data and records pertaining to this plan will be managed according to **HSMS-SE-1025-Information Control**.

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Appendix 1 Trigger Action Response Plan

Monitoring and Controls	Trigger	Action / Response
Powerlines – LW30-31		
• **Centennial** to establish subsidence monitoring and inspection sites for public / private roads and adjacent powerlines prior to mining. • **Centennial** to conduct pre and post mining 3D scanning and survey of power poles. • **Ausgrid** to model and install mitigation works on affected section of the powerline. • **Centennial** to mark the centreline and edges of current longwall panel on public/private road pavement one month prior to public road and powerlines being affected by subsidence. • **Centennial** to notify Ausgrid one month prior to powerline being affected by subsidence from each longwall panel. • **Centennial** to conduct weekly visual inspections of public/private roads and powerlines located along road easement when influenced by subsidence within the Active Longwall Subsidence Zone. Record results on the Subsidence Inspection Checklist. • **Centennial** to conduct monthly visual inspections for the following six months and record results on the Subsidence Inspection Checklist. • **Centennial** to be in regular contact with private property owner during the development of subsidence. • **Centennial** to conduct post-mining surveys following the development of subsidence (majority of subsidence developed when LW is completed or LW face is 800m past feature). • **Centennial** to provide pre and post mining subsidence monitoring results to Ausgrid, RR and SANSW.	**LEVEL 1 – LOW** **Operations within prediction and approved impact** • Development of subsidence and impact as expected. • Subsidence within predicted range (Upper 95% CL). • No noticeable impact to the surface or powerline network. • Damage powerlines unlikely.	• **Centennial** to conduct post mining inspection and subsidence monitoring and provide results to the Ausgrid, RR and SA NSW**.**
	LEVEL 2 – MEDIUM **Operations within approved impact but exceed or potentially exceed predictions** • Development of subsidence exceeding or potentially exceeding prediction (greater than Upper 95% CL). • Minor impact to powerline network • No immediate mitigation / remediation works on poles, insulators and conductors is considered necessary.	• **Centennial** to inspect powerlines. • **Centennial** to notify **Ausgrid** and **RR** of increased subsidence and any observed impact to powerline network. • **Ausgrid** to conduct inspection and investigate the impact of increased subsidence on powerline network. • **Ausgrid** to conduct repairs if considered necessary. • **Centennial** to advise **SA NSW** of potential repairs. • **Centennial** to review results and predictions as per Extraction Plan LW30-31.
	LEVEL 3 – HIGH **Operations exceed approved impact** • Development of subsidence and impact greater than expected. • Damage to powerline network that causes loss or potential loss of service.	• **Centennial** to immediately advise **Ausgrid** of observed damage to the powerline network. • **Ausgrid Emergency Service -** 1800 627 005 • **Ausgrid** to inspect any damage to powerline network and arrange repairs. • **Centennial** to promptly notify **RR** and **SA NSW** of increased subsidence and observed impact to powerlines. • **Centennial** to conduct post mining inspection and subsidence monitoring and provide results to **Ausgrid, RR** and the **SANSW.** • **Centennial** to review results and predictions as per Extraction Plan LW30-31. • **Centennial** to notify external stakeholders and government agencies in accordance with **Incident Reporting** requirements DC S6 Condition 10 and WHS Regulations.

Appendix 2 Key Personnel List

Mandalong Mine	Contact	Phone No.	Mobile No.	Email
Mining Approvals Coordinator	Phil Enright	49730948	0439 409 781	phil.enright@centennialcoal.com.au
Subsidence Surveyor	Mark Harrower	49730955	0447 234 185	mark.harrower@centennialcoal.com.au
Technical Service Superintendent	Brendan Newham	49730951	0438 401 275	brendan.newham@centennialcoal.com.au
Environmental Coordinator	Jeff Dunwoodie	49730947	0448 490 023	jeffrey.dunwoodie@centennialcoal.com.au
Logistics Coordinator (Emergency Order No.)	Amy Hancock	49730939	0414 713 711	amy.hancock@centennialcoal.com.au
Control Room (24hr)	Control Room Operators	49730901 or 49730902	0428 247 788	mandalong.control@centennialcoal.com.au
SA NSW				
Emergency Service	24hr Emergency Service	1800 248 083		
Ausgrid				
Emergency Service	24 hr Emergency Service	1800 627 005		
Network Services	Tony Daley	49519287	0439611172	tdaley@ausgrid.com.au
Civil Earth Works				
Barrie Toepfer Earthmoving - Manager	Barrie Toepfer	43571216	0407783 791	

Appendix 3 Inspection Check List

SUBSIDENCE INSPECTION CHECKLIST	
Date & Time	
Longwall Number	
Face Position (chainage)	
Road or Area Inspected	
Inspected by:	
Inspection Zone (Face chainage - 500m) to (Face chainage +100m)	

INSPECTION ITEM	CHECKED	COMMENTS
Surface cracking		
Surface humps (compression)		
Step change in road pavement		
Damage to roadside drainage channels		
Warning Signage		
Powerline – poles, insulators, conductors, reduced conductor clearance.		
Rock mass stability		
Dams		
Other		

SUBSIDENCE INSPECTION CHECKLIST

Where to Inspect

500 metres behind and 100 metres in front of the current face position.

Cover the full subsidence bowl out to the 26.5° angle of draw.

What to look for

- Surface cracking - edges of extraction void and travelling abutments particularly in rock outcrop areas.
- Surface humps (compression) - near centre of extracted panels and travelling abutment
- Step change in land surface - associated with cracking
- Serviceability of the road and drainage devices
- Damage to poles, insulators or conductors
- Increase or decrease in conductor tension
- Reduced conductor clearance
- Rock mass stability – boulders and cuttings.
- Any effect that may cause a safety risk to road users. – If unsure report immediately.

Actions if there is damage to infrastructure or surface

Immediately notify the:

- Mine Manager
- Mining Approvals Coordinator
- Subsidence Surveyor
- Lake Macquarie City Council – Emergency Response phone number
- Subsidence Advisory NSW – Emergency Service phone number
- Ausgrid - Emergency Service phone number

If road repairs or remediation work is required these will be undertaken by LMCC or by their approved contractor.

Appendix 4 Correspondence

Mandalong Mine Extraction Plan LW 30-33 - Ausgrid Powerlines

Phil Enright to: tdaley 28/10/2020 10:33 AM
Cc: joswald

Hi Tony,

Mandalong Mine is currently preparing a mining application for the extraction of Longwalls 30-33, similar the previous application for LW25-31.

Correspondence was provided to Ausgrid earlier in the year regarding Modification 9 to the Mine's development consent SSD-5144 to re-orientate Longwalls 30-33 due to geological and operation requirements.

The proposed Extraction Plan for LW30-33 will affect 14 power poles off Binalong Way, Mandalong as shown on the attached plan MG14221. The line is a continuation of the powerline currently being undermined by LW25-29 and managed by the Powerline Management Plan LW25-31.

As part of the mining application for Extraction Plan LW30-33, a Powerline Management Plan is now required for to manage the impacts of subsidence on the Ausgrid network.

An extract of the subsidence assessment for Modification 9, relating the predicted subsidence on the power poles is provided for your review and consideration of any necessary mitigation and monitoring.

It would be appreciated if you could assist in the preparation of the management plan.

Mining will commence in Longwall 30 during June 2021 and be completed by December 2022 following the extraction of Longwall 33.

Mining beneath the first section of the powerline located over Longwall 30 is scheduled to commence by August 2021.

If you have any questions or require further information please don't hesitate to contact me.

MG14221.pdf Ausgrid Powerlines - Pages from DgS Report MAN-005-1 (Extraction Plan LW30-33)18.08.20.pdf

1900103780 - SO 236016913 - Mandalong Mine Extraction Plan LW30-33 - Ausgrid PowerlinesTony Daley to: Phil Enright 10/12/2020 03:37 PM
Cc: "John Oswald"
From: "Tony Daley" <tdaley@ausgrid.com.au>
To: "Phil Enright" <phil.enright@centennialcoal.com.au>
Cc: "John Oswald" <joswald@ausgrid.com.au>
History:
This message has been replied to and forwarded.

1 Attachment

1900103780 - 236016913 - Short Form Contract.pdf

Phil

As discussed, we will need to model the existing overhead lines and install line rollers etc during the period of subsidence.

Please refer to the attached short form contract to model the overhead lines and produce a design. Once the design is completed, we will be able to provide a quote to carry out works that will minimise the impact of subsidence to our assets.

If you have any questions, please let me know.

Regards

Tony Daley
Engineering Officer – Design Newcastle
Engineering – Asset Management

Ausgrid Connecting communities, empowering lives

Ph. 02 4951 9287
Bldg. 3 Wallsend Depot – 78 Abbott st, Wallsend 2287
tdaley@ausgrid.com.au

From: Phil Enright <phil.enright@centennialcoal.com.au>
Sent: Wednesday, 28 October 2020 10:33 AM
To: Tony Daley <tdaley@ausgrid.com.au>
Cc: John Oswald <joswald@ausgrid.com.au>
Subject: Mandalong Mine Extraction Plan LW30-33 - Ausgrid Powerlines

Hi Tony,

Mandalong Mine is currently preparing a mining application for the extraction of Longwalls 30-33, similar the previous application for LW25-31.

Correspondence was provided to Ausgrid earlier in the year regarding Modification 9 to the Mine's development consent SSD-5144 to re-orientate Longwalls 30-33 due to geological and operation requirements.

The proposed Extraction Plan for LW30-33 will affect 14 power poles off Binalong Way, Mandalong as shown on the attached plan MG14221. The line is a continuation of the powerline currently being undermined by LW25-29 and managed by the Powerline Management Plan LW25-31.

As part of the mining application for Extraction Plan LW30-33, a Powerline Management Plan is now required for to manage the impacts of subsidence on the Ausgrid network.

An extract of the subsidence assessment for Modification 9, relating the predicted subsidence on the power poles is provided for your review and consideration of any necessary mitigation and monitoring.

It would be appreciated if you could assist in the preparation of the management plan.

Mining will commence in Longwall 30 during June 2021 and be completed by December 2022 following the extraction of Longwall 33.

Mining beneath the first section of the powerline located over Longwall 30 is scheduled to commence by August 2021.

If you have any questions or require further information please don't hesitate to contact me.

Regards

Phil Enright
Mining Approvals Coordinator

p: +61 (0) 2 4973 0948 | f: +61 (0) 2 4973 0999 | m: +61 (0) 439 409 781 | Internal: 3948

Centennial Coal Company Limited | Mandalong
12 Kerry Anderson Drive, Mandalong NSW 2264 Australia
centennialcoal.com.au

Re: 1900103780 - SO 236016913 - Mandalong Mine Extraction Plan LW30-33 - Ausgrid Powerlines

Phil Enright to: Tony Daley 15/12/2020 09:50 AM

Cc: "John Oswald"

Hi Tony,

Please find attached the signed short form contract for the subsidence mitigation modelling. Purchase order ML298574/1 has been raised.

Let me know if you require any additional information.

Ausgrid Form Contract - Extraction Plan LW30-33.pdf

"Tony Daley"	Phil As discussed, we will need to model the...	10/12/2020 03:37:42 PM

Ausgrid

Ausgrid Operator Partnership
Licence No 295783C
ABN No 78 508 211 731

Short Form Contract (PART A)

SFC No. 236016913
Date: 10/12/2020

1.	**Customer Quotation** Dear Customer, we are pleased to give you this offer and quotation to do the works as detailed below. These works are subject to price regulation by the Australian Energy Regulator. Part A of the offer and quotation gives details and describes the works. Part B sets out the terms under which we will do the works. You can accept this offer at any time for the next 30 days, but until we receive your acceptance, neither of us is under any obligation. **To accept, please complete and sign Part A where indicated, and return it to us.** Ausgrid has collected your business contact details for dealing with you in your business capacity. We may pass your personal details to contractors for the purpose of completing the works and in order to conduct credit checks. More information about how we handle your personal information, including your right of access is contained at **www.ausgrid.com.au**			
2.	**Price before GST**	**$4,028.20**	**Total GST payable**	**Total charges (includes GST)**
	Taxable	**$4,028.20**	**$402.80**	**$4,431.00**
	Non Taxable	**$0.00**		
	Cancellation Fees (If works cancelled or rescheduled)		**1 - 20 Business Days**	**On the day**
3.	**Works**	Engineering Support - Ausgrid to carry out assessment of Powerline Management Plan Longwalls 30 to 33. Ausgrid to model existing overhead network and produce design for the installation of overhead rollers and removal of stay wires to reduce impact of mine subsidence on Ausgrids assets.		
4.	**Commencement Date**	Date to be confirmed.		
5.	**Completion Date**	Date to be confirmed.		
6.	**Site**	Mandalong Road Mandalong		
7.	**Utilities and services you must provide**			

ACCEPTANCE – To be completed by Customer

I / We (PLEASE PRINT)

Individual (non-business customer)

First Name:	Last Name:	Date of Birth:
Postal Address:		Post Code:
Telephone no:	Email:	

Company (Business customer)

Contact (Full Name): RICHARD GELSON		Company: CENTENNIAL MANDALONG PTY LTD	
ABN no: 74101508892		ACN no: 101508892	
Postal Address: PO BOX 1000 TORONTO NSW			Post Code: 2283
Telephone no. 49 730 911	Email: richard.gelson@centennialcoal.com.au		
Purchase order no. (if used):		Existing Customer - Provide Account No. (If known):	

hereby accept all the terms in this contract and authorise *Ausgrid* to complete the works described in Part A. I / We the financially responsible party, agree to pay for the works and acknowledge Part B, section 6.

Signature: [signature] **Date:** 10/12/2020

To be completed by Ausgrid

SIGNED for and on behalf of Ausgrid by

Tony Daley (Full Name) [signature] (Signature)

10/12/2020 (Date)

Responsible Officer

Tony Daley

0439 611172

tdaley@ausgrid.com.au

Code	Centre no.	Internal Order no.	Price before GST $	GST $
	1824	**236016913**	**$4,028.20**	**$402.80**

Receipt no.

Account no. | Sales Order no.

(PART B) Contract Terms and Conditions

1. Definitions:

additional rental charge	see Part A item 2 and Part B item 6(1).
additional rental period	see Part B item 6(1);
Ausgrid, we, our or us	Ausgrid Operator Partnership (ABN 78 508 211 731), trading as Ausgrid, a partnership carried on under that name by: (a) Blue Op Partner Pty Ltd (ACN 615 217 500) as trustee for the Blue Op Partner Trust; (b) ERIC Alpha Operator Corporation 1 Pty Ltd (ACN 612 975 096) as trustee for ERIC Alpha Operator Trust 1; (c) ERIC Alpha Operator Corporation 2 Pty Ltd (ACN 612 975 121) as trustee for ERIC Alpha Operator Trust 2; (d) ERIC Alpha Operator Corporation 3 Pty Ltd (ACN 612 975 185) as trustee for ERIC Alpha Operator Trust 3; and (e) ERIC Alpha Operator Corporation 4 Pty Ltd (ACN 612 975 210) as trustee for ERIC Alpha Operator Trust 4;
GST	has the meaning defined in the "A New Tax System (Goods and Services Tax) Act 1999";
taxable	relates to supplies where GST is payable;
non taxable	relates to supplies where no GST is payable;
completion	the works are completed when they are reasonably capable of being used for their intended purpose;
commencement date	the day set out in Part A item 4;
completion date	the later of (a) the last day of the period set out in Part A item 5; (b) the day set out in a modification notice we give you (see clause 4(2); or (c) the day agreed by the parties under clause 5(1);
connection policy	means the document published by Ausgrid and approved by the Australian Energy Regulator entitled 'Connection Policy – Connection Charges';
contract date	the date this contract has been signed by both parties;
included rental period	the period for which any Ausgrid equipment may be used by the customer before the additional monthly rental charge becomes payable, as set out in Part A item 3.
interest rate	an annual rate of 2% above the rate applicable to 90 day bank bills as published on the due date in the Australian Financial Review;
modification notice	see Part B item 4(2);
site	the place identified in Part A item 6;
works	the works described in Part A item 3;
you or your	the customer, to whom this offer and quotation is addressed.

2. We must do the works

We must do the works using reasonable care and skill.

3. What you have to do so that we can do the works

You must:

- **[Upfront payment]** If upfront payment is required under clause 6(2), you must make the payment, inform the Ausgrid contact whose contact details appear on page 1 of this contract that payment has been made and provide the short form contract reference number. Works will only commence after we have verified that payment has been made.
- **[Information]** as soon as you can after the date of this contract, give us all the information, documents, and other material you have or have under your control relevant to the works; and
- answer any questions we or our workers have about the works; and
- **[Access]** see to it that we have enough access to the site to do the works; and
- **[Services and utilities]** ensure that the services and utilities identified in Part A item 7 are available at the site for us and our workers to use.

In an emergency, you can do whatever is necessary to protect the works and the site.

4. Delays to commencement date or during the carrying out of the works

(1) **[New quotation]** If the commencement date is delayed by 2 weeks or longer and that delay is caused by your breach of this contract then we can submit a new quotation to complete the works.

(2) **[We tell you about expected delays]** We must give you written notice (**modification notice**) of any breach of this contract by you during the carrying out of the works that does or, we reasonably expect, will, delay us in carrying out our obligations under this contract. The notice must set out:

- the cause of the delay (as far as we know it); and
- how long we expect the delay to last; and
- the new day for completion

and may also include any action we recommend you take to minimise the effect of the delay.

(3) **[Obligations to pay not affected]** This clause 4 does not affect your obligations to pay us.

5. Completion

(1) **[How the completion date changes]** The completion date can change as follows:

- it is changed to the day specified in a modification notice from us (see clause 4(2)); or
- we and you agree on a new completion date.

(2) **[Completion]** We must complete the works by the completion date.

6. The price

(1) **[Payment]** You must pay all charges for works under this contract at the earlier of the completion of the works or the due date of the invoice, unless upfront payment is required under clause 6(2) below. If an additional monthly rental charge for equipment we rent to you is included in Part A item 2, you must pay it for each month or part thereof from the end of the included rental period until the date you give us notice in accordance with item 10 of this contract that the rented equipment is no longer required (**additional rental period**). We will invoice you for additional monthly rental charges monthly. Interest may be charged on amounts outstanding after the due date of an invoice. Payment advices are to be emailed to ausgrideft@ausgrid.com.au.

(2) **[Upfront payment]** You must pay us upfront:

- in all cases, for any torapoli works set out in Part A; and/or
- if we consider it necessary after conducting a credit check on you, for all works under this contract.

Your Ausgrid contact will inform you if upfront payment is required. Upfront payment must be made by electronic funds transfer to the following Ausgrid bank account: **BSB: 062 000 Account No: 12 986 213** and must quote the short form contract reference number on page 1 of this contract as payee reference.

(3) **[How prices can change]** The amount of total charges under this contract can change as follows after the contract date:

- any change after the contract date in taxes, duties or levies (whatever they may be called) (but not GST or tax on our income) that we must pay in respect of this contract may result in a change to prices;
- the reasonable costs to us of any delay specified in a modification notice to you and caused by your breach of this contract will be added to the price;
- the total charges will be the prices before GST plus the amount of any GST payable on supplies made from 1 July 2000.

(3) **[How we must charge]** We must calculate all charges under this contract in accordance with the connection policy.

(4) **[Other rights]** This clause 6 does not affect any other right we have under another contract with you (for example, a right to disconnect the site from the electricity supply or to stop supplying electricity to the site).

(5) **[Credit check]** You consent to us collecting credit-related information about you directly from you and from publicly available sources, credit reporting bodies, credit providers, banks, and other third parties. We will collect, use and disclose credit-related information about you to consider whether to provide you with credit and for other incidental purposes. You consent to our disclosure of credit-related information about you to the same parties for these purposes. We will use, disclose and manage your credit-related information in accordance with our privacy policy [and credit reporting policy] which are available at ausgrid.com.au.

7. You must warn of defects

You must take reasonable steps to prevent anyone using a part of the works that you know, or that a reasonable person in your position would know, is defective, unsafe or out of repair so as to threaten the safety of a person using it.

8. Indemnities and liabilities

(1) **[You indemnify us]** You must indemnify us against loss, damage and claims in respect of:

- damage to real or personal property, or injury to or death of a person, arising in respect of the works or the use of the site; and
- physical conditions on the site suffered by us that affect the performance of our obligations under this contract.

However, the amount of the indemnity is to be reduced to reflect the extent to which we caused or contributed to the loss or damage concerned (it can be reduced to zero).

(2) **[We indemnify you]** We must indemnify you against loss, damage and claims in respect of damage to real or personal property, or injury to, or death of, a person, arising in respect of the works or our use of the site. However, the amount of the indemnity is to be reduced to reflect the extent to which you or your workers and agents, and visitors to the site, caused or contributed to the loss or damage concerned (it can be reduced to zero).

(3) **[Exclusion of liability]** Despite the other provisions of this contract, we are not liable for any loss or damage:

- to the physical condition of the site that occurs because of carrying out the works in accordance with this contract; or
- that you suffer because of a shutdown of electricity supply that we reasonably think is necessary to carry out the works.

(4) **[Liability cap]** The most we will ever have to pay in respect of this contract is the sum of the contract price set out in Part A item 2 (disregarding adjustments) plus amounts we actually receive from an insurer in respect of our liability for the loss concerned.

9. Resolving disputes

Each of us must do our best to resolve any dispute in relation to this contract by negotiation in good faith.

10. Giving notices

Except where this contract makes different provision, the only way to give a notice under this contract is in writing to the respective party. A notice to a party is to be sent to the party at its address, or the most recent postal or email address the other party has for it. We can assume that you received a notice on the day after it was sent, as long as it is sent in accordance with these procedures. We can assume that a notice that appears to come from you does so. Notices to Ausgrid should be in writing and addressed to your Ausgrid business contact.

RE: 1900103780 - SO 236016913 - Mandalong Mine Extraction Plan LW30-33 - Ausgrid PowerlinesTony Daley to: Phil Enright 04/02/2021 08:30 AM
Cc: "John Oswald"
From: "Tony Daley" <tdaley@ausgrid.com.au>
To: "Phil Enright" <phil.enright@centennialcoal.com.au>
Cc: "John Oswald" <joswald@ausgrid.com.au>
History:This message has been replied to.

Phil

We have done the assessment and now just waiting on an estimate to carry out the minor changes to the network needed. Should be in the next few weeks I can issue a short form contract to you for the construction works.

If you have any questions, please let me know.

Regards

Tony Daley
Engineering Officer – Design Newcastle
Engineering – Asset Management

Ausgrid Connecting communities, empowering lives

Ph. 02 4951 9287
Bldg. 3 Wallsend Depot – 78 Abbott st, Wallsend 2287
tdaley@ausgrid.com.au

From: Phil Enright <phil.enright@centennialcoal.com.au>
Sent: Tuesday, 2 February 2021 4:36 PM
To: Tony Daley <tdaley@ausgrid.com.au>
Cc: John Oswald <joswald@ausgrid.com.au>
Subject: Fw: 1900103780 - SO 236016913 - Mandalong Mine Extraction Plan LW30-33 - Ausgrid Powerlines

Hi Tony,

Just following up to see how the modelling for the subsidence mitigation works is progressing.

Please let me know if require any further information or have any questions.

Regards

Phil Enright
Mining Approvals Coordinator

p: +61 (0) 2 4973 0948 | f: +61 (0) 2 4973 0999 | m: +61 (0) 439 409 781 | Internal: 3948

CENTENNIAL

Centennial Coal Company Pty Limited | Mandalong
12 Kerry Anderson Drive, Mandalong NSW 2264 Australia
centennialcoal.com.au

Mandalong Mine Powerline Management Plan LW 30-31

Phil Enright to: tdaley 12/02/2021 10:34 AM
Cc: joswald

Hi Tony,

I have prepared a draft Powerline Management Plan for the extraction of Longwalls 30 and 31, noting that mitigation works are required.

The document is based on the current Powerline Management Plan for LW25-31.

It would be appreciated if you could review the document.

I've highlighted a couple of sections regarding the requirement for laser scanning and Ausgrid Lidar survey. Does Ausgrid still require these?

As always, timing is tight for us and it would be appreciated if you could review in the next week or two.

If you have any questions or need further information, don't hesitate to give me a call.

RE: 1900103780 - Mandalong Mine Powerline Management Plan LW 30-31

Phil Enright to: Tony Daley 24/02/2021 02:36 PM
Cc: "Andrew Rodway", "John Oswald"

Tony,

Mine workings in AutoCad format.

If you need a dxf file, I can send via Dropbox due file size (51MB).

Mandalong Mine Workings 23102020.dwg

"Tony Daley" Phil Are you able to provide a Cad file with th... 24/02/2021 02:30:10 PM

From: "Tony Daley" <tdaley@ausgrid.com.au>
To: "Phil Enright" <phil.enright@centennialcoal.com.au>
Cc: "Andrew Rodway" <arodway@ausgrid.com.au>, "John Oswald" <joswald@ausgrid.com.au>
Date: 24/02/2021 02:30 PM
Subject: RE: 1900103780 - Mandalong Mine Powerline Management Plan LW30-31

Phil

Are you able to provide a Cad file with the actual location of the long walls?

If you have any questions, please contact me to discuss.

Regards

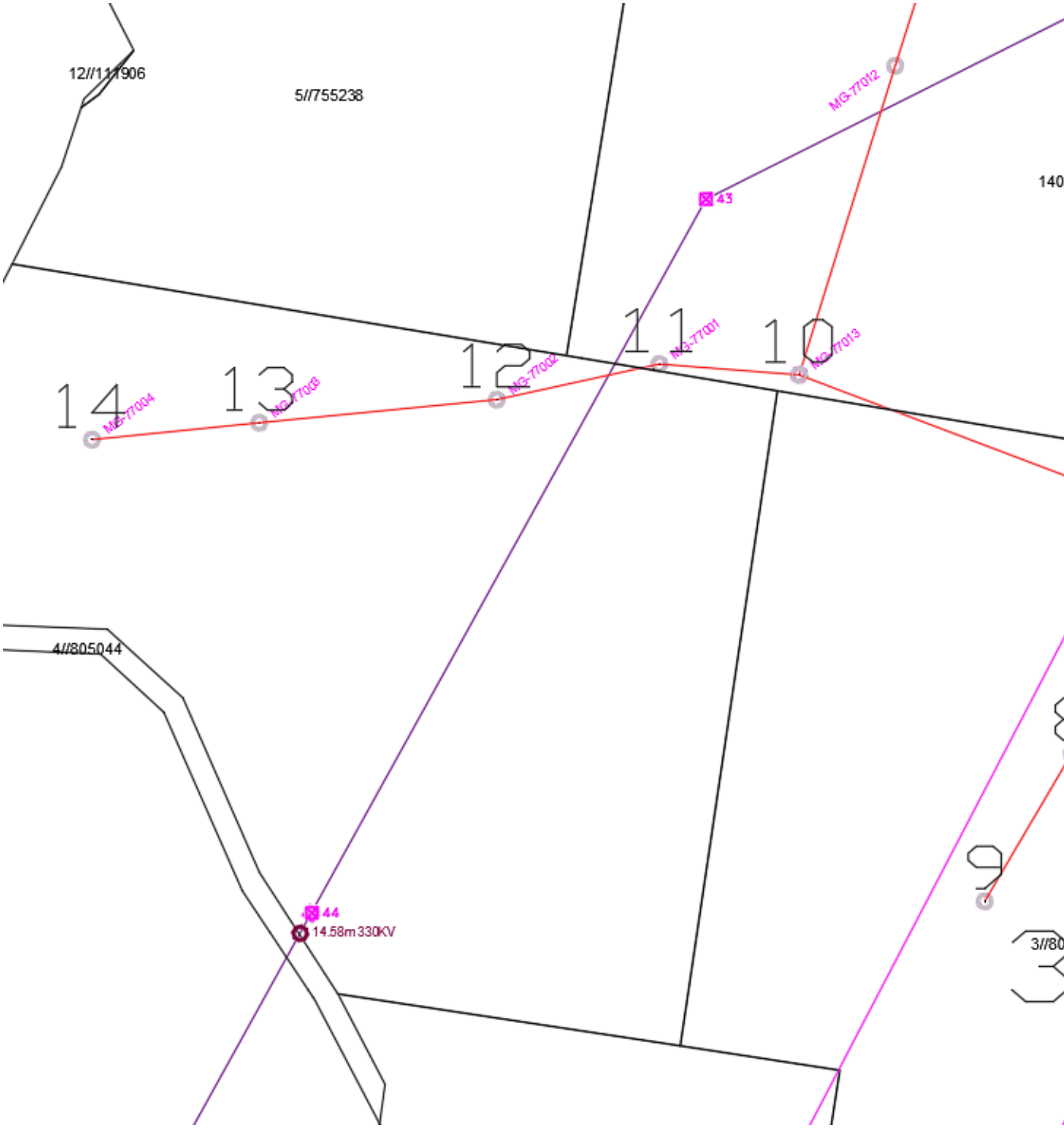
Tony Daley
Engineering Officer – Design Newcastle
Engineering – Asset Management
Ausgrid Connecting communities, empowering lives
Ph. 02 4951 9287
Bldg. 3 Wallsend Depot – 78 Abbott st, Wallsend 2287
tdaley@ausgrid.com.au

From: Phil Enright <phil.enright@centennialcoal.com.au>
Sent: Wednesday, 24 February 2021 12:19 PM
To: Tony Daley <tdaley@ausgrid.com.au>
Cc: Andrew Rodway <arodway@ausgrid.com.au>; John Oswald <joswald@ausgrid.com.au>
Subject: Re: 1900103780 - Mandalong Mine Powerline Management Plan LW30-31

Hi Tony,

Further to the information provided to your questions, attached is a figure showing the pole numbers in relation to Ausgrid numbering.

If you could confirm the Ausgrid pole numbers are correct, I will include them an additional column in Table 10 in the management plan.



From: "Tony Daley" <tdaley@ausgrid.com.au>

To: "Phil Enright" <phil.enright@centennialcoal.com.au>

Cc: "John Oswald" <joswald@ausgrid.com.au>, "Andrew Rodway" <arodway@ausgrid.com.au>
Date: 22/02/2021 02:45 PM
Subject: 1900103780 - Mandalong Mine Powerline Management Plan LW30-31

Phil

Could you please provide a diagram that clearly shows the poles and how you have numbered them . I cannot make out any pole number to the right of pole 10.

I am trying to work out where your pole 4 is as this has a predicted subsidence of 1.2 metres. Is this pole MG77015.

Also what is the difference in table 10 between Extraction Plan and Mod 9?

If you have any questions, please contact me to discuss.

Regards

Tony Daley
Engineering Officer – Design Newcastle
Engineering – Asset Management
Ausgrid Connecting communities, empowering lives
Ph. 02 4951 9287
Bldg. 3 Wallsend Depot – 78 Abbott st, Wallsend 2287
tdaley@ausgrid.com.au

From: Phil Enright <phil.enright@centennialcoal.com.au>
Sent: Friday, 12 February 2021 12:28 PM
To: Tony Daley <tdaley@ausgrid.com.au>
Cc: John Oswald <joswald@ausgrid.com.au>
Subject: Fw: Mandalong Mine Powerline Management Plan LW30-31

Tony

Please see attachment left off the previous email.

Regards

Phil Enright
Mining Approvals Coordinator

p: +61 (0) 2 4973 0948 | f: +61 (0) 2 4973 0999 | m: +61 (0) 439 409 781 | Internal: 3948

RE: Mandalong Powerline Management Plan LW30-31 for reviewTony Daley to: Phil Enright 22/03/2021 09:38 AM
Cc: "John Oswald"
From: "Tony Daley" <tdaley@ausgrid.com.au>
To: "Phil Enright" <phil.enright@centennialcoal.com.au>
Cc: "John Oswald" <joswald@ausgrid.com.au>
History:This message has been replied to.

Phil

I am happy with the content of the Powerline Management Plan LW30-31, date 19/3/21.

As discussed, we have not received any of the 3D scanning images from previous long walls to review. Could you please follow this up?

If you have any questions, please contact me to discuss.

Regards

Tony Daley
Engineering Officer – Design Newcastle
Engineering – Asset Management

Ausgrid Connecting communities, empowering lives

Ph. 02 4951 9287
Bldg. 3 Wallsend Depot – 78 Abbott st, Wallsend 2287
tdaley@ausgrid.com.au

From: Phil Enright <phil.enright@centennialcoal.com.au>
Sent: Friday, 19 March 2021 12:23 PM
To: Tony Daley <tdaley@ausgrid.com.au>
Cc: John Oswald <joswald@ausgrid.com.au>
Subject: Mandalong Powerline Management Plan LW30-31 for review

Hi Tony,

Please find attached the draft Powerline Management Plan prepared for the LW30-31 Extraction Plan.

It would be appreciated if you could review the management plan and provide any comments or confirm that Ausgrid is satisfied that the plan will manage the impact of subsidence following the completion of mitigation works on the Ausgrid network.

If you have any questions, please don't hesitate to give me a call.

Regards

Phil Enright
Mining Approvals Coordinator

p: +61 (0) 2 4973 0948 | f: +61 (0) 2 4973 0999 | m: +61 (0) 439 409 781 | Internal: 3948

CENTENNIAL

Centennial Coal Company Pty Limited | Mandalong
12 Kerry Anderson Drive, Mandalong NSW 2264 Australia
centennialcoal.com.au

1900103780 - SO 236016913 - Mandalong Mine Powerline Management Plan LW30-31Tony Daley to: Phil Enright 23/03/2021 04:49 PM
From: "Tony Daley" <tdaley@ausgrid.com.au>
To: "Phil Enright" <phil.enright@centennialcoal.com.au>

2 Attachments

1900103780 - Design (Mandalong Mine).pdf 1900103780 - Short Form Contract_For construction.pdf

Phil

Ausgrid has carried out an assessment of the works required for preparing our network for possible mine subsidence for LW30-31. I have attached a copy for your record.

The short form contract attached is the cost to construct these works. If you wish to proceed, please have this signed and returned.

If you have any questions, please contact me to discuss.

Regards

Tony Daley
Engineering Officer – Design Newcastle
Engineering – Asset Management

Ausgrid Connecting communities, empowering lives

Ph. 02 4951 9287
Bldg. 3 Wallsend Depot – 78 Abbott st, Wallsend 2287
tdaley@ausgrid.com.au

Ausgrid

Ausgrid Operator Partnership
Licence No 295783C
ABN No 78 508 211 731

Short Form Contract (PART A)

SFC No. 236016913_A
Date: 23/03/2021

1.	**Customer Quotation** Dear Customer, we are pleased to give you this offer and quotation to do the works as detailed below. These works are subject to price regulation by the Australian Energy Regulator. Part A of the offer and quotation gives details and describes the works. Part B sets out the terms under which we will do the works. You can accept this offer at any time for the next 30 days, but until we receive your acceptance, neither of us is under any obligation. **To accept, please complete and sign Part A where indicated, and return it to us.** Ausgrid has collected your business contact details for dealing with you in your business capacity. We may pass your personal details to contractors for the purpose of completing the works and in order to conduct credit checks. More information about how we handle your personal information, including your right of access is contained at **www.ausgrid.com.au**			
2.	**Price before GST**	**$32,546.16**	**Total GST payable**	**Total charges (includes GST)**
	Taxable	**$32,546.16**	**$3,254.62**	**$35,800.78**
	Non Taxable	**$0.00**		
	Additional overtime rate (if applicable)		**Per hour (GST)**	**Per hour (Includes GST)**
3.	**Works**	Ausgrid to carry out works to modify overhead network to ensure network security as a result of possible mine subsidence for long walls 30 - 31. Refer to design 1900103780.		
4.	**Commencement Date**	TBA		
5.	**Completion Date**	TBA		
6.	**Site**	Mandalong Road Mandalong		
7.	**Utilities and services you must provide**			

ACCEPTANCE – To be completed by Customer

I / We (PLEASE PRINT)

Individual (non-business customer)

First Name:	Last Name:	Date of Birth:
Postal Address:		Post Code:
Telephone no:	Email:	

Company (Business customer)

Contact (Full Name):	Company:	
ABN no:	ACN no:	
Postal Address:		Post Code:
Telephone no.	Email:	
Purchase order no. (if used):	Existing Customer - Provide Account No. (If known):	

hereby accept all the terms in this contract and authorise *Ausgrid* to complete the works described in Part A. I / We the financially responsible party, agree to pay for the works and acknowledge Part B, section 6.

Signature: **Date:**

To be completed by Ausgrid

SIGNED for and on behalf of Ausgrid by

Tony Daley
(Full Name)

(Signature)

23/03/2021
(Date)

Responsible Officer

Tony Daley

0439 611172

tdaley@ausgrid.com.au

Code	Centre no.	Internal Order no.	Price before GST $	GST $
	1824	**236016913**	**$32,546.16**	**$3,254.62**

Receipt no.

Account no. | Sales Order no.

(PART B) Contract Terms and Conditions

1. Definitions:

additional rental charge	see Part A item 2 and Part B item 6(1).
additional rental period	see Part B item 6(1);
Ausgrid, we, our or us	Ausgrid Operator Partnership (ABN 78 508 211 731), trading as Ausgrid, a partnership carried on under that name by: (a) Blue Op Partner Pty Ltd (ACN 615 217 500) as trustee for the Blue Op Partner Trust; (b) ERIC Alpha Operator Corporation 1 Pty Ltd (ACN 612 975 096) as trustee for ERIC Alpha Operator Trust 1; (c) ERIC Alpha Operator Corporation 2 Pty Ltd (ACN 612 975 121) as trustee for ERIC Alpha Operator Trust 2; (d) ERIC Alpha Operator Corporation 3 Pty Ltd (ACN 612 975 185) as trustee for ERIC Alpha Operator Trust 3; and (e) ERIC Alpha Operator Corporation 4 Pty Ltd (ACN 612 975 210) as trustee for ERIC Alpha Operator Trust 4;
GST	has the meaning defined in the "A New Tax System (Goods and Services Tax) Act 1999";
taxable	relates to supplies where GST is payable;
non taxable	relates to supplies where no GST is payable;
completion	the works are completed when they are reasonably capable of being used for their intended purpose;
commencement date	the day set out in Part A item 4;
completion date	the later of (a) the last day of the period set out in Part A item 5; (b) the day set out in a modification notice we give you (see clause 4(2); or (c) the day agreed by the parties under clause 5(1);
connection policy	means the document published by Ausgrid and approved by the Australian Energy Regulator entitled 'Connection Policy – Connection Charges';
contract date	the date this contract has been signed by both parties;
included rental period	the period for which any Ausgrid equipment may be used by the customer before the additional monthly rental charge becomes payable, as set out in Part A item 3.
interest rate	an annual rate of 2% above the rate applicable to 90 day bank bills as published on the due date in the Australian Financial Review;
modification notice	see Part B item 4(2);
site	the place identified in Part A item 6;
works	the works described in Part A item 3;
you or your	the customer, to whom this offer and quotation is addressed.

2. We must do the works

We must do the works using reasonable care and skill.

3. What you have to do so that we can do the works

You must:

- [**Upfront payment**] If upfront payment is required under clause 6(2), you must make the payment, inform the Ausgrid contact whose contact details appear on page 1 of this contract that payment has been made and provide the short form contract reference number. Works will only commence after we have verified that payment has been made.
- **[Information]** as soon as you can after the date of this contract, give us all the information, documents, and other material you have or have under your control relevant to the works; and
- answer any questions we or our workers have about the works; and
- **[Access]** see to it that we have enough access to the site to do the works; and
- **[Services and utilities]** ensure that the services and utilities identified in Part A item 7 are available at the site for us and our workers to use.

In an emergency, you can do whatever is necessary to protect the works and the site.

4. Delays to commencement date or during the carrying out of the works

(1) **[New quotation]** If the commencement date is delayed by 2 weeks or longer and that delay is caused by your breach of this contract then we can submit a new quotation to complete the works.

(2) **[We tell you about expected delays]** We must give you written notice (**modification notice**) of any breach of this contract by you during the carrying out of the works that does or, we reasonably expect, will, delay us in carrying out our obligations under this contract. The notice must set out:

- the cause of the delay (as far as we know it); and
- how long we expect the delay to last; and
- the new day for completion

and may also include any action we recommend you take to minimise the effect of the delay.

(3) **[Obligations to pay not affected]** This clause 4 does not affect your obligations to pay us.

5. Completion

(1) **[How the completion date changes]** The completion date can change as follows:

- it is changed to the day specified in a modification notice from us (see clause 4(2)); or
- we and you agree on a new completion date.

(2) **[Completion]** We must complete the works by the completion date.

6. The price

(1) **[Payment]** You must pay all charges for works under this contract at the earlier of the completion of the works or the due date of the invoice, unless upfront payment is required under clause 6(2) below. If an additional monthly rental charge for equipment we rent to you is included in Part A item 2, you must pay it for each month or part thereof from the end of the included rental period until the date you give us notice in accordance with item 10 of this contract that the rented equipment is no longer required (**additional rental period**). We will invoice you for additional monthly rental charges monthly. Interest may be charged on amounts outstanding after the due date of an invoice. Payment advices are to be emailed to ausgrideft@ausgrid.com.au.

(2) **[Upfront payment]** You must pay us upfront:

- in all cases, for any torapoli works set out in Part A; and/or
- if we consider it necessary after conducting a credit check on you, for all works under this contract.

Your Ausgrid contact will inform you if upfront payment is required. Upfront payment must be made by electronic funds transfer to the following Ausgrid bank account: **BSB: 062 000 Account No: 12 986 213** and must quote the short form contract reference number on page 1 of this contract as payee reference.

(3) **[How prices can change]** The amount of total charges under this contract can change as follows after the contract date:

- any change after the contract date in taxes, duties or levies (whatever they may be called) (but not GST or tax on our income) that we must pay in respect of this contract may result in a change to prices;
- the reasonable costs to us of any delay specified in a modification notice to you and caused by your breach of this contract will be added to the price;
- the total charges will be the prices before GST plus the amount of any GST payable on supplies made from 1 July 2000.

(3) **[How we must charge]** We must calculate all charges under this contract in accordance with the connection policy.

(4) **[Other rights]** This clause 6 does not affect any other right we have under another contract with you (for example, a right to disconnect the site from the electricity supply or to stop supplying electricity to the site).

(5) **[Credit check]** You consent to us collecting credit-related information about you directly from you and from publicly available sources, credit reporting bodies, credit providers, banks, and other third parties. We will collect, use and disclose credit-related information about you to consider whether to provide you with credit and for other incidental purposes. You consent to our disclosure of credit-related information about you to the same parties for these purposes. We will use, disclose and manage your credit-related information in accordance with our privacy policy [and credit reporting policy] which are available at ausgrid.com.au.

7. You must warn of defects

You must take reasonable steps to prevent anyone using a part of the works that you know, or that a reasonable person in your position would know, is defective, unsafe or out of repair so as to threaten the safety of a person using it.

8. Indemnities and liabilities

(1) **[You indemnify us**] You must indemnify us against loss, damage and claims in respect of:

- damage to real or personal property, or injury to or death of a person, arising in respect of the works or the use of the site; and
- physical conditions on the site suffered by us that affect the performance of our obligations under this contract.

However, the amount of the indemnity is to be reduced to reflect the extent to which we caused or contributed to the loss or damage concerned (it can be reduced to zero).

(2) **[We indemnify you]** We must indemnify you against loss, damage and claims in respect of damage to real or personal property, or injury to, or death of, a person, arising in respect of the works or our use of the site. However, the amount of the indemnity is to be reduced to reflect the extent to which you or your workers and agents, and visitors to the site, caused or contributed to the loss or damage concerned (it can be reduced to zero).

(3) **[Exclusion of liability]** Despite the other provisions of this contract, we are not liable for any loss or damage:

- to the physical condition of the site that occurs because of carrying out the works in accordance with this contract; or
- that you suffer because of a shutdown of electricity supply that we reasonably think is necessary to carry out the works.

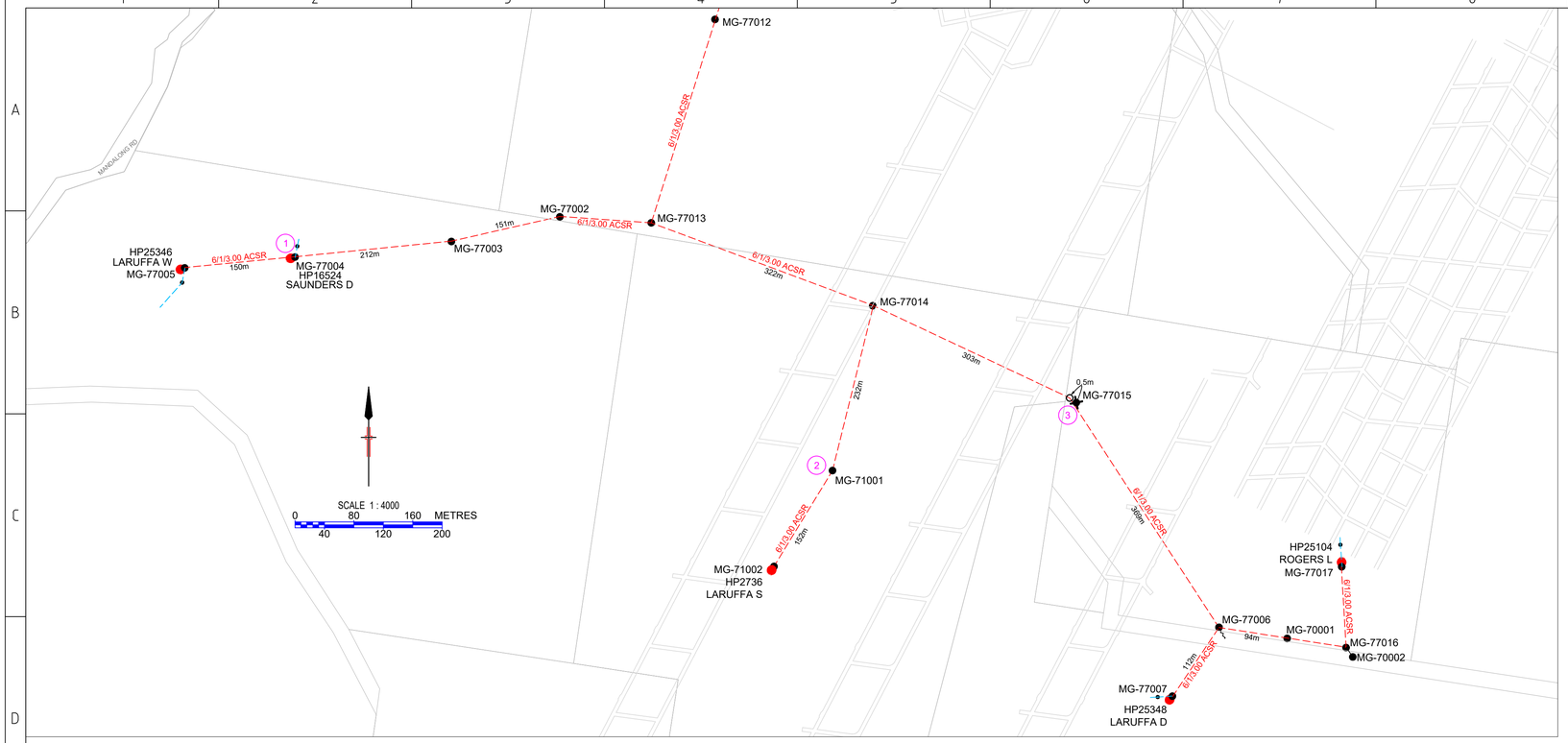
(4) **[Liability cap]** The most we will ever have to pay in respect of this contract is the sum of the contract price set out in Part A item 2 (disregarding adjustments) plus amounts we actually receive from an insurer in respect of our liability for the loss concerned.

9. Resolving disputes

Each of us must do our best to resolve any dispute in relation to this contract by negotiation in good faith.

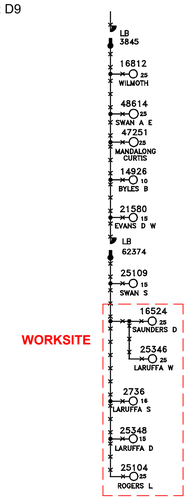
10. Giving notices

Except where this contract makes different provision, the only way to give a notice under this contract is in writing to the respective party. A notice to a party is to be sent to the party at its address, or the most recent postal or email address the other party has for it. We can assume that you received a notice on the day after it was sent, as long as it is sent in accordance with these procedures. We can assume that a notice that appears to come from you does so. Notices to Ausgrid should be in writing and addressed to your Ausgrid business contact.



SYSTEM DIAGRAM

ZONE: MORISSET
FEEDER: 80093
PAGE: 243/5
REF: D9



WORKSITE

LOCALITY PLAN

OFF MANDALONG RD, MANDALONG (NEAR CURTIS RD)
N.T.S.

AS BUILT VERIFICATION
THIS DRAWING IS THE AS BUILT COPY. ALL AMENDMENTS TO THE DESIGN, IF ANY, ARE SHOWN IN RED PEN ON THIS DRAWING.
PRINT NAME: ..... DATE: .....
SIGNED: .....
AS BUILT DRAWING APPROVED BY DESIGNER. INCLUDING ANY AMENDMENTS.
PRINT NAME: ..... DATE: .....
SIGNED: .....

NOTE:

- ROLLER TO BE USED IS UNIVERSAL, 110mm, SWL 1130Kg, 51mm MAX COND AL SHEAVE PART No. SPP-A1
- INSULATOR BRACKET TO BE USED IS 125mm MAX OD INSULATOR FLANGE, SML/MED NECK INSULATOR PART No. 1A-2A
- ROLLERS AND BRACKETS PROCURED FROM THE ENERGY NETWORK.
- THIS DESIGN CANNOT BE USED FOR CONSTRUCTION PURPOSES UNTIL THE LOCATION OF ALL EXISTING SERVICES IS VERIFIED.
- THE INFORMATION PROVIDED IN THIS DESIGN MUST BE CHECKED ON SITE AND THE MOST CURRENT INFORMATION ON THE CONFIGERATION OF ALL SERVICES, INCLUDING AUSGRID'S NETWORK, MUST BE VERIFIED IMMEDIATLEY BEFORE CONSTRUCTION COMMENCES BY CONTACTING DIAL-BEFORE-YOU-DIG BY TELEPHONE ON 1100 OR AT www.1100.com.au.
- DIAL-BEFORE-YOU-DIG INFORMATION MUST NOT BE OLDER THAN 20 BUSINESS DAYS AT THE TIME OF CONSTRUCTION.
- THIS DESIGN INCLUDES DATA FROM THE NSW DIGITAL CADASTRAL DATABASE BY LAND AND PROPERTY INFORMATION 2016, USED UNDER CREATIVE COMMONS LICENCE VERSION 4.0.
- DESAPPED DURABLE SPECIES POLES REQUIRED DUE TO BEING POSITIONED WITHIN A BUSHFIRE PRONE AREA, VEGETATION CATEGORY 1. DESAPPED POLES ARE TO BE PROCURED FROM COFFS HARBOUR HARDWOODS.
- MAINS AT POLE MG-77014 ARE IN ROLLERS AND MAY REQUIRE ALTERNATE CONSTRUCTION TECHNIQUES. ALTERNATIVELY THESE MAINS MAY NEED TO BE TIED IN DURING CONSTRUCTION AND UNTIED AT THE COMPLETION OF THE POLE REPLACEMENT.
- AUSGRID TO CONTACT MINING APPROVALS COORDINATOR, PHIL ENRIGHT PH: 4973 0948 MOBILE:0439 409 781 IN DECEMBER 2022 TO DETERMINE ONGOING NEED FOR ROLLERS. SERVICE ORDER 236016913 MUST NOT BE CLOSED OUT, AS IT COVERS THE COST OF REMOVAL OF ROLLERS AT COMPLETION OF LONGWALL MINING.

***** CHECK FOR OTHER SERVICES BEFORE BORING OR EXCAVATING *****

ALL MAINS BEING ALTERED HAVE BEEN DESIGNED TO THEIR RESPECTIVE MAXIMUM DESIGN TEMPERATURE.

MG-77005 - REF_1	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 184.09	SPAN (m): 150							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	4.04	4.1	4.16	4.22	4.29	4.35	4.41	4.46
TIME FOR 3 RETURN WAVES (Secs)	10.86	10.94	11.03	11.11	11.19	11.27	11.34	11.42
TENSION (kN)	1.18	1.16	1.15	1.13	1.11	1.10	1.08	1.07

REF_1 - MG-77003	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 184.09	SPAN (m): 212							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	8.27	8.4	8.53	8.65	8.78	8.9	9.02	9.15
TIME FOR 3 RETURN WAVES (Secs)	15.32	15.44	15.56	15.67	15.79	15.9	16.01	16.11
TENSION (kN)	1.18	1.16	1.15	1.13	1.11	1.10	1.08	1.07

MG-77003 - MG-77002	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 123.76	SPAN (m): 151							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	4.09	4.19	4.29	4.38	4.48	4.57	4.66	4.75
TIME FOR 3 RETURN WAVES (Secs)	10.88	11.01	11.14	11.26	11.38	11.5	11.61	11.72
TENSION (kN)	1.19	1.16	1.13	1.11	1.08	1.06	1.04	1.02

MG-77013 - MG-77014	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 311.13	SPAN (m): 322							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	7.05	7.26	7.46	7.67	7.87	8.07	8.27	8.47
TIME FOR 3 RETURN WAVES (Secs)	14.36	14.58	14.78	14.98	15.18	15.37	15.56	15.75
TENSION (kN)	3.08	3.00	2.91	2.83	2.76	2.69	2.63	2.57

MG-77014 - REF_3	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 311.13	SPAN (m): 302							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	6.18	6.36	6.55	6.73	6.91	7.08	7.26	7.43
TIME FOR 3 RETURN WAVES (Secs)	13.48	13.68	13.87	14.06	14.25	14.43	14.6	14.78
TENSION (kN)	3.08	3.00	2.91	2.83	2.76	2.69	2.63	2.57

REF_3 - MG-77006	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 368.1	SPAN (m): 369							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	9.53	9.74	9.94	10.15	10.35	10.55	10.75	10.94
TIME FOR 3 RETURN WAVES (Secs)	16.74	16.93	17.1	17.28	17.45	17.61	17.78	17.94
TENSION (kN)	2.99	2.92	2.86	2.81	2.75	2.70	2.65	2.60

MG-77014 - REF_2	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 193.7	SPAN (m): 232							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	8.05	8.23	8.4	8.56	8.73	8.89	9.05	9.21
TIME FOR 3 RETURN WAVES (Secs)	14.93	15.09	15.24	15.4	15.54	15.69	15.83	15.97
TENSION (kN)	1.48	1.45	1.42	1.39	1.37	1.34	1.32	1.30

REF_2 - MG-71002	VOLTS: 11kV				CONDUCTOR: 6/1/3.00 ACSR (APPLE)			
EQUIV. SPAN(m): 193.7	SPAN (m): 152							
AMBIENT TEMPERATURE (Deg C)	5 (F)	10 (F)	15 (F)	20 (F)	25 (F)	30 (F)	35 (F)	40 (F)
SAG (m)	3.34	3.41	3.48	3.55	3.62	3.69	3.76	3.82
TIME FOR 3 RETURN WAVES (Secs)	9.8	9.9	10	10.1	10.2	10.29	10.39	10.48
TENSION (kN)	1.48	1.45	1.42	1.39	1.37	1.34	1.32	1.30

Detailed plans of all utility constructions must be obtained prior to undertaking any excavations. Machine excavation must not be used in the vicinity of live electricity cables.

Only relevant construction is shown. All lengths are indicative only for the purpose of estimating and should be confirmed on site.

All work to be undertaken in accordance with all relevant Ausgrid Network Standards and the necessary safety, traffic and environmental measures.

DIAL BEFORE YOU DIG www.1100.com.au

	PROPOSED	EXISTING		PROPOSED	EXISTING		PROPOSED		EXISTING	
Pole	○	●	Pole-to be removed	✕	✕	UGOH	○ Pot End	◁	UGOH ● Pot End	◀
SL Standard	▣	▣	Underslung Link	▯▯	▯▯	Joint	⬭ Sealed End	◁	Joint ⬬ Sealed End	◀
Pillar Standard	⊘	⊘	Air Break Switch	◁	◀	Conduit				
LV Pillar	□	■	Interdistributor Tee	▯	▮		OH Lines	UG Cables	OH Lines	UG Cables
LV Link Pillar	⊠	⊠	Kiosk Sub				HV	HV		
Streetlight			Chamber Sub				LV	LV		
Streetlight-PEC			Pole Sub				SL	SL		
Streetlight-replacement			Two Pole Sub				SV	SV		
						Remove OH			Abandon UG	

DESIGN COMPLIANCE VALIDATION
THIS DESIGN HAS BEEN PREPARED IN ACCORDANCE WITH AUSGRIDS NETWORK STANDARDS. DEPARTURES FROM STANDARDS HAVE BEEN APPROVED BY AUSGRID ASSET MANAGEMENT.

OVERHEAD DETAILS

POLE												
REF	NUMBER	SIZE (m)	STRENGTH (kN)	TYPE	STATUS	FOOTING	DEPTH (m)	11 kV	DISTANCE FROM HEAD OF POLE (m)	LV	DISTANCE FROM HEAD OF POLE (m)	REMARKS
1	MG-77004				EXISTING			2-11	0.30			INSTALL NEW 125x125x2750mm FIBREGLASS CROSSARM 100mm BELOW EXISTING & TERMINATE MAINS AS PER STRINGING CHART
2	MG-71001				EXISTING			2-11	0.30			INSTALL NEW 125x125x2750mm FIBREGLASS CROSSARM 100mm BELOW EXISTING & TERMINATE MAINS AS PER STRINGING CHART
3	MG-77015	15.5	12kN	DESAPPED	REPLACE	SITE SPOIL	2.70					INSTALL NEW DESAPPED DURABLE SPEECIES TIMBER POLE 0.5m NORTH WEST OF THE EXISTING POLE.
								2-12	0.20			INSTALL NEW 125x125x2750mm FIBREGLASS CROSSARM & TERMINATE MAINS AS PER STRINGING CHART. UPPER CROSSARM TO BE STRUNG TO MG-77014, & LOWER CROSSARM TO BE STRUNG TO MG-77006. NOTE: THE MAINS AT POLE MG-77014 ARE IN ROLLERS & MAY NEED TEMPORARY FIXING DURING CONSTRUCTION

CAD DRAWING
AMENDMENTS

ASSOCIATED DRAWINGS

Ausgrid
Abbott Street
WALLSEND NSW 2287
P: 4951 9408

DESIGNED	T. DALEY
DRAWN	A. RODWAY
CHECKED	T. DALEY
AUTHORISED	J. OSWALD
DATE	20.01.2021
SCALE	1:4000
MAP REF.	MG-72
LGA	LAKE MACQUARIE
IAMS NUMBER	1900103780
PROJTRAK No.	

OFF MANDALONG RD
MANDALONG
ALTER OH NETWORK DUE TO LONGWALL MINE SUBSIDANCE

SIZE A1 | DRAWING No | SHEETS 1 of 1 | AMD. 0

20160505

Centennial Mandalong

12 Kerry Anderson Drive
Mandalong NSW 2264
PO Box 1000
Toronto NSW 2283
Telephone 1800 730 919
Facsimile 49 730 999