Tahmoor Colliery
Longwalls 25 to 26

INTEGRAL ENERGY

SURFACE SAFETY AND SERVICEABILITY MANAGEMENT PLAN

REVISION D

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September 2008

GENERAL

AUTHORISATION OF SURFACE SAFETY AND SERVICEABILITY MANAGEMENT PLAN

Authorised on behalf of Tahmoor Colliery:	
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Signature:	
Position:	MANAGER ENVIRONMENT & COMMUNITY
Date:	22 SEPTEMBER 2008.

Authorised on behalf of Integral Energy:	
Name:	DAVID OLLEY
Signature:	
Position:	PROJECT OFFICER - NETWORK ASSET OPERATIONS
Date:	19TH SEPTEMBER, 2008.

REVIEW

Date	Rev	Comments
09-Mar-06	A	Draft for Submission to Integral Energy
09-May-06	B	Agreed plan
07-Aug-06	C	Chapter 1 amended, as agreed in Plan Review Meeting, 7 August 2006
10-Sep-08	D	Updated for Longwall 25

REFERENCES

1	*AS/NZS 4360:1999 Risk Management.*
2	*Tahmoor Colliery Longwalls 24 to 26 - The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Surface and Sub-Surface Features due to mining Longwalls 24 To 26 at Tahmoor Colliery in support of an SMP Application.* (Report MSEC157), prepared by Mine Subsidence Engineering Consultants.
3	*Report on the Status of Integral Energy's Assets in the areas of Longwalls 24, 25 and 26 for Centennial Tahmoor Coal.* prepared by Power Line Design, March 2006.

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Drawings

Drawings referred to in this report are included in Appendix B at the end of the report.

Drawing No.	*Description*	*Rev*
MSEC286-040601	Electrical Infrastructure	C
MSEC286-040602	Power Poles to be monitored	B

CHAPTER 1. INTRODUCTION

1.1. Background

Tahmoor Colliery is located approximately 80 kilometres south west of Sydney in the township of Tahmoor NSW. It is managed and operated by Xstrata Coal. Tahmoor Colliery has previously mined 24 longwalls to the north and west of the mine's current location.

Longwalls 25 to 26 are a continuation of a series of longwalls that extend into the Tahmoor North Lease area, which began with Longwall 22. The longwall panels are located between the Bargo River in the south-east, the township of Thirlmere in the west and Picton in the north. A portion of each longwall is located beneath the urban area of Tahmoor. Infrastructure owned by Integral Energy is located within these areas.

Longwalls 22 to 24A have directly mined beneath approximately 16.7 kilometres of electrical cables and 380 power poles and no noticeable impacts have been recorded so far.

This Management Plan provides detailed information about how the risks associated with the mining beneath electrical infrastructure will be managed by Tahmoor Colliery and Integral Energy.

The Management Plan is a live document that can be amended at any stage of mining, to meet the changing needs of Tahmoor Colliery and Integral Energy. There are no changes to the risk control procedures in Chapter 4.

1.2. Predicted Subsidence Movements

A summary of the predicted maximum incremental parameters over the whole subsided area, due to the extraction of each longwall, is shown in Table 1.1.

Table 1.1 Maximum Predicted Incremental Subsidence Parameters

Subsidence Parameter	LW 22	LW 23	LW 24	LW 25	LW 26
Vertical Subsidence (mm)	503	613	596	631	636
Transverse Tilt (mm/m)	3.5	4.9	4.7	5.0	5.1
Longitudinal Tilt (mm/m)	3.0	3.8	3.5	3.7	3.7
Transverse Tensile Strain (mm/m)	0.4	0.7	0.7	0.8	0.8
Longitudinal Tensile Strain (mm/m)	0.6	0.7	0.8	0.8	0.8
Transverse Compressive Strain (mm/m)	0.9	1.6	1.5	1.7	1.7
Longitudinal Compressive Strain (mm/m)	0.6	0.8	0.6	0.6	0.8
Transverse Hogging Curvature (km^{-1})	0.03	0.05	0.05	0.05	0.05
Longitudinal Hogging Curvature (km^{-1})	0.04	0.05	0.05	0.05	0.05
Transverse Sagging Curvature (km^{-1})	0.06	0.11	0.10	0.11	0.11
Longitudinal Sagging Curvature (km^{-1})	0.04	0.05	0.04	0.04	0.05

The maximum predicted cumulative subsidence parameters, after the extraction of each longwall, are shown in Table 1.2.

Table 1.2 Maximum Predicted Cumulative Subsidence Parameters

Subsidence Parameter	LW 22	LW 23	LW 24	LW 25	LW 26
Vertical Subsidence (mm)	503	756	850	892	934
Transverse Tilt (mm/m)	3.5	5.0	4.8	5.2	5.2
Longitudinal Tilt (mm/m)	3.0	4.4	4.9	5.1	5.2
Transverse Tensile Strain (mm/m)	0.4	0.7	0.7	1.0	1.3
Longitudinal Tensile Strain (mm/m)	0.6	0.7	0.8	0.9	0.9
Transverse Compressive Strain (mm/m)	0.9	1.6	1.7	1.7	1.8
Longitudinal Compressive Strain (mm/m)	0.6	0.8	0.8	0.8	0.8
Transverse Hogging Curvature (km^{-1})	0.03	0.05	0.05	0.07	0.09
Longitudinal Hogging Curvature (km^{-1})	0.04	0.05	0.05	0.06	0.06
Transverse Sagging Curvature (km^{-1})	0.06	0.11	0.11	0.11	0.12
Longitudinal Sagging Curvature (km^{-1})	0.04	0.05	0.05	0.05	0.05

1.3. Limitations

This Management Plan is based on the predictions of the effects of mining on surface infrastructure as provided in Report No. MSEC157 by Mine Subsidence Engineering Consultants. Predictions are based on the planned configuration of longwalls at Tahmoor Colliery (as shown in Drawing No. MSEC286-040601), along with available geological information and data from numerous subsidence studies for longwalls previously mined in the area.

Infrastructure considered in this Plan has been identified from aerial photographs, regional maps and from discussions between Tahmoor Colliery representatives and Integral Energy personnel.

The impacts of mining on surface and sub-surface features have been assessed in detail. However, it is recognised that the prediction and assessment of subsidence can be relied upon only to a certain extent. The limitations of the prediction and assessment of mine subsidence are discussed in report MSEC157 by Mine Subsidence Engineering Consultants.

As discussed in the report, there is a low probability that ground movements and their impacts could exceed the predictions and assessments. However, if these potentially higher impacts are considered prior to mining, they can be managed. This Surface Safety and Serviceability Management Plan will not necessarily prevent impacts from longwall mining, but will limit the impact by establishing appropriate procedures that can be followed should evidence of increased impacts emerge.

1.4. Objectives

The objectives of this Surface Safety and Serviceability Management Plan (SSSMP) are to establish procedures to measure, control, mitigate and repair potential impacts that might occur on surface infrastructure owned by Integral.

The objectives of the SSSMP have been developed to:-

- Ensure the safe and serviceable operation of all surface infrastructure. Public and workplace safety is paramount. Disruption and inconvenience should be kept to minimal levels.
- Monitor ground movements and the condition of surface infrastructure during mining.
- Initiate action to mitigate or remedy potential significant impacts that are expected to occur on the surface.
- Provide a plan of action in the event that the impacts of mine subsidence are greater than those that are predicted.
- Provide a forum to report, discuss and record impacts to the surface. This will involve Tahmoor Colliery, Integral Energy, Mine Subsidence Board, Department of Mineral Resources, and consultants as required.
- Establish lines of communication and emergency contacts.

1.5. Scope

The SSSMP is to be used to protect and monitor the condition of the items of infrastructure identified to be at risk due to mine subsidence. The major items at risk are:-

- All electrical infrastructure

The SSSMP only covers infrastructure that is located within the general application area, which defines the extent of land that may be affected by mine subsidence as a result of mining Longwalls 25 to 26. The management plan does not include other property owned by Integral Energy which lies outside the extent of the general application area.

The Plan also applies to persons employed or engaged by Tahmoor Colliery requiring them to carry out activities described by this Plan.

Impacts are considered in terms of mining directly affecting infrastructure owned by Integral Energy, rather than the effects from loss of services.

1.6. Proposed Mining Schedule

It is planned that each longwall will extract coal working northwest from the southeastern ends. This SSSMP covers longwall mining until completion of mining in Longwall 26 and for sufficient time thereafter to allow for completion of subsidence effects.

The current schedule of mining is shown in Table 1.3.

Table 1.3 Schedule of Mining

Longwall	Start Date	Completion Date
Longwall 25	August 2008	August 2009
Longwall 26	October 2009	October 2010

1.7. Definition of Active Subsidence Zone

As a longwall progresses, subsidence begins to develop at a point in front of the longwall face and continues to develop after the longwall passes. The majority of subsidence movement typically occurs within an area 150 metres in front of the longwall face to an area 450 metres behind the longwall face.

This is termed the "active subsidence zone" for the purposes of this SSSMP, where surface monitoring is generally conducted. The active subsidence zone for each longwall is defined by the area bounded by the predicted 20 mm subsidence contour for the active longwall and a distance of 150 metres in front and 450 metres behind the active longwall face, as shown by Fig. 1.1.

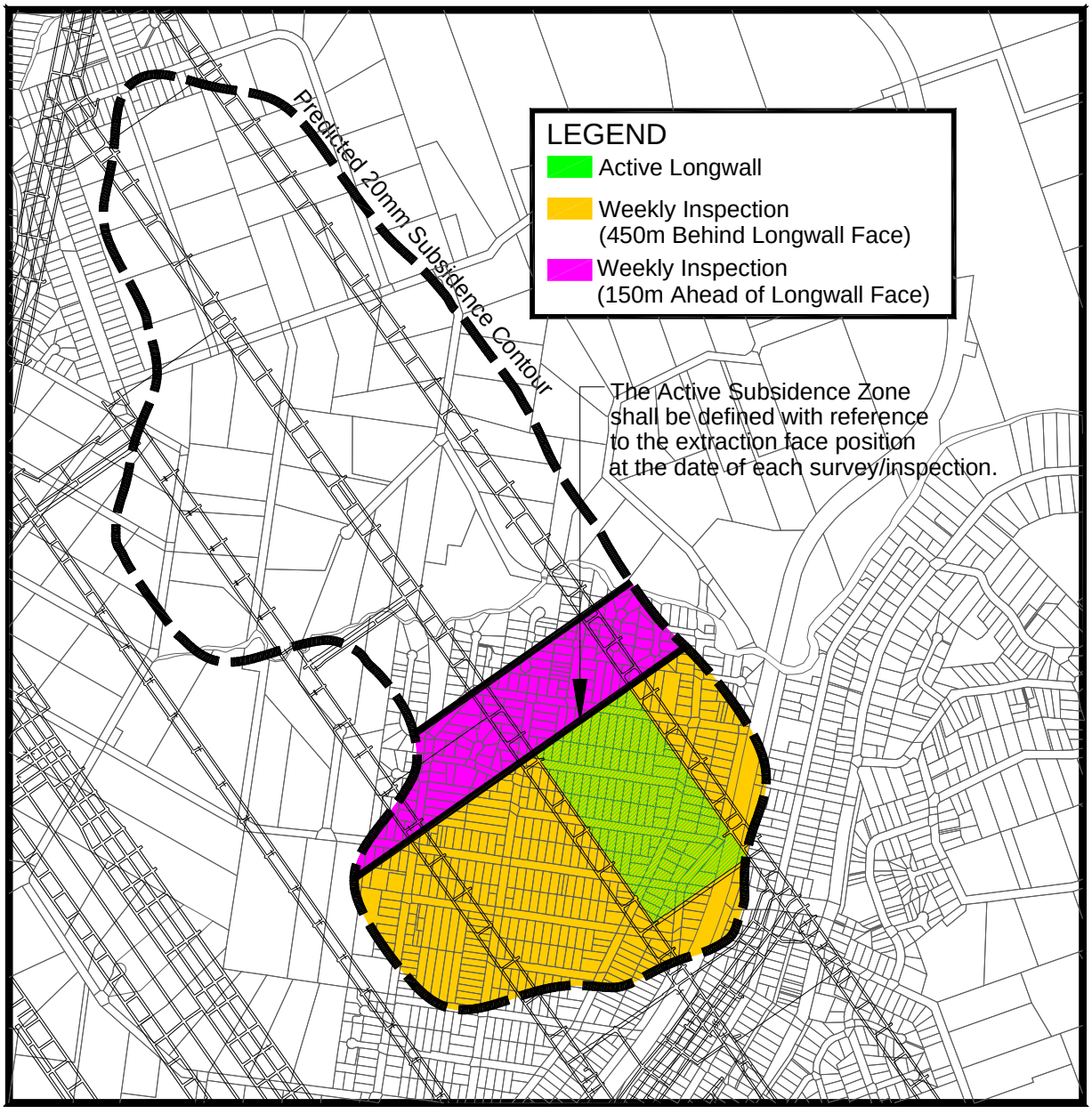

Fig. 1.1 Diagrammatic Representation of Active Subsidence Zone

CHAPTER 2. RISK MANAGEMENT METHOD

Please refer to the letter by Integral Energy, dated 4 May 2006, which is shown in Appendix D. Given that no impacts have been experienced to date, Integral Energy considers that there is no need to amend the contents of this letter.

2.1. Experience of mining Longwall 24A

Increased subsidence has been observed above Longwall 24A with no reported impacts to electrical infrastructure. Subsidence monitoring and daily visual inspections were undertaken along the streets during mining. Observed subsidence was greatest above the southern half of Longwall 24A, and gradually reducing in magnitude towards the northern half of the longwall, which was directly beneath the urban area of Tahmoor. These observations are shown graphically in Fig. 2.1, which shows observed subsidence at survey pegs located along the centreline of Longwall 24A.

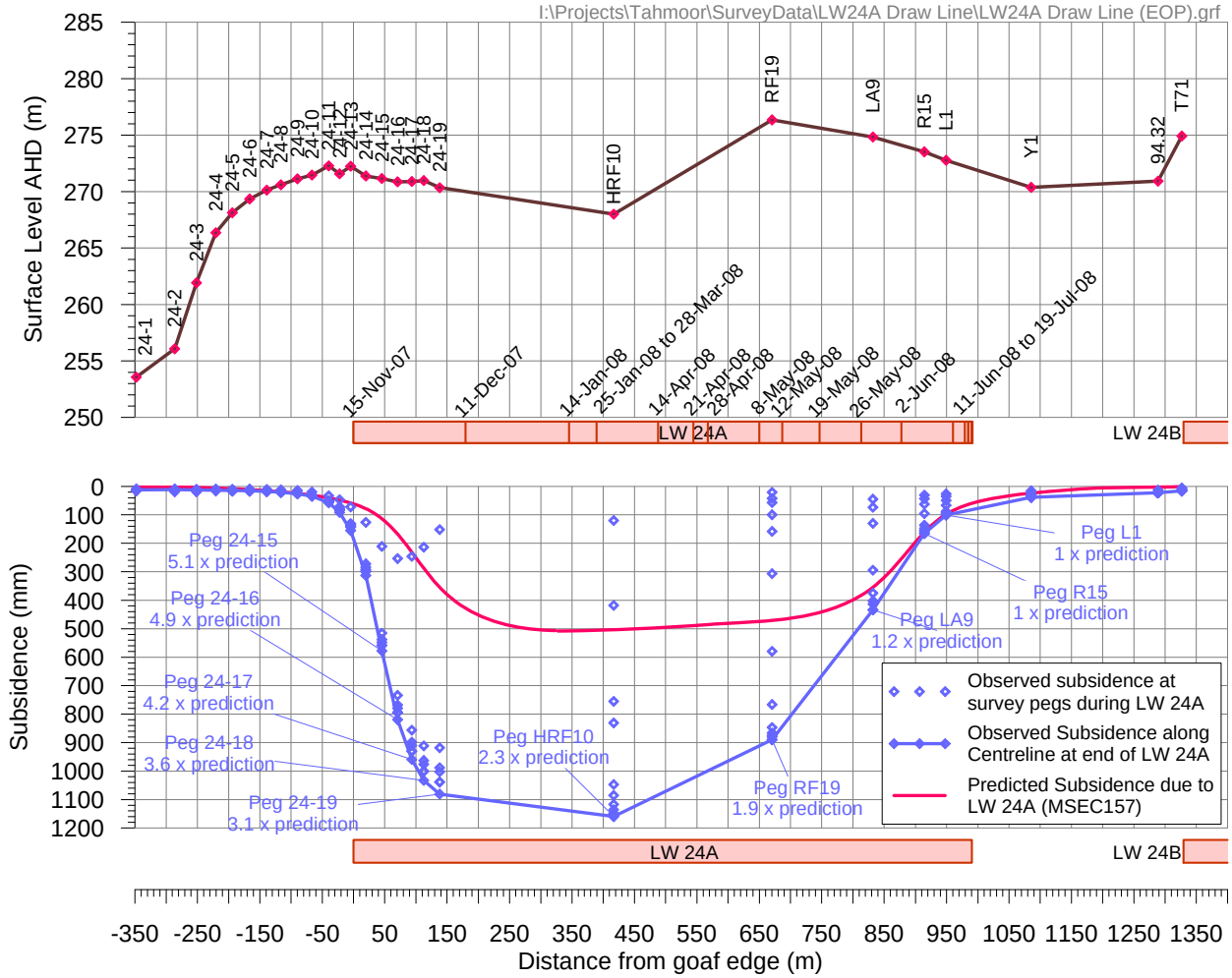

Fig. 2.1 Observed Subsidence along Centreline of Longwall 24A

It can be seen from Fig. 2.1 that while observed subsidence was substantially greater than predicted above the commencing end of the longwalls, observed subsidence compared reasonably well with predictions towards the finishing end of Longwall 24A. It is noted that the extent of the urban area of Tahmoor above Longwall 25 is located near Remembrance Drive (refer Peg R15 in Fig. 2.1).

2.2. Potential Increased Subsidence during the mining of Longwall 25

Given the experience above Longwall 24A, it is considered possible that increased subsidence could be observed above Longwall 25, particularly near the commencing (southern) end of the longwall.

Given that no impacts were observed to electrical infrastructure above Longwall 24A, it is considered that the risk profile for electrical infrastructure directly above Longwall 25 does not change substantially if increased subsidence is observed. It is noted, however, that Tahmoor Colliery will increase monitoring and inspection frequencies if increased subsidence is observed.

CHAPTER 3. RISK ASSESSMENT

3.1. Electrical Infrastructure

Integral Energy has an extensive electrical infrastructure network within the SMP Area. The electrical distribution lines within the SMP Area are shown according to their voltage in Drawing No. MSEC286-040601.

It can be seen from this drawing that the distribution lines range between low voltage (LV) and 66 kV. The main 66 kV transmission line runs alongside the Main Southern Railway. The majority of distribution lines are 11 kV or low voltage cables, which provide power to each property.

All of the electrical distribution lines are overhead cables, supported by power poles, which are shown in Drawing No. MSEC286-040601. This drawing also shows that the Tahmoor Substation is located outside the SMP Area.

3.2. Hazard Identification

The network will be subjected to a wide range of systematic subsidence impacts and the maximum predicted subsidence parameters are provided in Table 1.1 and Table 1.2.

The power lines will also be subjected to travelling tilts and strains due to the subsidence waves that move through as each longwall face passes beneath the power lines, although these are less than the maximum predicted subsidence parameters that are provided in Table 1.1 and Table 1.2.

The maximum predicted tilt along the power lines is 5.2 mm/m, or a change in gradient of 1 in 192. It is unlikely that tilts of this magnitude will significantly affect the cable catenaries, but could cause instability problems in tension poles that are supported by guy ropes.

The maximum predicted systematic tensile strain is 1.3 mm/m. Copper cables can in some cases tolerate tensile strains of up to 20 mm/m without damage. It is unlikely therefore, that any electrical services will be damaged due to systematic mine subsidence impacts during the extraction of Longwalls 25 to 26. Underground cables should also be capable of accommodating the maximum predicted strains.

The 66kV power line crosses Myrtle Creek and it is predicted that the sides of this valley will close by approximately 34 mm. The adjoining bays are also expected to experience some tensile movements, however, these are expected to be much less than the maximum predicted systematic tensile strains above the proposed longwalls.

An inspection of all power poles within the SMP Area has been conducted by Power Line Design (2006). The report concludes that the electricity infrastructure is generally in a good state of repair. A total of three (3) poles were observed to have experienced some non-mining related movement. A total of twenty-eight (28) critical poles have been identified, which comprise twenty-six (26) substation poles, one (1) air break switch pole and one (1) transmission line pole. It is recommended by Power Line Design (2006) that these thirty-one poles be monitored during mining.

A risk assessment has been conducted by Integral Energy, and the results are provided in Appendix D.

Longwalls 22 to 24A have directly mined beneath approximately 16.7 kilometres of electrical cables and 380 power poles and no noticeable impacts have been recorded so far. Given that no impacts have been experienced to date, it is not considered necessary to amend this plan.

The poles are listed in Table 3.1, and are shown in Drawing No. MSEC286-040602.

Table 3.1 Power Poles selected for Monitoring

Sub No.	Pole No.	Street Name	Type	Position relative to LWs
11892	240	Lintina Street	Substation Pole	Above LW24A
11536	247	Courtland Avenue	Substation Pole	Above LW24A
10576	275	Progress Street	Substation Pole	Above LW25
12075	295	Greenacre Drive	Substation Pole	Above LW26
4822	1044	Abelia Street	Substation Pole	Above LW25
10663	140	Tahmoor Road	Substation Pole	Above LW26
12349	177	Krista Place	Substation Pole	Above LW26
12060	194	Remembrance Drive	Substation Pole	Near side of LW26
ABS K596	136	York Street	Air Break Switch Pole	Near side of LW26
11725	457	York Street	Substation Pole	Above LW26
10835	470	Bradbury Street	Substation Pole	Above LW25
5141	1123	Thirlmere Way	Substation Pole	Above LW25
11106	700	Thirlmere Way	Substation Pole	Near side of LW24B
10508	630	Fraser Street	Substation Pole	Above LW24B
11990	608	Elphin Street	Substation Pole	Above LW24B
11104	568	Park Street	Substation Pole	Above LW25
12053	561	Castlereagh Street	Substation Pole	Above LW25
20344	214571	Castlereagh Street	Substation Pole	Above LW25
10217	296	Hilton Park Road	Substation Pole	Above LW25
3993	396	Hilton Park Road	Substation Pole	Above LW26
11753	271	Glenanne Place	Substation Pole	Above LW24B
11606	268	Elphin Street	Substation Pole	Above LW25
10728	664	Marion Street	Substation Pole	Near end of LW24B
11284	238	Brundah Road	Substation Pole	Above LW24B
11675	214	Rita Street	Substation Pole	Above LW25
11941	257	Tickle Drive	Substation Pole	Above LW26
10903	183	Bridge Street	Substation Pole	Above LW26
-	67	George Street	Transmission Line Pole	Above LW25
-	287	Greenacre Drive	Pole	Above LW25
-	293	Greenacre Drive	Pole	Above LW25
-	294	Greenacre Drive	Pole	Above LW26

Infrastructure	Hazard / Impact	Risk	Trigger	Control Procedure/s	Frequency	By Whom?
Electrical Infrastructure	Impacts to infrastructure	**Refer Letter from Integral in App D**	None	Conduct visual inspection for surface deformations along streets	Twice a week when the roads are within active subsidence area Daily during active subsidence if increased subsidence observed as per LW24A	Tahmoor Colliery (SBPS)
				Conduct surveys along survey lines to provide some early warning for potentially damaging subsidence events	Every 200 metres of longwall face movement Weekly level surveys if increased subsidence observed as per LW24A	Tahmoor Colliery (L&H/MSEC)
				Conduct pole surveys that measure subsidence at base and vertical offset or tilt of selected poles.	Monthly for each pole within active subsidence zone and for next 3 months after leaving active subsidence zone End of Longwall for all poles within limit of subsidence for panel	Tahmoor Colliery (L&H/MSEC)
				Advise of position of longwall by email	Weekly	Tahmoor Colliery
				Keep Mine Subsidence Board informed of events – Tahmoor Colliery / Integral Energy.	As required	Tahmoor Colliery / Integral Energy
				Communicate regularly	Ongoing	Tahmoor Colliery / Integral Energy
			Impacts observed	Notify all stakeholders, including Integral, Tahmoor Colliery, Mine Subsidence Board and Department of Primary Industries – Minerals	Within 24 hours	Integral or Tahmoor Colliery
				Repair impact.	As per Integral procedures	Integral
				Increase the frequency of survey and visual inspections in vicinity of impact, if appropriate.	As agreed between Tahmoor Colliery and Integral	Tahmoor Colliery

CHAPTER 5. GEOLOGICAL STRUCTURES AND ANOMALIES

Should any geological structures be discovered or unexpected movement occur on the surface during mining operations, this information should immediately be reported to stakeholders to consider the implications on Integral Energy infrastructure.

CHAPTER 6. RESOURCES

The Risk Control Procedures indicate which party is responsible for each risk control procedure. A contact list is provided in Chapter 10.

CHAPTER 7. MANAGEMENT PLAN REVIEW MEETINGS

The monitoring of natural surface features and surface infrastructure which forms an integral part of this Management Plan will be carried out by Tahmoor Colliery. Management Plan Review Meetings will be held between Tahmoor Colliery, Integral Energy, the Mine Subsidence Board and / or the Department of Mineral Resources for discussion and resolution of issues raised in the operation of the Management Plan. The frequency of the Plan Review Meetings will be monthly unless agreed otherwise between representatives of each Plan Review Meeting.

A secretary will be appointed at the Plan Review Meeting. All documentation, distribution of meeting minutes and organising of meeting times will be undertaken by the secretary.

Plan Review Meetings will discuss any incidents reported in relation to the relevant surface feature, the progress of mining, the degree of mine subsidence that has occurred, and comparisons between observed and predicted ground movements.

It will be the responsibility of the meeting representatives to determine whether the incidents reported are due to the impacts of mine subsidence, and what action will be taken in response.

In the event that a significant risk is identified for a particular surface feature, any party may call an emergency Plan Review Meeting, with one day's notice, to discuss proposed actions and to keep other parties informed of developments in the monitoring of the surface feature.

CHAPTER 8. AUDIT AND REVIEW

All Management Plans within this document have been agreed between parties. The Management Plan will be reviewed following extraction of each longwall.

Should an audit of the Management Plan be required during that period, an auditor shall be appointed by Tahmoor Colliery to review the operation of the Management Plan and report at the next scheduled Plan Review Meeting.

Other factors that may require a review of the Management Plan are:-

- Observation of greater impacts on surface features due to mine subsidence than was previously expected.
- Observation of fewer impacts or no impacts on surface features due to mine subsidence than was previously expected.
- Observation of significant variation between observed and predicted subsidence.

CHAPTER 9. RECORD KEEPING

The secretary will keep and distribute regular minutes of each Plan Review Meeting for each surface feature. The minutes will include reports on the condition of the relevant surface feature, the progress of mining, the degree of mine subsidence that has occurred, comparisons between observed and predicted ground movements, agreements reached between parties, and a log of incidents that have occurred on the surface feature.

CHAPTER 10. CONTACT LIST

Organisation	Contact	Phone	Email / Mail	Fax
Department Primary Industries (Mineral Resources Division)	Phil Steuart	(02) 4931 6648	phil.steuart@dpi.nsw.gov.au	(02) 4931 6790
Department Primary Industries (Mineral Resources Division)	Gang Li	(02) 4931 6644 0409 227 986	gang.li@dpi.nsw.gov.au	(02) 4931 6790
Department Primary Industries (Mineral Resources Division)	Ray Ramage	(02) 4931 6645 0402 477 620	ray.ramage@dpi.nsw.gov.au	(02) 4931 6790
Mine Subsidence Board	Darren Bullock	(02) 4677 1967	d.bullock@minesub.nsw.gov.au	(02) 4677 2040
Mine Subsidence Engineering Consultants (MSEC)	Daryl Kay	(02) 9413 3777	daryl@minesubsidence.com	(02) 9413 3822
Sunrise Building and Property Services (SBPS)	John Schwarz	(02) 4883 9030 0400 390058	sunbuilding@westnet.com.au	(02) 4883 9738
Tahmoor Colliery	David Clarkson	(02) 4640 0133	d.clarkson@xstratacoal.com.au	(02) 4640 0140
Tahmoor Colliery – Environment and Community Manager	Ian Sheppard	(02) 4640 0156 0408 444 257	isheppard@xstratacoal.com.au	(02) 4640 0140
Integral Energy	Emergency Contact	131 003		
Integral Energy	David Olley	(02) 4861-0476	david.olley@integral.com.au	(02) 4861-0435
Integral Energy	Babu Kumar	(02) 9853-5628	babu.kumar@integral.com.au	

Appendix A - Glossary of Terms and Definitions

Glossary of Terms and Definitions

Angle of draw	The angle of inclination from the vertical of the line connecting the goaf edge of the workings and the limit of subsidence (which is usually taken as 20 mm of subsidence).
Chain pillar	A block of coal left unmined between the longwall extraction panels.
Cover depth (H)	The depth from the surface to the top of the seam. Cover depth is normally provided as an average over the area of the panel.
Critical area	The area of extraction at which the maximum possible subsidence of one point on the surface occurs.
Curvature	The change in tilt between two adjacent sections of the tilt profile divided by the average horizontal length of those sections.
Extracted seam	The thickness of coal that is extracted. The extracted seam thickness is thickness normally given as an average over the area of the panel.
Effective extracted seam thickness (T)	The extracted seam thickness modified to account for the percentage of coal left as pillars within the panel.
Face length	The width of the coalface measured across the longwall panel.
Goaf	The void created by the extraction of the coal into which the immediate roof layers collapse.
Goaf end factor	A factor applied to reduce the predicted incremental subsidence at points lying close to the commencing or finishing ribs of a panel.
Horizontal displacement	The horizontal movement of a point on the surface of the ground as it settles above an extracted panel.
Inflection point	The point on the subsidence profile where the profile changes from a convex curvature to a concave curvature. At this point the strain changes sign and subsidence is approximately one half of S max.
Incremental subsidence	The difference between the subsidence at a point before and after a panel is mined. It is therefore the additional subsidence at a point resulting from the excavation of a panel.
Overlap adjustment factor	A factor that defines the ratio between the maximum incremental subsidence of a panel and the maximum incremental subsidence of that panel if it were the first panel in a series.
Panel	The plan area of coal extraction.
Panel length (L)	The longitudinal distance along a panel measured in the direction of (mining from the commencing rib to the finishing rib.
Panel width (Wv)	The transverse distance across a panel, usually equal to the face length plus the widths of the roadways on each side.
Panel centre line	An imaginary line drawn down the middle of the panel.
Pillar	A block of coal left unmined.
Pillar width (Wpi)	The shortest dimension of a pillar measured from the vertical edges of the coal pillar, i.e. from rib to rib.
Strain	The change in the horizontal distance between two points divided by the original horizontal distance between the points.
Sub-critical area	An area of panel smaller than the critical area.
Subsidence	The vertical movement of a point on the surface of the ground as it settles above an extracted panel.
Super-critical area	An area of panel greater than the critical area.
Tilt	The difference in subsidence between two points divided by the horizontal distance between the points.
Uplift	An increase in the level of a point relative to its original position.
Upsidence	A reduction in the expected subsidence at a point, being the difference between the predicted subsidence and the subsidence actually measured.

Appendix B – Drawings and Illustrations

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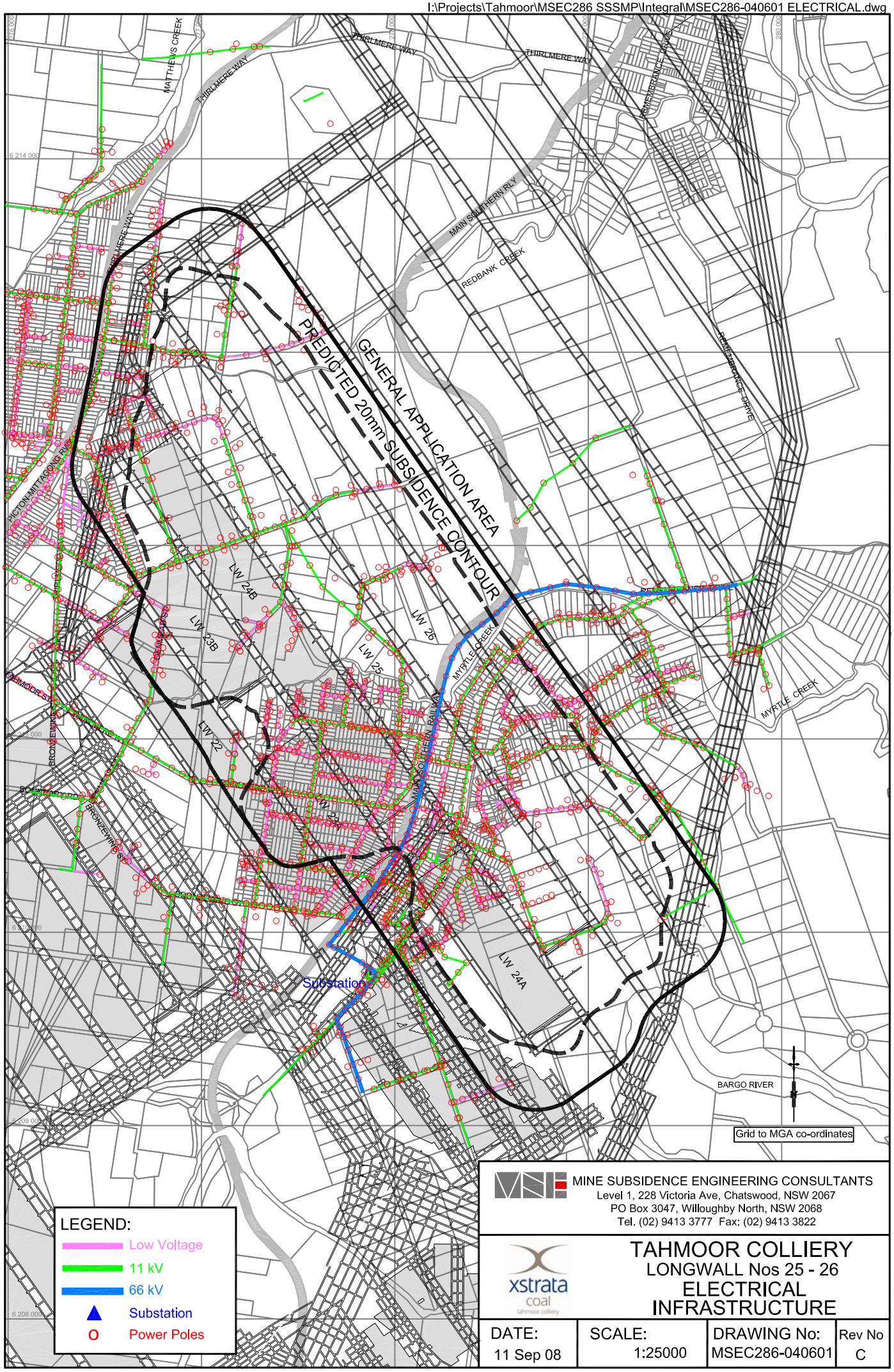

LEGEND:

- Low Voltage
- 11 kV
- 66 kV
- ▲ Substation
- O Power Poles

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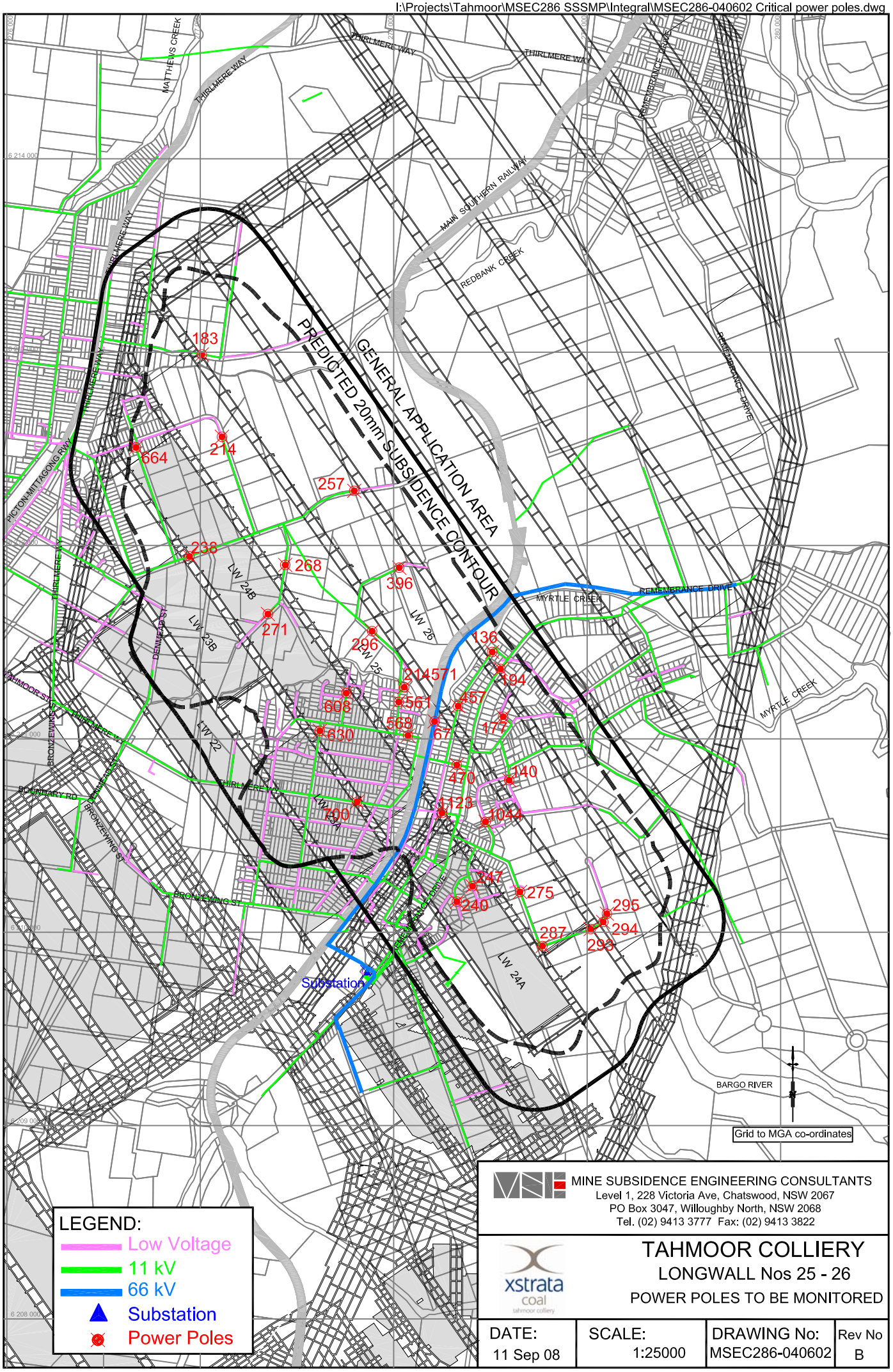
TAHMOOR COLLIERY
LONGWALL Nos 25 - 26
ELECTRICAL INFRASTRUCTURE

DATE:	SCALE:	DRAWING No:	Rev No
11 Sep 08	1:25000	MSEC286-040601	C

I:\Projects\Tahmoor\MSEC286 SSSMP\Integral\MSEC286-040602 Critical power poles.dwg



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TAHMOOR COLLIERY

LONGWALL Nos 25 - 26

POWER POLES TO BE MONITORED

DATE:	SCALE:	DRAWING No:	Rev No
11 Sep 08	1:25000	MSEC286-040602	B

Appendix C – Report from Power Line Design

Power Line Design Pty Ltd

ABN: 33 107 591 846

Report on the Status of Integral Energy's Assets in the areas of Longwalls 24, 25 & 26

for

Centennial Tahmoor Coal

Remembrance Drive, Tahmoor NSW 2573

Prepared by

Laurence McKinnon
Power Line Design Pty Ltd
Level 3 Accredited Service Provider
Accreditation No: 2486

1 March 2006

P.O. Box 338, Mittagong, NSW, 2575 *ph: 02 4872 1920*
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Power Line Design has conducted an on-site audit of Integral Energy's Assets within the areas of Longwalls 24, 25 & 26 at Tahmoor as recommended by Mine Subsidence Engineering Consultants Report No. MSEC157 para 3.12.10.

Each pole and pole substation within the defined area as has been identified and inspected visually to determine its state of repair. As recommended in the above-mentioned report MSEC157, it is important that measures should be put in place to monitor the movements and maintain the power lines and the power poles in a safe and serviceable condition.

Our on-site inspection shows that the electricity infrastructure within the defined area is generally in a good state of repair. The power lines and power poles appear to be in a safe and serviceable condition. This could change with movement caused by subsidence.

As a result we have identified 28 critical poles within the defined Longwall mining area including 26 substation poles, 1 Air Break Switch Pole and 1 transmission line pole. Attachment A. is a list of these critical poles with photographs and comments.

In addition to the critical poles identified in "Attachment A", there are 3 existing poles showing signs of movement in Greenacre Drive (not photographed) in the area of Longwall 25.
These poles have moved up to 2 poles in the head and although they are not in the same critical category as the substation poles should be monitored. The pole numbers are;

- 287
- 293
- 294

Recommendations
Due to the likelihood of pole movement due to subsidence it is recommend that for the duration of the mining period and for a suitable period after mining has concluded that the 28 poles identified on attachment A and the 3 poles in Greenacre Drive be monitored by periodically measuring the top and base co-ordinates of each pole.
Should significant movement of the poles be detected Integral Energy should be contacted so that mitigating measures can be implemented.

Appendix D – Risk Assessment by Integral Energy

INTEGRAL energy

The power is in your hands

4th May, 2006

Centennial Coal Tahmoor
PO Box 100
TAHMOOR NSW 2573

Attention: Mr David Clarkson

Integral Energy
Asset Management

Result of On Site Audit
Integral Energy Assets

For

Centennial Coal Tahmoor

At Tahmoor
Longwalls 24 - 26

(On Site Audit conducted on Tuesday 4th April, 2006)

INTEGRAL energy

The power is in your hands

4th May, 2006

Centennial Coal Tahmoor
PO Box 100
TAHMOOR NSW 2573

Attention: Mr David Clarkson

Dear Sir,

PROPOSED LONGWALLS 24 – 26, Centennial Coal - Tahmoor

In order to assist Centennial Coal Tahmoor in their application to the Department of Mineral Resources, for approval to mine Longwalls 24 – 26 at Tahmoor, Integral Energy has conducted a risk assessment based on the on-site audit, performed by Power Line Design Pty Ltd, with the following results.

The on-site audit indicates Integral Energy's existing assets to be in a good state of repair and in serviceable order. History has also shown that similar projects in other locations have resulted in little or no unduly influence on Integral's assets due to subsidence.

Given the above, and the "prediction of subsidence parameters" from Mine Subsidence Engineering Consultants Pty Ltd (Report No. MSEC286 Revision A), it is considered unlikely that Centennial Coal's proposal will result in any adverse effect on Integral Energy's assets in the Tahmoor Longwalls 24 - 26 area.

However, as a means of assisting with Integral Energy's ongoing risk management, it is important that should subsidence impact our assets we have some quantitative information to assist with our evaluations. We believe that it is appropriate that a number of our assets, which have been identified as "critical poles", should be monitored to assess any impact of the proposed mining.

It is requested, at a minimum, that Centennial Coal Tahmoor arrange for the following:

- Monitoring of subsidence at the base of the identified Integral Energy "critical poles"
- Monitoring of the coordinates at the base and top of each of the identified Integral Energy "critical poles" to detect any movement.

Integral Energy would require the monitoring identified above to be undertaken on the "critical poles" as listed in Table 3.1, Report No. MSEC286 Revision A and the On Site Audit conducted by Power Line Design Pty Ltd.

Please send the results of these observations in report format to:

Mr David Olley
Integral Energy Asset Management
Central Region
PO Box 6366
Blacktown NSW 2148

Alternatively, email to:

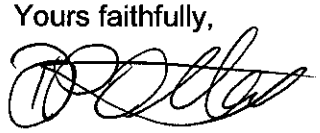
david.olley@integral.com.au

The initial report should be sent prior to commencement of works and updated reports submitted on a monthly basis over a period up to 3 months after extraction has been completed.

Subject to your agreement with the requested monitoring, reporting regime and the responsibility for any proven damage to Integral Energy assets in the forecast subsidence period, we endorse your application to proceed as planned.

If you have any queries or wish to further discuss this matter further, please contact David Olley, Project Officer Asset Management at Bowral, on phone (02) 4861 0476.

Yours faithfully,



David Olley
Project Officer
Asset Management
Integral Energy Australia

Asset Status / Condition Audit For Centennial Coal - Tahmoor

(On Site Audit performed by Power Line Design Pty Ltd on 1-3-2006)

Site: **Tahmoor Colliery**
Longwalls 24, 25 and 26

Refer to Pictures in On Site Audit performed by Power Line Design Pty Ltd on 1-3-2006.

Scope:

The inspection was carried out to determine the condition of existing Integral Energy Assets which may potentially be adversely impacted by works carried out at the above mentioned sites, prior to commencement of those works.

Areas considered during the inspection process included:-

- Stability of pole foundations
- Ground clearance
- Alignment of poles
- Electrical clearances to structures
- Identification of "critical poles" for the purpose of regular monitoring.

Observations:

Integral Energy's assets constructed over the above sites were visually inspected. The On Site Audit including photographs show that the poles are generally in good order above ground and that they are vertical in both the traverse and longitudinal directions to the lines.

From the on site audit 10 poles were noted as leaning slightly and pictured in the audit and an additional 3 poles (Nos. 287, 293 & 294) also noted as slightly leaning. Movement of these poles is consistent with the settling of the pole foundation and the effects of wind loading on the poles and conductors over an extended period of time.

There is no compromising of clearances to ground or structures evident and insulator swing angles were also minimal, indicating very little, if any, relative movement of structures since installation.

The On Site Audit performed by Power Line Design Pty Ltd confirms the observations made above.

Conclusion:

There was no evidence found to suggest any compromise of the integrity of the inspected distribution lines in the effected mining zone. The lines were found to be in a good state of repair and in serviceable order.

We note that our site audit, whilst extensive, was not exhaustive and therefore we reserve the right to identify other critical structures or issues in the future.