



DONALDSON COAL PTY LIMITED

ABEL MINE

Subsidence Management Plan

Subsidence Monitoring Program

Panels 1 & 2 - Surface

April 2010

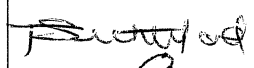
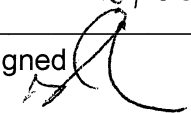
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Approved by		Version No	1		
Issue date	7/04/2010	Revision date	n/a		Page 1 of 9
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Document Control

Description

Document No.	
Title	Subsidence Monitoring Program - Panels 1 & 2 – Surface
General Description	Provides a program for the management of subsidence monitoring on the surface in the area potentially influenced by mining in Panels 1 & 2 at Abel Mine.
Key Support Documents	Abel Mine Subsidence Management Plan

Approvals

ORIGINATOR	Grant Lord	Position Registered Mine Surveyor	Signed 	Date 11/5/90
REVIEWED	Tony Sutherland	Position Technical Services Manager- Underground Operations	Signed 	Date 11-5-10
APPROVED	Matt Blackham	Position Manager Mining Engineering	Signed 	Date 11-5-10
CONFIRMED (I&I-MR if Applicable)		Position	Signed	Date

Revisions

Version #	Date	Description	By	Checked	Approved	
					Name	Signed

Consultation

Version#	Date	Name	Position

The nominated Coordinator for this document is

Manager of Mining Engineering

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1. PURPOSE AND SCOPE

The purpose of this Monitoring Program is to provide a subsidence monitoring and reporting program to measure and monitor both subsidence and any effects relating to mining (pillar extraction) in the Subsidence Management Plan area. The program includes monitoring both pre and post mining for the first two extraction panels within SMP area 1, Panels 1 & 2. The proposed subsidence mark locations and the relevant surface features are shown on **Figure 1**. Individual monitoring programs and details are listed in **Section 6 – Monitoring Details**.

This Monitoring Program has been developed as part of the Abel Subsidence Management Plan.

2. RESPONSIBILITIES AND RESOURCES

The Abel Mine Surveyor is responsible for the implementation of the subsidence monitoring component and the visual and photographic monitoring and inspection component of this Program.

The Abel Manager of Mining Engineering is responsible for ensuring that sufficient resources are available to implement the requirements of this Program.

3. CONSULTATION

This program has been developed considering recommendations contained within reports provided by Ditton Geotechnical Services Pty Ltd, in consultation with officers of Industry & Investment-Mineral Resources and is submitted to the Principal Subsidence Engineer I & I – Mineral Resources for approval.

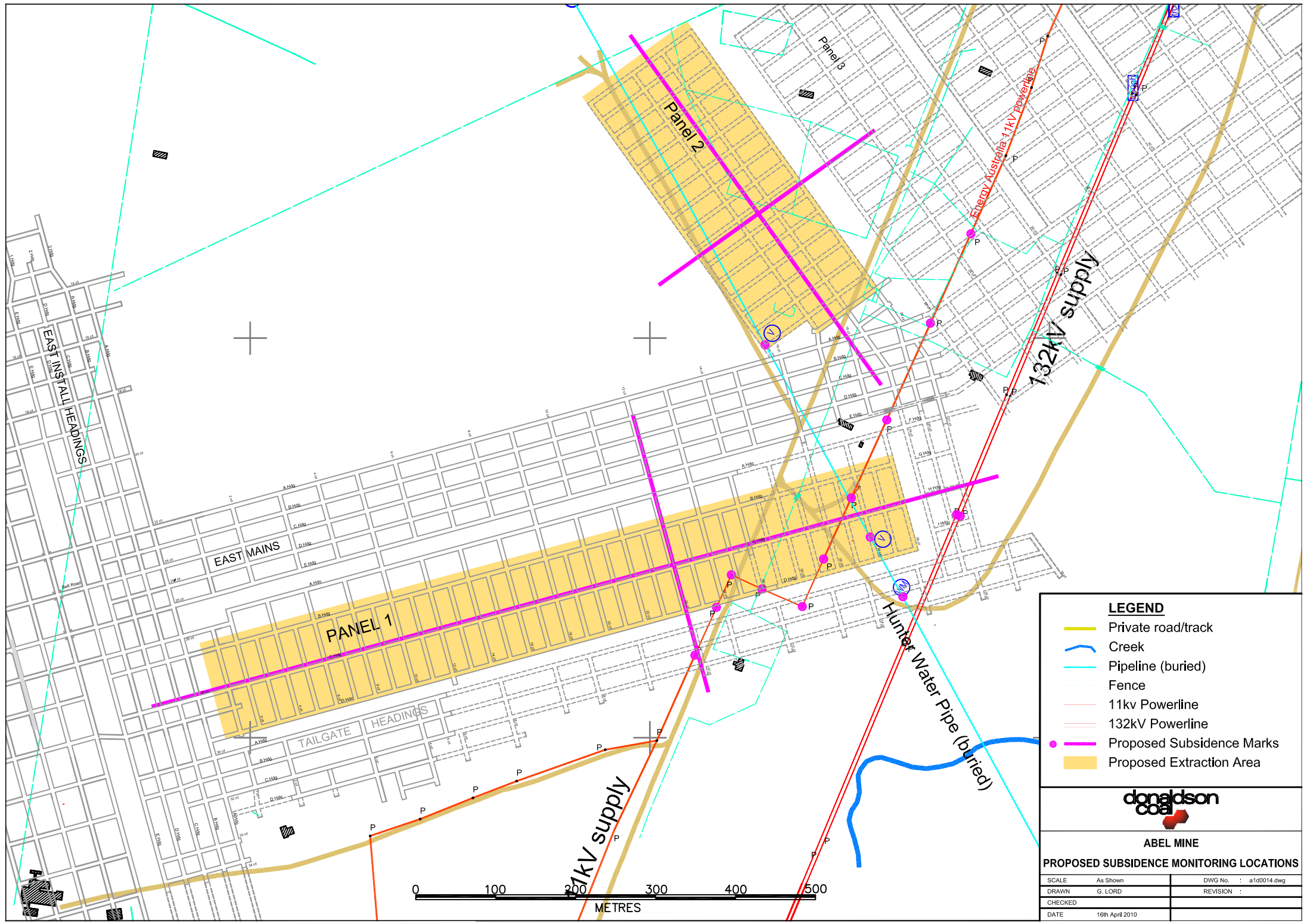
4. BACKGROUND

Abel Mine is an underground coal mine operated by Donaldson Coal Pty Limited. The mine access, entries and primary surface facilities are located approximately 23km north-west of Newcastle on John Renshaw Drive at Blackhill. Abel commenced mining operations in May 2008, and is planning to commence pillar extraction during June 2010. Abel uses the bord and pillar method to develop mining panels which will support secondary extraction. The SMP Application has been submitted and is awaiting approval for this secondary extraction of Area 1, which includes Panels 1 & 2 within the Upper Donaldson Seam.

This Subsidence Monitoring Program includes the monitoring of:

- Longitudinal and transverse monitoring lines above extraction panels
- Horizontal and tilt surveys of power poles,
- Photographic monitoring and visual inspections of the general surface plus power poles, water lines, roads, tracks and fences.

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LEGEND

- Private road/track
- Creek
- Pipeline (buried)
- Fence
- 11kv Powerline
- 132kv Powerline
- Proposed Subsidence Marks
- Proposed Extraction Area



ABEL MINE

PROPOSED SUBSIDENCE MONITORING LOCATIONS

SCALE	As Shown	DWG No.	: a1d0014.dwg
DRAWN	G. LORD	REVISION	:
CHECKED			
DATE	16th April 2010		

5. APPROACH TO SUBSIDENCE MONITORING

The Mine's overall strategy for monitoring and management is:

1. **Measure baseline information** - Established background data for the surface above the mining area.
2. **Monitor the effects of mining** - Continue monitoring of identified parameters at key positions relating to the mining position.
3. **Regularly assess and interpret monitoring** – Monitoring data is analysed to identify any variations from predictions or unexpected anomalies.
4. **Subsidence Management Status Reports** - Regular reports will be supplied to the relevant Stakeholders, along with periodic consultation meetings. Such updates will review the monitoring results, review the requirement to reassess subsidence effects and identify/implement remedial actions (see below).
5. **Reporting of monitoring results** – as described in **Section 7**.
6. **Re-assess any impacts** – where variations are greater than predictions made in the SMP, additional assessment/investigation of impacts will be undertaken. This will be carried out by specialist consultants and Abel personnel where required.

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6. MONITORING DETAILS

6.1 Subsidence Monitoring

6.1.1 Panel 1 - Longitudinal and Transverse Monitoring Lines

Two lines of stable marks to be established across Panel 1. These lines will extend beyond the predicted angle of draw. Stations to be placed at generally 10 metre spacing's along the lines. Monitoring by precise level and steel band to provide level, strain and tilt information (anticipated accuracy +/- 3mm). See "Figure 1" for proposed monitoring point locations.

6.1.2 Panel 2 - Longitudinal and Transverse Monitoring Lines

Two lines of stable marks to be established across Panel 2. These lines will extend beyond the predicted angle of draw. Stations to be placed at generally 10 metre spacing's along the lines. Monitoring by precise level and steel band to provide level, strain and tilt information (anticipated accuracy +/- 3mm). See "Figure 1" for proposed monitoring point locations.

6.1.3 11kV and 132kV Power Pole Monitoring

Stable marks established adjacent to power poles. Monitoring by total station survey to provide x, y and z values to establish movement of poles. Also radiations measured to top of each pole to measure for any possible tilt. (anticipated accuracy +/- 10mm). See "Figure 1" for proposed monitoring point locations.

6.1.4 Hunter Water Line Monitoring

Monitoring of existing valves on waterline by total station survey to provide x, y and z values to establish movement of pipeline. (anticipated accuracy +/- 10mm) See "Figure 1" for proposed monitoring point location.

6.2 Monitoring Schedule

Timing and frequency of survey monitoring of subsidence marks will be as follows :-

- 2 x baseline surveys prior to extraction.
- 1 x survey at completion of extraction of the panel.
- 1 x survey 6 months after completion of mining of the panel
- 1 x survey 12 months after completion of mining of the panel

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6.3 Surface Features – Surface Inspections and Photographic Monitoring

Surface features include paddocks used for cattle grazing and private access roads to paddocks. A pre-mining inspection of the area will identify existing condition of the surface area.

6.3.1 Surface Inspections, Parameters, Monitoring and Frequency

A pre-mining inspection of the panel shall be undertaken prior to commencement of pillar extraction. The purpose of this inspection is to gain a baseline record of the surface before carrying out pillar extraction beneath an area. Visual inspections will then be conducted of any sensitive surface features at regular intervals during undermining by the panel plus post mining. If any change is noted photographs will be taken and used as a comparison against the baseline photographs.

6.3.2 Photographic Monitoring, Parameters, Methods and Frequency

Where sensitive surface features are located during the pre-mining visual inspection, photographic monitoring sites will be established (with GPS location). Photographic inspections of the panel shall be undertaken prior to commencement of pillar extraction and at completion of mining. Additional photography will be undertaken if visual inspections, conducted during mining, reveal any changes.

A summary of results will be reported to the Principal Subsidence Engineer. An annual summary will be prepared for the Annual Environment Management Report (AEMR).

6.4 Monitoring – General Information

Monitoring or inspections shall not be discontinued or the approved monitoring program modified without the agreement of the Principal Subsidence Engineer.

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Table 1. Surface Inspections and Photographic Monitoring Methods and Parameters

Item	Monitoring Type	Monitoring Frequency	Notes	Responsibility
Surface features	Photographic	• Pre mining • Additional if visual inspections identify impact • Post mining		Abel mine surveyor
Surface features	Visual inspections	• Pre mining • weekly during undermining • Post mining		Abel mine surveyor

7. SURVEY STANDARDS

GENERAL

Control survey information datum for both coordinates and level to be either from State Survey Grid or confirmed unaffected station installed from State Survey Grid.

- Total station coordination (x,y) and level (z).
- Surveys conducted at intervals noted within document.
- Traverse accuracy to be ICSM SP1 Class D or better.

8. REPORTING

Information generated as a result of monitoring surveys conducted over subsidence marks shall be supplied to the Principal Subsidence Engineer in Excel format via e-mail.

Results of each survey, in Excel format, shall be forwarded promptly following completion.

9. REVIEW

This plan will be reviewed as necessary including:

- In the event that relevant stakeholders raise issues that necessitate a review;
- Monitoring demonstrates that the subsidence results are such that a review is warranted; and/or
- At the completion of each mining Panel.

The review at the completion of each panel will be conducted in consultation with Industry and Investment – Mineral Resources, Principal Subsidence Engineer.

The objective of the review will be to ensure that the program is adequately and efficiently measuring subsidence parameters. In the event of the monitoring program being changed a copy will be provided on the Donaldson Coal website.

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