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Illawarra Coal

26 February 2010

The Director-General
Industry & Investment NSW – Mineral Resources
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Attn: Jonathon Smith

Dear Jon

West Cliff Colliery Longwall 34 – 36 Subsidence Management Plan Variation – Reduction in Longwall 34 void length.

Pursuant to Condition 10 of the Subsidence Management Plan Approval for Longwall 34 – 36 dated 13 May 2009 and in accordance with section 8 of the Guideline for Applications for Subsidence Management Approvals, please find an Application for Variation of the Subsidence Management Plan for Longwalls 34 - 36 at West Cliff Mine.

A variation is sought to reduce the length of Longwall 34 (void) by 125 m at the eastern end of the longwall adjacent to the Georges River. This shortening in length of Longwall 34 will result in the finishing end of the longwall being at least 130m from the Georges River. The reduction in length of Longwall 34 is co-incident with the position of the closest pre-driven cut through and has been selected on the basis of mining practicality. The predicted subsidence movements and environmental consequences are less than those predicted for the current Approved Plan.

The decision to shorten Longwall 34 has been made in accordance with Illawarra Coal's commitment to review the location of the finishline of each longwall, in light of impacts identified in the Georges River for the previous longwall. In this instance, Illawarra Coal has recently observed and reported Level 1 impacts in the Georges River that occurred as a result of mining Longwall 33. The variation to the Longwall 34 finish position is based on reducing the level of impacts observed from Longwall 33.

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If you have any queries in relation to the SMP Variation Application, please call the undersigned on (02) 42553302.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Richard Walsh', written in a cursive style.

Richard Walsh
Manager Approvals

cc: IAC members

Att: 2 x A0 signed copies of the Approved Plan (AS-2223)
2 x A0 copies of Surface Features Plan 2 (AS-2224)
MSEC444 (Rev B) Modified Finishing End of Longwall 34



Illawarra Coal

West Cliff Colliery Modified Finishing End of Longwall 34

REPORT

on

**THE EFFECTS OF THE PROPOSED MODIFIED FINISHING END
OF LONGWALL 34 AT WEST CLIFF COLLIERY ON PREVIOUS
SUBSIDENCE PREDICTIONS AND IMPACT ASSESSMENTS**



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Revision B
February 2010**

DOCUMENT REGISTER

| Revision | Description | Author | Checker | Date |
|----------|-----------------|--------|---------|-------------------------|
| A | Final Issue | JB | DRK | 11 th Feb 10 |
| B | Minor Revisions | JB | DRK | 16 th Feb 10 |
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Previous reports:-

WKA97 (May 2002) – West Cliff Colliery – Longwalls 5A5 to 5A8 - The Prediction of Subsidence Parameters and the Assessment of Subsidence Impacts on Natural Features and Surface Infrastructure.

WKA118 (October 2002) – West Cliff Colliery – Revised Longwalls 5A5 to 5A8 - The Prediction of Subsidence Parameters and the Assessment of Subsidence Impacts on Natural Features and Surface Infrastructure (In Support of a Section 138 Application).

MSEC208 (Revision E – March 2006) – The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Surface and Sub-Surface Features due to Mining Longwalls 31 to 33 at West Cliff Colliery (In Support of a SMP Application).

MSEC261 (Revision B – July 2006) - The Effects of the Modified Commencing End of Longwall 32 at West Cliff Colliery on the Subsidence Predictions and Impact Assessments (In Support of a Modification to the Section 138 Application).

MSEC326 (Revision C – December 2007) - The Prediction of Subsidence Parameters and the Assessment of Mine Subsidence Impacts on Natural Features and Surface Infrastructure Resulting from the Extraction of Proposed Longwalls 34 to 36 in Area 5 at West Cliff Colliery (In Support of the SMP Application).

MSEC327 (Revision B – September 2007) - The Effects of the Modified Commencing End of Longwall 33 at West Cliff Colliery on the Subsidence Predictions and Impact Assessments (In Support of a Modification to the Section 138 Application).

MSEC344 (Revision B – February 2008) - Predicted Subsidence Parameters at the Sydney Catchment Authority Infrastructure Resulting from Alternative Layouts of West Cliff Longwalls 34 to 36.

MSEC386 (Revision B – December 2008) - The Effects of Five Optional Modified Commencing Ends of Longwall 34 at West Cliff Colliery on the Previous Subsidence Predictions and Impact Assessments.

CHAPTER 1. EFFECTS OF THE PROPOSED MODIFIED FINISHING END OF LONGWALL 34 ON SUBSIDENCE PREDICTIONS AND IMPACT ASSESSMENTS

1.1. Background

Illawarra Coal (IC) has completed the extraction of West Cliff Longwalls 29 to 33 and approval has been granted for the extraction of Longwalls 34 to 36. The approved layout of the longwalls at West Cliff Colliery, referred to as the *SMP Layout* in the remainder of this report, is shown in Drawing No. MSEC444-01, in Appendix A. At the time of this report, IC had commenced the extraction of Longwall 34, which is being mined from the north-west to the south-east.

Some impacts have been observed in the Georges River as a result of the extraction of Longwalls 32 and 33. The locations of these impacts are illustrated in Drawing No. MSEC444-02, in Appendix A.

Fracturing was first observed in Rockbar 36 at the completion of Longwall 32, which is located immediately adjacent to the most eastern corner of this longwall.

Further fracturing was observed in Rockbar 36 as Longwall 33 approached the Georges River. The water level in the pool upstream of this rockbar was first observed to drop on the 27th November 2009, when the longwall extraction face was 80 metres from the finishing end and was at a distance of 290 metres from Rockbar 36.

Fracturing was also observed in Rockbar 39 at the completion of Longwall 33, which is located 40 metres from the most eastern corner of this longwall.

Rockbar 39 is located in a similar position relative to Longwall 34 as Rockbar 36 is located relative to Longwall 33. Based on the observations to date, it is possible that similar impacts could occur along the Georges River, as a result of the extraction of Longwall 34, based on the approved finishing end of this longwall, which was designed to finish just short of the river.

IC therefore proposes to shorten the finishing end of Longwall 34 by one pillar length (i.e. 125 metres), so as to reduce the potential for further impacts on the Georges River. The location of the proposed modified finishing end, which is referred to as the *Modified Layout* in the remainder of this report, is shown in Drawing No. MSEC444-01, in Appendix A.

1.2. Predicted and Observed Movements along the Georges River for Longwall 33

The predicted mine subsidence movements along the Georges River, resulting from the extraction of Longwalls 29 to 33, were provided in Report No. MSEC208, which supported the SMP Application for these longwalls.

The profiles of predicted subsidence, upsidence and closure along the river, after the completion of Longwall 33, are shown as cyan lines on Fig. A.01, in Appendix A. The observed closure movements at the Georges River Cross-Lines are also shown in this figure as green circles. It can be seen from this figure, that the observed movements near Rockbar 36 (i.e. G-Line) and near Rockbar 39 (i.e. H-Line) are similar to those predicted at the completion of Longwall 33. The observed movements elsewhere are less than those predicted.

The predicted and observed subsidence, upsidence and closure movements at Rockbar 36, when the upstream pool was first observed to drop on the 27th November 2009, are provided in Table 1.1. The observed movements are those measured along the G-Line on the 25th November 2009.

Table 1.1 Predicted and Observed Subsidence, Upsidence and Closure at Rockbar 36 when the Upstream Pool was First Observed to Drop

| Location | Parameter | Subsidence (mm) | Upsidence (mm) | Closure (mm) |
|------------|-----------|-----------------|----------------|--------------|
| Rockbar 36 | Predicted | 50 | 110 | 125 |
| | Observed | 110* | 60* | 100 |

* denotes that the measured net vertical movement at the rockbar, taken at Mark G05, was 50 mm on the 25th November 2009. The upsidence of 60 mm was estimated based on the shape of the measured net vertical movement profile along the monitoring line. The conventional subsidence component was calculated as the addition of the measured net vertical movement and upsidence component. It is noted, that the actual upsidence and, hence, the actual conventional subsidence component could be greater than these values, as the monitoring line does not extend right up the valley sides.

1.3. Prediction Movements along the Georges River for Longwall 34

The profiles of predicted subsidence, upsidence and closure along the Georges River, resulting from the extraction of Longwalls 29 to 34, are shown in Fig. A.01, in Appendix A. The predicted profiles based on the approved finishing end are shown as red lines and the predicted profiles based on the proposed shortened finishing end are shown as blue lines. A summary of the maximum predicted mine subsidence movements along this river for each layout is provided in Table 1.2.

Table 1.2 Maximum Predicted Subsidence, Upsidence and Closure along the Georges River Resulting from the Extraction of Longwall 34

| Layout | Longwalls | Maximum Predicted Subsidence (mm) | Maximum Predicted Upsidence (mm) | Maximum Predicted Closure (mm) |
|-----------------|----------------|-----------------------------------|----------------------------------|--------------------------------|
| SMP Layout | Increment LW34 | 85 | 75 | 40 |
| | LW29 to LW34 | 95 | 135 | 120 |
| Modified Layout | Increment LW34 | 30 | 55 | 35 |
| | LW29 to LW34 | 45 | 125 | 110 |

It can be seen from the above table, that the maximum predicted incremental subsidence along the river, due to Longwall 34, reduces significantly as a result of the proposed shortened finishing end. It can also be seen, that the predicted incremental upsidence and incremental closure also reduce as a result of the proposed shortened finishing end.

As described previously, fracturing has already been observed in Rockbar 39, which is located in a similar position relative to Longwall 34 as Rockbar 36 is located relative to Longwall 33. A summary of the predicted mine subsidence movements at this rockbar for each layout is provided in Table 1.3.

Table 1.3 Maximum Predicted Subsidence, Upsidence and Closure at Rockbar 39 Resulting from the Extraction of Longwall 34

| Layout | Longwalls | Maximum Predicted Subsidence (mm) | Maximum Predicted Upsidence (mm) | Maximum Predicted Closure (mm) |
|-----------------|----------------|-----------------------------------|----------------------------------|--------------------------------|
| SMP Layout | Increment LW34 | 30 | 35 | 25 |
| | LW29 to LW34 | 55 | 110 | 120 |
| Modified Layout | Increment LW34 | < 20 | < 20 | < 20 |
| | LW29 to LW34 | 35 | 90 | 110 |

It can be seen from the above table, the predicted total subsidence, upsidence and closure at Rockbar 39 after the completion of Longwall 34, based on the Modified Layout, are less than those predicted at Rockbar 36 when the water levels in the upstream pool were first observed to drop during the extraction of Longwall 33.

The distance of Rockbar 39 from the finishing end of Longwall 34, based on the Modified Layout, is 270 metres, which is greater than the distance of Rockbar 36 from the finishing end of Longwall 33, which is 215 metres. This distance is similar to but is slightly less than the distance of Rockbar 36 from Longwall 33 at the time when the upstream pool was first observed to drop, which was 290 metres. It is noted, however, that Rockbar 36 is located immediately adjacent to the eastern corner of Longwall 32, whereas Rockbar 39 is located at a distance of 40 metres from the eastern corner of Longwall 33.

The proposed shortened finishing end of Longwall 34 by one pillar length (i.e. 125 metres) has been assessed to reduce the potential for impacts on the Georges River, whilst minimising the volume of coal sterilised.

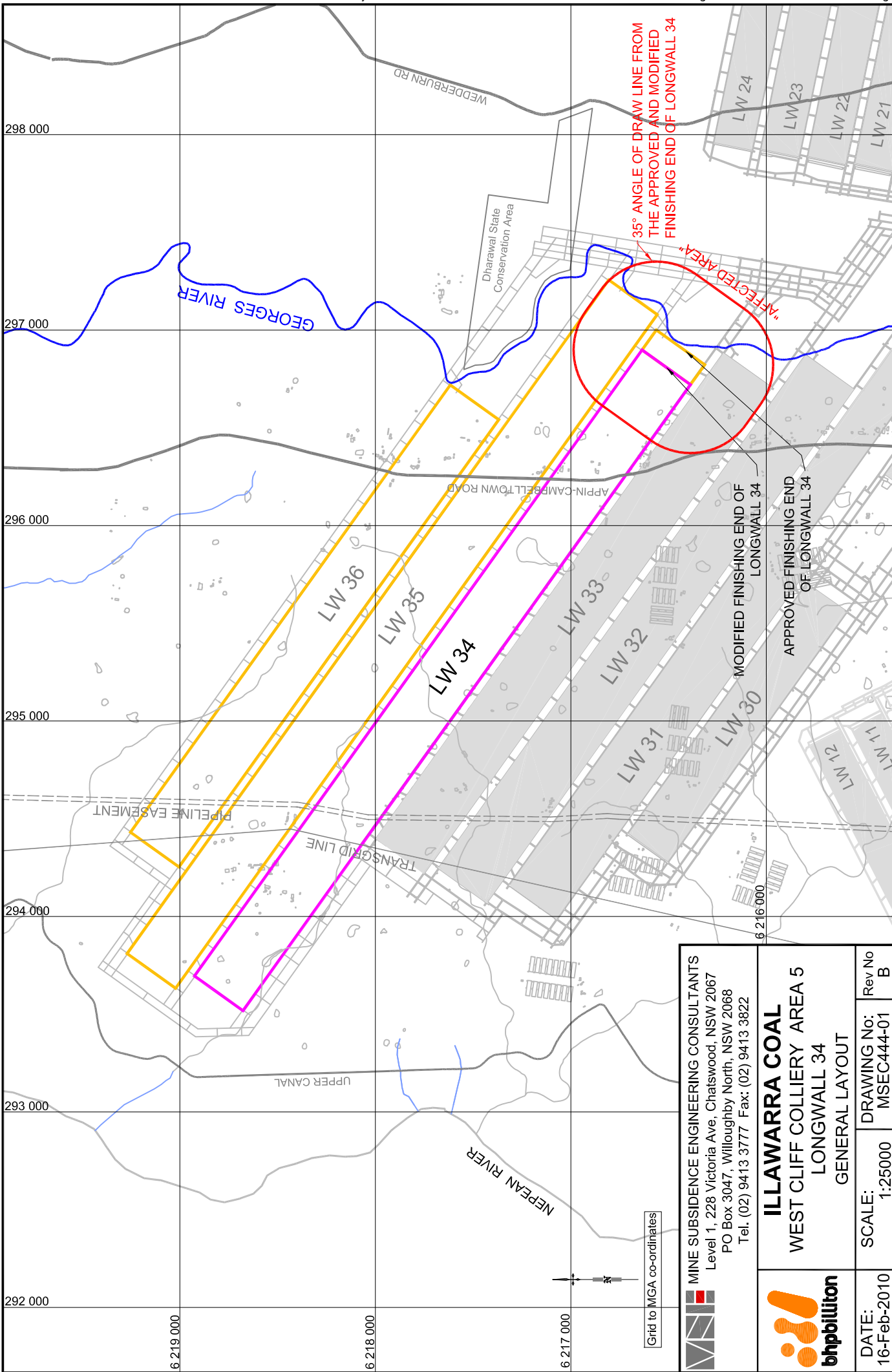
1.4. Effects of the Modified Finishing End of Longwall 34 on Other Features

The natural features and items of infrastructure near the finishing end of Longwall 34 are shown in Drawing No. MSEC444-02, in Appendix A. The *Affected Area* has been defined as the zone where the predicted systematic subsidence parameters, based on the Modified Layout, are different to those previously predicted based on the SMP Layout. The *Affected Area* has been based on a 35 degree angle of draw line around the finishing end of Longwall 34, based on both the SMP and Modified Layouts.

There are a number of features identified within the *Affected Area*, including small drainage lines, steep slopes, eight rural building structures, three farm dams, two houses, three archaeological sites and four heritage sites. The predicted mine subsidence movements at these features, based on the Modified Layout, are all similar to, but slightly less than those predicted based on the SMP Layout.

In consequence, the assessed levels of impact for these features reduce as a result of the proposed shortened finishing end of Longwall 34. The proposed management strategies for these features are the same as those previously provided in Reports Nos. MSEC208 and MSEC326 and the SMP Application.

APPENDIX A. FIGURES AND DRAWINGS



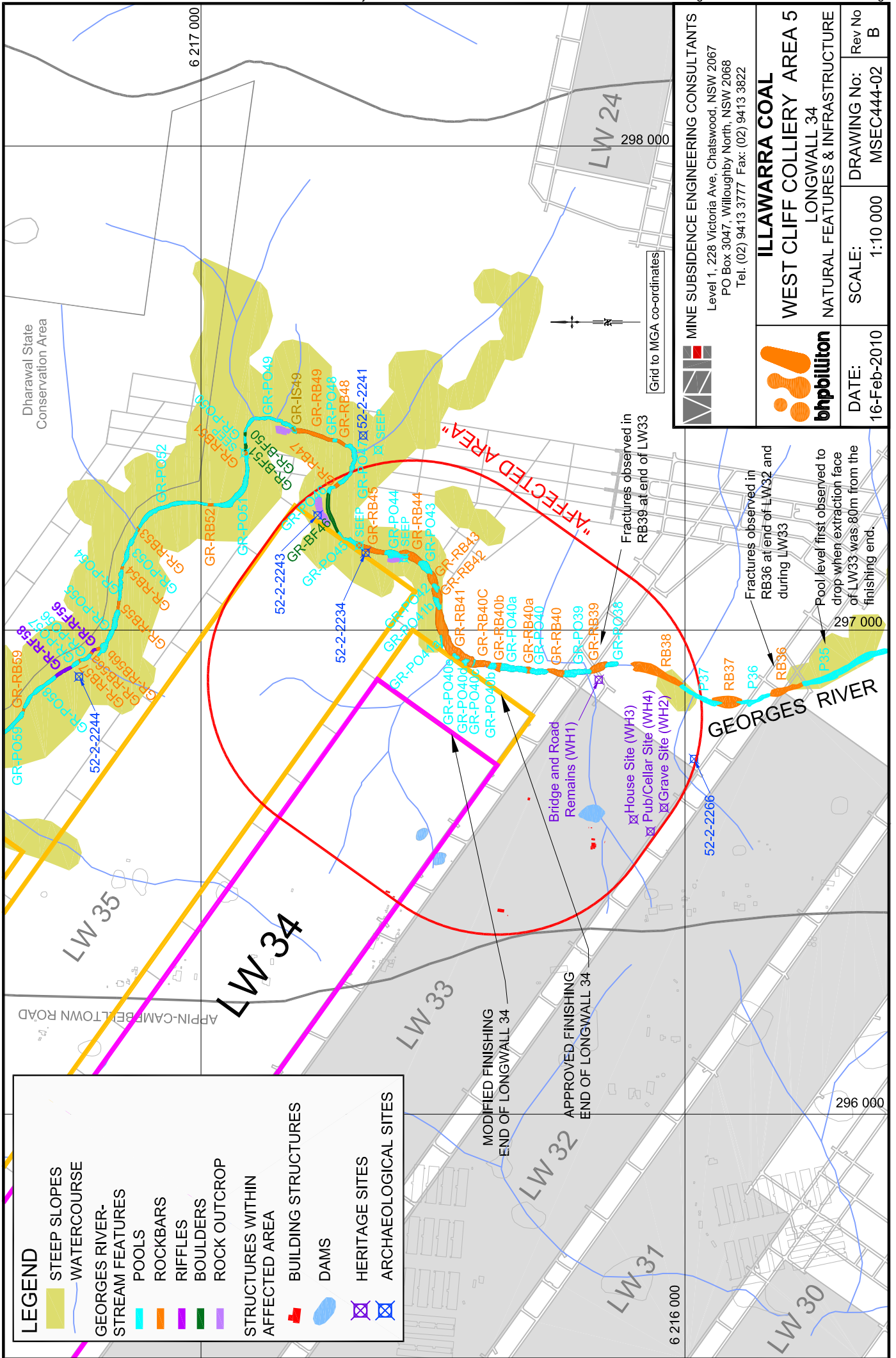
Grid to MGA co-ordinates

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ILLAWARRA COAL
WEST CLIFF COLLIERY AREA 5
LONGWALL 34
GENERAL LAYOUT

| | | | |
|----------------------|-------------------|---------------------------|-------------|
| DATE: 16-Feb-2010 | SCALE: 1:25000 | DRAWING No: MSEC444-01 | Rev No B |
|----------------------|-------------------|---------------------------|-------------|



Predicted Profiles of Subsidence, Upsidence and Closure along the Georges River Resulting from the Extraction of Longwalls 29 to 34

