Mining Geomechanics and Materials Engineering

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Hoskings Resource Management
1 Swann Road,
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Attention: Richard Hoskings

Dear Richard,

RE: GEOTECHNICAL EVALUATION OF SLOPE STABILITY
CENTRAL WEST COAL PROJECT

Background

Minserve provided a revised geotechnical assessment of slope stability for the projected 90m highwall in April, 2006. Since then the projected depth of mining has increased to 140m. This letter report presents the results of revised slope stability analyses for the Aviva Central West Coal Project taking into consideration the increased slope height.

Material Properties

The material input parameters used for the various lithological units in these analyses was the same as establish previously. The general condition of the rockmass is very weak with the different lithological units being saturated and of high porosity.

Slope Stability Analyses

Based on the revised material properties data a series of limit equilibrium slope stability analyses were made to establish the effect of slope angle and degree of saturation in the rockmass. Figure 2 presents the results of the fully drained slopes for slope angles of 25, 30, 35 and 40 degrees.

In our previous report it was demonstrated that the presence of groundwater in the slope would severely reduce the stability. Indeed optimising slope stability relies completely on

dewatering of the slope. Hence the impact of groundwater has not been included in this brief study.

Figure 1 shows the effect of dewatering 140m high 40^o slope. In the first plot the critical failure surfaces are shown for the case of the dry slope. The minimum Factor of Safety for this slope is 1.147. The second plot shows the critical surfaces for the case of a fully saturated slope. Subject to these conditions the slope will have a FoS of 0.745. The third plot is for the case of the groundwater table having been reduced to an elevation 100m below slope crest. The FoS for the dewatered slope is 1.123.

It is concluded from these analyses that a 140m high 40 degree slope will not achieve the minimum design criterion FoS of 1.3 irrespective of the groundwater condition.

Figure 2 presents a summary of the calculated Factors of Safety for a 140m highwall slope for the fully dewatered condition as a function of slope angle. Based on a design criterion of FoS=1.3 it can be concluded from this plot that the steepest 140m high slope that will be stable under fully drained conditions is 35^o.

Conclusions

The following conclusions are drawn from the analyses reported:

- The maximum slope stability that can be achieved for a 40^o slope which is 140m high is FoS=1.147.
- Based on a design criterion of FoS=1.3 it is concluded that the steepest slope that can be accommodated in a fully drained 140m highwall is 35^o

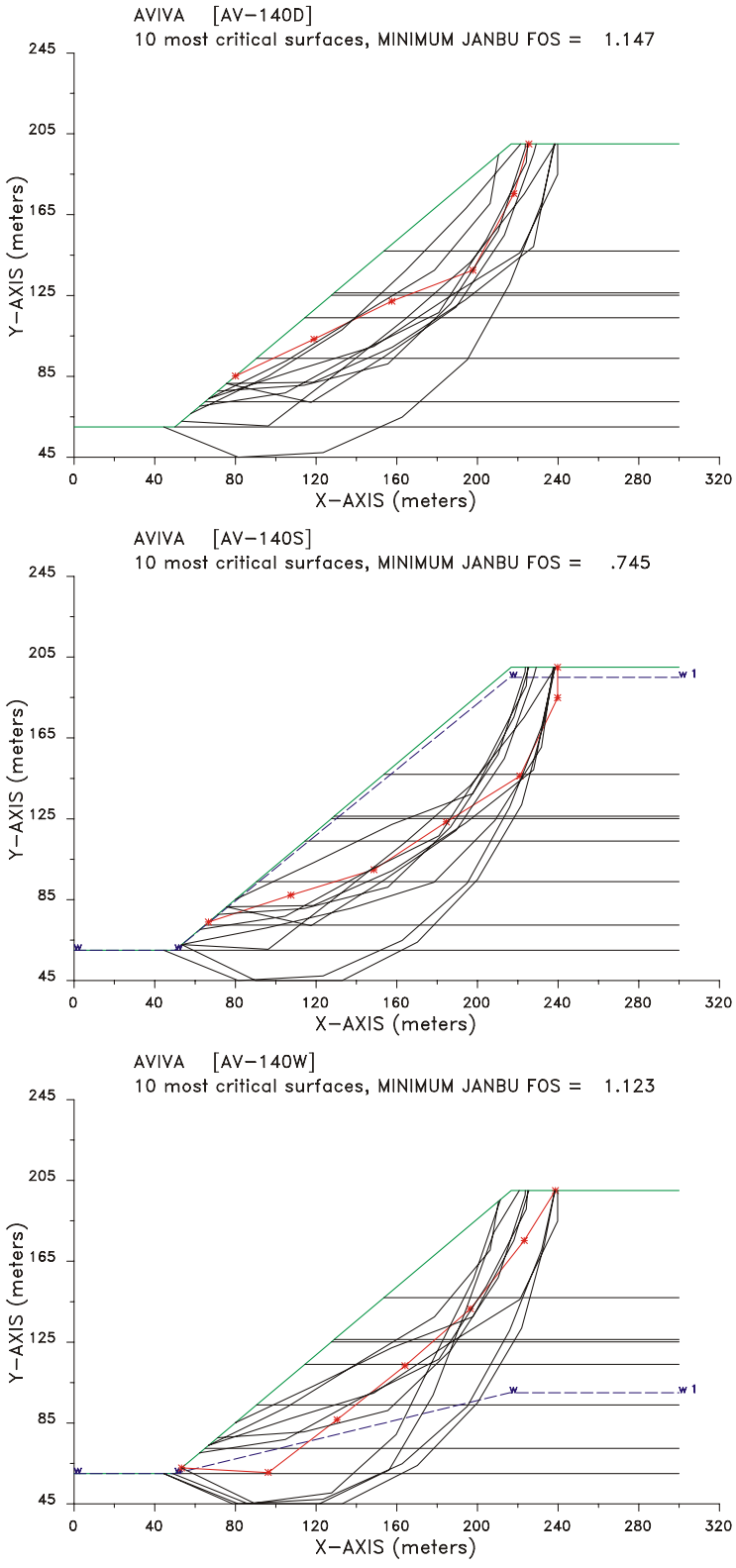

Figure 1 Effect of dewatering 140m high 40 degree slope

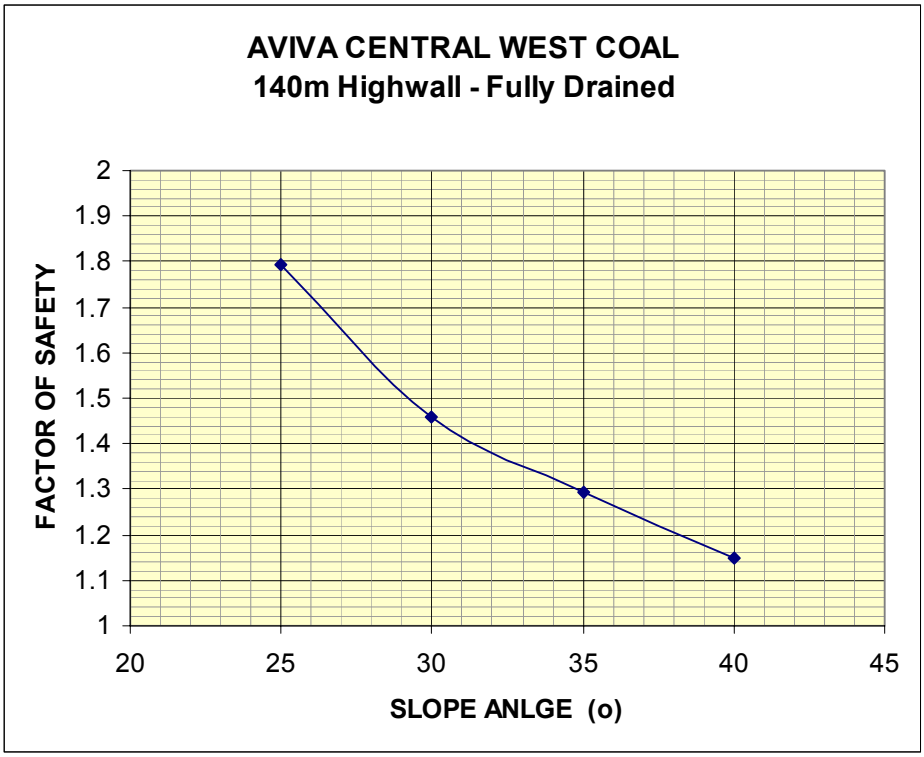

Figure 2: Summary of Slope Stability for fully drained 140m highwall

I trust that this letter report covers the full scope of your original request. If there are any further aspects which you wish to discuss or have included please give me a call.

Yours faithfully,

GEONET *Consulting Group*

Dr Ian H. Clark

Principal Consultant, Director