

CASE STUDY

Carbon14 Mine Scheduler and Carbon Economics

Title - Options analysis to decide on a decline position

Overview

A large platinum producer on the eastern limb of the bushveld complex was investigating a capital project for the development of a trackless mechanised underground mine.

The capital project team was requested to investigate a number of additional options that had not previously been considered before the Client was to take the project any further. As such a very tight deadline was imposed so as not to impact the intended project implementation start date.

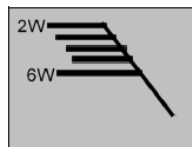
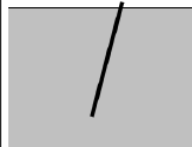

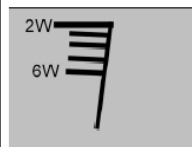
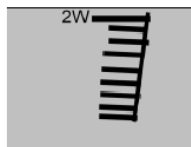
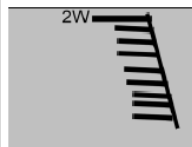
Business Challenge

The capital project team was tasked to investigate different mine design options which could not be evaluated with traditional mine planning solutions due to the tight time constraint of 4 months. A senior Mining Engineer, trained on Carbon14 Mine Scheduler was assigned to the project team.

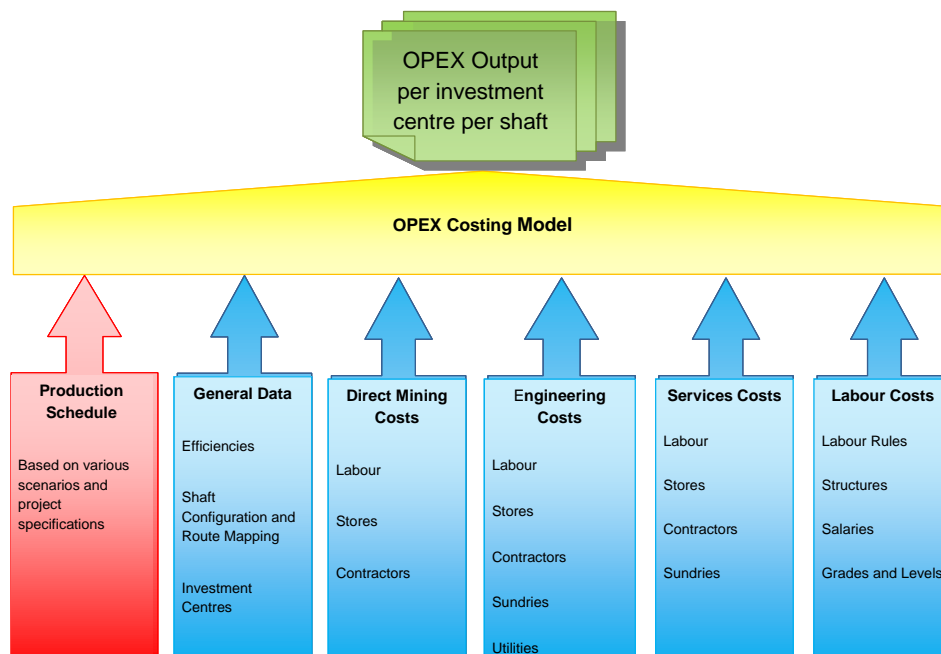
Management had asked that alternative mechanised mining options be investigated that impacted the mine layout and decline position.

Approach Taken

Nine different mechanised mining designs and 6 corresponding decline positions were identified by the project team. The six different decline positions are depicted in the table on page 2.

Option 1	Option 3	Option 4	Option 5	Option 8	Option 9
					
Apparent dip with access at Strike 2 to 6	True dip with surface access	True dip with access via Strike 2	True dip underground access via Strike 2 to 6	Mine through from Central shaft (all strikes)	Mine through from Central shaft (all strikes)

Each of the options was scheduled in Carbon14 Mine Scheduler with full labour, operating costs and project valuations completed using the Carbon Economics solution. The detailed activity costing performed in Carbon Economics is depicted below.



All design, scheduling and costing of the options were completed within three months.

Results

Once all the options were complete it was possible for the project team to test and adjust the mine design, scheduling and costing assumptions on a live model which demonstrated the impact on production, costs and NPV in a one day workshop. Carbon Economics allows for integration with the mine schedule and therefore every adjustment to the schedule automatically updates the capital profile, working costs and NPV.

The different options highlighted the following:

- Capital estimates did not vary significantly between the options.
- Life of Mine average operating costs were impacted by the length of time in which steady state production could be maintained.
- The steady state operating costs did not vary significantly between the options.

Conclusion

The options were evaluated based on the period of time in which peak production was achieved. As a result, options 1, 3, 8 and 9 were selected for further optimisation where higher annual production levels were attempted. The higher production levels shortened the Life of Mine by 5 – 6 years and improved tail management resulting in a significantly higher NPV.

The work done enabled the project team to recommend the best option with confidence. In addition it was possible to quantify the upside and to validate the impact of higher annual production in monetary terms. This value engineering would not have been possible using conventional planning tools.