

Scheduling solution uncovers value

Maptek™ Evolution scheduling solution has uncovered more than \$10 million in extra value for a Barrick Gold Corporation project in western Africa.

Massawa Gold Project is a large greenfields exploration project located about 700km southeast of Dakar, the capital of Senegal. In 2018, Barrick commissioned Maptek™ to produce a detailed strategic schedule and equipment study for Massawa.

Barrick had already completed a considerable amount of mine planning and now wanted to find out if Maptek Evolution could help increase Net Present Value (NPV) and optimise equipment utilisation.

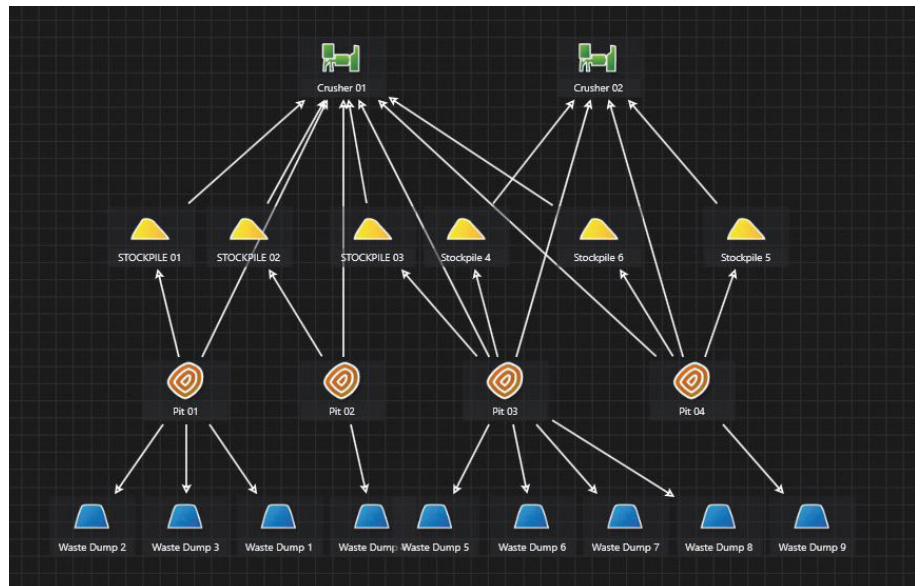
Any form of scheduling is a complex task, requiring considerable data preparation, heavy computational power and long processing times. The Massawa project was all the more complex due to its size and number of components. A total of 13 mine phases, 4 pits, 2 processing plants, 6 stockpiles and 9 waste dumps required scheduling.

Barrick wanted to maximise NPV and optimise haulage and equipment allocation, meet plant production targets and create a consistent waste mining profile.

Increasing NPV

Using Evolution allowed NPV to be increased by deferring waste and minimising equipment investment.

The first step involved exporting all of Barrick's data and previous designs into Maptek Vulcan™ mine planning package to design the pits and stages. This included block models, topography, waste dumps, current stockpiles and surfaces, tonnes and grade/blending targets, haulage routes, speed limits and equipment requirements.



Simple data transfer between Vulcan and Evolution allows full integration between mine design and scheduling.

Evolution uses industry-leading genetic algorithms, delivers systematic production schedules along with a practical development plan and is intelligent enough to concurrently consider multiple objectives.

Traditionally, many schedulers focus on optimising material movement, whereas Evolution optimises both haulage and trucking hours simultaneously rather than in two separate steps.

This results in time and cost savings, is far more practical and delivers a more achievable, realistic schedule.

The new Evolution production schedule for the entire site improved NPV by 2%, or \$10.5m, compared with the previous schedule.

Evolution optimised ore and waste movements in the four open pits, namely Sofia, Central Zone, North Zone and Delya, and estimated the minimum size of the haulage and equipment fleet required to deliver the proposed schedule.

As a result, Maptek proposed purchasing the minimum number of trucks during the early stages of mining.

A key feature of the new schedule was that waste mining was shifted towards the end of the life of mine which improved NPV, reducing costs by \$54.27m.

Waste was reduced by 16.7 Mt for the loss of only 53 Kt of ore across all pits.

Other highlights included redesign of staging to reduce stripping ratios early on in production, haulage hours being postponed to late in the strategic schedule, and providing a continuous supply of ore to the crusher.

Bringing forward value

The new schedule allows Barrick to reduce costs and improve NPV early in the life of mine, meaning it will be able to pay back its investment more quickly. Barrick now has a practical schedule that maximises the use of its truck and equipment fleet.

The Barrick project was able to deliver NPV, stockpiling, haulage optimisation, material movement and plant feed targets in a single run.

A unique solution

Evolution's highly evolved algorithms, cloud processing and ability to handle multi-objective optimisation transforms the scheduling process.

Evolution allows mine planners to undertake scheduling tasks which would take countless hours or have been impossible with other methods. The speed of delivering results means users can run and compare multiple scenarios with different parameters.

Evolution also enables haulage to be optimised on a block-by-block basis, rather than bench-by-bench, which helps improve NPV and reduce haulage costs compared to other scheduling approaches.

Users can create practical schedules to meet production with full control of bench turnover by period, minimum mining width and mining setback. Projects can be scheduled by available stages or phases and broken down into weeks, months, quarters and years.

Thanks to Barrick

