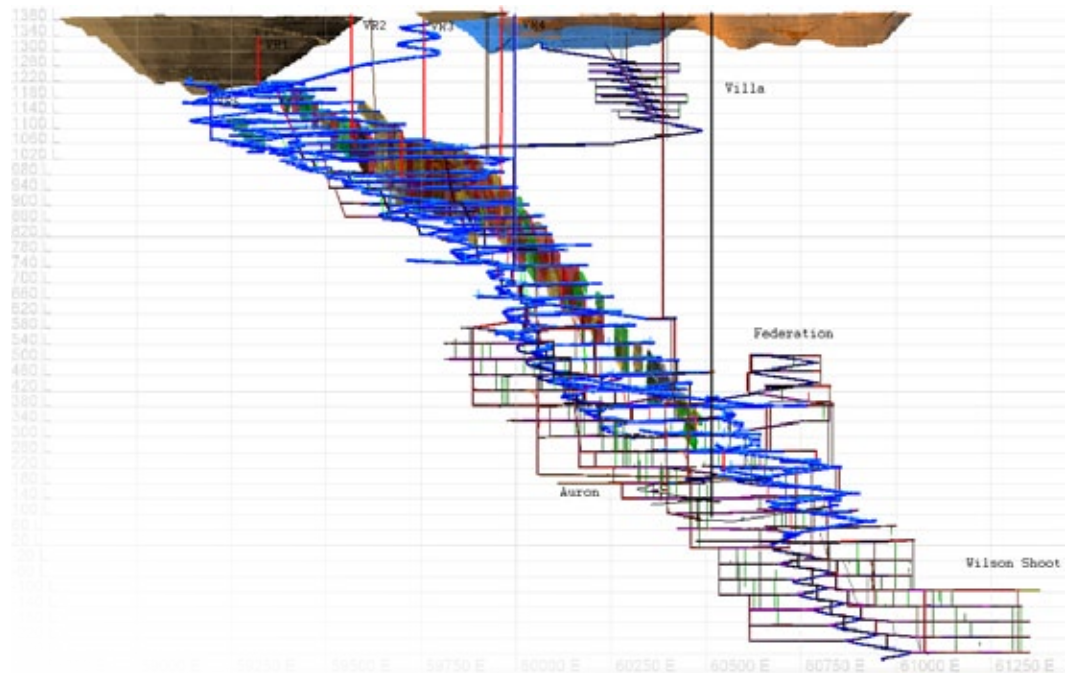# Vulcan helps shape Tanami

Newmont Asia Pacific recently tested the new Vulcan™ Stope Optimiser on scenarios for the Tanami Operations in the Northern Territory of Australia.

Long projection of Newmont's Tanami underground orebodies

> 'THIS IS A LONG PROJECT, AND WE'RE STILL WORKING ON IT. GETTING THE INFORMATION QUICKLY HAS MEANT THE PROJECT HAS NOT BEEN DELAYED. INFORMATION FROM THE VULCAN REPORTS CAN BE FED INTO THE MINE PLANS, AND USED BY THE GEOLOGISTS AS WELL.'
>
> Nadine Wetzel, Newmont Asia Pacific

Mining for gold began in the early 1900s and most recently from the late 1980s. Current production comes from the Callie underground orebody. Exploration and feasibility investigations continue as Newmont looks for opportunities to extend the life of the mine.

In early 2011 Newmont's mine planning team used the Vulcan Stope Optimiser, available in Vulcan 8.1, to assess how cut-off grade variations may affect the orebody expansion plans.

Newmont is looking to set up a haulage shaft at the Tanami which would allow the operation to reduce the cut-off grade at which stopes are mined. Improving economies of scale, and overcoming haulage and trucking constraints would mean they could extract more material from the mine.

Establishing a hoisting shaft for the main Callie orebody is expected to reduce the cut-off grade by around 0.5 g/t.

The Stope Optimiser was part of the process to assess the new haul shaft in terms of cut-off grades and volume of ore recovered. A dramatic time improvement was seen in getting results, over a manual design method.

The Stope Optimiser was run for a range of cut-off grades and several shape configurations. The results were tabulated in a spreadsheet to obtain expansion factors for tonnes and ounces. These factors were used in the mine schedule to prepare quick estimates for shaft scenarios.

'The results were enough to enable us to move on without having to re-design stopes manually', said Nadine Wetzel, Senior Mine Planning Engineer for Newmont.

'This is a long project, and we're still working on it. Getting the information quickly has meant the project has not been delayed. Information from the Vulcan reports can be fed into the mine plans, and used by the geologists as well.'

The Stope Optimiser was also run for the Villa orebody, which is a narrow vein type deposit close to the surface. A range of cut-off grades and minimum stoping widths were evaluated. Comparing the results in a spreadsheet helped the mine planning team to get a feel for the continuity of the orebody under a range of assumptions.
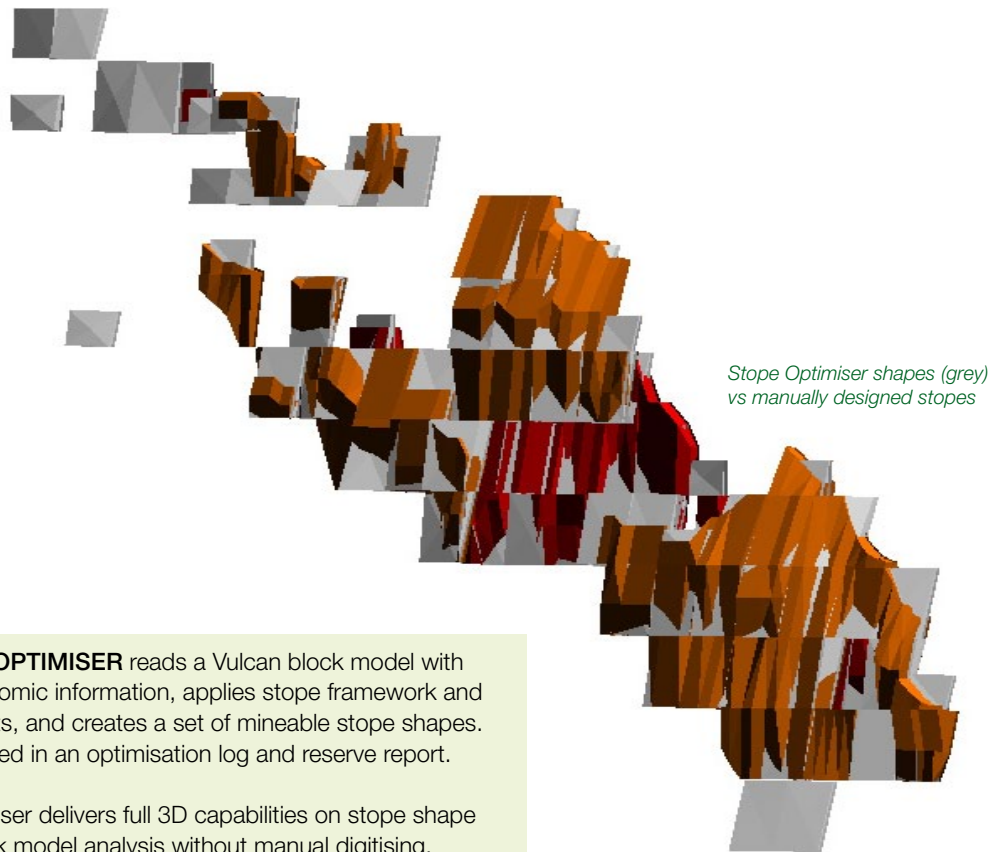
'The benefits of the Stope Optimiser are that it is very quick, its design parameters can be changed very easily and it gives a repeatable result every time with the same parameters. In comparison, if 2 or 3 engineers did this manually, different designs would eventuate from the same parameters. And you know that the Stope Optimiser generates the optimum design', added Wetzel.

The current version of the Stope Optimiser is an output of AMIRA's PRIMO research project.

Newmont was involved in sponsoring this project and is now sponsoring AMIRA's P1037 project which aims to continue development of the Stope Optimiser tool. Newmont is contributing experience and suggestions to the research project team, and looks forward to the results of the next stage.

Stope Optimiser shapes (grey) vs manually designed stopes

VULCAN™ STOPE OPTIMISER reads a Vulcan block model with either grade or economic information, applies stope framework and geometric constraints, and creates a set of mineable stope shapes. These are summarised in an optimisation log and reserve report.

Vulcan Stope Optimiser delivers full 3D capabilities on stope shape generation and block model analysis without manual digitising. Because reserving is incorporated, no iteration is required to produce the optimum 3D stope shape. Stope design time is reduced by 98% compared with manual design. Productivity is increased substantially.

Vulcan's 3D integration removes 2D cross-section constraints and enables multiple runs for analysing 'what-if' scenarios. Hanging wall and footwall visualisation allows the planner to have influence over the final stope design.

Further information about the Vulcan Stope Optimiser can be found at www.maptek.com/vulcan8.1/