

Evolution of gold extraction scheduling

Outside of the box thinking has helped provide a solution to an open pit heap leach operation scheduling challenge involving the reuse of leaching pads on a set footprint.

Coeur Mining operates the Wharf open pit gold mine in South Dakota, USA. Leaching is used to extract gold from the low grade deposit. In early 2021, Coeur implemented Maptek™ Vulcan™ and Evolution™ software for geology, mine planning and scheduling applications.

Scheduling of the open pit mining is relatively straightforward, with several material types and two fleets of both trucks and diggers to be considered.

The operation must properly track the planned tons sent to leach pads, which is critical for ensuring the proper amount of time is allocated for lifts to leach.

A unique aspect is planning the pad offload, since, unlike most leach operations that must leave and reclaim material in place, Wharf mine is permitted to reuse its leach pad footprint.

There are five pads within the approved footprint that use live leaching, and the reuse method requires the sequencing of material movement to include both stacking and unloading.

This component was not included in the initial Maptek software rollout due to its complexity, remaining a 'wishlist' item to scope once the main applications were covered.



After the primary implementation, Maptek Mining Engineer Amanda Wahrer spent a week considering the pad stacking and offloading challenge and produced a solution using existing functionality in Evolution Origin Solids.

'I was able to use the current features in Evolution in an outside of the box way,' Wahrer said.

The proposed solution uses existing tailings tracking to model the pad stacking portion of the process and models pad offload as a separate 'pit' model. The overlapping entities (pad stack and pad offload) are then sequenced via constraints and dependencies.

Prior to this solution, the client had to use separate planning tools to document all material movement. A majority of the scheduling was done in complex Excel spreadsheets and required many iterations.

Wahrer commented that the client appreciated having a solution contained entirely in a single Origin Solids setup – no other scheduling package they had investigated produced a usable method.

'The offloading meant Wharf mine wanted to move things twice, and they kept running into a software limitation that the scheduling tools were only able to say whether it was in the pit or the mill,' she said.

Wahrer enjoyed dedicating the time to collaborating and trying out different applications of the Evolution tools and was excited by the outcomes.

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