THE ÇÖPLER GOLD MINE, ERZINCAN PROVINCE, TURKEY

THE PROJECT:

The Çöpler Gold Mine, operated by Alacer Gold is one of the largest gold mines in Turkey and is located in the central eastern Erzincan Province.

The Definitive Feasibility Study for the Çöpler Sulfide Expansion Project has demonstrated robust financial returns from processing sulfide ore, and this has extended Çöpler’s Mine life to year 2037.1 Alacer pride itself on being a sustainable low cost producer. It’s focused on leveraging the cornerstone Çöpler Mine and strong balance sheet to maximize portfolio value, maximize free cash flow and minimise project risk.

Since 2013 Leapfrog Geo has been used to produce the Çöpler geologic model, the base for resource modelling. More recently, the mine has added Leapfrog Geo into the grade control process. This system is currently being developed, and will be improved as the needs of the mine change.

Loren Ligocki, Resource Geology Manager for Alacer Gold Corp commented, “Leapfrog Geo is used throughout our mine process due to its user friendly shape generation, data comparison and data presentation. Leapfrog is now supplementing our grade control process as it allows for the integration of information that wasn’t previously used, generating a more accurate model and further reducing our risk exposure.”

SITUATION:

Çöpler is currently an open-pit, heap-leach operation that is producing gold from oxide ore. It is centred on a composite diorite to monzonite porphyry stock that has intruded into the surrounding metasediments and limestone-marbles. Crossing these units are two main parallel east-northeast striking faults with smaller northeast/northwest striking faults between them, providing a permissive environment for the hydrothermal mineralisation.

Open-pit mining at Çöpler is a typical drill, blast, load haul operation. The Çöpler plant now has the capacity to process approximately 17,000 tonnes per day of oxide ore. Grade control is a key function that dominates the mining geologists day-to-day activity. This includes taking into account the planning of data collection, physical collection of data, management of that data, interpretation, modelling and production of practical excavation plans.

During resource model updates, Leapfrog Geo is used for the validation step of both block models and resource cones. Estimated block grades are imported into Leapfrog Geo to more easily compare drilling, geology, production data (when available) and resource cones. Loren Ligocki, Resource Geology Manager explains, “While this comparison is possible in other software packages, Leapfrog Geo excels in showing relationships and has the ability to quickly change visual parameters to answer on-the-fly questions by setting the opacity, changing the value filter and checking against production data. Other packages require the reload of data to change the colour scheme or to include/exclude samples.”

“One of the benefits of using the Leapfrog method during grade control is the ability to use information from previous mining.”

Emre Tasdildiren, Chief Mine Geologist

USE IN THE GRADE CONTROL PROCESS

The primary software package at Çöpler is Vulcan. Vulcan’s grade control module had previously been used for the entire process. Leapfrog has been introduced at the start of the grade control process as it enables all of the assay information to be used, reducing risk and producing a better grade estimate. Leapfrog supplements the grade control process.

One challenge was to generate a process that updates quickly, as this information is used on a daily basis meaning computer run time needs to be reasonable.

Emre Tasdildiren, Chief Mine Geologist says, “One of the benefits of using the Leapfrog method during grade control is the ability to use information from previous mining. Blast holes from overlying benches are considered (flagged) when generating block grades. We feel this is an improvement over the prior estimation method that only used blast hole data from the one active bench.”
Leapfrog uses the blast hole information to develop shapes to estimate and set out grade control markers for the line operation team. Leapfrog’s grade shells lead the market and are a useful way to visualise a 3D block model according to a particular grade value or a range of values.

Emre Tasdildiren, Chief Mine Geologist explains, “Using the above steps, within a period of 10 minutes we can generate a grade shell to be used in daily grade control work. We are able to quickly export this grade shell to Vulcan. The software is quick to generate solids and the ability to export shapes to other packages is a positive.”

At present, production files containing blast hole information are loaded into Leapfrog on a daily basis. This information is used to update gold grade shells for sample selection during the grade estimation process. The resulting estimate is used for ore control markout, accomplished in Vulcan. At some point, the site may add in the ODBC link to Leapfrog Geo from an Access data set to assist manual transfer.

**OUTCOME**

“Leapfrog Geo has supplemented our grade control process with the easy generation of grade shells, allowing us to implement this process on a day-to-day basis,” says Loren.

Emre adds, “It has also accelerated the flow of information within the team. We use screenshots and on-screen presentations for this purpose.”
I often import all the blast hole information into Leapfrog Geo to get an entire picture of mining to date. I then compare ground activity with all the other data information.

Loren Ligocki, Resource Geology Manager for Alacer Gold Corp

MORE TIME TO HYPOTHESIZE

Emre continues, “The interface itself and the way the software works is rapid. Its interface is very simple and steps are not complicated. Modelling your data does not take too much time, so you can spend more time considering additional ideas and scenarios. The team became familiar with the software and started to make use of it quickly.”

The Leapfrog UK team has been on hand to provide ongoing training as new software features are added. Troubleshooting has also been provided by the local Leapfrog team in Turkey. Samed Guven, Mine Geologist says, “Refreshment trainings can be beneficial as it keeps the users up to date with recent changes and improvements to the software.”

At Alacer Gold Corp in Denver Loren Ligocki has also used Leapfrog Geo to provide an overall managerial perspective of the Turkey operation. He comments, “I often import all the blast hole information into Leapfrog Geo to get an entire picture of mining to date. I then compare ground activity with all the other data information.”

A similar approach is taken with surrounding development projects; a geologic model from Leapfrog Geo is generated and then used during downstream work on grade estimation. Loren concludes, “New ways are being explored to use the software for improved reporting and transparency of mine reconciliation.”

Leapfrog’s Regional Director for North America, Rob Ferguson says, “This example of how Leapfrog Geo is used at the Çöpler Mine demonstrates that Leapfrog has the flexibility to rapidly add value, in this case in the production environment. We look forward to continuing to work with Alacer to help them further improve their geological modelling and reduce their risk exposure.”