NEWSLETTER – February - 2021

Pilots in operation

HELLENIC COPPER MINES (HCM)

The X-MINE project is currently demonstrating how novel use of X-Ray Fluorescence (XRF) and X-Ray Transmission (XRT)-sensing technologies integrated in drill core scanning and with 3D vision in mineral sorting equipment can improve the efficiency and sustainability of mining operations.

Figure 1. Short drill core samples from West Apliki

The mines are of different sizes (from small-scale to large-scale) and target different minerals (zinc-lead-silver-gold, copper-gold, gold). The four sites offer different geology and challenges to the equipment which widens the experience base for the continuous development of the technology.

At HCM the technology has been applied to drill core (Fig. 1 and 2) and samples from reverse circulation (RC) drilling (Fig. 2).

The project has deployed combinations of the technologies in 4 existing mining operations in Sweden, Greece, Bulgaria, and Cyprus.

Altogether, experiments and installations of four drill core analyser pilots, one for each mine, and two sorting pilots, shared between three locations, are, and have been, carried out.

Figure 2. Drill chip samples from RC-drilling and bottom, drill core from the Mathiatis deposit

The cores are part of a systematic exploration campaign at the Apliki copper deposit.

Figure 3. Preparation of the cores for scanning

The core has been scanned with the base metal version of the X-MINE-drill core scanner (Model GX-10 by Orexplore) and the data is used for ore body definition, 3D-modelling, resource calculation and a review of the business plan which examines the possibility to reopen the Apliki mine.

Gold ore samples from Skouriotissa and Stroggilos - Mathiatis (Fig. 2) have also been collected for scanning.

Figure 4. Arrival of the GX-10 scanner at HCM

Figure 5. Training

Within the X-MINE project there are also plans to deploy a drill core scanner with increased sensitivity for gold, such a version would be an excellent opportunity for exploration and estimation of resources of small-scale gold bearing deposits that could potentially feed the existing Skouriotissa gold plant.

Figure 6. Scanning procedure: inserting the core, setting the depth, scan in progress.

Figures 3, 4, 5 and 6 show the arrival, initiation of experiments, training, and demonstration at the Hellenic Copper Mines' premises. The results from the drill core scanner are deployed mainly in the field of exploration, 3D modelling and estimation of mineral resources.

Field exploration and ore body definition

The samples from the drilling campaigns will be scanned with the drill core scanner. A large benefit is that the geologists can examine, evaluate, and process the obtained data (mineralogy, density, lithology, structural geology, and geochemistry) in a very short time.

Hellenic Copper Mines will also use the results from the drill core scanner for better selective mining to avoid the extraction, transportation, and processing of refractory (chalcopyrite) ore which is not amenable to leaching.

3D Modelling and estimation of mineral resources

Results from the scanner are included in the block model which is part of the foundation for business planning and decision making.

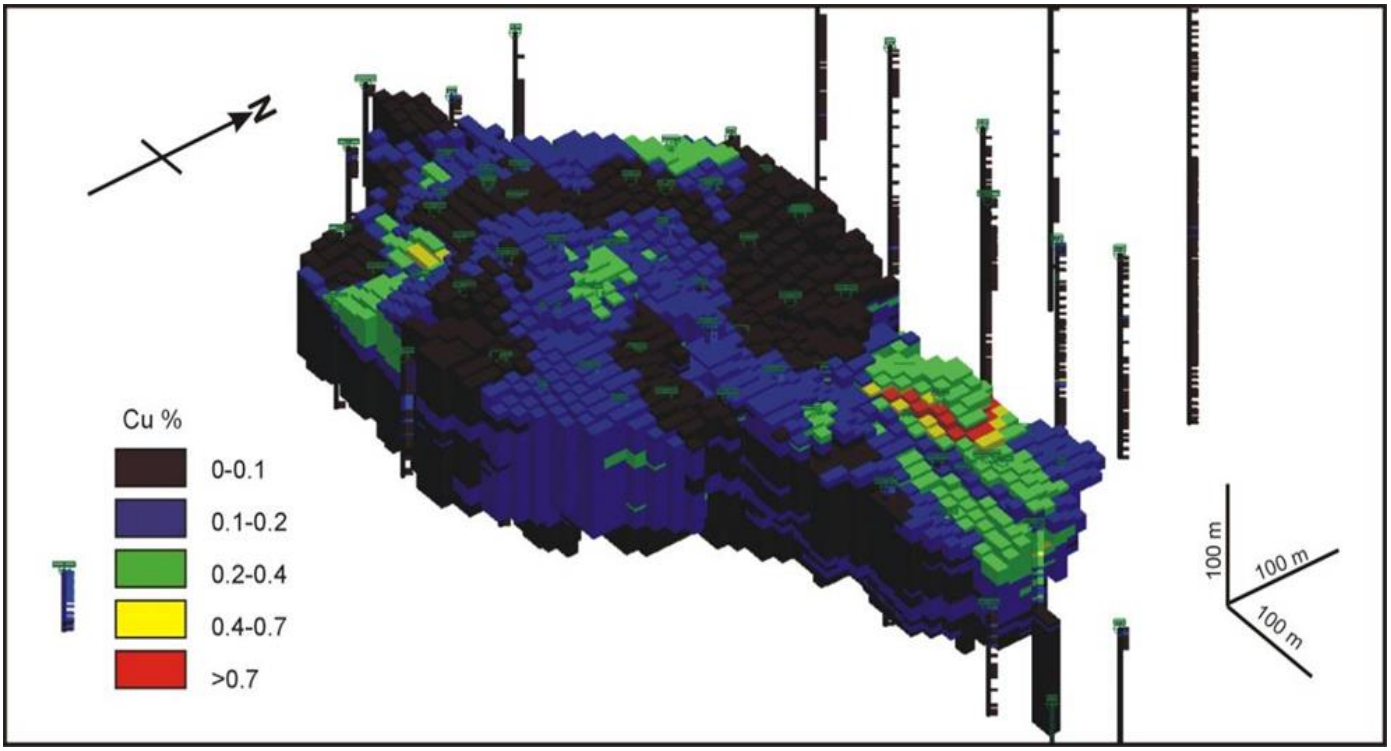

Figure 7. Existing block model of West Apliki deposit

Results from the drill core scanner also provides detailed information on alteration, leading to a better understanding of the ore deposit genesis and more accurate and quicker 3D modelling (Fig. 7) and resources calculation.

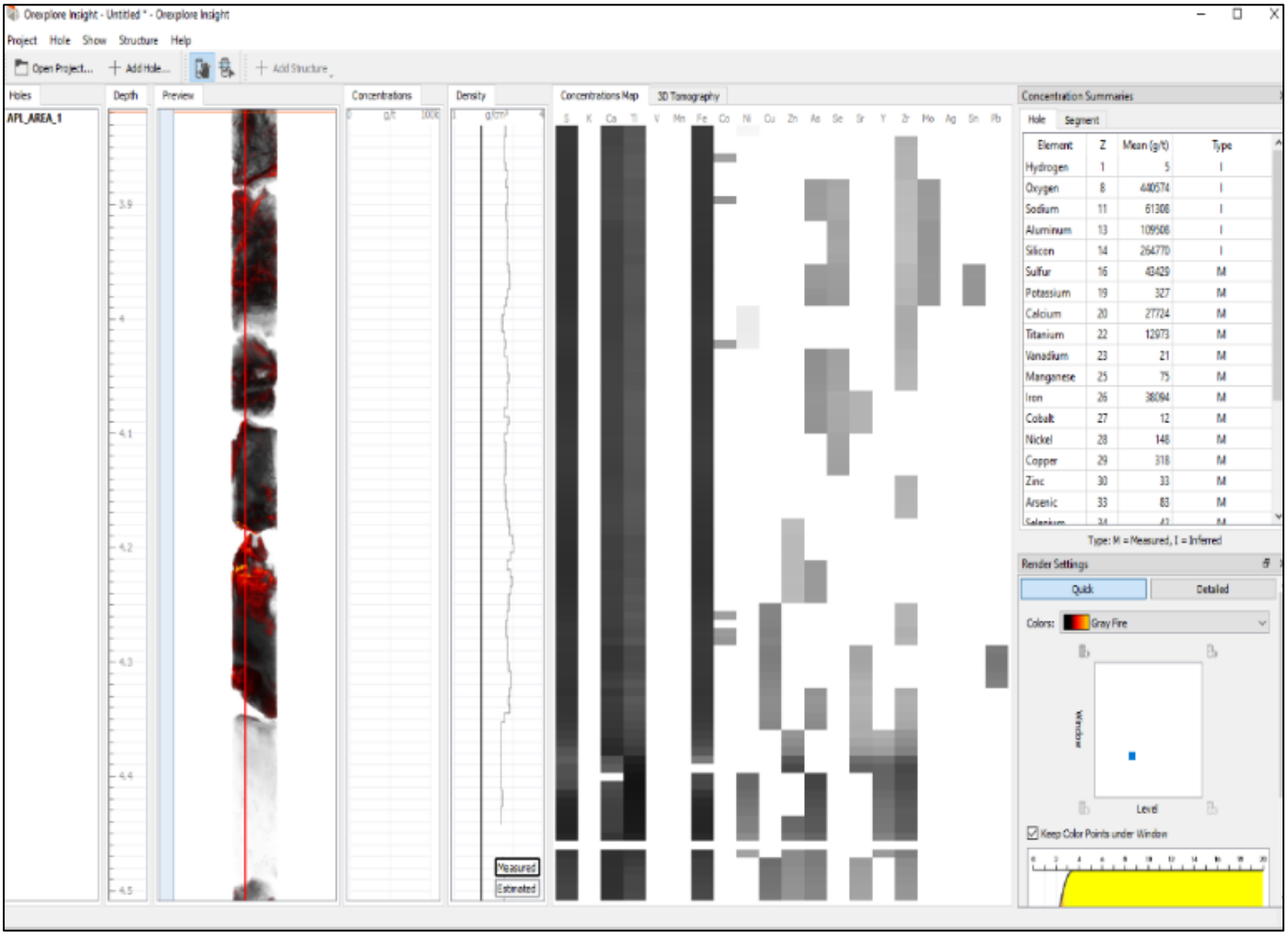

Figure 8. Results of scanning displayed in Orexplore's Insight software.

An improved 3D model will also be made for the Apliki mine. Evaluation of the first results indicate that the unit delivers invaluable information about the drill core that has not previously been accessible to the mine geologist.

The tomographic imagery is very useful and gives detailed information about structure, distribution of individual minerals and indicative chemistry (Fig. 8 and 9).

X-MINE

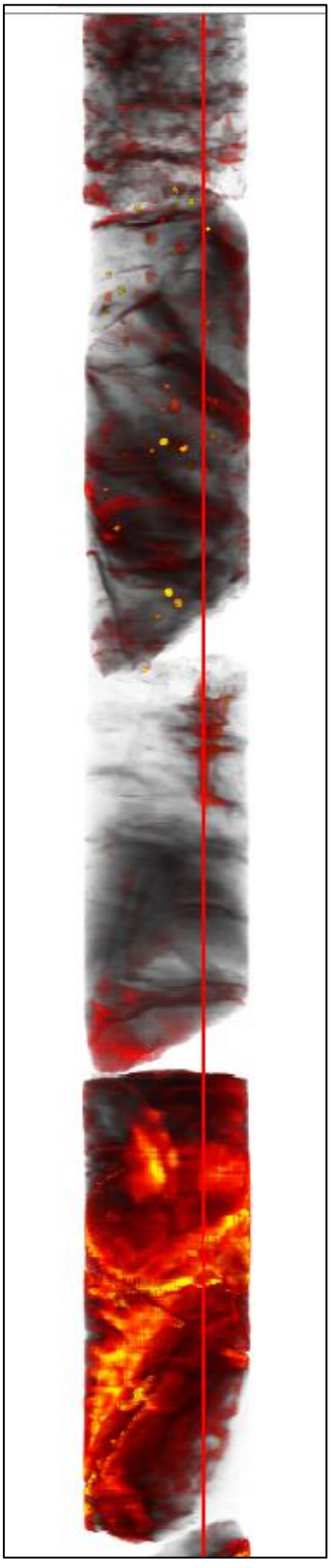

Figure 9. Tomographic image of drill core

Hellenic Copper Mines is thrilled to continue with the scanning and obtaining the results as the company believes that the X-MINE project is very promising and that it will have high impact on the mining industry.

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