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Ore deposits of Western Anatolia, Turkey – Sofia University SEG Student Chapter field trip, 2022

Рудни находища в Западна Анатолия, Турция – геоложка екскурзия на Студентската секция към Асоциацията по икономическа геология на Софийския университет, 2022

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Sofia University SEG Student Chapter has organized a field trip to Western Anatolia, Turkey from 14th to 18th of June 2022. The aim of the trip was to contribute the students understanding of the geological characteristics of Western Anatolia, Turkey, and to provide insights into the exploration and exploitation of different types of deposits, by visiting the Efemçukuru gold mine, Kışladağ gold mine, TV Tower Property Epithermal & Porphyry Prospects, Ayazmant deposit and Lapseki Project. Participants in this year's field trip were total of 8 people: 4 students from Sofia University SEG Student Chapter, 3 students representing First Quantum Minerals Ltd. and one representative of Velocity Minerals Ltd. We also had the pleasure of having Prof. Tolga Oyman as our guide in Turkey.

On the first day of our trip, we visited the Efemçukuru gold deposit, where the mineralization is a typical low sulphidation epithermal vein type, developed in an active fault setting. Vein textures are typical of an epithermal system, where the gold was precipitated by boiling of the hydrothermal fluids and also by chemical reaction with the surrounding wall rocks.

Gold mineralization is concentrated in steeply dipping quartz and quartz-rhodonite veins, hosted

by altered hornfels and phyllites. Gold is fine-grained, occurring as free grains in quartz and rhodonite gangue and locked in grains of pyrite (95% of all Au), galena and sphalerite. The mineralized zone forms three distinct shoots that are currently open at depth – in some shoots with average grade of 20 g/t Au.

Next day we visited the Kışladağ gold-only porphyry type (Baker et al., 2016) open-pit deposit, and its leach pad. The Kışladağ deposit is hosted by a suite of nested subvolcanic monzonite porphyry intrusions that are subdivided into Intrusions #1, #2, #2A, and #3. Intrusion #1 is the oldest, and generally best mineralized phase. It forms the core of the system and is cut by the younger porphyritic intrusions.

On the third day we went to the Ayazmant Fe–Cu skarn deposit. Ayazmant deposit is associated with a magmatic–hydrothermal system formed in a high-level porphyry environment by the Kozak pluton. The skarns (well-developed endo- and exo-skarns) mostly occur in limestones. The main ore mined there is magnetite, but Cu is extracted as a by-product from chalcopyrite. Sulphides are accompanied by gold with grades up to 1–2 g/t.

During our last day we visited TV Tower Property – Epithermal & Porphyry Prospects. TV Tower

is underlain by hydrothermally altered intermediate volcanic rocks and intrusive bodies. The property contains nine targets including Küçükdağ, Kayalı, Karaayı/K2, Columbaz, Valley, Kestaneçik, Gümüşlük, Tesbihçukuru and Kartaldağ West. The Küçükdağ target (the best explored), hosting the third largest silver resource in Turkey, is characterized by a high sulphidation gold-pyrite-enargite assemblage and associated silicification and advanced argillic alteration (Oyman, 2019) with grades that go up to 15.8 g/t and in Columbaz – up to 2.5 g/t.

After TV Tower, we visited the Lapseki Gold and Silver Project – an epithermal gold-base metals deposit. The project consists of a series of low sulphidation style epithermal quartz vein zones namely, Karatepe, Karakovan (KK1, KK2 KK3), Kestanelik – “K” (K1, K2, K3, KS and KW) (Oyman, 2019). The veins are hosted within Paleozoic metamorphic rocks and Lutetian quartz-feldspar-hornblende porphyry stock (Ünal-İmer et al., 2013). The mine is underground and four open pits are operating. The average grades for Au are 1.85 g/t and for Ag – 1.86 g/t.

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