



Western Anatolian precious metal deposits – 2013 Sofia University Society of Economic Geologists Student Chapter field trip

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The Sofia University Society of Economic Geologists (SU SEG) Student Chapter organized a field trip to Western Anatolia, Turkey. The main purpose of the trip was to introduce the students with different types of gold deposits and provide insides of their exploration and exploitation. In addition to SU SEG student chapter members the six days field trip joined professors from Sofia University “St. Kliment Ohridski” including, two students from the newly formed Mugla University SEG student chapter, Turkey and four geologists from the industry (First Quantum Minerals Ltd.). Both SEG Student Chapters’ academic advisers Assoc. Prof. K. Bogdanov and Prof. I. Kuscü were our trip leaders.

During the six days we traveled over 2400 km and visited seven gold and base metal ore deposits. The gold deposits are related to Late Alpine extensional tectonics in Western Turkey and the associated magmatic activity developed in the Eocene–Miocene (Yigit, 2012). The genetic deposit type varies from porphyry, high sulphidation (HS) through intermediate sulphidation (IS) to low sulphidation (LS) epithermal and iron oxide-copper-gold (IOCG) styles.

Our first visit was at Sahinly IS gold deposit (Yildirim, Cengiz, 2004). It is still in exploration stage and we were shown the area where the future open pit will be situated and some outcrops with the typical mineralization. Afterwards we visited the drill core warehouse and observed some core samples. The estimated resources for Sahinly are 2.7 Mt at 5.76 g/t Au. They are expected to rise with around 50% continuing the exploration. The exploitation stage is planned to start in 2016.

The second day we visited Kartaldag HS Au deposit. The area has long exploitation history starting from ancient roman times. Since 2011 it is being explored and the resources are being estimated at 4.25 t at 4 g/t Au. The company has six months of exploration and afterwards they will decide whether to start exploitation. We were shown typical HS hydrothermal alteration zoning starting from outside: propylitic → quartz-kaolinite → quartz-alunite → vuggy silica and local quartz-adularia alternation.

Our next stop was at Halilaga Cu-Au-Mo porphyry deposit. The deposit, still in exploration stage, is exposed on the surface. It is covered by colluvial sediments in its eastern part only. The approximate stockwork ore body size is about 800 × 1000 m. Diopside-andradite skarn type mineralization occurs along west margin of the porphyry body, while HS epithermal system is situated on both NW and SW sides of the Cu-porphyry stockwork. We sampled an outcrop where perfect stockwork structures where clear “B” and “D” veins’ relations could be observed. An indicated resources are estimated on 168.16 Mt at 0.30% Cu, 0.31 g/t Au and 0.006% Mo.

During the third day we visited two open pit deposits near Balikesir. The first one was Samli IOCG deposit. The mineralization is attached to the contact of the Samli pluton and to the host metamorphic rocks (Kuşcu et al., 2010). The main ore is dominated by magnetite. The Cu grade is 0.2% and Au – 8 g/t. Both have not been exploited yet. The annual production of magnetite is about 250 tons. The next deposit that we

visited the same day Balya is a Pb-Zn vein type mine that has been mined since 1880. It is supposed to be a distal mesothermal system with a porphyry system expected in depth. The mine produces 50% of the Pb in Turkey. A small group has got a chance to enter the underground mine with mining bus to 795m level. The geologists showed us the main ore veins which consist mainly of galena, sphalerite, pyrite and chalcopyrite and we were lucky to collect samples.

The next day we visited Ovacik LS Au deposit near Bergama. It consists of high-grade gold-bearing epithermal quartz veins hosted by andesite-dacitic lava dome of Miocene age (Yilmaz, 2002; Yilmaz et al., 2007). A resource of over 2.98 Mt at 9.0 g/t Au has been reported. We were deeply impressed at the high ecological standards kept by the mine during the carbon in pulp (CIP) leaching process of the ore.

During the last day we have visited Efemçukuru deposit that is a typical low sulphidation epithermal vein deposit. We observed and sampled vein textures that are typical for an epithermal system where the gold has been precipitated by boiling of the hydrothermal fluids. The proven and probable resources are estimated at 3.78 Mt at 10.04 g/t Au.

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