SEG 2017 Conference

Developing a newly discovered gold district in southwestern Mongolia

Michael A. MacDonald*, Peter C. Akerley, Michael X. Gillis, Bat-Erdene Gendenjamtsyn

*Erdene Resource Development Corp., Dartmouth, Canada, NS, Email: mmacdonald@erdene.com

Since 2009 Erdene Resource Development Corp. has focussed its exploration activities on southwest Mongolia, especially in the Edren Paleozoic island arc terrane. In addition to advancing the Zuun Mod porphyry Mo-Cu deposit (218 Mt at 0.057% Mo and 0.069% Cu) the company has made two grassroots epithermal Au discoveries, Altan Nar (AN) and Bayan Khundii (BK). The Edren Terrane is characterized by Devonian to Carboniferous andesite flows and pyroclastic units, interbedded with marine clastic and chemical sedimentary rocks that were intruded by a series of granitoid intrusions with compositions mostly ranging from granodiorite, monzonite, and syenite to granite, with minor gabbro and diorite.

Altan Nar, discovered in Q3 2011, is an epithermal Au-Ag-Pb-Zn deposit with intermediate sulphidation features within a 5.6 by 1.6 km mineralized corridor containing 18 targets. Two targets, Discovery Zone and Union North, have a combined maiden resource estimate of 249, 000 oz. (indicated & inferred) gold equivalent (AuEq) averaging 2.5 g/t and 2.1 g/t AuEq respectively (calculated using US$1, 200/oz. Au., $18/oz. Ag, and $0.90/lb for Zn and Pb). The mineralization of these bodies have a moderate Ag: Au ratio (~8) and contain base metals (0.53% Zn, 0.34% Pb) and abundant Mn and Ca carbonate gangue minerals. Mineralization is hosted by andesite flows and pyroclastic units and is confined to structurally controlled N-S and ENE trending zones with associated white mica alteration. AN resembles some carbonate and base metal-bearing epithermal deposits of southeast Asia, such as Kelian and Porgera. In contrast, Bayan Khundii, discovered 16 km from AN during a regional exploration program in Q2 2015, has characteristics typical of low-sulphidation epithermal deposits, with a low Ag: Au ratio (mostly 0.2-1.5) and very low base metal content, the presence of arsenopyrite and pyrrhotite, and lack of carbonate gangue aside from very minor rhodochrosite. Unlike AN, BK mineralization is hosted by pervasively quartz-illite-altered lapilli and ash tuffs, locally welded. Gold occurs in comb textured and multiphase quartz-adularia-specularite veins, quartz-hematite breccias, and hematite-specularite veinlets. Part of the deposit is unconformably overlain by Cretaceous basalt and sedimentary units.

A preliminary rock-chip sampling program at BK returned up to 4, 380 g/t Au and 570 g/t Ag, leading to an aggressive exploration program initiated in the second half of 2015, including geological mapping, structural analysis, soil geochemistry, magnetic and induced-polarization surveys, mineralogical study, and Short-Wave Infrared analyses. To date, approximately 11, 340 meters of drilling in 96 drillholes has been completed, with local bonanza Au grades (up to 306 g/t Au over 1 m) encountered within broad mineralized envelopes (e.g., 65 metres averaging 6.3 g/t Au, including 12 metres of 29 g/t Au). Results from recent drilling, coupled with geophysical data, indicate the mineralized Devonian tuffs extend beneath the Cretaceous cover.

The Edren Terrane contains porphyry Mo-Cu and intermediate- and low-sulphidation Au-Ag±Pb-Zn deposits hosted by andesite volcanic rocks. It resembles fertile island arc settings

around the world, mostly younger, and is emerging as a new gold district in a remote, poorly known area of Mongolia.