

## **The Malmyzh porphyry Cu-Au discovery, Khabarovsk Krai, Far East Russia**

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The Malmyzh porphyry copper-gold project is a district scale discovery in a prospective, under-explored region of Far East Russia. The project is located 220 kilometers northeast of the city of Khabarovsk and the nearby border with China. Malmyzh was a Phelps Dodge (now Freeport-McMoRan Exploration Corporation) grassroots exploration project starting in 2006, with IG Copper LLC advancing the project to discovery and earning a 51% joint venture stake in 2011. The project area was selected for initial reconnaissance exploration based upon a prospective regional geologic setting composed of a collage of accretionary complexes and magmatic arcs active during the Cretaceous through Early Tertiary. Other essential selection factors included nearby transportation and power options, and proximity to Asian copper concentrate markets.

Malmyzh's multiple Cu-Au mineralized porphyry centers occur within a northeast trending, 16 x 5 kilometer intrusive corridor of multi-phase dioritic to granodioritic stocks that intruded and hornfels-altered Early Cretaceous turbidites. The turbidites were accreted onto the Asian continental margin and subsequently subjected to Late Cretaceous intrusive activity inferred to be related to Sikhote Alin arc magmatism.

Copper-gold mineralization, principally hosted in porphyritic diorites and hornfelsed sandstones and siltstones, consists of near-surface chalcocite (at 10-70 meters from surface) that transitions to primary chalcopyrite and chalcopyrite-bornite-magnetite mineralization. Mineralization extends from subcrop (~1-50 meters) to >400-850 meters depth. Higher grades are associated with biotite-magnetite and chlorite-magnetite alteration and quartz stockworks. Multiple Cu-Au mineralization stages are indicated by overlapping alteration assemblages and hydrothermal breccias with mineralized matrix and clasts.

The Malmyzh district occurs in the low relief, forested hills of the Amur River valley, and is concealed beneath a veneer of soils and alluvium. Recognition of barren, peripheral limonitic D-veinlet stockworks exposed in a small gravel pit were critical to establishing the porphyry affinity of the district during initial field reconnaissance. Early exploration consisted of ground magnetics and geochemical surveys. Magnetic highs often delineate zones of potassic alteration with secondary magnetite, and Au and Cu soil anomalies are frequently indicative of underlying porphyry mineralization where there is <5-15 meters of cover. Coincident magnetic and soil geochemical anomalies have proven effective in identifying drill targets.

Project drilling, totalling ~74,000 meters in 221 core holes, has confirmed 15 porphyry Cu-Au targets within the Malmyzh district. The majority of drilling has been concentrated on the Valley, Freedom, Central, and Flats deposits at nominal 200 meter centers. These four deposits have "on balance" C1+C2 reserves of 1.26 billion tonnes averaging 0.41% Cu and 0.22 g/t Au, or 0.52% CuEq as approved by Russia's GKZ state reserves committee ( $CuEq = Cu\% + Au\text{ g/t} * 0.5$ ). As reported using western standards, the deposits have combined open pit constrained inferred resources of 1.66 billion tonnes averaging 0.34% Cu and 0.17 g/t Au, or 0.42% CuEq.

Importantly, higher-grade Cu-Au mineralization occurs at Valley in shallow hornfels units, at Freedom in cross-cutting zones with high Au:Cu ratios, and at Central in a steeply-plunging potassic core. All four resource deposits are open for expansion, and the additional porphyry targets identified provide further exploration upside.