Exploration implications of contrasting geochemistry and mineralogy in the Lawyers Property, Toodoggone District, British Columbia, Canada

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The Toodoggone district in north-central British Colombia hosts a series of intermediate intrusions associated with epithermal and porphyry deposits. The Lawyers Property within the Toodoggone district hosts a well-known extensively-explored low sulfidation style epithermal deposit. To the west of the low sulfidation prospects and across the NS ELF fault there is a exploration target area known as Silver Pond. The Silver Pond prospect is characterized by the presence of a large argillic alteration lithocap, with a high degree of leaching and texturally destructive clay alteration of the intermediate volcanic host rocks. The style of alteration in Silver Pond is significantly different from the low sulfidation prospects east of the ELF fault. The Silver Pond clay anomaly as well as geochemical indicators, suggest that there may be potential for a magmatic metal source and an underlying porphyry system. In this study, comprehensive analysis of historic data and recent exploration efforts aims to constraint the relationship across the ELF fault in the Lawyers project as well as provide potential clues to the location and nature of the magmatic hydrothermal system underlying Silver Pond. This model will be applied to formulate an applied exploration strategy that can be utilized to improve the understanding and results of exploration efforts in the Silver Pond prospect area and surrounding region.

In the 2020 field season a comprehensive exploration program including soil and rock sampling, drilling, geophysics (magnetcis and IP) surveys, as well as SWIR analysis of drillcore was undertaken to better understand the geometry, geochemistry and economic potential of Silver Pond. Early results confirmed argillic-advanced argillic clay alteration extensive both at surface as well as in the subsurface. Core logging and SWIR analysis identified a typical high sulfidation epithermal zonation pattern, as represented by an advanced argillic alteration zone with high temperature. Low pH mineralogy (alunite, dickite, kaolinite, pyrophyllite), encased in a large argillic alteration envelope (smectite, illite) gradually transitions to a regional scale propylitic alteration domain. Soil, rock and core assays indicate significant, broad scale enrichment in epithermal suite elements as well as rare high-grade Au-Ag intersections.

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