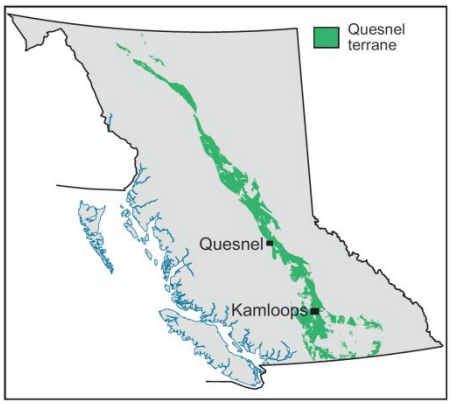
Lac La Hache Copper-Gold Porphyry System

Copper-gold porphyry deposits are ore bodies associated with porphyritic intrusions and the fluids that accompany them during their cooling from magma to rock at depths of 1 – 5 kms below the earth's surface.

The Lac La Hache deposits occur within the Quesnel Terrane, a geological belt comprising volcanic and related sedimentary rocks formed with an island arc setting about 200-210 million years ago, within the Late Triassic Period, when some of the early dinosaurs evolved. Similar to modern island arcs, such as Fuji or Hawaii and others, driven by crustal scale tectonic events, upwelling magmas reach the surface, erupting volcanically, building linear belts of submarine seamounts and exposed volcanic islands, over millions of years. The Quesnel Trough island arc formed well off the current coast of BC, but continued easterly movement and subduction of the oceanic crust upon which the belt was formed, results in accretion of the belt onto the margin of the much thicker, ancestral North American continent to the east. A very simple analogy might be the effect of pushing snow across a parking lot, building successive snow ridges (belts) after each snowfall.



Through time and as the eruptive volcanic system builds, the hot, buoyant sub-volcanic magmas rise up through their own extrusive-equivalent, volcanic-sedimentary rocks. Changes in temperature, pressure, interaction of magmatic, meteroric and sea waters and many other processes, cause precipitation of metals derived from the magma and it's surround host rocks, forming various deposit types typically observed within both the porphyritic intrusions and their host rocks, within these large systems.

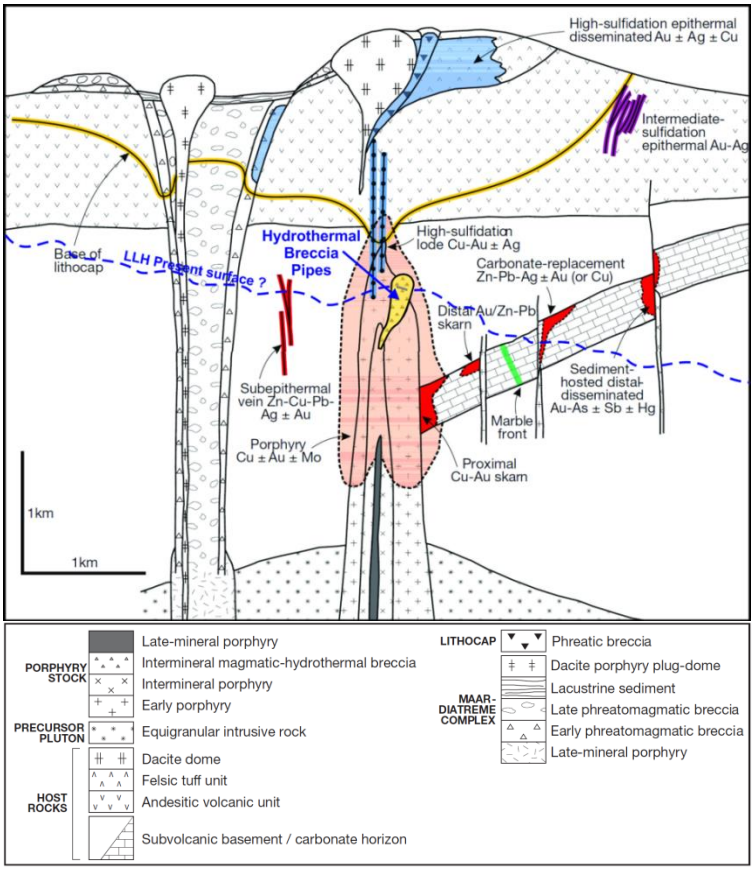
The island-arc porphyry deposit model has been well established for many years and has been used in the discovery of numerous deposits worldwide. The model has the following properties:

- Cu-Au porphyries are generally associated with island-arc settings.
- Mineralisation is associated with subvolcanic intrusions ranging in compositions from diorite to quartz monzonite.
- Host rocks generally comprise volcanic rocks and associated volcanic-derived sedimentary rocks.
- Intrusions typically form upright-vertical cylindrical bodies and/or dyke-complexes.
- Hydrothermal alteration around deposits is typically zoned from propylitic to phyllic/argillic, with a potassic core, and may extend hundreds of metres from mineralised intrusion.
- An outer-halo of Fe sulphides (pyrite) is present surrounding the mineralised core.
- Mineralisation characterised by copper-sulphides is localised within a network of fracture-controlled stockwork veinlets and breccias.

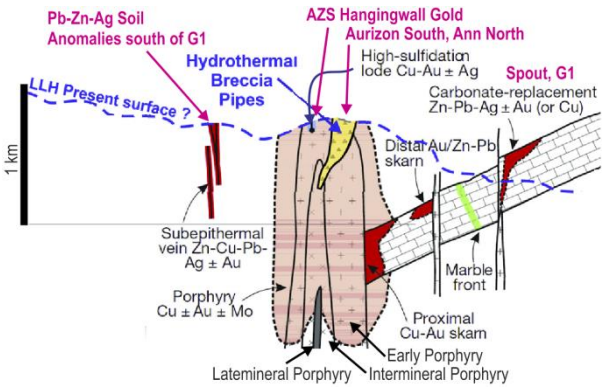
All of these features are present at Lac La Hache, and have been placed within our conceptual exploration model to better understand geological relationships between known showings, prospects, deposits, associated alteration trends and mineralization types. The model has served well as a guide to exploration within the large porphyry system at Lac La Hache, predicting depth extensions of shallow drilled zones at Spout and Aurizon Deposits and additional deposits such as the 2017 Discovery of semi-massive carbonate-replacement-deposit (CRD) of magnetite-copper at G1. The model continues to evolve as we learn more, providing ongoing predictive targeting.

The Conceptual Exploration Model at Lac La Hache

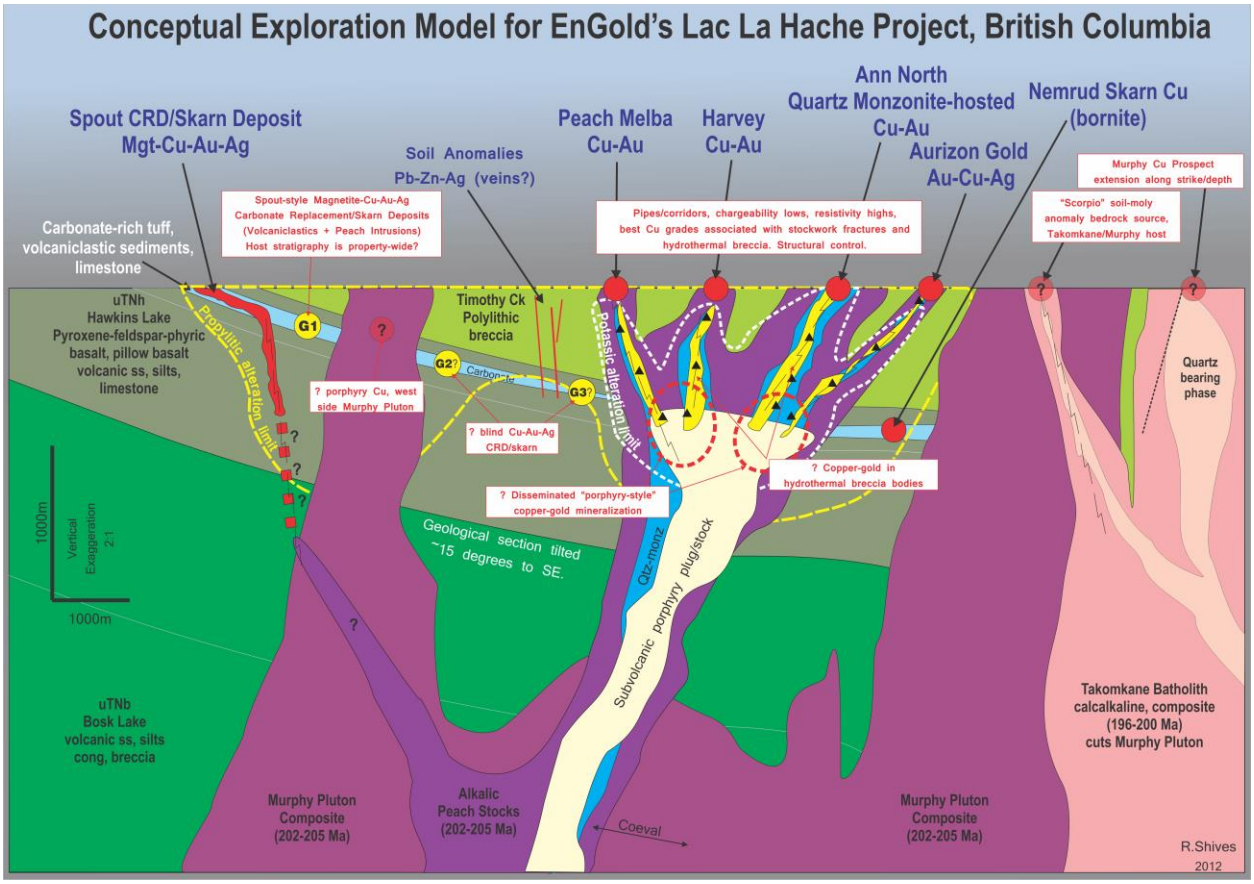
We have based our model for Lac La Hache on a widely adopted copper porphyry system model published in 2010, created by Dr. Richard H. Sillitoe, based on his many decades of study of hundreds of porphyry deposits worldwide. The image on the right shows Dr. Sillitoe's full model, extending from the underlying "precursor pluton" located below the mineralized porphyry stocks (latter shown in pink highlight) up to the highest epithermal parts at surface. The interpreted present erosional surface at Lac La Hache is indicated by the blue dashed line: epithermal features located above this are no longer present.



Many features of the Sillitoe model are found at Lac La Hache (right), including: hydrothermal breccia pipes (Aurizon Central, Aurizon South, Ann North, others); skarns and carbonate replacements (Spout, G1, Nemrud); lead-zinc-silver veins (indicated at Lac La Hache by strong combined Pb-Zn-Ag geochem anomalies on multiple surveys); disseminated copper within intrusive phases (Berkey Phase); and intrusion hosted fracture-vein copper (Aurizon Central, Ann North, others).



Adaption of the Sillitoe model to fit our current understanding spatially has resulted in the Lac La Hache model shown below. The model incorporates regional and property-scale geological mapping results, all known prospects and drilling results over ~25 years.



A simplified version of the model (below) illustrates several future exploration targets for possible new porphyry and carbonate replacement mineralization. One of these targets will be tested in February 2020 beneath encouraging but shallow historical drilling results at Ann North, supported by positive 3D modeled geophysical data.