STRUCTURAL AND STRATIGRAPHIC CONTROLS ON MINERALIZATION IN THE BRONSON CORRIDOR, ISKUT REGION, NW BC

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Kyba, J. and Nelson, J.L., 2015, Stratigraphic and tectonic framework of the Khyber-Sericite-Pins mineralized trend, lower Iskut River, northwest British Columbia.

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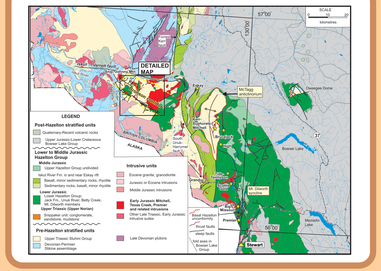


ABSTRACT

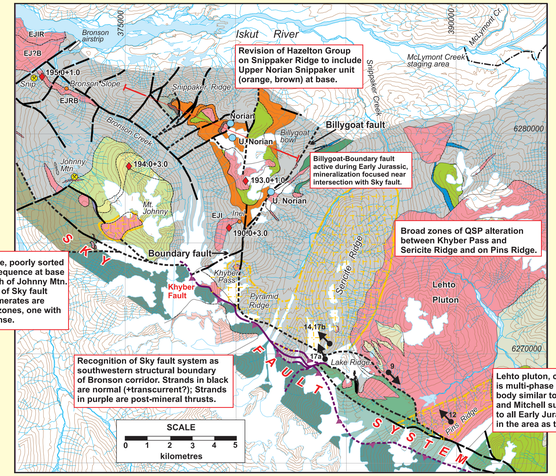
The Bronson corridor is a belt of mineralization in northwest Stikinia that extends southeast from the past-producing Snip and Johnny Mountain gold mines, and includes the Khyber Pass - Sericite Ridge - Pins trend (KSP), currently being explored by Colorado Resources. Within the mineralized belt, a series of Early Jurassic (195-190 Ma) plutons, stocks and dikes of the Lehto plutonic suite cut stratified Stuhini Group and Hazelton Group rocks. Large quartz-sericite-pyrite (QSP) alteration zones and precious-metal veins and stockworks are spatially associated with the intrusive suite.

The Bronson corridor is bounded to the southwest by the Sky fault system, a 20 kilometre-long set of syn-mineral normal faults and reactivated post-mineral reverse faults. Notable among the latter is the Khyber reverse fault, which forms the immediate hanging wall to intense QSP alteration and mineralization at the Khyber-Inel prospects.

Very coarse, immature lower Hazelton Group conglomerates near the Sky fault zone south of Mt. Johnny indicate steep local slopes and clast contributions from a variety of nearby sources. Previously brecciated hypabyssal intrusive clasts in one of the deposits suggest deposition proximal to a penecontemporaneous fault.

Previous workers distinguished between the Stuhini and Hazelton groups on chronostratigraphic grounds, placing the contact at the Triassic-Jurassic boundary (201 Ma). In contrast, we use lithostratigraphic criteria, and place the base of the Hazelton Group at an angular unconformity cut into Stuhini Group volcaniclastic rocks that is overlain by a distinctive Upper Norian conglomerate-bearing siliciclastic unit, herein referred to as the Snippaker unit. The Snippaker unit consists of polymictic conglomerate, arkose, and siltstone, and is compositionally mature relative to Stuhini Group strata beneath the unconformity. Coeval with Late Triassic porphyry deposits of Stikinia such as Red Chris, the unit records the termination of Stuhini arc volcanicalastic sedimentation and erosional unroofing of the Stuhini Group.

The structural and stratigraphic setting of the Bronson corridor closely resembles that of the Kerr-Sulphurets-Mitchell-Brucejack porphyry-epithermal camp. The Sky fault system appears to have played a similar role to that of the Sulphurets thrust and its precursor basin-bounding faults, in localizing Early Jurassic intrusion and mineralization. The Khyber reverse fault, with its highly QSP-altered footwall, is a close analogue to the Sulphurets thrust fault. In both cases, Cretaceous thrust reactivation was facilitated by mechanically weak, highly altered, clay-sericite-rich rocks.



Revision of Hazelton Group on Snippaker Ridge to include Upper Norian Snippaker unit (orange, brown) at base.

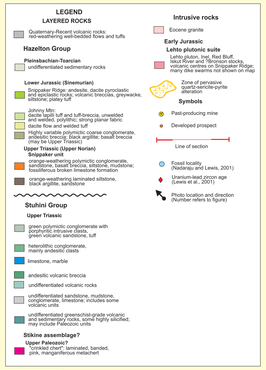
Billygoat-Boundary fault active during Early Jurassic, mineralization focused near intersection with Sky fault.

Broad zones of QSP alteration between Khyber Pass and Sericite Ridge and on Pins Ridge.

Coarse, immature, poorly sorted conglomeratic sequence at base of Hazelton south of Johnny Mtn. shows influence of Sky fault scarps. Conglomerates are cut by mylonite zones, one with dextral shear sense.

Recognition of Sky fault system as southwestern structural boundary of Bronson corridor. Strands in black are normal (+transcurrent?); Strands in purple are post-mineral thrusts.

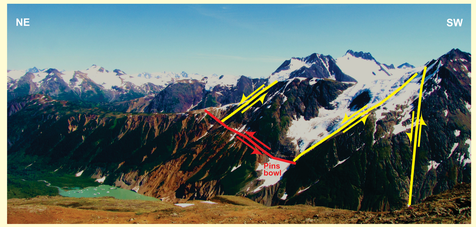
Lehto pluton, ca 191 Ma, is multi-phase porphyritic body similar to Premier and Mitchell suites. We refer to all Early Jurassic plutons in the area as the Lehto suite.



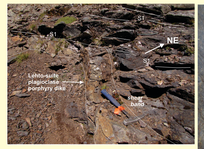
GEOLOGY OF THE BRONSON CORRIDOR

Mapping by J. Nelson and J. Kyba, 2014; compilation from J. Oliver, 2014; Alldrick et al., 1990; Metcalfe and Moors, 1993; Lewis, 2013.

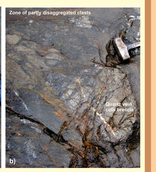
SKY FAULT - EXTENSIONAL PHASE



Normal faults on Pins Ridge - truncated against interpreted thrust strand at top of "Pins bowl".



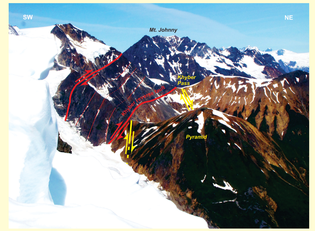
Plagioclase-phyric Lehto-suite dike in normal-sense shears, top of Pins Ridge.

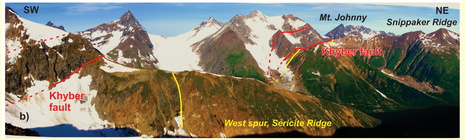


Boulder-size clasts of fault-brecciated, rehealed hypabyssal intrusive, from debris-flow conglomerate south of Mt. Johnny.

SKY FAULT - THRUST REACTIVATION

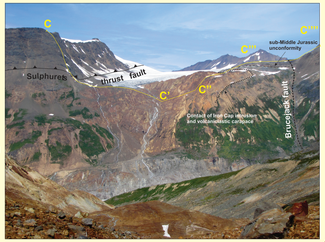
Views of Khyber thrust fault and extensive quartz-sericite-pyrite alteration in footwall, Khyber Pass - Pyramid - Sericite Ridge area. Mt. Johnny in background to west.



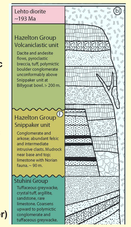


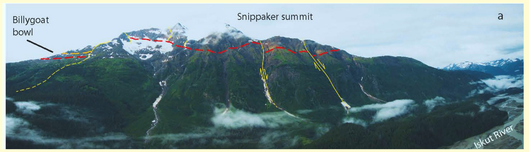
The Khyber thrust fault as bounding fault of the Bronson corridor is analogous to the Sulphurets fault in the KSM-Brucejack camp, shown here in the hanging wall of the Iron Cap zone.

In both cases, former basin-bounding faults were reactivated during compressional tectonics, faciliated by extensive quartz-sericite-pyrite alteration that created a mechanically weakened footwall.



REVISED HAZELTON GROUP STRATIGRAPHY





View of Snippaker Ridge from the north, showing the basal Hazelton unconformity. High peaks are in Jurassic volcanic-intrusive complex that overlies the Snippaker unit.

Snippaker unit:

* rests unconformably on Stuhini Group
* clean arkose and round-pebble conglomerate
* carbonate cement not lithic matrix
* contains Upper Norian fossils, woody debris
* uplift, siliciclastic sedimentation post-Stuhini arc

uppermost Stuhini unit on Snippaker Ridge: green pebble sandstone, wacke matrix