Mesozoic Magmatic History and Metallogeny of the Hotailuh Batholith (NW BC)

Bram van Straaten[1], Jim Logan[1] and Larry Diakow[1]

[1] Ministry of Energy and Mines, British Columbia Geological Survey , Victoria, BC

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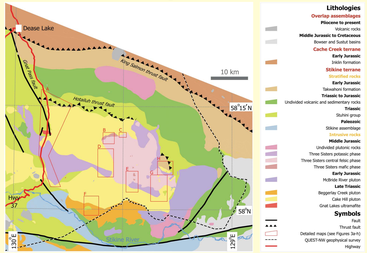
For More Information
Bram.vanStraaten@gov.bc.ca
+1-250-952-0304

QUEST-Northwest

Airborne magnetic survey + *Regional geochemical stream sediment survey* + *Bedrock mapping*

Regional geology

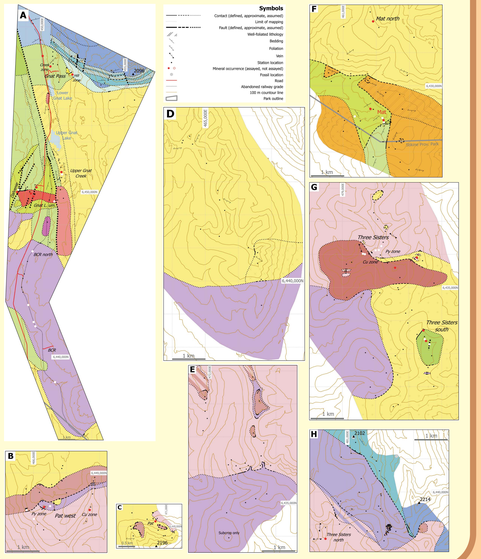
- *Northern Stikine terrane*
- *Large composite batholith within Triassic - Jurassic volcanic and sedimentary rocks*
  - *Late Triassic plutonic suite*
  - *Early Jurassic plutonic suite*
  - *Middle Jurassic plutonic suite*



Goals

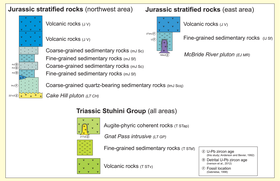
- *Refine temporal* ***magmatic and geochemical evolution***
- *Link* ***magmatism and mineralization***
- *Identify prospective* ***magmatic-hydrothermal systems***
- *Provide geological base to* ***interpret airborne magnetic survey & regional geochemical stream sediment survey***
- *Stimulate* ***mineral exploration***

Geological maps

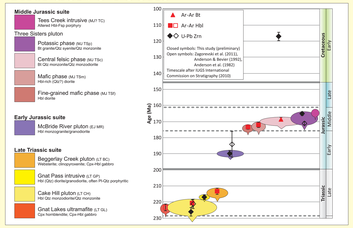


Geological units

Stratified rocks



Intrusive rocks

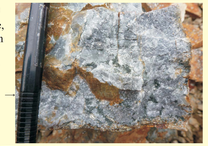


Triassic rock-hosted mineral occurrences

Gnat Pass (Cu)
Indicated reserves (non-NI 43-101): 30.4Mt @ 0.389% Cu
Host rock: Qtz-Pl porphyry (LT GP)
Alteration: Silicification, tourmaline veining, Fe-Carb-cemented breccias
Ore mineralogy: Ccp, Py

Upper Gnat Creek (Au,Cu,Ag)
Size: Vein with 20 x 20 cm pod of massive-sulphide-cemented breccia
Host rock: Hbl Qtz monzodiorite / Qtz monzonite (LT CH)

3 Sisters South (Cu±Mo)
Size: Several ≤20 m wide, pyritic, subvertical, north striking fault zones
Host rock: Stuhini Group volcanic rocks (T STv)
Associated minerals: Act



Mat North (Cu)
Size: cm/dm-sized pods
Host rock: Hbl Qtz monzodiorite / Qtz monzonite (LT CH)
Associated minerals: coarse-grained euhedral Bt
Ore minerals: Py ± Bn

Middle Jurassic rock-hosted mineral occurrences

Pat West (Cu)
Size: 1 m wide, intensely veined zone
Host rock: Bt Qtz monzonite / Qtz monzodiorite (MJ TSc)
Vein mineralogy: Qtz, Py, Cu sulph

[Several 10-100s m gossanous exposures present slightly west]

3 Sisters North (Cu±W)
Size: Subvertical, west striking veins (~5% by volume in several m wide interval)
Host rock: Bt Qtz monzonite / Qtz monzodiorite (MJ TSc)
Vein mineralogy: Ep,Act,sulph

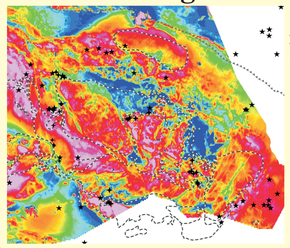
3 Sisters (Cu)
Size: Three m-scale intensely veined / in-situ brecciated exposures with copper sulphides
Host rock: Fine-grained Hbl diorite (MJ TSf)
Vein mineralogy: Qtz, Py ± Ccp, Ep

[A 2 x 0.2 km gossanous zone is exposed towards the north/northeast]

Mineral occurrences

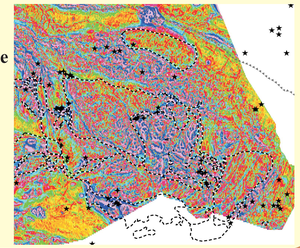
Name	Map	Type	Deposit	Host	Age	Assay results
Gnat Pass	A			*GP*	LT	0.7% Cu (n=1/3)
Upper Gnat Creek	A	new		*CH*	≤LT	1.7g/t Au, >1% Cu, 82g/t Ag (n=1/1)
Dalvenie	A			ST	≤T	0.57g/t Au, >1% As (n=1/2)
BCR North	A	new	?	*TSp/TC*	≤MJ	Not sampled
BCR	A		?	*TSp*	≤MJ	Not sampled
Gnat Lake ultramafite	A	new	?	*GL/ST*	≤LT	No significant results (n=3/3)
Pat West	B	new		*TSc/p*	≤MJ	0.7% Cu (n=1/2)
Pat	C			*CH?*	≤LT/MJ	0.3% Cu (n=1/1)
Mat North	F	new		*CH*	≤LT	>1% Cu (n=1/1)
Mat	F		?	ST	≤T	No significant results (n=1/1)
Three Sisters	G	new		*TSf/CH*	≤MJ	0.35% Cu (n=1/2)
Three Sisters South	G	new		ST	≤T	0.34% Cu, 0.03% Mo (n=1/2)
Three Sisters North	H	new		*TSc*	≤MJ	0.36% Cu, >0.02% W (n=1/1)

Airborne magnetics (QUEST-NW block 1)



Total magnetic intensity

First vertical derivative



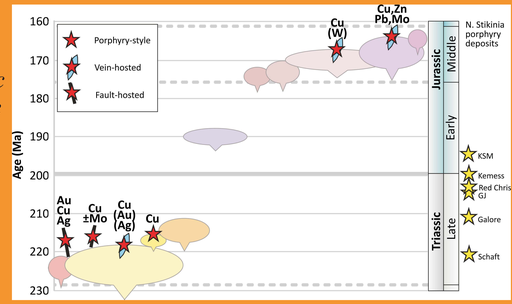
Legend
- Outline of Mesozoic intrusions
- ★ MINFILE showings, prospects
- ✦ Other mineral occurrences

Implications for exploration

- *Identified several new Cu, Au mineral occurrences*
- *Presence of significant Late Triassic magmatic-hydrothermal metallogenic event, similar to elsewhere in N. Stikinia*
- *Previously unrecognized Middle Jurassic magmatic-hydrothermal mineralization deserves more attention*

Intrusion-related mineralization

(plotted according to age of intrusive host rock or age of spatially associated intrusion)



More information

BC Ministry of Energy and Mines, Geological Fieldwork 2011 article by *van Straaten, Logan and Diakow.* Available online as a downloadable file at www.empr.bc.ca/geology see *Publications Catalogue*

Acknowledgements

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