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Preliminary geology of Notch Peak and Ogden Creek (parts of NTS 094C/04 and 093N/13), northern Hogem batholith, Quesnel terrane, north-central British Columbia

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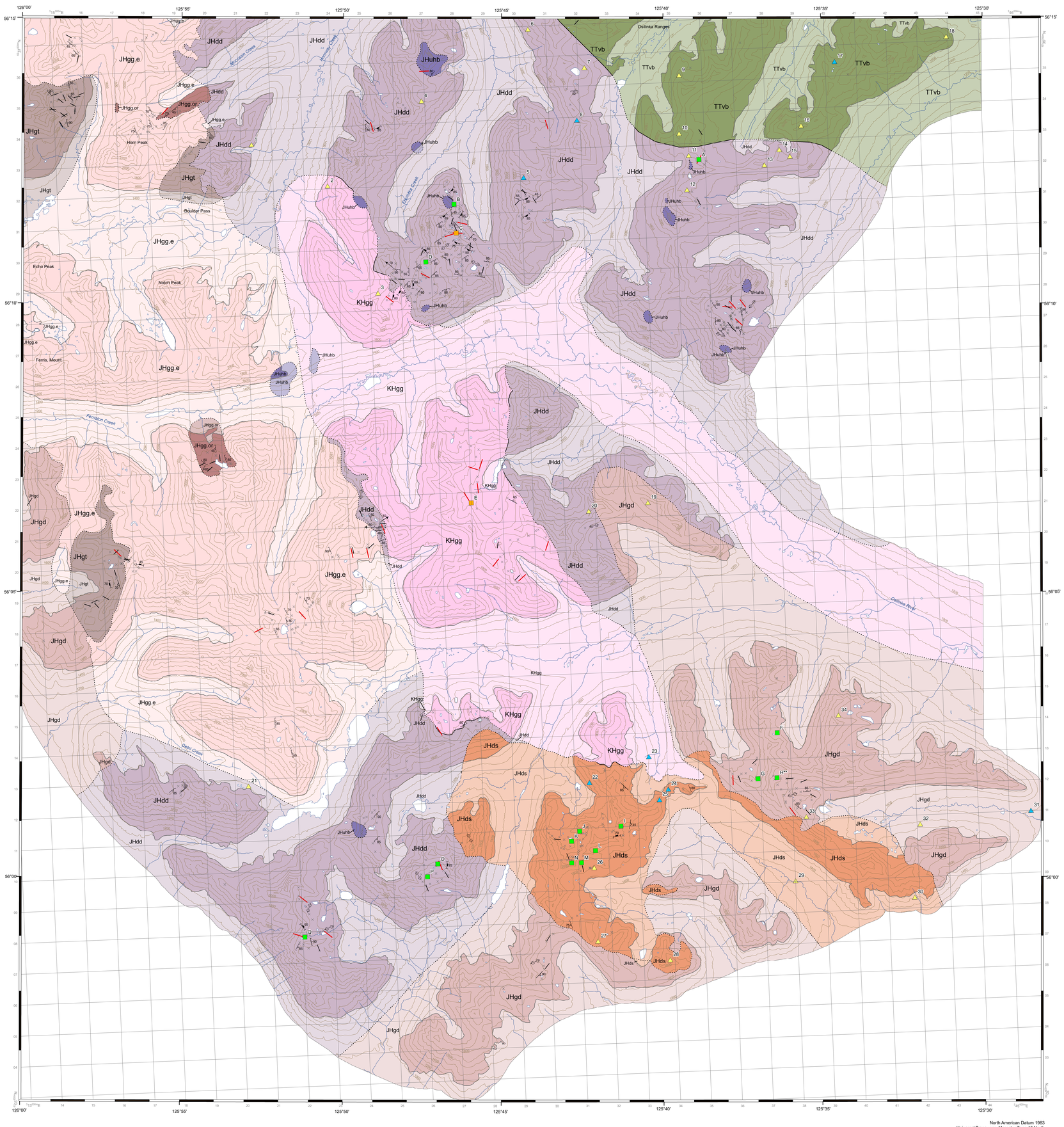
0 1 2 4 6 8 10
Kilometres

Scale 1:50,000



North American Datum 1983
Universal Transverse Mercator Zone 10 North
Contour interval 100 metres

LEGEND for detailed unit descriptions refer to Ootes et al. (2019)

Bedrock	Bedrock covered by Quaternary
KHgg	KHgg
JHgg.or	JHgg.or
JHgg.e	JHgg.e
JHds	JHds
JHgd	JHgd
JHgt	JHgt
JHdd	JHdd
JHuhb	JHuhb
TTvb	TTvb

Osilinka suite (Cretaceous)

Granite: Equigranular, medium grained; light pink to white; low mafic mineral content (< 5%), mafic minerals are commonly altered to epidote, or chlorite; unfoliated but with local shear zones and more than three joint sets; local muscovite on joints; low magnetic expression; airborne radiometrics indicate K > Th. Cut by unnamed < 4 m wide subhorizontal sheets of felsic and intermediate feldspar porphyry and quartz-feldspar porphyry.

Mesilinka suite (Jurassic to Cretaceous)

Granite: Porphyritic; K-feldspar phenocrysts, up to 5 cm long, in medium- to coarse-grained equigranular groundmass; pink to grey; biotite-rich; foliated; foliation crosscuts intrusive contacts with older rock units; low to medium magnetic expression; airborne radiometrics indicate Th > K.

Granite: Equigranular, medium grained, with 10-20% biotite; light pink to grey; common pegmatite and aplite dikes and sheets; foliated; xenoliths of JHgt in the northwest, garnet ± muscovite in granite close to xenoliths; xenoliths of JHdd in the southwest, typically at higher elevations; generally low magnetic expression, with higher magnetic signatures coincident with JHdd xenoliths; airborne radiometrics indicate Th > K.

Duckling Creek suite (182 to 175 Ma)

Monzodiorite to syenite: Medium to coarse grained; equigranular to K-feldspar porphyritic; monzonite is most common composition with syenite, lesser monzodiorite and local zones of biorite pyroxenite, but textural and compositional heterogeneity is common; quartz-free; amphibole concentration from 10 to 80%, groundmass of equigranular green amphibole and lesser plagioclase; generally two-feldspar-bearing, with K-feldspar >> albite/plagioclase; K-feldspar commonly contains multiple growth zones; foliated; contains local syenitic pegmatite; malachite staining in early mafic phases and local disseminated chalcopyrite; dated by U-Pb zircon between 182 and 175 Ma (Bath et al., 2014; Devine et al., 2014); cuts JHdd; moderate to strong magnetic expression; airborne radiometrics indicate low Th/K. May contain zones of undifferentiated JHuhb and JHdd.

Thane Creek suite (Triassic to Jurassic)

Granodiorite to quartz monzodiorite to quartz monzonite: Equigranular, medium grained; beige to white to grey; weakly to moderately foliated; crosscut by JHgg.e; in the southwest, may include phases of JHgt; moderate to strong magnetic expression; airborne radiometrics indicate Th > K > U.

Tonalite: Equigranular, medium grained; biotite-rich (~50%); white to grey; moderately foliated; intruded by sheets and dikes of JHgg.e that are commonly garnet bearing; locally cut by JHgg.or; occurs as phases in quartz monzodiorite to granodiorite (JHgd) in the southwest of study area; low to moderate magnetic expression; airborne radiometrics indicate low K, with moderate to high Th-U.

Diorite to quartz monzodiorite, monzodiorite, and minor gabbro: Equigranular, medium to coarse grained; foliated to locally mylonitic; green-white, melanocratic, although locally leucocratic depending on amphibole concentration; typically quartz poor; monzodiorite and quartz monzodiorite compositions may be result of potassic alteration, variably mottled mint green and pink groundmass (epidote and K-feldspar concentrations); mingled with margins of JHuhb hornblendite and mingling is generally texturally and compositionally heterogeneous; may contain enclaves of JHuhb and fine-grained, layered green rock (Takla Group?); cut by JHgg.e, JHgg.or, and KHgg; moderate to high magnetic expression directly related to amount of magnetite in groundmass; airborne radiometrics indicate K > Th-U, but K varies in relation to alteration; locally contains malachite staining and disseminated chalcopyrite.

Hornblendite: Medium grained to pegmatitic; black to white and black; amphibole-rich, with variable amounts of biotite and plagioclase (0-20%); may include some pyroxenite; local disseminated chalcopyrite (< 5%); plutons are less than 100 m wide; margins are cut by and comingled with JHdd; high magnetic expression; airborne radiometrics indicate low K-Th-U.

Takla Group (Triassic)

Plughat Mountain succession: Undivided mafic volcanic and lesser sedimentary rocks: augite-phyric basalt flows and tuffs; tuffaceous siltstone and argillite; airborne radiometrics indicate low K-Th-U; adapted from Ferri et al. (2001).

Station
Foliation 85
Igneous layering 45
Lineation 40
Brittle shear 80
Striation (flow direction unknown)
Vein
Dike (mafic to felsic, mostly pegmatite in JHgg.e)

Lithological contacts
Inferred
Defined
Outcrop; area of defined bedrock (combined ground and air photo observation)

New mineral occurrences (see Table 1; letters indicate Map ID)
Vein-hosted C
Porphyry style A

MINFILE occurrences (see Table 2; numbers indicate Map ID)
Vein-hosted 8
Porphyry style 1

Table 1. New mineral occurences from this study.

MAP ID	STATION	STATUS	COMMODITY	DEPOSIT TYPE
A	18ab-6-3c	*Known	Au, Cu	Porphyry
B	18lo-6-2a	Showing	Cu	Porphyry
C	18lo-7-2a	Showing	Cu	Vein
D	18DMI-8-10	Showing	Cu	Porphyry
E	18lo-15-1b-1	Showing	Au	Vein
F	18bg-31-1b	Showing	Cu	Porphyry
G	18ab-26-4	Showing	Ag, Cu	Porphyry
H**	18ab-24-11	Showing	Au	Porphyry
I	18lo-24-5a	Showing	Cu	Porphyry
J	18ab-17-2	Showing	Cu	Porphyry
K	18ab-18-10b	Showing	Au, Cu	Porphyry
L	18lo-25-2c	Showing	Au, Cu	Porphyry
M	18bg-28-2	Known	Au, Cu	Porphyry
N	18ab-16-9	Showing	Cu	Porphyry
O	18ab-23-8	Showing	Cu	Porphyry
P	18ab-22-7	Showing	Cu	Porphyry
Q	18bg-26-2b	Showing	Cu	Porphyry

*Known = close to previously documented MINFILE showing; ** - may contain lepidolite

Table 2. Mineral occurrences from MINFILE database. Deposit type correspond to definitions provided by Lefebure and Ray (1995) and Lefebure and Höy (1996).

MAP ID	MINFILE NO.	NAME	STATUS	COMMODITY	DEPOSIT TYPE
1	094C 045	HORNWAY CREEK	Showing	Cu	Alkalic porphyry
2	094C 098	PAUL	Showing	Mo	Porphyry
3	094C 011	OS	Showing	Cu	Alkalic porphyry
4	094C 010	ET	Showing	Cu	Alkalic porphyry
5	094C 016	CHIEF THOMAS	Showing	Cu	Polymetallic veins
6	094C 046	ETSCHITKA CREEK	Showing	Cu	Alkalic porphyry
7	094C 047	MATETLO CREEK	Showing	Cu	Alkalic porphyry
8	094C 017	ELIZABETH	Showing	Au, Ag	Au-quartz veins
9	094C 117	YETI	Showing	Cu	Alkalic porphyry
10	094C 116	BILL	Showing	Cu, Au	Alkalic porphyry
11	094C 115	INTREPID	Showing	Cu	Alkalic porphyry
12	094C 188	LAKE AREA (CATHEDRAL)	Showing	Cu	Alkalic porphyry
13	094C 018	MATETLO	Prospect	Cu	Alkalic porphyry
14	094C 114	KOALA	Showing	Cu	Alkalic porphyry
15	094C 113	YAK	Showing	Cu	Alkalic porphyry
16	094C 118	DRAGON	Showing	Cu, Au	Alkalic porphyry
17	094C 099	MAT 1	Prospect	Ag, Cu, Pb, Zn, Au	Polymetallic veins
18	094C 119	TOUGH	Showing	Cu	Alkalic porphyry
19	094C 174	OSI	Showing	Cu, Pt	Alkalic porphyry
20	094C 050	HOGEM COPPER	Showing	Cu	Porphyry
21	094C 051	DETNI CREEK	Showing	Cu	Porphyry
22	094C 140	HAWK (HSW)	Showing	Au, Cu	Au-quartz veins
23	094C 138	HAWK (AD)	Prospect	Au, Cu, Pb, Zn, Ag	Au-quartz veins
24	094C 171	MEADOW	Showing	Au, Ag, Cu	Au-quartz veins
25	094C 139	HAWK (RADIO)	Prospect	Au, Cu, Ag	Au-quartz veins
26	094C 063	DOVE	Showing	Cu, Mo, Ag	Alkalic porphyry
27	093N 171	HAW	Showing	Cu	Alkalic porphyry
28	093N 249	RAVEN	Showing	Au, Cu	Alkalic porphyry
29	093N 176	FLAME	Showing	Cu, Mo	Alkalic porphyry
30	093N 242	SLIDE	Prospect	Cu, Au, Ag	Alkalic porphyry
31	094C 097	REM	Showing	Cu, Pb	Polymetallic veins
32	094C 077	ND	Showing	Cu	Alkalic porphyry
33	094C 170	GOAT	Showing	Cu, Au, Ag	Alkalic porphyry
34	094C 177	NOVA 5	Showing	Cu	Alkalic porphyry

Data Sources
Aeromagnetic and airborne radiometric data: CGG Canada Services Ltd. (2018). Previous bedrock mapping: Armstrong and Roots (1954), Garnett (1972), Woodsworth (1976), Ferri et al. (2001), and Nelson et al. (2003).
MINFILE: Minfile BC mineral inventory BC Ministry of Energy, Mines and Petroleum Resources, https://minfile.gov.bc.ca/. Accessed October 2018.

Acknowledgements
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References cited

Armstrong, J.E. and Roots, E.F., 1954. Aiken Lake, Cassiar District, British Columbia. Geological Survey of Canada, A Series Map 1030A, 1 inch:4 miles scale.

Bath, A.B., Cooke, D.R., Friedman, R., Faure, K., Kamenetsky, V.D., Tosdal, R.M., and Berry, R.F., 2014. Mineralization, U-Pb geochronology, and stable isotope geochemistry of the Lower Main Zone of the Lorraine deposit, north-central British Columbia: A replacement-style alkalic Cu-Au porphyry. Economic Geology, 109, 979-1004.

CGG Canada Services Ltd., 2018. Geophysical survey report MIDAS high resolution magnetic and radiometric survey Search Project Phase III; Geoscience BC Report 2018-2.

Devine, F.A.M., Chamberlain, C.M., Davies, A.G.S., Friedman, R., and Baxter, P., 2014. Geology and district-scale setting of tilted alkalic porphyry Cu-Au mineralization at the Lorraine deposit, British Columbia. Economic Geology, 109, 939-977.

Ferri, F., Dudka, S.F., Rees, C.J., Meldrum, D.G., and Willson, M.J., 2001. Geology of the Uslika Lake Area, North-Central B.C. (NTS 94C/2, 3 & 4). British Columbia Ministry of Energy and Mines, Geoscience Map 2001-04, 1:50,000 scale.

Garnett, J.A., 1972, Preliminary geological map of part of Hogem batholith, Duckling Creek area (parts of NTS 93N/13, 14; 94C/3, 4). British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Preliminary Map 09.

Lefebure, D.V. and Höy, T. (eds.), 1996. Selected British Columbia mineral deposit profiles, Volume 2–More metallic deposits; British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Open File 1996-13, 172 p.

Lefebure, D.V. and Ray, G.E. (eds.), 1995. Selected British Columbia mineral deposit profiles, Volume 1–Metallics and coal; British Columbia Ministry of Energy, Mines and Petroleum Resources, British Columbia Geological Survey Open File 1995-20, 136 p.

Nelson, J., Carmichael, B., and Gray, M., 2003. Innovative gold targets in the Pinchi Fault/Hogem Batholith area: The Hawk and Axelgold properties, central British Columbia (94C/4, 94N/13),British Columbia Ministry of Energy and Mines, British Columbia Geological Survey, Geological Fieldwork 2002, Paper 2003-1, 97-114.

Ootes, L., Bergen, A., Milidragovic, D., Graham, B., and Simmonds, R., 2019. Preliminary geology of northern Hogem batholith, Quesnel terrane, north-central British Columbia. In: Geological Fieldwork 2018, British Columbia Ministry of Energy, Mines and Petroleum Resources British Columbia Geological Survey Paper 2019-01, pp. 31-53.

Woodsworth, G.J., 1976. Plutonic rocks of McConnell Creek (94 D west half) and Aiken Lake (94 C east half) map-areas, British Columbia. Geological Survey of

Location

094D08 CARRUTHERS PASS	094C05 AIKEN LAKE	094C06 BLACKPINE LAKE
094D01 NANITSCH LAKE	094C04 NOTCH PEAK	094C03 USLIKA LAKE
093M16 LION CREEK	093N13 OGDEN CREEK	093N14 DISCOVERY CREEK

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