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Ministry of Energy and Mines, British Columbia

British Columbia Geological Survey
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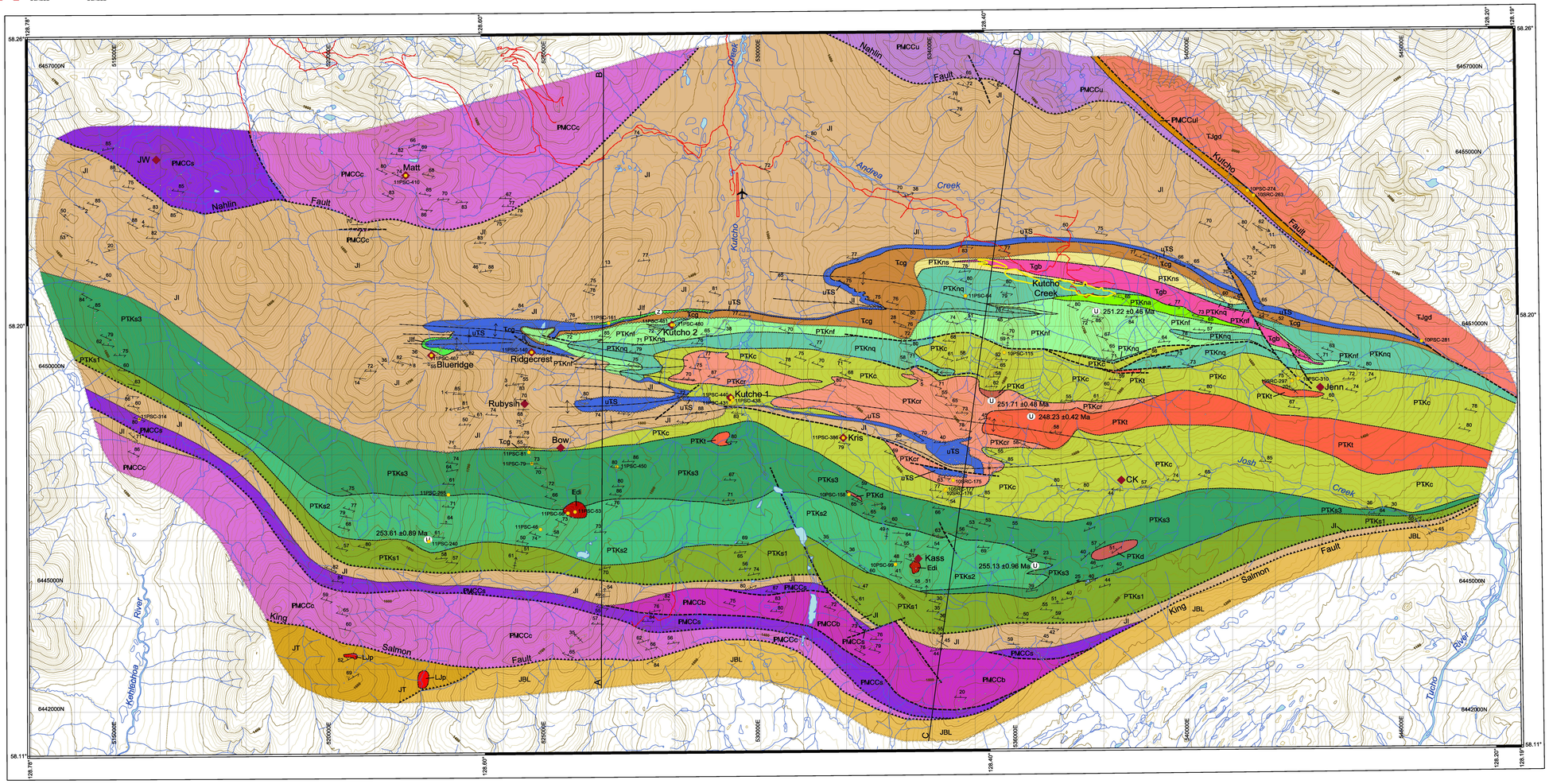
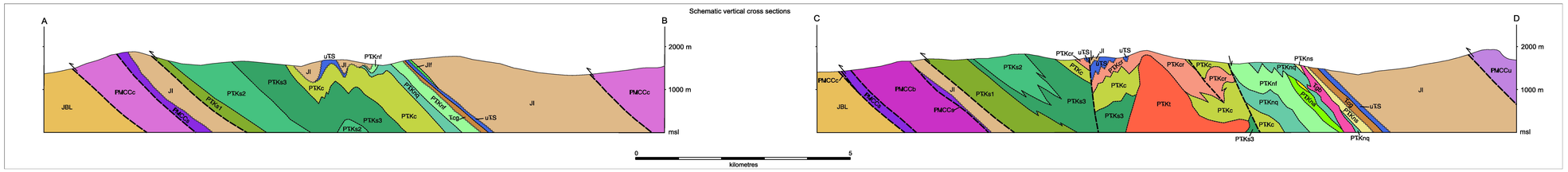
Geological Survey of Canada
Open File 7234

Bedrock geology of the upper Kutcho Creek area parts of NTS 104-I/01, 02

by Paul Schiarizza





Legend

Eocene

- **Edi** — Diorite, pyroxene-hornblende-biotite porphyry

Late Jurassic(?)

- **LJp** — Hornblende-plagioclase-quartz porphyry, granodiorite

Bowser Basin

Middle - Upper Jurassic

- **JBL** — Bowser Lake Group: chert-pebble conglomerate, sandstone, siltstone, shale

Quesnel Terrane

Late Triassic - Early Jurassic

- **TJgd** — Granodiorite, tonalite, quartz diorite, diorite

Whitehorse Trough

Lower - Middle Jurassic

- **JT** — Takwahoni Formation: slaty siltstone, sandstone, pebbly sandstone
- **Jl** — Inklin Formation: metasandstone, metasiltstone, slate; locally includes conglomerate, limestone
- **Jlf** — Feldspathic metasandstone, sericite-chlorite-quartz-plagioclase schist; lithologically similar to parts of Kutcho assemblage, but detrital zircons indicate Early Jurassic age and Stikine terrane provenance

Upper Triassic

- **uTS** — Sinwa Formation: limestone, marble

Middle - Upper Triassic(?)

- **Tcg** — Conglomerate unit: schistose metaconglomerate containing felsic volcanic and plutonic clasts that were probably derived from the Kutcho assemblage; locally includes metasandstone, phyllite, limestone

Triassic(?)

- **Tgb** — Metagabbro; locally grading to biotite-chlorite-actinolite-epidote-plagioclase semischist

Cache Creek Terrane

Late Permian - Middle Triassic

Kutcho assemblage

Intrusive rocks

- **PTKt** — Tonalite; locally grading to chlorite-sericite-plagioclase-quartz semischist
- **PTKd** — Metadiorite, chlorite-actinolite-epidote-plagioclase semischist

Northern division

- **PTKns** — Phyllite, metasiltstone, metasandstone; commonly includes dikes and sills of metagabbro
- **PTKna** — Pyritic quartz-sericite schist, commonly with small quartz grains and/or flattened felsic lithic fragments
- **PTKnf** — Sericite-chlorite schist containing feldspar and quartz grains and, commonly, felsic lithic fragments; locally includes breccia, metasandstone, metasiltstone, phyllite, quartz-plagioclase-phyric metarhyolite
- **PTKnq** — Chlorite-sericite-plagioclase-quartz schist and fragmental schist characterized by large relict quartz grains; locally includes coarse breccia, metasandstone, metasiltstone, phyllite, chert

Central division

- **PTKc** — Quartz-plagioclase-phyric metarhyolite and sericite-quartz schist; epidote-actinolite-chlorite-plagioclase schist (mafic metavolcanic); chlorite-sericite schist with quartz, feldspar and felsic lithic fragments (felsic volcaniclastic rocks); pyritic chert (exhalite); metasandstone, metasiltstone, phyllite, bedded chert
- **PTKcr** — Quartz-plagioclase-phyric metarhyolite, locally grading to sericite-quartz schist and fragmental schist

Southern division

- **PTKs3** — Epidote-actinolite-chlorite-plagioclase schist derived from mafic volcanic rocks; locally includes metadiorite, plagioclase-phyric metarhyolite, and sericite-plagioclase-quartz schist (felsic volcaniclastic)
- **PTKs2** — Chlorite-sericite-quartz schist with quartz, feldspar and felsic lithic fragments; plagioclase-phyric metarhyolite; epidote-actinolite-chlorite-plagioclase schist (mafic metavolcanic); metasandstone, metasiltstone, phyllite
- **PTKs1** — Chlorite-sericite schist with quartz, feldspar and felsic lithic fragments (derived mainly from epiclastic rocks); locally includes metasandstone, metasiltstone and laminated phyllite

Late Paleozoic - Early Mesozoic

Cache Creek complex

- **PMCCc** — Quartz phyllite, chert, limestone, metabasalt; locally includes serpentinite, gabbro, diabase
- **PMCCb** — Metabasalt, grading to actinolite-epidote-chlorite-plagioclase semischist; locally includes serpentinite, chert, limestone, gabbro
- **PMCCs** — Serpentinite, talc-magnesite schist and serpentinite melange containing knockers of gabbro, diabase, basalt, pyroxenite, harzburgite, chert, limestone
- **PMCCu** — Harzburgite, dunite, serpentinite; locally includes listwanite-altered rock and lenses of slaty siltstone and chlorite schist
- **PMCCul** — Listwanite-altered ultramafic rock

Geological contact (defined, approximate, inferred) .....
Unconformity (defined, approximate inferred) .....
Fault (defined, approximate, inferred) .....
Thrust fault, teeth on upthrust side (inferred) .....
Axial trace of fold, inferred (anticline, syncline) .....
Limit of mapping .....
Bedding, inclined (tops known, overturned, tops unknown) 50 80 55
Schistosity or slaty cleavage (inclined, vertical) 70
Lineation, plunging (bedding/cleavage intersection, crenulation) 5 11
Mesoscopic fold axis, plunging (synmetamorphic, postmetamorphic) 2 24
Field station, 2010 and 2011 mapping programs.....
Sample dated by U/Pb on zircons, with crystallization age (R. Friedman, UBC) ... U 248.23 ±0.42 Ma
Sample dated by U/Pb on detrital zircons ..... Z
Assay sample (Table 1) 10PSC-115
Mineral showing (Table 2) ..... Kass
Kutcho Creek deposit, massive sulphide lens (projected vertically to surface) .....
Topographic contour (20 m, 100 m intervals) 1700
Rough road .....
Gravel airstrip .....

Table 1: Assay data; samples collected during 2010 and 2011 field seasons and analysed at Acme Laboratories, Vancouver, using ICP-MS after aqua regia digestion

			Element	Mo	Cu	Pb	Zn	Ag	Ni	Co	Mn	Fe	As	Au	Sb	Bi	Cr	Ba	B	W	Hg
			Units	PPM	PPM	PPM	PPM	PPM	PPM	PPM	PPM	%	PPM	PPB	PPM	PPM	PPM	PPM	PPM	PPM	PPM
			Detection LImit	0.1	0.1	0.1	1	0.1	0.1	0.1	1	0.01	0.5	0.5	0.1	0.1	1	1	1	0.1	0.01
Sample	Easting	Northing	Rock Type																		
10PSC-99	533140	6445448	pyritic, silicified sericite-chlorite schist	0.4	95.1	6.8	42	<0.1	32.8	26.1	523	5.27	619	1	3.4	1.1	76	5	3	<0.1	<0.01
10PSC-115	535675	6450387	pyritic quartz-chlorite-sericite schist	0.3	54.5	2.7	1091	<0.1	56.6	18.6	2487	5.85	3.3	<0.5	<0.1	<0.1	174	21	<1	<0.1	0.03
10PSC-158	532055	6447076	pyritic sericite-quartz-altered lens	17.2	93.8	9.1	199	0.4	36.8	10	529	11.79	10.2	<0.5	0.3	<0.1	100	27	<1	<0.1	<0.01
10PSC-274	541344	6454167	listwanite	<0.1	5.9	4.6	6	<0.1	572.7	49.2	704	2.21	1.3	1.3	0.3	<0.1	218	3	3	<0.1	<0.01
10PSC-281	545403	6450661	listwanite	0.1	5.7	2	6	<0.1	2134.8	67.2	383	3.06	16.7	1.8	1	<0.1	195	66	2	<0.1	0.11
10PSC-310	542526	6449784	pyritic siliceous lens in metarhyolite	3.5	9	3.2	19	0.1	4.1	1.2	105	3.95	5.8	1.8	0.2	0.2	<1	8	<1	<0.1	<0.01
10SRC-175	534485	6447408	pyritic, silicified metarhyolite	0.5	2.9	7.1	9	<0.1	3.4	0.8	50	1.09	1.6	2.3	0.4	<0.1	3	17	<1	<0.1	<0.01
10SRC-176	534293	6447169	pyritic sericite-quartz schist	1.3	16.1	1.7	87	<0.1	1.3	6.5	838	4.7	0.9	2.1	0.1	0.1	3	3	<1	<0.1	<0.01
10SRC-177	534313	6447198	pyritic sericite-quartz schist	0.2	19.3	1.3	57	<0.1	1.5	3.7	212	1.99	0.6	2	<0.1	<0.1	4	21	<1	0.1	<0.01
10SRC-263	541484	6454054	listwanite	<0.1	6.3	1.7	6	<0.1	1560.7	60.3	700	3.69	1.3	<0.5	0.3	<0.1	350	5	<1	<0.1	<0.01
10SRC-297	542383	6449732	epidote-chlorite schist with pyrrhotite-pyrite	6.4	84.3	1.4	159	0.4	42.2	26.9	1778	15.71	6.1	3.7	<0.1	1.4	87	48	<1	<0.1	<0.01
11PSC-46	524864	6446260	pyritic sericite-quartz schist	6.8	20.8	2.3	21	<0.1	48.7	19.5	131	2.96	19.7	1.5	0.2	<0.1	53	21	<1	<0.1	0.02
11PSC-53	525669	6446669	pyritic hornblende-biotite porphyry	2.6	93.7	4.2	31	0.1	29	21.3	244	3.5	1.5	2.1	0.2	0.3	60	91	<1	5.4	<0.01
11PSC-56	525504	6446638	pyritic hornblende porphyry	3.2	71.8	7	49	0.2	25.1	22	362	3.11	4	3.5	0.2	0.3	41	73	<1	0.4	<0.01
11PSC-64	534771	6451708	pyritic chert (exhalite?)	3	13.9	5.8	11	0.1	2.2	1.6	37	0.84	3.8	3.2	0.5	0.3	3	18	<1	<0.1	0.01
11PSC-79	524663	6447795	pyritic sericite-quartz schist	0.2	38.4	1.2	39	<0.1	109.2	40.2	282	3.64	6.7	1.6	<0.1	<0.1	174	6	<1	<0.1	<0.01
11PSC-81	524594	6448059	pyrite-quartz alteration	0.2	4.9	1.2	35	<0.1	0.5	0.5	358	2.73	<0.5	3.6	<0.1	<0.1	2	2	<1	<0.1	<0.01
11PSC-140	524657	6450389	quartz vein with pyrite, chalcocite, galena, malachite, azurite	1.1	>10000	7652.8	1239	>100.0	3.5	1.2	35	0.44	829.4	96.3	>2000.0	2.8	7	11	<1	<0.1	1.55
11PSC-161	526455	6451070	feldspathic sandstone with disseminated pyrite	0.4	17.4	4.6	97	0.5	11.6	10.2	794	4.36	7.2	0.6	1.9	<0.1	23	36	1	0.1	<0.01
11PSC-240	522260	6445979	quartz-epidote alteration with disseminated pyrite	1.5	74.5	27	76	2.2	4	7	627	4.71	2.7	0.7	13.1	<0.1	19	8	<1	<0.1	0.01
11PSC-265	522719	6447069	quartz-sericite-pyrite alteration	0.5	26.1	1.6	41	<0.1	4.8	25.7	181	10.55	17.1	<0.5	0.3	<0.1	3	11	2	<0.1	0.01
11PSC-314	515514	6448828	listwanite	<0.1	10.4	1.7	12	0.2	883.4	63.8	1721	4.23	1.5	0.7	1.7	<0.1	937	5	3	<0.1	0.01
11PSC-386	531923	6448398	quartz-sericite schist with pyrite, chalcopyrite, malachite	0.1	380.3	3	80	<0.1	32.9	45	676	7.74	38.6	1.4	0.8	0.3	29	12	3	<0.1	0.02
11PSC-410	521721	6454512	pitted siliceous phyllite with malachite	33.3	4468.9	29.1	71	1.3	201.6	42.4	2922	7.69	45	1.4	1.7	0.2	84	2335	2	<0.1	0.08
11PSC-431	529289	6449215	pyritic iron chert (exhalite)	2.6	14.3	1.9	5	0.3	1.9	0.5	54	3.99	1.8	15.6	0.3	0.5	8	36	<1	0.2	0.21
11PSC-438	529344	6449274	pyritic iron chert (exhalite)	3.7	652.5	33.3	669	1.2	2.1	3.8	1081	2.91	5.3	1.2	0.9	<0.1	10	67	<1	<0.1	0.46
11PSC-440	529307	6449337	pyritic siliceous exhalite	6	25	3.9	17	0.1	4.2	5.9	739	3.37	9.7	2.2	0.2	0.9	8	41	<1	<0.1	<0.01
11PSC-450	526646	6447718	quartz-sericite-pyrite alteration	0.2	41.1	1.9	100	0.1	80.1	28.8	802	7.02	7.5	0.8	0.4	<0.1	204	26	<1	<0.1	0.01
11PSC-467	522321	6450317	quartz vein with pyrite, chalcocite, galena, malachite, azurite	0.4	6222.8	>10000	806	>100.0	4.9	0.6	28	1.16	612	128.7	>2000.0	7.4	8	23	<1	<0.1	0.96
11PSC-480	527964	6451029	massive to heavily disseminated pyrite, chalcopyrite	1.8	>10000	103.1	253	45	2.3	3	411	8.13	3	4549.2	13.6	5.2	5	47	<1	0.2	0.46
11PSC-481	527925	6451029	massive to heavily disseminated pyrite, chalcopyrite	0.4	>10000	78.8	159	11.4	4.5	5.7	501	4.35	5.6	8228.2	10.9	0.9	14	14	<1	0.2	0.34

Table 2: Mineral occurrences

Name	MINFILE No.	Easting	Northing	Description	Reference
Blueridge		522321	6450317	quartz veins with pyrite, chalcocite, galena, malachite, azurite	Stn 11PSC-467
Bow	104I 071	525336	6448164	quartz vein with minor amounts of bornite and chalcopyrite; intersected in drill hole	Assessment Report 5911
CK	104I 075	538406	6447415	pyrite, with traces of chalcopyrite and sphalerite, in sericite-quartz schist	Assessment Reports 6630, 20636
Jenn		543041	6449581	pyritic quartz-sericite schist with traces of chalcopyrite and sphalerite; intersected in drill hole	Assessment Reports 5138, 5641, 11323
JW	104I 066	515904	6454875	nephrite	Assessment Reports 5100, 6008
Kass	104I 095	533672	6445582	lenses of laminated to brecciated pyrrhotite, with traces of chalcopyrite and sphalerite	Assessment Report 11314
Kris		531923	6448398	pyritic quartz-sericite schist with minor chalcopyrite and malachite	Assessment Reports 20636, 31029; Stn 11PSC-386
Kutcho 1		529293	6449333	pyritic chert with lenses of semimassive to massive sulphides (pyrite, chalcopyrite)	Stn 11PSC-438; Assessment Reports 24866, 6686
Kutcho 2	104I 072	527925	6451029	lenses of massive to semimassive sulphides (pyrrhotite, pyrite, chalcopyrite)	Stn 11PSC-481; Assessment Reports 24866, 9170
Kutcho Creek	104I 060	537594	6451842	massive sulphide lenses; pyrite, sphalerite, chalcopyrite, bornite	Bridge et al. (1986); Barrett et al. (1996)
Matt		521721	6454512	pitted phyllite with malachite	Stn 11PSC-410
Ridgecrest	104I 052	524657	6450389	quartz veins with pyrite, chalcocite, galena, malachite, azurite	Stn 11PSC-140
Rubysh	104I 061	524495	6449190	quartz-siderite veins containing tetrahedrite and galena	MINFILE

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For a more detailed description of the geology see:
Schiarizza, P. (2012): Geology of the Kutcho Assemblage between the Kehlechoa and Tucho rivers, northern British Columbia (NTS 104I/01, 02); in Geological Fieldwork 2011, British Columbia Ministry of Energy and Mines, Paper 2012-1, pages 75-98.

Topographic base produced from TRIM data supplied by LandData B.C.
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Geological interpretation based mainly on fieldwork conducted in 2010 and 2011. Additional sources of information shown below.

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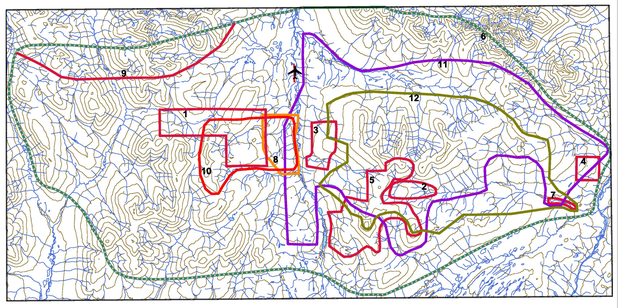

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