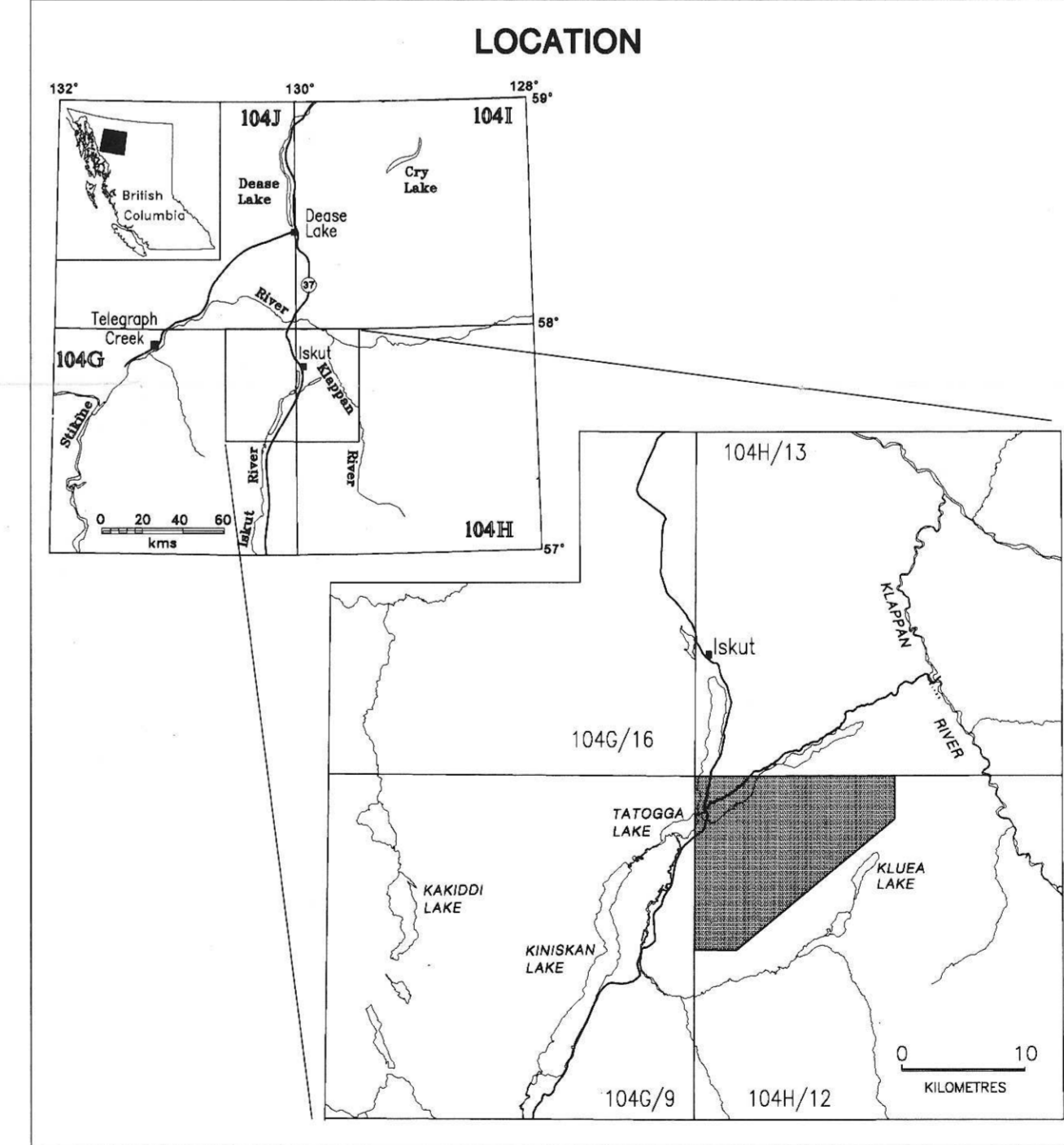


Geological Survey Branch
OPEN FILE 1996-4
GEOLOGY OF THE TODAGIN PLATEAU
RED CHRIS AREA
 NTS 104H/12NW
 Geology by C.H. Ash, P.K. Stinson,
 T.M. Fraser, R.W.J. Macdonald and K.J. Nelson

Scale 1:20 000
 0 1 2
 KILOMETRES

- LEGEND**
- QUATERNARY**
- Qal Unconsolidated glacial till and poorly sorted alluvium.
- PLIOCENE TO RECENT**
- MITLAND VOLCANICS**
- Pm_v Olivine phyric basalt: black, columnar jointed flows.
- MIDDLE JURASSIC**
- BOWSER LAKE GROUP**
- Bajocian to Oxfordian
- mJ_{og} Over- to pebbly conglomerate: green, black, white and red, laminated chert clasts in a tan-brown sandstone matrix, interbedded on a scale of several tens of centimetres to several metres, with thinner sandstone interbeds.
 - mJ_{as} Siltstone-sandstone: dark-grey to black, laminated to thinly bedded (1-2cm), intercalated siltstone to silty mudstone and lesser limy mudstone with widely spaced interbeds (8-15 cm thick) of light-brown, fine to medium-grained sandstone.
- LOWER JURASSIC**
- HAZELTON GROUP**
- Pliensbachian to Toarcian
- IJ_{ss} Siliceous siltstone: black to light grey, laminated to very thinly bedded (0.5 to 3cm); locally interbedded with pale-green to buff-white, fine to medium-grained felsic tuff.
 - IJ_{rv} Rhyolite volcanics and volcanoclastics: pink, buff-white and bright-green, aphyric to locally quartz-feldspar rhyolite flows; locally flow bedded; includes volcanic breccias, welded lapilli, ash and dust tuffs; rare chalcocite quartz veins; locally gossanous; ca. 181 Ma, U-Pb zircon age.
 - IJ_{ra} Rhyolite autobreccia: pink, buff-white and light green, aphyric to locally feldspar porphyritic; angular rhyolite clasts from 1 to 15 cm; local intervals from one to several metres thick of bedded, medium-grained felsic tuff/volcanic sandstone.
 - IJ_{rb} Rhyolite breccia, shrapstone conglomerate and felsidolite wacke: tan to light grey medium to coarse grained felsidolite wacke with pebble sized angular clasts of buff white aphyric rhyolite; lesser similar sized, subangular, black siltstone fragments.
 - IJ_{rl} Limestone: light to dull grey, massive to locally bedded, medium to coarse grained calcareous sandstone; Weyla bivalves locally abundant.
 - IJ_{rv} Basaltic volcanics: dark olive-green to black, clinopyroxene phyric flow and pillow breccias most common, also massive and columnar jointed flows; locally well pillowed, quartz porphyritic (3 to 15%, 2 to 5 mm), commonly calcite filled amygdaloids (3 to 10%, 3 to 6 mm); intervals of medium-grained felsidolite wacke and siltstone.
 - IJ_{vg} Volcanic breccia and conglomerate: maroon, massive monomictic basaltic volcanic breccia and intercalated polymictic volcanoclastic sediments with both andesitic and basaltic clasts.
 - IJ_s Felsidolite wacke-siltstone: light grey to beige, massive wacke and black, laminated siltstone; may be interbedded on the centimetre scale or forms continuous intervals of one or the other; contains early Pliensbachian ammonites.

- SYMBOLS**
- Contact (defined, approximate inferred)
 - Fault (defined, approximate inferred)
 - Bedding, tops known (inclined, vertical, overturned)
 - Bedding, tops unknown (inclined, vertical)
 - Foliation (inclined, vertical)
 - Spaced cleavage (inclined, vertical)
 - Minor fault zone (inclined, with slickensides)
 - Minor fold hinge line (inclined)
 - Banding in volcanic rocks (inclined, vertical)
 - Dike (inclined, vertical)
 - Sheeted quartz veins (inclined, vertical)
 - Anerkite vein (inclined, vertical)
 - Sample locality
 - Assay (see table)
 - Geochronology (see table)
 - Fossil (see table)



TABLES

METAL ABUNDANCES OF ALTERED AND/OR MINERALIZED SAMPLES

Map #	Sample #	Rock Type	Easting	Northing	Au	Ag	Cu	Mo	Pb	Zn	As	Sb	Ba	Co	Cd	V	Cr	
A1	CA594-185	carbonate-altered andesite breccia (2-4% pyrite)	442705	6393713	<2	<0.3	27	2	4	53	7.4	1.8	230	7	44	<0.2	<1	89
A2	CA594-248	carbonate-altered mafic volcanic (trace-9% pyrite)	442704	6399114	<2	<0.3	44	1	8	25	23	72	240	261	63	<0.2	<1	593
A3	CA594-274	carbonate-altered mafic volcanic (trace-9% pyrite)	454721	6397613	19	<0.3	579	3	9	49	5.5	6	210	25	110	<0.2	<1	59
A4	CA594-291	intensely carbonate-altered rock (3-15% pyrite)	446201	6394430	37	1.5	133	4	24	229	52	14	330	2	9	<0.2	<1	7
A5	CA595-593	myolite breccia with chalcocite-quartz	446201	6394430	<2	<0.3	3	3	7	74	3.7	5.5	1200	3	1	0.3	2	163
A6a	CA595-556A	gossan in pillowed augite phyric basalt (trace-2% pyrite)	442533	6388990	<2	<0.3	21	16	<3	71	11	0.5	1300	32	18	0.8	176	83
A6b	CA595-556B	gossan in pillowed augite phyric basalt (trace-2% pyrite)	442532	6388986	<2	<0.3	27	11	<3	44	13	0.8	790	53	22	0.9	160	92
A6c	CA595-556C	gossanous siltstone	442552	6389003	<2	<0.3	13	24	7	38	12	0.8	270	12	5	0.3	127	43
A7	CA595-598	gossan in pillowed augite phyric basalt (trace-2% pyrite)	442315	6388546	<2	<0.3	23	6	<3	42	5.1	0.3	2600	36	13	0.9	168	140
A8	CA595-659	dissected fine-grained myolite	442319	6388296	6	<0.3	3	3	11	5	5.1	1	230	3	1	<0.2	1	130
A9	P5175-063	gossanous mafic volcanics	442519	6389199	<2	<0.3	37	1	4	105	2.4	0.6	740	44	27	0.7	177	89
A10	RM495-361	gossanous siltstone-argillite	444231	6386468	<2	<0.3	<1	30	11	36	20	1.5	1200	1	<1	0.5	1	83
A11	RM495-461	ankerite veins in carbonate-sericite altered porphyry	441698	6388347	3	<0.3	<1	1	<3	47	0.9	0.6	290	1	4	0.3	15	32
A12*	TR84-036	chalcopyrite in andesitic volcanic breccia	444428	6400471	146	11.8	2937	1	35	78	260	5.1	<50	42	430	<0.2	<1	18

U-Pb ISOTOPIC AGE DATA

Map #	Sample #	Lithology	UTM Easting	UTM Northing	Mineral Dated	Age (Ma)
G1	CA594-215	hornblende monzodiorite	454951	6388870	zircon	197.9 ± 81.3-2
G2	CA594-307	hornblende quartz diorite	452546	6399235	zircon and titanite	200.4 ± 141.3
G3	DH495-224 (105m)	Red stock - monzodiorite	452778	63395648	zircon	203.8 ± 1.3
G4	CA595-404C	rhyolite	440594	6389577	zircon	181.0 ± 58.0-2.4

Analyses by Richard Friedman, Department of Geological Sciences, University of British Columbia.

FOSSIL DATA

Map #	BC-GSB Sample #	GSC Location #	Lithology	UTM Easting	UTM Northing	Fossil Type	Age
F1	CA595-429	C-208815	siltstone	442267	6388800	Ammonite - Dubanceras (Frebaldi)	Early Pliensbachian
F2	RM495-041	C-208817	siltstone	443372	6388800	Ammonite - ?Adeloceras sp. ?Leptacoceras sp. ?Mastaceras sp. Kunze zone	Probably Late Pliensbachian
F3	KN695-203	C-208816	limestone	445376	6391560	Bivalve - Welya sp.	Early Jurassic

Fossils examined by Howard Tipper, Geological Survey of Canada, Vancouver.

MARGINAL NOTES

The 1:20 000 topographic base is a photographic enlargement of the 1971, 1:50 000 Kluea Lake (104H/12) map sheet.

Both high and low-angle faults are more frequent than indicated.

Ankerite alteration indicated only where identified in outcrop. No attempt has been made to extrapolate alteration into areas devoid of outcrop. Only areas of intense alteration are indicated. These are commonly, though not always surrounded by broad areas of moderate to weak ankerite alteration.

Only outcrops examined are indicated.

- INTRUSIVE ROCKS**
- EARLY JURASSIC**
- Pliensbachian (?)
- EJ_d Pyroxene diorite: dull grey to buff white, massive, medium grained to locally coarse-grained, equigranular; does not appear to be affected by carbonate alteration.
- Sinemurian
- EJ_{md} Hornblende quartz-diorite, monzodiorite and monzonite: leucocratic light-grey to buff-white, medium grained, equigranular to porphyroclastic hornblende porphyritic; quartz from trace to several percent; ca 199-203 Ma, U-Pb age; Red stock is pervasively carbonate and sericite altered with disseminated pyrite from trace to 20%.

- ALTERATION**
- Zones of intense, secondary ankerite-iron magnetite: tan orange-brown, pervasively CO₂-metasomatized country rocks, intensity of alteration typically dissipates away from a core zone of hydrothermal ankerite veins and vein breccias; locally trace to 10% pyrite as disseminations and 1 to 2 cm cists.
 - Known area of chalcopyrite-bearing quartz stockwork in pervasively carbonate-sericite altered Red stock (Blanchflower, 1996).

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