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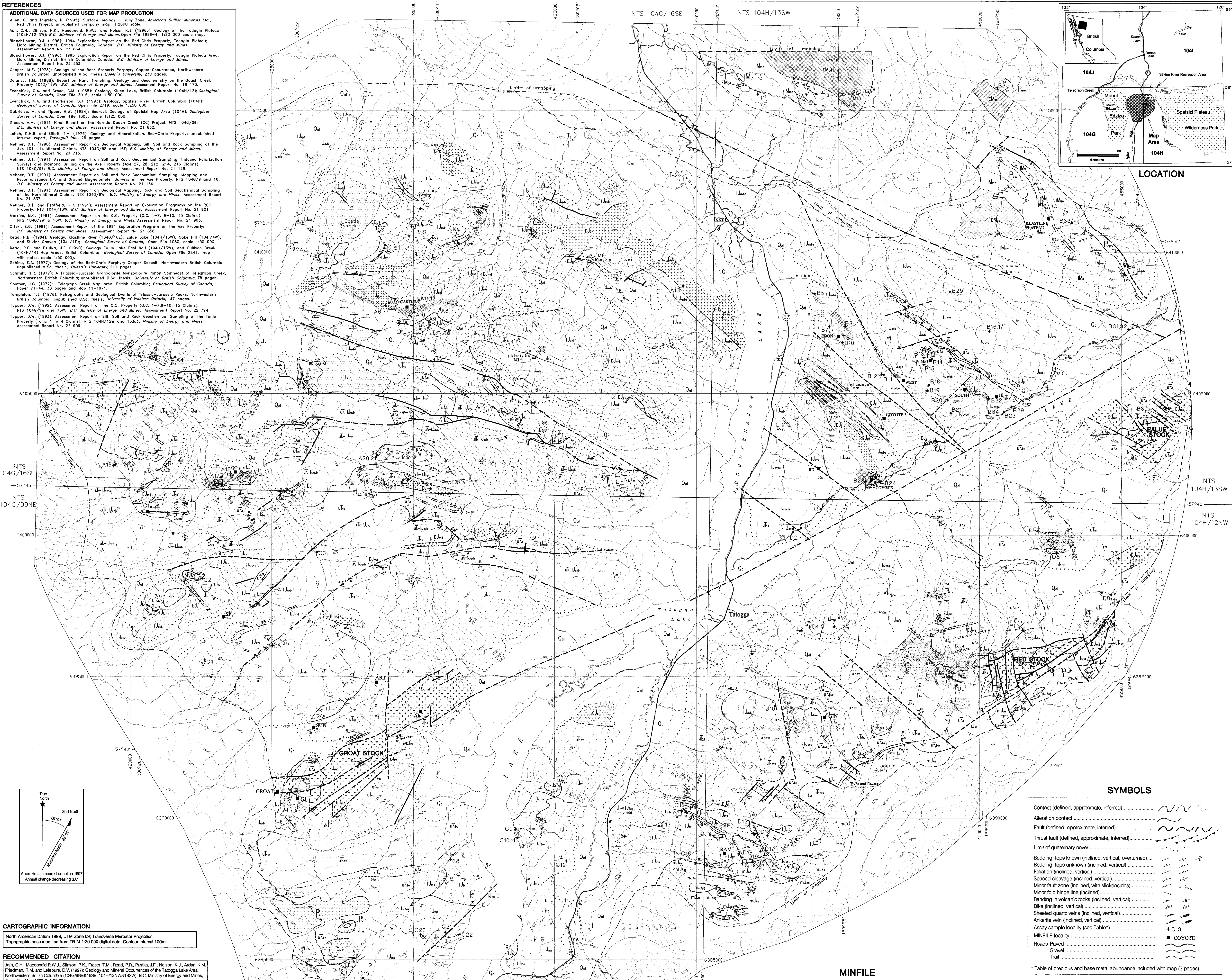

Approximate mean declination 1997
Annual change decreasing 3.0′

LOCATION

British Columbia
Ministry of Energy and Mines
Energy and Minerals Division
Geological Survey Branch

Geological Survey Branch

OPEN FILE 1997-3

GEOLOGY AND MINERAL OCCURRENCES OF THE TATOGGA LAKE AREA

NTS 104G/9NE, 16SE & 104H/12NW, 13SW

Geology by C.H. Ash, R.W.J. Macdonald, P.K. Stinson,
T.M. Fraser, P.R. Read, J.F. Pustka, K.J. Nelson,
K.M. Arden, R.M. Friedman and D.V. Lefebure

Scale 1:50 000

0 1 2 3 4 5

KILOMETRES

(Note: This digital file was last updated on June 19th, 1998)

QUATERNARY

Q_{al}	Unconsolidated glacial till and poorly sorted alluvium.

PLIOCENE TO RECENT

T_v	Olivine basalt: black, flow and pillow breccias, pyroclastic rocks and loose tephra; in part, younger than Qal.

PLIOCENE

NIDO VOLCANICS

P_v	Olivine phyric basalt: black, columnar jointed flows (5.7 to 4.9 Ma, K-Ar).

MIDDLE JURASSIC

BOWSER LAKE GROUP

Bajocian to Oxfordian

Ashman Formation

mJ_{Acg}	Chert-pebble conglomerate: green, black, white and red, subrounded 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

lJ_{me}	Mafic heterolithic conglomerate: black, mafic dominated, thickly bedded (0.5 to 1m), components of all Mesozoic volcanic rocks are present. Calcite fragments comprise from 5 to 15%.
lJ_{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.
lJ_{fve}	Felsic volcaniclastics and epiclastics : breccia, sharpstone conglomerate; tan to light-grey medium to coarse-grained feldspathic wacke with pebble sized angular clasts of buff white aphanitic rhyolite and lesser subangular, black siltstone fragments.
lJ_{fv}	Felsic volcanics and volcaniclastics: monolithic, pink, buff-white and bright-green, aphyric to locally quartz-feldspar phyric, locally flow banded; includes volcanic breccias, welded lapilli, ash and dust tuffs; rare chalcedonic quartz veins; locally gossanous; ca. 183 Ma, U-Pb zircon age.
lJ_{mv}	Mafic to intermediate volcanics: grey-green; plagioclase microphyric flow and pillow breccias most common, also massive and columnar jointed flows; locally well pillowed; intervals of medium-grained feldspathic wacke and siltstone.
lJ_{vcg}	Volcanic breccia and conglomerate: maroon, massive monomictic basaltic volcanic breccia and intercalated polymictic, volcaniclastic sediments with both andesitic and basaltic clasts.
lJ_L	Limestone: light to dull grey, massive to locally bedded, medium to coarse-grained, calcareous sandstone; Weyla locally abundant.

Sinemurian

lJ_{avb}	Andesitic volcanic breccias and conglomerates: grey-green and maroon, feldspar hornblende-porphyritic andesitic to dacitic debris flows and lahars; minor flows; contains intervals of green and maroon epiclastic conglomerate and medium to coarse-grained crystal lithic wacke with angular, red mudstone fragments. Unit labled lJ_{avbe} where epidote-chlorite-calcite altered. Designated as lJ_{avbc} where chlorite-calcite altered.
	Volcanic breccia and conglomerate: maroon, massive monomictic basaltic volcanic breccia and intercalated polymictic, volcaniclastic sediments with both andesitic and basaltic clasts.
lJ_{vcg}	Volcanic conglomerate: red-brown, typically well bedded (<0.2 to 2 m), clast to matrix supported, subrounded pebble to cobble clasts of plagioclase hornblende phyric andesite in a poorly sorted crystal lithic matrix, lesser intrusive dioritic clasts; interbeds of medium to coarse-grained crystal lithic wacke common.

LOWER JURASSIC-UPPER TRIASSIC ?

$uTR\text{-}lJ_{avb}$	Unit is similar to lJ_{avb}, but contains limestone clasts in volcanic breccias with upper Triassic limestone. Clasts with fossils of this age dominate along a zone of inferred interfingering between the volcanic breccia unit underlying sediments. Limestone may be olistromal. Unit labled $uTR\text{-}lJ_{avbe}$ where epidote-chlorite-calcite altered. Designated as $uTR\text{-}lJ_{avbc}$ where chlorite-calcite altered.

UPPER TRIASSIC

STUHINI GROUP

uTR_{bve}	Mafic volcaniclastics and epiclastics derived from uTR_{bv}. Maroon and dark green, poorly sorted massive to thickly bedded volcanic conglomerate; locally, well bedded
uTR_{bv}	Basalt: dark olive-green to black; clinopyroxene-phyric flow and pillow breccias; euhedral clinopyroxene phenocrysts (3 to 15%, 2 to 8 mm); occasionally calcite amygdaloidal (trace to 10%, 2 to 5 mm); locally intensely carbonate-altered. Unit may in part be lJ_{vcg}.
uTR_s	Volcanic sandstone, siltstone, mudstone and lesser siliceous mudstone and chert: Volcanic sandstone is dominant, tan-brown to grey, typically medium-grained, massive to thickly bedded with intervals of bedded siltstone and mudstone. Locally dominated by thin bedded intervals of mudstone-siltstone.
uTR_L	Limestone: light to dull grey, massive to locally bedded, medium to coarse-grained, locally brecciated; contains Upper Triassic conodonts.

STIKINE ASSEMBLAGE

PALEOZOIC (?)

P_{mv}	Mafic volcanic: green to grey-green, fine to medium-grained, massive, typically equigranular; mafic tuff.
P_{vw}	Volcanic greywacke: green-grey, fine to medium-grained, massive; contains intervals of interbedded volcanic sandstone, mudstone, siliceous siltstone. May be in part equivalent to uTR_s.

LOWER MISSISSIPPIAN

lM_{mv}	Metavolcanic and metasedimentary rocks: includes green chloritic phyllite, brown phyllitic argillite, light grey-green to tan quartz-sericite schists (felsic metavolcanics, ca. 342 Ma, U-Pb zircon age).
lM_c	Limestone, dolostone: grey, light grey to buff white, massive to strongly foliated and recrystallized.

INTRUSIVE ROCKS

EARLY JURASSIC

Toarcian (?)

EJ_g	Alkali granite/felsite: leucocratic, pink, tan to buff white; ranges from medium-grained, equigranular to quartz-feldspar porphyritic to aphyric aphanitic varieties (ca 182-186 Ma, U-Pb ages).
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 plagioclase hornblende porphyritic; quartz from trace to several percent (ca 198-205 Ma, U-Pb age), Red stock is pervasively carbonate and sericite-altered with disseminated pyrite from trace to 20%.

EARLY MISSISSIPPIAN

EM_{gd}	Granodiorite, diorite: light-grey to buff-white, medium to coarse grained, equigranular to locally foliated proximal to intrusive contacts. Mafics replaced by secondary chlorite. (ca 342 - 353 Ma, U-Pb ages).

SYMBOLS

Contact (defined, approximate, inferred)
Alteration contact
Fault (defined, approximate, inferred)
Thrust fault (defined, approximate, inferred)
Limit of quaternary cover
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)
Ankerite vein (inclined, vertical)
Assay sample locality (see Table*) ✦ C13
MINFILE locality ■ COYOTE
Roads Paved
Gravel
Trail

* Table of precious and base metal abundance included with map (3 pages)

MINFILE

Name	MINFILE Number	Status	UTM Easting	UTM Northing	Commodities	NTS Map
QC	104G 033	SHOW	423143	6402636	Cu	104G16W
GJ	104G 034	SHOW	425900	6390676	Cu, Au, Ag	104G09E
SF	104G 035	PROS	423286	6397127	Ag, Au, Ba, Pb, Zn, Cu	104G09W
Al	104G 044	SHOW	420627	6400829	Cu, Au	104G09W
Wolf	104G 045	SHOW	430264	6393753	Cu, Au, Ba	104G09E
Art	104G 071	SHOW	428708	6394801	Cu	104G09E
Castle	104G 076	SHOW	429771	6408051	Au, Ag, Cu	104G09E
Goat	104G 086	SHOW	425192	6390942	Cu, Au, Pb, Zn	104G09W
Sun	104G 087	SHOW	426493	6393201	Cu, Ag	104G09E
MFJ	104H 001	PROS	448249	6406164	Cu,Au	104H13W
West	104H 002	SHOW	447299	6405464	Cu, Au, Ag	104H13W
Edon	104H 004	SHOW	445007	6407011	Cu, Au, Mo	104H13W
Red Chris	104H 005	DEPR	452202	6395444	Cu, Au, Ag, Pb, Zn, Mo	104H12W
South	104H 006	SHOW	449459	6405158	Cu, Pb, Au, Ag	104H13W
Ram	104H 011	SHOW	440993	6388757	Mo	104H12W
Coyote	104H 012	SHOW	446192	6401943	Mo, Cu	104H13W
Hi	104H 014	PROS	450595	6404897	Cu, Au	104H12W
Kitty	104H 015	SHOW	442672	6415735	Cu	104H13W
RD	104H 016	SHOW	444299	6402350	Cu	104H13W
Klastine	104H 018	SHOW	452421	6411184	Ls	104H13W
Coyote 3	104H 024	SHOW	446637	6404112	Cu	104H13W
Eldorado	104H 026	SHOW	460150	6400585	Cu, Au, Pb, Zn, Mo	104H12E
Gin	104H 031	SHOW	444542	6393563	Cu, Au, Ag, Pb, Zn, As	104H12W

ALTERATION

No attempt has been made to extrapolate alteration into areas devoid of outcrop.
Only areas of intense alteration are indicated.

Toarcian (?)

▨	Zones of intense, secondary quartz-sericite-albite-pyrite alteration; rusty to yellow-brown weathering; light-green, very fine-grained to aphanitic, original texture typically obliterated; pyrite common as disseminations and locally concentrated as fracture fillings and clots. This alteration type is hosted mainly by the andesitic volcanic breccia unit (lJ_{avb} & $uTR\text{-}lJ_{avb}$) and contain secondary epidote-chlorite-calcite alteration.

lJ_{avbe} & $uTR\text{-}lJ_{avbe}$ - epidote-chlorite-calcite altered volcanics
lJ_{avbc} & $uTR\text{-}lJ_{avbc}$ - chlorite-calcite altered volcanics

Sinemurian (?)

▨	Zones of intense, secondary ankerite-iron magnesite: tan orange-brown, pervasively CO_2-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, fractue and breccia cavity fillings. These zones are commonly surrounded by broad areas of moderate to weak ankerite alteration.

CARTOGRAPHIC INFORMATION

North American Datum 1983, UTM Zone 09; Transverse Mercator Projection.
Topographic base modified from TRIM 1:20 000 digital data; Contour interval 100m.

RECOMMENDED CITATION

Ash, C.H., Macdonald R.W.J., Stinson, P.K., Fraser, T.M., Read, P.R., Pustka, J.F., Nelson, K.J., Ardan, K.M., Friedman, R.M. and Lefebure, D.V. (1997): Geology and Mineral Occurrences of the Tatogga Lake Area, Northwestern British Columbia (104G/9NE&16SE, 104H/12NW&13SW); B.C. Ministry of Energy and Mines, Open File Map 1997-3, 1:50 000 scale map.

MARGINAL NOTES

GEOLOGY

For descriptions of the geology of the Tatogga Lake area refer to the folowing publications and references therein.

Ash, C.H., Fraser, T.M., Blanchflower, J.D., and Thurston, B.G., (1995): Tatogga Lake Project, Northwestern British Columbia (104H/11, 12); in Geological Fieldwork 1994, Grant, B. and Newell, J.M., Editors, B.C. Ministry of Energy, Mines and Petroleum Resources, Paper 1995-1, pages 343-358.

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CONTACT INFORMATION

Questions or comments may be directed to Chris Ash, BC Ministry of Energy & Mines, Geological Syrvey Branch
Phone (250) 952-0426; FAX 952-0381; E-mail Chris.Ash@gems2.gov.bc.ca

To Accompany Open File Map 1997-3

TABLE 1. METAL ABUNDANCES OF ALTERED AND/OR MINERALIZED SAMPLES

Designation of samples as A, B, C & D indicates NTS sheet in which they occurr. A - 104G16(NW portion of map); B - 104H13(NE); C - 104G09(SW); D - 104H12(SE)

Sample		Sample Description	UTM		*Au	Ag	Cu	Mo	Pb	Zn	*As	*Sb	Ni	Hg	*Co	Cr	*Ba
			Easting	Northing	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Dectection Limit —>			2	0.3	1	1	3	1	0.5	0.1	1	1	1	1	50
A1	RMA96-720	malachite stain along gossanous fractures in ankerite alteration zone (location not shown on map)	421918	6411890	7	0.7	8561	2	4	39	3.1	2	26	<1	16	19	440
A2	RMA96-697	gossan in flow-banded and autobrecciated rhyolite	430228	6411504	3	< .3	10	2	9	29	6.8	0.6	3	<1	<1	11	1300
A3	RMA96-759	3m wide gossanous zone with pyrite-chalcopyrite + malachite/azurite stain	421406	6406252	1770	15.2	5645	10	630	7378	840	26	5	<1	9	8	170
A4	RMA96-757	1 m wide, intensely ankerite altered zone in dark green plagioclase porphyry intrusion	421566	6406257	2010	16.7	340	6	1200	48259	120	4.7	4	66	8	< 1	17000
A5	RMA96-695	3-5% disseminated pyrite in, and near gossanous fractures in andesitic breccia	429108	6408168	80	1.1	179	< 1	5	2280	48	3.9	3	<1	12	5	620
A6	RMA96-694	3-5% medium-grained pyrite in gossanous monzodiorite	428989	6408082	11	< .3	49	2	10	54	6.2	0.9	1	<1	2	15	1900
A7	RMA96-694	3-5% medium-grained pyrite in gossanous monzodiorite	428989	6408082	16	< .3	32	1	4	62	6.1	0.9	1	<1	2	15	1900
A8	RMA96-682	0.5 m wide gossan with 5% disseminated chalcopyrite + malachite stain in andesitic breccia/wacke	430927	6407959	<2	0.5	20336	3	4	136	3.7	6	8	<1	21	7	440
A9	RMA96-684	single 1.5 cm malachite stained vein with 0.5 cm clots of chalcopyrite	430512	6407490	107	6	58994	3	5	62	6.8	5	7	<1	9	8	130
A10	DVL96-035	20% disseminated to patchy fine-grained pyrite in altered rhyolite	429999	6407834	29	< .3	113	7	3	28	4.1	1.5	13	<1	42	7	260
A11	DVL96-032A	10-15% pyrite as dissemination's & veinlets in highly oxidized float, plagioclase phyric	430163	6408263	52	< .3	311	2	9	35	2.4	1.5	5	<1	33	6	1300
A12	DVL96-032B	5% medium-grained disseminated pyrite, malachite stain on fractures in gossan	430163	6408263	35	< .3	688	1	5	54	3.9	1.3	6	<1	17	9	560
A13	CAS96-1170	strongly gossanous rounded clast (FLOAT) in scree with 10-15% sulphides	439480	6408767	13	0.8	90	22	225	574	310	4.8	3	<1	23	8	1400
A14	CAS96-1170B	strongly gossanous rounded clast (FLOAT) in scree with 10-15% sulphides	439480	6408767	9	< .3	17	24	56	88	98	4.6	15	<1	88	4	440
A15	RMA96-843	0.3 m wide ankerite vein with a single veinlet and several large clots of galena and chalcopyrite	419457	6402482	97	2.1	601	1	49	403	3100	7.2	21	<1	47	7	<50
A16	CAS96-1393	2-6cm wide quartz vein with malachite stain in silicified siltstone	423218	6402047	156	6.5	3933	7	3	100	7.6	1.9	13	<1	8	11	360
A17	CAS96-1391	intensely silicified, rusty-brown weathering unit with 5% disseminated sulphides	423170	6402003	45	0.7	4450	3	3	66	9.7	1.1	16	<1	13	24	1200
A18	CAS96-1390	gossanous monzodiorite with 5-10% sulphides along late fractures	423082	6401796	94	2.5	2171	36	7	20	42	1.9	10	<1	18	27	1400
A19	CAS96-1387	silicified and epidote altered, gossanous siltstone(?) with 15% sulphides along fractures	423215	6401732	62	< .3	111	7	12	17	7	3.8	7	<1	11	11	820
A20	RMA96-782	gossanous fracture zone in silicified pebble wacke with up to 10% fine disseminated pyrite	428697	6402805	9	< .3	64	8	28	75	11	4.4	8	<1	9	16	880
A21	RMA96-782B	4m wide gossanous fracture zone with several % fine disseminated sulphides	428697	6402805	<2	< .3	78	7	21	86	9.7	4	13	<1	19	9	320
A22	RMA96-790	1m wide gossanous fracture zone in silicified siltstone with fine to medium-grained disseminated pyrite	428951	6401769	<2	< .3	46	3	8	50	3.3	0.7	40	<1	14	31	<50
A23	RMA96-791	ankerite altered and silicified fossiliferous volcanic sandstone with 3% medium-grained disseminated pyrite	429018	6401763	<2	< .3	4	1	4	9	1.3	0.8	3	<1	2	4	410
B1	CAS96-1179	0.5-1m gossanous zone with trace-2% pyrite in silicified greywacke and siltstone	442119	6415541	<2	< .3	64	3	9	32	3.6	2.4	12	<1	14	17	1200
B2	RMA96-826	gossanous patches with 3-5% pyrite in quartz veined hornfels sediments	444909	6416758	<2	< .3	231	17	7	76	7.6	0.8	69	<1	23	50	1000
B3	TFR94-068	5-10% pyrite along gossanous shear zone in fine grained volcanic greywacke	450581	6415778	5	0.1	88	4	13	65	12	8.6	7	<1	30	7	450
B4	CAS94-235	brecciated zone with localized gossan in altered mafic volcanics	455077	6409488	199	0.1	131	4	4	13	4	0.6	1	<1	71	8	460
B5	CAS94-193	gossanous quartz-sericite-pyrite altered rock with 5-10% fine dessiminated pyrite	444120	6408502	418	1.5	3330	17	7	36	13	1.7	1	<1	48	15	1500
B6	RMA96-647	float in scree with thin malachite stained fractures	440888	6407648	511	2.3	1435	2	20	16	1.5	0.5	2	<1	1	15	310
B7	CAS94-255	2-4% pyrite as fracture fillings and localized clots in gossanous andesitic tuff	444660	6407331	82	0.1	151	1	8	87	36	3.1	5	<1	33	9	4700
B8	TFR94-136	gossanous, yellow-brown quartz-sericite altered andesite with 10-15% pyrite	445222	6407333	<2	0.2	55	1	21	30	4.8	1.5	1	<1	91	11	1700
B9	TFR94-132	gossanous yellow-brown quartz-sericite altered andesite with 10-15% pyrite	445168	6407022	13	0.3	36	1	77	82	16	3.1	3	<1	44	8	1500
B10	TFR94-131	gossan with 10-12% pyrite as dessiminations and blebs in quartz-sericite-epidote altered andesitic breccia	445124	6406774	19	0.3	134	1	104	135	17	5	4	<1	32	8	1500
B11	CAS96-1295	5-10% pyrite as disseminations, clots and veinlets in quartz-sericite-epidote altered andesitic breccia	446596	6405630	<2	0.7	108	1	35	83	23	4.6	5	<1	6	8	560

To Accompany Open File Map 1997-3

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Sample		Sample Description	UTM		*Au	Ag	Cu	Mo	Pb	Zn	*As	*Sb	Ni	Hg	*Co	Cr	*Ba
			Easting	Northing	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Dectection Limit --->			2	0.3	1	1	3	1	0.5	0.1	1	1	1	1	50
B12	CAS96-1296	5-10% pyrite as disseminations, clots and veinlets in quartz-sericite-epidote altered andesitic breccia	446523	6405654	<2	0.5	23	4	25	45	13	4.5	7	<1	7	12	1500
B13	PST95-476	1% chalcopyrite as irregular veinlets in monzodiorite porphyry	447999	6406241	1090	2.4	8886	6	4	173	3.5	0.5	4	<1	10	60	980
B14	PST95-473	gossanous zone with 1-2% pyrite and trace chalcopyrite in felspathic volcanic sandstone	448268	6406171	<2	0.3	51	< 1	< 3	66	10	1.9	4	<1	6	27	1500
B15	PST95-472	spotty pyritic gossans localized in areas of fracturing in volcanic sandstone	447999	6405994	10	0.3	41	1	15	99	17	2.6	2	<1	7	11	1400
B16	CAS94-030A	5-6 m gossanous area with areas of malachite stain associated with 2-20% chalcopyrite	450312	6407172	11	70.8	20611	1	27	77	5.4	2.6	4	<1	28	8	52000
B17	CAS94-030B	5-6 m gossanous area with areas of malachite stain associated with 2-20% chalcopyrite	450312	6407172	18	12.9	14527	1	12	44	7.4	1.8	3	<1	25	4	38000
B18	RMA96-810	0.3m wide malachite stained fracture with 1-2% chalcopyrite in epidote-chlorite altered andesitic brx.	448184	6405277	682	56.5	32887	3	136	118	7.2	3	4	<1	12	7	1200
B19	RMA96-811	10m wide gossan with 2% pyrite along core with intence quartz-sericite alteration	448117	6405086	10	0.4	131	2	22	187	16	1.9	4	<1	11	8	1300
B20	RMA96-806	40m wide quartz-sericite altered gossanous zone with 2-8% pyrite	448820	6404755	13	0.4	61	< 1	87	156	56	3.6	4	<1	10	5	440
B21	PST95-188	gossan along shear with trace pyrite in andesitic volcanic conglomerate	448946	6404276	36	2.4	15	6	106	19	92	3.1	6	<1	4	170	140
B22	TFR94-045	10-15% pyrite as disseminations and blebs in quartz-sericite-epidote altered volcanic	450287	6404805	9	0.2	56	2	21	84	44	3.5	5	<1	33	10	1100
B23	CAS94-076	gossanous patched with fine disseminated pyrite and local clots in chlorite carbonate altered volcanic	450821	6404318	287	0.8	68	1	45	66	23	3.9	3	<1	45	9	3100
B24	CAS94-084A	10-20% py as disseminations and veinlets in quartz-sericite altered volcanic	446463	6401870	60	1.1	597	7	30	48	24	1.5	2	<1	35	8	1600
B25	CAS94-084B	gossanous quartz-sericite altered volcanic intrusion with trace to 3% pyrite	446303	6401823	126	0.8	50	2	4	18	7.3	0.8	2	<1	63	23	1000
B26	CAS94-084C	gossanous quartz-sericite altered volcanic intrusion with trace to 3% pyrite	446139	6401874	39	0.3	15	12	3	10	5.6	1.5	1	<1	57	13	1600
B27	CAS94-084D	gossanous quartz-sericite altered volcanic intrusion with trace to 5% pyrite	446153	6401876	44	0.1	67	33	6	10	2.9	0.9	1	<1	110	41	1300
B28	TFR94-011	Highly fracture, gossanous felsic intrusion(?) with 5-10% disseminated pyrite	445944	6401870	42	0.1	84	7	4	13	5.1	1.5	2	<1	67	17	1600
B29	CAS94-023	coarse pyritic fracture fillings 0.5-2cm wide in sheared and chloritized volcanic breccia	451189	6404562	41	1	91	79	12	20	220	3.6	7	<1	150	156	390
B30	CAS95-627	Several 0.5m gossanous patches with 2-4% disseminated pyrite in silicified siltstone	456399	6404187	11	< .3	112	2	< 3	22	4.2	2.4	10	<1	11	46	1400
B31	CAS94-015	5-10cm sulphide rich area in megacrystic syenite	455219	6407243	8	1.1	3140	< 1	5	109	6.3	0.4	8	<1	11	17	230
B32	CAS94-015	5-10cm sulphide rich area in megacrystic syenite	455219	6407243	10	1.2	3404	1	< 3	106	7.5	0.9	8	<1	12	17	240
B33	MMI96-20-6	minor malachite stain on quartz-sericite schist/felsic tuff	453225	6411003	13	< .3	17	12	25	12	130	1.8	9	<1	7	21	100
B34	MMC96-15	trace to 5% pyrite in gossanous calcite-chlorite-epidote altered andesitic volcanic breccia	450225	6404197	13	0.4	83	3	64	132	20	2.5	5	<1	26	11	500
C1	PST95-524	strong pyritic gossan (yellow to brown-red weathering) in silicified volcanic sandstone	420720	6400956	21	0.4	246	5	15	21	6.8	2	28	<1	6	159	1300
C2	CAS95-745	2-3m area of gossan in purple andesitic breccia; local concentrations over several cm up to 30%	422523	6398432	4	8.4	34	3	595	13015	970	29	44	3	43	63	1300
C3	CAS96-1289	1m wide gossanous zone with disseminated and fracture filling sulphides in chlorite altered andesitic breccia	426568	6399376	25	7	1431	6	43	40	630	9.3	155	<1	340	16	520
C4	RMA95-413	<1m wide sheeted quartz carbonate vein (088/80S)	422608	6395558	<2	0.3	9	< 1	< 3	23	2.7	3.8	4	<1	8	44	230
C5	PST95-245	minor pyrite in ankerite flooded zoe in andesitic volcanic breccia/conglomerate	425004	6396061	<2	< .3	94	8	7	67	18	3.5	10	<1	20	22	1100
C6	CAS95-583	gossanous silicified siltstone with several sulphide rich patches	426506	6391969	134	3.3	904	< 1	< 3	37	22	7.2	20	<1	9	41	100
C7	CAS95-583	gossanous silicified siltstone with several sulphide rich patches	426506	6391969	117	3.4	955	< 1	< 3	39	19	6.7	22	<1	8	36	90
C8	DVL96-056	12cm wide gossan zone in rhyolitic volcanics with 2-20% very fine-grained sulphides	431286	6388511	3	< .3	39	2	15	60	7.4	1.4	19	<1	24	25	1400
C9	RMA96-547	pyrite as disseminations, stringers and clast coatings in felsic volcanic breccia	433588	6389573	64	3.2	3	6	46	112	170	11	2	<1	1	48	1500
C10	RMA96-548	felsic volcanic with 0.8m wide silicified gossanous zone with 1-3% pyrite as disseminations and stringers	433644	6389279	<2	< .3	2	2	14	14	25	6.4	2	<1	1	35	1700
C11	RMA96-548B	1-6% pyrite as disseminations and stringers in gossanous felsic volcanic	433644	6389279	<2	< .3	1	3	6	13	15	6.8	1	<1	2	28	2400
C12	RMA96-669	0.5m gossanous patches with fine disseminated pyrite in felsic volcanic breccia	435378	6388458	5	< .3	14	2	10	76	21	3.4	2	<1	4	5	1100
C13	RMA96-537	area of gossan within strongly chloritized zone in felsic volcanic breccia	438652	6389680	<2	< .3	7	< 1	13	84	3.6	1.4	1	<1	6	18	1300
C14	RMA96-870	0.25cm pyrite stringers and coarse disseminations in patchy gossanous area in felsic volcanoclastic	439598	6390196	<2	0.3	13	8	33	138	13	3.7	30	<1	10	22	600

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Sample		Sample Description	UTM		*Au	Ag	Cu	Mo	Pb	Zn	*As	*Sb	Ni	Hg	*Co	Cr	*Ba
			Easting	Northing	ppb	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
		Dectection Limit —>			2	0.3	1	1	3	1	0.5	0.1	1	1	1	1	50
C15	RMA96-869	2-3% pyrite as disseminations and stringers in flow banded and brecciated rhyolite	439760	6390334	<2	0.3	5	7	14	14	9.1	2.7	8	<1	<1	16	1200
C16	RMA96-861	gossanous patches (<1m) with fine disseminated pyrite in calcite amygdaloidal mafic volcanic	440064	6388533	<2	0.3	26	2	7	61	2.7	1.5	51	<1	14	83	2800
C17	RMA96-861a	10-15% pyrite in 20cm gossanous intervals in calcite amygdaloidal mafic volcanic	440064	6388533	<2	< .3	24	1	4	50	4.5	0.9	34	<1	14	63	1300
C18	CAS95-636	0.5-1m gossanous patch in mafic volcanic near faulted contact; no visable sulphides	426353	6384767	5	0.3	29	2	9	68	7.7	2.2	53	<1	22	106	1000
C19	RMA96-609	3-5% disseminated pyrite in in bedded sandstone-siltstone-mudstone unit	428190	6384324	<2	< .3	24	11	12	268	22	3.1	19	<1	9	31	2000
C20	RMA96-580	<1mm pyrite stringers in bleached, calcite amygdaloidal mafic volcanic	430226	6385851	<2	< .3	44	< 1	< 3	77	2.7	0.2	68	<1	31	81	270
C21	RMA96-573	5-20cm wide gossanous fault zone with minor quartz veining in flow banded and brecciated rhyolite	431104	6385936	10	< .3	4	8	10	18	44	6.3	< 1	<1	3	18	1500
C22	CAS95-815	0.5-1m gossanous patches wit 3-5% disseminated pyrite in autobrecciated rhyolite	431585	6385862	<2	0.3	4	2	7	74	35	3.2	3	<1	5	42	1100
C23	RMA95-050	fine grained disseminated pyrite in heterolithic felsic volcanic breccia	430983	6384145	<2	0.5	9	23	7	61	3.6	0.6	1	<1	6	17	800
D1	TFR94-040	chlorite-calcite altered andesitic breccia with rare malachite stained 1-3cm sulphide patches	443663	6400225	406	1.8	6792	8	< 3	49	1.4	0.5	5	<1	13	16	750
D2	TFR94-042	moderately gossanous tan-brown chlorite-calcite altered volcanic breccia with 2-8% disseminated pyrite	443382	6400077	12	0.5	88	2	4	36	4.3	0.6	18	<1	15	50	930
D3	TFR94-036	10m wide gossan zone with 5-10% pyrite; locally up to 25% in areas of silica-carbinate alteration	444373	6400884	148	11.8	2937	1	35	76	260	5.1	42	<1	430	14	<50
D3b	TFR94-36-2	10m wide gossan zone with 5-10% pyrite; locally up to 25% in areas of silica-carbinate alteration	444373	6400884	87	11.3	2046	2	46	748	230	4.3	25	<1	220	15	<50
D4	RMA95-461	ankerite vein in carbonate-sericite altered porphyry	443966	6396723	3	< .3	< 1	1	< 3	47	0.9	0.6	1	<1	4	20	280
D5	RMA95-461	ankerite vein in carbonate-sericite altered porphyry	443966	6396723	<2	< .3	< 1	< 1	< 3	47	0.9	0.7	1	<1	3	20	300
D6	CAS94-246	carbonate-altered mafic volcanic (trace-5% pyrite)	452697	6399345	<2	0.1	44	1	8	25	33	72	261	<1	60	154	240
D7	CAS94-215	slightly gossanous hornblende monzodiorite with 1-4% medium-grained disseminated pyrite	454874	6399153	<2	< .3	213	149	4	14	0.8	0.3	2	<1	5	8	1300
D8	CAS94-274	carbonate-altered mafic volcanic (trace-5% pyrite)	454623	6397866	19	0.3	579	3	9	49	5.5	8	26	<1	110	27	210
D9	CAS94-291	intensely carbonate-altered rock (3-15% pyrite)	449261	6394430	37	1.5	133	4	24	228	52	14	2	<1	9	3	330
D10	CAS94-185	carbonate-altered andesite breccia (2-4% pyrite)	442756	6393937	<2	0.1	27	2	4	53	7.4	1.8	7	<1	44	46	230
D11	CAS95-593	rhyolite breccia with chalcedonic quartz	440133	6389839	<2	< .3	3	3	7	74	3.7	5.5	3	<1	1	91	1200
D12	RMA96-770	2-3% pyrite as stringers in calcite amygdaloidal mafic volcanic breccia	441847	6389762	<2	< .3	12	2	6	27	1.2	0.2	10	<1	10	43	250
D13	PST95-063	gossanous mafic volcanics	442478	6389353	<2	< .3	37	1	4	105	2.4	0.6	44	<1	27	73	740
D14	CAS95-595A	gossan in pillowed augite phyric basalt (trace-2% pyrite)	442423	6389181	<2	< .3	21	16	< 3	71	11	0.5	32	<1	18	60	1300
D15	CAS95-595B	gossan in pillowed augite phyric basalt (trace-2% pyrite)	442423	6389181	<2	< .3	27	11	< 3	84	13	0.8	53	<1	22	69	790
D16	CAS95-595C	gossanous siltstone	442423	6389181	<2	< .3	13	24	7	38	12	0.8	12	<1	5	37	270
D17	CAS95-598	gossan in pillowed augite phyric basalt (trace-2% pyrite)	442233	6388802	<2	< .3	23	6	< 3	42	5.1	0.3	36	<1	13	91	2600
D18	RMA95-361	gossanous siltstone/argillite	441584	6388586	<2	< .3	< 1	30	11	36	20	1.5	1	<1	<1	48	1200
D19	CAS95-659	moderately gossanous, bleached, fine-grained rhyolite; no visible sulphides	441959	6388456	6	< .3	3	3	11	5	5.1	1	3	<1	1	87	730

Elements with an asterisk were assayed using instrumental neutron activation (INAA) by Activation Laboratories Ltd.
Remaining elements were analyzed using aquaregia digest - inductively coupled plasma emission spectroscopy (ICP) by ACME Analytical Laboratories Ltd.