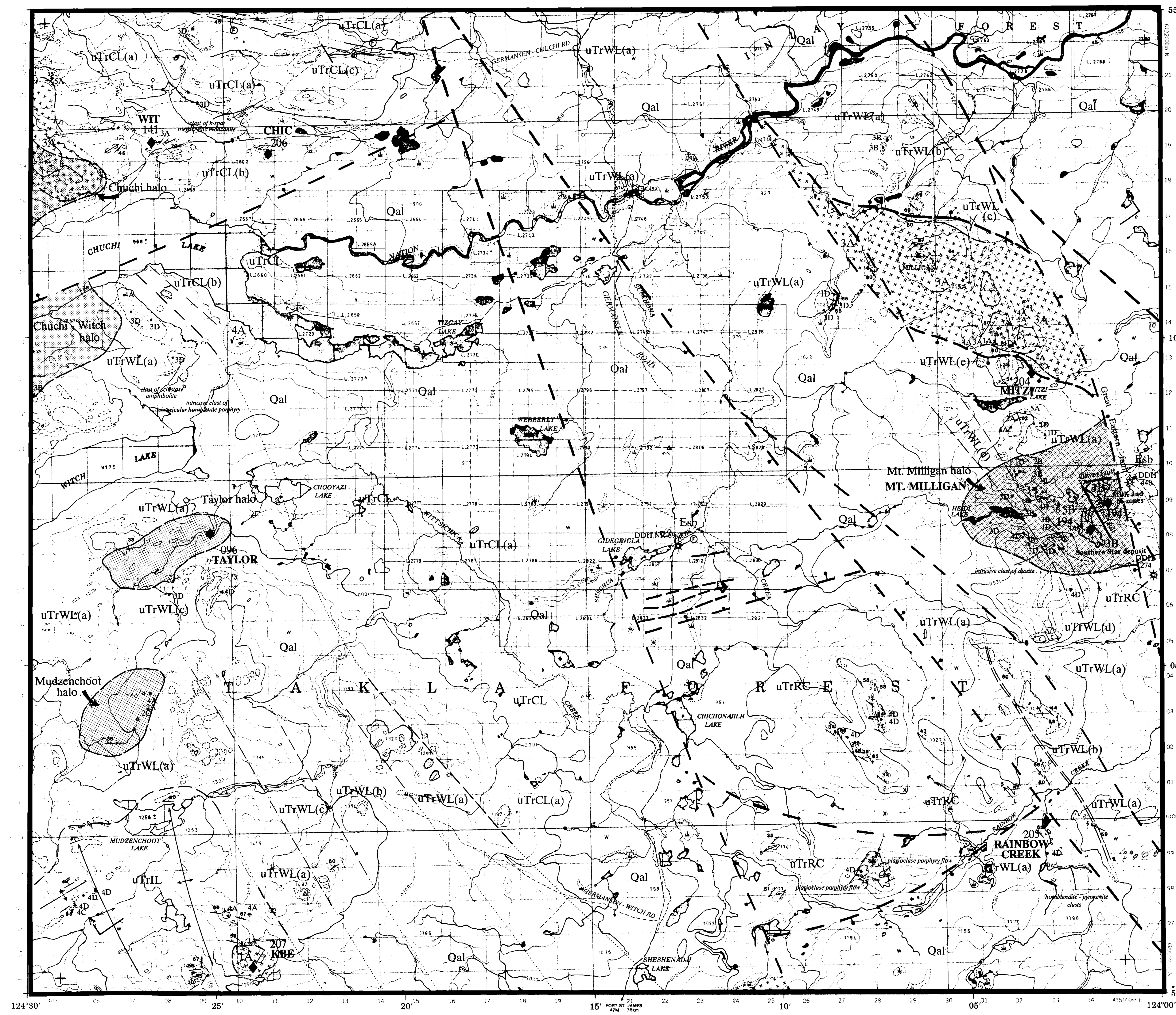
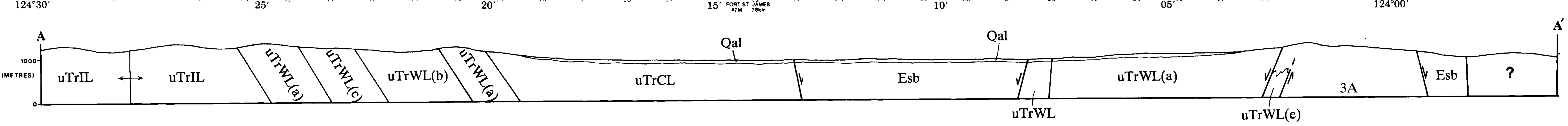
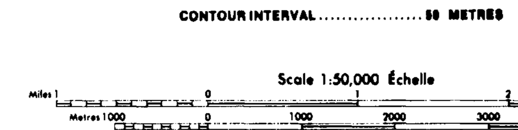




ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL
CONTOUR INTERVAL .... 50 METRES



SHEET 1 - GEOLOGY OF WITTSICHICA CREEK (93N/1)

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources
MINERAL RESOURCE DIVISION
GEOLOGICAL SURVEY BRANCH

OPEN FILE 1991-3

GEOLOGY AND MINERAL POTENTIAL OF THE WITTSICHICA CREEK AND TEZZERON CREEK MAP AREAS

NTS 93N/1 AND 93K/16

J.L. NELSON, K.A. BELLEFONTAINE, K.C. GREEN, M.E. MACLEAN

SCALE 1:50,000

LEGEND

LAYERED ROCKS

QUATERNARY

Qal — *UNCONSOLIDATED GLACIAL TILL AND ALLUVIUM*

QUATERNARY?

Qb — *OLIVINE-BEARING BASALT*

EOCENE - OLIGOCENE

Esb — *VOLCANIC WACKE, PLANT- BEARING, VOLCANIC ASH-RICH MUDSTONE AND BASALT*

UPPER TRIASSIC (- JURASSIC?)

TAKLA GROUP

uTrCL — **CHUCHI LAKE FORMATION: (A)** *GREEN AND MAROON HETEROLITHIC AGGLOMERATE;* **(B)** *PLAGIOCLASE-PORPHYRY TRACHYTE FLOWS AND BRECCIAS;* **(C)** *INTERVOLCANIC SEDIMENTS*

uTrWL — **WITCH LAKE FORMATION: (A)** *AUGITE (± PLAGIOCLASE ± HORNBLENDE) PORPHYRY AGGLOMERATE, LAPILLI TUFF AND EPICLASTIC SEDIMENTS;* **(B)** *TRACHYTE FLOWS AND TUFF-BRECCIAS;* **(C)** *PLAGIOCLASE (± AUGITE) PORPHYRY LATITE FLOWS AND AGGLOMERATES;* **(D)** *EPICLASTIC SEDIMENTS (SANDSTONES AND SILTSTONES) AND MINOR AMYGDALOIDAL TRACHYTE FLOWS;* **(E)** *AMPHIBOLITE AND METAMORPHOSED AUGITE PORPHYRY FLOWS, LAPILLI TUFF, AGGLOMERATE AND SEDIMENTS*

uTrIL — **INZANA LAKE FORMATION:** *VOLCANIC SANDSTONE, SILTSTONE, MUDSTONE, ARGILLITE, LAPILLI TUFF AND SEDIMENTARY BRECCIA*

uTrRC — **RAINBOW CREEK FORMATION:** *GREY SLATE, THIN-BEDDED SILTSTONE, MINOR VOLCANIC SEDIMENTS*

INTRUSIVE ROCKS

LATE CRETACEOUS-EARLY TERTIARY?

1 — **GRANITE SUITE: (1A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR GRANITE;* **(1D)** *RHYODACITE/DACITE*

LATE TRIASSIC-EARLY JURASSIC

2 — **SYENITE SUITE: (2A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR SYENITE;* **(2B)** *CROWDED PLAGIOCLASE PORPHYRITIC SYENITE;* **(2C)** *MEGACRYSTIC SYENITE*

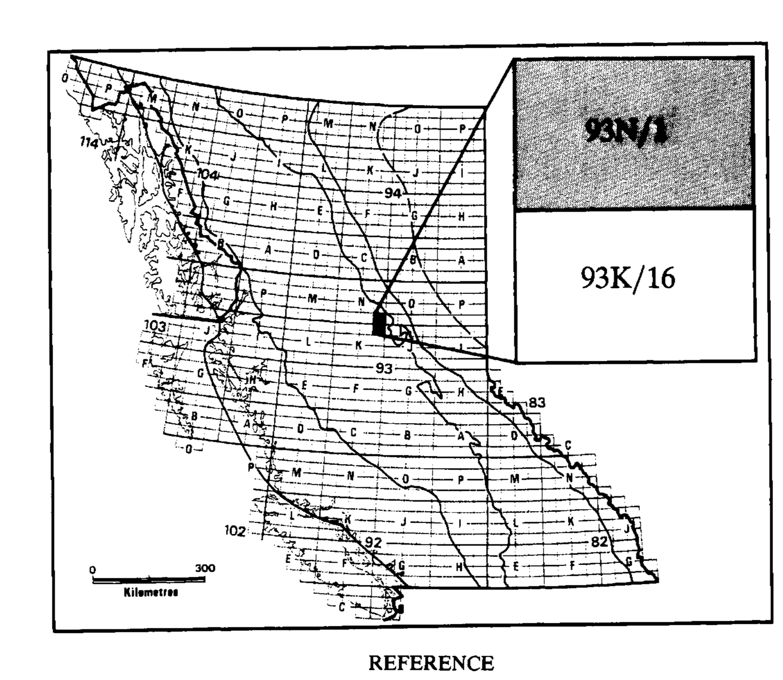
3 — **MONZONITE SUITE: (3A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR MONZONITE;* **(3B)** *CROWDED PLAGIOCLASE PORPHYRITIC MONZONITE;* **(3C)** *MEGACRYSTIC PLAGIOCLASE MONZONITE;* **(3D)***SPARSELY PORPHYRITIC LATITE*

4 — **DIORITE/MONZODIORITE SUITE: (4A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR DIORITE/MONZODIORITE;* **(4B)** *CROWDED PLAGIOCLASE PORPHYRITIC DIORITE;* **(4C)** *MEGACRYSTIC PLAGIOCLASE (± AUGITE) PORPHYRITIC DIORITE;* **(4D)** *SPARSELY PORPHYRITIC ANDESITE*

5 — **GABBRO/MONZOGABBRO SUITE: (5A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR GABBRO/MONZOGABBRO*

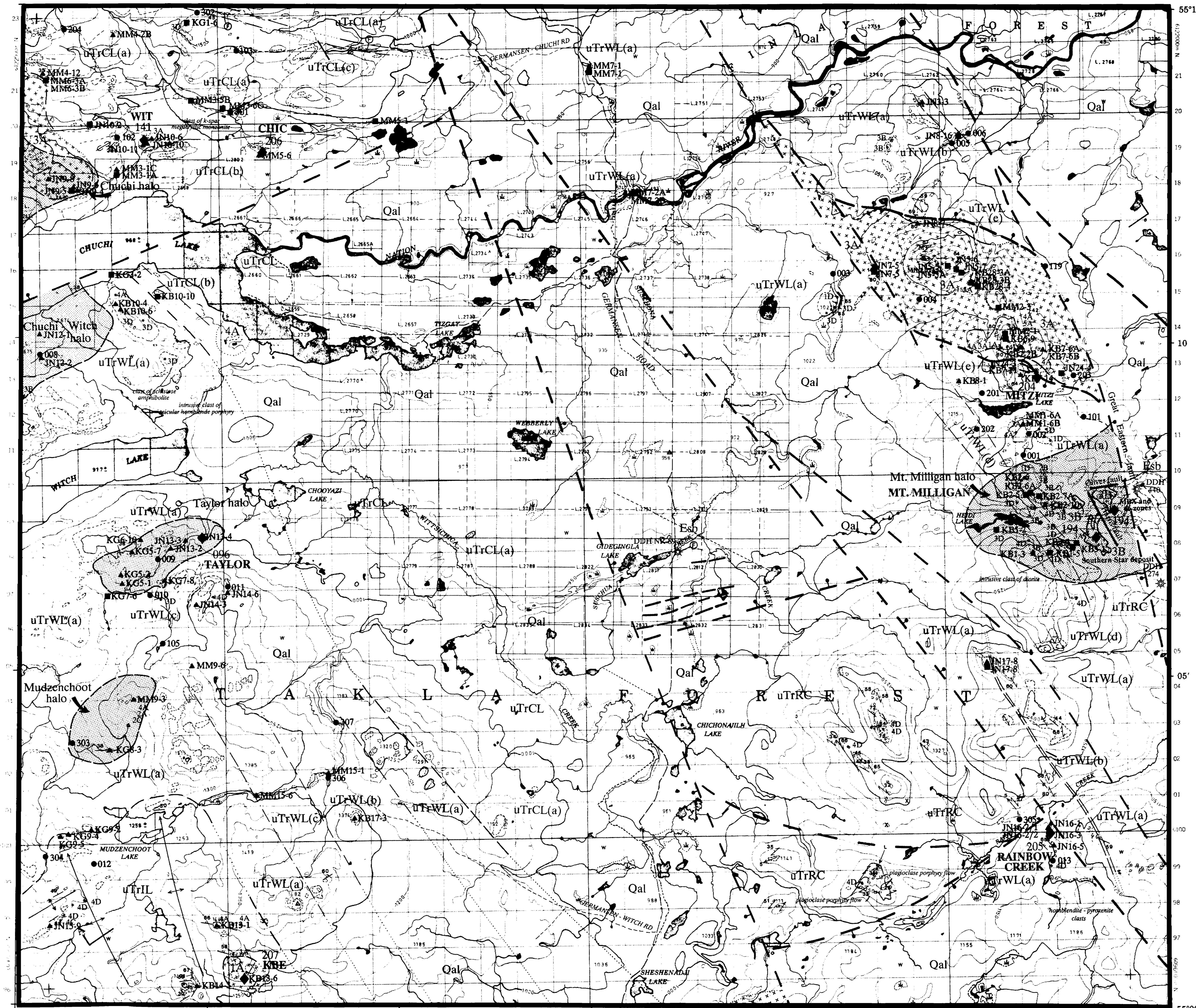
SYMBOLS

geologic contact (approximate, inferred)
lithologic contact (approximate, inferred)
fault (defined, inferred)
F_1 axial trace (anticlinal, synclinal)
F_2 axial trace (antiformal, synformal)
bedding (tops known, tops unknown, overturned)
foliation
F_1 fold axis
F_2 fold axis
current lineation
mineral lineation
glacial striation
dyke attitude
large intrusion
small intrusion
area of alteration
mineral occurrence and MINFILE number ◆ 086
fossil locality
diamond drill hole



REFERENCE

Nelson, J., Bellefontaine, K., Green, K. and MacLean, M. (1991): Regional Geological Mapping Near the Mount Milligan Copper-Gold Deposit (93k/16, 93N/1), British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1990, Paper 1991-1.



ELEVATIONS IN METRES ABOVE MEAN SEA LEVEL

CONTOUR INTERVAL .... 20 METRES

Scale 1:50,000 Échelle

SHEET 2 - MINERAL POTENTIAL OF WITTSICHICA CREEK (93N/1)

MINERAL OCCURRENCES

MOUNT MILLIGAN (MINFILE 093N-194)

Published reserves of the Mt. Milligan porphyry copper-gold deposit are 400 million tonnes of 0.48 grammes per tonne gold and 0.2 per cent copper. At present, two potential orebodies have been identified on the property: the MBX zone associated with the MBX stock, which grades into the peripheral, gold-rich 66 zone; and the Southern Star zone, associated with the Southern Star stock. Gold and copper mineralization correlate with intense potassic alteration. The copper-to-gold ratio is highest in the Southern Star stock. The gold-rich 66 zone developed by bedding-parallel infiltration and replacement of volcanic sediments and andesites of the Witch Lake formation above and spreading away from the MBX stock. Rotation of northeasterly dipping and facing stratigraphy to horizontal shows the MBX stock as a vertical feeder to the laccolithic, sill-like Rainbow dike. Dilation along bedding planes may have controlled the emplacement of the Rainbow dike and also provided increased permeability, which channelled ore fluids to create the 66 zone.

TAYLOR (MINFILE 093N-096)

The Taylor showing lies on the Mitzi claim group, within the Taylor alteration halo. It outcrops in a northeast flowing tributary of Wittsichica Creek, 3 kilometres south of the outlet of Witch Lake. Diverse alteration assemblages including secondary biotite, chlorite, secondary amphibole, black tourmaline, garnet skarning and white bleaching are intermixed in an outcrop less than 20 metres long. Up to 10 per cent pyrrhotite occurs with fine grained pyrite and chalcopyrite. Values of 1.59 per cent copper and 4.93 grammes per tonne gold have been obtained from grab samples.

WIT (MINFILE 093N-141)

The WIT showing is located on the north shore of Chuchi Lake. It is an irregular epithermal vein (5 metres wide by 20 metres vertical extent) of banded white and grey quartz and chalcedony that is exposed in and around a trench. The vein hosts small pods and disseminations of galena and sphalerite with possible argentite and tetrahedrite. Banded chalcedony and quartz with calcite, pyrite and trace galena occurs 150 metres east of the main vein outcrop.

Exploration work on the property has delineated an estimated geological reserve of 20,000 tonnes grading 7 per cent combined lead-zinc. The surface showing seems to be the top of a larger epithermal system. The best 1990 assays obtained from the trenched area on the surface contain up to 10.5 per cent zinc, 1.87 per cent lead and 4.32 oz/ton Ag. Barite lenses and stockworks as well as strongly oxidized and limonitic zones have also been documented by previous workers.

The host rocks are maroon and green matrix-supported polymictic breccias and lahars of the Chuchi Lake formation. The volcanics are in places scoriaceous and amygdaloidal and have calcite, albite and celadonite vesicle infillings. Sulphides are also disseminated in the host rocks and in fracture fillings.

CHIC (MINFILE 093N-202)

The Chic showing is located on the Goldfinger claim group approximately 3 kilometres north of the outlet of the Nation River on Chuchi Lake, 2.5 kilometres east of the Wit prospect. The showing is a poddy epithermal vein that cuts a megacrystic-feldspar porphyry intrusion. The vein contains light green kaolinite and quartz with abundant blebs of disseminated pyrite and traces of chalcopyrite.

KBE (MINFILE 093N-203)

This showing is located approximately 10 kilometres north-northeast of the east end of Inzana Lake and 5 kilometres southeast of Mudzenchoot Lake. The showing consists of less than 1 per cent disseminated malachite in a bleached and slightly gossanous hornblende granite or granodiorite intrusion. No visible pyrite or other sulphides are associated with the malachite. A grab sample from this showing contains 196 ppb gold and 0.2 per cent copper. Minor amounts of epidote and magnetite occur in the granite within 100 metres of the showing. The granite intrudes epiclastic sediments of the Inzana Lake formation.

MITZI (MINFILE 093N-204)

The Mitzi showing is located on the Phil claim group 1 kilometre north-northeast of the east end on Mitzi Lake and 4.5 kilometres northwest of the Mount Milligan deposit. The showing is a tetrahedrite-chalcopyrite-bearing quartz-ankerite breccia vein hosted in hornfelsed augite porphyry agglomerate of the Witch Lake formation. The 20-centimetre vein trending 045°/65°NW contains up to 5 per cent tetrahedrite with minor chalcopyrite. Prominent red-weathering zones occur within 500 metres of the vein, but contain no visible sulphides.

RAINBOW CREEK (MINFILE 093N-205)

The Rainbow Creek showing is located on the Rain claims along a north flowing tributary into Rainbow Creek; about 15 kilometres south of the Mount Milligan deposit. A strong base metal geochemical anomaly occurs at the creek junction (21.5ppm arsenic, 9.4ppm antimony and 128ppm zinc; RGS data).

A grey to black fault-zone breccia with quartz and carbonate veining and up to 20 per cent pyrite outcrops on the banks of the tributary. The fault zone cuts through augite porphyry agglomerates and white-weathering tuffaceous black siltstone and mudstone of the Witch Lake formation. Gossanous zones contain 3 per cent disseminated pyrite with magnesite and traces of fuchsite. A few discontinuous chalcedony veins cut the pyritic breccia. The fault breccia itself is geochemically flat except for one sample that contains 140 ppm copper, but a grab sample of one of the veins returned an anomalous analysis of 1400 ppb gold and 180 ppm arsenic.

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NTS 93N/1 AND 93K/16

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SCALE 1:50,000

LEGEND

LAYERED ROCKS

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QUATERNARY?

Qb — *OLIVINE-BEARING BASALT*

EOCENE - OLIGOCENE

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LATE TRIASSIC-EARLY JURASSIC

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lithologic contact (approximate, inferred)
fault (defined, inferred)
F_1 axial trace (anticlinal, synclinal)
F_2 axial trace (antiformal, synformal)
bedding (tops known, tops unknown, overturned)
foliation
F_1 fold axis
F_2 fold axis
current lineation
mineral lineation
glacial striation
dyke attitude
large intrusion
small intrusion
area of alteration
mineral occurrence and MINFILE number ◆ 086
fossil locality
diamond drill hole

GEOCHEMISTRY

SAMPLE NUMBER	MINERAL SHOWING/ SAMPLE DESCRIPTION	UTM EAST	UTM NORTH	Au ppb	Ag ppm	Cu ppm*	Pb ppm*	Zn ppm*	As ppm	Sb ppm
JN3-3	oxidized trachyte	429550	6120300	3	0.5	126	15	85	3	4
JN7-5	oxidized zone in mylonite	428170	6115725	18	<0.5	81	11	49	5	1
JN8-7	pyritic mylonite	429420	6116950	5	<0.5	154	11	171	2	1
JN9-4	py + trace cpy in augite porphyry flow	406150	6118210	35	<0.5	42	38	180	150	3
JN9-6	diorite, with minor disseminated pyrrhotite	406020	6118300	5	<0.5	100	8	82	2	0.6
JN9-8	diorite, with 10% pyrrhotite	405350	6118580	10	<0.5	129	21	217	36	1
JN10-6	carbonate altered diorite + pyrrhotite	408200	6119800	3	<0.5	93	9	55	8	<10
JN10-10	WIT: epithermal banded quartz vein + pyrite	408050	6119500	160	13	62	388	0.10%	55	94
JN10-10Dup	WIT: epithermal banded quartz vein + pyrite	408050	6119500	163	13	62	388	0.10%	55	82
JN10-11	WIT: banded qtz vein + gn + sl + tet? + arg?	407950	6119450	233	2	8	0.15%	0.42%	2	15
JN12-1	altered monzonite, secondary mt, ksp, ep	405000	6114250	1	<0.5	49	6	34	<1	<0.5
JN12-2	altered xt-tuff with mt, py, chl veins	405000	6113600	2	<0.5	70	9	40	2	0.5
JN13-2	altered plag porphyry + po + py	408515	6108225	4	<0.5	288	14	68	3	2
JN13-3	alt plag-cpx porph, sec bi + po + py + cpy?	408960	6108450	1	<0.5	438	10	71	11	2
JN13-4	TAYLOR: altered plag porph + cpy	409400	6108525	38	0.5	0.21%	10	160	9	0.7
JN14-3	bleached, fg volc + 1% disseminated pyrite	409175	6106650	6	<0.5	16	108	420	32	14
JN14-6	bleached pyritic plag-cpx porphyry	410100	6106985	2	<0.5	102	14	58	4	3
JN15-9	volcanic sandstone with 5% py + po	405060	6097750	2	<0.5	57	10	76	<1	<0.5
JN16-1	RAINBOW CREEK: black pyritic breccia	432800	6100225	10	<0.5	25	10	66	2	<0.5
JN16-2-1	RAINBOW CREEK: carb alt xt-tuff + py + fu?	432775	6100100	5	<0.5	75	18	83	5	7
JN16-2-2	RAINBOW CREEK: quartz carbonate vein	432775	6100100	1383	0.7	70	<5	47	188	34
JN16-2-2Dup	RAINBOW CREEK: quartz carbonate vein	432775	6100100	1435	0.5	71	4	52	174	30
JN16-3	RAINBOW CREEK: alt volc in fault bx zone	432775	6099925	6	<0.5	140	9	91	5	3
JN16-5	RAINBOW CREEK: carb + sil fault bx with py	432875	6099715	3	<0.5	28	12	77	3	2
JN17-8	pyritic augite porphyry	431250	6104660	17	<0.5	89	12	81	4	3
KB1-3	augite porphyry + 10% pyrite	432480	6107750	5	<0.5	116	13	72	13	1
KB2-10	MILLIGAN: carbonate vein in shear zone	432870	6109070	267	1	0.12%	8	28	12	3
KB7-2B	granodiorite with minor pyrite	432250	6113600	3	<0.5	124	8	64	1	<0.5
KB7-6A	meta-Takla with pyrite stringers	432880	6113430	4	<0.5	140	6	316	4	1
KB7-6B	meta-Takla with pyrite stringers	432880	6113430	5	<0.5	143	8	780	8	2
KB7-11	volcanic tuff? with pyrite	432650	6112800	5	<0.5	138	6	140	2	0.6
KB7-14	gossan in pyritic augite porphyry	432200	6112720	2	<0.5	83	8	91	6	20
KB8-1	volc breccia with minor disseminated pyrite	430550	6102600	4	<0.5	63	8	69	2	1
KB10-4	sulphide bearing diorite	407100	6115030	9	<0.5	54	10	60	3	0.7
KB10-6	volcanic flow with malachite and pyrite	407260	6114830	46	<0.5	201	10	88	3	0.6
KB13-1	siltstone with minor disseminated pyrite	409680	6097740	10	<0.5	192	10	31	2	1
KB13-6	KBE: oxidized hbl granite with diss malachite	410450	6096200	168	<0.5	0.20%	9	33	1	<0.5
KB13-6Dup	KBE: oxidized hbl granite with diss malachite	410450	6096200	196	0.7	0.20%	10	33	<1	<0.5
KB14-3	cpx mafic intrusion? with 5% diss pyrite	409125	6096000	12	<0.5	58	9	65	1	<0.5
KB17-3	oxidized brecciated tuff	413580	6100600	2	<0.7	23	26	72	7	2
KB19-6	bleached tuff with 5% diss py + po	435375	6092875	18	0.7	85	6	79	8	1
KG5-1	bleached cpx porphyry with py + po	407350	6107250	5	<0.5	103	12	75	7	1
KG5-2	bleached cpx porphyry flow with pyrite	407175	6107475	4	<0.5	81	20	83	11	3
KG5-7	bleached cpx porphyry with pyrite	407475	6108100	54	<0.5	534	12	53	3	2
KG6-10	bleached cpx porph flow with py + po	407700	6108460	7	<0.5	167	12	71	14	2
KG7-8	cpx-feldspar porphyry with py + po	408375	6107350	3	<0.5	113	18	74	2	1
KG8-3	bleached cyrstal-lapilli tuff with 20% pyrite	406780	6102600	5	<0.5	113	14	90	2	0.7
KG9-2	qtz vein in augite porph agglom, ep altered	406215	6100425	7	<0.5	37	10	32	9	1
KG9-4	hornfelsed augite porph, minor pyrite	405625	6100300	3	<0.5	16	7	39	3	0.7
KG9-5	gossan in volc sediments, minor pyrite	405500	6100250	8	<0.5	83	9	83	3	2
MM1-6A	gossan in augite porphyry	432280	6111350	10	<0.5	119	9	50	6	2
MM1-6B	gossan in augite porphyry	432280	6111350	1	<0.5	4	11	108	3	3
MM3-1C	oxidized andesite	407200	6118725	3	<0.5	38	19	33	9	4
MM4-2B	silicified crystal-tuff with pyrite	407200	6122325	2	<0.5	53	10	77	1	<0.5
MM4-12	magnetite bearing diorite	405225	6121475	3	<0.5	600	9	92	2	0.5
MM5-6	CHIC: qtz + kaol + py vein in ksp porph intr	410925	6119415	3	<0.5	176	27	32	22	6
MM7-1	carbonate altered andesite	420375	6121475	10	<0.5	86	18	64	9	1
MM7-2A	gossan in silicified crystal-tuff with 30% pyrite	421350	6117800	3	<0.5	32	10	101	4	1
MM7-2B	gossan in silicified crystal-tuff with 30% pyrite	421300	6117950	6	<0.5	47	<5	85	5	0.7
MM9-3	oxidized volc with secondary bi and 3% pyrite	407475	6004000	3	<0.5	335	<5	64	<1	<0.5
MM9-6	plag + cpx vesicular diorite with 2-3% pyrite	409075	6004925	10	<0.5	160	9	100	2	2
MM15-1	ash tuff with 2% pyrite	412850	6101750	38	<0.7	28	22	87	18	2
MM15-6	plagioclase porphyry with 5-6% pyrite, cpy?	410870	6101290	2	0.9	127	10	85	2	0.9

* values in ppm or percent where indicated

Abbreviations:

alt = altered, aggl = agglomerate, arg = argentite, bi = biotite, bx = brecciá, carb = carbonate, chl = chlorite, cpx = clinopyroxene, cpy = chalcopyrite, diss = disseminated, ep = epidote, fg = fine grained, fu = fuchsite, gn = galena, hbl = hornblende, intr = intrusion, kaol = kaolinite, ksp = potassium feldspar, mt = magnetite, plag = plagioclase, po = pyrrhotite, porph = porphyry, py = pryite, qtz = quartz, sec = secondary, sil = silicified, sl = sphalerite, tet = tetrahedrite, xt = crystal, volc = volcanic

REGIONAL GEOCHEMICAL SURVEY - STREAM SEDIMENT RESULTS

SAMPLE NUMBER	UTM EAST	UTM NORTH	Au ppb FA+AA	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm Aqua R	Ni ppm	Co ppm	Fe %	Mn ppm	As ppm	W ppm	Hg ppb	Sb ppm	U ppm
001	432250	6110525	<5	32	<1	4	68	0.2	20	13	2.70	630	5	<2	60	0.2	delay
002	432425	6111125	<5	44	<1	<1	38	<0.2	19	10	3.90	380	2	<2	50	0.4	delay
0020	432425	6111125	<5	40	<1	<1	36	<0.2	18	10	3.70	340	2	<2	50	0.2	delay
003	427050	6115650	<5	22	<1	<1	38	<0.2	18	9	5.00	1850	5	<2	40	<0.2	delay
004	429425	6114875	<5	40	<1	1	44	<0.2	14	12	4.20	1400	2	<2	40	<0.2	delay
005	430400	6118225	<5	44	<1	<1	44	<0.2	50	16	3.80	1400	2	<2	50	<0.4	delay
006	430850	6119500	<5	48	1	<1	36	<0.2	36	14	3.20	1200	2	<2	70	<0.2	delay
008	405025	6113675	<5	180	1	2	74	<0.2	30	14	3.30	610	3	<2	80	<0.4	delay
009	408050	6127900	<5	114	<1	2	44	0.5	40	11	2.60	890	12	<2	100	0.4	delay
010	407950	6128900	<5	48	<1	4	58	<0.2	26	12	3.50	1200	6	<2	70	0.2	delay
011	410150	6127175	<5	170	2	8	70	<0.2	72	30	6.00	1200	114	4	100	19.6	delay
012	406275	6099450	<5	80	1	4	90	0.4	48	12	2.80	540	2	<2	110	0.4	delay
013	433675	6098200	<5	60	<1	4	60	<0.2	24	20	6.00	1100	18	<2	60	1.2	delay
101	433950	6111525	10	58	<1	2	36	0.2	22	14	3.00	490	6	<2	60	0.2	delay
102	427225	6116700	<5	96	<1	10	250	<0.2	18	14	4.10	910	5	<2	40	0.2	delay
103	410575	6122075	25	54	<1	4	50	<0.2	14	12	3.00	700	3	<2	50	0.2	delay
104	408275	6105550	35	52	1	2	76	0.2	36	16	3.00	710	4	<2	90	<0.2	delay
118	432950	6115750	<5	34	<1	1	32	<0.2	14	8	2.40	340	2	<2	40	<0.2	delay
119D	432950	6115750	130	38	<1	1	33	<0.2	14	9	2.85	370	1	<2	70	<0.2	delay
201	431075	6112225	<5	58	1	6	58	0.3	20	10	2.60	590	2	<2	90	0.2	delay
202	430950	6111250	<5	30	1	6	52	<0.2	22	12	2.90	2500	3	<2	80	0.2	delay
203	433675	6112675	<5	66	<1	4	48	<0.2	28	11	2.30	1050	6	<2	100	0.4	delay
204	405775	6122700	<5	54	<1	8	94	<0.2	10	10	3.20	870	8	2	70	<0.2	delay
301	410400	6120300	<5	74	<1	8	74	<0.2	12	12	3.40	1100	4	<2	70	<0.2	delay
302	409475	6123150	<5	56	1	10	64	<0.2	18	16	4.30	950	3	<2	50	<0.2	delay
303	405725	6102650	<5	54	2	4	70	0.2	54	16	3.00	1400	5	<2	140	0.4	delay
304	405000	6099675	<5	37	3	4	108	0.3	40	18	3.80	1050	8	<2	130	0.4	delay
305	407475	6100850	<5	48	1	6	60	0.5	28	14	3.60	850	6	<2	80	0.4	delay
306	412775	6101775	<5	56	1	6	90	0.2	34	16	3.60	1800	5	<2	80	0.4	delay
307	413075	6103300	<5	58	1	2	74	0.2	28	14	3.30	830	5	3	70	0.4	delay

GEOCHEMICAL SAMPLES

Stream Sediment .... ●
Geochemistry .... ▲
Whole Rock .... ■

ANALYTICAL PROCEDURES FOR GEOCHEMISTRY

ANALYTICAL PROCEDURES FOR ROCK GEOCHEMISTRY

Analysis performed by B.C. Geological Survey - Analytical Sciences Laboratory

1. GOLD (AU) AND SILVER (AG)

Fire Assay/Atomic Absorption A 0.5 Assay Ton (approx. 15 gram) sample weight is subjected to a standard fire assay technique to generate a Au/Ag bead. The bead is dissolved in acid; Au is measured to a detection limit of <20 ppb and Ag is measured to a detection limit of <0.5 ppm by atomic absorption analysis.

2. BASE METALS (CU, PB, ZN)

Atomic Absorption Samples are digested using acid attack which includes HF. The dilute acid dissolution of the residue is further diluted to a specific volume and the elements are measured using AAS.

3. ELEMENTS AS AND SB

Hydride Generation A 1 g sample is digested using a mixture of HCl and HNO_3; a portion of the diluted sample solution is treated with $NaBH_4$ and the liberated hydride compound is swept into a hot cell in the light path of the AAS unit. The hydride decomposes to give a vapour of the element which is measured.

ANALYTICAL PROCEDURES FOR STREAM SEDIMENT GEOCHEMISTRY

Analyses performed by Chemex Labs Ltd., 212 Brooksbank Ave., North Vancouver, B.C., V7J 2C1

1. ELEMENTS CU, MO, PB, ZN, AG, NI, CO, FE, MN, W

Atomic Absoption 1 g of sample is digested with nitric - aqua regia. The metals are determined by atomic absorption techniques. Lead, silver, nickel, and cobalt are corrected for background absorption.

Detection limits: Cu - 1 ppm, Mo - 1 ppm, Pb - 1 ppm, Zn - 1 ppm, Ag - 0.2 ppm, Ni - 1 ppm, Co - 1 ppm, Fe - 0.05%, Mn - 5 ppm, W - 10 ppm.

2. ANTIMONY (SB)

Atomic Absorption A 2 g sample is digested with concentrated HCl-$KClO_3$ at low heat. The iron is reduced to Fe^{2+} state and the Sb extracted with TOPO-MIBK and analyzed with atomic absorption, correcting for background absorption. Detection limit is 0.2 ppm.

3. ARSENIC (AS)

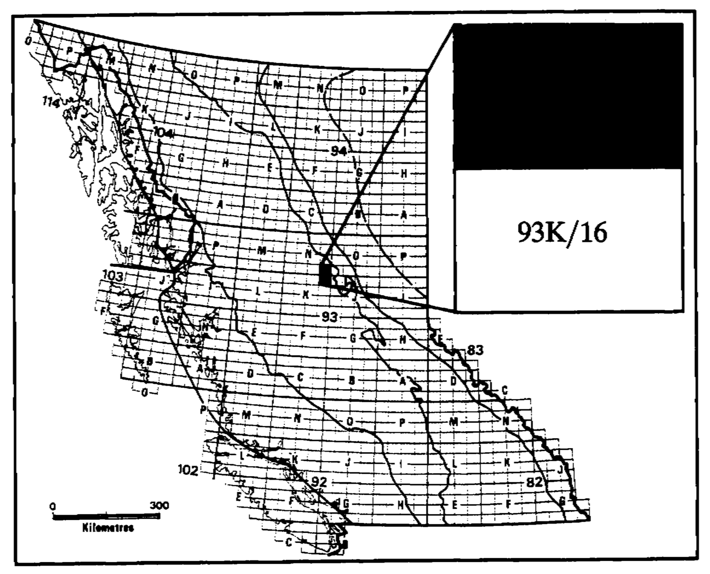
Atomic Absorption A 1 g sample is digested with HNO_3 - aqua regia acids. An aliquot of the digest is acidified and reduced with $NaBH_4$ and arsenic content determined using flameless atomic absorption. Detection limit is 1 ppm.

4. GOLD (AU)

Fire Assay/Atomic Absorption A 10 g sample is fused with a neutral flux inquarted with 6 mg of Au-free silver an then cupelled. Silver beads for atomic absorption finish are digested in HNO_3 and HCl. The samples are cooled and made to a volume of 5 ml, homogenized and analyzed with atomic absorption with background correction. Detection limit is 5 ppb.

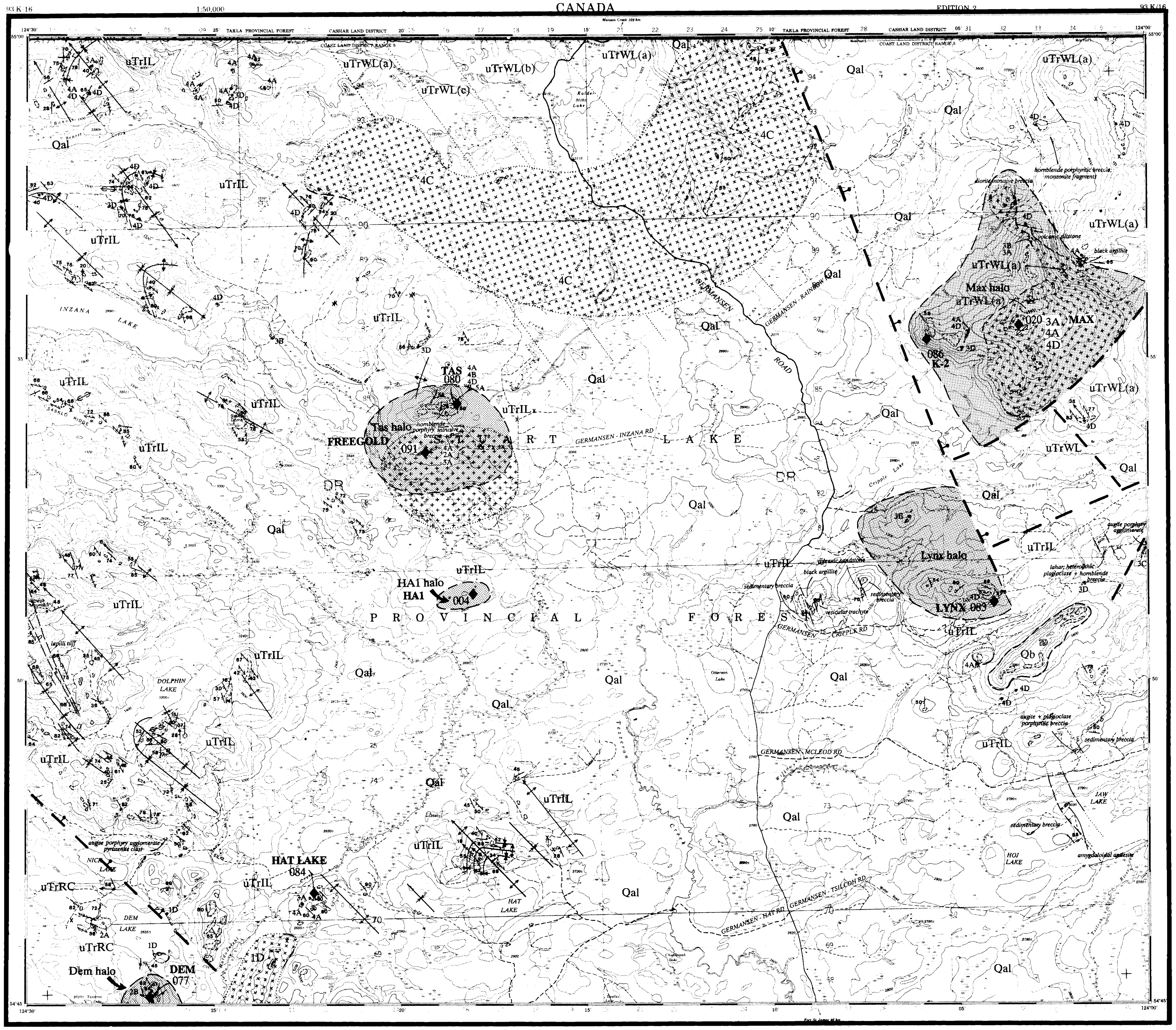
5. MERCURY (HG)

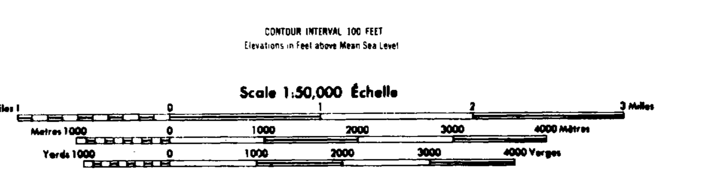
Flameless Atomic Absorption A 5 g sample is digested with HNO_3 and HCl acids and is analysed using flameless atomic absorption. Detection limit is 10 ppb.



REFERENCE

Nelson, J., Bellefontaine, K., Green, K. and MacLean, M. (1991): Regional Geological Mapping Near the Mount Milligan Copper-Gold Deposit (93K/16, 93N/1), British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1990, Paper 1991-1.





SHEET 3 - GEOLOGY OF TEZZERON CREEK (93K/16)

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources
MINERAL RESOURCE DIVISION
GEOLOGICAL SURVEY BRANCH

OPEN FILE 1991-3

GEOLOGY AND MINERAL POTENTIAL OF THE WITTSICHICA CREEK AND TEZZERON CREEK MAP AREAS

NTS 93N/1 AND 93K/16

J.L. NELSON, K.A. BELLEFONTAINE, K.C. GREEN, M.E. MACLEAN

SCALE 1:50,000

LEGEND

LAYERED ROCKS

QUATERNARY

Qal	*UNCONSOLIDATED GLACIAL TILL AND ALLUVIUM*

QUATERNARY?

Qb	*OLIVINE-BEARING BASALT*

EOCENE - OLIGOCENE

Esb	*VOLCANIC WACKE, PLANT- BEARING, VOLCANIC ASH-RICH MUDSTONE AND BASALT*

UPPER TRIASSIC (- JURASSIC?)

TAKLA GROUP

uTrCL	**CHUCHI LAKE FORMATION: (A)** *GREEN AND MAROON HETEROLITHIC AGGLOMERATE;* **(B)** *PLAGIOCLASE-PORPHYRY TRACHYTE FLOWS AND BRECCIAS;* **(C)** *INTERVOLCANIC SEDIMENTS*
uTrWL	**WITCH LAKE FORMATION: (A)** *AUGITE (± PLAGIOCLASE ± HORNBLENDE) PORPHYRY AGGLOMERATE, LAPILLI TUFF AND EPICLASTIC SEDIMENTS;* **(B)** *TRACHYTE FLOWS AND TUFF-BRECCIAS;* **(C)** *PLAGIOCLASE (± AUGITE) PORPHYRY LATITE FLOWS AND AGGLOMERATES;* **(D)** *EPICLASTIC SEDIMENTS (SANDSTONES AND SILTSTONES) AND MINOR AMYGDALOIDAL TRACHYTE FLOWS;* **(E)** *AMPHIBOLITE AND METAMORPHOSED AUGITE PORPHYRY FLOWS, LAPILLI TUFF, AGGLOMERATE AND SEDIMENTS*
uTrIL	**INZANA LAKE FORMATION:** *VOLCANIC SANDSTONE, SILTSTONE, MUDSTONE, ARGILLITE, LAPILLI TUFF AND SEDIMENTARY BRECCIA*
uTrRC	**RAINBOW CREEK FORMATION:** *GREY SLATE, THIN-BEDDED SILTSTONE, MINOR VOLCANIC SEDIMENTS*

INTRUSIVE ROCKS

LATE CRETACEOUS-EARLY TERTIARY?

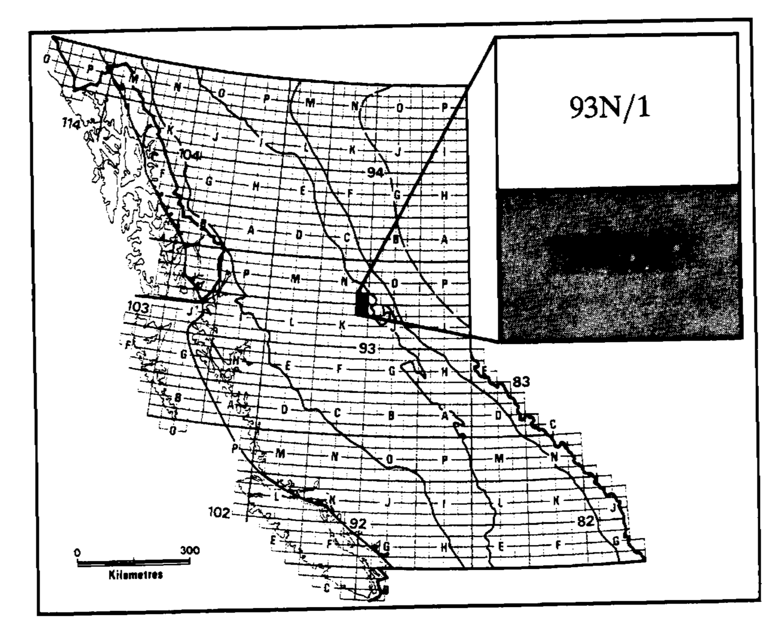
1	**GRANITE SUITE: (1A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR GRANITE;* **(1D)** *RHYODACITE/DACITE*

LATE TRIASSIC-EARLY JURASSIC

2	**SYENITE SUITE: (2A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR SYENITE;* **(2B)** *CROWDED PLAGIOCLASE PORPHYRITIC SYENITE;* **(2C)** *MEGACRYSTIC SYENITE*
3	**MONZONITE SUITE: (3A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR MONZONITE;* **(3B)** *CROWDED PLAGIOCLASE PORPHYRITIC MONZONITE;* **(3C)** *MEGACRYSTIC PLAGIOCLASE MONZONITE;* **(3D)***SPARSELY PORPHYRITIC LATITE*
4	**DIORITE/MONZODIORITE SUITE: (4A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR DIORITE/MONZODIORITE;* **(4B)** *CROWDED PLAGIOCLASE PORPHYRITIC DIORITE;* **(4C)** *MEGACRYSTIC PLAGIOCLASE (± AUGITE) PORPHYRITIC DIORITE;* **(4D)** *SPARSELY PORPHYRITIC ANDESITE*
5	**GABBRO/MONZOGABBRO SUITE: (5A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR GABBRO/MONZOGABBRO*

SYMBOLS

geologic contact (approximate, inferred)
lithologic contact (approximate, inferred)
fault (defined, inferred)
F_1 axial trace (anticlinal, synclinal)
F_2 axial trace (antiformal, synformal)
bedding (tops known, tops unknown, overturned)
foliation
F_1 fold axis
F_2 fold axis
current lineation
mineral lineation
glacial striation
dyke attitude
large intrusion
small intrusion
area of alteration
mineral occurrence and MINFILE number ◆ 086
fossil locality
diamond drill hole



REFERENCE

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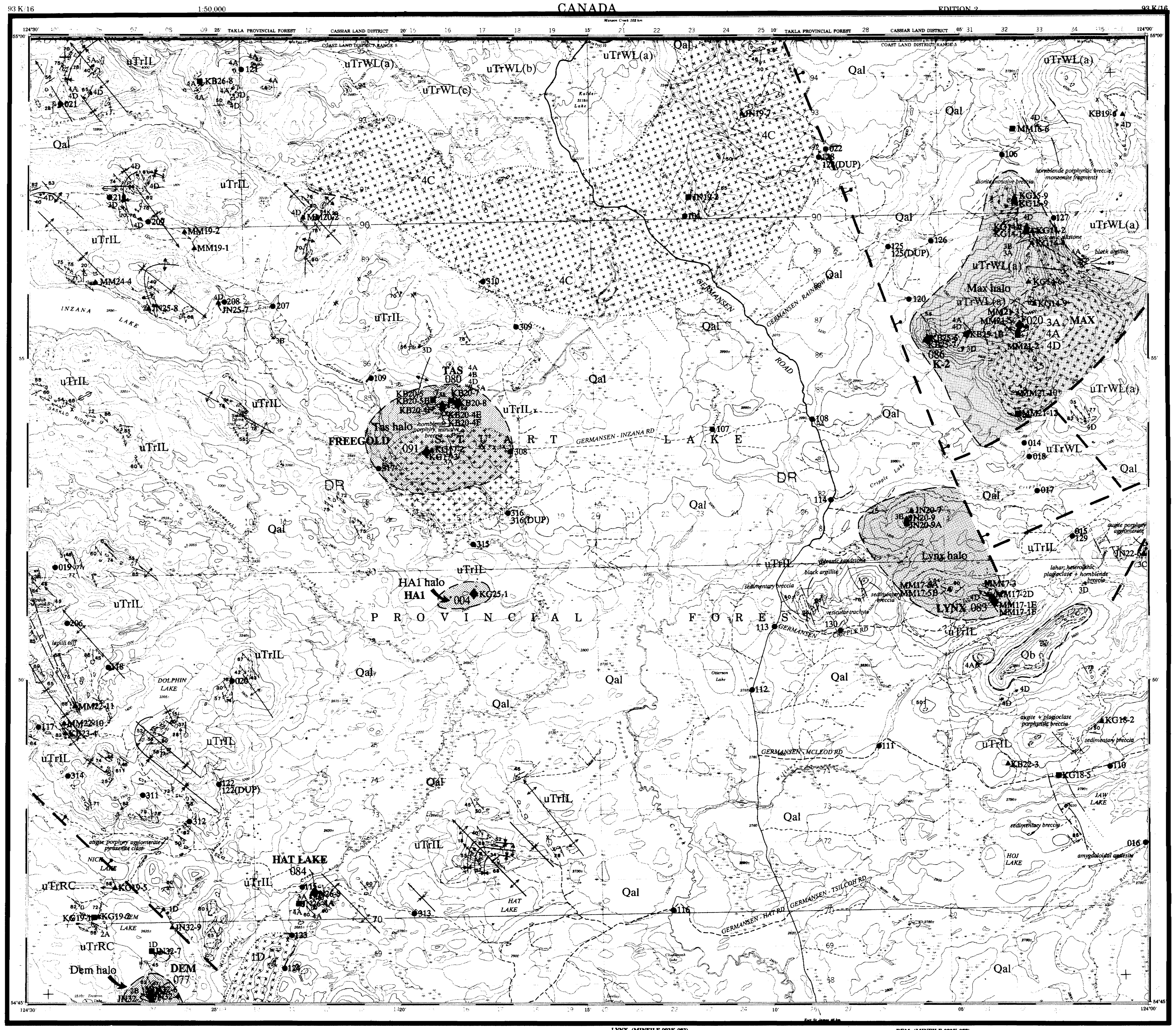

Province of British Columbia
Ministry of Energy, Mines and Petroleum Resources
MINERAL RESOURCE DIVISION
GEOLOGICAL SURVEY BRANCH

OPEN FILE 1991-3

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NTS 93N/1 AND 93K/16

J.L. NELSON, K.A. BELLEFONTAINE, K.C. GREEN, M.E. MACLEAN

SCALE 1:50,000

LEGEND

LAYERED ROCKS

QUATERNARY

- **Qal** — *UNCONSOLIDATED GLACIAL TILL AND ALLUVIUM*

QUATERNARY?

- **Qb** — *OLIVINE-BEARING BASALT*

EOCENE - OLIGOCENE

- **Esb** — *VOLCANIC WACKE, PLANT- BEARING, VOLCANIC ASH-RICH MUDSTONE AND BASALT*

UPPER TRIASSIC (- JURASSIC?)

TAKLA GROUP

- **uTrCL** — **CHUCHI LAKE FORMATION: (A)** *GREEN AND MAROON HETEROLITHIC AGGLOMERATE;* **(B)** *PLAGIOCLASE-PORPHYRY TRACHYTE FLOWS AND BRECCIAS;* **(C)** *INTERVOLCANIC SEDIMENTS*
- **uTrWL** — **WITCH LAKE FORMATION: (A)** *AUGITE (± PLAGIOCLASE ± HORNBLENDE) PORPHYRY AGGLOMERATE, LAPILLI TUFF AND EPICLASTIC SEDIMENTS;* **(B)** *TRACHYTE FLOWS AND TUFF-BRECCIAS;* **(C)** *PLAGIOCLASE (± AUGITE) PORPHYRY LATITE FLOWS AND AGGLOMERATES;* **(D)** *EPICLASTIC SEDIMENTS (SANDSTONES AND SILTSTONES) AND MINOR AMYGDALOIDAL TRACHYTE FLOWS;* **(E)** *AMPHIBOLITE AND METAMORPHOSED AUGITE PORPHYRY FLOWS, LAPILLI TUFF, AGGLOMERATE AND SEDIMENTS*
- **uTrIL** — **INZANA LAKE FORMATION:** *VOLCANIC SANDSTONE, SILTSTONE, MUDSTONE, ARGILLITE, LAPILLI TUFF AND SEDIMENTARY BRECCIA*
- **uTrRC** — **RAINBOW CREEK FORMATION:** *GREY SLATE, THIN-BEDDED SILTSTONE, MINOR VOLCANIC SEDIMENTS*

INTRUSIVE ROCKS

LATE CRETACEOUS-EARLY TERTIARY?

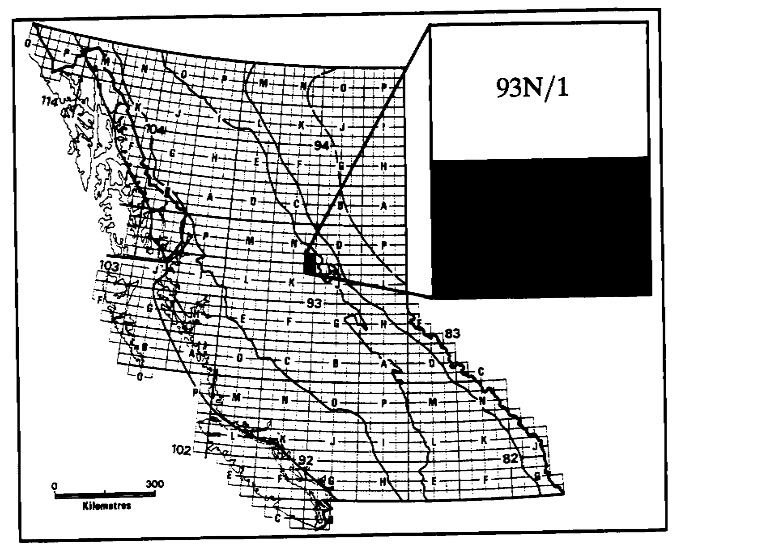
- **1** — **GRANITE SUITE: (1A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR GRANITE;* **(1D)** *RHYODACITE/DACITE*

LATE TRIASSIC-EARLY JURASSIC

- **2** — **SYENITE SUITE: (2A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR SYENITE;* **(2B)** *CROWDED PLAGIOCLASE PORPHYRITIC SYENITE;* **(2C)** *MEGACRYSTIC SYENITE*
- **3** — **MONZONITE SUITE: (3A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR MONZONITE;* **(3B)** *CROWDED PLAGIOCLASE PORPHYRITIC MONZONITE;* **(3C)** *MEGACRYSTIC PLAGIOCLASE MONZONITE;* **(3D)** *SPARSELY PORPHYRITIC LATITE*
- **4** — **DIORITE/MONZODIORITE SUITE: (4A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR DIORITE/MONZODIORITE;* **(4B)** *CROWDED PLAGIOCLASE PORPHYRITIC DIORITE;* **(4C)** *MEGACRYSTIC PLAGIOCLASE (± AUGITE) PORPHYRITIC DIORITE;* **(4D)** *SPARSELY PORPHYRITIC ANDESITE*
- **5** — **GABBRO/MONZOGABBRO SUITE: (5A)** *COARSE TO MEDIUM GRAINED, EQUIGRANULAR GABBRO/MONZOGABBRO*

SYMBOLS

geologic contact (approximate, inferred)
lithologic contact (approximate, inferred)
fault (defined, inferred)
F_1 axial trace (anticlinal, synclinal)
F_2 axial trace (antiformal, synformal)
bedding (tops known, tops unknown, overturned)
foliation
F_1 fold axis
F_2 fold axis
current lineation
mineral lineation
glacial striation
dyke attitude
large intrusion
small intrusion
area of alteration
mineral occurrence and MINFILE number ◆ 086
fossil locality
diamond drill hole



REFERENCE

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REGIONAL GEOCHEMICAL SURVEY - STREAM SEDIMENT RESULTS

SAMPLE NUMBER	UTM EAST	UTM NORTH	Au ppb	Cu ppm	Mo ppm	Pb ppm	Zn ppm	Ag ppm	Ni ppm	Co ppm	Fe %	Mn ppm	As ppm	W ppm	Hg ppb	Sb ppm	U ppm
014	432375	6083450	<5	70	2	8	82	0.2	37	17	3.60	1100	4	<2	70	0.2	delay
015	433650	6080700	<5	46	<1	4	46	<0.2	30	12	2.90	590	3	<2	60	0.4	delay
016	435675	6071775	<5	50	<1	4	62	<0.2	46	14	3.30	1000	7	<2	110	0.6	delay
017	432725	6082000	115	32	2	8	56	<0.2	24	13	3.80	1600	6	<2	100	<0.2	delay
018	432500	6083000	<5	52	1	6	74	0.2	32	14	3.50	850	5	<2	80	0.4	delay
019	404450	6080325	<5	62	2	4	68	<0.2	34	17	4.00	780	5	<2	120	0.8	delay
020	409450	6076925	<5	70	1	4	110	0.4	46	15	3.35	1400	6	<2	240	0.6	delay
021	404850	6093650	<5	70	<1	6	72	0.2	38	14	3.55	570	5	<2	130	0.4	delay
022	426775	6091975	<5	42	1	4	102	0.4	32	24	3.90	1850	3	<2	110	<0.2	delay
104	422750	6090125	<5	74	1	6	96	<0.2	30	17	3.40	1200	4	2	40	0.2	delay
106	431850	6091750	<5	50	<1	4	50	<0.2	30	14	3.00	650	4	<2	50	0.2	delay
107	423375	6083950	<5	30	<1	4	70	<0.2	22	13	3.10	1500	4	<2	50	<0.2	delay
108	426275	6084225	<5	32	<1	4	80	<0.4	76	16	2.80	920	2	n.s.s.	n.s.s.	n.s.s.	delay
109	413600	6085600	<5	80	<1	6	74	<0.2	30	18	3.40	950	5	<2	90	0.4	delay
110	434650	6074025	<5	36	<1	6	82	<0.2	40	14	2.90	980	5	<2	100	0.6	delay
111	428025	6074775	<5	44	1	8	86	<0.2	42	18	3.50	1000	8	<2	100	0.6	delay
112	424350	6076400	<5	55	1	6	114	<0.2	48	17	3.60	850	8	<2	130	0.8	delay
113	425075	6078250	<5	38	1	6	82	0.3	34	12	3.00	510	5	<2	70	0.4	delay
114	426750	6081850	<5	38	2	4	80	0.2	26	16	5.00	6200	7	n.s.s.	n.s.s	<0.4	delay
115	411575	6070975	<5	32	1	6	100	<0.2	40	18	3.80	2700	8	n.s.s.	70	n.s.s.	delay
116	422050	6070100	<5	24	<1	4	52	0.2	24	11	2.60	570	4	<2	70	<0.2	delay
117	403825	6075650	<5	28	<1	6	62	0.2	30	11	2.70	800	4	<2	80	0.4	delay
118	405850	6077375	<5	56	1	9	84	0.2	44	16	3.30	850	6	<2	110	0.6	delay
120	429125	6087600	<5	26	1	1	56	<0.2	24	11	3.00	580	4	<2	40	<0.2	delay
121	410000	6094625	105	126	5	2	74	0.4	34	15	3.20	1100	22	<2	200	1.8	delay
122	409025	6073975	<5	50	1	5	82	0.2	30	14	3.00	710	5	<2	70	0.4	delay
122D	409025	6073975	<5	50	1	4	86	0.2	32	14	3.10	650	5	<2	100	0.4	delay
123	411050	6069575	<5	26	1	6	84	0.2	32	14	3.50	1900	6	<2	90	0.8	delay
124	410800	6068600	<5	26	<1	4	62	0.2	20	8	2.20	340	6	4	100	0.2	delay
125	428525	6089125	<5	44	<1	2	66	<0.2	30	14	3.00	740	6	<2	100	<0.2	delay
125D	428525	6089125	<5	40	1	2	62	<0.2	28	14	2.85	680	3	<2	60	<0.2	delay
126	429800	6089300	<5	36	<1	2	44	<0.2	22	12	2.40	500	3	<2	60	<0.2	delay
126D	429800	6089300	<5	35	<1	4	44	<0.2	21	12	2.45	480	5	<2	40	<0.2	delay
127	433350	6089625	15	80	1	6	62	0.3	26	18	4.20	680	5	<2	90	0.2	delay
128	426600	6091725	<5	64	<1	3	62	0.2	28	16	3.10	1000	5	<2	80	<0.2	delay
128D	426600	6091725	<5	60	<1	8	52	<0.2	26	15	3.10	750	5	<2	70	0.2	delay
129	433650	6080700	<5	62	2	8	114	0.7	44	16	3.45	2300	3	<2	240	0.2	delay
130	426950	6078075	<5	60	1	9	72	0.2	44	17	3.45	1200	6	<2	120	0.6	delay
206	404750	6078700	<5	120	1	12	114	0.5	40	14	3.50	790	7	<2	210	0.8	delay
207	410625	6087750	<5	56	<1	8	78	0.3	22	13	2.60	630	3	<2	140	<0.2	delay
207D	410625	6087750	<5	52	<1	8	76	0.2	22	12	2.60	640	3	<2	130	<0.2	delay
208	409425	6087850	<5	70	1	8	104	0.3	40	16	4.00	1500	5	<2	140	0.2	delay
209	407250	6090200	<5	68	<1	8	74	0.2	40	18	3.50	810	12	<2	90	0.8	delay
210	406175	6090925	<5	74	<1	11	86	0.2	46	16	3.50	750	6	<2	150	0.6	delay
308	417575	6083450	5	50	<1	2	60	<0.2	30	12	2.70	470	6	<2	80	0.4	delay
309	417800	6087025	20	50	1	3	100	0.3	42	17	3.35	950	5	n.s.s.	120	0.4	delay
310	416900	6088375	<5	62	2	4	108	0.3	36	22	3.30	1300	5	<2	60	0.6	delay
311	406850	6073675	<5	56	1	4	104	0.2	40	17	3.60	890	8	<2	210	1	delay
311D	406850	6073675	<5	56	1	4	104	<0.2	40	16	3.40	850	6	2	200	1	delay
312	408150	6072900	<5	80	2	6	136	0.4	70	18	4.80	710	8	2	240	1.2	delay
313	414550	6070125	<5	50	<1	8	104	<0.2	48	18	3.70	420	5	2	130	1.8	delay
314	404700	6074300	<5	32	<1	3	86	0.2	40	12	2.95	560	6	2	150	1	delay
315	416425	6080750	20	56	1	2	92	0.2	28	20	3.20	1250	5	n.s.s.	n.s.s.	n.s.s.	delay
316	417450	6081625	<5	34	1	<1	90	0.2	26	14	2.90	680	5	<2	60	0.4	delay
316D	417450	6081625	<5	36	2	2	90	0.2	26	15	3.10	800	3	<2	70	0.4	delay
317	413750	6082975	<5	60	1	8	76	0.3	26	12	2.40	360	1	<2	130	<0.2	delay

n.s.s. = not sufficient sample

GEOCHEMISTRY

SAMPLE NUMBER	MINERAL SHOWING/ SAMPLE DESCRIPTION	UTM EAST	UTM NORTH	Au ppb	Ag ppm	Cu ppm*	Pb ppm	Zn ppm*	As ppm*	Sb ppm*
JN19-7	1 cm wide cpy + fluorite vein	424420	6093000	330	1	108	130	97	2	0.6
JN20-7	MAX: hornfels, minor pyrrhotite	429100	6081460	11	<0.7	34	20	65	6	1
JN20-7Dup	MAX: hornfels, minor pyrrhotite	429100	6081460	15	<0.7	37	22	66	6	1
JN20-9	MAX: horfelsed argillite with 15% pyrite	428950	6081120	26	0.7	81	8	87	21	2
JN22-6	pyritic, brecciated augite porhyry with gypsum	435720	6080050	5	0.7	121	14	88	15	2
JN24-3	MITZI: qtz ank breccia vein with tetrahedrite	432700	6112800	145	46	0.77%	88	0.11%	97	0.44%
JN25-7	qtz veinlets with diss po + py in horn argillite	409250	6087775	19	0.7	358	10	54	16	0.9
JN25-8	small zone of disseminated py in sil argillite	407250	6087640	121	0.9	30	72	50	12	1
JN26-3	HAT LAKE: gossan zone with 10% pyrrhotite	411520	6070625	7	0.7	199	16	72	11	3
JN32-4	DEM:gn act skarn, 5% py + po	407000	6067800	16	<0.5	137	9	78	43	10
JN32-5	DEM: mt - po - py skarn	407015	6067675	204	<0.5	41	5	87	13	26
JN32-6	DEM:qtz bx vein, 5-10% aspy, ep + trem	405975	6067900	361	0.7	7	14	63	2.11%	66
JN32-9	listwanite	407675	6096775	2	<0.5	96	5	72	4	3
KB20-4H	TAS: shear with mass py + mal in diorite	415720	6084730	6871	4	0.28%	14	31	192	2
KB20-8	TAS: East Zone-mass py + po + cpy in shear	416070	6084770	46356	5	450	8	30	2	1
KB22-3	breccia with 5% disseminated py + po	431800	6074070	32	<0.7	105	10	84	2	0.5
KB23-4	quartz carbonate vein	404650	6075400	99	<0.7	30	4	26	6	2
KB25-6	plag + cpx porph with 5% diss py + po	429660	6086450	5	<0.7	104	16	67	5	1
KB25-7	K-2: qtz carb vein, 20% mass sulph; cpy + ??	429560	6086400	28	55	1.06%	16	440	217	0.19%
KB25-7Dup	K-2: qtz carb vein, 20% mass sulph; cpy + ??	429560	6086400	24	47	0.99%	14	400	208	0.17%
KG14-1	MAX: augite porphyry with py and trace cpy	432550	6089840	127	<0.7	189	8	80	4	1
KG14-2	MAX: hornfelsed sediments, 1-5% py + po	432690	6089470	28	0.7	207	4	61	4	1
KG14-4	MAX: gossan with carbonate + pyrite	432680	6089150	14	<0.7	143	10	63	78	7
KG14-6	MAX: bleached feldspar porphyry with pyrite	432500	6088020	7	<0.7	60	10	38	9	2
KG14-9	MAX: 10-20% pyrite in augite porphyry	432700	6087380	4	<0.7	64	20	63	14	2
KG15-9	MAX: 2-3 cm massive pyrite + magnetite vein	432180	6090400	41	0.7	606	14	220	9	2
KG17-2	carb + ep alt diorite with < 1% py	415350	6083500	5	<0.7	7	18	20	2	1
KG17-3	FREE GOLD ZONE: carb - qtz vein	415040	6083350	6846	1	40	16	68	57	14
KG18-2	1-5% pyrite in sedimentary breccia	434400	6075360	9	<0.7	83	14	87	5	1
KG19-2	quartz carbonate veins	405520	6070200	1	<0.7	21	6	41	3	2
KG19-5	carbonate vein	406000	6071000	1	<0.7	27	20	90	17	2
KG25-1	HA-1: minor disseminated py + cpy in sil argl	416350	6079350	7	0.5	85	5	158	16	4
MM17-1E	LYNX: 30% py + cpy + mal in sil tuff-breccia	431420	6078800	603	2	660	38	250	5	1
MM17-1F	LYNX: 30% py + cpy + mal in sil tuff-breccia	431420	6078800	51	5	0.20%	48	390	14	1
MM17-3	LYNX: bl + sil tuff with 10% py + cpy	431250	6079000	221	0.7	252	16	57	17	6
MM17-5A	LYNX: epidote - biotite - garnet skarn	430150	6079170	63	<0.7	5	18	88	15	14
MM17-5B	LYNX: 50-70% massive po with cpy	430150	6079170	921	3	900	22	115	6	2
MM19-1	pyrite blebs and veinlets in sil black argillite	408625	6089350	2	<0.7	103	8	53	1	0.6
MM19-2	qtz vein with 5-10% py in bl and sil argillite	408375	6089800	10	<0.7	384	14	56	9	2.0
MM20-2	disseminated py and po in fine grained tuff	411760	6090250	1	<0.7	95	26	220	4	0.6
MM21-2	gossan, prop alt, 5-10% py + po + mt	432500	6086725	8	0.9	62	14	103	8	2
MM21-3	intense prop alt in aphanitic dyke, 10-15% py	432400	6086750	28	<0.7	165	28	56	98	2
MM21-5	epidote altered diorite	432235	6086640	5	0.7	74	12	110	9	2
MM21-10	bleached plag porphyry with 5% pyrite	432215	6084825	5	<0.7	21	22	67	10	3
MM22-10	banded quartz carbonate vein	404590	6075810	49	<0.7	17	12	71	5	0.7
MM22-11	quartz carbonate vein in tuffaceous seds	404920	6076250	9	<0.7	19	16	39	4	3
MM24-4	gossan in altered tuffaceous seds	405800	6088475	6	0.7	117	20	120	5	4

* values in ppm or percent where indicated

Abbreviations:

act = actinolite, alt = altered, ank = ankerite, argl = argillite, aspy = arsenopyrite, bl = bleached, bx = breccia, carb = carbonate, cpy = chalcopyrite, diss = disseminated, ep = epidote, horn = hornfelsed, gn = garnet, mt = magnetite, mal = malachite, mass = massive, plag = plagioclase, po = pyrrhotite, porph = porphyritic, prop = propylitic, py = pyrite, qtz = quartz, sil = silicified, sulph = sulphides, trem = tremolite

GEOCHEMICAL SAMPLES

Stream Sediment ●
Geochemistry ▲
Whole Rock ■

ANALYTICAL PROCEDURES FOR GEOCHEMISTRY

ANALYTICAL PROCEDURES FOR ROCK GEOCHEMISTRY

Analysis performed by B.C. Geological Survey - Analytical Sciences Laboratory

1. GOLD (AU) AND SILVER (AG)

Fire Assay/Atomic Absorption A 0.5 Assay Ton (approx. 15 gram) sample weight is subjected to a standard fire assay technique to generate a Au/Ag bead. The bead is dissolved in acid; Au is measured to a detection limit of <20 ppb and Ag is measured to a detection limit of <0.5 ppm by atomic absorption analysis.

2. BASE METALS (CU, PB, ZN)

Atomic Absorption Samples are digested using acid attack which includes HF. The dilute acid dissolution of the residue is further diluted to a specific volume and the elements are measured using AAS.

3. ELEMENTS AS AND SB

Hydride Generation A 1 g sample is digested using a mixture of HCl and HNO_3; a portion of the diluted sample solution is treated with $NaBH_4$ and the liberated hydride compound is swept into a hot cell in the light path of the AAS unit. The hydride decomposes to give a vapour of the element which is measured.

ANALYTICAL PROCEDURES FOR STREAM SEDIMENT GEOCHEMISTRY

Analyses performed by Chemex Labs Ltd., 212 Brooksbank Ave., North Vancouver, B.C., V7J 2C1

1. ELEMENTS CU, MO, PB, ZN, AG, NI, CO, FE, MN, W

Atomic Absoption 1 g of sample is digested with nitric - aqua regia. The metals are determined by atomic absorption techniques. Lead, silver, nickel, and cobalt are corrected for background absorption.

Detection limits: Cu - 1 ppm, Mo - 1 ppm, Pb - 1 ppm, Zn - 1 ppm, Ag - 0.2 ppm, Ni - 1 ppm, Co - 1 ppm, Fe - 0.05%, Mn - 5 ppm, W - 10 ppm.

2. ANTIMONY (SB)

Atomic Absorption A 2 g sample is digested with concentrated HCl-$KClO_3$ at low heat. The iron is reduced to Fe^{2+} state and the Sb extracted with TOPO-MIBK and analyzed with atomic absorption, correcting for background absorption. Detection limit is 0.2 ppm.

3. ARSENIC (AS)

Atomic Absorption A 1 g sample is digested with HNO_3 - aqua regia acids. An aliquot of the digest is acidified and reduced with $NaBH_4$ and arsenic content determined using flameless atomic absorption. Detection limit is 1 ppm.

4. GOLD (AU)

Fire Assay/Atomic Absorption A 10 g sample is fused with a neutral flux inquarted with 6 mg of Au-free silver an then cupelled. Silver beads for atomic absorption finish are digested in HNO_3 and HCl. The samples are cooled and made to a volume of 5 ml, homogenized and analyzed with atomic absorption with background correction. Detection limit is 5 ppb.

5. MERCURY (HG)

Flameless Atomic Absorption A 5 g sample is digested with HNO_3 and HCl acids and is analysed using flameless atomic absorption. Detection limit is 10 ppb.

MINERAL OCCURRENCES

TAS (MINFILE 093K-080)

The Tas (East zone) is located on a small hill just north of the Germansen-Inzana forest road, approximately 10 kilometres from its junction with the Fort St. James - Germansen logging road. Hornfelsed and bleached siliceous argillites of the Inzana Lake formation are intruded by texturally variable hornblende ± biotite ± plagioclase porphyry. The hornblende porphyry often forms intrusive breccia with xenoliths of sediments and hornblendite. It is weakly propylitized. Later, more felsic diorite intrudes this package.

Mineralization in the sedimentary and intrusive rocks is confined to minor amounts (<2 per cent) disseminated pyrite and pyrrhotite. Semimassive sulphide pods are found in steeply dipping, north-trending shear zones 10 to 20 centimetres wide. On surface these zones contain up to 70 per cent sulphides: mainly pyrite and pyrrhotite with minor chalcopyrite and marcasite(?).

FREE GOLD ZONE (MINFILE 093K-091)

The Free Gold zone is located on the Tas claims on the Germansen-Inzana forest road. A small zone of intense quartz-carbonate alteration is exposed in a quarry. Up to 10 per cent pyrite with traces of magnetite and malachite and rare native gold occur in the rock. Propylitized hornblende diorite with sporadic potassium feldspar veins and traces of malachite on fractures outcrop near the showing. The diorite and the Free Gold zone are hosted by the Inzana Lake formation.

K-2 (MINFILE 093K-086)

The K-2 showing is located near the western boundary of the Max claims approximately 3 kilometres north-northeast of Cripple Lake. The showing is a hydrothermally brecciated quartz - carbonate vein which is exposed in a subcrop zone approximately 2 metres wide that trends south-southeast over 50 metres. The vein contains bleached and milled wallrock and is strongly hematite stained. Up to 30 per cent chalcopyrite with minor malachite and an unidentified grey-silver-coloured sulphide occur in the rock. A grab sample of the vein (KB25-7) contains approximately 1.0 per cent Cu, 0.2 per cent Sb and anomalous Zn and As.

MAX (MINFILE 093K-020)

The Max claims are located east of the Fort St. James - Germansen logging road near Cripple Lake. The property covers an extensive area of propylitic alteration and sporadic mineralization that is associated with a complex polyphase intrusive body. The occurrence location recorded in Minfile is at the highest elevation on the Max claims (1370 metres), the approximate centre of the Max alteration halo. The Max halo includes several small showings in and around the main intrusive body.

The complex intrusive suite includes texturally variable monzonite, diorites and monzodiorites. Hornblendite and aplite dikes have also been mapped on the property. In one locality hornblendite apparently grades into amygdaloidal extrusive equivalents.

Propylitic alteration is extensive in the intrusive rocks; epidote and secondary chlorite are abundant. Minor potassic alteration also occurs. The intrusions contain up to 20 per cent pyrite in places, but average sulphide contents are closer to 3 per cent.

The intrusions cut heterolithic augite ± plagioclase porphyry flows and agglomerates, black siliceous argillite and volcanic siltstones and sandstones of the Witch Lake formation. The sediments are intensely hornfelsed with abundant secondary biotite; the volcanic rocks are strongly epidotized. Up to 30 per cent pyrite occurs in these host rocks. Minor disseminated pyrrhotite is found with chlorite in veinlets. Chalcopyrite and magnetite have also been identified.

LYNX (MINFILE 093K-083)

The Lynx showing is located on the southern portion of the Max claims south of Cripple Creek. It occurs within a large area (approximately 2 km by 1 km) of bleached, silicified and mineralized rocks. This alteration zone may be part of a larger propylitic alteration halo associated with the intrusive body on the Max claims to the north.

The main part of the Lynx showing occurs in a trench adjacent to the Germansen-Cripple logging road. A three-metre square sulphide-rich oxidized zone occurs within light green, silicified and brecciated ash and dust tuffs of the Inzana Lake formation. The zone contains up to 30 per cent massive and crystalline pyrite, up to 5 per cent chalcopyrite and minor malachite. The rocks have a well-developed network of hairline fractures with alteration envelopes along them. Both propylitic and potassic alteration are present. The rocks are strongly hornfelsed and contain abundant secondary biotite, however, no intrusive rocks have been identified on the property. Adjacent to the gossan a northwest trending, steeply dipping fault contains a 30-centimetre gouge zone that hosts quartz but no sulphides.

Stratigraphically above the main showing (approximately 1.25 kilometres to the west-northwest), tuffaceous siltstones and minor lapilli tuffs are sporadically converted to skarn. Biotite and diopside hornfelsing are widespread for several hundred metres. One zoned garnet-epidote-diopside-biotite skarn contains concentrations of massive pyrrhotite (50-70 per cent) with minor flecks of chalcopyrite and possibly covellite. The meta-tuffs are interbedded with intermediate plagioclase + augite ± hornblende porphyry flows and/or sills. They contain disseminated pyrite and abundant epidote in streaky veins.

Several rock samples anomalous in gold (221-921 ppb) were collected in this area.

DEM (MINFILE 093K-077)

The Dem showings are hosted in metasomatically altered sediments of the Inzana Lake formation, within the Dem alteration halo. Well-laminated sandstones and siltstones are intruded, hornfelsed and altered by syenomonzonite dikes. Areally extensive alteration in the sediments ranges from local massive epidote - tremolite skarning to biotite-diopside hornfelsing. Samples contain up to 137 ppm copper.

The main showing is a pod-shaped subcrop exposure (20 centimetres by 1 metre) of brecciated quartz vein. The vein contains between 5 and 10 per cent arsenopyrite that forms in clumps with epidote and tremolite. A grab sample of this vein contains 361 ppb gold, 2.11 per cent arsenic and 66 ppm antimony.

Approximately 500 metres south of the arsenopyrite quartz breccia vein, another massive skarn pod (0.5 metre wide) occurs within the sediments in close proximity to syenomonzonite dikes. Skarn mineralization consists of pyrite and pyrrhotite with secondary biotite and actinolite veinlets. A grab sample contains 204 ppb gold and 41 ppm copper.

HAT LAKE (MINFILE 093K-084)

The Hat Lake showing is located on the Hat Lake claim group 1.5 kilometres south of Hat Lake on the Germansen - Hat logging road. Silicified, hornfelsed and fractured black argillite, cherty tuffs and green sandstone of the Inzana Lake formation contain disseminated pyrite. The sediments are cut by texturally highly variable gabbro and diorite intrusions, gabbro pegmatite and intrusion breccias. A trench exposes a plagioclase-augite-hornblende diorite dike that contains 10 per cent pyrrhotite. Pale quartz carbonate alteration and a shear zone were also noted at the showing.

HA1 (MINFILE 093K-004)

The HA1 showing is located on the HA1 claim near Taslinchecko Creek, approximately 5.5 kilometres south of the Tas property. The showing consists of 5 per cent pyrite and <1 per cent chalcopyrite disseminated in siliceous black argillite of the Inzana Lake formation. Quartz ± carbonate stringers are abundant in the rocks; some of them contain minor pyrite. Abundant hematite coated fractures occur in silicified sediments in a trench exposure. Drilling on the property has shown the presence of sub-surface diorite and gabbro intrusions.

SHEET 4 - MINERAL POTENTIAL OF TEZZERON CREEK (93K/16)

Scale 1:50,000 Échelle

CONTOUR INTERVAL 100 FEET
Elevations in Feet above Mean Sea Level