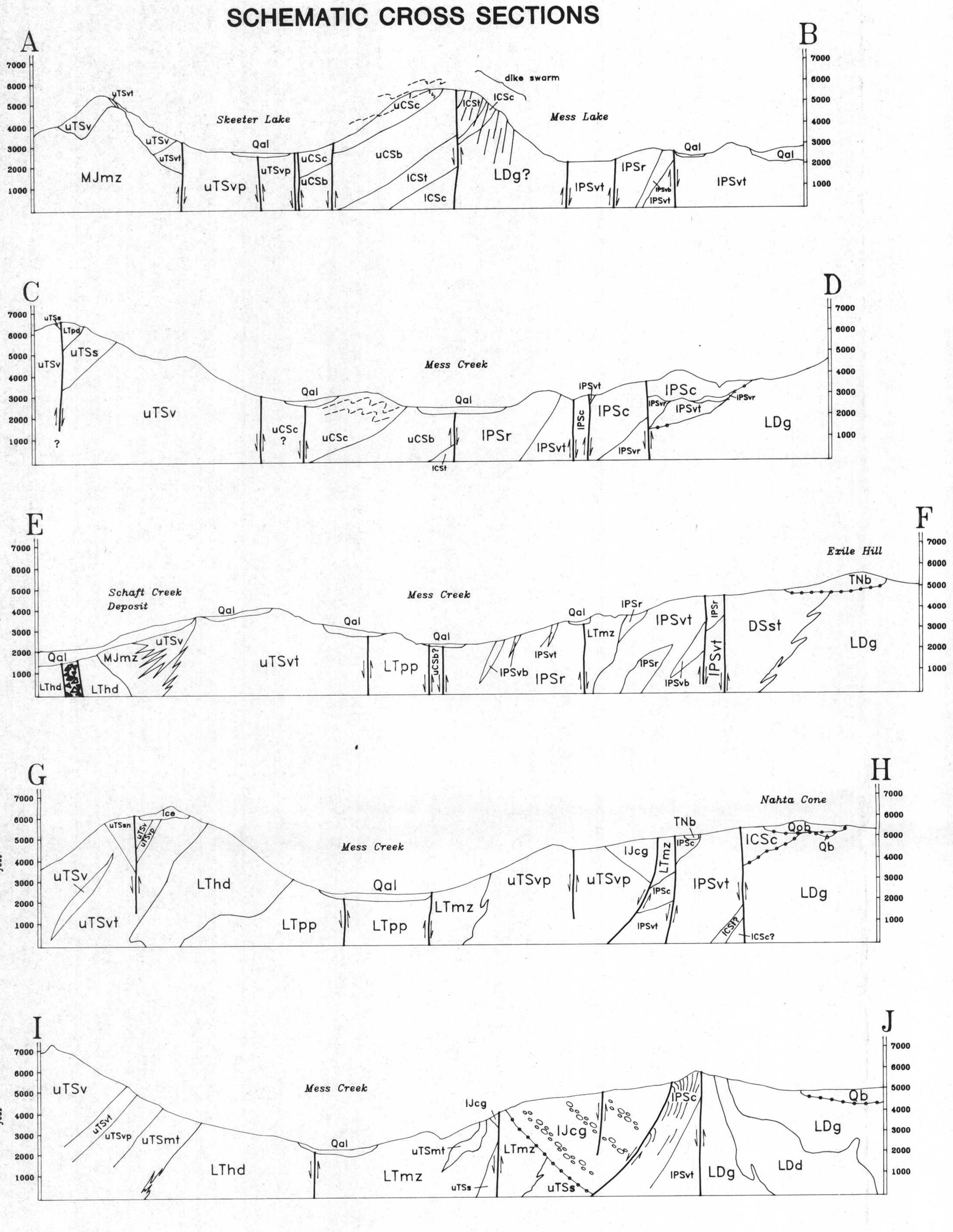
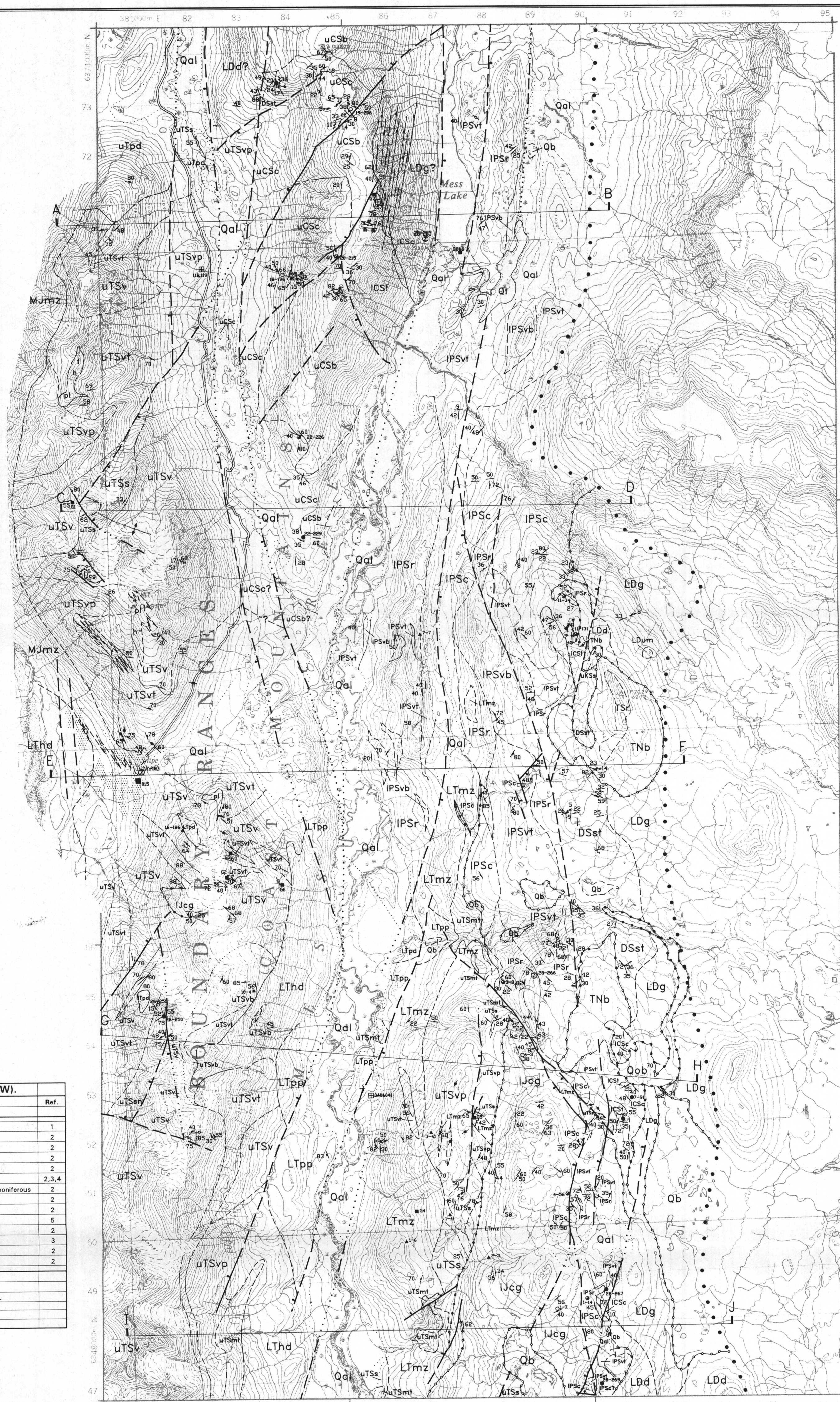
SCHEMATIC CROSS SECTIONS



CONTOUR INTERVAL .... 100 FEET
ELEVATIONS IN FEET ABOVE MEAN SEA LEVEL
NORTH AMERICAN DATUM 1927
TRANSVERSE MERCATOR PROJECTION

The 1974 MAGNETIC BEARING is 30°30' (542 mils) EAST of GRID NORTH.
ANNUAL CHANGE DECREASING 3.4'
GRID NORTH is 1°28' (26 mils) WEST of TRUE NORTH for centre of map.



OPEN FILE 1993-6

Ministry of Energy, Mines and Petroleum Resources

GEOLOGY OF THE MESS LAKE AREA NORTHWESTERN BRITISH COLUMBIA

NTS 104G/7W

J.M. LOGAN AND J.R. DROBE

Kilometres 0 1 2 3 4 Kilometres

SCALE 1 : 50 000

LEGEND

LAYERED ROCKS

QUATERNARY
PLEISTOCENE AND RECENT

Qt	*hotspring deposits, mainly tufa*
	BIG RAVEN FORMATION
Qob	*columnar jointed olivine basalt flows; plagioclase, clinopyroxene, and olivine phyric; pyroclastic cone and tephra*
Qal	*unconsolidated glacial till and poorly sorted alluvium*
	ARCTIC LAKE FORMATION
Qb	*plagioclase-augite phyric basalt, minor olivine phenocrysts; tuff breccia and lava flows; intra-flow fluvial and glacial deposits*

TERTIARY
PLIOCENE

	SPECTRUM FORMATION
TSr	*leucocratic peralkaline rhyolite*
	NIDO FORMATION - KOUNUGU MEMBER
TNb	*aphyric and olivine-phyric basalt, subaerial flows, intercalated fluvial gravel*

UPPER CRETACEOUS TO TERTIARY

	SUSTUT GROUP
uKSs	*chert-pebble conglomerate, quartzose sandstone and minor siltstone*

LOWER JURASSIC

lJcg	*maroon weathering cobble to boulder conglomerate and coarse sandstone; quartz-rich, well-bedded, poorly graded; lower section of quartz-feldspar crystal-lithic tuff, upper section also tuffaceous; brecciated along north-trending faults*

UPPER TRIASSIC

	STUHINI GROUP
uTSs	*well-bedded green dust tuff, tuffaceous siltstone-sandstone turbidites, minor limestone and conglomerate*
uTSv	*augite-phyric, plagioclase-phyric and aphyric basaltic andesite flows, often amygdaloidal, in places pillowed; includes equivalent massive subvolcanic intrusions with same phenocryst assemblages and coarser textures, including a phaneritic groundmass.*
uTSvt	*massive to weakly stratified, pale grey weathering polylithic lapilli tuff and crystal tuff; minor bedded epiclastics*
uTSvp	*plagioclase phyric and aphyric, dark grey, massive basalt flows and subvolcanic fine-grained gabbro*
uTSmt	*recessive weathering mafic tuff, lapilli tuff, and lesser flows; distinctive alteration products include talc, magnesite and dolomite*

STIKINE ASSEMBLAGE

LOWER PERMIAN

lPSc	*dark grey and buff, medium-bedded and fetid to massive and recrystallized fossiliferous carbonate; intercalated tuff occurs near base*
lPSr	*pink to mauve, typically flow-layered and spherulitic aphyric to sparsely plagioclase phyric rhyolite lava; also quartz-feldspar phyric rhyolite lava, autobreccia and minor ashflow tuffs*
lPSvt	*maroon feldspar-phyric lapilli and crystal tuff; interbeds of fossiliferous limestone near top*
lPSvb	*massive to thick bedded, dark grey aphyric and plagioclase and pyroxene-phyric andesite and basalt flows and related breccias*

UPPER CARBONIFEROUS

uCSc	*grey, thin-bedded, fetid and dolomitic limestone, maroon and green lapilli tuff and cherty siltstone; typically foliated, in places massive*
uCSb	*massive amygdaloidal green, grey and maroon basalt flows; mainly aphyric but locally plagioclase phyric*

LOWER CARBONIFEROUS

lCSt	*tuffaceous wacke, siltstone, sandstone and volcanic conglomerate*
lCSc	*grey, medium-bedded to massive, bioclastic limestone; buff dolomitic and ferruginous units*

LOWER DEVONIAN

DSst	*green and red-purple schistose tuff and minor flows, thin interbeds recrystallized grey and buff limestone; chlorite schist, quartz sericite schist*

INTRUSIVE ROCKS

DIKES	*(a) aphyric andesite and basalt; (pp) mafic plagioclase ± pyroxene porphyry; (f) felsic ± quartz eyes; (h) hornblende porphyritic diorite; (pl) plagioclase porphyry*

MIDDLE JURASSIC

	YEHINIKO PLUTON
MJmz	*pink equigranular hornblende-biotite monzonite, monzodiorite*

LATE TRIASSIC OR YOUNGER

LTpd	*medium-grained equigranular augite diorite and gabbro*
LTpp	*grey to green, stubby-plagioclase porphyritic hornblende-pyroxene diorite*
LTmz	*salmon-orange crowded plagioclase hornblende monzonite porphyry, trachytic and equigranular phases*
	HICKMAN PLUTON
LThd	*equigranular, pink and grey, medium-grained hornblende monzonite and diorite*

LATE DEVONIAN

	FORREST KERR PLUTON
LDg	*pink biotite granodiorite to tonalite; medium to coarse grained, equigranular*
LDd	*hornblende diorite, quartz diorite; mainly equigranular, gneissic in places*
LDum	*coarse-grained gabbro, hornblendite, clinopyroxenite; associated with LDg*

SYMBOLS

Limit of mapping
Depositional contact (known, approximate, inferred)
Unconformity (known, approximate, inferred)
Intrusive contact (known, approximate, inferred)
Normal and strike slip faults
Fold axis trace (anticline, syncline)
So (tops known, unknown)
S1
S2
Flow layering
Dike
Fracture and joints
Veins
Axial plane
Fold axis
Bedding cleavage lineation
Crenulation lineation
Minor fault
Fossil locations (conodont, macrofossil, both)
Whole rock geochemistry sample
Assay sample
Geochronology sample
Minfile location (developed, showing)
Schaft Creek Deposit:
Approximate limit of >0.3% Cu

TABLE 1993-6-1: CONODONT SAMPLES

GSC Loc. Number	Sample Number	UTM Zone 9 East	UTM Zone 9 North	Strat Unit
C207959	92JDR1-7	388690	6348273	lJcg
C207960	92JDR1-14	389331	6348443	lPSc
C207961	92JDR3-8-4	387800	6354995	lPSc
C207962	92JDR4-3	388141	6353462	lJcg
C207951	92JLO4-56	389012	6350621	lJcg
C207952	92JLO11-131	389567	6362011	lPSc
C207953	92JLO11-134	389295	6362778	lPSc
C207954	92JLO18-196	383789	6369490	uCSc
C207955	92JLO19-206	385323	6372784	uCSc
C207957	92JLO20-215	384933	6369810	uCSc
C207956	92JLO22-226	384031	6366215	uCSc
C207958	92JLO26-251	380866	6354557	uTSsn

TABLE 1993-6-2: MACRO FAUNA COLLECTION FOR THE MESS LAKE MAP AREA (104G/07W).

GSC Loc. Number	Sample Number	UTM Zone 9 East	UTM Zone 9 North	Strat Unit	Fauna-Description		Age	Ref.
28948	-	390000	6351000	lTSsn	*Monotis Subcircularis*	brachiopod	Upper Norian (Late Triassic)	1
C207976	92JDR3-8-4	387800	6354995	lPSc	Fusulininds and brachiopods		Lower Permian	2
C207974	92JDR12-6	383780	6373338	uCSc	Horn coral		Upper Paleozoic	2
C207975	92JLO4-56	389012	6350621	lJcg	Coral fragments from limestone cobbles		Mid- Carboniferous and Triassic	2
C207963	92JLO7-91	390373	6352521	lCSc	Corals and foraminifera		Bashkirian (mid- Carboniferous)	2
C207964	92JLO7-93	390146	6352125	lCSt	Bivalves and (?) brachiopods		Indeterminate	2,3,4
C207965	92JLO11-131	389567	6362011	lPSc	Corals and brachiopods		Lower Permian, possibly mid- Carboniferous	2
C207966	92JLO11-134	389295	6362778	lPSc	*Productid*	brachiopod	Lower Permian	2
C207967	92JLO20-215	384933	6369810	uCSc	Possible fusulinids, tabulate coral		Paleozoic	2
C207968	92JLO22-226	384031	6366215	uCSc	Fusulinids		Late Late Carboniferous	5
C207970	92JLO22-229	384055	6364167	uCSc	Corals, poorly preserved		Carboniferous or Permian	2
C207971	92JLO26-250	380864	6354577	uTSsn	*Monotis Subcircularis*	brachiopod	Upper Norian (Late Triassic)	3
C207969	92JLO28-267	389650	6348800	lPSc	Fusulinids		Wolfcampian (Lower Permian)	2
C207973	92JLO28-269	389550	6346800	lPSc	Tabulate coral		Carboniferous to Permian	2

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1. Souther, J.G. (1972): Telegraph Map Sheet, Geological Survey of Canada, Paper 71-44
2. E. W. Bamber, personal communication (1992): Preliminary Fossil Identifications; Institute of Sedimentary and Petroleum Geology, G.S.C.
3. T. Tozer, personal communication (1992)
4. H.W. Tipper, personal communication (1992)
5. Lin Rui, personal communication (1992): Preliminary Fossil Identification; Institute of Sedimentology and Petroleum Geology, G.S.C.

TABLE 1993-6-3: ASSAY AND GEOCHEMICAL RESULTS FOR THE MESS LAKE MAP AREA (104G /07W).

MAP NO	EASTING	NORTHING	AU	AG	CU	PB	ZN	NI	MO	AS	SB	FE	DESCRIPTION
ANALYTICAL METHOD			FA	AAS	AAS	AAS	AAS	AAS	AAS	AAS-	AAS-H	AAS	
DETECTION LIMITS			5 ppb	0.5 ppm	2 ppm	4 ppm	2 ppm	2 ppm	3 ppm	1 ppm	0.5 ppm	5 ppm	
G 1	387133	6350504	5	5	1.17	9	14	2	5	4	1	5.24	tuff hosted ml stained ep + carb veins with cpy
G 2	387157	6350032	10	20	4.02	15	100	17	5	7	0.6	5.22	tuff hosted ml + az stained carb veins with tt + cpy
G 3	382315	6357809	5	19	3.69	11	59	51	5	20	0.7	4.56	ml stained fractures in andesite flows
G 4	385884	6350377	5	0.3	27	8	31	3	5	5	2	5.66	qtz stwk with disseminated specular hem
G 5	387353	6351521	155	165	1.07	17	0.18	20	9	0.10	0.66	8.19	ml stained tt veinlets with disseminated py
G 6	383371	6357114	5	0.4	45	16	130	6	5	23	3	3.85	disseminated py + hem and ep veins in felsic intrusion
G 7	385725	6371004	5	3	0.66	18	43	6	5	1	0.9	1.87	silicified fracture zone with disseminated cpy + py + tt
G 8	387573	6372498	5	37	0.17	262	260	4	5	31	450	2.67	ml stained qtz veining in augite-phyric basalt
G 9	387573	6372498	5	5	450	7	40	2	5	3	0.6	0.98	ep + carb altered basalt with traces of disseminated py

Abbreviations: qtz = quartz, carb = carbonate, py = pyrite, cpy = chalcopyrite, sph = sphalerite, po = pyrrhotite, mgnt = magnetite, ml = malachite, az = azurite, aspy = arsenopyrite, gl = galena, stwk = stockwork, alt = alteration, brcc = breccia, sil = silicification hem = hematite, ser = sericite, tt = tetrahedrite

ANALYTICAL PROCEDURES

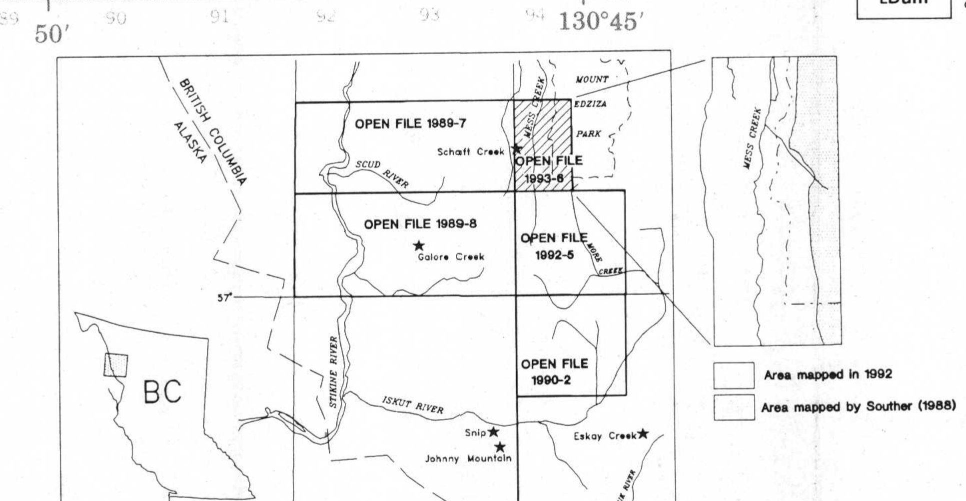
SAMPLE PREPARATION:
Samples are pulverized to approximately 200 mesh using tungsten carbide equipment.

TRACE ELEMENT ANALYSIS: Ag, Cu, Pb, Zn, As, Sb
Samples (usually 0.5 grams) are digested in Teflon beakers using a mixed acid attack which includes HF. A dilute dissolution of the residue is then diluted to a specific volume and the elements measured using atomic absorption spectroscopy. As and Sb were determined by atomic absorption using a hydride evolution method wherein the hydride (AsH_3 or SbH_3) is evolved, passing a heated quartz tube in the light path of an atomic absorption spectrometer. Background corrections were made for Pb, As and Sb.

TRACE ELEMENT ANALYSIS: Au
A 20 gram sample is concentrated into a silver bead by the classical fire assay method. The bead is dissolved by aqua regia and gold determined by graphite furnace atomic absorption spectroscopy.

TABLE 1993-6-4 MINERAL OCCURRENCES FOR THE MESS CREEK MAP AREA (104G/07W)

TYPE/ PROB. AGE	MINFILE 104G	NAME	HOST	COMMODITY	DESCRIPTION	REFERENCE
GOLD-COPPER PORPHYRY						
Late Triassic - Middle Jurassic ?	015	SCHAFT CREEK	uTSvp, uTSvt LTmz	Cu, Mo, Au, Ag	Disseminated and fracture-controlled chalcopyrite, molybdenite, gold and silver mineralization is related to a high-level intrusive complex of felsic to intermediate dike swarms and a breccia pipe. Mineralization is discordant to volcanic stratigraphy. Unclassified reserves of 910 million tonnes grading 0.3 % Cu, 0.03 % Mo, 0.113 g/t Au, and 0.992 g/t Ag.	Linder (1975), Fox et al. (1976), Melville et al. (1992)
Late Triassic ?	040, 041	RUN, MIX, RUN NORTH	uTSvp, LTmz	Cu, Au, Mo	Chalcopyrite, magnetite and pyrite disseminations and molybdenum on fracture selvages and in quartz veinlets cut crowded plagioclase porphyries and mafic volcanic rocks. Steep fracture and breccia zones control mineralization.	Gutrath (1971), Panteleyev (1973), Cloutier (1976)
Late Triassic ?	118	BB 57	uTSvp, LTpd	Cu	Trace amounts of disseminated chalcopyrite, magnetite, pyrite and bornite occur in fractured and sheared propylitic andesite, augite porphyritic diorite and monzodiorite.	House (1971)
Late Triassic ?	119	BB 38	uTSvt, uTSv	Cu	Trace amounts of disseminated chalcopyrite, magnetite and pyrite occur in fractured and sheared andesite.	House (1971)
GOLD-SILVER-QUARTZ VEINS						
Jurassic	057	COT & BULL	uCSc	Ag, Cu, Au	Disseminated blebs of tetrahedrite, chalcopyrite and pyrite occupy fractures and breccia zones in a bedding-parallel, east-trending fault cutting limestone. Mineralization either predates or is syngenetic with a north-trending basalt dike swarm.	Betmanis (1981), Hewgill and Walton (1986)



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Souther, J.G. (1988): Mount Edziza Volcanic Complex, British Columbia; *Geological Survey of Canada*, Map 1623A.
Fox, P.E. (1979): Liard Project, Schaft Creek, British Columbia, Summary Report 1978, for Hecla Mining Company of Canada Limited.