GEOLOGY OF THE BEARSKIN (MUDDY) LAKE, TATSAMENIE LAKE DISTRICT, NORTHWESTERN B.C.;

By Jim L. Oliver

SHEET A: NORTHEASTERN QUADRANT

The map sheet extends across the extreme northeastern portions of the project area. Much of the rock underlying this portion of the map area is an upper Triassic granodiorite which has been U-Pb dated at 218 ± 3.6 Ma (Oliver and Gabites, 1993). Isolated volcanic roof pendants are also present. Additional geological highlights include:

1. A porphyry copper-molybdenum occurrence has been mapped across the eastern portions of the map area. Preliminary unpublished zircon age data for this intrusion indicates that it is upper Triassic in age and about 2.0 Ma years younger than the surrounding granodiorite batholith. Copper-molybdenum mineralization in this zone occurs as classical porphyry style fracture controlled veinlets and disseminations. This mineralized intrusion is tentatively named the Icy Pass Porphyry.

2. The upper Triassic hornblende diorite which hosts porphyry copper-molybdenum mineralization is cut by a younger quartz-feldspar and biotite porphyry intrusion. Semi-massive stibnite and gold mineralization is associated with this younger intrusive phase. These younger porphyritic intrusions may be correlated with the upper Cretaceous to Tertiary Sloko intrusions.

3. Contact relationships between the large dioritic to gabbroic intrusive body, located in the extreme northwestern portions of the map area, and the enclosing granodiortie are poorly constrained. This rock may be simply be a more mafic phase of the larger granodiorite body.

SHEET B: NORTHWESTERN QUADRANT

This map sheet covers the northwestern portions of the map area. The following points are relevant to the interpretation of the lithologic and structural relations shown on this map:

- 1. In the extreme southwestern corner of the map Pennsylvanian to Permian age rocks are exposed in the core of a large regional antiform, the Tatsamenie antiform. Felsic volcanics rocks, exposed at the south end of Tatsamenie Lake, have been dated at 307 ± 2Ma (Oliver and Gabites, 1993). The older felsic rock package structurally overlies younger Permian age carbonates. The contact is a south verging thrust.
- 2. Felsic rocks in this area have an unusual map pattern. Rapid changes in the orientation of early linear rock fabrics and the development of an unusual north trending lobe, a weak Type 2 interference pattern, clearly indicates that these rocks have been deformed by a second fold structure. These younger folds typically trend north-northeast, have moderate northeast directed plunges and are upright.
- 3. An unconformable contact relation is shown in the west central portions of the map area. Highly foliated and strongly actinolite porphyroblastic pre-middle Triassic rocks are overlain by non-foliated, weakly deformed volcanic and sedimentary rocks. These rocks are likely correlates of the upper Triassic Stuhuni group.
- 4. A large zone of hydrothermal alteration, approximately 14 square kilometres in extent outcrops from the central to the northeastern portions of the map area. The rock modifier "ak" (ankerite) defines in part the distribution of iron carbonate. This mineral is the principle alteration product and forms a bright orange-buff weathering zone. Green micas, secondary silica, secondary potassic feldspars and pyrite are also important mineral assemblages. The alteration zone does not appear to track the contact of the main granodiorite body exposed on the northern portions of the map area. Rock alteration is likely related to the emplacement of several smaller diorite to granodiorite stocks and the presence of several large extensional faults which are located in this area. One of these large faults, which strikes east-west and dips subvertically, is enveloped by an alteration zone up to 50 metres in width. For up to 100 metres on either side of this fault drag folds deform the rock and rotate supracrustal rocks into this fault zone. Fracture controlled copper mineralization may be identified at several locations within this alteration zone and limited data also suggests that a few of the smaller stocks may host porphyry style mineralization.

SHEET C: CENTRAL QUADRANT

Most of the volcanic rocks shown on this map are strongly porphyroblastic. Actinolite, biotite, albite and sometimes hornblende are formed from a mafic volcanic protolith. This metamorphic assemblage is not related to contact effects along the western margin of the granodiorite batholith. Most of these rocks have two cleavages. The younger of these is best identified petrographically and is present as a weak crenulation cleavage. Some rotational fabrics, and pressure shadows are associated with larger porphyroblasts. These are not interpreted as S/C fabrics.

Other features of interest on this map sheet include:

- 1. Ultramafic bodies are exposed in four areas on this map. Although no isotopic age constraints may be imposed on these rocks, they are likely younger than the upper-Triassic. These rocks. are clinopyroxene - magnetite Alaskan style intrusions. Near major fault zones they are extensively serpentinized and carbonitized. These rocks were initially interpreted by Oliver and Hodgson (1990) as part of a poorly preserved and dismembered ophiolite. This interpretation has been revised based on updated petrographic data, on the development of a broader geological map base and a revision in the interpretation of field relationships.
- 2. The large north trending fault zone which traverse

the central portions of the map area is a continuation of the Bear Fault system which hosts gold mineralization at the Golden Bear deposit, 10 kilometres to the south. This structure is not well exposed on the north side of Tatsamenie Lake. Based on offset stratigraphy, the last movement across this fault is dextral and rotational.

- 3. Contact relations for the intravolcanic limestone unit shown on the west central portions of this map are weakly constrained and have been identified at only three geological stations. This unit does not appear to cross the north trending Bear Fault defined in the central portions of the map area.
- 4. The extreme western contact of the isolated granodiorite body in the north-central portions of the map area is weakly constrained by available field relations. Offsets of this rock mass across the northern extension of the Bear fault have not been determined.
- 5. A northeast trending synform-antiform couple is shown on the extreme southern edge of this map area. The antiform is the northern extension of the Sam Creek antiform. Its position is well constrained by both lithology and rock fabric orientations. The position of the synform is defined by the rapid rotation of early linear rock fabrics across the axial surface of the younger synform.

SHEET D: SOUTHERN QUADRANT.

Several complex geological relations are shown on this map. The present contact patterns have been strongly influenced by a minimum of two folding events and by both contractional and wrench faults. Significant geological and structural features on this map include:

- 1. The large mass of Permian carbonate rocks shown in the central portions of the map have been deformed into a large north trending antiform, the Tatsamenie antiform. This fold has a south directed plunge in the southern portions of the map area. To the north, plunges reverse. This reversal is caused by the interaction of a younger northeast trending antiform, the Sam Creek antiform with the older Tatsamenie antiform. The tear drop shaped map pattern of the Permian carbonate rocks is interpreted as a map scale Type 1 to 2 interference pattern.
- 2. The northern contact of the Permian succession with the overlying supracrustal rocks occurs across a south verging thrust. This contraction fault places an older felsic volcanic rock package dated at 301.8 +2/-4 Ma (Oliver and Gabites, 1993) on top of Permian carbonate rocks. These felsic rocks are correlated with the felsic succession exposed on the north shore of Tatsamenie Lake.
- 3. The Sam Creek antiform deforms early rock fabrics and lithology into a northeast plunging antiform. It does not deform the north trending Bear Fault system. K-Ar dates on sericite, formed in association with this fault, suggest that rocks are hydrothermally altered between 205 ± 7 Ma to 179 ± 6 Ma (Schroeter, 1987). The formation of the antiform predates the activation of this fault.
- 4. The Golden Bear deposit, located just north of Bearskin (Muddy) Lake, is bounded to the east by a non-mineralized gabbro and to the west by Permian carbonates. Mineralization forms in dilatant fault zones localized to carbonate-chert-and sulphidized mafic volcanic contacts. Prior to the initiation of mining, the deposit was estimated to contain 625 000 tonnes of 18.63 grams per tonne gold (Oliver and Hodgson, 1989).
- 5. Immediately west of the Golden Bear deposit, map scale second phase folds and interference structures are developed. These structures are believed to have formed at the same time as the larger Sam Creek antiform.
- 6. Several splays or strands of the Bear Fault are shown on this map. Many of these are associated with zones of strong iron carbonate development, sericite, pyrite and green micas or clays. Some of these structural zones, notably the Fleece Zone located 2.0 km's north of the Golden Bear mine, are also mineralized. The orientation of second order fault splays and the morphology of mineralized zones suggests that at the time of mineralization movement along the Bear Fault system was sinistral and reverse.

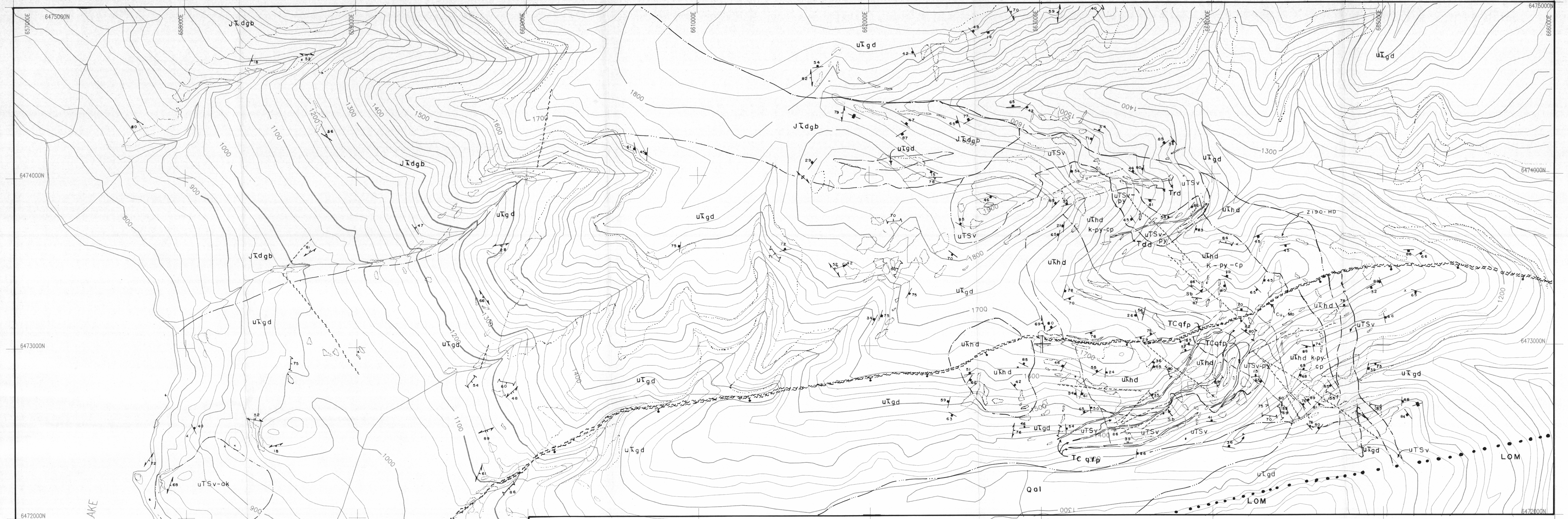
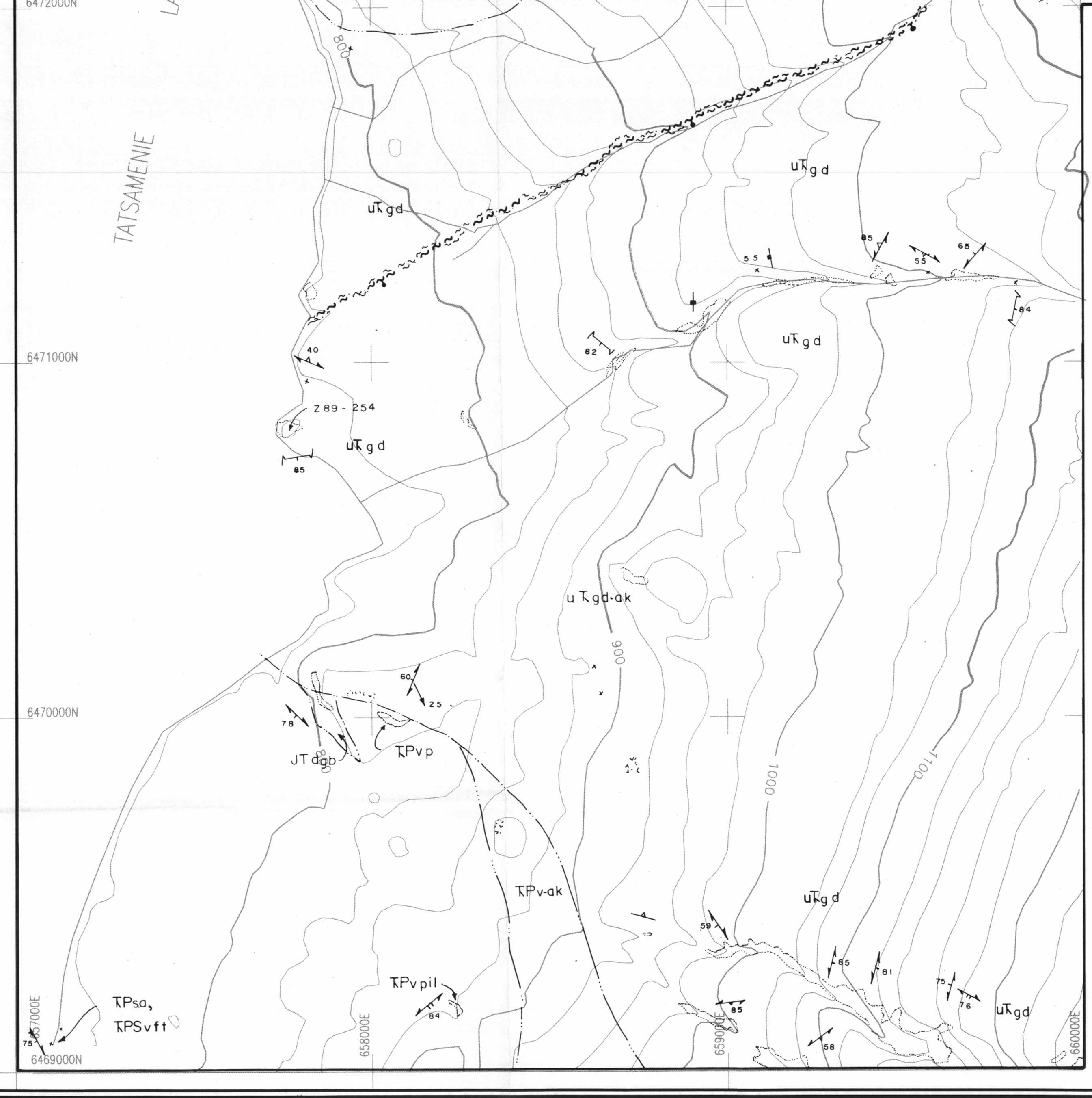
REFERENCES

Oliver, J.L. and Gabites, J. (1993): Geochronology of Rocks and Polyphase Deformation, Bearskin (Muddy) and Tatsamenie Lakes District, Northwestern, British Columbia (104K/8,1); *in* Geological Fieldwork 1992, Grant, B. and Newell, J.M., Editors, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1993-1, in Press.

Oliver, J.L. and Hodgson, C.J. (1989): Geology and Mineralization, Bearskin (Muddy) lake and Tatsamenie Lake District (South Half), Northwestern British Columbia (104K); *in* Geological Fieldwork 1988, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1989-1 pages 443 - 453.

Oliver, J.L. and Hodgson, C.J. (1990): Geology and Mineralization, Tatsamenie Lake District, Northwestern British Columbia (104K); *in* Geological Fieldwork 1989, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1989-1, pages 443 - 453.

Schroeter, T.G. (1987): Golden Bear Project (104K/1); *in* Geological Fieldwork 1986, *B.C. Ministry of Energy, Mines and Petroleum Resources*, Paper 1987-1, pages 103-110.

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GEOLOGY OF THE BEARSKIN (MUDDY) LAKE, TATSAMENIE LAKE DISTRICT, NORTHWESTERN B. C.

NTS 104K/1 AND 104K/5

By J.L. Oliver

Scale 1:10 000

0 500 1000

metres

LEGEND

STRATIFIED ROCKS

QUATERNARY

Qal	Unconsolidated sediments, glacialfluvial deposits.

MIOCENE(?) - RECENT(?)

Mob	Olivine basalt, dark brown, amygdaloidal olivine basaltic flows. Level Mountain equivalent(?).

UPPER TO MIDDLE TRIASSIC

STUHINI GROUP

uTSv	Undifferentiated volcanic rocks.
uTSva	Mafic ash falls, lesser interbedded epiclastics.
uTSvp	Mafic lapilli pyroclastics, lesser plagioclase crystal tuffs (uTSvpc) weak hematitic foliation parallel surfaces.
uTSvg	Mafic agglomerates, very coarse grained monolithologic fragmentals.
uTSvpx	Pyroxene (augite) porphyritic flows and lesser fragmentals, mafic composition.
uTSvpil	Pillowed flow sequences, of mafic composition.
uTSvfp	Feldspar porphyritic mafic flows, bladed to megacrystic plagioclase porphyritic flows.
uTSvh	Hornfelsed mafic volcanics, highly re-crystalized amphibolitic volcanic rocks localized to major intrusive-volcanic contacts.
uTSs	Undifferentiated sedimentary rocks.
uTSscw	Orange-buff calcareous, poorly sorted, medium to coarse grained lithic wackes with lesser light grey limestone interbeds (uTSsl).
uTSsa	Argillite and interbedded siltstone, argillite and interbedded volcaniclastics (uTSsavc).
uTSsil	Intravolcanic limestone interbeds.

TRIASSIC TO PERMIAN (ROCKS OF POORLY CONSTRAINED AGE)

TPv	Undifferentiated volcanic rocks and rocks of volcanic origin.
TPva	Mafic ash falls, lesser interbedded epiclastics.
TPpil	Pillowed flow sequences, mafic in composition.
TPvpx	Pyroxene porphyritic flows and lesser fragmentals.
TPvFt	Quartz eye porphyritic felsic flows and lesser tuffs..
TPvp	Mafic lapilli pyroclastics.
TPvFp	Feldspar porphyritic flows of mafic composition.
TPs	Undifferentiated sedimentary rocks.
TPsil	Intravolcanic limestone interbeds.
TPsavc	Argillites and volcaniclastic rocks; may contain re-worked crystal tuffs.
TPsp	Phyllites of sedimentary origin.

LOWER TRIASSIC TO PERMIAN

T Pv	Undifferentiated volcanic rocks and rocks of volcanic origin.
lT Pvap	Highly strained, porphyroblastic (actinolite) mafic pyroclastics with lesser flows, (lTPvatf) locally pillowed (lTPvpil) and discontinuous intravolcanic limestone beds (lTPvl).
lT Ps	Undifferentiated sedimentary rocks.

PERMIAN

STIKINE ASSEMBLAGE

PSs	Undifferentiated foliated sedimentary rocks.
PSach	Argillaceous chert, thinly bedded narrow, discontinuous black chert lenses.
PSch	White chert, massive poorly bedded white chert, may contain minor irregular, discontinuous dolomitic interbeds.
PSl	Undifferentiated limestones and chemical sediments.
PScag	Calcareous argillite, fine grained black clastics, with lesser calcareous interbeds.
PSsd	Siliceous dolomites, light grey to buff dolomitic limestone containing amorphous dark blue - grey to black cherty inclusions..
PSbscd	Crinoidal debris stones and dolostones, buff weathering, thin bedded crinoid rich debris stones and iron rich limestones/dolostones, may contain fine grained phyllitic interbeds.
PSgl	Limestone, massive, thick bedded, light grey limestone.

PENNSYLVANIAN

Pv	Undifferentiated volcanic rocks.
Pvit	Fine grained, light buff to cream, intermediate ash tuffs.
PvFt	Fine grained. light grey to pink-cream rhyolitic ash and dust tuffs, strongly re-crystallized and highly strained.
Pvsp	Siliceous phyllites, fine grained, moderately bedded buff-weathering siliceous phyllites, of volcanic origin. May contain weaker chloritic foliation surfaces.
Ps	Undifferentiated sedimentary rocks.
Psl	Light grey bioclastic limestones, may contain dark grey, fine grained black clastic lamella.

INTRUSIVE ROCKS

TERTIARY

Tdd	Diabase dike, fine grained dark green black plagioclase hornblende dikes.
Trd	Rhyolite dikes, cream weathering, aphanitic to fine grained quartz eye, felsic dikes.

EARLY TERTIARY AND CRETACEOUS

TCqfp	Quartz-feldspar-porphyritic dikes, light grey, strongly feldspar and quartz porphyritic dikes with lesser biotite.
Tchd	Hornblende diorite, quartz diorite, non-foliated medium, grained hornblende diorite, may vary through to melano-diorites and gabbro's (TCdg).

JURASSIC(?)

Jgb	Gabbro, massive, green black, medium grained, non-foliated gabbros.
Jum	Ultramafic, magnetite, clinopyroxene, lesser olivine and biotite, Alaskan type intrusive bodies, heavily serpentinized (Jums) along major fault zones.
Japg	Albitic to pegmatitic granitic dikes, orange weathering, blocky sodium and potassium feldspar rich dikes.

UPPER TRIASSIC

uT gd	Foliated granodiorite, pale cream buff weathering, medium to coarse grained granodiorites. Intensity of foliation highly variable, primary igneous compositional layers sometimes noted.

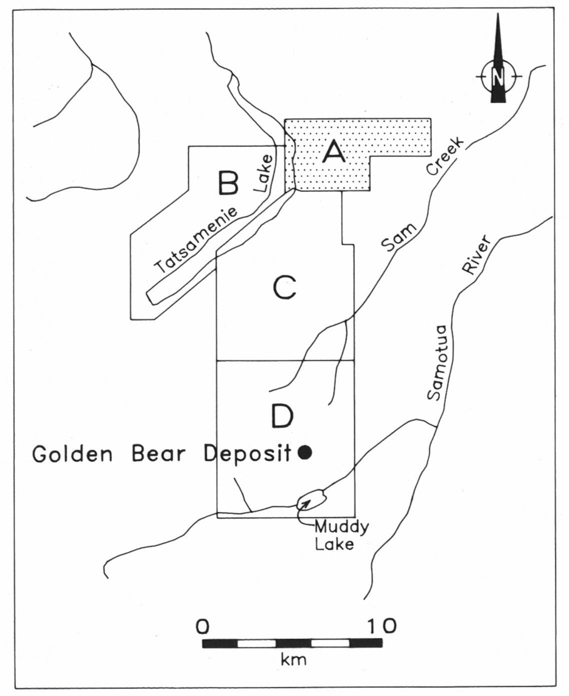
ALTERATION MODIFIERS

ak	ankerite	s	serpentine
ic-gm	iron carbonate, ± green micas	stb	stibnite
chl	chlorite	cu	copper
se	sericite, ankerite, lesser pyrite	mo	molybdenum
qtz	silica injection	au	gold
py	pyrite		

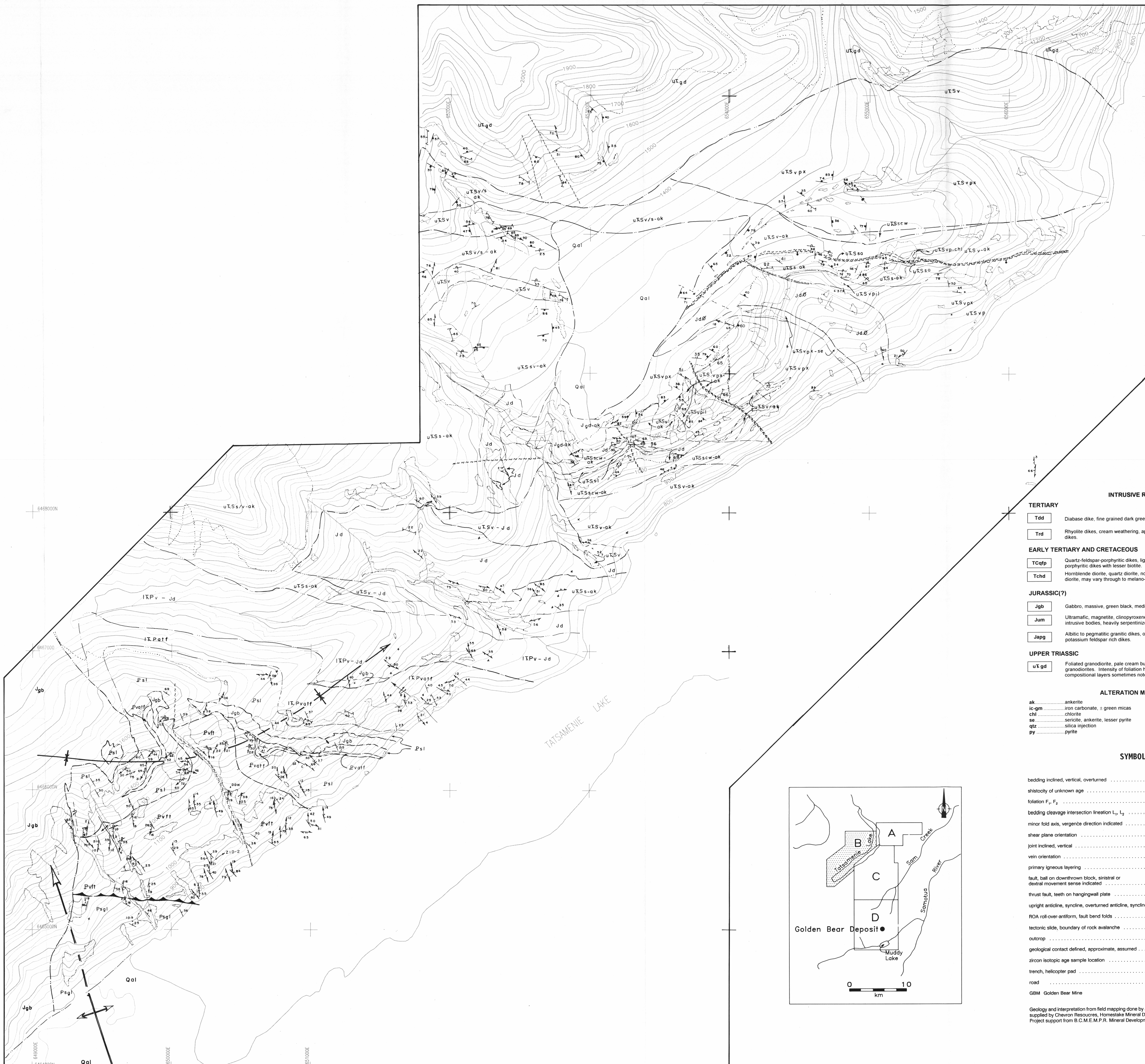
SYMBOLS

- bedding inclined, vertical, overturned
- shistocity of unknown age
- foliation F_1, F_2
- bedding cleavage intersection lineation L_1, L_2
- minor fold axis, vergence direction indicated
- shear plane orientation
- joint inclined, vertical
- vein orientation
- primary igneous layering
- fault, ball on downthrown block, sinistral or dextral movement sense indicated
- thrust fault, teeth on hangingwall plate
- upright anticline, syncline, overturned anticline, syncline
- ROA roll-over-antiform, fault bend folds
- tectonic slide, boundary of rock avalanche ... RAV
- outcrop
- geological contact defined, approximate, assumed
- zircon isotopic age sample location ... ZID-2
- trench, helicopter pad
- road

GBM Golden Bear Mine



Geology and interpretation from field mapping done by J. L. Oliver during 1988, 1989, 1990. Base maps supplied by Chevron Resoucres, Homestake Mineral Development Co., and Waterford Resources Inc. Project support from B.C.M.E.M.P.R. Mineral Development Research Grants during 1988, 1989, 1991.



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GEOLOGY OF THE BEARSKIN (MUDDY) LAKE, TATSAMENIE LAKE DISTRICT, NORTHWESTERN B. C.

NTS 104K/1 AND 104K/5

By J.L. Oliver

Scale 1:10 000

0 500 1000

metres

LEGEND

STRATIFIED ROCKS

QUATERNARY

Qal	Unconsolidated sediments, glacialfluvial deposits.

MIOCENE(?) - RECENT(?)

Mob	Olivine basalt, dark brown, amygdaloidal olivine basaltic flows. Level Mountain equivalent(?).

UPPER TO MIDDLE TRIASSIC

STUHINI GROUP

uTSv	Undifferentiated volcanic rocks.
uTSva	Mafic ash falls, lesser interbedded epiclastics.
uTSvp	Mafic lapilli pyroclastics, lesser plagioclase crystal tuffs (uTSvpc) weak hematitic foliation parallel surfaces.
uTSvg	Mafic agglomerates, very coarse grained monolithologic fragmentals.
uTSvpx	Pyroxene (augite) porphyritic flows and lesser fragmentals, mafic composition.
uTSvpil	Pillowed flow sequences, of mafic composition.
uTSvfp	Feldspar porphyritic mafic flows, bladed to megacrystic plagioclase porphyritic flows.
uTSvh	Hornfelsed mafic volcanics, highly re-crystalized amphibolitic volcanic rocks localized to major intrusive-volcanic contacts.
uTSs	Undifferentiated sedimentary rocks.
uTSscw	Orange-buff calcareous, poorly sorted, medium to coarse grained lithic wackes with lesser light grey limestone interbeds (uTSsl).
uTSsa	Argillite and interbedded siltstone, argillite and interbedded volcaniclastics (uTSsavc).
uTSsil	Intravolcanic limestone interbeds.

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TPs	Undifferentiated sedimentary rocks.
TPsil	Intravolcanic limestone interbeds.
TPsavc	Argillites and volcaniclastic rocks; may contain re-worked crystal tuffs.
TPsp	Phyllites of sedimentary origin.

LOWER TRIASSIC TO PERMIAN

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lT Ps	Undifferentiated sedimentary rocks.

PERMIAN

STIKINE ASSEMBLAGE

PSs	Undifferentiated foliated sedimentary rocks.
PSach	Argillaceous chert, thinly bedded narrow, discontinuous black chert lenses.
PSch	White chert, massive poorly bedded white chert, may contain minor irregular, discontinuous dolomitic interbeds.
PSl	Undifferentiated limestones and chemical sediments.
PScag	Calcareous argillite, fine grained black clastics, with lesser calcareous interbeds.
PSsd	Siliceous dolomites, light grey to buff dolomitic limestone containing amorphous dark blue - grey to black cherty inclusions..
PSbscd	Crinoidal debris stones and dolostones, buff weathering, thin bedded crinoid rich debris stones and iron rich limestones/dolostones, may contain fine grained phyllitic interbeds.
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chl	chlorite	cu	copper
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qtz	silica injection	au	gold
py	pyrite		

SYMBOLS

bedding inclined, vertical, overturned 58

shistocity of unknown age 62

foliation F_1, F_2 .... 71 53

bedding cleavage intersection lineation L_1, L_2 .... 15 26

minor fold axis, vergence direction indicated 32

shear plane orientation 81

joint inclined, vertical 16

vein orientation 72

primary igneous layering 48

fault, ball on downthrown block, sinistral or dextral movement sense indicated 75

thrust fault, teeth on hangingwall plate ....

upright anticline, syncline, overturned anticline, syncline ....

ROA roll-over-antiform, fault bend folds .... ROA

tectonic slide, boundary of rock avalanche .... RAV

outcrop ....

geological contact defined, approximate, assumed ....

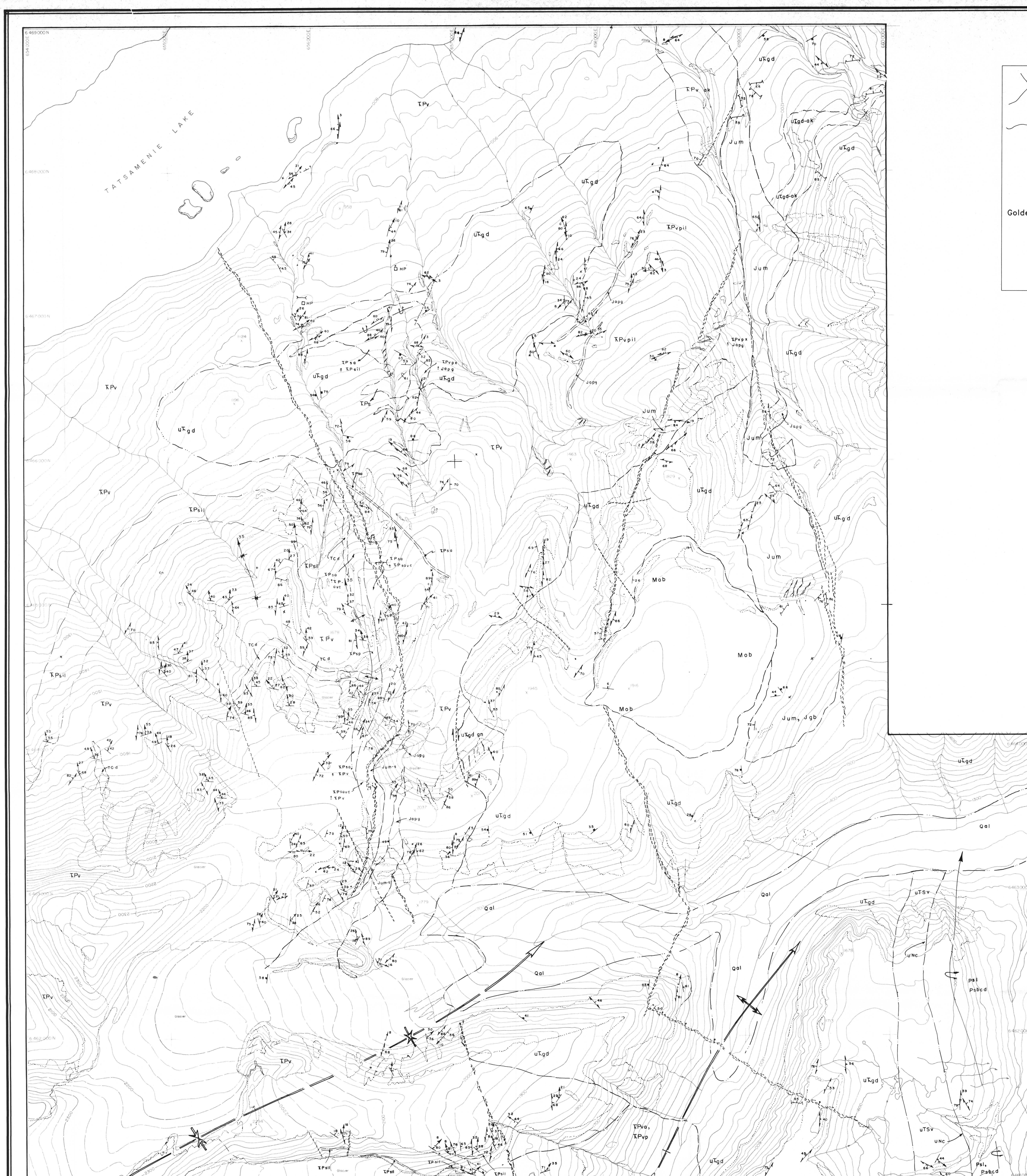
zircon isotopic age sample location ZID-2

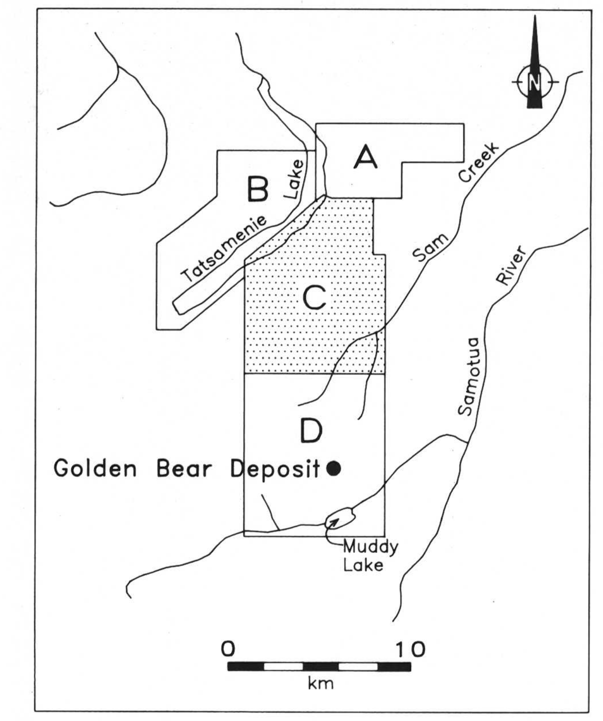
trench, helicopter pad ....

road ....

GBM Golden Bear Mine

Geology and interpretation from field mapping done by J. L. Oliver during 1988, 1989, 1990. Base maps supplied by Chevron Resoucres, Homestake Mineral Development Co., and Waterford Resources Inc. Project support from B.C.M.E.M.P.R. Mineral Development Research Grants during 1988, 1989, 1991.





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(Sheet 3 of 4)

GEOLOGY OF THE BEARSKIN (MUDDY) LAKE, TATSAMENIE LAKE DISTRICT, NORTHWESTERN B. C.

NTS 104K/1 AND 104K/5

By J.L. Oliver

Scale 1:10 000

0 500 1000
metres

LEGEND

STRATIFIED ROCKS

QUATERNARY

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UPPER TO MIDDLE TRIASSIC

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uTrSvp	Mafic lapilli pyroclastics, lesser plagioclase crystal tuffs (uTrSvpc) weak hematitic foliation parallel surfaces.
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TRIASSIC TO PERMIAN (ROCKS OF POORLY CONSTRAINED AGE)

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LOWER TRIASSIC TO PERMIAN

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lTr Ps	Undifferentiated sedimentary rocks.

PERMIAN

STIKINE ASSEMBLAGE

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PScag	Calcareous argillite, fine grained black clastics, with lesser calcareous interbeds.
PSsd	Siliceous dolomites, light grey to buff dolomitic limestone containing amorphous dark blue - grey to black cherty inclusions..
PSbscd	Crinoidal debris stones and dolostones, buff weathering, thin bedded crinoid rich debris stones and iron rich limestones/dolostones, may contain fine grained phyllitic interbeds.
PSgl	Limestone, massive, thick bedded, light grey limestone.

PENNSYLVANIAN

Pv	Undifferentiated volcanic rocks.
Pvit	Fine grained, light buff to cream, intermediate ash tuffs.
PvFt	Fine grained. light grey to pink-cream rhyolitic ash and dust tuffs, strongly re-crystallized and highly strained.
Pvsp	Siliceous phyllites, fine grained, moderately bedded buff-weathering siliceous phyllites, of volcanic origin. May contain weaker chloritic foliation surfaces.
Ps	Undifferentiated sedimentary rocks.
Psl	Light grey bioclastic limestones, may contain dark grey, fine grained black clastic lamella.

INTRUSIVE ROCKS

TERTIARY

Tdd	Diabase dike, fine grained dark green black plagioclase hornblende dikes.
Trd	Rhyolite dikes, cream weathering, aphanitic to fine grained quartz eye, felsic dikes.

EARLY TERTIARY AND CRETACEOUS

TCqfp	Quartz-feldspar-porphyritic dikes, light grey, strongly feldspar and quartz porphyritic dikes with lesser biotite.
Tchd	Hornblende diorite, quartz diorite, non-foliated medium, grained hornblende diorite, may vary through to melano-diorites and gabbro's (TCdg).

JURASSIC(?)

Jgb	Gabbro, massive, green black, medium grained, non-foliated gabbros.
Jum	Ultramafic, magnetite, clinopyroxene, lesser olivine and biotite, Alaskan type intrusive bodies, heavily serpentinized (Jums) along major fault zones.
Japg	Albitic to pegmatitic granitic dikes, orange weathering, blocky sodium and potassium feldspar rich dikes.

UPPER TRIASSIC

uTr gd	Foliated granodiorite, pale cream buff weathering, medium to coarse grained granodiorites. Intensity of foliation highly variable, primary igneous compositional layers sometimes noted.

ALTERATION MODIFIERS

ak .... ankerite
ic-gm .... iron carbonate, ± green micas
chl .... chlorite
se .... sericite, ankerite, lesser pyrite
qtz .... silica injection
py .... pyrite
s .... serpentine
stb .... stibnite
cu .... copper
mo .... molybdenum
au .... gold

SYMBOLS

bedding inclined, vertical, overturned
shistocity of unknown age
foliation F_1, F_2
bedding cleavage intersection lineation L_1, L_2
minor fold axis, vergence direction indicated
shear plane orientation
joint inclined, vertical
vein orientation
primary igneous layering
fault, ball on downthrown block, sinistral or dextral movement sense indicated
thrust fault, teeth on hangingwall plate
upright anticline, syncline, overturned anticline, syncline
ROA roll-over-antiform, fault bend folds
tectonic slide, boundary of rock avalanche .... RAV
outcrop
geological contact defined, approximate, assumed
zircon isotopic age sample location ZID-2
trench, helicopter pad
road
GBM Golden Bear Mine

Geology and interpretation from field mapping done by J. L. Oliver during 1988, 1989, 1990. Base maps supplied by Chevron Resoucres, Homestake Mineral Development Co., and Waterford Resources Inc. Project support from B.C.M.E.M.P.R. Mineral Development Research Grants during 1988, 1989, 1991.

Ministry of Energy, Mines and Petroleum Resources

Geological Survey Branch

OPEN FILE 1993-11

(Sheet 4 of 4)

GEOLOGY OF THE BEARSKIN (MUDDY) LAKE, TATSAMENIE LAKE DISTRICT, NORTHWESTERN B. C.

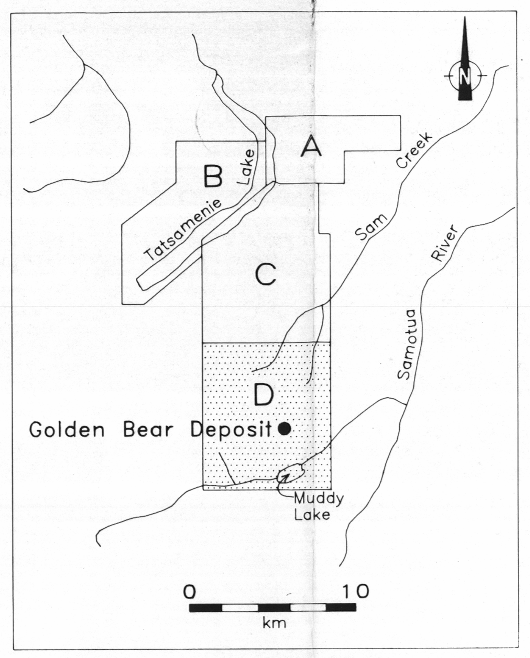
NTS 104K/1 AND 104K/5

By J.L. Oliver

Scale 1:10 000

0 500 1000

metres



LEGEND

STRATIFIED ROCKS

QUATERNARY

Qal	Unconsolidated sediments, glacialfluvial deposits.

MIOCENE(?) - RECENT(?)

Mob	Olivine basalt, dark brown, amygdaloidal olivine basaltic flows. Level Mountain equivalent(?).

UPPER TO MIDDLE TRIASSIC
STUHINI GROUP

uTRSv	Undifferentiated volcanic rocks.
uTRSva	Mafic ash falls, lesser interbedded epiclastics.
uTRSvp	Mafic lapilli pyroclastics, lesser plagioclase crystal tuffs (uTRSvpc) weak hematitic foliation parallel surfaces.
uTRSvg	Mafic agglomerates, very coarse grained monolithologic fragmentals.
uTRSvpx	Pyroxene (augite) porphyritic flows and lesser fragmentals, mafic composition.
uTRSvpil	Pillowed flow sequences, of mafic composition.
uTRSvfp	Feldspar porphyritic mafic flows, bladed to megacrystic plagioclase porphyritic flows.
uTRSvh	Hornfelsed mafic volcanics, highly re-crystalized amphibolitic volcanic rocks localized to major intrusive-volcanic contacts.
uTRSs	Undifferentiated sedimentary rocks.
uTRSscw	Orange-buff calcareous, poorly sorted, medium to coarse grained lithic wackes with lesser light grey limestone interbeds (uTRSsl).
uTRSsa	Argillite and interbedded siltstone, argillite and interbedded volcaniclastics (uTRSsavc).
uTRSsil	Intravolcanic limestone interbeds.

TRIASSIC TO PERMIAN (ROCKS OF POORLY CONSTRAINED AGE)

TRPv	Undifferentiated volcanic rocks and rocks of volcanic origin.
TRPva	Mafic ash falls, lesser interbedded epiclastics.
TRPpil	Pillowed flow sequences, mafic in composition.
TRPvpx	Pyroxene porphyritic flows and lesser fragmentals.
TRPvFt	Quartz eye porphyritic felsic flows and lesser tuffs..
TRPvp	Mafic lapilli pyroclastics.
TRPvFp	Feldspar porphyritic flows of mafic composition.
TRPs	Undifferentiated sedimentary rocks.
TRPsil	Intravolcanic limestone interbeds.
TRPsavc	Argillites and volcaniclastic rocks; may contain re-worked crystal tuffs.
TRPsp	Phyllites of sedimentary origin.

LOWER TRIASSIC TO PERMIAN

TR Pv	Undifferentiated volcanic rocks and rocks of volcanic origin.
lTR Pvap	Highly strained, porphyroblastic (actinolite) mafic pyroclastics with lesser flows, (lTPvatf) locally pillowed (lTPvpil) and discontinuous intravolcanic limestone beds (lTPvl).
lTR Ps	Undifferentiated sedimentary rocks.

PERMIAN
STIKINE ASSEMBLAGE

PSs	Undifferentiated foliated sedimentary rocks.
PSach	Argillaceous chert, thinly bedded narrow, discontinuous black chert lenses.
PSch	White chert, massive poorly bedded white chert, may contain minor irregular, discontinuous dolomitic interbeds.
PSl	Undifferentiated limestones and chemical sediments.
PScag	Calcareous argillite, fine grained black clastics, with lesser calcareous interbeds.
PSsd	Siliceous dolomites, light grey to buff dolomitic limestone containing amorphous dark blue - grey to black cherty inclusions..
PSbscd	Crinoidal debris stones and dolostones, buff weathering, thin bedded crinoid rich debris stones and iron rich limestones/dolostones, may contain fine grained phyllitic interbeds.
PSgl	Limestone, massive, thick bedded, light grey limestone.

PENNSYLVANIAN

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UPPER TRIASSIC

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ALTERATION MODIFIERS

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ic-gm	iron carbonate, ± green micas	stb	stibnite
chl	chlorite	cu	copper
se	sericite, ankerite, lesser pyrite	mo	molybdenum
qtz	silica injection	au	gold
py	pyrite		

SYMBOLS

bedding inclined, vertical, overturned 58
shistocity of unknown age 62
foliation F_1, F_2 .... 71 53
bedding cleavage intersection lineation L_1, L_2 .... 15 26
minor fold axis, vergence direction indicated 32
shear plane orientation 81
joint inclined, vertical 16
vein orientation 72
primary igneous layering 48
fault, ball on downthrown block, sinistral or dextral movement sense indicated 75
thrust fault, teeth on hangingwall plate ....
upright anticline, syncline, overturned anticline, syncline ....
ROA roll-over-antiform, fault bend folds .... ROA
tectonic slide, boundary of rock avalanche .... RAV
outcrop ....
geological contact defined, approximate, assumed ....
zircon isotopic age sample location ZID-2
trench, helicopter pad ....
road ....
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