Box 13

C.M.H. Jennings.

GEOLOGICAL MAPPING & INTERPRETATION OF THE REGIONAL SETTING OF THE ZAP CLAIMS

ALBERT CREEK AREA, B.C.

PN 079 NTS 104P/13E Liard M.D.

B.W. Downing Report #29-079-81

CLAIMS (ALBERT CREEK) Geological 104-P-13
Mapping & Interpretations of the Regional B.C.
Setting of the Zap Claims. Report #29-079-81
by: B. Downing April 1982.

6415 - 64th Street, Delta, B.C.

INTER-OFFICE MEMORANDUM

DATE: May 10, 1982

TO: C.M.H. Jennings

COPIES TO: H.R. Stockford, B.W. Downing

FROM: J.B. Gammon

SUBJECT: REPORT NO. 29-079-81, ALBERT CREEK GEOLOGY

Please find attached Downing's summary of the geology of the Albert Creek area. Emphasis on this property has shifted from the search for a a Keno type silver vein, prompted by the initial, high, silver silt anomaly, to the investigation of the possibilities of shale hosted Pb/Zn mineralization. No direct encouragment has been obtained for the latter possibility, however as Downing's summary of the regional geological environment underlines, this region has many of the characteristics favourable for shale hosted deposits. A regional compilation of data related to such "sedex" deposits is currently underway.

J.B. Gammon

GEOLOGICAL MAPPING AND INTERPRETATION OF THE REGIONAL SETTING OF THE ZAP CLAIMS, ALBERT CREEK AREA, B.C.

PN 079

NTS 104P/13E LIARD M.D.

LATITUDE 59° 54'N LONGITUDE 129° 33'W

April, 1982 B. W. Downing

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GEOLOGICAL REPORT, ALBERT CREEK AREA

1. SUMMARY

The Albert Creek Property is located on the western edge of the Selwyn Basin, a large tectonostratigraphic trough hosting several large shale-hosted or sedimentary-exhalative (sedex) zinc, lead and silver deposits.

The geology and subsequent interpretation of Albert Creek is not fully understood owing to a lack of outcrop in a well glaciated area. The claims cover a favourable Upper Devonian shale horizon, similar to the black clastic group at the Gataga Camp - Driftpile, Cirque deposits . The same horizon is evident at the Midway Property of Amax, approximately 40 km west -northwest of Albert Creek. Tectonically, the map -area occurs on the edge of a carbonate platform, the shales possibly being deposited in a sub-basin. The dominant structural-stratigraphic trend is northwest-southeast truncating an older (secondary) northeast-southwest trend. The present structural configuration implies that the property is within a "graben structure".

Detail mapping indicates that shale occurring in synformal structures covers a large portion of the claims. The shale appears to coincide with the resistivity lows derived from the Dighem Survey. Folding and thrust faulting together with lack of outcrop adds to the complexity of the area and subsequent stratigraphic relationships and interpretations. To date no mineralized ore horizon has been delineated but the possibility of one occurring is quite good owing to favourable geological indications.

2. INTRODUCTION

The Albert Creek area has been mapped on a detail and regional scale by P. Burns during the 1979 field season (FNM report, July 1980).

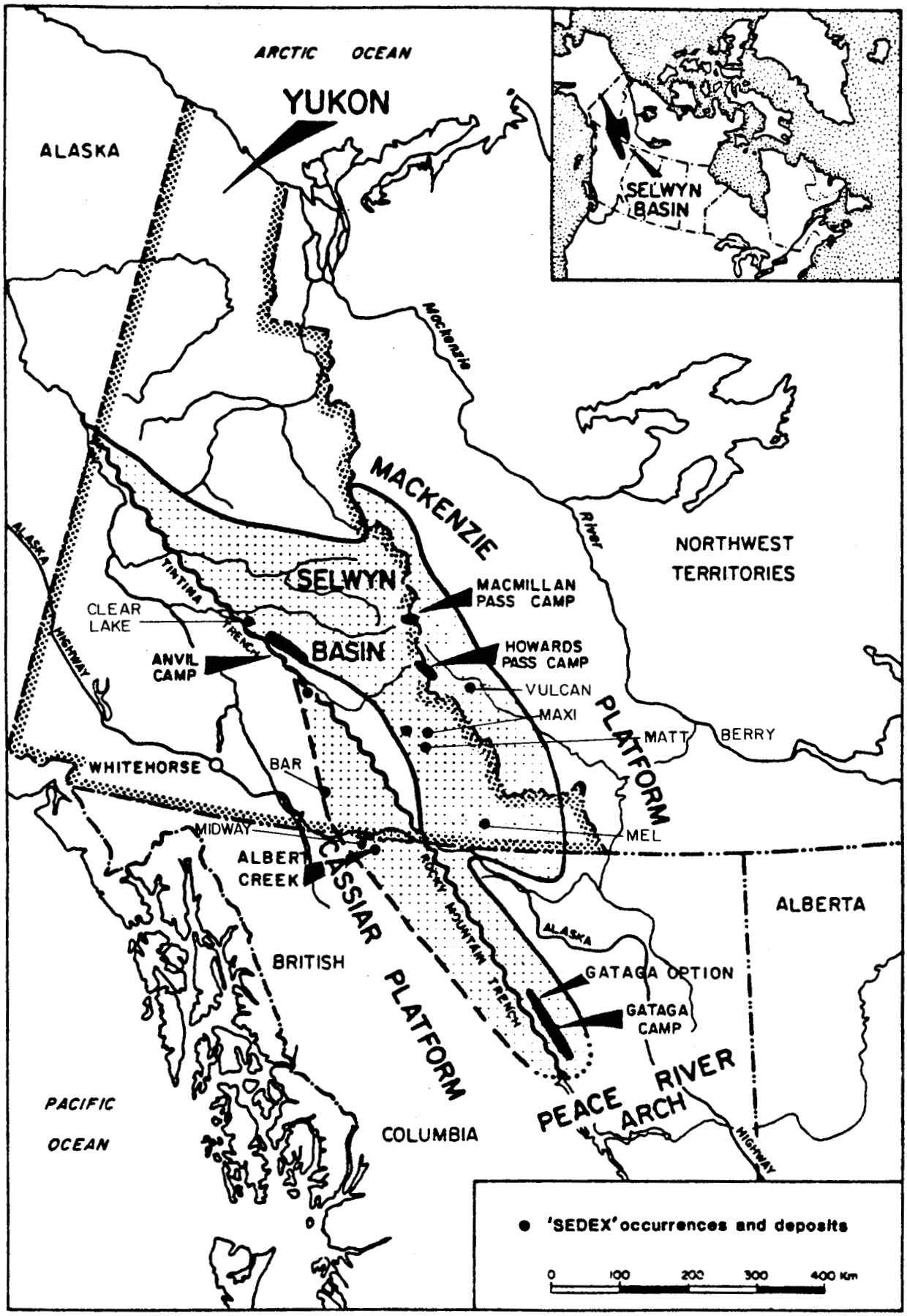

Figure 1 **Location of Selwyn Basin and main sedex Zn-Pb-Ag camps**

FIGURE 2 Albert Creek Property

Previous mapping by H. Gabrielse of the Geological Survey of Canada on a regional basis (1950-54) is described in Memoir 319, 1963. Other geological data is derived from the drilling programs of 1980 (J. Wilson, FNM report January,1981) and 1981 B. Downing, FNM report March,1982). Geological mapping during the 1981 field season consisted of re-examination of outcrops mapped by Burns and detail mapping traverses of the five grids established for the soil geochemcal and geophysical surveys conducted during the summer. One day field trips were made with H. Gabrielse (July 7) and R.T. Bell (August 18), both from the G.S.C..

Access to the area throughout the 1981 field season was by helicopter from Watson Lake, supplemented on occasion by truck when the roads were passable. Physiographically, Albert Creek occurs within the Dease Plateau. Topographically the area has been well glaciated characterized by extensive glacial drift resulting in low undulating hills and valleys(Figure 2). Outcrops are sparse (approximately 5-10%) and the dominant rock outcrops are limestone or dolomite as shale is easily eroded. Owing to the scarcity of outcrops, the Albert Creek area remaining largely unmapped and prospected by government and company surveys. Both glaciation and structure (faults) have had a major influence on the drainage pattern. The area is moderately to densely covered by pine, aspen, spruce and larch. Numerous swamps occur along the creeks.

The Albert Creek area is one of the few remaining areas in B.C. for which 1:50,000 topographic maps have not been made.

3. DETAIL GEOLOGY - ZAP GROUP

Six units were recognized and mapped within the map-area, figure 3. Unit four has been tentatively dated at Middle Devonian from the fossil assemblage (Burns, 1979), and unit two at Lower Cambrian (Gabrielse, comm.). A description of the various units is given in Appendix I. The dolomitic units (3 and 3a) are not readily distinguished in the field and a judgement based on colour was applied.

All rocks were tested with dilute HCl to differentiate between limestone and dolomite. Several fossiliferous samples were collected for dating by the Geological Survey (in progress). Unit six appears to be an enigmatic rock type as its occurence has not been noted elsewhere and its relationship to the other units is unknown. It has been given a tentative date as no older than Cretaceous (Gabrielse, per com). The shale is poorly exposed due to glacial scouring, but the unit appears to correlate with the Dighem resistivity lows and can be outlined as such. The same shale unit is exposed along the Blue River Canyon, approximately 17 km southeast of the ZAP claims. The shale unit overlies the fetid limestone (#4) as observed in two trenches. The contact zone is irregular and generally characterized by non-mineralized calcite veins. The breccia unit encountered in DDH A6 may either be a debris flow or an unconformity, however, it is not a tectonic breccia.

Structurally, the dominant trend of bedding and interpreted faults and fold axes is northwest-southeast. A secondary trend,(northeast-southwest) is approximately normal to the dominant strike. Fault location and trend are primarily interpreted from abrupt topographical breaks. The faults are probably thrusts and together with the folding are responsible for the geological complexity of the map-area. Shale appears to occur within the synclinal structures.

4. REGIONAL GEOLOGY

Tectonically, the Albert Creek Area occurs on the western edge of the Selwyn Basin. The name "Selwyn Basin" was coined by H.Gabrielse(1967) to describe an epicontinental trough that is bounded to the west and northwest by the Cassiar Platform and Tintina Trench and to the east and northeast by the carbonate rocks of the Mackenzie Platform, Figure 1. The map area itself is structurally bounded on the west by the Cassiar Platform assemblage of volcanics and intrusives.

A regional compilation of the Albert Creek area is shown in figure 4. An attempt has been made to correlate the various map units and structure originating from four map sheets. The structural-stratigraphic relationships as inferred from detailed mapping and regional extrapolation indicate a northwest-southeast trend. The Albert Creek area appears to be bounded by two dominant regional faults (thrust or wrench?) which may be indicative of a graben structure . Regional and local folding and thrust faulting is apparent throughout the area. Neither the amount nor the sense of displacement along the faults is known. Another trend evident on a regional scale is the northeast-southwest fault system truncated by the northwest striking faults. The NE-SW faults may be related to paleofaults/graben structures of possible Precambrian age.

The youngest unit is the vesicular olivine basalt occurring to the north-northwest of Albert Creek. This unit may, in part, be associated with the cause of the warm springs on the property and those to the south. This unit coincides with an airborne magnetic anomaly.

A generalized facies-tectonic map of the area is shown in figure 5. The Albert Creek area occurs adjacent to a carbonate platform, the shales being restricted to sub-basins. No barite has been found within the slope-basin area, however, sedimentary derived barite occurs along the volcanic-carbonate platform contact (barite property, south of Alec Chief Lake). The apparent absence of barite within the Albert Creek area together with laminated mudstone may be indicative of a small sub-basin analogous to the Howard's Pass deposits (Morganti, J., 1981). The Midway property, currently optioned by Amax, is of a shale-barite hosted stratiform type (Pb-Zn-Ag-Ba - analogous to the Cirque deposit?). The shale unit at Albert Creek is analogous to the Black Clastic Group as coined by Carne for the Driftpile deposit.

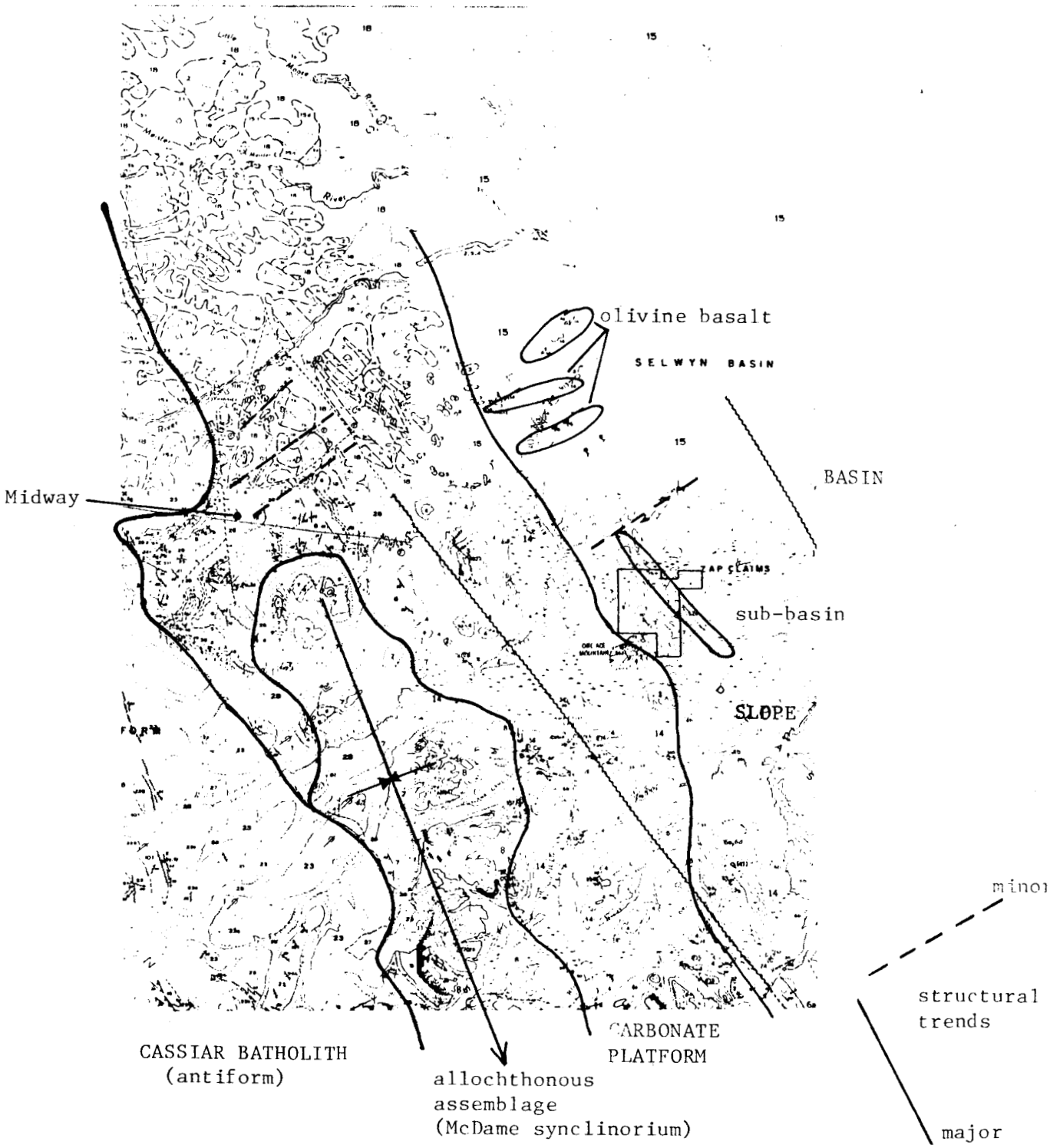

Figure 5: Generalized regional facies map.

Carbonate deposition was apparently in a southwest direction onto a continental margin. The Black Clastics were deposited in a southeasterly to easterly direction during the Upper Devonian in a large basinal structure(H. Gabrielse, per comm.). The actual thickness of the shales in the Albert Creek area is unknown, however, being in a platformal environment the shales would tend to be thin bedded as contrasted to the thick beds at the Gataga - Howard's Pass area.

The Tintina - Rocky Mountain Trenches have been active throughout the depositional period(s). The possibility of lateral displacement along the major regional NW-SW faults should be considered. These are subparallel and may even be splays of the Tintina fault along which there has been approximately 300 kms. of right lateral displacement. This would indicate that the Albert Creek area may in fact be originally part of the "Gataga Camp" which has been displaced some 290km to the northwest. If the secondary NE-SW trending fault system is Precambrian, then the "graben structure" may be responsible for the sub-basins as in the Albert Creek and Midway Properties.

The Mississippian volcanic assemblage (greenstone, cherts - Upper Sylvester Group) was emplaced (rifted plate margin?) upon the carbonate during the Mesozoic (H. Gabrielse, per comm.) and now occupies a synform (McDame Syncline).

5. MINERALIZATION

No mineralized horizon has been located to date on the Albert Creek property. Disseminated sphalerite and pyrite and pyrite laminae/veinlets have been intersected in drilling, The best mineralized section is from DDH A5 - 0.6% Zn, 70 ppmPb and 4.0 ppm Ag.

The high silver value (55ppm) obtained in a silt sample (Burns 1979) has not yet been explained. The possible presence of silver compound coatings on silt grains derived from the warm springs may explain the anomalous value.

An idealized section is shown in figure 6. The presence of laminated mudstone, chert-calcareous shale intersected in the drill holes on the claims is a favourable indication for mineralization.

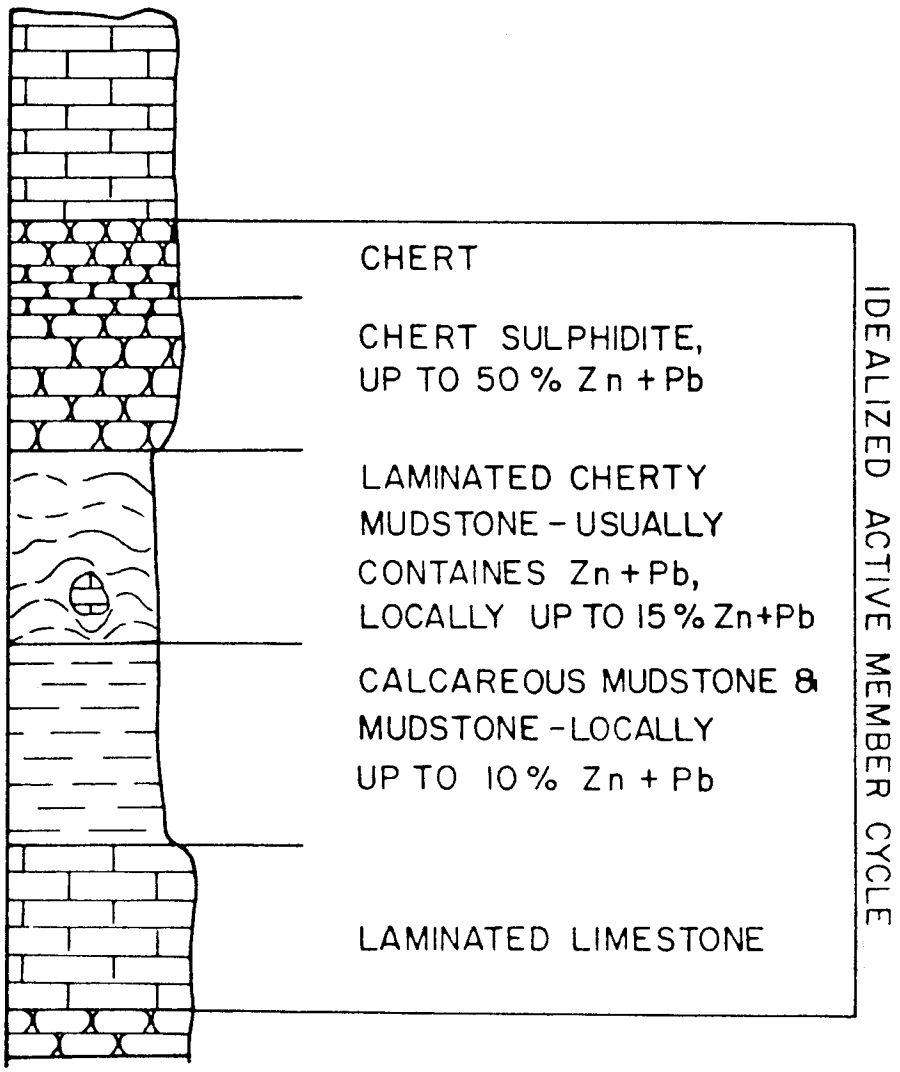

Figure 6 Generalized stratigraphic section of an idealized active member showing a typical sequence of facies. Note that there is a decrease in carbonate and an increase in chert upward. (after morganit, 1981)

6. CONCLUSIONS

The lack of outcrop in the Albert Creek area hinders the interpretation and exploration for a favourable mineralized horizon.

Within a tectonic framework, the property is favourably located and based on the intersection of the laminated mudstone (DDH A6-81), a possible mineralized horizon may be present. The concept of the area being part of the Selwyn Basin and analogous to the shale hosted PB-Zn-Ag deposits is new and will probably spur further exploration, especially with the good intersection obtained on the Midway property (9.3% Pb, Zn, 2.52 oz/t Ag. over 9 feet - George Cross Newsletter, December 2, 1981)

7. RECOMMENDATIONS

The most efficient way of delineating the shale unit is by an airborne geophysical survey interpreting the resistivity lows as caused by the shale unit. This method was also used by Amax for their Midway property (Dighem survey flown immediately after the Albert Creek Survey). Ground geophysical surveys would be a necessity for follow-up work resulting in "fence drilling".

8. REFERENCES.

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Morganti, J.M., 1981, Geoscience Canada, Vol. 8, No. 2. p. 65.

APPENDIX I

Lithologic Units

Unit	Age	Formation	Description
6	Tertiary	-	Greywacke. interbeds of pebble conglomerate,(chert shale, limestone fragments disseminated muscovite in matrix; few grains pyrite; weakly to moderately carbonatized.
5	Upper Devonian	Sylvester Group	Black,silty to sandy, carbonaceous to siliceous Shale; interbeds of black-light grey chert/quartzite sandstone; laminated mudstone with minor pyrite non conductive; scattered melanterite-coated fractur
4	Middle Devonian	McDame Group	Limestone; fetid odour; grey colour; fossiliferous brecciated inplaces; scattered calcite veins at near contact with overlyin shale; non-mineralized
3	Middle Devonian	McDame Group	Dolomite (silt-mudstone); fetid; dark grey; fossiliferous; brecciated in places; non-mineralized; interbeds of chert

APPENDIX I

Lithologic Units

Unit	Age	Formation	Description
3a	Lower Devonian -Upper Silurian		Dolomite; tan coloured; non-mineralized, massi to laminated, fine grained.
2	Lower Cambrian	Atan Group Rosella fm.	Limestone; light grey; fossiliferous; massive crystalline;
1	Lower Cambrian	Atan Group Boyo fm.	Quartzite; massive; medium grained; white-cream colour;

YUKON TERRITORY
BRITISH COLUMBIA

60°00'

129°30'

Extensive Glacial Drift Cover

37 seepages (springs)

Shale

GRID A-81

GRID B-81

GRID C-81

GRID D-81

DDH A8(81)

DDH A7(81)

DDH A5(80)

DDH A3&4(80)

DDH A1(80)

DDH A2(80)

D.D.H. 1980 J. Schussler

DONNA 1

DONNA 2

DONNA 3

ZAP 1 ZAP 2 ZAP 3 ZAP 4 ZAP 5 ZAP 6 ZAP 7 ZAP 8 ZAP 9 ZAP 10 ZAP 11

Detail Grid 1978

Detail Grid-81

Old camp

drill camp 1980

Road to One Ace

One Ace Mtn.
△ 1690 Metres

quartzite

limestone

site D
Tufa mori
deposit warm spring

trenches 1968
qtz veins

numerous qtz vein (tr. Au.)

Lake

Little Rancheria River

See report 1981

L.C.P. ACE CLAIM

CAL VEIN

MAJOR REGIONAL FAULT

ALEC CHIEF LAKE

CAPTAIN LAKE

16,000N
14,000N
12,000N
10,000N
8,000N
6,000N
4,000N

INDEX MAP
BRITISH COLUMBIA
0 150 300 Km Scale 1:7 500 000

YUKON
ALBERTA
Watson Lake
Albert Creek
Liard River
Fort Nelson
Dease Lake
Fort St John
Peace R.
Smithers
Prince Rupert

LEGEND

Cretaceous
6 Greywacke, minor conglomerate

Upper Devonian
5 Lower Sylvester (black clastic group)
Shale; black-grey chert, siltstone, chert arenite

Middle Devonian
McDame Group
4 Limestone
3 Dolomite (dolomitic silt / mudstone)
3a dolomite, maybe Lower Devonian-Upper Silurian

Lower Cambrian
Atan Group
2 Limestone (Rosella fm.)
1 Quartzite (Boya fm.)

X Outcrop
(F) Fossils
BD-1 Rock sample location / number
Drill hole
△ Survey station / number (Elevation – metres)
■ Site A - geochemical study site, J. Fortesque
LCP - Legal corner post with claim boundaries
Marsh
51 Traverse station / number
Trench / number
Fault
Geological contact (approximate)
Bedding
Dighem electromagnetic anomaly
Dighem resistivity low
cpy- chalcopyrite
bn- bornite
bx- breccia

400 0 400 800 1200 m.
SCALE: 1:20 000

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY: ZAP Claim Group

LOCATION: Albert Creek McDame Area B.C.

TYPE OF MAP: Geology

WORKING PLACE:

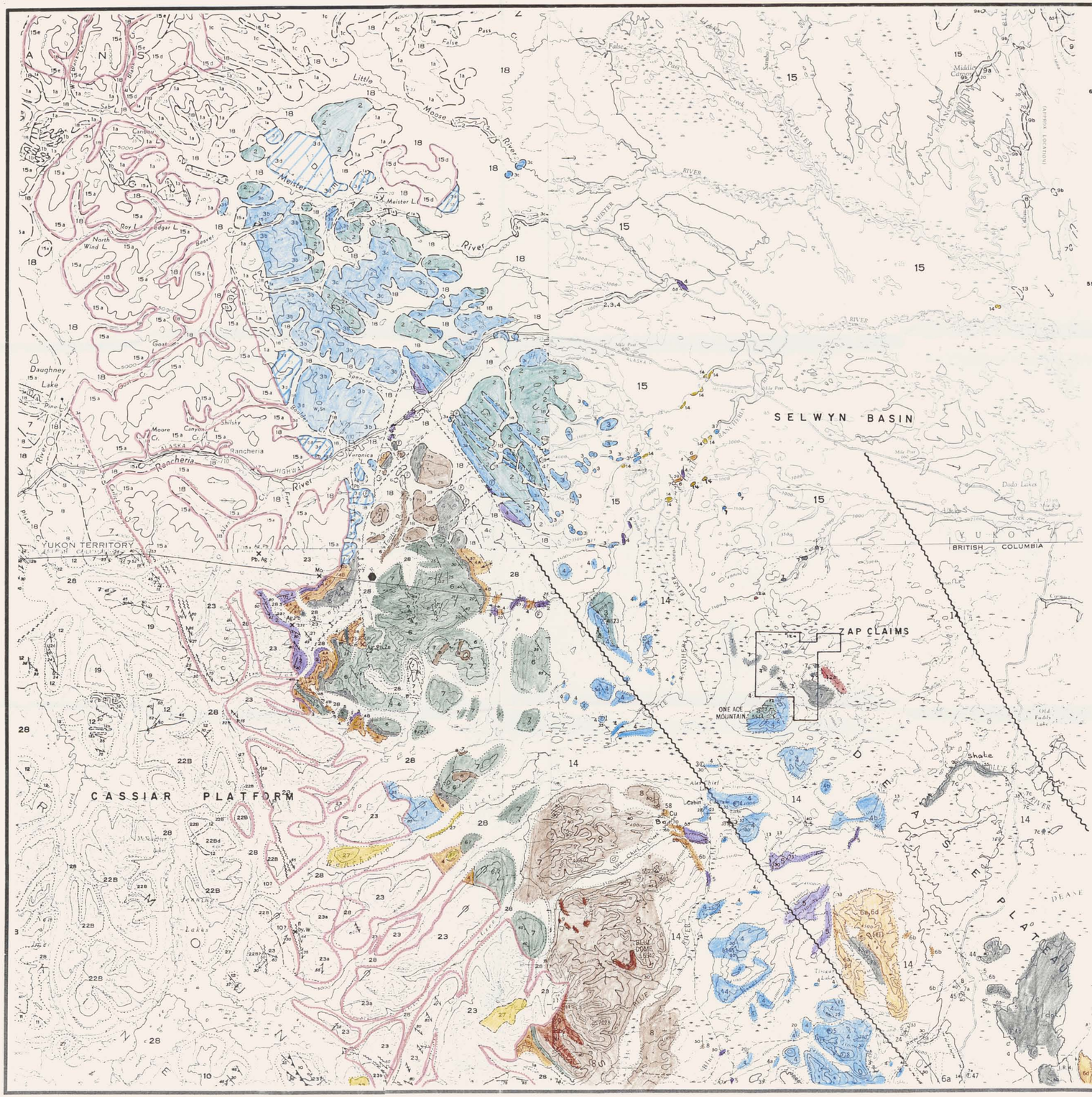
BASED ON: Fieldwork by B.W. Downing

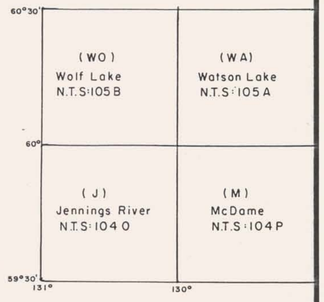
DATE OF WORK: June-Aug. 1981 | MAP REF. NO.: | FIG. NO.: 3.

DRAWN BY: G.T.

DATE: | N.T.S. NO.: 104-P-13

59°45'





LEGEND

TERTIARY

- Vesicular olivine basalt (WA14, WO17)
- Tuya formation, lava, tuff, agglomerate (M13, J27)
- Greywacke, conglomerate (M12a)

MIDDLE CRETACEUS

- Cassiar Batholith (M11, WO15, J23)

MISSISSIPPIAN

- Serpentinite, peridotite (J7-8, M9) greenstone, chert

UPPER DEVONIAN

- Sylvester Group (J6- , M8, WO7) Shale , argillite, chert, quartzite, limestone, conglomerate

MIDDLE DEVONIAN

- McDame Group (M7, J5, WO6) fetid dolomite, limestone, chert, nodular breccia, barren-laminated dolomite

LOWER/ MIDDLE SILURIAN

- Sandpile Group (M6, J4, WO5, WA6) cherty dolomite

ORDOVICIAN / CAMBRIAN

- Kechika Group (M5, J2-3, WO4, WA4) phyllitic limestone, calcareous phyllite hornfels, skarn

CAMBRIAN

- Atan Group Limestone (M4, J1, WO3, WA3)
- Quartzite (M3, J1, WO2, WA2)
- Skarn, marble (J3d)
- Metamorphic rock (M1, J1, WO1, WA1)

5 0 5 10 15 Km.

SCALE: 1:250·000

FALCONBRIDGE NICKEL MINES LIMITED

PROPERTY:

LOCATION: Albert Creek Area

TYPE OF MAP: Regional Geology

WORKING PLACE:

BASED ON:

DATE OF WORK:	MAP REF. NO.:	FIG. NO.:
DRAWN BY: G.T.		
DATE:	N.T.S. NO.:	079-82-4

NCI-273