

REPORT ON THE 1986 DIAMOND DRILLING  
on the  
WIM-TA CLAIM GROUP

Sovereign Creek Area  
93A/13W  
CARIBOO MINING DIVISION  
BRITISH COLUMBIA

FILMED

for

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by

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August 26, 1986

GEOLOGICAL BRANCH  
ASSESSMENT REPORT

15,729

PART

3 OF 3

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## 1. SUMMARY

Recent exploration conducted during June, 1986 on Trifco Minerals Ltd.'s WIM-TA Claim Group situated 35 km east of Quesnel, B.C. has identified a zone of strong talc mineralization within a sequence of serpentinized ultramafic rocks. 91 m (300 ft) of diamond drilling in 6 holes with a backpack portable Winkie drill and associated geological mapping and prospecting on the "Dodo Creek Showing" have identified a zone at least 110 m in length, 35 m in width at surface and 20 to 25 m deep containing talc grades from 20% to as high as 95%. "Proven and Probable" reserves of 150 000 tonnes of material grade an average of 45% talc. "Possible" reserves are 316 000 tonnes grading an average 45 percent talc.

Several other unexplored talc occurrences (Creek 1, Creek 2, Creek 3, Swift River Forest Road) are present on the property with good potential to develop further talc reserves.

Continued exploration to further delineate the Dodo Creek talc deposit, and other showings on the WIM-TA Group is recommended. Bulldozer or backhoe trenching is required at Dodo Creek, Creek 3 and the Swift River Forest Road areas to open up the talc zones for inspection. Mapping and magnetometer surveys are recommended to determine the configuration of the individual zones and their relationship to each other. Additional drilling is recommended at the Dodo Creek deposit to expand reserves. Drilling of the other talc zones will be required following the initial surveys and trenching.

## 2. INTRODUCTION

### 2.1 Terms of Reference

Nevin Sadlier-Brown Goodbrand Ltd. (NSBG) was retained by Mr. Rene Trifaux, President of Trifco Minerals Ltd. to conduct a geological evaluation of talc occurrences on the WIM-TA claim group situated 32 km (20 miles) east of Quesnel, B.C. (Figure 1).

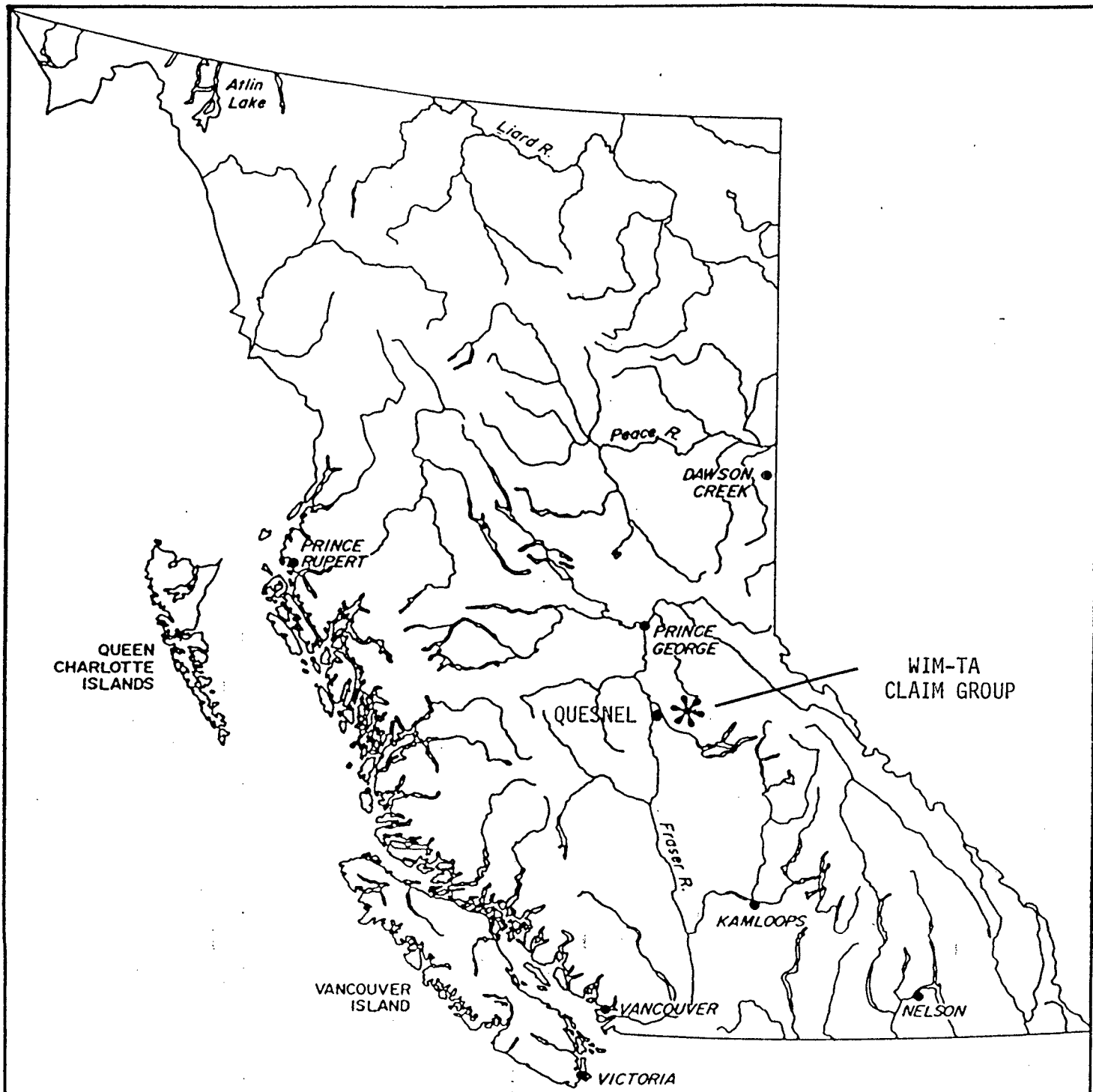
This report is based on a one week exploration and drilling program conducted June 23-29, 1986 under the supervision of the writer in the company of Mr. Trifaux. It is intended as a description and assessment of results of work recently performed on the property and as a set of recommendations for further development.

### 2.2 Property Description

Trifco Minerals Ltd. holds by terms of an agreement with Rene Trifaux the WIM-TA claim group which comprises 10 contiguous one-unit and three two-unit claims (Figure 2). The claims are located in the Sovereign Creek area in the Cariboo Mining Division at 52° 59' 30"N, 121° 53' 30"E<sub>W</sub>(NTS) Map Sheet 93A/13W). Several claim posts were inspected in the field and in the writer's opinion, staking conforms to the Mineral Act Regulations for British Columbia. Pertinent claim data on the subject property verified at the Mining Recorder's office, is summarized as follows:

**TABLE 1 - CLAIM DATA**

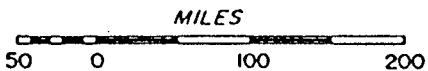
<u>Claim Name</u>	<u>Record No.</u>	<u>Units</u>	<u>Expiry Date</u>	<u>Recorded Owner</u>
WIM 1	418	1	June 8, 1986	Rene Trifaux
WIM 2	334	1	May 12, 1989	" "
WIM-TA 1	335	1	May 12, 1989	" "
WIM-TA 2	338	1	May 16, 1989	" "
WIM-TA 3	461	1	July 25, 1989	" "
WIM-TA 4	462	1	July 25, 1989	" "
WIM-TA 5	419	1	June 8, 1989	" "
WIM-TA 6	463	1	June 25, 1989	" "
WIM-TA 7	6869	2	June 26, 1989	" "
WIM-TA 8	6868	2	June 26, 1989	" "
WIM-TA 9	7082	1	Aug. 12, 1989	" "
ARNE	6893	2	July 10, 1989	" "
TOM	4766	1	April 14, 1990	" "



QUEEN CHARLOTTE ISLANDS

VANCOUVER ISLAND

VICTORIA



TRIFCO MINERALS LTD.	
LOCATION MAP WIM-TA CLAIM GROUP	
FIGURE 1	JULY, 1986
NEVIN SADLIER-BROWN GOODBRAND LTD.	



In order to simplify property administration and to ensure that no open fractions exist between the single unit claims, consolidation of the present land holdings into a single (12-20 unit) claim should be considered.

### **2.3 Access and Physiography**

Road access to the WIM-TA claim group is by way of the Swift River Forest Road (No. 1300), which leaves southward from Highway 26 at a point 32 km (20 miles) east of Quesnel. The Swift River Road is an all weather, secondary gravel road that traverses the southern portion of the claims, crossing Dodo Creek at Kilometre 16. Talc occurrences on Dodo Creek, Creek 1, Creek 2 and Creek 3 are all within 500 m of the road and are reached on foot. Currently, there are no known permanent facilities on the group.

The property is on the south flank of Sovereign Mountain between 1050-1350 m (3500-4500 feet) in elevation. Local relief is 650 m (2100 ft). Mountains are generally rounded with moderate slopes forested predominantly by fir and pine. Perennial undergrowth is thick, particularly in shallow, moist depressions common throughout the property. Except along the creeks and at higher elevations, bedrock is mantled by overburden, resulting in poor outcrop conditions. Glacial drift blankets the low-lying southerly portions of the property.

### **2.4 Exploration History and Current Work Synopsis**

The existence of talc at the Dodo Creek ultramafic has been recognized since at least 1960, when it was discovered by R. Trifaux. During the early 1970's, Mr. Trifaux explored the ultramafic for nickel with a series of shallow diamond drill holes. Extensive talc mineralization was noted at that time. More recently, prospecting by Trifco Minerals Ltd. has extended known talc occurrences across much of the WIM-TA group.

Exploration during June, 1986, focussed primarily on the Dodo Creek area. A work program involving 91 m (300 ft) of diamond drilling, geological mapping and prospecting, and sampling was conducted in this vicinity in an attempt to delineate the extent of the talcose serpentinite unit exposed in Dodo Creek. Work was conducted as partial fulfillment of the recommendations of an earlier report by NSBG (Fairbank, 1985). Additionally, a brief geological evaluation was performed at talc showings on Creek 1, Creek 2, and Creek 3 although the assessment was of a cursory nature.

### 3. GEOLOGY

#### 3.1 Regional Geology

The property is underlain by three main geologic units (Figure 3). From youngest to oldest, these are as follows:

- Upper Triassic phyllite, argillite, quartzite, schist and minor greenstone ( $uK_{a1}$ ) best exposed along Dodo Creek above the road.
- ANTLER FORMATION serpentinite and sheared mafic rocks ( $MP_{AU}$ ) which are locally talcose
- RAMOS CREEK SUCCESSION ( $MP_R$ ) olivine and micaceous quartzite, phyllite slate and limestone in the northern upper reaches of the property.

Upper Triassic rocks and the Antler Formation are thrust over the Ramos Creek Succession. Stratigraphy generally trends west-northwest and dips southwest. However, on a local or property scale recumbent drag folding and other complex structures are evident.

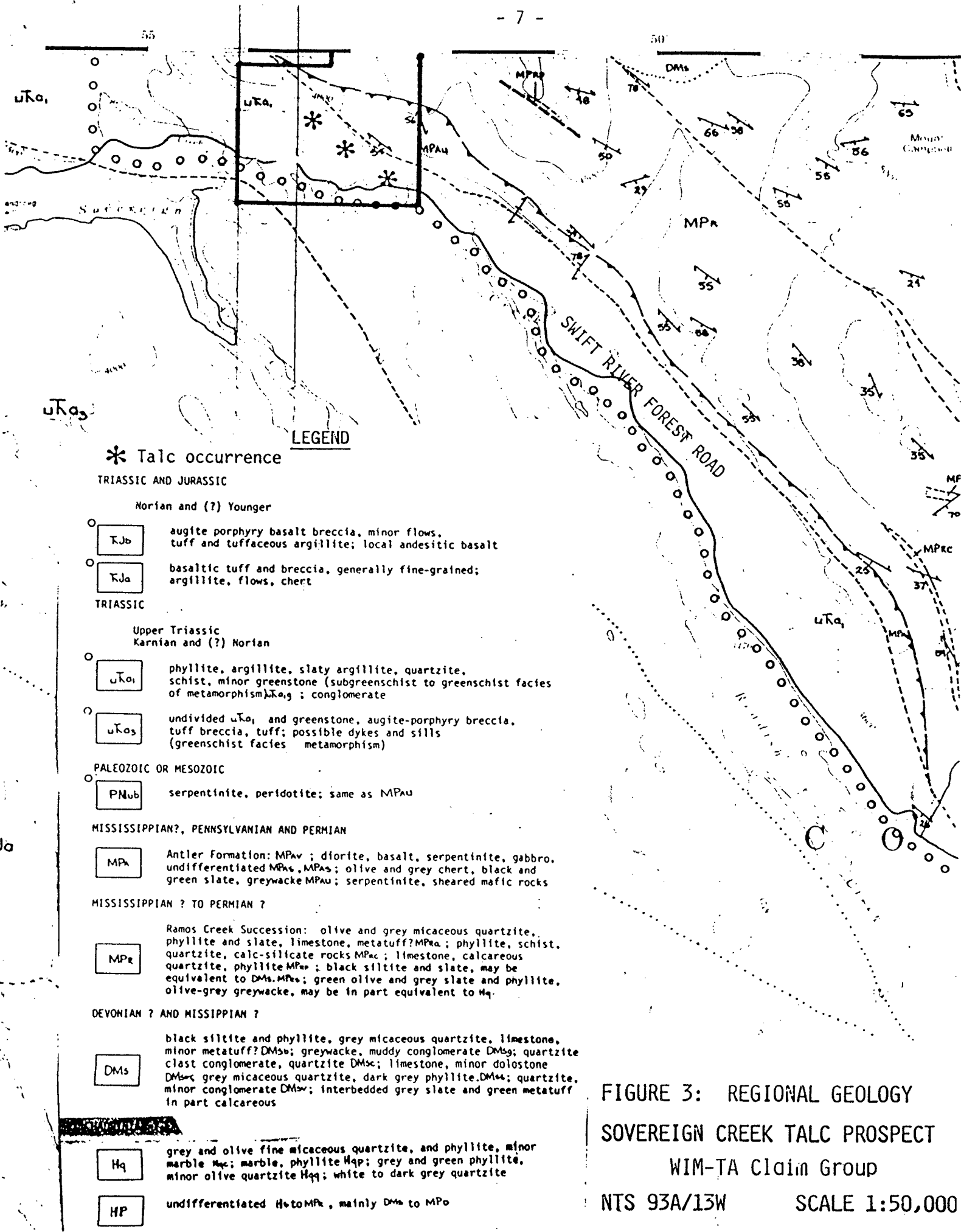
Folded graphitic phyllite in lower Dodo Creek (refer to Figure 4) strikes  $120-145^\circ$  and dips northward contrary to the regional trend. An overturned, anticline has an axial plane striking parallel to the foliation (bedding?) and dipping northward. These relationships indicate that additional fold structures must occur northward towards the Dodo Creek talc occurrence in order for strata to be in proper sequence, and that thickening and/or repetition of beds occur locally.

#### 3.2 Talc Occurrences

Talc occurrences are confined to Antler Formation serpentinite and serpentinitized ultramafic intrusions (Figure 4).

Four widely separated areas of talc alteration along a one kilometre linear trend have been identified as:





\* Talc occurrence

TRIASSIC AND JURASSIC

Norian and (?) Younger

- K<sub>2</sub>b augite porphyry basalt breccia, minor flows, tuff and tuffaceous argillite; local andesitic basalt
- K<sub>2</sub>a basaltic tuff and breccia, generally fine-grained; argillite, flows, chert

TRIASSIC

Upper Triassic  
Karnian and (?) Norian

- u<sub>2</sub>a<sub>1</sub> phyllite, argillite, slaty argillite, quartzite, schist, minor greenstone (subgreenschist to greenschist facies of metamorphism); conglomerate
- u<sub>2</sub>a<sub>3</sub> undivided u<sub>2</sub>a<sub>1</sub> and greenstone, augite-porphyry breccia, tuff breccia, tuff; possible dykes and sills (greenschist facies metamorphism)

PALEOZOIC OR MESOZOIC

- PN<sub>ub</sub> serpentinite, peridotite; same as MP<sub>au</sub>

MISSISSIPPIAN?, PENNSYLVANIAN AND PERMIAN

- MP<sub>a</sub> Antler Formation: MP<sub>av</sub>; diorite, basalt, serpentinite, gabbro, undifferentiated MP<sub>as</sub>, MP<sub>as</sub>; olive and grey chert, black and green slate, greywacke MP<sub>au</sub>; serpentinite, sheared mafic rocks

MISSISSIPPIAN ? TO PERMIAN ?

- MP<sub>r</sub> Ramos Creek Succession: olive and grey micaceous quartzite, phyllite and slate, limestone, metatuff? MP<sub>ra</sub>; phyllite, schist, quartzite, calc-silicate rocks MP<sub>rc</sub>; limestone, calcareous quartzite, phyllite MP<sub>re</sub>; black siltite and slate, may be equivalent to DM<sub>s</sub>, MP<sub>rs</sub>; green olive and grey slate and phyllite, olive-grey greywacke, may be in part equivalent to H<sub>q</sub>.

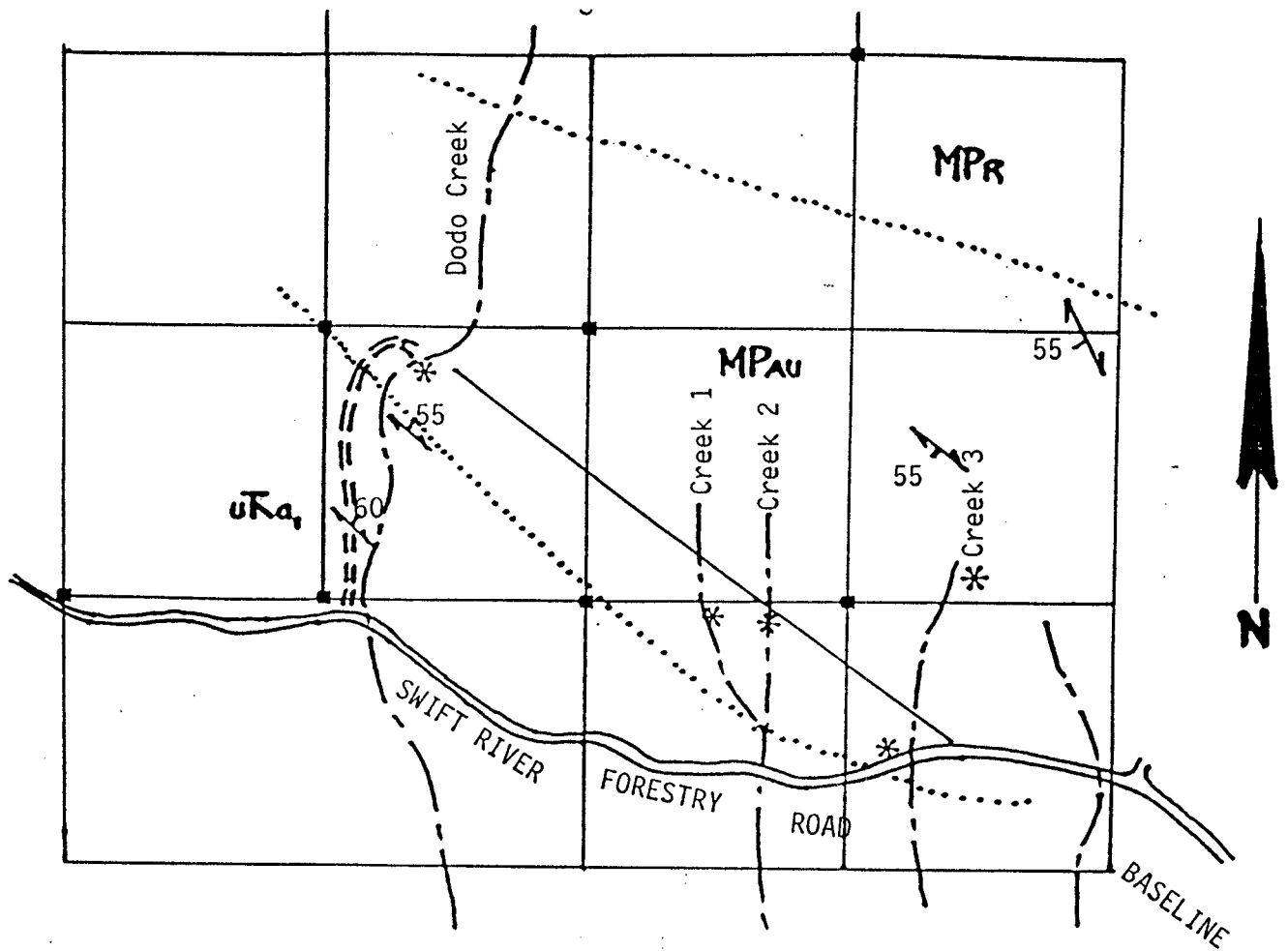
DEVONIAN ? AND MISSISSIPPIAN ?

- DM<sub>s</sub> black siltite and phyllite, grey micaceous quartzite, limestone, minor metatuff? DM<sub>sb</sub>; greywacke, muddy conglomerate DM<sub>sg</sub>; quartzite clast conglomerate, quartzite DM<sub>sc</sub>; limestone, minor dolostone DM<sub>sd</sub>; grey micaceous quartzite, dark grey phyllite DM<sub>ss</sub>; quartzite, minor conglomerate DM<sub>sw</sub>; interbedded grey slate and green metatuff in part calcareous

- H<sub>q</sub> grey and olive fine micaceous quartzite, and phyllite, minor marble H<sub>qc</sub>; marble, phyllite H<sub>qp</sub>; grey and green phyllite, minor olive quartzite H<sub>qq</sub>; white to dark grey quartzite

- HP undifferentiated H<sub>to</sub>MP<sub>a</sub>, mainly DM<sub>s</sub> to MP<sub>o</sub>

FIGURE 3: REGIONAL GEOLOGY  
SOVEREIGN CREEK TALC PROSPECT  
WIM-TA Claim Group  
NTS 93A/13W SCALE 1:50,000



LEGEND

- uKa, Phyllite, argillite, quartzite schist, minor greenstone
- MPAU ANTLER FORMATION serpentinite, gabbro
- MPR RAMOS CREEK SUCCESSION quartzite, phyllite, slate, limestone
- 55 Foliation
- \* Talc occurrence
- == Road
- Legal Corner Post (LCP)

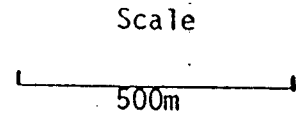


FIGURE 4: PROPERTY MAP  
GEOLOGY AND TALC OCCURRENCES

- 9 -

- 1) Dodo Creek talcose serpentized ultramafic
- 2) Creek 1 and Creek 2 platy talc float
- 3) Creek 3 platy talc and float
- 4) Swift River Forest Road talc-carbonate schist boulders.

Apart from the primary exploration target at Dodo Creek (described in Section 4.2), "platy" steatite occurrences at Kilometer 17.2 on the Swift River Forestry Road and in Creek 3, a small, intermittent tributary to Sovereign Creek which crosses the forestry road at 17 km are of particular interest. A small prospecting program of 16 hand dug pits at the former site has identified an area of approximately 3000 m<sup>2</sup> containing occurrences of talcose schist in either bedrock or large, angular boulders. At Creek 3, the writer observed an area approximately 50 m by 200 m mantled by overburden containing angular steatite cobbles. In both areas, the nature of the float suggests close proximity to the bedrock source.

750 metres southeast of the Dodo Creek talc showing, angular platy talc float occurs over 50 metre intervals in Creek 1 and Creek 2. Overburden appears shallow near Creek 2 and the angularity and consistent large size (typically 30-60 cm across) again indicating that the float is not far from its bedrock source. Creek 1 float is in an area of thicker overburden and is probably slightly further from its upstream source.

Creek 1 and 2 float boulders are distinctly different from the talc at Dodo Creek. Platy fine grained talc comprises 80-90 percent of the rock with the remainder being mostly chlorite. Pyrite and limonite are up to 5 percent by volume.

The alignment of the talc alteration zone indicates a probable west-northwest stratigraphic or structural control of the mineralization. Although the four occurrences may occur along the same structural zone or stratigraphic horizon, it is unlikely that they form a continuous deposit. Rather, it is expected that a series of deposits of unknown tonnage occurs, possibly elongated parallel or subparallel to regional stratigraphic and structural trends.

#### 4. RESULTS

##### 4.1 1986 Drilling Program

During June 1986, a small scale diamond drilling program designed to delineate the extent of the Dodo Creek talc showing was implemented. A total of 91 m (299 ft) of drilling was conducted at six sites, with all holes drilled at -90°.

Drilling was performed by H. Allan Drilling Ltd. using a backback portable J.K. Smit Winkie drill. The technique employs standard diamond drilling practice and provides EX (30 mm DIA) core. Because the core spins with the core barrel, softer sections of rock such as heavily faulted or fractured core is more susceptible to "washing out" under the pressure of the drill fluid circulation than would be expected with the more common wireline drilling methods.

As the Winkie drill does not perform well in overburden conditions, as many holes as possible were sited on or near surface bedrock exposures. In general, overburden thicknesses were found to be minimal on the right bank and northeast of Dodo Creek.

<u>Hole Number</u>	<u>Depth, m(ft)</u>	<u>Comments</u>
86-1	20.4 (67.0)	20 m talcose ultramafic intersected
86-2	9.8 (32.0)	Abandoned in overburden
86-3	22.6 (74.0)	19.5 m talcose ultramafic intersected
86-4	9.1 (30.0)	Abandoned in overburden
86-5	3.7 (12.0)	" " "
86-6	25.6 (84.0)	23.7 m talcose ultramafic intersected

The drill core was logged by the author (see Appendix B) and is currently stored at the residence of:

Mr. Arne Fardal  
408 Fiege Road  
Quesnel, B.C.  
V2J 5C9

Drill holes were sampled at 10 to 15' (3 to 5 m) intervals that were considered to be representative of different sections within the sequence. Because of the nature of the EX core, sampling was conducted by selecting core segments of 2 to 4 cm in length at spacings of 30 cm (1 foot) over the sample interval. Samples are described in Table 3, Section 4.3.

#### 4.2 Dodo Creek Deposit

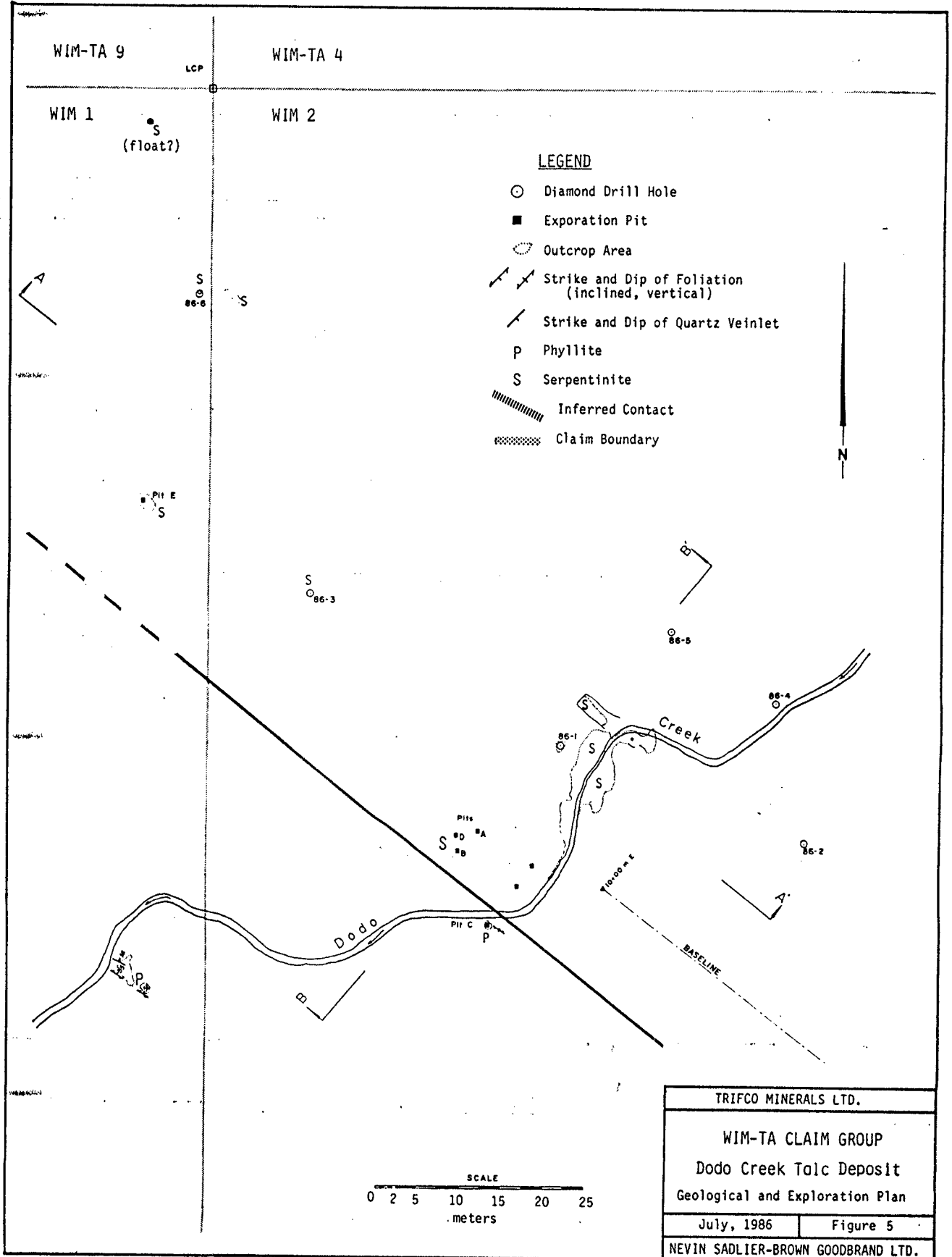
Talc showings at Dodo Creek consist of talcose serpentinite bedrock exposed for a distance of approximately 30 m along the creek, in numerous small hand-dug pits and trenches, and in three 1986 diamond drill holes (Figure 5). Talc occurs within a serpentinitized ultramafic intrusive in amounts ranging from 15 to 95%. Drilling, trenching and mapping on the deposit have indicated a strike length in excess of 75 m and a width at surface of at least 30 m. Further investigation in the vicinity of serpentinite float located north-northwest of "86-6" could extend the dimensions of the deposit substantially.

The ultramafic is bounded on the southwest by a medium grey-green dolomitic phyllite unit which, near the ultramafic, exhibits a strong foliation pattern striking  $130^{\circ}$  and dipping sub-vertically. Quartz veinlets and folia in phyllitic outcrop slightly further southwest of the contact maintain a similar strike while dipping  $50$  to  $60^{\circ}$  towards the northeast. Comparisons of petrographic analyses of material from Pits C and D indicate that the contact between talcose serpentinite and dolomitic phyllite is quite sharp.

As elsewhere on the property, it is presumed that the serpentinitized ultramafic conforms structurally to regional geologic trends and that it too will exhibit a strike of approximately  $130^{\circ}$ . The phyllite was not penetrated by drilling and because of limited surface expression, it is difficult to ascertain the contact attitude. However, for the purposes of reserve calculations, the  $55^{\circ}$  northeastward dip is assumed.

The northeastern contact of the ultramafic is completely obscured in the vicinity of Dodo Creek. Attempts to drill through overburden north and east of the main showings proved unsuccessful, with each of three holes abandoned in as much as 10 m of unconsolidated material. Talc discoveries northwest of the creek in float near the WIM-TA 9 legal corner post suggest the serpentinite zone may be substantially wider than current mapping would indicate. However, further investigation will be required before definitive contact attitudes are determined.

Talc occurs primarily as an alteration-replacement mineral of an original igneous host. Talc as colourless, randomly oriented flakes 0.02 mm to 0.5 mm in length with varying amounts of dolomite and lesser chlorite forms a fine-grained matrix to clots of antigorite flakes to 15 mm in length. Antigorite flakes are themselves commonly cut by a reticulated network of talc and chrysotile veinlets.



Two distinct grades of talcose alteration are present. Visual, petrographic and chemical analyses ranges of a lower grade, serpentinite rock indicate talc content between 15 and 40%. Typical exposures of this phase are located along the banks of Dodo Creek.

A substantially higher grade material is typified by intense talcose alteration ranging from 50 to 95%. This rock tends to be somewhat more schistose and was located at depths below 15 m in the drill holes.

The highest grade of talcose alteration is associated with an albite syenite intrusive, which was encountered in two of the three drill holes into bedrock (86-1 and 86-3). Although it is very indistinct the contact appears to form an angle between 30 and 45° to the core axis. Again, because of limited exposure, it is neither possible to ascertain an attitude of the intrusive nor to determine a clear relation between the two units. As talc grades exceeding 95% are encountered in the vicinity of the syenite, its presence is very significant.

#### **4.3 Analysis and Grade Determination**

Samples of talcose material from the Dodo Creek prospect were collected by the writer and analyzed by Chemex Labs Ltd. and Geotex Consultants Ltd. Geotex (Read, 1986) first conducted an X-Ray Diffraction analysis on selected samples in order to identify major mineral assemblages and in particular, to determine carbonate mineralogy not otherwise readily distinguishable by other techniques. Secondly, petrographic analyses of thin sections were performed to estimate mineralogical modes for each sample. Because of the small volume of the material used in x-ray diffraction and petrographic determinations, the results of a "Classical Whole Rock" analysis by Chemex were considered to be most representative of the sample. The chemical analyses were recast into weight and volume percents based on the assumption that talc, serpentine, dolomite and chlorite are the major rock forming minerals in the Dodo Creek ultramafic assemblage (Read, 1986). The results of the 1986 sampling are presented in Table 2, which is extracted from the Geotex report.

TABLE 2 COMPARISON BETWEEN MODES FROM THIN SECTION AND  
MODES CALCULATED FROM CHEMICAL ANALYSES

Sample	TALC			SERPENTINE			DOLOMITE			CHLORITE		
	wt% c.	vol% c.	vol% o.	wt% c.	vol% c.	vol% o.	wt% c.	vol% c.	vol% o.	wt% c.	vol% c.	vol% o.
71601	40.5	41.0	-	22.2	23.4	-	36.2	34.5	-	1.1	1.1	-
71602	51.1	51.6	44.7	15.4	16.1	27.3	27.5	26.1	24.3	6.0	6.1	2.7
71603	49.1	49.0	96.7	22.2	23.0	0.0	13.6	12.8	0.0	15.1	15.2	3.0
71604	17.4	17.3	-	51.6	53.5	-	29.8	28.0	-	1.2	1.2	-
71605	43.9	43.9	23.0	30.6	31.7	67.4	17.4	16.3	8.7	8.1	8.1	0.0
71606	77.9	77.9	97.0	10.4	10.8	0.0	7.5	7.1	0.0	4.2	4.2	3.0
71607	0.0	0.0	-	77.2	78.8	-	22.0	20.4	-	0.8	0.8	-
71608	0.0	0.0	13.4	87.9	88.9	50.8	12.1	11.1	35.7	0.0	0.0	0.0
71609	36.0	36.0	72.3	31.3	32.5	4.3	23.2	21.8	21.3	9.5	9.6	2.0
71610	not an ultramafic rock											
71611	not an ultramafic rock											
71612	56.0	55.5	49.0	21.9	22.6	43.5	3.2	3.0	0.0	18.9	18.9	7.2
71613	7.9	7.8	52.0	68.3	70.0	47.0	23.1	21.5	0.0	0.7	0.7	0.0

wt% c. = weight % calculated    vol% c. = volume % calculated    vol% o. = volume % observed

71603 The rock analysis indicates a carbonate is present, X-ray diffraction shows calcite, but the thin section shows no carbonate.

71601, 71604, and 71607 were not thin sectioned or X-rayed.

Note: This method of recasting chemical analyses into constituent minerals is valid only if the minerals talc, serpentine, dolomite and chlorite are the dominant minerals present.



Variation in talc content within the ultramafic is clearly evident. Visual estimates of talc in drill cores (Appendix B) vary from 15 to 85% with grades generally increasing with depth. Inconsistencies between "calculated" and "observed" modes in Table 2 demonstrate the difficulties in correlating chemical analyses of a comparatively large sample (which represents up to 5 m of drill core) with petrographic determinations performed on one thin section. The chemical complexity and compositional heterogeneity of the ultramafic have complicated correlation between visual, petrographic and chemical analytical techniques. However, talc occurrence within the ultramafic is ubiquitous, and of all ultramafic rocks observed, none contained less than an estimated 15% talc. Read (1986) suggests "a large homogeneous sample should be thin sectioned in a few locations and the sample analysed so that a sample with a known mode can be compared against a chemical analysis recast into minerals present". While it would be considerably more expensive, it appears that beneficiation trials involving crushing and separation would provide the most definite talc grades.

For the purposes of reserve calculations, talc percentages have been derived by combining visual estimates, petrographic and x-ray determinations, and whole rock chemical analyses. While various other minerals such as dolomite and antigorite are common minor constituents of industrial talc concentrates, their contribution to talc reserves is not considered appropriate for this calculation.

Comparisons between 1986 results and several previous studies (NSBG, 1985; O.R.F., 1985) are reasonably consistent (Table 3). In particular, the similarities in chemical analyses between this and Ontario Research Foundation's report indicate that encouraging talc grades and quality of a bulk sample collected at Dodo Creek by the Trifaux in 1985 might reasonably be extrapolated throughout the remainder of the deposit explored to date. O.R.F. notes further that "most of the present-day talc products usually contain many other minerals such as tremolite, chlorite, dolomite, mica and magnetite" and that "filler grade talcs sold to the paper, plastics and rubber industries contain, at best, 90% talc". As such, the presence of the various mineral components in the Dodo Creek talc deposit should not detract from its value.

TABLE 3: Comparative Analyses of Major Oxide Components from Talc Samples of the WIM-TA Claim Group

Sample	Description	SiO <sub>2</sub> %	Al <sub>2</sub> O <sub>3</sub> %	Fe <sub>2</sub> O <sub>3</sub> %	MgO %	CaO %	LOI %	Others* %	Estimated Talc %
NSBG, 1986									
71601	86-1, 12-27'	30.10	1.31	6.08	27.07	10.83	21.79	0.28	40
602	32-47'	36.10	2.65	6.22	27.82	8.22	17.64	0.76	50
603	52-65'	41.49	5.18	6.96	27.85	4.08	12.22	0.60	65
604	86-3, 20-35'	34.66	1.33	5.73	28.50	8.92	19.51	0.29	17
605	40-50'	41.29	2.50	6.77	28.19	5.22	13.09	0.39	44
606	50-65'	52.96	2.15	5.50	28.98	2.23	7.52	0.29	75
607	86-6, 15-30'	33.96	1.22	6.00	33.10	6.57	19.26	0.27	15
608	40-55'	36.86	0.88	6.62	34.70	3.61	16.44	0.21	20
609	70-84'	38.59	3.64	6.36	27.84	6.94	15.47	0.37	75
611	Pit C	57.45	6.53	4.23	11.66	6.23	11.14	2.58	-
612	Pit B	45.82	6.22	6.83	30.60	0.97	9.26	0.53	50
613	Pit E	32.94	1.20	7.16	29.25	6.92	19.78	0.33	50
O.R.F., 1985	Bulk "peridotite" sample	34.6	1.4	6.6	27.3	9.9	19.5	0.05	-
NSBG, 1985									
89331	grab sample, Dodo Ck								20
332	grab sample, Dodo CK								42
333	old drill core								24

\*Note: Analyses for Na<sub>2</sub>O, K<sub>2</sub>O, TiO<sub>2</sub>, P<sub>2</sub>O<sub>5</sub> and MnO are included as "Others". No trace metals analysis was performed for the 1986 samples.

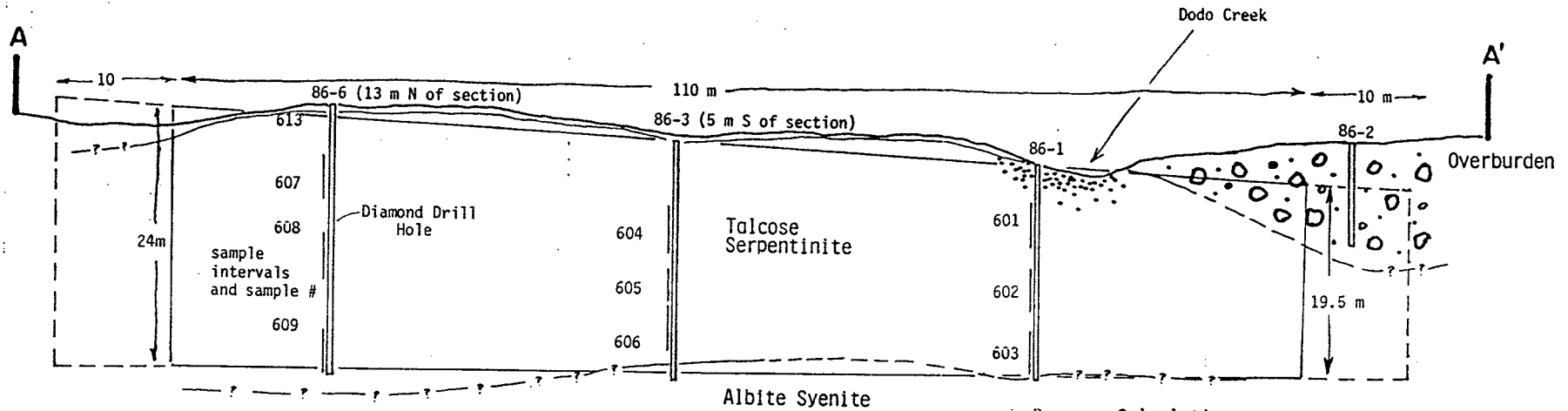
#### 4.4 Reserve Calculation

The 1986 drilling program was designed partly to provide an early indication of the amount of talc in place at the Dodo Creek deposit. Three holes situated along the trend the ultramafic encountered talcose alteration of varying grades to depths exceeding 25 m. For the purposes of calculating reserves in the "Proven and Probable" category, the following criteria were followed:

- 1) The contact between the talcose ultramafic and the phyllite unit is sharp, passing between Pits B and C on a strike of 130°.
- 2) The footwall (ultramafic-phyllite contact) dips at an angle of 55°NE while the "hanging" wall dips vertically.
- 3) The "known" occurrences of talcose alteration may reasonably be extended for 15 m along strike beyond mapped surface outcrops of the ultramafic (i.e. 15 m northwest of 86-6; 25 m southeast of 86-1).
- 4) A surface width of 35 m has been assumed. Outcrop exposure in Dodo Creek extends for 30 m perpendicular to strike northeastward from the ultramafic-phyllite contact before becoming obscured by overburden.
- 5) Two distinct grades of talc are present. The bulk of the deposit consists of material similar to the serpentinized ultramafic exposed in Dodo Creek and intersected by the upper 15 m of the drill holes. Based on visual estimates, and petrographic and chemical analyses, an average grade of 35% talc is assigned to this portion of the deposit. A tabular high grade talc zone approximately 4 m true thickness appears to roughly conform to the footwall (southwest) contact of the deposit. Analyses of this material indicate talc grading between 50 and 85%; an average high grade estimate of 75% talc is selected as being representative of this zone.
- 6) An average specific gravity of 2.70 is assumed for the talcose material.

The configuration of the talc deposit for the ore reserve calculation is outlined in Figure 6. As the quality and grade of talc in "Zone II" appears substantially higher than that in "Zone I", calculations are made in two parts (Appendix C). Mining and marketing strategies could be strongly influenced by the presence of the high grade ore material.

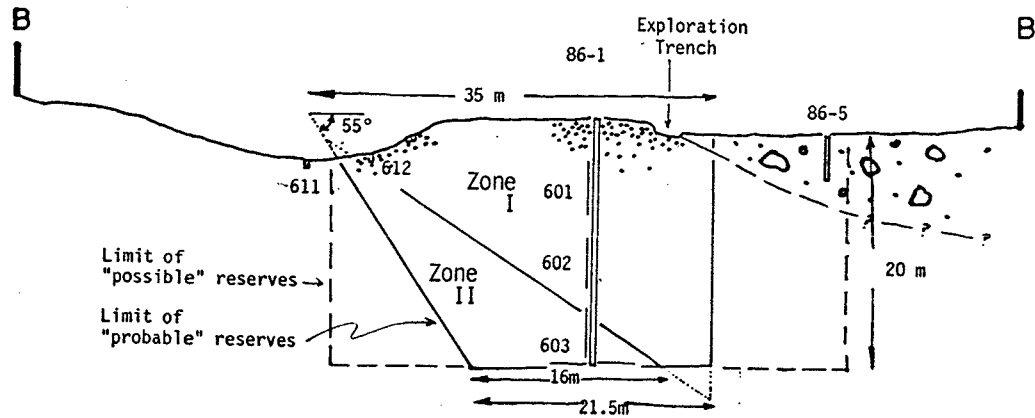
SECTION A-A parallel to strike (Refer to Figure 5)



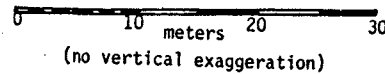
Reserve Calculations:

Proven & Probable	Zone I (@35% talc)	Zone II (@70% talc)	Total
Volume (m <sup>3</sup> )	37 800	17 600	55 400
Tonnage (tonnes)	102 200	47 500	149 700
Potential Talc (tonnes)	35 800	33 300	69 100
<b>Possible</b>			
Volume (m <sup>3</sup> )			117 000
Tonnage (tonnes)			316 000
† Potential Talc (tonnes)			142 000

SECTION B-B perpendicular to strike



SCALE



† assuming an average grade of 45% over the cross section

TRIFCO MINERALS LTD.

RESERVE CALCULATIONS

Dodo Creek Talc Deposit

July 1986

Figure 6

NEVIN SADLER-BROWN GOODBRAND LTD.

## 5.0 CONCLUSION

### 5.1 Conclusions

Preliminary exploration drilling on Trifco Minerals Ltd.'s Dodo Creek talc deposit is very encouraging. Three drill holes stepped as far back as 70 m from known talc occurrences confirm that the longitudinal extent of a serpentinized ultramafic averaging 45% and locally containing up to 95% talc, is at least 110 m (360 ft). 316,000 tonnes of possible ore reserves including proven and probable reserves of at least 150 000 tonnes of talcose material grading an average of 45% are indicated by the recent drilling program.

Understanding of lithological and structural controls on talc occurrences is somewhat limited and further work at Dodo Creek is required to determine the configuration of talcose alteration in the serpentinized ultramafic. Information on the overall width and depth of the deposit will improve the proven and probable talc reserve figures. A better understanding of the size and shape of high grade zones and controls on mineralization are vital to an efficient development of the prospect.

In addition to the Dodo Creek deposit, talc occurrences at several other localities on the WIM-TA group should be delineated on surface and drilled. While it is not anticipated that the talcose ultramafic forms a continuous band across the property, the areal extent of talc showings indicate that continued exploration may lead to the development of further talc reserves on the property outside of the Dodo Creek area.

### 5.2 Recommendations

Continued development of Trifco's Dodo Creek deposit and exploration at other sites on the WIM-TA group is strongly recommended. A two phase approach is envisioned.

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- 20 -

Phase I is intended primarily to establish road access to the various talc prospects on the property and to perform a trenching program in order to open up and detail the surface extent of known talc occurrences. It consists of construction of an access road to the upper Dodo Creek area, preferably from Kilometer 17 of the Swift River Road. This would permit exposure of the known talc prospects in road cuts and would allow for local stripping and trenching. In conjunction with the geological supervision, a magnetometer survey to trace stratigraphy and structure outward from known talc areas should be conducted along a control grid.

Subsequent trenching by backhoe or caterpillar tractor would be conducted at Dodo Creek and Swift River Road Kilometer 17.2 sites. Bulk samples for chemical and petrographic analysis, and for beneficiation trails would be collected at this time. Provisions should be made for a limited diamond drilling program.

Contingent upon results from Phase I, a second phase involving pilot production should be contemplated. At this time, access to the site(s) should have been upgraded. Phase II should include preparation of a pit design and mine plan, submission of various permit and licence applications (including a water use permit for Dodo Creek), and mining and milling equipment obtained. Phase II would be conducted with the intent of demonstrating the feasibility of talc production from the WIM-TA group. Given positive results, pilot production could readily be upgraded to a full scale operation.

### 5.3 Cost Estimate

#### Phase I

1. Road survey and engineering	\$ 2,000
2. Geological mapping and supervision	11,000
3. Accommodation, meals, transport	3,500
4. Road construction and trenching	5,000
5. Trenching, blasting	4,000
6. Diamond drilling	15,000
7. Bulk sample analyses	6,000
8. Reporting, administration, drafting	5,500
9. Contingency @ approx. 10%	5,000

Total Phase I \$ 57,000

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**Phase II**

1. Mine engineering study	\$ 2,500
2. Permitting, review, preliminary studies	3,500
3. Pilot plant, equipment purchase and lease	45,000
4. Mining services	35,000
5. Milling, transportation	25,000
6. Process design and refining	10,000
7. Road maintenance	5,000
8. General administration, mining and geological consulting	15,000
9. Contingency @ approx. 10%	<u>15,000</u>
Total Phase II	\$156,000

Note: No revenue figures have been incorporated in the above cost estimate.

Respectfully submitted,

NEVIN SADLIER-BROWN GOODBRAND

  
Stuart A.S. Graft, P.Eng.

Brian D. Fairbank, P.Eng.

August 26, 1986

**REFERENCES**

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- O.R.F., 1985: Beneficiation and Evaluation of Two Talc-Bearing Bulk Samples from Quesnel, British Columbia. Report by Ontario Research Foundation to Trifco Minerals Ltd. (December 4, 1985).
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- Struik, L.C., 1978: Bedrock Geology, Swift River, B.C.: Geological Survey of Canada, Open File 858.
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APPENDIX A  
AUTHOR'S CERTIFICATE

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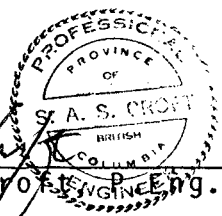
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CERTIFICATE AND STATEMENT OF QUALIFICATIONS

I, Stuart A.S. Croft, hereby certify that:

1. I am a consulting geological engineer residing at 1340 Inglewood Avenue, West Vancouver, B.C. V7T 1Y9.
2. I am employed as a consulting geological engineer by the firm of Nevin Sadlier-Brown Goodbrand Ltd., 401-134 Abbott Street, Vancouver, B.C. V6B 2K4.
3. I hold a B.A.Sc., in Geological Engineering (Geotechnical Option) from the University of British Columbia and have been practicing my profession since 1981.
4. I am a registered member of the Association of Professional Engineers of British Columbia (Geological).
5. During June 1986 I personally visited the WIM-TA claim group and examined and supervised the drilling and sampling program on the Dodo Creek prospect described in this report.
6. I hold no interest, direct or indirect, in the securities or properties of Trifco Minerals Ltd. nor do I expect to receive such interest.
7. I consent to the use by Trifco Minerals Ltd. of this report in a Statement of Material Facts or such other documents as may be required by the Vancouver Stock Exchange, the Superintendent of Brokers, Insurance and Real Estate of B.C. or similar regulatory authorities of the Province of British Columbia.

  
*Stuart A.S. Croft*  
Stuart A.S. Croft, P. Eng.

August 26, 1986

CERTIFICATE OF QUALIFICATIONS

I, Brian D. Fairbank, hereby certify that:

1. My residence address is 320 East Windsor Road, North Vancouver, B.C., V7N 1K1
2. I am a consulting geologist and was employed with the firm of Nevin Sadlier-Brown Goodbrand Ltd., 401-134 Abbott Street, Vancouver, B.C., V6B 2K4 at the time of this report.
3. I hold a B.A.Sc. in Geological Engineering from the University of British Columbia. I have been practicing my profession since 1973, and I am a member of the Association of Professional Engineers (Geological) of the Province of British Columbia
4. I am a Fellow of the Geological Association of Canada and a member of the Canadian Institute of Mining and Metallurgy.
5. I have examined the WIM-TA Claim Group and reviewed the data thereon personally.
6. I hold no direct or indirect beneficial interest in the above properties nor in the securities of Trifco Minerals Ltd.
7. I consent to the use by Trifco Minerals Ltd. of this report in any such documents as may be required by the Vancouver Stock Exchange, the Superintendent of Brokers, Insurance and Real Estate of B.C.; or similar regulatory authorities in the Province of British Columbia.



B. D. Fairbank, P.Eng.

August 26, 1986

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**APPENDIX B**  
**DIAMOND DRILL LOGS**

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GRAPHIC LOG									
ALTERATION					PRECIPITATES				
CHLORITE	ACTINOLITE	ANTIGORITE	DIOPHANE	EPIDOTE	CHLORITE	ACTINOLITE	ANTIGORITE	DIOPHANE	EPIDOTE
ESTIMATED TALC									

DIAMOND DRILL LOG SHEET

HOLE 86-6

SHEET 3 OF 3

DRILLING LOG				GRAPHIC LOG										GEOLOGIC LOG				
FROM	TO	%	ROD	DRILLING COND.	CHLORITE	ACTINOLITE	ANTIGORITE	DIOPHANE	EPIDOTE	CHLORITE	ACTINOLITE	ANTIGORITE	DIOPHANE	EPIDOTE	ESTIMATED TALC	LITHOLOGY STRUCTURE	ALTERATION	PRECIPITATES
80 24.4m	84 25.6m	100		84.0 END OF HOLE											75	"soapstone" though strong remnant features present. 80-82 Remnant shear zone(?) strongly serpentinized. Some phlogopite(?) present within more mafic sections. Talc-antigorite-chlorite form a microcrystalline aggregate throughout section.		Pyrite commonly sheared on fracture faces; mixes with talc.



APPENDIX C  
DETAILS OF RESERVE CALCULATIONS

## Details of Reserve Calculations

In reference to Figure 6:

The "Talcose Serpentinite" shown in Section A-A' is an elongate prism with an average height of

$$(24\text{m} + 19.5\text{m})/2 = 21.8\text{m} \quad \text{SAY } 22\text{m}$$

Remove 2m from the average height to account for overburden, gulleys, etc. Therefore,

$$\text{AVERAGE HEIGHT OF PRISM} = 20\text{m}$$

"PROVEN AND PROBABLE" reserves have been calculated in two parts, ZONE I (grading 35% talc) and ZONE II (grading 70% talc). ZONE II has a triangular cross-section; ZONE I is a truncated triangle. The volume of each prism was obtained by multiplying cross-sectional area by length as follows:

### ZONE I

$$\begin{aligned} \text{VOLUME: } V_I &= \frac{1}{2} [(B \times H) - (b \times h)] \times l \\ &= \frac{1}{2} [(35\text{m} \times 20\text{m}) - (4\text{m} \times 3\text{m})] \times 110\text{m} \\ &= 37840 \text{ m}^3 \end{aligned}$$

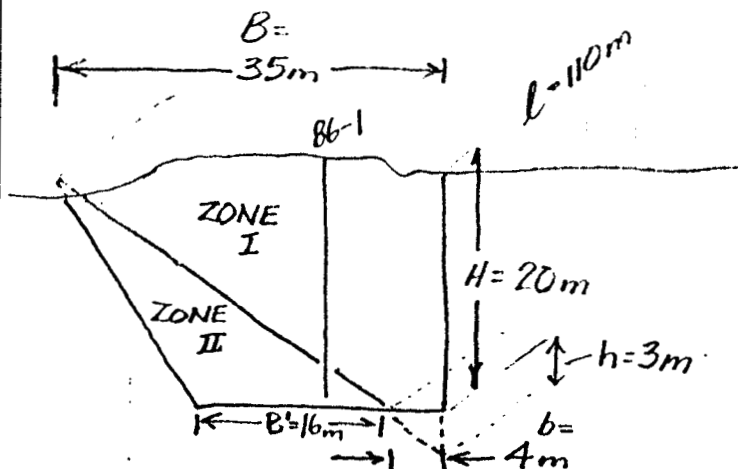
$$\text{TONNAGE: } T = \text{VOLUME} \times \text{SPECIFIC GRAVITY} (= 2.70)$$

$$\begin{aligned} T_I &= 37840 \text{ m}^3 \left( 2.70 \frac{\text{Tonnes}}{\text{m}^3} \right) \\ &= 102168 \text{ Tonnes} \end{aligned}$$

### ZONE II

$$\begin{aligned} V_{II} &= \frac{1}{2} [B' \times H] \times l \\ &= \frac{1}{2} [(16\text{m} \times 20\text{m})] \times 110\text{m} \\ &= 17600 \text{ m}^3 \end{aligned}$$

$$\begin{aligned} T_{II} &= 17600 \text{ m}^3 \left( 2.70 \frac{\text{Tonnes}}{\text{m}^3} \right) \\ &= 47520 \text{ Tonnes} \end{aligned}$$



## POTENTIAL TALC:

$$P = \text{Tonnage} \times \text{estimated grade}$$

$$P_I = 102\,168 \text{ Tonnes (35\% Talc)} \quad P_{II} = 47\,520 \text{ Tonnes (70\%)}$$

$$= 35\,759 \text{ Tonnes talc}$$

$$= 33\,264 \text{ Tonnes talc}$$

TOTAL

TONNAGE	POTENTIAL TALC
149 700 Tonnes	69 100 Tonnes talc

"PROVEN AND  
PROBABLE  
RESERVES"

## AVERAGE OVERALL GRADE ESTIMATE:

$$\frac{69\,023 \text{ Tonnes talc}}{149\,688 \text{ Tonnes "ore"}} = 46.1\% \text{ Talc}$$

"POSSIBLE" reserves are calculated by assigning an average overall grade estimate of 45% talc to a rectangular prism of rock as follows:

## VOLUME:

$$V = l \times w \times h$$

$$= (130 \text{ m}) \times (45 \text{ m}) \times (20 \text{ m})$$

$$= 117\,000 \text{ m}^3$$

## TONNAGE:

$$T = V \times \text{SPECIFIC GRAVITY}$$

$$= 117\,000 \text{ m}^3 (2.70 \text{ tonnes/m}^3)$$

$$= 315\,900 \text{ tonnes}$$

## POTENTIAL TALC

$$T \times \text{grade} = 315\,900 \text{ tonnes (45\%)} = 142\,160 \text{ tonnes}$$

TONNAGE	POTENTIAL TALC
316 000 tonnes	142 000 tonnes talc

POSSIBLE  
RESERVES