SUMMARY REPORT

ON EXPLORATION PROGRAMS

TOMMY JACK PROPERTY

OMINECA MINING DIVISION, BRITISH COLUMBIA

Lat. 56° 06½' N Long. 127° 36' W

N.T.S. 94 D/4E

by

A. I. Betmanis, P.Eng.

January 18, 2002 Vancouver, B.C.

SUMMARY

The Tommy Jack Property, comprised of 49 mineral claim units and covering 1,225 hectares, is located 95 kilometres north of Hazelton in north-western British Columbia. The Property is owned 100% by Alan R. Raven of Madeira Park, B.C. Title to the mineral claims currently is in good standing until September 2002 and October 2003.

The Property is a gold-silver prospect with subordinate values in base metals. The property and adjacent area has been partly explored by modern techniques since the mid-1960's by Canex (Placer-Dome), Noranda, Goldcap, Intertech and Raven. Although total value of exploration work on the actual Tommy Jack claims cannot be estimated accurately due to incomplete recording of work for assessment purposes, an approximate amount expended on the Property and to the credit of exploration advancement of the Property is in excess of $650,000 unadjusted to the year 2002 dollar value.

Mineralization occurs in Mesozoic Bowser Lake Group sediments that have been carbonate altered over an area in excess of 4 kilometres by 2½ kilometres. Within the carbonate altered zone mineralization is primarily in vein structures with some dissemination. Sulphide mineralization in the veins includes pyrite, galena, arsenopyrite, sphalerite pyrrhotite, chalcopyrite, and traces of tetrahedrite. To the south of the carbonate altered zone sulphide-poor gold-silver quartz veins occur. In the Noranda explored area in the northern part of the Property veins generally are high in gold with lesser silver values. In the Unnamed Creek area known veins are high in silver with lesser gold values. It appears likely that two or more mineralizing events have taken place on the property. Although economically mineable zones have not been located to date, precious metal values encountered in exploration of veins is approaching grades that could be economic if sufficient volumes of mineralization are found.

It is not the objective of this report to give specific recommendations for future exploration programs, but to evaluate whether continued exploration is warranted and to suggest what direction that exploration should take.

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TOMMY JACK PROPERTY, OMINECA MINING DIVISION, B.C.

INTRODUCTION

This report summarizes exploration programs that have been conducted on the Tommy Jack precious metal prospect located in northwestern British Columbia. The report was commissioned by Alan R. Raven, mineral titleholder of the property.

Data presented in this report are based on results accumulated from work done to explore the property over a number of years primarily by Noranda Exploration Company Limited, Goldcap Incorporated, Intertech Minerals Corporation and Alan Raven. Incorporated also is information available from Provincial and Federal Government sources. The author has neither visited the property nor carried out exploration work on the property. Data examined have been prepared by persons with professional qualifications and are accepted as a factual representation of exploration results.

The property is a gold and silver precious metal prospect with associated subordinate base metal values in lead, zinc and copper. Mineralization occurs primarily in veins and to a lesser extent as dissemination. No economically mineralized zones or mineable areas as yet have been identified. Abundant mineralized occurrences and indications have been found in an area greater than 4 kilometres by 2½ kilometres to justify additional exploration for economically mineralized zones.

LOCATION, ACCESS AND PHYSIOGRAPHY

The Tommy Jack property is situated 95 kilometres north of Hazelton, in the Omineca Mining Division, B.C. It lies a short distance south of the Sicintine River at its junction with Tommy Jack Creek (Figs 1 and 2). Beaver Creek and Unnamed Creek (locally adopted names) flow northerly through the western and eastern edges respectively of the property.

The claims are located centrally within the N.T.S. 94 D/4E map division at about longitude 127° 36' W and latitude 56° 06½' N, or U.T.M. coordinates Zone 09 588,000 E, 6,219,000 N (NAD^{27}).

Elevations on the property vary from 900 metres near Sicintine River area to about 1760 metres a.s.l. at Moret Ridge in the southern part of property, and are within the Atna Range of the Skeena Mountains.

Access to the property is by helicopter. In recent years logging roads have been extended to within 10 kilometres south of the property thereby reducing helicopter costs considerably if materials and supplies are ferried to the property from the logging road. Helicopters chartered from Smithers, the closest large supply center, requires a ferry distance of 150 kilometres and takes somewhat over one hour flying time each way.

Several tent campsite locations have been used in the past. The old Noranda camp site location shown in Fig. 4 is well established, convenient to a water supply, and situated fairly centrally on the property.

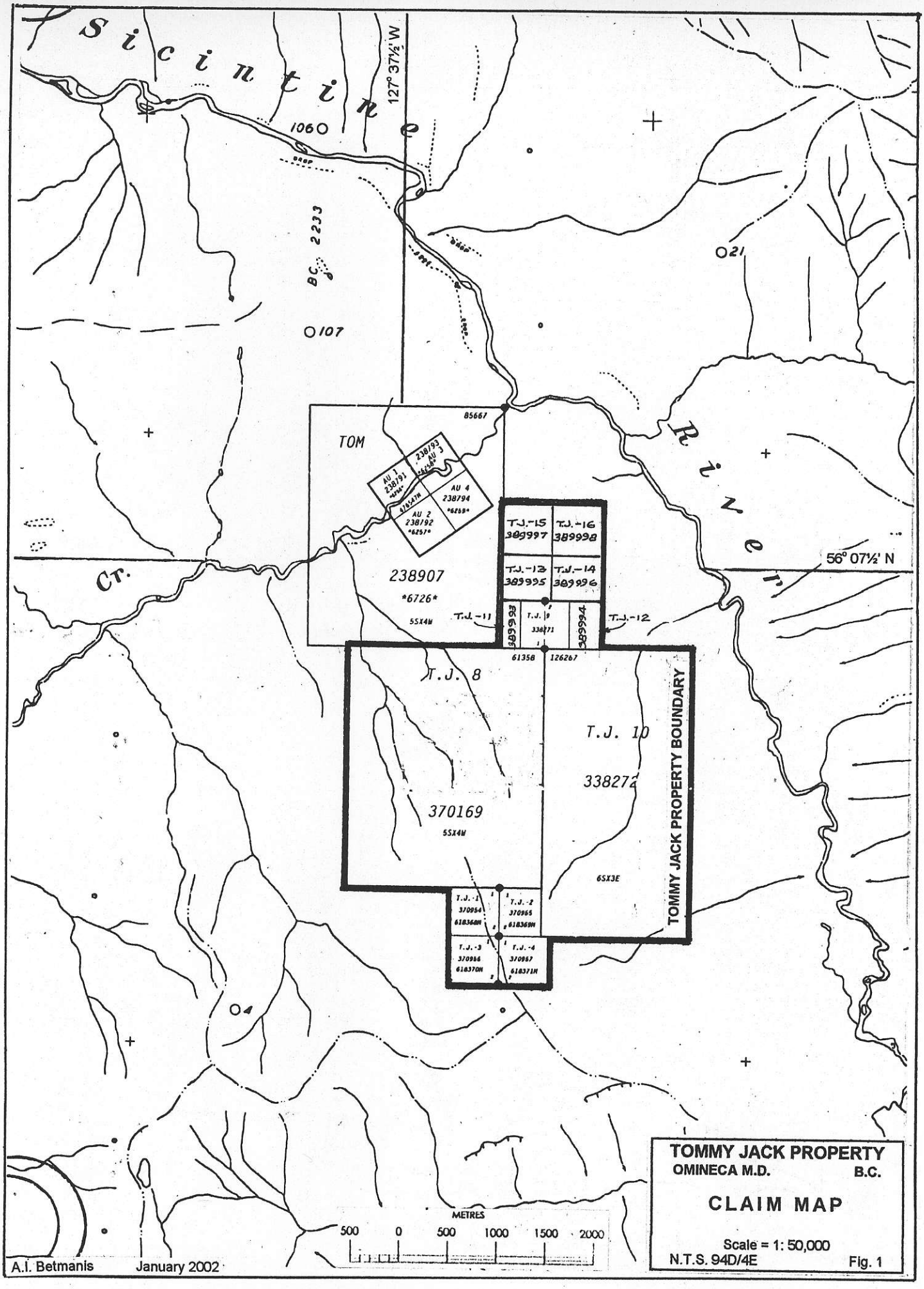
Topography is moderate to moderately steep. The area is heavily forested with virgin balsam fir, spruce and hemlock up to the tree line at 1500 metres elevation. Above the tree line heather, scrub fir, grassy areas and talus slopes predominate.

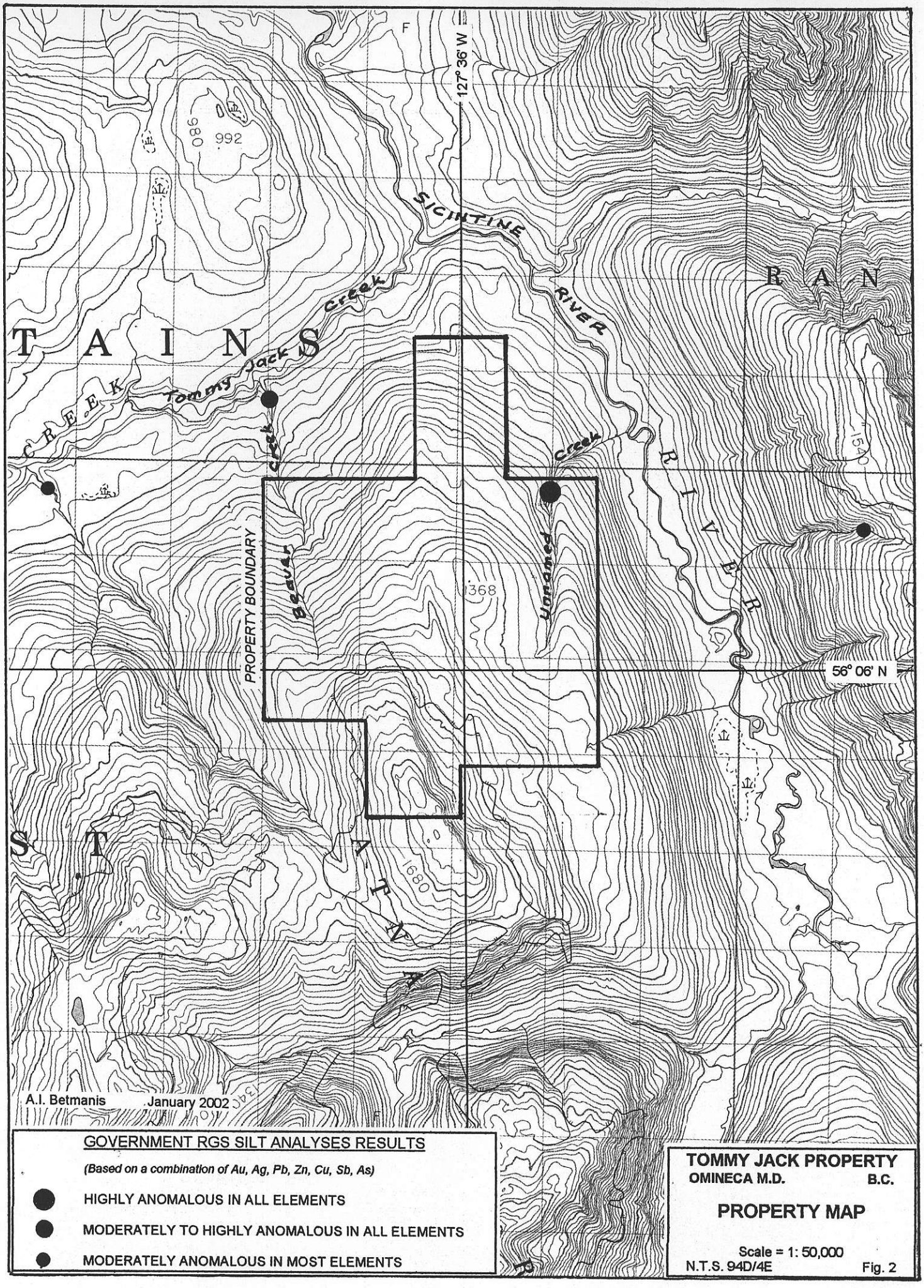
PROPERTY OWNERSHIP AND DATA

The Tommy Jack property is comprised of 49 mineral claim units covering an area of 1,225 hectares. The claims are contiguous. They were staked and are 100% owned by Alan R. Raven of Madeira Park, B.C. All claims are in good standing. A list of the claims is tabulated below:

CLAIM	UNITS	TENURE N^{0}	RECORDED	EXPIRY DATE
T.J. 1	1	370954	Jul 31/99	Oct 01/03
T.J. 2	1	370955	Jul 31/99	Oct 01/03
T.J. 3	1	370956	Jul 31/99	Oct 01/03
T.J. 4	1	370957	Jul 31/99	Oct 01/03
T.J. 8	20	370169	Jul 11/99	Oct 01/03
T.J. 9	1	338271	Jul 28/95	Oct 01/03
T.J. 10	18	338272	Jul 20/95	Oct 01/03
TJ 11	1	389993	Sep 16/01	Sep 16/02
TJ 12	1	389994	Sep 16/01	Sep 16/02
TJ 13	1	389995	Sep 16/01	Sep 16/02
TJ 14	1	389996	Sep 16/01	Sep 16/02
TJ 15	1	389997	Sep 16/01	Sep 16/02
TJ 16	1	389998	Sep 16/01	Sep 16/02

Adjacent and to the northwest of the Tommy Jack property and straddling Tommy Jack Creek are the TOM (20 units) and included AU 1-4 (4 units) claims owned by Lorne Warren of Smithers, B.C. These claims cover the original Tommy Jack Creek showings that were found by early prospectors. They were optioned by Noranda from Warren and led to the discovery of mineralization of the Tommy Jack property now held by Raven. The Warren claims are in good standing.


Sicintine
127° 37½' W
1060
BC. 2233
0107
021
River
56° 07½' N
Cr.
85667
TOM
238907
6726
5SX4W
AU 1
238791
AU 2
238792
6257
AU 3
AU 4
238794
6258
T.J.-15
389997
T.J.-16
389998
T.J.-13
389995
T.J.-14
389996
T.J.-11
T.J.-12
389993
389994
61358
126267
T.J. 8
T.J. 10
338272
370169
5SX4W
6SX3E
TOMMY JACK PROPERTY BOUNDARY
T.J.-1
370964
T.J.-2
370965
T.J.-3
370966
T.J.-4
370967
04
METRES
500 0 500 1000 1500 2000
TOMMY JACK PROPERTY
OMINECA M.D. B.C.
CLAIM MAP
Scale = 1: 50,000
N.T.S. 94D/4E
Fig. 1
A.I. Betmanis January 2002


127° 36' W
SICINTINE RIVER
Tommy Jack Creek
CREEK
PROPERTY BOUNDARY
Beaver Creek
Unnamed Creek
RIVER
56° 06' N
1540
1368
1680
A.I. Betmanis January 2002
GOVERNMENT RGS SILT ANALYSES RESULTS
(Based on a combination of Au, Ag, Pb, Zn, Cu, Sb, As)
HIGHLY ANOMALOUS IN ALL ELEMENTS
MODERATELY TO HIGHLY ANOMALOUS IN ALL ELEMENTS
MODERATELY ANOMALOUS IN MOST ELEMENTS
TOMMY JACK PROPERTY
OMINECA M.D. B.C.
PROPERTY MAP
Scale = 1: 50,000
N.T.S. 94D/4E
Fig. 2

PREVIOUS EXPLORATION

The Tommy Jack Creek showings are reported to have been discovered by Tommy Jack, a trapper from Hazelton. Prospectors did some work around the showings in the 1930's and 1940's with financial assistance from Maynard Kerr of Vanderhoof. In 1962-3 Kerr and Glen Huck relocated the showings. Whatever work was done by Kerr and Huck and earlier prospectors has been poorly documented.

In 1964 Canex Aerial Exploration acquired the Tommy Jack Creek property and carried out a limited geochemical soil survey and some trenching. In 1968 four shallow drill holes were drilled near Tommy Jack Creek. Results of the drilling and trenching have not been documented. The property was relinquished due to being considered a poor porphyry copper-molybdenum target.

In 1984 Noranda examined the property and negotiated an option from Warren. Noranda recognized that mineralization extends well onto the current Tommy Jack property and extended the claim area. In 1985 a soil grid was sampled over an area of 2 kilometres by 3 kilometres. Geological mapping, prospecting and silt sampling were also carried out. A Joint Venture to further explore the property was negotiated with Goldcap Incorporated.

In 1986 Noranda and Goldcap carried out magnetic, VLF-EM and geophysical surveys and drilled 10 NQ diamond drill holes for a total of 762 metres. This work was continued in 1987 with extended geophysical and geochemical surveys, geological mapping, and the drilling of an additional 25 diamond drill holes to bring the total drill testing to 2,452.5 metres drilled in 35 holes. Twelve of these holes were drilled on the current Tommy Jack property.

In 1988 Intertech Minerals Corporation negotiated an option to acquire 50% interest in the property from Noranda and Goldcap. In 1989 under the new Joint Venture agreement Intertech extended Noranda's geochemical and geophysical surveys and carried out more extensive prospecting and geological mapping.

Over the next few years Noranda readjusted company objectives and priorities and the claims were permitted to lapse. Raven acquired the Tommy Jack property as the ground became open.

In 1995 Raven expanded geechemical anomalies and prospected in the Unnamed Creek area. Highly anomalous precious metal rock samples were located. Silver values generally were higher than obtained by Noranda in the northern part of the Tommy Jack property and on the Warren ground.

Further rock sampling and prospecting was done by Raven in 1999. Fairly detailed self-potential (SP) surveys were carried out by Raven. SP anomalies were followed up by hand trenching and pits with fairly good success in locating

precious metal sulphide mineralized veins. There was some correlation of SP anomalies with VLF-EM anomalies located earlier by Intertech. Some SP anomalies were explained by graphitic structures. Occasionally overburden depths prevented adequate trench testing of SP anomalies.

An estimate by Raven of the monies spent on exploration on the Tommy Jack property and on the Warren ground that indirectly benefits exploration of Tommy Jack is over $650,000. This amount has not been adjusted to a year 2002 dollar value and does not include work done but not declared for assessment purposes.

GEOLOGY

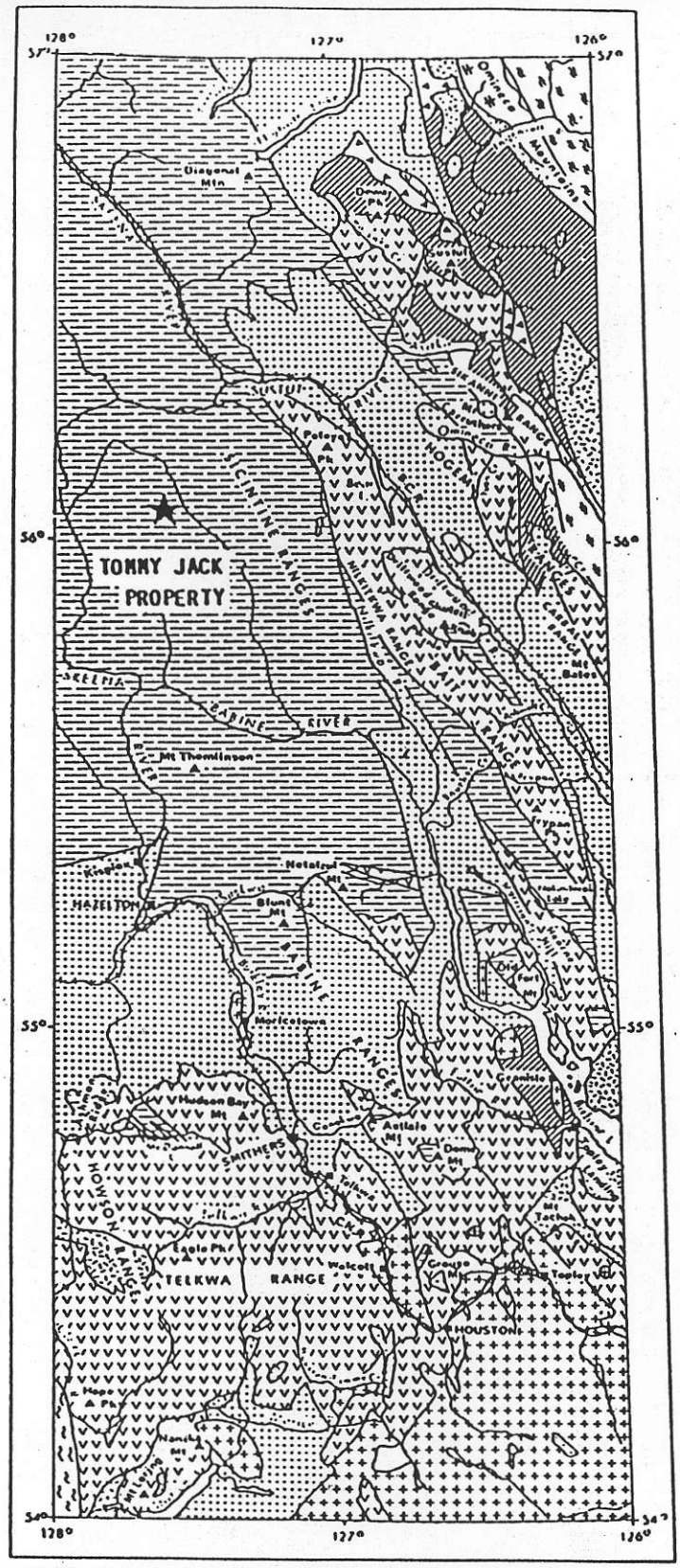
Regional Geology

Knowledge of regional geology is based mainly on data provided by Tipper and Richards and provides only a generalized setting in which the Tommy Jack property is situated.

The property is located near the eastern limit of the Bowser Basin that is filled with a thick assemblage of middle to upper Jurassic marine and non-marine Bowser Lake Group sediments. The sediments are composed of shale, siltstone, sandstone and minor conglomerate. The Bowser Lake sediments are bounded on the east by lower to middle Jurassic Hazelton Group volcanic rocks. West of the Bowser Basin granitic and metamorphic rocks of the Coast Crystalline Belt outcrop. Small stocks and batholiths of Cretaceous Bulkley Intrusions composed of porphyritic granodiorite to quartz monzonite are emplaced in the Bowser Lake Group sediments. The closest Bulkley Intrusion to Tommy Jack has been mapped 10-15 kilometres to the south.

Geological interpretation by the B.C. Geological Survey indicates a regional northwesterly fault trending through the center of the property. This is substantiated by air photo interpretation. To the southwest of the fault the Bowser Lake group sediments have been grouped with Bowser Lake Facies B whereas to the northeast the sediments have been left undifferentiated. For all practical purposes there is not much difference between Facies B and Undifferentiated.

In a regional setting the closest mineralized deposits to Tommy Jack are the old Silver Standard Duffy Mine (225,000 tons mined of silver with associated sulphide ore) about 85 kilometres to the south and the Jake prospect about 25 kilometres to the northeast. Geologically the Silver Standard veins are similar to Tommy Jack, i.e. quartz-sulphide veins with silver and some gold emplaced in fissures in Bowser Lake Group sediments. Some of the veins extend into Bulkley Intrusion granodiorite. Mineralization at Jake is more varied with an occurrence of veins similar to Tommy Jack, auriferous sulphide dissemination adjacent to



GENERAL GEOLOGY

of the

SMITHERS, HAZELTON

and

McCONNELL CREEK MAP-AREAS

LEGEND

Tertiary (Paleocene to Miocene)

Ootsa Lake and Endako Groups

Lower Cretaceous (Hauterivian) to Eocene

Skeena and Sustut Groups

Middle to Upper Jurassic (Bathonian to Oxfordian)

Bowser Lake Group

Lower to Middle Jurassic (Sinemurian to Callovian)

Hazelton Group

Upper Triassic to Lower Jurassic

Intrusive Rocks

Upper Triassic

Takla Group

Upper Paleozoic

Asitka Group

Cache Creek Group

Lay Range Assemblage

Crystalline Terranes

Omineca Crystalline Belt

Coast Plutonic Complex

Kilometres

0 60 120

G.S.C.

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REGIONAL GEOLOGICAL SETTING
OF THE
TOMMY JACK PROPERTY

After Tipper and Richards (1974)

Fig. 3

intrusive dykes, and locally pyrite with weak chalcopyrite dissemination. A Bulkley Intrusion lies just southeast of Jake. Jake dyke swarms possibly are Kastberg Intrusions (T. Schroeter, BCGSB, pers. com.) which likely are later than the Bulkley Intrusions. Petrographically the dykes have been classed as quartz latite porphyries of hypabyssal intrusions rather than plutonic.

Property Geology

Geological mapping of the property has been hampered by outcrop exposures being confined to creek beds and partly to steep escarpments on the flanks of ridges. Diamond drilling core added somewhat to the geology. Lack of identifiable marker beds prevents even tentative correlation between lithological units.

Mapped sediments include Bowser Lake shale, argillite, siltstone and sandstone. Sandstone occurs more frequently in the western and southern parts of the property, which may be partly indicative of a more active deposition of Facies B. Conglomerate has not been mapped in outcrop but minor amounts have been logged in drill core. The sediments are various shades of grey and weather tan to brown due to carbonate content. Minor bituminous coal beds have been found in tributaries of Beaver Creek. Some carbonized fossils have been found. Shallow marine deposition is indicated. The sediments trend from northwesterly to northeasterly with gentle to moderate dips both east and west.

Fairly frequent granodiorite to dacite dykes and possible sills have been mapped and encountered in drilling. The dykes are narrow and rarely exceed 4 metres in width. Where dyke contacts have been found in outcrop variable attitudes have been noted. The frequency of dykes indicates that the property likely is underlain by a lager intrusive body at depth. No petrographic work has been done to relate the dykes to Bulkley Intrusions or Kastberg Intrusions.

Faulting has been mapped and interpreted to extend for a length of a few hundred metres to several hundreds of metres in the Beaver Creek and Unnamed Creek areas. Numerous smaller faults, fissures and fracture zones that cannot be extended or correlated have been mapped. A number of these fault, fissure or fracture zones have vein fillings and occasionally are graphitic.

Airphoto Interpretation and Satellite Imagery

Aerial photograph interpretations for structure were made by Noranda and Allen. Satellite imegery is available from BCGCS through the MapPlace.

The most striking feature obvious in aerial photographs and satellite images is a circular feature located in the north central part of the property and lying adjacent

to and just northeast of the northwest trending regional fault indicated by BCGCB. Allen shows the circular feature as being larger and located more to the south than shown by Noranda. This difference likely is due to a difference in interpreting the inside or outside rims of the feature and the degrees off vertical that the photographs used were filmed. Noranda shows the diameter of the circular as 1½ kilometres whereas Allen shows it as between 1½ and 2 kilometres diameter. Noranda did not want to postulate the significance of the circular without better geological understanding of the property. Allen presumed, possibly justifiably due to the abundance of dykes, that the circular indicates a buried intrusive at depth and represents a doming of the sediments. Distinct circulars such as on Tommy Jack are caused by volcanic necks, calderas, collapsed calderas, buried intrusives that advanced and then receded, and rarely by ring dykes. The latter has no field evidence for it and is highly unlikely. Geological mapping gives no evidence of a volcanic neck. The other causes are somewhat related but vary in degrees of development. From geophysical and geological field data available an advancing buried intrusive that receded with resultant fracturing, dyking and vein emplacement in fissures appears to be the most likely explanation.

A number of aerial photograph linears have been identified but not always supported by field evidence, possibly and partly due to lack of rock outcrop exposures. The majority of these linears trend north northwesterly. A few trend northerly. These are the trends of geochemical soil anomalies, electromagnetic anomalies, and a number of geological attitudes. They can assist in projecting mapped structures. One northwesterly linear identified by both Noranda and Allen correlates with the regional fault through the property interpreted by BCGSB.

Mineralization and Alteration

Mineralization is primarily gold, silver, lead, zinc, and copper occurring in quartz-carbonate veins, as stockwork veinlets and dissemination adjacent to intrusive dykes, and in quartz veins. The metal bearing minerals are pyrite, galena, sphalerite, chalcopyrite, and lesser pyrrhotite and tetrahedrite, and rare ruby silvers. Gangue minerals are quartz and carbonate composed of calcite, dolomite and ankerite. A number of veins encountered display a well-banded texture with fine to coarse-grained sulphides interlayered with gangue minerals. The veins generally are from a few centimetres to less than one metre wide but can range up to two metres wide.

A broad carbonate alteration zone at least 3½ kilometres long in a northwesterly direction and 2½ kilometres wide has been mapped by Allen. The predominant carbonate mineral of the zone is ankerite. Sericite and chlorite occur to a lesser extent in dykes and quartz-carbonate veins within the alteration zone. Ankerite

N

LEGEND

- DIAMOND DRILL HOLE
- 87-6 DIAMOND DRILL HOLE WITH SIGNIFICANT Au-Ag
- mJKB BOWSER LAKE GROUP SEDIMENTS, undivided
- mJKBB BOWSER LAKE GROUP SEDIMENTS, facies B
- APPROXIMATE BOUNDARY OF ALTERATION AND VEIN ZONES
- B.C.G.S.B. MAPPED AND PROJECTED FAULT
- AIRPHOTO LINEAR, CIRCULAR (Noranda and Allen)
- EXPLORATION SURVEY CONTROL BASE LINES
- CREEK BED

mJKB
mJKBB
87-16
Unnamed Creek
Alteration
Linear
Carbonate
Approx. location
BL 217 E
BL 100 E
87-11
87-10
87-8
Camp
Linear
Airphoto circular
Airphoto linear
Fault
Zone
Vein
Linear
Ridge
Moret
87-18
87-1
87-20
87-14
87-19
87-22
87-23
86-4
86-2
86-1
BL 100 E
Regional
Carbonate Alteration
BL 210 E
Beaver
Creek
BL 200 E

0 500m 1km

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TOMMY JACK PROPERTY
OMINECA M.D. B.C.

BASIC GEOLOGY
AND
DRILL HOLE LOCATIONS

Scale = 1: 20,000
N.T.S. 94D/4E Fig. 4

alteration is most apparent by its tan colour in weathered outcrops. The Moret Ridge veins are situated to the south and outside the carbonate alteration zone.

The carbonate alteration zone follows the trend of the regional northwesterly fault, occurs on both sides of it, includes the entire circular feature and is widest around the circular feature.

The quartz-carbonate veins are widespread throughout the Tommy Jack property. Gold-quartz veins with lesser sulphides are more frequent in the Moret Ridge area at the southern end of the property. From the accumulation of data over several exploration phases broad generalizations become apparent. These are:

Majority of mineralized veins occurs near the rim or outside but proximal to the circular feature.
The circular feature has a direct bearing on mineralization.
Gold-silver quartz-carbonate veins are more common northwest and west of the circular feature.
Silver-gold quartz-carbonate veins are most common east of the circular feature.
The Moret Ridge gold-quartz veins are distal and distinct from any mineralization that is very closely associated with the circular feature but likely are related to the main mineralizing event.

GEOCHEMICAL SURVEYS

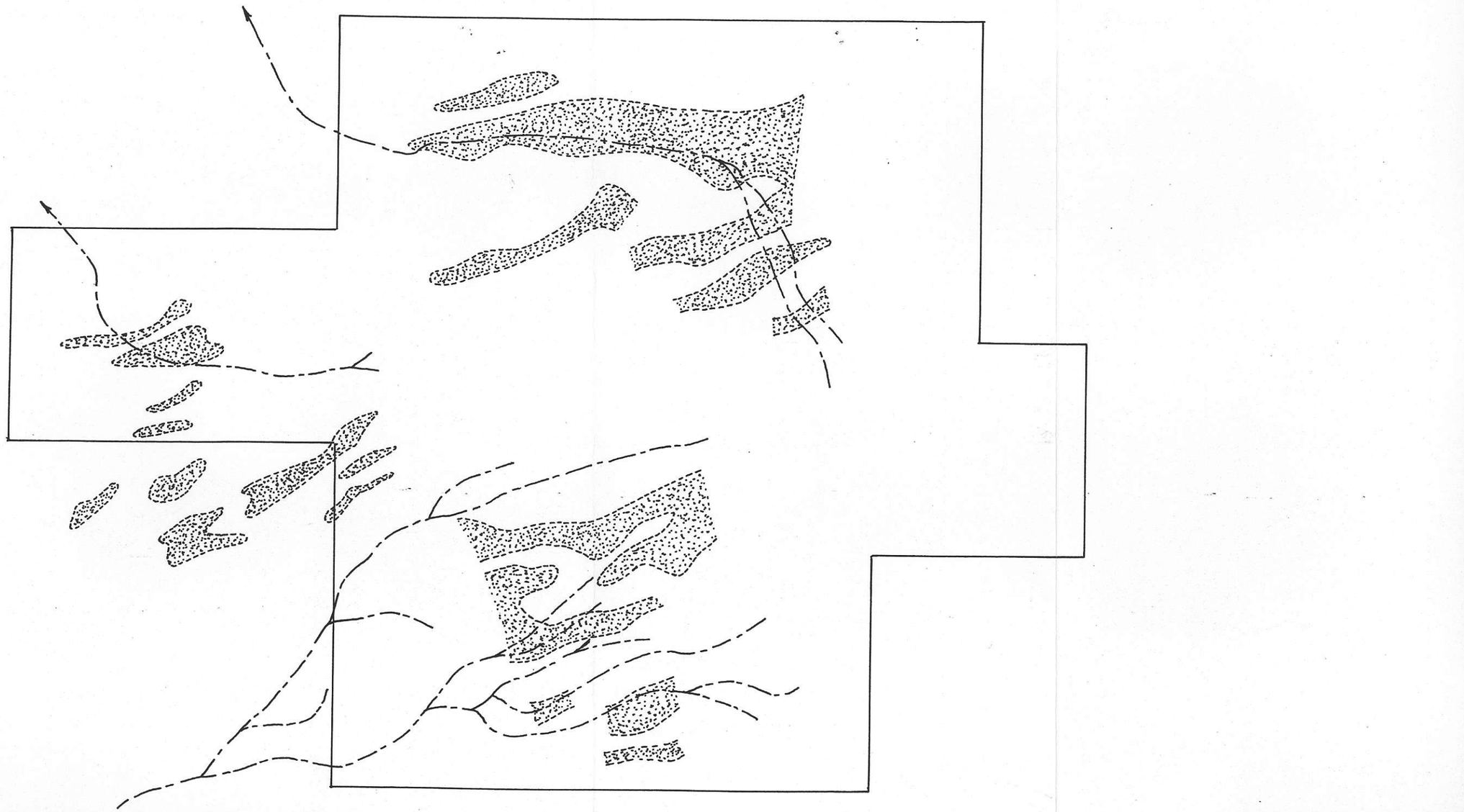
Stream Silt Surveys

The B.C. Geological Survey sampled stream silts from the N.T.S. 94 D map sheet and analyzed them for a large group of elements, including gold, that would be of assistance to exploration. The actual results have been published and on the MapPlace website are expressed for each element in percentile relative to all results for that element from the map sheet. The percentile presentation is a useful evaluation of the degree to which each sample is anomalous relative to the regional geological environment. The size of the drainage basin will affect the absolute analyzed value due to dilution.

In the Tommy Jack area Unnamed Creek is highly anomalous in Au, Ag, Pb, Zn Cu, Sb, and As. Beaver Creek is moderately to highly anomalous in all of the above elements. Adjacent creeks outside the property are only moderately anomalous in most of the elements.

Noranda collected 92 silt samples and analyzed them for Au by AA and 30 elements by ICP methods. The most highly anomalous results were from Unnamed Creek. Allen collected only a few silt samples to compliment

N



0 500 m 1 km

SOIL ANOMALIES SHOWN ARE BASED PRINCIPALLY ON Au AND Ag
AND COMPLIMENTED WITH ASSOCIATED RELATED Sb, As, AND Hg.

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TOMMY JACK PROPERTY
OMINECA M.D. B.C.
GOLD AND ASSOCIATED ELEMENT
SOIL ANOMALIES
Scale = 1: 20,000
N.T.S. 94D/4E Fig. 5

Noranda's sampling since the exploration programs had progressed to the stage where more obviously anomalous areas had been identified.

Soil Surveys

Geochemical soil surveys were conducted by Noranda, Allen and Raven. Samples were analyzed for gold and multi elements by ICP. Most soil samples were collected from B-horizon soils. Noranda at times resorted to collecting A horizon soil whenever the B-horizon was not developed or reached. Some of Allen's sampling included talus fines on steep slopes with poor soil development. Raven collected only well developed B-horizon soils.

Initial soil sampling by Noranda extended from the Warren ground to the northern part of Tommy Jack, and included grids in the Beaver Creek and Unnamed Creek areas. Allen extended Noranda's soil sample grids mainly in the Unnamed Creek area. Raven's soil sampling was in the Unnamed Creek area. Approximately two thirds of the Tommy Jack property has been soil sampled. No soil sampling has been done in the south end of the property or at Moret Ridge.

A compilation of soil anomalies based on Au with associated Ag, Sb, and As is shown in Fig. 5. The anomalies show a persistent north-northwest trend. This is the predominant geological trend on the property. Glacial ice movement was from the north to northeast and does not appear to have smeared or transported soils sufficiently to significantly distort anomalies.

Rock Surveys

Rock samples have been collected for assay and geochemical analyses by Noranda, Allen and Raven. Due to scarcity of outcrops a large proportion of rock samples had to be float or talus samples. Since glacial smearing is not indicated from soil anomalies as being overly significant, samples collected from other than outcrop likely are proximal to their source.

Rock samples that have significantly anomalous gold values are shown on Fig 6 and results tabulated in Table 1. Although these samples are from narrow veins, large proportion of them have metal content that is comparable to mined deposits where sufficient volumes of mineralized rock occur.

N

88881
88886
76122
86619
729-2
724-1
729-4
76124
86621
727-3
76121
727-1
88892
88893
906318
906319
88895
78072
88977
86615
76110
76111
99081
19700
99085
88979
26778
TJ-6
906322
906323
99097
92601
99091

0 500m 1km

LEGEND

- ● ○ NORANDA SAMPLES, outcrop, float
- ■ □ INTERTECH SAMPLES, outcrop, float
- ▲ △ RAVEN SAMPLES, outcrop, float

(refer to table by sample number for Au and Ag assays)

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TOMMY JACK PROPERTY
OMINECA M.D. B.C.
ROCK SAMPLE LOCATIONS
HIGHLY ANOMALOUS Au-Ag
Scale = 1: 20,000
N.T.S. 94D/4E Fig. 6

SAMPLE	g/t Au	g/t Ag	MINERALIZATION	ORIGIN
19700	7.06	1099.5	qz, py, as, gn	Noranda
26778	6.99	6.2	qz, as, py	Noranda
76110	13.73	Trace	qz, fe, gn	Noranda
76111	6.78	Trace	qz, fe, py	Noranda
76121	5.40	2.1	qz, py	Noranda
76122	14.95	0.2	qz, ak, py, sp, gn	Noranda
76124	29.90	0.2	qz, ak, py, gn, sp	Noranda
78072	25.03	158.7	qz, py, gn?	Noranda
86615	12.21	Trace	qz, cb, py, as, gn	Noranda
86619	25.89	79.9	py, qz, sp, gn	Noranda
86621	31.61	114.2	py, qz, gn	Noranda
88881	6.89	79.2	qz	Noranda
88886	14.16	67.5	qz, py, gn	Noranda
88892	17.90	102.9	qz, py, as, sp	Noranda
88893	39.77	851.7	qz, py, gn	Noranda
88895	8.54	28.5	qz, py, as?	Noranda
88977	18.93	75.1	qz, py	Noranda
88979	7.47	22.6	?, as, gn, py	Noranda
92601	37.03	272.9	qz, gn, py	Noranda
99081	7.58	28.5	qz, py, as, gn, sp	Noranda
99085	5.62	1428.0	qz, py, as, td, gn	Noranda
99091	14.19	2540.6	qz, sp, td, gn, py	Noranda
99097	33.12	224.2	qz, py,gn	Noranda
TJ-6	22.77	Trace	qz	Intertech
906318	74.40	616.11	qz, py, gn, sp	Intertech
906319	1.44	9.94	qz, py, as	Intertech
906322	1.68	16.46	qz, py	Intertech
906323	34.25	1914.86	qz, py, gn, sp, cp	Intertech
724-1	0.14	87.4	py, sp, gn, cp, fe	Raven
724-2	0.01	41.4	py, gn, sp, cp	Raven
727-2	0.47	1.6	fe, py	Raven
727-3	0.29	1.2	py, cp, sp	Raven
729-4	2.73	14	py, as, gn	Raven

Sulphide minerals: py-pirite, gn-galena, sp-sphalerite, as-arsenopyrite, cp-chalcopyrite, td-tetrahedrite.

Gangue and alteration minerals: qz-quartz, fe-limonite, cb-carbonates, ak-ankerite

Table 1. SIGNIFICANTLY ANOMALOUS ROCK SAMPLES

GEOPHYSICAL SURVEYS

Magnetic Surveys

A large but moderately weak aeromagnetic low is located in the north central part of the property (MapPlace). The magnetic low corresponds well with the circular feature evident from aerial photographs and satellite imagery, as well as the center of the carbonate altered zone. The low is presumed to be the result of alteration. Most Bulkley Intrusions have a positive magnetic signature. If an intrusion exists at depth it most likely is deeply buried.

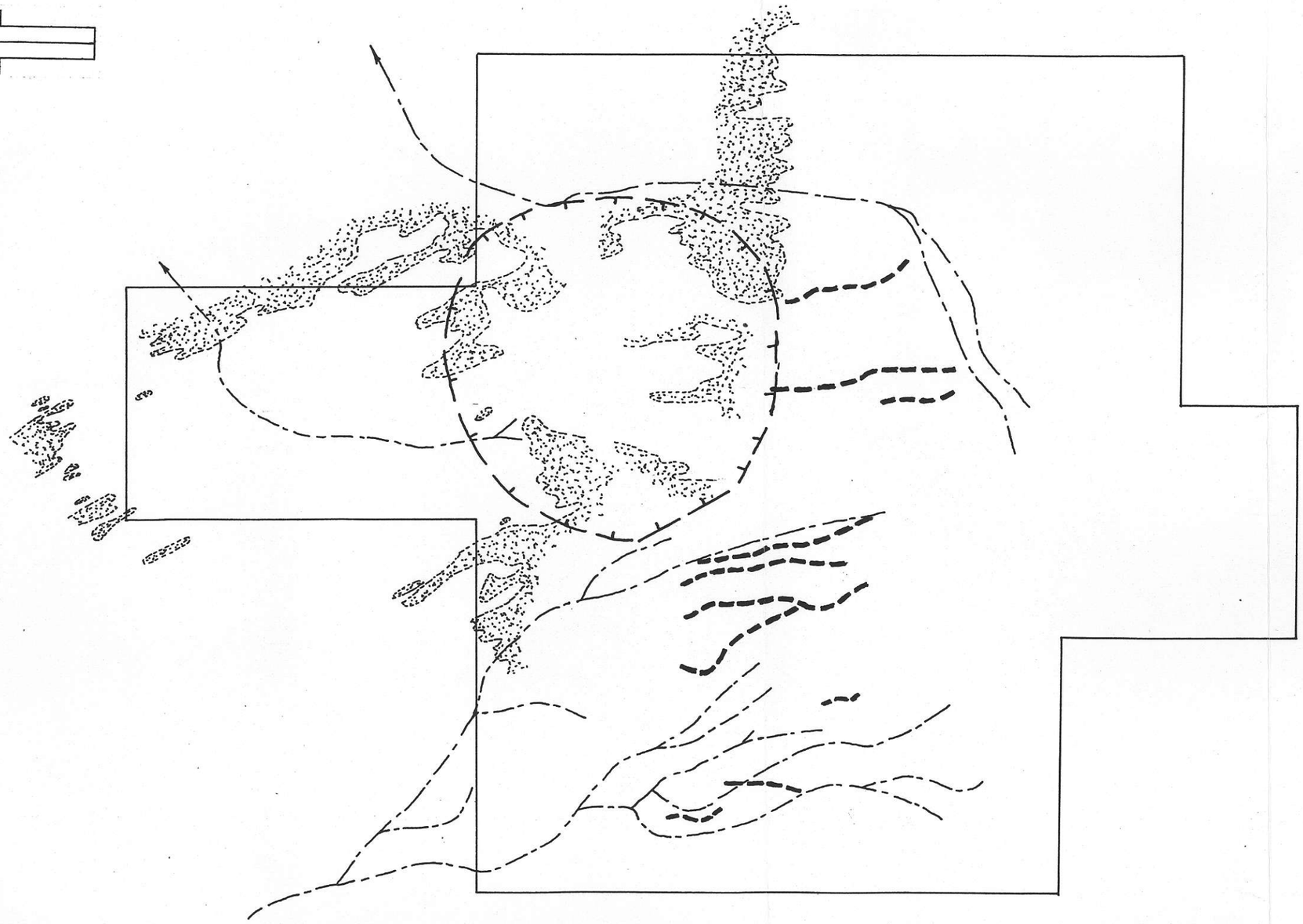
Total field ground magnetic surveying by Noranda and Allen shows areas of magnetic highs that have a rough northwesterly trend similar to geology and the direction of geochemical soil anomalies. In the northern part of the property the magnetic highs are located mainly outside the carbonate zone. In the central Unnamed Creek area and just east of Beaver Creek magnetic highs lie within the carbonate altered zone. Geologically the mixture of Bowser Lake sediments on the property is fairly uniform, indicating that ground magnetics are largely a reflection of alteration intensity. Pyrrhotite mineralization gives a positive magnetic response, but the amount of pyrrhotite present in veins is so slight that only a very detailed magnetic survey would indicate pyrrhotite-bearing veins.

VLF-Electromagnetic Surveys

VLF-electromagnetic (VLF-EM) surveys were carried out by Noranda and Allen. The locations of main anomaly axes are shown in Fig. 7. VLF-EM is an easy and fast electromagnetic survey method. It responds to a variety of conductors and could be caused by sulphide concentrations, graphite, large faults, water-saturated fractures and, to some extent, geological contacts. It is dependent on low frequency radio waves that travel near the earth's surface and generated from various points in the world. The response of VLF-EM to conductors is therefore dependent on the signal strength and the direction to the transmitting station selected relative to conductor strike. A VLF-EM survey is not as definitive as other electromagnetic methods that use a locally generated signal.

Several northwesterly to northerly VLF-EM conductors were located outside the circular feature in the Beaver Creek area and south of the circular. Not all of them have been explained geologically. Trenching by Raven in the Unnamed Creek area related some sulphide mineralized veins to VLF-EM indicated conductors.

N



LEGEND

TOTAL FIELD MAGNETIC HIGH (based on 25 gamma isomagnetics)

VLF-EM ANOMALY AXIS

CIRCULAR AIRPHOTO FEATURE

PROFESSIONAL ENGINEER
PROVINCE OF BRITISH COLUMBIA
A. I. BETMANIS

0 500m 1km

TOMMY JACK PROPERTY
OMINECA M.D. B.C.

GEOPHYSICAL SURVEY COMPILATION

Scale = 1: 20,000
N.T.S. 94D/4E Fig. 7

A.I. Betmanis January 2002

Self Potential Surveys

A self potential (SP) survey was carried out by Raven in the Unnamed Creek area. SP surveying has not been very popular in recent years due to more advanced geophysical methods that have better ground penetration. A SP survey is dependent on a natural direct current generated in the ground. It is cost effective and does not require elaborate equipment. It will respond to massive to semi-massive sulphide concentrations, graphite, to some extent local topographical features, and occasionally to sources that cannot be easily explained. A good SP anomaly generally registers as minus 100 milivolts. Massive sulphides and graphite concentrations can give anomalies to minus several hundred milivolts. The limitation of SP surveys is its effective depth penetration of less than 100 metres.

Raven's SP survey in the Unnamed Creek area found several SP anomalies. A few of them correlated with VLF-EM anomalies. The anomalies were trenched. Where bedrock was reached the anomalies often were explained by sulphide mineralized veins or graphitic structures. The survey proved to be a useful confirmation of geochemical anomalies and as a prospecting tool.

DIAMOND DRILLING

Noranda drilled 35 NQ diamond drill holes for a total of 2,452.5 metres between 1986 and 1987. Twelve of these holes were drilled on the Tommy Jack property. The location of all drill holes is shown in Fig. 4. Mineralized sections were split for assay and geochemical analyses. Drill core from drilling has been stored on the property and, apart from boxes that may have suffered too much weathering, should be available for examination.

Most of the holes were drilled to test geochemical anomalies. A few holes were drilled as fill-in or step-out holes from previous drill hole intersections. DDH 87-16 in the Unnamed Creek area was drilled to test mineralization observed at surface.

All highly anomalous gold and silver drill hole intersections are tabulated in Table 2. Four of these highly anomalous drill holes are located on the Tommy Jack property. Although the very strongly mineralized intercepts are quite narrow, the drilling shows that mineralization is sufficiently abundant that it could extend to mineable widths.

DISCUSSION OF RESULTS

Geologically the property is favourable for mineralization. A shallow marine sedimentary country rock often is susceptible to mineral deposition. The finer

DDH	From (m)	To (m)	Width (m)	g/t Au	g/t Ag
TJ 86-1	61.6	62.75	1.15	2.57	12.7
	78.0	79.0	1.0	3.63	23.0
TJ 86-2	42.2	45.5	3.3	2.01	35.3
	46.7	47.15	0.45	9.60	121.0
	54.6	55.6	1.0	2.09	2.7
TJ 86-4	24.1	24.9	0.8	8.90	151.0
	67.2	68.1	0.9	4.12	7.6
TJ 86-5	9.8	11.8	2.0	1.95	29.6
	21.6	28.2	6.6	4.30	83.6
TJ 87-1	12.9	13.9	1.0	1.89	164.0
	16.8	21.6	4.8	1.57	23.6
TJ 87-8	**50.1**	**51.0**	**0.9**	**5.04**	**37.0**
TJ 87-10	**8.1**	**11.6**	**3.5**	**1.00**	**27.0**
TJ 87-11	**4.0**	**6.5**	**2.5**	**2.54**	**158.0**
TJ 87-14	28.7	29.3	0.6	31.85	129.0
	38.2	39.6	1.4	1.99	5.0
	59.1	60.6	1.5	3.27	10.3
TJ 87-15	42.1	42.7	0.6	6.24	17.5
	49.8	50.3	0.5	7.68	27.1
	56.5	56.9	0.4	12.90	12.0
	69.4	70.6	4.25	4.25	17.6
TJ 87-16	**14.6**	**15.0**	**0.4**	**0.38**	**1380.00**
TJ 87-18	27.3	28.0	0.7	3.63	16.1
TJ 87-19	16.4	16.9	0.5	6.48	289.0
TJ 87-20	8.5	10.2	1.7	4.69	71.3
	16.4	16.7	0.3	7.75	42.5
TJ 87-22	17.2	17.4	0.2	13.00	46.2
	52.9	54.0	1.1	1.98	8.9
TJ 87-23	11.3	12.6	1.3	14.60	36.3
	13.7	13.9	0.2	48.50	1243.0
	22.3	23.3	1.0	3.77	80.9
TJ 87-25	4.2	4.3	0.1	40.60	274.0
	8.5	8.9	0.4	26.10	91.8

Diamond drill holes shown in bold type are on the Tommy Jack property of A. Raven
All other drill holes are on Warren property proximal to Tommy Jack

Table 2. SIGNIFICANTLY ANOMALOUS DRILL HOLE INTERCEPTS

grained shale and siltstone is more likely to yield to fracturing whereas more porous sandstone is a good host for spreading disseminated mineralization from its source. The abundance of narrow granodioritic to dacitic dykes is the likely source of mineralization. They are sufficiently siliceous to carry precious metal mineralizing solutions. Although the circular feature has not been explained adequately, it appears to be closely related to mineralization with the greatest abundance of mineralized veins occurring close to the rim of the feature. Structures, which are also partly indicated by linears, help provide channel ways for mineralizing solutions. Influence of the northeasterly regional fault to mineralization is not known but has affected the configuration of the carbonate altered zone that encompasses most of the Tommy Jack mineralization.

The difference between gold-silver mineralization northwest and west of the circular feature and silver-gold mineralization east of the feature may indicate a mineral zoning or a different pulse of mineralization. The formor is more likely. The vein zone area at Moret Ridge is outside the carbonate altered zone and distal from the circular feature. It is unlikely that it is zoning from the main mineralized area. It is more likely to be a different pulse of mineralization, whether related to an underlying satellite source or just a mere distal deposition of gold from the primary source.

Soil geochemistry has proved to be a useful exploration tool at Tommy Jack. It has led to the successful location of a large proportion of the holes drilled. Although not always was the same soil horizon sampled, geochemical soil anomalies could be identified. Geochemical soil sampling does not extend far enough to the south to delimit anomalies. Rock sampling has given a good indication of grades to be expected in underling veins, and as such favorably compliments soil sampling. Stream silt sampling is an early stage exploration tool. The property has passed the stage where additional silt sampling would be beneficial.

Magnetic surveying has had no direct influence on targeting drill hole locations. It could be used for more detailed alteration interpretation but would not benefit exploration significantly. VLF-EM has only partly indicated mineralized vein zones. Other electromagnetic methods may have served more purpose for exploration of sulphide zones. The SP survey proved to be a useful exploration tool at Tommy Jack as evidenced by Raven's hand trenching results. The extent of the survey, however, is limited to the Unnamed Creek area.

Hand trenching was most seriously attempted by Raven with generally favourable results. It greatly assists in deciding whether drilling is justified.

Drilling, although expensive, is the only definitive way of testing for economically mineralized zones. It was undertaken by Noranda in only the first two years of exploration and was based largely on initial soil geochemical surveys in the very northern part of the Tommy Jack property with favorable results. Since then

exploration surveys have progressed over a large part of Tommy Jack with similar mineralization indications that remain to be tested.

CONCLUSIONS AND EXPLORATION SUGGESTIONS

The Tommy Jack property claims a sizeable area with indicated precious and base metal mineralization. Previous work has been extensive in exploration surveys but only a small fraction of the property has been drill tested. Although new drilling targets currently exist on the property extensions to existing surveys are required and other types of surveys should be considered prior to comprehensive drill testing.

Mineralization consists of veins and stockworks hosted in clastic sedimentary rocks, dacitic and granodioritic dykes. The dacitic and granodioritic intrusions are intimately associated with mineralization. Adequate ground preparation such as faulting and fracturing combined with favourable lithology assist mineral deposition. At least two phases of mineralization occur and some differences in metalization in the main area may be due to mineral zoning.

Although the circular feature identified on Tommy Jack has not been fully explained, its relation to mineralization and possible mineral zoning appears to be significant. Air photo linears may prove important but a thorough ground examination in the areas of linear locations would be advisable.

It is not the intention of this report to provide specific recommendations since they would be dependent on funding available for continued exploration and results obtained. The primary purpose at this time is to suggest how to prepare the property for drill testing by exploration methods that are most likely to result in favourable drilling results.

Since geochemical soil surveys have been the most effective exploration tool, they should be extended to provide the maximum number of drilling targets so that the best ones can be selected. The Moret Ridge vein area should be surveyed as a second priority.

Of geophysical methods SP has been the most effective in finding mineralization. SP surveying should be done in areas of strongest geochemical anomalies. Electromagnetic methods other than VLF-EM should be considered under the advice of reputable geophysical contractors. Serious consideration should be given to induced polarization surveying to locate stronger disseminated and stockwork mineralized areas and to distinguish from geochemical anomalies caused by isolated veins.

Mechanical trenching with a small backhoe easily transportable by helicopter should be considered to test better coincident geochemical and geophysical

anomalies prior to drill testing. The backhoe can be used to prepare good drill sites where encouraging mineralization is encountered.

Additional drilling will be required but drilling targets have to be selected carefully. All drilling done will have to be helicopter supported with accompanying helicopter ferry costs and delay times due to weather. The amount of drilling required cannot be predicted until all surveys are complete.

Respectfully submitted,

January 18, 2002

A.I. Betmanis, P.Eng.

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STATEMENT OF QUALIFICATIONS and CERTIFICATE

I, Andris I. Betmanis, do hereby certify that:

1. I am a geologist residing at 775 Chelwood Road, Gabriola, B.C., V0R 1X1 and #308-1000 Bowron Court, North Vancouver, B.C. V7H 2V8.

2. I am a graduate of the University of Toronto with a degree of B.A.Sc. in Applied Geology (1965);

3. I am a registered member of the Association of Professional Engineers and Geoscientists of the Province of British Columbia, registration #8336;

4. I have practiced my profession as an exploration geologist for the past 32 years in Canada, western U.S.A. and Alaska, Central and South America, and the Caribbean primarily in the employ of Teck Corporation and associated companies;

5. This report is based largely on results of exploration projects carried out by Noranda Exploration Company Limited, Goldcap Incorporated, Intertech Minerals Corporation and Alan R. Raven on the Tommy Jack Property and incorporates data available in the public domain primarily from government sources. I have neither visited the Property nor field checked locations of claim posts. I am familiar with some similar mineral prospects in the general area;

6. I have no interest nor do I expect to receive any interest in the title or securities related to the Tommy Jack Property;

7. I consent to this report being used by Alan Raven or any related company or associate in providing informational data on the Property on the condition that parts of the report are not used out of context.

January 18, 2002
Vancouver, B.C.

Andris I. Betmanis
P. Eng. (B.C.)