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GEOLOGICAL INVESTIGATION
OF THE
SAM, SWING, ET AL. MINERAL CLAIMS
TAHTSA LAKE AREA, B. C.
OMINECA MINING DIVISION
93 E/11 W

Prepared for

Tahtsa Mines Ltd.

Arctex Engineering Services

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SUMMARY

The Tahtsa Mines Ltd. property is located in west-central British Columbia, 182 km south of Houston, B. C. Approximately 39 square kilometres comprise the contiguous claims which lie on the south side of Tahtsa Reach, a part of the Nechako Reservoir. Geological mapping and soil and stream sediment sampling were conducted during the 1981 field season. Sedimentary rocks of the Lower Cretaceous Skeena Group are overlain by a volcanic pile of andesitic to rhyolitic composition belonging to the Upper Cretaceous Kasalka Group. Hypabyssal (or exhalative) andesite-diorite appears to intrude these volcanics and sediments in the vicinity of two exploration adits. These drifts have been driven along sulfide veins coincident with a north-trending shear zone. Lenses or pods of galena within the vein structures contain up to 8.4 ounces Ag per ton, 2.62% lead and 1.26% zinc in widths up to 0.9 metres. The east half of the property is underlain by volcanic and sedimentary rocks of the Hazelton Group of Lower Jurassic age. Exploration in this area has been initiated. A zone of weak pyrite stockwork veining was discovered in the northern outcrop area which is coincident with an area of anomalous zinc in soil and stream sediment samples. Additional mapping and a grid layout for sampling are recommended for this area.

INTRODUCTION

The "Sam" claims, owned by Tahtsa Mines Ltd., are located in the Tahtsa Lake area of the Omineca Mining Division, B. C. The property straddles the east end of the Kasalka Range, bordered on the north by Tahtsa Reach, which is part of the Nechako Reservoir.

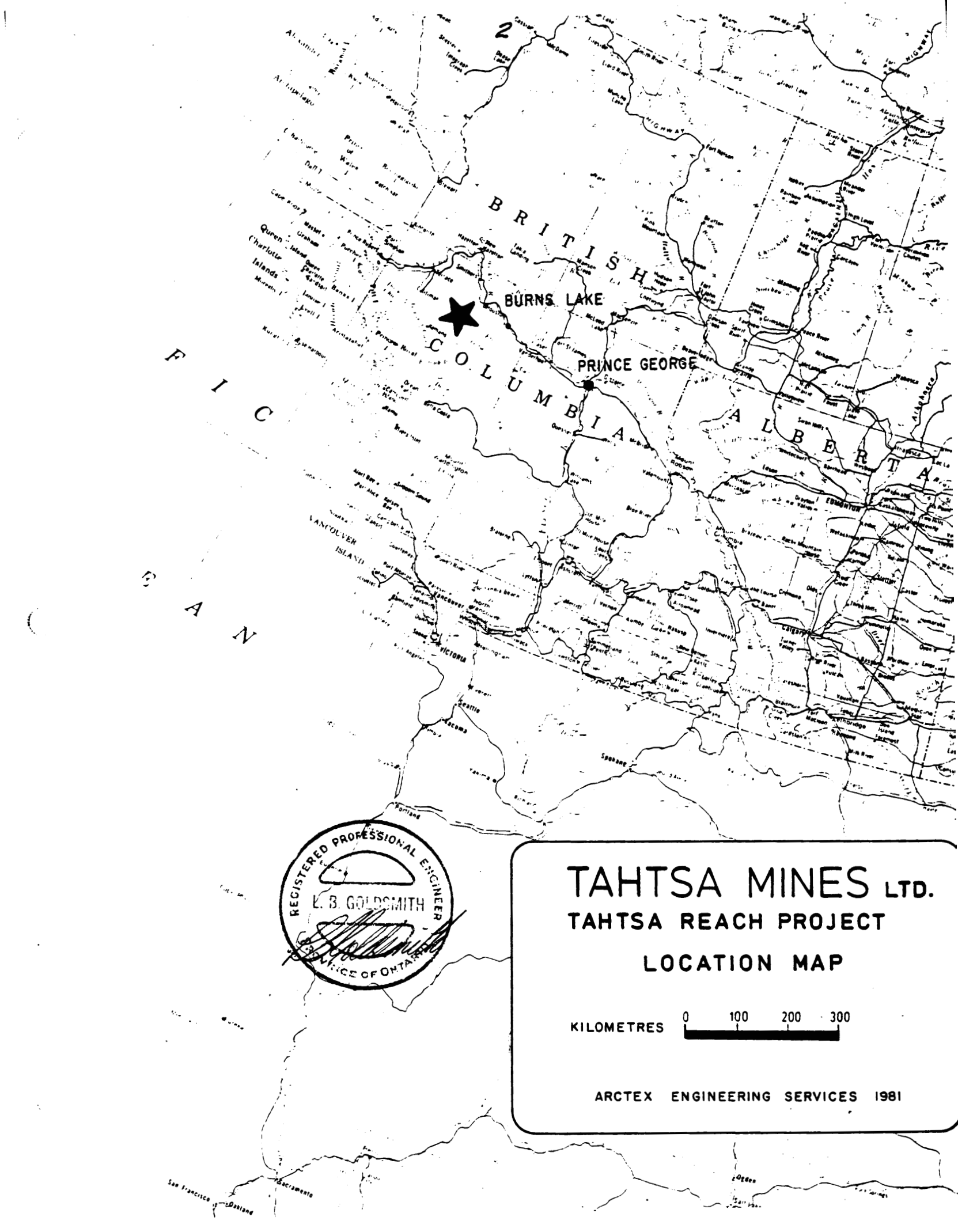
A gravel road connects the north shore of Tahtsa Reach with Burns Lake, B. C., 182 km to the northeast,or Houston, B. C., 110 km to the north. A short crossing of the Reach by launch or raft is required to arrive at the camp which is located near the north boundary of the property. The 1:10,000 geology map shows the geographic setting of the property.

During the 1981 field season a substantial amount of property was added to "Sam" claims of Tahtsa Mines Ltd. Four large claims and two fractions were added to the existing claims, bringing the total to approximately 39 square kilometres.

Between July 30 and September 7, 1981, Arctex Engineering Services conducted a geological survey of the property. The two existing adits were examined and sampled, and a geological map of the property was prepared. Recommendations regarding future exploration for lead-zinc-silver veins, large tonnage-low grade gold deposits, and copper-molybdenum "porphyry" targets are herein stated.

HISTORY

Early work on the property was carried out by George Seel and the Tahtsa Mining Company during the late 1920's. The upper tunnel was driven along what is now called the Captain Vein. Since 1938, Clifford "Cap" McNeil has prospected the Swing Peak area, and is still involved in exploration at the former "Swanell Group" of claims. A limited amount of diamond drilling has been conducted from surface on the Captain Vein. Evidently, Tom McQuillum directed four short core holes totalling <120 metres during the 1962 field season.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REGISTERED PROFESSIONAL ENGINEER
E. B. GOLDSMITH
PROVINCE OF ONTARIO
TAHTSA MINES LTD.
TAHTSA REACH PROJECT
LOCATION MAP
KILOMETRES 0 100 200 300
ARCTEX ENGINEERING SERVICES 1981

Improvements to the property include the upper (circa 1928) adit which is 115 m (376') long; the lower (circa 1980) adit and raise which is 27 m in horizontal length and 24 m vertical; a landing at both sides of Tahtsa Reach; a camp consisting of 4 cabins, mess hall, drying and laundry building, and a machine shop-generator shed, all located on the south shore of Tahtsa Reach. A four-wheel drive road has also been constructed from camp to the lower adit, a distance of 4.3 km with a vertical gain of 550 m (1800').

CLAIM STATUS

The accompanying map at 1:10,000 scale shows the "Sam 1" and "Sam 2" claims which cover the original prospect area and the new claims staked during 1981.

The "Swing" 1 through 4, "Long", "Short", and "Deuce" 1 and 2 were staked in 1981. Total acreage held by Tahtsa Mines Ltd. is approximately 3900 hectares.

REGIONAL GEOLOGICAL SETTING

The "Sam" and other claims of Tahtsa Mines Ltd. lie on the eastern flank of the Coast Range Plutonic Complex approximately 25 km east of the main granitic masses of the range. The area near the property is underlain by sedimentary and volcanic rocks of the Middle Jurassic Hazelton Group. Overlying or in fault contact with Hazelton rocks are Lower to Upper Cretaceous sedimentary and volcanic rocks of the Skeena and Kasalka Groups. They form the basement and main volcanic assemblages of the Tahtsa property.

Intrusive rocks near the map area range in age from Late Cretaceous to Eocene and vary in composition between diorite, quartz diorite, granite, and feldspar porphyries. Although only one stock of dioritic composition intrudes the property at Kasalka Butte, dikes of basaltic to rhyolitic composition are common.

ROCK UNITS ON THE PROPERTY

Hazelton Group - Lower Jurassic

In the eastern part of the property ("Long" and "Short" claims) sedimentary and volcanic rocks have been assigned to the Telkwa Formation of the Hazelton Group. A traverse along the eastern flank of Kasalka Butte releaved abundant exposures of reddish-brown to dark green andesite and andesite tuff which contained occasional calcite amygdules and locally intense quartz, epidote and hematite. Along the south shore of Tahtsa Reach, north of Kasalka Butte, conglomerate, composed predominantly of red to green volcanic clasts and a greenstone with weak irregular calcite veins, are exposed. Slightly to the west black, cherty shales strike northerly and dip nearly vertical near a fault contact with pale green tuffaceous rocks.

Other sedimentary and volcanic rocks have been mapped in the "Long" claim but none contained significant mineralization.

As can be seen from the accompanying 1:10,000 scale claim and geology map, a major fault has been mapped by Woodsworth (1980), which forms the western boundary of the Hazelton rocks.

Skeena Group - Lower or Middle Cretaceous (Albian)

West of the north-trending fault that bisects the "Deuce" 1 and 2 claims, abundant exposures of black fissile shale and siltstone can be seen in the first major stream east of Swing Creek. They commonly display carbonaceous partings, traces of pyrite and calcite veinlets. Ammonoid fossils are also common.

Within the area of the 1:5000 scale geology map the dark sedimentary rocks of the Skeena Group appear to form a basement for overlying volcanics. Black shale, grey siltstone and grey-brown sandstone are exposed sporadically along the lower slopes of the two prominent east-west trending ridges within the "Sam" and "Swing" claims, and also along a large portion of Swing Creek below 1220 m (4000 feet) elevation. Bedding attitudes are commonly oriented east-west and dip from 10 to 35 degrees to the south. Near faults and dikes, attitudes are more contorted. Thickness of the unit may exceed 300 m (1000 feet) as approximated from the Swing Creek exposures.

Kasalka Group - Upper Cretaceous

During mapping at the Tahtsa property, a crude subdivision evolved within the volcanic pile of the Kasalka Group. Although it is far from complete, it does help to visualize the stratigraphy.

At the base of the Group, a volcanic conglomerate composed of dark reddish-brown to dark grey-green clasts of andesite, basalt and minor red to green chert appears to lie conformably upon the Skeena Group. This is especially true in the upper reaches of Swing Creek and vaguely so on the north side of the north ridge in the "Swing 2" claim.

Above the conglomerate is the main volcanic complex which includes andesite, andesite tuff breccia, dacite, dacite porphyry, rhyolite and rhyolite breccia. Contacts between the units are difficult to distinguish; no doubt many gradational zones exist. Alteration, particularly the abundant limonite oxidation of pyrite and pyrrhotite, masks the inherent texture of the rock. The geology map (1:5000) depicts some of the more readily distinguishable units. Petrographic samples collected in the vicinity of the Captain Vein reveal a more intrusive texture to the rocks. Porphyritic dacite, which could be a near-surface intrusive or extrusive igneous rock proximal to its vent has been grouped within the map-unit termed Andesite-Diorite. Previous Geological Survey maps (Duffell, 1959) indicate a light coloured, porphyritic, plutonic rock as outcropping near the upper adit and extending southerly across the peak (formerly called Swing Peak). This unit was not identified but it may be part of the andesite-diorite of the current study.

Most of the mineralized shear zones which have been targets of silver and lead exploration transect the volcanic (and intrusive?) complex in a northerly direction and are located on the north slope of the south ridge ("Sam" 1 and 2 claims). At about 1830 m (6000') elevation on this ridge a gently-dipping sedimentary unit is encountered. It nearly circumvents the south ridge and is less than 35 metres thick. Typically the sediments are well-indurated, finely-banded siliceous shales, chert or grey siltstone. However, in the west-central portion of the "Sam 1" claim on the north side of the south ridge below the icefield, a dark grey to black conglomerate with strong chlorite is exposed. It is at the same general horizon as the other finer-grained sediments to the east and southeast.

Above the sedimentary unit are more volcanics of intermediate to felsic composition. They are less iron-stained and of a fresher nature on the south ridge and along the west margin of the Tahtsa property. A large proportion of this unit is composed of grey porphyritic andesite or dacite conglomerate or breccia with clasts of angular to well-rounded lighter-coloured porphyry. Near-horizontal bedding attitudes are visible in the flows and beds in the cliffs above the westernmost glaciers.

No bedded sedimentary unit was found within the volcanic complex in the north ridge ("Swing" 1 and 2 claims) as was seen on the south ridge, therefore a stratigraphic section above the Skeena Group basement is much more questionable. Most of the north side of the ridge is similar to the previouly described porphyritic andesite or dacite conglomerate or breccia. Rhyolite or rhyolite breccia is commonly associated with intense argillic altered areas and gossanous or ferricrete zones.

Intrusives

Only one large intrusive body, other than the previously described high-level andesite-diorite, was seen on the property. In the west-central part of the "Long" claim a northeast-trending ridge almost 1 km long shows a fine-grained diorite with weak chloritic alteration and traces of disseminated pyrite.

Dikes of basaltic to rhyolitic composition ranging in size from a few centimetres to 10 metres in width are common throughout the property. They appear to bisect all rock units. Therefore, at least some of them may be the youngest rock types in the area. Andesite and basalt are the most common dike lithologies. Occasionally they are amygdaloidal with calcite or quartz fillings. Dacite is also common; latite porphyry and rhyolite are infrequent. Felsite dikes also fall into the light cream-coloured category.

In the 1:5000 geology map area most dikes can be seen to trend in a northerly direction, parallel to the predominant shear and fracture zones. Length of the dikes is certainly variable and continuous exposures are not seen. Nevertheless, some are known to exceed at least 1 km.

Of special note is a fine-grained diorite dike on the north side of the north ridge in the "Swing 4" claim. It has moderate chlorite alteration of

mafic minerals, traces to 1% pyrite, and is moderately magnetic. It outcrops in a stream bed which also shows weak stockwork pyrite veining in fine-grained sediments and/or volcanics. The dike continues to the northwest to an area of moderately high values of zinc in soils.

In the south-central part of the "Sam 2" claim a small outcrop of argillic to weak sericitic-altered granitic rock with a trace of disseminated chalcopyrite was found. It may have been a small dike although exposures in adjacent outcrops were not found.

South of the "Sam 1" claim numerous boulders of talus were found which have fallen from the very steep slopes in the southwest part of that claim; these are of medium-grained, unaltered granodiorite.

STRATIGRAPHY

The oldest rocks on the property are the Hazelton Group sedimentary and volcanic rocks in the eastern third of the claim area. Survey maps show them as belonging to the Telkwa Formation of Lower Jurassic (Sinemurian?) age. Although the Hazelton Group may exceed 3,000 metres in thickness, the thickness of the Telkwa Formation is not known.

In fault contact with the Telkwa Formation on the west is the Skeena Group of Lower to Middle Cretaceous age (Middle Albian). It is primarily dark, fine-grained sedimentary rock and may exceed 300 metres.

Lying conformably above the Skeena Group is the volcanic complex of the Kasalka Group. Numerous flows, several sedimentary units and one or more closely related hypabyssal intrusives are included in this group. The thickness of this volcanic pile could be as much as 900 metres in the claim area.

In addition to numerous dikes of a wide composition outcropping throughout the property, a stock of fine-grained diorite intrudes the "Long" claim. It has been related to the Kasalka Intrusions (Woodsworth, 1980) and may be of Late Cretaceous or Early Tertiary age.

STRUCTURE

Fault zones from a fraction of a metre to several metres in thickness are very common in the "Sam 1" and "Sam 2" claims. Their trend is generally 335° to 025° and dip near vertical. In many of these shears, carbonate or sulfides

have formed in or near the ubiquitous clay. Topographically these shear zones have been accentuated and form the strong network of subparallel drainages on either side of Swing Creek. On the south side of the south ridge these fracture zones reappear and host sporadic sulfide mineralization.

Toward the head of Swing Creek near the northwest corner of "Sam 1" claim, a very strong east-to-west trending fault zone displays abundant clay and broken rock cemented by limonite and/or silica. Although not seen farther to the east it may contribute to the location of Swing Creek itself and perhaps could be related to the clay and ferricrete deposits just north and parallel to Swing Creek.

East-west trending faults were also found in the north side of the north ridges. In addition, several strong topographic linear features which are parallel to these faults are present on the top of the north ridge.

As previously mentioned a strong fault contact appears to have brought Hazelton Group rock in contact with the Skeena Group at the west side of the "Long" claim. A diorite stock has also been intruded along this fracture zone.

A joint system, forming tabular rock outcrops parallels the north-trending shear system. This is clearly apparent in the cliff faces above the icefield, just west of the Bennett Lead in the central part of the "Sam 1" claim.

Folding on a small scale can be seen in the Skeena Group near faults or dikes, particularly in Swing Creek below the road crossing. Larger scale folding was not seen but regional dips of the Skeena Group show a east-west trend with southerly dip underlying the north ridge. At the south ridge dips on overlying (?) beds indicate a more northerly inclination. Perhaps a synclinal axis coincides with Swing Creek.

MINERALIZATION

As can be seen from the mineralization and alteration map, limonite and iron stain resulting from the oxidation of pyrite, pyrrhotite and to a lesser extent from mafic rock-forming minerals is abundant on the property. The rusty hills and mountainsides of the Tahtsa property are distinctive and can be seen from many kilometres distant.

Much of this iron can be attributed to the original composition of the volcanic rocks. Mapping has shown that a band of iron stain immediately below

the upper sedimentary unit on the south ridge appears to circumscribe the mountain just as do the shales. Strong limonite on the north ridge appears to follow certain conglomerate or breccia "tongues" or flow features.

Pyrite and limonite also coincide with shear or fault zones. Often brecciation has taken place and surficial oxidation has left gossanous limonite encrustations. In several of these shears, particularly the north-trending shears, galena, sphalerite, chalcopyrite and more rarely tetrahedrite and jamisonite ($Pb_4Fe\ Sb_6S_{14}$) have formed. Manganese is common at the surface where shears contain polymetallics. Calcite or a carbonate breccia is also common in many of the shear zones.

Geology and assay location maps have been drawn of the upper and lower adits which are located on the Captain Vein. The lower adit and raise are partially blocked with debris and do not permit a good examination of the vein and shear zone. Only the surface opening of the raise revealed galena mineralization. The majority of the raise had been filled with surficial debris.

The upper adit or drift follows the shear zone and associated sulfide mineralization for 87 or its 114.6 metres. Galena, sphalerite, pyrite, and rarely tetrahedrite occur as stringers or veins up to 5 cm within the shear zone, most commonly on the east wall. Although shears or leads are continuous, sulfide mineralization is intermittent. Most sulfide veins pinch out within 5 to 10 metres of length.

At 1768 m (5800') elevation, 320 metres south and on strike with the Captain Vein is the Captain Vein Extension. It trends N10E. Its orientation suggests that the two veins may be continuous beneath the talus cover. However, epidote and sphalerite content are much higher and brecciation is more pronounced than in the Captain Vein. A diamond drill hole had been cored to intersect this vein at a shallow depth. Unfortunately the core was scattered and incomplete. It evidently was drilled during the early 1960's when other holes were cored on the Captain Vein. No mineralization was observed in the remaining core.

The #2 vein outcrops near a major north-trending stream, 200 metres east of the Captain Vein. The vein or veins are exposed sporadically along 150 m of strike length and 100 m of vertical relief. Galena, sphalerite and pyrite with strong manganese oxide resemble the Captain Vein very closely. The main

shear zone strikes N20E and as with the Captain Vein sulfides also occur in fissures oriented at an oblique angle to the main shear.

The Bennett Lead is another vein-shear zone located 300 metres southwest of the upper adit at an elevation of 1677 m (5500'). Only the lower of 4 or 5 trenches is still free of debris. Here, traces of galena and sphalerite are visible in two small parallel shears. In float above this trench a boulder of massive galena was found which must have come from a vein at least 15 cm thick. The zone trends N20E and is at least 35 metres long.

At least three other sulfide veins in shear zones are present on the property and are shown on the 1:5000 mineralization map. One of these veins is in the southwest corner of the "Swing 4" claim. It trends to the northwest and contains abundant carbonate and up to 4% zinc. Exposed along the creek bed where this vein is located is a pervasive, weak stockwork of pyrite veinlets which continue for at least 400 metres. The north end of this zone of moderately silicified and alteration appears to decrease in exposures to the north. However, the presence of a diorite dike and anomalous zinc geochemistry to the northwest may indicate additional mineralization in that area.

Several zones of silicification and argillization may be questionably attributed to hydrothermal alteration. The areas mapped as rhyolite contain abundant silica and occasionally a few feldspar phenocrysts. Some of the silica may have been introduced subsequent to rhyolite deposition, especially in those areas closely associated with intense clay and/or ferricrete formation. For example, near Swing Creek in the south side of the north ridge and in the northwest side of the north ridge, siliceous rhyolite (?), clay, and ferricrete (limonite cemented rock fragments) are closely associated.

There are also several patches on the north side of the south ridge which have intense silicification, and pyritization. However, metallic mineralization other than iron is not present.

ASSAYS AND GEOCHEMISTRY

All rock, soil and stream sediment samples collected for analysis are listed in the Appendix. A brief description of the important results is as follows.

The upper adit was sampled along the shear zone at 3-metre intervals across the back of the drift. Of 39 channel samples collected, the highest sample assayed 8.44 ounces silver per ton, 2.62% lead, 1.26% zinc, and 0.09% copper across 0.9 metres. The average of samples contained less than 1 ounce silver per ton and less than 1% combined lead and zinc. As an indicator of high-grade values, a sample of a 5 cm galena vein assayed 56.34 ounces silver per ton, 46.6% lead, 0.08% zinc, 0.1% gold and 0.006 ounces gold per ton.

The lower adit was also sampled on 3-metre intervals over widths of approximately 2.5 metres. Minor lead and zinc and a high value of 0.44 ounces silver per ton were obtained.

As can be seen from the assay maps other vein-shear zones on the property contain significant amounts of lead, zinc and/or silver. Of note are the Bennett Lead which contains up to 103 ounces silver per ton in high-grade samples, the Captain Vein Extension with greater than 10% sphalerite, the #2 vein with up to 11.72 ounces silver/ton, and on the north side of the north ridge where a sphalerite-carbonate vein assays 4.5% zinc.

In at least 3 stream drainages on the slopes of the north ridge, a white precipitate is currently being deposited on stream detritus in a restricted slope length of up to 200 metres in the channels. A geochemical sample of a small bag of heavily coated pebbles contained 1300 ppm lead, 135 ppm zinc, and 6.5 ppm silver. These values are unexpectedly high. The source of metals is unknown and should be sought.

A combined soil and stream sediment sampling survey was conducted along the north slopes of the property. Seventy-one samples were collected and analyzed for copper, lead, zinc, silver, molybdenum and gold. Locations and values are plotted on the 1:10,000 map.

A probability plot was constructed of the stream sediment and soil sample geochemical abundances of zinc, where n = 71. A threshold of 170 to 214 ppm and an anomalous value of greater than 214 ppm were determined. Only two values occur in the high population, these being 385 and 390 ppm zinc. Along with 4 of the 7 samples of threshold value the anomalous values are grouped in the area below and to the west of the weak stockwork pyrite zone in the southeast corner of "Swing 4" claim.

Copper, molybdenum and gold did not display two populations or anomalous geochemical patterns. Lead values are slightly elevated in the same locations as the zinc values. Silver appears to confirm the zinc anomaly with values of 3 to 7 times background. Probability plots were only constructed for zinc, as the other elements did not display a wide enough range to suggest useful analysis of data.

Fourteen stream sediment samples were collected on the south side of the north ridge from drainages which empty into Swing Creek. Two of the samples were anomalous in zinc, with 258 and 310 ppm values.

GEOPHYSICS

Magnetometer and VLF-EM surveys were completed in the vicinity of the Captain Vein. The grid is shown on the 1:5000 scale geology map. Linear VLF-EM responses correspond to the trench of shear zones which host silver-lead-zinc mineralization. A separate report of the geophysical interpretations is being prepared.

CONCLUSIONS

During the 1981 field season geological mapping was concentrated in the area of the adits and the north and south ridges. Mineralization had previously been known in the Captain Vein and its extension and several other similar shear zones on the north side of the south ridge within the "Sam" 1 and 2 claims. Shear and vein zones were also discovered on the south side of the north ridge suggesting throughgoing mineralized structures which may transect the south ridge. Silver, lead and zinc mineralization is limited to these shear zones. Width of sulfide veins seldom exceeds 5 cm; rare pods may be found which approach 15 to 20 cm in width. Strike continuity of sulfide veins within shear zones seldom exceeds 10 metres.

As evidenced by the amount of shearing and alteration (including argillic, silicic and carbonate) in the Captain Vein-Shear Zone, a potential was thought to exist for wide zones (10 to 15 metres) of low-grade silver mineralization. However, geochemical results did not support this concept.

Exploration for veins, pods or low-grade zones of silver, lead and zinc would be costly and the probability of encountering larger zones of richer ore than is exposed near or in the adits of the Captain Vein is not encouraging.

Zones of intense silicification or argillic alteration were mapped and sampled as were ferricrete or intensely limonitized zones. No significant base of precious metal values was encountered.

A zone at least 400 metres in one dimension was discovered on the north side of the north ridge (southeast corner of "Swing 4" claim) which contains a weak pyritized stockwork of veins and fractures. This zone presents the possibility of a sulfide halo near a copper or molybdenum porphyry. Rock geochemistry of this zone (samples collected at 50-metre spacing) did not contain significant metallic values. Nevertheless, there is some encouragement from zinc and silver values in soil and stream sediment geochemistry from this general area. Values up to 390 ppm zinc and 1.5 ppm silver were detected.

A curious and as yet unexplained high geochemical value has been detected in what is apparently a white encrustation or precipitate on detritus of several streams on the north ridge. Evidently the hydrological regime and the change in the chemical balance of the water is depositing base metal ions. Further investigation of this curiosity is required before any conclusions can be drawn.

Exploration of the "Long" and "Short" claims, which are underlain by Hazelton Group rocks and at least one large diorite intrusive, has only begun. Massive sulfide or porphyry deposits are realistic targets in this area, but initial mapping, prospecting, and geochemistry did not indicate zones of mineralization.

RECOMMENDATIONS

Anomalous zinc values in soil and stream sediments and less anomalous but significant silver values in the southern part of the "Swing 3" and "Swing 4" claims should be investigated. These samples are in the general vicinity of the weak stockwork of pyrite veins and a shear zone containing 4% zinc. A grid with 100-metre spacings should be planned and enough samples collected on the lower slopes of the north ridge to delineate the anomaly. Additional geological mapping should be undertaken in this area. If this phase of

exploration is encouraging a programme of I.P. (induced polarization) geophysics is recommended to explore for sulfides.

During additional geological mapping, a brief investigation should be made of the white precipitate currently being deposited on the gravels. Additional samples would help to clarify its importance.

The "Long" and "Short" claims were examined only in a cursory manner. Several days of prospecting, sampling and mapping on these claims are warranted.

COST ESTIMATE

Phase I

Geological mapping, grid layout and sampling of 1 square kilometre above zinc anomalies. General prospecting on other portions of the claim group.

Geological mapping, sampling and grid layout		$15,000	
Prospecting		8,000	
Geochemistry and assays		2,000	
Camp supplies		5,000	
Camp maintenance		10,000	
Travel, accommodation, vehicles		4,000	
Supervision		4,000	
Reporting		6,000	
		$54,000	
Contingencies @ 10%		5,400	
	Total Phase I	$59,400	$ 59,400

Phase II

Geophysics: I.P. on delineated soil geochemical target.

I.P. survey on approx. 1 sq km using 100-m line spacings - 11 km @ $1500/km		$16,500	
Camp maintenance, cook		5,000	
Camp supplies		5,000	
Travel and accommodation		5,000	
Supervision		5,000	
Reporting		6,000	
		$42,500	
Contingencies @ 20%		8,500	
	Total Phase II	$51,000	$ 51,000
	TOTAL		$110,400

All of which is respectfully submitted,

REGISTERED PROFESSIONAL ENGINEER L. B. GOLDSMITH PROVINCE OF ONTARIO

Locke B. Goldsmith, P.Eng.
Consulting Geologist

Paul Kallock
Geologist

Vancouver, B. C.

November 10, 1981

GEOLOGIST'S CERTIFICATE

I, Paul Kallock, do state: that I am a geologist to Arctex Engineering Services, 301-1855 Balsam Street, Vancouver, B. C.

I Further State That:

1. I have a B.Sc. degree in Geology from Washington State University, 1970.
2. I have engaged in mineral exploration since 1970, both for major mining and exploration companies and as an independent geologist.
3. I have co-authored the report entitled, "Geological Investigation of the Sam, Swing, et al. Mineral Claims, Tahtsa Lake Area, B. C." The report is based on my fieldwork carried out on the property and from previously accumulated geologic data.
4. I have no direct or indirect interest in any manner in either the property or securities of Tahtsa Mines Ltd., or its affiliates, nor do I anticipate to receive any such interest.
5. I consent to the use of this report in a prospectus or in a statement of material facts related to the raising of funds.

Paul Kallock

Paul Kallock,
Geologist

Vancouver, B. C.

November 10, 1981

ENGINEER'S CERTIFICATE
LOCKE B. GOLDSMITH

1. I, Locke B. Goldsmith, am a Registered Professional Engineer in the Province of Ontario and a Registered Professional Geologist in the State of Oregon. My address is 301, 1855 Balsam Street, Vancouver, B. C.
2. I have a B.Sc. (Honours) degree from Michigan Technological University and have done postgraduate study in Geology at Michigan Tech, University of Nevada and the University of British Columbia. I am a graduate of the Haileybury School of Mines and am a Certified Mining Technician. I am a member of the Society of Economic Geologists, the AIME, and the Australasian Institute of Mining and Metallurgy, and a Fellow of the Geological Association of Canada.
3. I have been engaged in mining exploration for the past 22 years.
4. I have co-authored the report entitled, "Geological Investigation of the Sam, Swing, et al. Mineral Claims, Tahtsa Lake Area, B. C." dated November 10, 1981. The report is based upon fieldwork and research supervised by the author.
5. I have no ownership in the property, nor in the stocks of Tahtsa Mines Ltd.
6. I consent to the use of this report in a prospectus or in a statement of material facts related to the raising of funds.

Respectfully submitted,

Locke B. Goldsmith

Locke B. Goldsmith, P.Eng.
Consulting Geologist

Vancouver, B. C.
November 10, 1981

REFERENCES

Bullis, A. R. (1953) Report on Captain Group Swing Peak, B. C. Private report.

Duffell, S. (1959) Whitesail Lake Map-Area, B. C. GSC Memoir 299, Map 1064A.

Ogryzlo, Peter (1980) Map and Notes, Tahtsa Mines Ltd. Sam Claims, Swing Peak 93 E 11. Consultants report.

Sookochoff, L. (1980) Geological Report on the Sam Claim for Tahtsa Mines Ltd., Pan American Consultants Ltd.

Woodsworth, G. J. (1980) Geology of the Whitesail Lake Map-Area 93 E B.C. GSC OF 708.